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Impact of Sanctions on Russian and Chinese Stock Markets

- An empirical analysis based on stock data

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Abstract

An ongoing war in Ukraine turned out to be the biggest event of 2022. Allied nations decisively imposed series of sanctions that sent Russian economy into a turmoil. As shock and awe of the first weeks of invasions dissipated, academia began to get supplemented by new views and ideas of scholars on the consequences and prospects of war. In this paper we provide a fresh outlook on sanctions by analyzing stock prices in Russia and China.

Stock prices provide multiple storylines, and thus our analysis covers topics like insider trading, medium-term outcome, market rebound and covert trades. To examine consequences of sanctions on Russia we utilized a multi-layered approach by looking into logarithmic returns, correlations, and betas of companies. We discovered compelling results that informed that Russian companies incurred severe losses, were not involved in insider trading and were the only ones that rebound in the short aftermath of war.

To examine behaviour of stocks in China we applied the event study method and difference in difference empirical analysis method. Results showed that China as a neutral country is less affected by the sanctions. However, some Chinese companies benefited due to the shift of Russian economic transactions from Europe to Asia.

Acknowledgement

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1. Introduction

Russia invaded Ukraine on February 24, 2022 and that have sent multiple ripples through international geopolitics. A retaliatory response in the form of sanctions initiated by the states from a Western bloc was far more extensive and profound in nature than in the previous occurrence of 2014. Not only did it concern individuals and certain pinpointed elements of the Russian economy but was much wider in coverage. The majority of global companies chose to abandon their assets and investments in Russia, thus leaving the aggressor without a supply of goods, expertise, and access to world markets necessary to effectively sustain economic development.

The aim of this research is to answer some major questions related to sanctions. By analyzing stock prices of Russian and Chinese companies we intend to retrieve valuable insights on how wide spanning they are at their ability to reflect events of different magnitude, how effective at unveiling covert affairs and, how good at foretelling occurrence of cases before they happen.

In our approach, we look into the stock performance of Russian and Chinese companies to answer our hypotheses related to direct and indirect consequences of sanctions. Although some critics like to spread doubts on stock prices' ability to build reliable conclusions on economy's performance, we argue that its pros outweigh cons and represent one of the best ways to measure efficiency of sanctions, especially in circumstances like these. Chosen class of dataset has a solid list of advantages that allow us to make a multitude of reflections and remarks about current events, as well as about markets in general.

First of all, Russian companies are the main target of sanctions, hence react first in the chain of Russian economy and serve as a function of subsequent reactions in GDP, unemployment, and inflation. They vastly outclass economic KPIs or companies' financial statements at the reaction speed and granularity of data. That is due to KPIs and statements getting released on quarterly or yearly basis and not providing the required number of inputs to make strong arguments on how effective sanctions are. Stock prices incorporate all current information and consequently are sensitive enough to provide clues on every event, political comment, or sanction right at the time of occurrence. This provision allows to see how deeply a sanction package cuts at the time of announcement even before it gets enacted. It is a leading indicator, which by some have been identified as overly sensitive, however its effectiveness

in providing a transparent and immediate outlook dwarfs those of lagging economic KPIs and financial statements.

It is also true that stock prices are far more reliable, when one takes into consideration that due to propaganda, economic KPIs reported by Russia could be a subject of distortion by the government with the aim to convince general public that sanctions are futile. Additionally, KPIs are generally hard to interpret at unstable periods like sanctions. A great example is if inflation appears to be stable, but oil prices, upon which Russian economy is dependent, are dropping, while other goods are getting more expensive, both detrimental to economy. One another sensible instance is if interest rates are calm, however they are such due to credit-rationing when many Russian firms cannot get hands on the credit. In both illustrations, stock prices will perhaps be the first to demonstrate that in reality the economy is troubled.

Utilization of these strengths will allow us to answer several hypotheses.

- Firstly, it will help with investigating insider trading.
- Secondly, provide a clear outlook on how Russian stocks performed throughout war.
- Thirdly, give insights on the magnitude of market correction.

Another great trait of stock prices lies in their capacity to display phenomenon that could be otherwise hard or impossible to track. For example, while an attempt to observe prices on black markets would be futile, any trades that were concealed from the general public still get shown by stock prices. This feature is particularly relevant for our analysis of Chinese stock market.

China is one country that did not cut the majority of its economic ties with Russia. Based on multiple statements by its government officials where West is blamed for excessively punitive measures and its reluctance to express discontent towards invasion of Ukraine, we propound that China is not as neutral. It appears that it is trying to keep a balance between trade relations with the West and its own interest in the pursuit of becoming a dominant power. The latter claim is not an overstatement considering that in the past decades we witnessed numerous occasions when Chinese government acted and behaved in opposition to Western democratic values. Being an authoritarian state, which has lots of resemblance with political structure of Russia, it has several times acted in a rather aggressive manner to its own neighbors. Based on the past history it may be naïve to think that Chinese and Russian interests are not aligned. Both are working hard to challenge the balance of power that in the past

decades since the collapse of the Soviet Union has been dominated by the US and its allies. A careful observation of global geopolitics shows consolidation of authoritarian states into their own form of alliance helmed by China. Further delve is not within purview of the paper. In our research we leave aside many implications of this consolidation, except keeping one that explains why China has interest in the success of Russia in Ukrainian war.

China claimed that it has not been exporting military goods or providing Russia with alternatives for sanctioned goods. These claims and reluctance to openly support Russia are driven by apprehension of getting sanctioned themselves. Despite having interests tight closely to those of Russia, the majority of Chinese consumers and suppliers are countries of the Western bloc. Around half of all trade, it conducted in 2021 falls on the USA, Hong Kong, Japan, South Korea, Germany, Netherlands, United Kingdom, Australia, all staunch accusers of Russian invasion. Despite being a strong motive to dissuade China from providing any support to Russia, it is still debatable that there were some covert deals in which assistance have been provided. We aim to investigate that.

The government and the largest Chinese companies are not within the scope of our research, because any of their conduct with Russia would have been easily identified and sanctioned. Instead, we focus on the small and medium sized firms, whose actions are not easily detectable on the radar. The best way to do that is by analyzing their stocks. Stock prices are able to reflect both public and concealed information, and thus by conducting an empirical observation of Chinese stocks, we should be able to discern if there have been obscure changes in trading patterns with Russia and consequently find out whether our presumption is correct.

2. Literature review

The field of sanction applied on Russia is relatively new in the academic literature. Nevertheless, due to gravitas of situation and number of ripples that were sent through global markets, it has been rapidly complemented by new research that varied in its methodology approach, data, and the observation angles. An interested individual would be able to introduce oneself with related papers that began to get written in 2014, when in aftermath of annexation of Crimea, the first round of sanctions got slapped on Russia. However, accrual of new material has accelerated especially in recent months after Russia invaded Ukraine, and its consequences were discovered not just within financial structures and economies of belligerents, but practically in all global markets. In the past months, scholars employed diverse sets of tools to pinpoint magnitude of losses incurred by various stakeholders. Many go for implementing spill over effect into their work, where losses for all parties are being analyzed.

Described spill over effect is discussed by Sedrakyan (2022) where the object of study are transition economies of past-Soviet Union countries. Their economies are tied closely to Russian yet get often neglected from the scrutiny on the effect of sanctions. While her analysis covers only the period of 2014-2018, drawn conclusions are quite relevant to our case where the scope of analysis goes beyond Russia. It is being argued in the paper that although sanctions of 2022 are more severe than those in 2014, they have less impact on Russia. That is due to elevated oil prices and preparedness of Russian government to imposed sanctions. Sedrakyan stresses the necessity to attract a more diversified group of sanction senders, instead of limited number of large players.

In addition to that, Qureshi, Rizwan, Ahmad, Ashraf (2022) studied eight countries that are closely involved in the conflict and imposition of sanctions. They found that while European countries and the US are quite susceptible to spill over effect of sanctions, China showed the exceptional resilience to systematic risk and ended up being the least harmed party. They advise regulators to be vigilant to further consequences of systematic risk.

In their paper Estrada, Koutronas (2022) add a new term of a trade suffocation that affects macroeconomic foundations in both parties in the short run. They advise that searching for alternatives will be a gradual rather than sudden process, given the socioeconomic differentials across countries and assert that reverse globalization would be beneficial for the

trade efficiency. They argue that semi-autonomous regional blocs will allow to decentralize value chain and generally improve trade efficiency.

Perdana, Vielle, Schenckery (2022) warn of even more extreme outcome where sanctions will hurt Europe more than Russia. Supply shocks brough by embargo on oil and coal, they say, will substantially increase energy prices and welfare costs of EU residents. Extension of it to natural gas would double those costs. More importantly, they believe that in terms of welfare costs Russia will have to pay smaller costs than that of Europe. They suggest that EU policy should be optimising across the system. In practical terms, the policy taken should be based on flexibility potentials to deal with the energy scarcity. Activating coal power plant capacity and gas storage optimisation will be an unavoidable short-term solution. While the acceleration of developing renewables to support deep electrification and control the demand through energy saving becomes a long-term measure to achieve EU dependency on Russian Energy in line with REPower EU.

Mahlstein, McDaniel, Schropp, Tsigas (2022) are of a different opinion on the consequences of sanctions. In their analysis they found that Russia loses upwards of 14% of real GDP even in short run, while Allies economies range in their losses from 0.1% to 1.6%. Quite importantly, they distilled that the biggest punch of sanctions comes from the exit of Allied FDI. If Russia applies countersanctions, they will lose more. They concluded by giving the number of important insights that: sanctions are costly for Russia, Belarus is only marginally affected by sanctions, economic pain of spill over is unevenly distributed for Allies, non-Allies stand to lose, China won't involve, countersanctions will be self-defeating, withdrawal of Allied FDI is the most powerful tool.

There is not much literature on the impact of sanctions on China's financial markets, but many newspapers and journals have published the views of some scholars.

Northeastern China borders Russia and there is not much trade between China and Russia, but the relationship between China and Russia is friendly and the political motives outweigh the economic ones. The impact of European and U.S. economic sanctions against Russia on Chinese financial markets is indirect – Russian purchases of Chinese good may rise as consumption is redirected from western suppliers, following the imposition of sanctions – and it is interesting to see (via their stock prices) how much Chinese firms benefitted from this displacement.

Wang Zhan et al. (2022) argue that the conflict between Russia and Ukraine is a contest between great powers. By examining the impact of the Russian-Ukrainian conflict on financial market connectivity, Wang Zhan et al. conclude that the Russian-Ukrainian conflict has led to a sharp increase in geopolitical risk to regional and international financial markets. Onur et al. (2022) claim that the overall impact of international conflicts on financial markets is usually negative in the short run. Martin et al. (2022) argue that during the Russian-Ukrainian conflict cumulative average abnormal returns of energy companies were positive. But Luis et al. (2022) show that COVID-19 had a greater impact on market efficiency than the Russian-Ukrainian conflict.

Helsy et al. (2022) compare the impact of war on those UN member states that condemned the invasion versus those that remained neutral and find that those that condemned the invasion suffered significantly more. Shuxian Zheng et al. (2022), examining the impact of sanctions on crude oil trade, claim that sanctions facilitated a shift in the center of energy control from Europe to Asia and state that the U.S. would be the largest beneficiary.

Currently, most of the studies related to the war in Russia and Ukraine are about company stock prices and energy prices in Europe and the United States and other countries. This paper partly fills a research gap regarding the impact of the Russian-Ukrainian conflict on Asian countries. It also contributes to the literature that examines the impact of exogenous shocks (e.g., war and sanctions) on capital markets.

3. Hypotheses

3.1 Insider trading was present before the invasion

Casual inspection of Russian stock prices reveals that they behaved in a fashion similar to their respective benchmark before the key date of January 12. However, the situation changed dramatically on January 12, 2022 (i.e., six weeks prior to invasion). For a short period up until January 18, 2022 an unusual sell-off occurred. Some of the largest companies in Russia ceased following their benchmarks, as if some irregular factor came into play. A simple example is given in figure 1 below. Stock price movements of Russian oil and gas firms moved synchronously with the international oil price until January 12 before experiencing a sudden divergence. Our further research suggested that there were no important systematic events within industries that could have led to such an extensive sell-off. Such observation led us to believe that there was an element of insider trading that happened before the invasion.

Figure 1 Russian oil giants: Gazprom (purple), Lukoil (orange) and Rosneft (green) plotted against the spot price of WTI (candlesticks). Blue area: 12/01/2022 – 18/01/2022

We hypothesise that the invasion decision of the state - which holds the majority of ownership in the largest companies – became known to market participants ahead of the actual invasion. In expectation of the consequences following the invasion, they prepared by offloading stocks from their portfolios, thus minimizing their expected losses due to the invasion.

3.2 Sanctions are having a significant impact on the Russia economy

There is a wide range of opinions on whether enacted sanctions are having sufficient pressure on Russian government and country in general. Many Asian countries generally remained neutral or supportive to Russia in its stance. A representative of Chinese government, for example, claimed Western sanctions to be overly punitive, while India is taking advantage by planning to increase their export to Russia by $2bn. Both states increased imports of Russian oil. These are just some examples from a more extensive number of cases when various states from different parts of the world refused to take a resolute stance to impose great sanctions on Russia. With these factors, it may seem questionable whether punitive measures will have a substantial impact.

We hypothesize that sanctions make Russian economy take a substantial hit. This will be reflected in the valuations of Russian firms, and hence in their stock prices. Examining a wide range of daily stock prices will enable us to say more precisely – in terms of timing and sector – which parts of the economy seem to have been most affected.

3.3 Market Correction happened only for Russia companies

A third hypothesis that gets proposed in relation to the direct impact of sanctions is that a price correction occurred about month and a half after the invasion due to overestimation of the impact of the event by investors, and their subsequent repositioning. When one observes Russian stocks, there is a general pattern of price falls about three days before the invasion, followed by missing data from February 25 to the end of March, and then an upswing. We

propose that this behaviour was peculiar only to Russian stocks, while global stocks have not rebound.

Figure 2 Major Russian companies: Gazprom (purple), Lukoil (orange), UNAC (yellow) and Sberbank (light blue) plotted against MOEX Index (candlesticks). Orange area: 17/02/2022 – 24/02/2022; Red area: 24/02/2022 – 01/04/2022

3.4 Sanctions on Russia have an effect on the Chinese stock market

As Russia wages war against Ukraine, Russia's demand for military equipment increases, so we expect sanctions to have a positive impact on the stock returns of Chinese companies in the defence industry. In terms of the commodity trade, as large European and US firms pull out of Russia, the Russian supply of commodities will also partially shift to China, so we expect to see higher stock returns for Chinese listed companies that trade commodities with Russia after the country is sanctioned. In financial services, Russia switched to Ruble payments after being expelled from the SWIFT payment system, and China provided Russia with large amounts of cash remittances and cash notes in RMB, so we expect that Chinese banks providing currency support have higher stock returns post-sanctions.

4. Empirical approach

In the course of the study, we adopted different methods of empirical analysis in terms of both direct and indirect effects.

4.1 Direct Impact

There are several steps in our analysis of the performance of major companies in Russia on the Moscow Exchange for stocks (MOEX), as well as to search for an evidence of insider trading. First, we look at simple correlations between companies and their respective benchmarks. Second, we look at betas to cover limitations of correlation analysis. Third, we compare returns for our firms against different benchmarks, in various periods. We justify these methods in section 4.2 below.

Testing our first hypothesis – that there was insider trading – is usually difficult. Stock movement is affected by a myriad of systematic and idiosyncratic factors and forces. While a particular price movement may be consistent with the presence of insider trading, a deeper and more meticulous investigation is required to confirm that it indeed happened. For this reason, our regression analysis for this part is also multi-layered and looks into the situation from various perspectives (such as comparing 2022 to 2021 to look for seasonal stock market effects that might typically be associated the Orthodox new year).

Testing our second hypothesis – that sanctions have an effect – warrants a medium-term analysis. We look at stock performance in the period since the invasion and compare it to a similar period before the invasion. At the same time, we also want to compare Russian firms to global counterparts. We could have claimed that Russian companies stock performance was much worse after invasion by comparing them to themselves prior to the event; but the true magnitude of their weak performance is revealed only by seeing how much they have lost compared to other major companies outside of Russia. Thus, we have a kind of panel data approach in our investigation, analyzing multiple cross-sectional units over time.

The third event, a short-term behaviour of prices right after invasion is the only kind for which we deemed a time-series regression to be enough, because the sole purpose of this exercise was to show by how much prices have actually rebounded. For that reason, the results

for them will only include Russian stocks' performance shortly after invasion against their performance in some period later, when we observed some corrections after the initial sell-off.

4.1.1 Components of Panel Data

Companies and benchmarks

We downloaded daily prices of some of the largest Russian companies and their global counterparts. When we need a market index, we take MSCI Global as a basis in our regressions. MSCI Global is a value-weighted benchmark capturing equity performance across the markets of developed countries.

One may argue that our choice of stocks is not covering the entire spectrum of stocks in the Russian economy. In particular, Small and Medium-sized Enterprises (SMEs) are not included in our analysis. Let us explain why we chose large companies over SMEs to examine the impact of sanctions.

First, the revenues of the top 20 companies account for almost half of all revenues earned by the top 500 companies in Russia. So, in general, the biggest companies contribute the largest share of GDP. This peculiarity of Russian economy makes inclusion of smaller companies into our analysis almost futile.

Second, sanctions targeted only the biggest companies. While it is likely that smaller companies were indirectly hurt by sanctions, too, its extent is probably not comparable with direct impact.

Third, large companies have higher correlation with global benchmarks and the bigger part of their risk is systematic, rather than idiosyncratic. The effect of sanctions will therefore be easier to detect because there will be less noise from other random shocks. For the global companies we similarly chose some of the largest companies within each industry, since they are usually well correlated with the benchmark and suffer less from idiosyncratic shocks. As noted previously, their main purpose is to serve as a control group to prove that only Russian companies were affected by the events of interest.

Finally, the inclusion of benchmarks into our analysis is based on the following rationale. For the examination of company performance, the stock price itself is not informative enough. Upswings and downswings may be triggered either by systematic risk,

idiosyncratic risk, or both. Without looking at the behavior of comparable assets it is not clear whether the observed stock is doing better or worse than we should expect. For example, a conclusion that the stock is underperforming due to losing five percent of its value would be wrong if, in fact, the whole market is in a downturn and enduring even bigger losses.

Let us now consider various industries and companies, both Russian and global, as well as their corresponding benchmarks.

Oil and Gas

Most of the Russian economy is depends on commodities and the most important are oil and gas. Russian oil companies are essentially stocks of crude oil, so we expect their value to be highly correlated with the world price of oil. Hence, we use the price of West Texas Intermediate (WTI), a popular benchmark for oil spot prices, as a benchmark for the stock prices of Russian oil companies. Similarly, the performance of Russian gas companies was assessed against Dutch TTF Natural Gas Futures since the main part of gas business of Russia is made with Europe. Note that several companies are present on both industries' lists, since usually the same company is involved in the exploration and sale of both kinds of commodities.

Table 1. Observed Oil and Gas Companies

Name	Country	Market Cap (in bn USD)	Chosen benchmark
Saudi Aramco	Saudi Arabia	1936.63	WTI / Dutch TTF Natural Gas Futures
Exxon	United States	456.27	WTI / Dutch TTF Natural Gas Futures
Shell	United Kingdom	199.25	Dutch TTF Natural Gas Futures
Total Energies	France	160.31	WTI / Dutch TTF Natural Gas Futures
Petrochina	China	129.17	WTI / Dutch TTF Natural Gas Futures
BP	United Kingdom	105.88	Dutch TTF Natural Gas Futures
Gazprom	Russia	73.26	WTI / Dutch TTF Natural Gas Futures
China National Petroleum Corporation	China	73.19	WTI / Dutch TTF Natural Gas Futures
Rosneft	Russia	52.21	WTI / Dutch TTF Natural Gas Futures
Novatek	Russia	50.86	Dutch TTF Natural Gas Futures
Lukoil	Russia	39.92	WTI / Dutch TTF Natural Gas Futures
Gazprom Neft	Russia	29.46	WTI / Dutch TTF Natural Gas Futures
Surgutneftegas	Russia	14.53	WTI / Dutch TTF Natural Gas Futures
Tatneft	Russia	14.35	WTI / Dutch TTF Natural Gas Futures
Bashneft	Russia	2.72	WTI / Dutch TTF Natural Gas Futures
Transneft	Russia	2.20	WTI / Dutch TTF Natural Gas Futures
Russneft	Russia	0.42	WTI / Dutch TTF Natural Gas Futures

Slavneft	Russia	0.20	WTI / Dutch TTF Natural Gas Futures

Banking

In terms of revenue, banks are second to oil and gas companies in Russia. Two big Russian banks that are majorly state owned: VTB and Sberbank. For comparative purposes, we chose the KBW Nasdaq Global Bank as a benchmark.

Table 2 Observed Banks

Name	Country	Market Cap (in bn USD)	Chosen benchmark
JPMorgan	United States	396.45	KBW Global Nasdaq
Bank of America	United States	289.45	KBW Global Nasdaq
Industrial and Commercial Bank of China	China	220.00	KBW Global Nasdaq
Mistubishi UFJ	Japan	70.73	KBW Global Nasdaq
BNP	France	67.75	KBW Global Nasdaq
Sberbank	Russia	46.99	KBW Global Nasdaq
VTB Bank	Russia	3.90	KBW Global Nasdaq
Credit Bank of Moscow	Russia	3.37	KBW Global Nasdaq
TCS Group	Russia	2.47	KBW Global Nasdaq

Trade

The next sector in the list by revenue is Food Retail. These companies primarily own the largest chains of convenience stores, supermarkets, and hypermarkets. The largest market shares are split between three giants: Magnit PAO, X5 Group and Lenta. Note that these companies are privately owned. The importance of this factor will be discussed in Results and Discussions section. Magnit and X5 Group are compared in their performance against the global S&P Retail Select Industry Index. Data for our specified dates by Lenta were not available. To fix such issue we added a bit smaller electronics retail company M.Video that follows the chosen benchmark and hence was useful for our analysis.

Table 3 Observed Retail Trade Companies

Name	Country	Market Cap (in bn USD)	Chosen benchmark
Wallmart	United States	415.88	S&P Retail Select Industry Index
CostCo	United States	218.88	S&P Retail Select Industry Index
Seven & I Holdings	Japan	35.811	S&P Retail Select Industry Index
Kroger	United States	34.05	S&P Retail Select Industry Index
Carrefour	France	12.84	S&P Retail Select Industry Index

Magnit	Russia	7.07	S&P Retail Select Industry Index
X5 Group	Russia	4.985	S&P Retail Select Industry Index
M.Video	Russia	0.576	S&P Retail Select Industry Index

Metals and Mining

Metals and Mining play a big role in the Russian economy. Interestingly, this industry is represented by a number of small companies with obscure abbreviations. As each metal has its own benchmark in the market, each of companies from this category were subcategorized by the metal they work with. Again, each of these firms essentially represents a stock of a particular metal or mineral and we therefore expect the stock price to be highly correlated with changes in the value of the metal or mineral (absent any impact from sanctions).

Table 4 Observed Metals and Mining Companies

Name	Country	Market Cap (in bn USD)	Chosen benchmark
RIO Tinto	Australia	110.85	Aluminium Spot
Norsk Hydro	Norway	15.36	Aluminium Spot
Chalco	China	10.01	Aluminium Spot
Alcoa	United States	8.83	Aluminium Spot
China Hongqiao Group	China	8.55	Aluminium Spot
Rusal	Russia	7.76	Aluminium Spot
BHP	Australia	157.56	Dow Jones Commodity Nickel
GLENCORE	Switzerland	86.99	Dow Jones Commodity Nickel
VALE	Brazil	79.47	Dow Jones Commodity Nickel
ANGLO-AMERICAN	United Kingdom	53.35	Dow Jones Commodity Nickel
S32	Australia	13.06	Dow Jones Commodity Nickel
Norilsk Nickel	Russia	4.62	Dow Jones Commodity Nickel
ARCELORMITTAL	Luxembourg	23.01	US Midwest Domestic Hot-Rolled Coil Steel Futures
CHINA BAOWU	China	17.72	US Midwest Domestic Hot-Rolled Coil Steel Futures
NIPPON STEEL	Japan	15.41	US Midwest Domestic Hot-Rolled Coil Steel Futures
Novolipetsk Steel	Russia	12.94	US Midwest Domestic Hot-Rolled Coil Steel Futures
Severstal	Russia	10.76	US Midwest Domestic Hot-Rolled Coil Steel Futures
Magnitogorsk Iron and Steel Works	Russia	5.63	US Midwest Domestic Hot-Rolled Coil Steel Futures
ANSTEEL	China	3.51	US Midwest Domestic Hot-Rolled Coil Steel Futures
SHAGANG GROUP	China	1.30	US Midwest Domestic Hot-Rolled Coil Steel Futures

Mechel	Russia	1.20	US Midwest Domestic Hot-Rolled Coil Steel Futures
OAO TMK	Russia	1.01	US Midwest Domestic Hot-Rolled Coil Steel Futures

Airlines

The airline industry is pretty much monopolised by the state-owned company Aeroflot. The company's performance is compared against the .

Table 5 Observed Airlines Companies

Name	Country	Market Cap (in bn USD)	Chosen benchmark
Delta Airlines	United States	22.90	Nasdaq Global Smart Airlines Index
China Southern Airlines	China	16.71	Nasdaq Global Smart Airlines Index
Ryanair	Ireland	15.61	Nasdaq Global Smart Airlines Index
China Eastern Airlines	China	11.97	Nasdaq Global Smart Airlines Index
Lufthansa	Germany	9.76	Nasdaq Global Smart Airlines Index
American Airlines	United States	9.08	Nasdaq Global Smart Airlines Index
Aeroflot	Russia	1.55	Nasdaq Global Smart Airlines Index

Defence

In theory, Defence companies should perform better due to the war and subsequent demand for their products, so this is a particularly interesting area. Generally, all companies in this sector are state-owned with one company per sub-industry, such as air defence, shipbuilding, helicopters, missiles and other. Unfortunately, data is not accessible for most of these, but we managed to find the biggest company, United Aircraft Corporation, which produces jets, transport aircraft, fighter jets and other aircraft for defence purposes.

Table 6 Observed Air Defence Companies

Name	Country	Market Cap (in bn USD)	Chosen benchmark
Raytheon Techonologies	United States	148.49	S&P Aerospace & Defense Select Industry Index
Lockheed Martin	United States	130.05	S&P Aerospace & Defense Select Industry Index
Northrop Grumman	United States	83.97	S&P Aerospace & Defense Select Industry Index
General Dynamics	United States	70.21	S&P Aerospace & Defense Select Industry Index
BAE Systems	United Kingdom	30.395	S&P Aerospace & Defense Select Industry Index
UNAC	Russia	5.33	S&P Aerospace & Defense Select Industry Index

It should be noted that some of the other biggest companies in Russia did not make it to the list either due to unavailability of stock prices on the dates of interest; or because those companies were not listed on a public stock exchange, so stock prices are simply not available.

Time periods

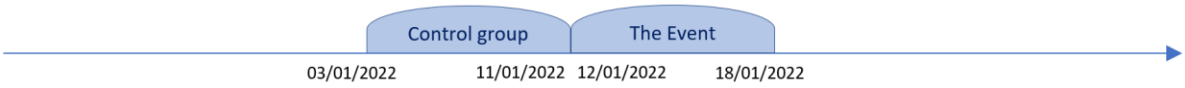
Prices of stocks and benchmarks were downloaded in from the January 1, 2021, to September 30, 2022. The basis for choosing such dates are to provide coverage of the pre-war period and key events that are being observed:

- significant drop in Russian stocks' prices on 17/02/2022, around a week prior to invasion of Ukraine on 24/02/2022
- the suspected case of insider trading on 12/01/2022
- rebound of stock prices at the end of March-beginning of April.

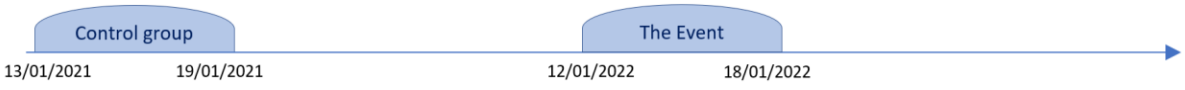
Insider Trading

The first possible "event" that we saw was possible insider trading. On 12/01/2022 Russian stocks seemed to lose their correlation with global benchmarks as traders engaged in an aggressive sell-off that lasted about a week until 18/01/2022.

Our initial endeavour was to see how the period from the above fares in comparison to a week before that. Based on that the control group was represented by a date range from 03/01/2022 to 11/01/2022.



We were concerned that our control was not adequate here. In particular, the so-called New Year effect implies a reopening of positions closed prior to the Orthodox New Year, thus often driving demand and stock prices notably higher. That was an unfavourable condition for our research and therefore we decided to introduce an additional our control group to the corresponding days of the week from the previous year, 2021. Those dates fell on 13/01/2021 - 19/01/2021.



Finally, to make our case stronger we searched for news that may have contributed to the observed price fall in January, 2022.

Medium-term Effect of Invasion

The consequences of sanction are, perhaps, of the utmost importance in our research. To learn whether sanctions had a medium-term effect, we compare the performance of stocks in a period before and after the event. We take 180 days prior to 12/01/2022 as a reflection of the market in the default mode, a control group that is not extensively affected by various geopolitical factors or some form of insider trading. Hence, the starting point of observations is 15/07/2021.

The "event" itself appears to start on 17/02/2022, when many of Russian companies began to notably drop in value as a result of Russia bulking up their forces on their border with Ukraine. The end of the period under observation is 16/08/2022, or 180 days after the key date.

Market Rebound

The final event that we examine is the rebound that stock prices experienced after the decline due to the invasion. As previously noted, stock prices are prone to volatile movements that are grounded, not in fundamental events, but rather on market exhilaration or panic; the aftermath often results in price corrections, with prices returning some of their earlier earnings or losses. The invasion of Ukraine was no exception, as the prices of the majority of Russian stocks that initially plunged rebounded about a month later. It should be noted that we may have witnessed a rebound earlier, if not for the MOEX closure from 25/02/2022 to 24/03/2022.

To examine the extent of the correction, a relatively short period of a week was to be put against a longer period of a month after stocks have plunged just before the invasion. That formed periods of 17/02/2022 – 24/02/2022 and 17/02/2022 – 30/03/2022.

Hence the following periods are used in calculations

Table 7 Observed periods

From	To	Type	Used to calculate
12/01/2022	18/01/2022	Event	Presence of insider trading
13/01/2021	19/01/2021	Control group	Presence of insider trading
17/02/2022	16/08/2022	Event	Medium-term effect of invasion
15/07/2021	11/01/2022	Control group	Medium-term effect of invasion
17/02/2022	24/02/2022	Event	Market rebound
17/02/2022	30/03/2022	Control group	Market rebound

4.1.2 Methodology

Pearson's Correlation

We begin our analysis with some simple descriptive statistics. First, we check to see whether our chosen companies are correlated with their corresponding benchmarks.

While correlation provides a good illustration of the relationship between benchmark and stock performance, there is one notable drawback. It does not link the magnitude of the change in benchmark's value to the price of a stock. So correlation tells us whether two assets move together but does not capture the degree of volatility nor how much the price change in one asset moves another asset. This is reflected in the covariance, which is very important in the standard model of asset prices, the Capital Asset Pricing Model (CAPM). Hence, we then move on to a consideration of the CAPM "beta".

Beta

To complement the issue with correlation, an additional measure, beta, needs to be computed. It should provide a more thorough comprehension of change in stock prices through time. Beta represents a market risk component of a stock. A Beta of 1.0 for a stock means that it has been just as volatile as the broader market. If the index moves up or down 1%, so too would the stock, on average. Betas larger than 1.0 indicate greater volatility - so if the beta were 1.5 and the index moved up or down 1%, the stock would have moved 1.5%, on average. Betas less than 1.0 indicate less volatility: if the stock had a beta of 0.5, it would have risen or fallen just half-a-percent as the index moved 1%.

Within CAPM framework expected return of a stock is represented by the following formula:

$$R_i = R_f + \beta_i * (R_m - R_f) \quad (1)$$

For our purposes we only need to calculate β_i(beta), therefore we will ignore other components. In statistical terms, beta represents the slope of the line through a regression of data points. Hence, we can calculate slope with the following formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (2)$$

where (x1, y1) and (x2, y2) are the coordinates of the two points lying on the line of a regression.

Logarithmic Returns

The preceding metrics use the volatility of the stock prices and their benchmarks to tell us how the war, and sanctions, affected firms. But we can also look at the stock returns posted by Russian firms, and their benchmarks, over the same periods. We there take an approach, which is standard in economics, of analysing the changes in the natural logarithm of the price (i.e. the "log returns"). One advantage of taking logs is that is makes the data distribution more normal, which is useful when using regression analysis.

$$R_{at} = \ln(\frac{P_{a\,"to"}}{P_{a\,"from"}}) \quad (3)$$

where R_{at} is the log return on asset *a* for the period *t*; *P* is the price of an asset *a* on the date *"to"*; $P_{a\,"from"}$ is the price of asset *a* on the date *"from"*.

Further Calculations

With basic correlation, beta and log returns calculated, it becomes possible to elaborate further calculations.

1) *Analysis of correlations and betas*

   Recall that we are going to analyze the correlations and betas through differences in the event and control group periods, so it is a kind of difference-in-difference analysis. The calculations are done by subtracting correlation of an event

period from the correlation of a control group period. This is done for all stocks. The same operation applies to beta.

2) *Analysis of log returns*

Similarly, to create measures indicative of medium and long-term achievement, as well as the presence of insider trading, we calculate.

- $$R_{it} = R_{st} - R_{bt} \quad (4)$$

  where R_{ip} is log return of the stock in relation to benchmark in period *t*; R_{st} is log return of the stock in period *t*; and R_{bt} is log return of the benchmark in period *t*. Recall that there are 6 periods in our calculations.

  - A measure that represents the difference between the event and control group is calculated by subtracting R_{ip} of the event from R_{ip} of a control group Long-term effect and Insider Trading. This operation is conducted for all stocks in the dataset.
  - A measure that shows the degree of market rebound is calculated the other way around, by subtracting R_{ip} of control group from R_{ip} of the event. This operation is conducted for all stocks in the dataset.
- To see the performance of any selected industry in Russia, performances of global and Russian companies are averaged separately. The difference between the two will provide the desired measure.

By implication, if Russian companies are affected by the war and sanction events then the calculated measures should differ much from global companies. On the other hand, if these measures are dramatically different for Russian companies then we can safely conclude that the event had an effect.

4.2 Indirect Impact of Sanctions

To study the indirect effects of sanctions, we chose China as our subject because it is the world's second largest economy and abstained from voting in the early stages of sanctions.

4.2.1 Data

National Defense industry

When there is a geopolitical conflict, the first sector that investors focus on is the defense and military sectors. There is no evidence that China is providing military help to Russia or Ukraine.

However, we understand that the war has caused a significant increase in the prices of many commodities and energy, which could put pressure on valuations by increasing pressure to raise interest rates in Europe and the US, while there is the potential for spillover of demand for some midstream and upstream products to China as a result of the sanctions imposed on Russia, but there is a lot of uncertainty about the exact extent and time cycle of the impact. We are not sure which national defense and military companies are directly affected by the US and European sanctions against Russia. We can, however, estimate the indirect impact of the sanctions on China's defense and military industry by examining the volatility of share prices during the sanctions period.

There are 127 companies listed in the defense and military industry in the mainland China stock market. We first downloaded the stock price information of 127 companies in the whole industry, and in order to study the impact of European and American sanctions against Russia on stock movements, screened the companies with stock price information from September 2021 to the end of August 2022, of which only 114 companies meet the requirements, and the remaining 13 companies are excluded because they have been listed for less than one year or have incomplete stock price information in the recent year, so we here only The remaining 13 companies were excluded because they had been listed for less than one year or had incomplete information in the last year, so we only select these 114 companies with comprehensive stock price information for our study.

Here are the research steps

1. Define the event: European and American economic sanctions against Russia

2, Sample selection: all A-share companies in the defense industry from September 1, 2021 to August 21, 2022, the rise and fall

3. Examination: The impact of economic sanctions imposed by Europe and the United States on Russia on February 24, 2022 on the share prices of 114 companies.

4, Data source: wind

5, Event window: February 24, 2022 as the event date, five days before and after the event (-5, +5) as the study period

6, Estimation window: one month before and after the event (-30, 30) as the estimation period

7, Estimation model: market model

8, Estimated normal return. (Normal return: the return that would have been realized by the stock if the event had not occurred)

9, Estimation of abnormal returns and cumulative excess returns

10, Significance test

11, All events cross-test

Bulk commodity trade

Regarding China-Russia commodity trade, I have selected 10 companies. Here is a brief introduction to these ten companies.

Zhongcheng (stock code 000151), which is mainly engaged in the export of complete sets of equipment and engineering contracting, general trade, overseas industrial operation; the business involves industry, transportation, infrastructure and many other fields; it set up a subsidiary in Russia.

FTI Elevator (stock code 002774), which is a top ten brand of elevator in China, has also set up a subsidiary in Russia.

China Nuclear Power (stock code 601985) is a general engineering contracting unit leading in nuclear engineering R&D and design. Zhongman Petroleum (stock code 603619) is an oil and gas company with the corporate vision of creating a multinational energy company. China Nuclear Power and Zhongman Oil both signed several contracts with Russian companies.

Zongsheng Pharmaceutical (stock code 002317) mainly aims at R&D, production and sales of pharmaceuticals. Taiji Group (stock code 600129)is an import and export business of proprietary Chinese medicine, western medicine, health care products, medical packaging products, medical equipment production and sales, and raw materials, Chinese herbal medicine and pharmaceutical packaging. Kalitai (stock code 300326) is a high-end medical device group that integrates the research and development, production and sales of medical

devices. Luoyang Molybdenum (stock code 603993) has a range of rare metal products such as molybdenum and tungsten, as well as rare precious metals such as gold and silver and electrolytic lead. All three medical-related companies and Luoyang Molybdenum have been granted relevant patents, approvals or access by the Russian side.

Angie's Yeast (stock code 600298) is specialized in the production, operation and technical service of yeast-based biotechnology products. It has production lines in Russia. Yueling (002725) is a national high-tech enterprise and national auto parts export base enterprise focusing on the research and development, design, production and sales of aluminum alloy wheels. Yueling established a subsidiary in Russia in 2017. By 2022, Yueling was exporting more than $5m dollars of goods to Russia and Belarus every year.

Since Angie's share price is much higher than the other nine companies and Angie's share price fluctuates very little, here we will observe and analyze the share prices of the nine companies other than Angie's yeast that have trade with Russia.

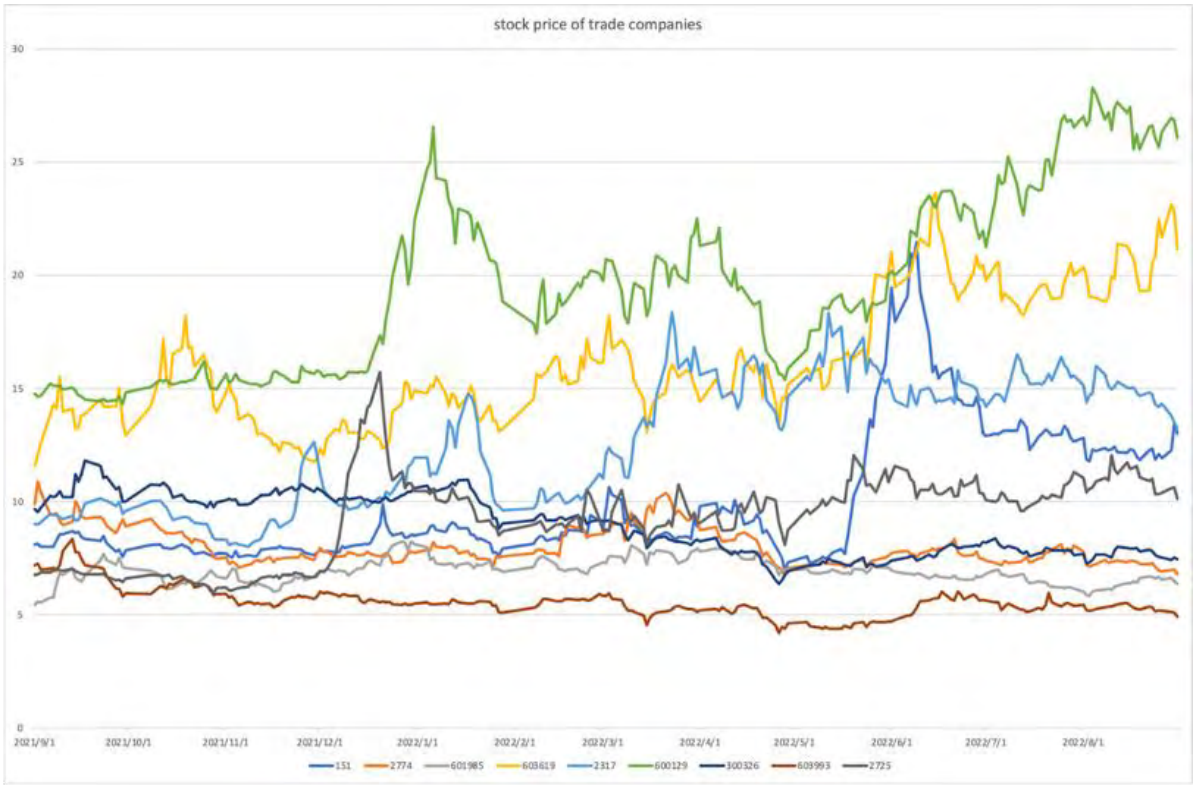


Figure 3 Stock Price of Trade Companies from Sep.2021-Sep.2022

From Figure 3, we can see that the nine companies whose share prices showed significant growth after February 24, 2022 were 151(Zhongcheng, the engineering firm with a production line in Russia) and 2317(Zongsheng, the pharmaceutical firm). However, Zhongcheng's share price began to decline after mid-June 2022, with a share price of 9.8 on

February 23, 2022, and 22.5 on June 10, before falling back to 9.8 on October 28, 2022. By contrast, Zongsheng's stock price showed steady growth after February 24, 2022, and the share price even tripled between October and November.603619(Zhonghman Petroleum) has slao shown persistently rising stock price since the invasion, which is consistent with Russia selling hydrocarbons to China and India at heavily discounted prices.

Financial services

Russia's Yamal LNG announced that it has agreed to a 15-year loan of 9.34 billion euros ($10.7 billion) from China Exim Bank and 9.76 billion yuan ($1.5 billion) from China Development Bank. However, since the China Exim Bank and the China Development Bank are not listed, they are unable to reflect the impact of this new business, or any other post-sanctions activity, by studying stock prices.

There are news reports about a Sino-Russian financial union initiated by Harbin Bank and the Russian Federal Savings Bank. And during the period of sanctions in Europe and the United States, Harbin Bank provided substantial financial services support to Russia. Therefore, we focus on selecting Harbin Bank's stock for the last year for analysis.

The stock price of Harbin Bank is affected, not only by the sanctions imposed by Europe and the United States on Russia, but also by the size of the company, geographical restrictions, and the new coronavirus situation. In order to avoid the interference of these other effects, we choose a control group comprising the same local commercial banks in the north of China: Shengjing Bank and Jinzhou Bank. We can see that Jinzhou Bank and Shengjing Bank have the same trend of share price change. The economy of the northeastern Chinese cities has been in decline due to the constraints of the regional economy, so this is an appropriate benchmark. However, since Shengjing Bank is much larger than Harbin Bank, I choose Jinzhou Bank as the control group here.

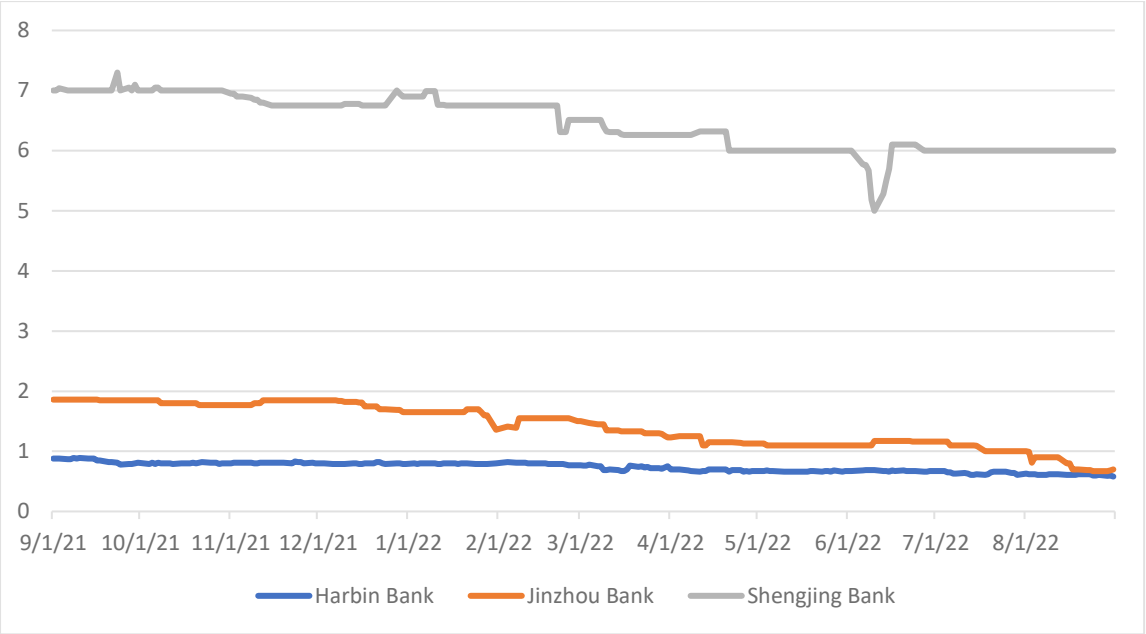


Figure 4 Stock Price of Harbin Bank, Jinzhou Bank and Shengjing Bank from Sep.2021-Sep.2022

Figure 5 Stock Price of Harbin Bank and Jinzhou Bank from Sep.2021-Sep.2022

Comparing the stock prices of the two banks, it can be seen that Harbin Bank is still declining steadily after the European and American sanctions against Russia, while Jinzhou Bank has an obvious downward trend.

Oil

Russia is a major energy exporter. Due to the economic sanctions imposed on Russia by Europe and the United States, Russia's energy exports have encountered great challenges and in order to resolve the crisis, it has shifted its export targets from the West to the East, such as China and India.

In order to study the impact of the European and American economic sanctions on Russia on the stock prices of energy companies, this study selected the stock prices of two major energy companies at the head of China, PetroChina and Sinopec, and also selected Exxon Mobil(XOM) in the U.S. and Gazprom(GAZP)in Russia. The stock prices of these four companies in the last year are shown in the chart below.

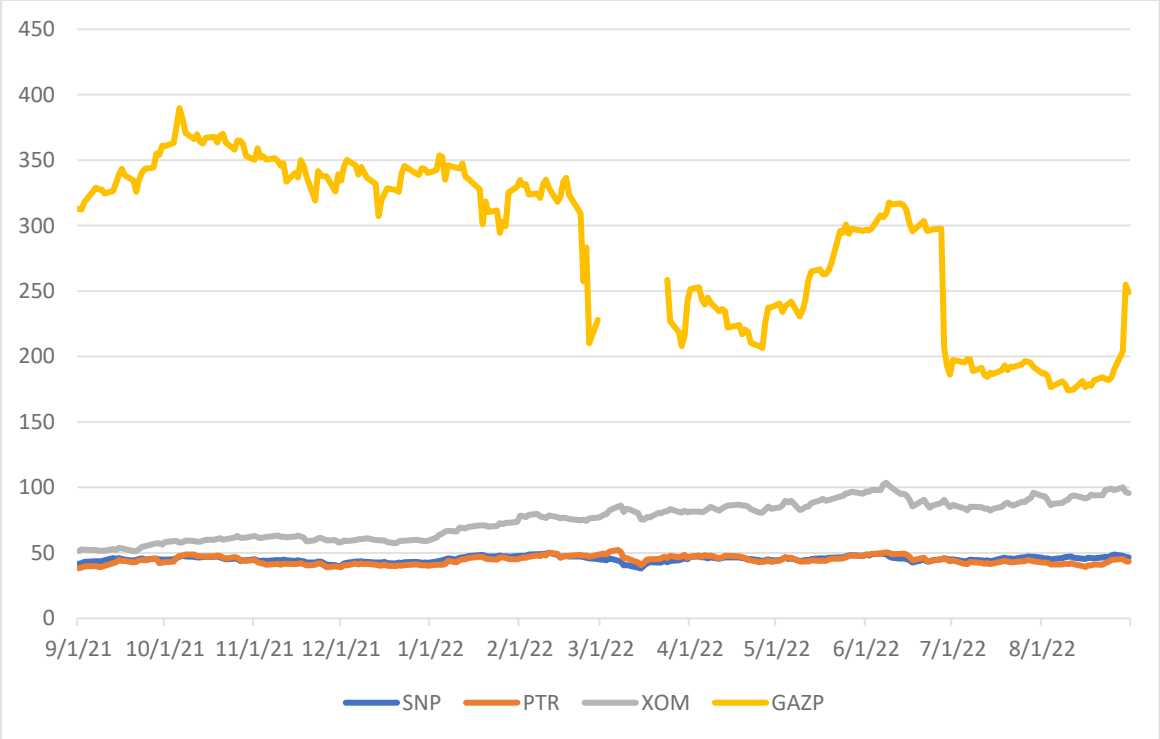


Figure 6 Stock Price of SNP, PTR,XOM and GAZP from Sep.2021-Sep.2022

As we can see from the chart, the share prices of Chinese energy companies are less volatile compared to the share prices of energy companies in the US and Russia. The share prices of both Chinese energy companies are basically always in the range of 40-50. This indicates that the growth of Russian-Chinese energy trade is mainly reflected in the volume of imported crude oil and natural gas, and the stock price fluctuations do not respond significantly. To investigate further, we therefore choose trade data and oil price data for our analysis.

China has always maintained good energy trade relations with Russia. Despite its large territory and abundant resources, China is still unable to fully supply its population of 1.4 billion with energy production and reserves. Trade cooperation between Russia and China has been growing rapidly for eight consecutive years.

The chart below shows the amount of crude oil and the amount of natural gas that China imports from Russia.

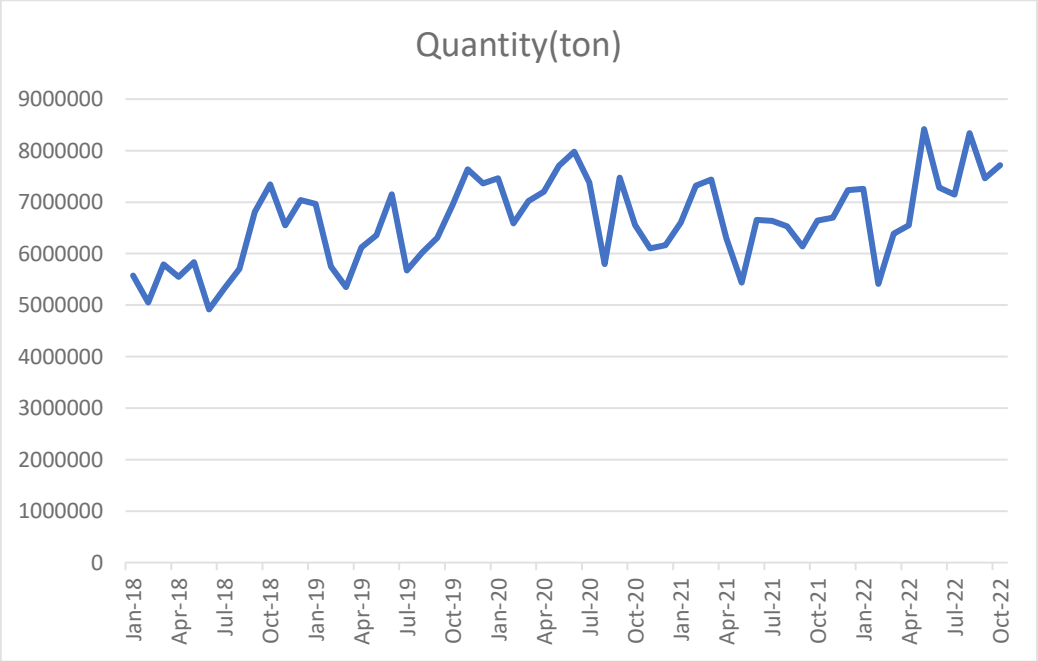


Figure 7 Oli import from Russia to China from Jan.2018-Oct.2022 (Ton)

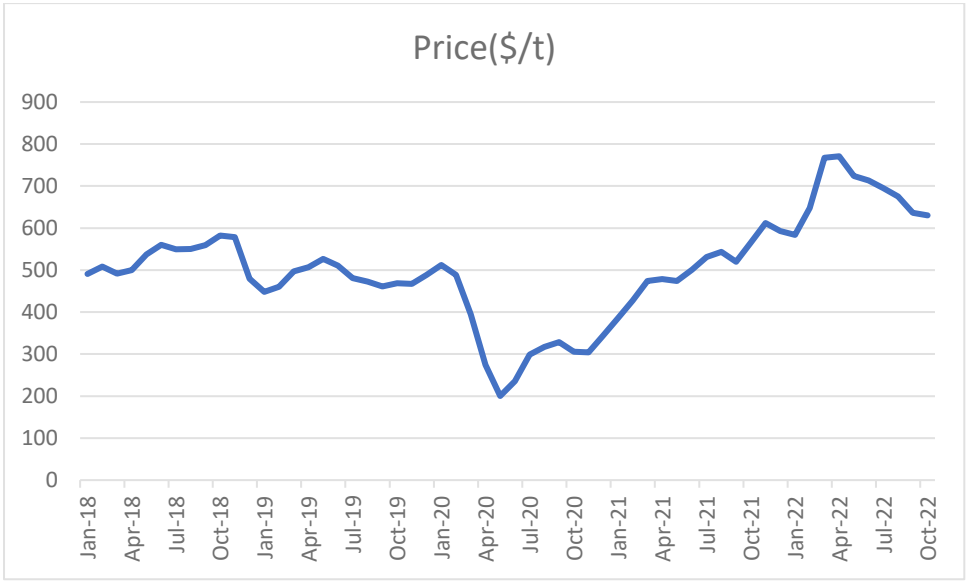


Figure 8 Historical transaction prices for China's oil imports from Russia

As can be seen in the above chart, the volume of crude oil imports fell in February, but picked up in March and continued to grow, with crude oil imports exceeding January's imports after May. China imported a total of 56.89 million tons of oil from Russia from January to August 2022.

Russia is a major energy exporter and in August 2022, China imported 40.354 million tons of crude oil, of which 8.34 million tons were imported from Russia, an increase of 1.2 million tons compared to July. China's crude oil imports from Russia are second only to Saudi Arabia. In September 2022 China's crude oil imports were at 40,241,700 tons, down 112,000 tons from the previous month, down 0.28% year-on-year and down 1.5 percent year on year in 2021.The main sources of China's crude oil imports in September were Saudi Arabia, Russia, Iraq, Malaysia and Oman. Saudi Arabia returned to the position of the first source of imports: 7,530,600 tons, accounting for 18.71% of the month, down 5.35% year-on-year. Russia was similar, with imports of 7,463,000 tons, accounting for 18.55% for the month, up 21.55% year-on-year.

Overall, China's oil imports from Russia have been on the rise. Going back a decade, China's oil imports from Russia accounted for about 8% of China's total imports. As of last year, that share had grown to 16%. And he share increased further recently, exceeding 20 percent. As for Russia, it is constantly trying to export more crude oil to Asian countries because of the ban on Russian oil imports by sea issued by the European Union. At the same time, China's LNG trade with Russia continues to grow. The outlook for energy trade between China and Russia is now positive, with a win-win situation for both sides.

4.2.2 Methodology

ESM

The event study method is a statistical approach that examines whether stock prices fluctuate when an event occurs in the market and whether abnormal returns are generated. Comparing abnormal returns to the volatility of the market itself provides insight into the correlation between the volatility of stock prices and this event.

The abnormal return ($AR_{i,t}$) for a day within the event window is the difference between the actual stock return $R_{i,t}$ on that day and the normal return

The market model is the most commonly used model of expected returns, which is predicted based on two inputs; the typical relationship between the firm's stock and its reference index (expressed by the α and β parameters), and the actual reference market's return (Rm,t).

$$ARi, t = Ri, t - (\alpha i + \beta iRm, t) \quad (4)$$

To measure the overall impact of the event within the event window, all anomaly returns are summed to create a cumulative anomaly return (CAR), where t_1 is the first day of the event window and t_2 is the last day of the event window.

$$CAR(t1, t2) = \sum t = t1t2ARi, t \quad (5)$$

DID

Difference in difference is a quasi-experimental design that uses longitudinal data from the treatment and control groups to obtain appropriate counterfactuals to estimate causal effects.

The basic idea of the double difference method is to construct a double difference statistic reflecting the effect of the policy by comparing the difference between the control and treatment groups before and after the implementation of the policy, and to translate this idea with the above table into a simple model (1), at which time it is only necessary to focus on the coefficients of the interaction terms in model (1) to obtain the desired net effect of the policy under DID.

We consider the sanction as a treatment for the stock data we want to study, with Y0 as the control group, Y1 as the treatment group, pre-treatment before the sanctions, and post-treatment after the sanctions.

DID model principle:

$$yit = \alpha + \beta TREATi + \gamma POSTt + \delta(TREATi * POSTt) + eit. \quad (6)$$

where yit is the outcome of individual i in time t. TREATi is equal to one if i is in the treated group and zero otherwise. POSTt is equal to one if time t is post-treatment and zero otherwise. δ is the DiD estimator.

Where E[Y1T |Post] : α + β + γ + δ. E[Y0T |Pre] : α + β . E[Y0C|Post] : α + γ. E[Y0C|Pre] : α. (E[Y1T |Post] − E[Y0T |Pre]) − (E[Y0C|Post] − E[Y0C|Pre]) :

(α + β + γ + δ − α − β) − (α + γ − α) = δ.

This can be represented graphically as

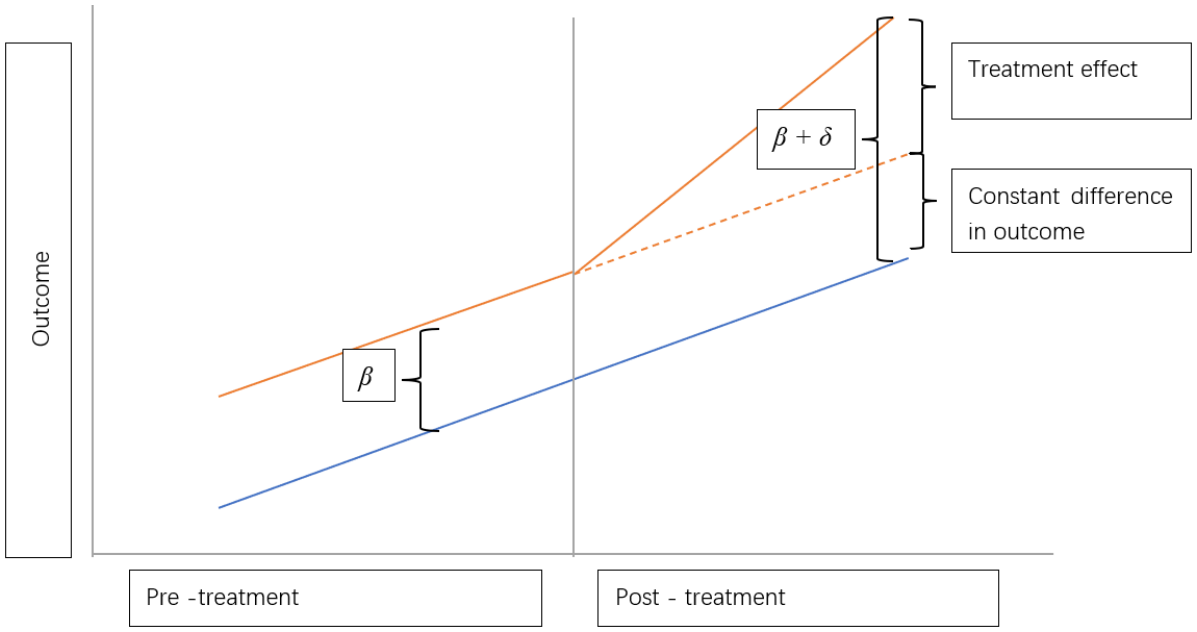


Figure 9 Difference-in-Difference estimation, graphical explanation

So δ is the net effect of the treatment, which also means the impact of the sanctions.

5. Results

5.1 The direct impact of sanctions

The direct impact of sanctions is encapsulated in three hypotheses concerning the performance of Russian stocks. Below are tables with results for calculations described in Methodology. Couple of tables at the beginning of each subsection can be considered general and show Russian sectors and companies ranked by their performance; most other tables exhibit Russian companies next to their global counterparts and are industry specific.

To make the following tables easier to read, the headings for the Russian companies are coloured in burgundy and global companies in navy. To distinguish outliers more easily, results are assigned coloured bars that represent distance from 0. Note that bars are based in relation to the highest and lowest value in the list.

The first table in each set shows how the company performed against its benchmark during the event period in comparison with the control group period. The lower the measure, the worse the firm performed, and vice versa. To measure how Russian companies fared in relation to global firms, results for each category were averaged and their difference shown in the final row.

The second table in each set shows how a company's correlation with its benchmark has changed due to the event. Lower numbers imply a decrease in the correlation, and vice versa.

The final table in each set illustrates a change in company's beta due to the event. Lower numbers imply a decrease in the beta, and vice versa. Note, measure for Saudi Aramco was not calculated and equals to 0 due to the lack of variables required for calculation of the proper beta. Saudi stock exchange is closed on Fridays, but open on other weekends, thus providing variables only for 4 days in the week.

Our analysis generated many results – too many for the reader to retain focus. Hence, we give highlights in the main text and relegate others to the appendices. For example, all stocks were regressed against benchmarks from their respective industries, as well as against MSCI Global. All the detailed results for this can be found in the appendix.

Similarly, regressions made for the periods between 03/01/2022 – 11/01/2022. But because they may have been affected by the New Year effect, we did not consider them to be our most reliable results and relegated them to the appendix.

5.1.1 The presense of insider trading

Table 8 Russian sectors potentially involved in insider trading

Industry	Loss in relation to the global companies
Nickel	-18.37%
Banking	-17.54%
Trade	-15.97%
Gas	-15.22%
Steel	-13.73%
Oil	-10.77%
Aluminium	-10.00%
Airlines	-9.70%
Defence	-9.33%

The most affected companies

Sectors that we think were involved in insider trading were topped by nickel industry. Within the period of 12/01/2022 – 18/01/2022, the difference between gains and losses (in relation to benchmark) of Russian and global nickel companies accounted to around 18%, making it the most shorted sector among others. At the same time, defence and airlines sectors lost around half of what nickel did, about 9%.

Table 9 Russian companies potentially involved in insider trading

Company	Loss in relation to the global companies
Rosneft || Dutch TTF Natural Gas Futures	-44.86%
TCS Group	-39.65%
Lukoil || Dutch TTF Natural Gas Futures	-38.84%
Gazprom || Dutch TTF Natural Gas Futures	-38.41%
Novatek || Dutch TTF Natural Gas Futures	-35.74%
Surgutneftgaz || Dutch TTF Natural Gas Futures	-33.33%
Rosneft || WTI	-22.91%
Sberbank	-19.59%
Lukoil || WTI	-16.89%
Gazprom || WTI	-16.46%
Magnitogorskiy Metallurgicheskiy Kombinat	-15.28%
Bashneft || WTI	-14.11%
RUSAL	-13.22%
M.Video	-12.14%
Gazprom neft || WTI	-12.00%
GMKN	-11.49%
Surgutneftgaz || WTI	-11.38%
VTB	-11.34%
Mechel	-10.95%
Moskovskiy Kreditnyi Bank	-10.76%
Trubnaya Metallurgicheskaya Kompaniya	-10.21%
Severstal	-9.49%
AEROFLOT	-9.38%
Slavneft || WTI	-9.04%
Tatneft || WTI	-8.41%
Novolipetsk Steel	-8.11%
X5 Group	-7.25%
Transneft || WTI	-6.87%
Russneft || WTI	-5.77%
Magnit	-1.80%
UNAC	-1.45%

By looking closer on the company level, we find a large disparity between the most and the least affected firms. In relation to gas, Rosneft was subject to the biggest sell-off creating a gap of almost 45% between gains and losses within event and control group periods.

UNAC and Magnit, had the least sell-off. It is important to note that UNAC is the only defence company in the list and that already provides some clue on relationship between war and stock performance.

Oil and Gas

WTI (Oil Benchmark)

Table 10 Results for Analysis of Log Returns for insider trading

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-16.46%	-16.89%	-14.11%	-22.91%	-9.04%	-5.77%	-12.00%	-11.38%	-8.41%	-6.87%	-2.12%	-1.95%	-1.84%	-1.88%	-0.26%
									-12.38%					-1.61%
						-10.77%								

Table 11 Results for Analysis of Correlation for insider trading

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-105.23%	-116.86%	-130.30%	-62.77%	-10.84%	-95.96%	-102.11%	-122.88%	-138.03%	-40.49%	-26.52%	4.44%	43.75%	15.87%	19.42%

Table 12 Results for Analysis of Beta for insider trading

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-78.97%	-3.35%	66.11%	-19.25%	-48.06%	51.78%	-68.25%	60.35%	-25.58%	38.45%	-9.90%	-70.26%	-25.49%	0.00%	24.57%

Dutch TTF Natural Gas Futures

Table 13 Results for Analysis of Log Returns for insider trading

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-38.41%	-38.84%	-35.74%	-44.86%	-33.33%	-21.17%	-23.90%	-23.79%	-23.83%	-22.41%
				-38.24%				-23.02%	
				-15.22%					

Table 14 Results for Analysis of Correlation for insider trading

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-46.12%	72.98%	-80.36%	109.33%	-76.65%	-35.87%	23.03%	30.29%	-100.65%	-1.48%

Table 15 Results for Analysis of Beta for insider trading

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
26.28%	22.21%	6.86%	26.91%	20.37%	1.49%	1.68%	-27.72%	0.00%	9.84%

Banking

Table 16 Results for Analysis of Log Returns for insider trading

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-19.59%	-11.34%	-10.76%	-39.65%	-3.65%	-3.67%	2.82%	-0.08%	-9.38%
		-20.33%						-2.79%
			-17.54%					

Table 17 Results for Analysis of Correlation for insider trading

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-39.65%	-39.41%	67.06%	135.96%	99.57%	-20.63%	-29.61%	7.04%	-31.81%

Table 18 Results for Analysis of Beta for insider trading

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
77.45%	11.74%	177.00%	607.02%	34.42%	-64.22%	35.99%	1.80%	93.01%

Retail Trade

Table 19 Results for Analysis of Log Returns for insider trading

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-1.80%	-7.25%	-12.14%	20.61%	2.22%	4.27%	9.09%	8.35%
-7.07%							8.91%
-15.97%							

Table 20 Results for Analysis of Correlation for insider trading

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
80.53%	79.88%	111.56%	77.82%	122.79%	-67.12%	-90.76%	32.31%

Table 21 Results for Analysis of Beta for insider trading

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
33.15%	141.77%	190.80%	18.89%	195.62%	285.84%	-337.88%	139.86%

Metals and Mining

Aluminium Spot

Table 22 Results for Analysis of Log Returns for insider trading

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-13.22%	-1.18%	-4.34%	-5.62%	-4.11%	-0.87%
-13.22%					-3.22%
-10.00%					

Table 23 Results for Analysis of Correlation for insider trading

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-157.46%	-117.51%	-168.73%	-151.46%	-20.41%	-9.06%

Table 24 Results for Analysis of Beta for insider trading

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-106.12%	-56.39%	-385.14%	-198.47%	116.40%	-18.26%

Dow Jones Commodity Nickel

Table 25 Results for Analysis of Log Returns for insider trading

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-11.49%	6.98%	7.12%	7.27%	7.38%	5.69%
-11.49%				6.89%	
-18.37%					

Table 26 Results for Analysis of Correlation for insider trading

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-34.86%	-93.09%	101.57%	-52.24%	117.79%	-111.40%

Table 27 Results for Analysis of Beta for insider trading

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
458.60%	-63.54%	155.45%	-21.06%	165.98%	-197.33%

US Midwest Domestic Hot-Rolled Coil Steel Futures (Steel benchmark)

Table 28 Results for Analysis of Log Returns for insider trading

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-9.49%	-15.28%	-10.95%	-8.11%	-10.21%	2.34%	0.12%	6.19%	6.33%	-0.38%

Table 29 Results for Analysis of Correlation for insider trading

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
81.48%	46.22%	160.95%	71.17%	144.05%	85.02%	172.72%	20.92%	177.97%	100.22%

Table 30 Results for Analysis of Beta for insider trading

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
276.68%	-169.38%	1156.34%	202.72%	190.42%	-95.92%	388.71%	917.77%	571.74%	1194.20%

Airlines

Table 31 Results for Analysis of Log Returns for insider trading

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-9.38%	-3.32%	2.88%	0.44%	0.08%	-0.45%	2.25%
-9.38%						0.31%
-9.70%						

Table 32 Results for Analysis of Correlation for insider trading

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
71.99%	-15.10%	-77.10%	7.75%	3.27%	27.35%	-114.93%

Table 33 Results for Analysis of Beta for insider trading

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
227.94%	55.83%	-227.53%	10.50%	55.27%	24.59%	-108.56%

Air Defence

Table 34 Results for Analysis of Log Returns for insider trading

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-1.45%	11.04%	4.42%	10.40%	7.12%	6.39%

Table 35 Results for Analysis of Correlation for insider trading

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
9.05%	-57.71%	39.63%	-86.08%	-40.13%	118.10%

Table 36 Results for Analysis of Beta for insider trading

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-14.63%	-140.77%	41.93%	43.55%	49.01%	33.99%

5.1.2 Sanctions are effective in the medium and long term

Table 37 Performance of Russian sectors in Medium Term

Industry	Loss in relation to the global companies
Aluminium	-57.41%
Airlines	-46.12%
Steel	-45.98%
Gas	-44.56%
Oil	-36.51%
Banking	-33.94%
Nickel	-17.75%
Defence	-5.42%
Trade	-4.04%

The Biggest Winners and Losers

The results of performance against global companies indicate that not all industries were affected by events to the same degree. Metals and Mining, Oil and Gas, Airlines, and Banking endured the biggest losses in the medium term. Perhaps not surprisingly, Defence and Trade (i.e. retail) were the most resilient parts of Russian economy. Since Energy, Metals and Mining Industries are the biggest contributors to Russian GDP, these results confirm that sanctions are effective in the medium term and – absent significant changes in the pattern of global trade – will likely be effective in the long term too.

Table 38 Performance of Russian companies in Medium Term

Company	Loss in relation to the global companies
Gazprom || Dutch TTF Natural Gas Futures	-103.32%
Magnitogorskiy Metallurgicheskiy Kombinat	-84.00%
Lukoil || Dutch TTF Natural Gas Futures	-82.35%
Rosneft || Dutch TTF Natural Gas Futures	-79.28%
Novatek || Dutch TTF Natural Gas Futures	-72.10%
Surgutneftgaz || Dutch TTF Natural Gas Futures	-69.48%
Severstal	-64.92%
Gazprom || Dutch TTF Natural Gas Futures	-60.67%
AEROFLOT	-59.19%
Russneft || WTI	-54.92%
RUSAL	-54.77%
VTB	-53.87%
Mechel	-48.32%
Novolipetsk Steel	-45.26%
Lukoil || WTI	-39.70%
Rosneft || WTI	-36.63%
Sberbank	-34.20%
TCS Group	-33.54%
Slavneft || WTI	-29.44%
Gazprom neft || WTI	-28.52%
Surgutneftgaz || Dutch TTF Natural Gas Futures	-26.82%
M.Video	-26.42%
Bashneft || WTI	-12.84%
Trubnaya Metallurgicheskaya Kompaniya	-11.10%
X5 Group	-11.04%
Transneft || WTI	-9.65%
Magnit	-5.54%
GMKN	-3.59%
UNAC	-3.17%
Tatneft || WTI	4.39%
Moskovskiy Kreditnyi Bank	6.39%

On a more granular level, the biggest loser is Gazprom when regressed against Dutch Natural Gas Futures. At the same time there are companies that have actually ended up with higher stock prices after the war. The biggest beneficiary is Moskovkiy Kreditnyi Bank, followed by Tatneft when it is regressed against WTI.

Tatneft had relatively poor performance during the control period, but in the event period it lost less than other Russian companies.

That in the end elevated final measure that represents difference between two periods. Reasons for its resilience throughout war are not clear.

Oil and Gas

WTI (Oil Benchmark)

Table 39 Results for Analysis of Log Returns in Medium-term

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-60.67%	-39.70%	-12.84%	-36.63%	-29.44%	-54.92%	-28.52%	-26.62%	4.39%	-9.65%	9.25%	14.28%	-11.13%	29.46%	-6.73%
						-29.48%								7.03%
							-36.51%							

Table 40 Results for Analysis of Correlation in Medium-term

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-2.34%	-95.72%	-49.25%	-75.90%	-68.44%	-54.40%	-39.73%	-105.94%	-72.33%	45.61%	5.70%	-34.70%	-8.81%	-54.01%	-33.14%

Table 41 Results for Analysis of Beta in Medium-term

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-34.93%	-54.34%	-46.61%	-57.05%	-66.92%	-67.54%	-46.68%	-50.11%	-48.59%	-60.17%	4.98%	0.42%	1.05%		-15.20%

Dutch TTF Natural Gas Futures

Table 42 Results for Analysis of Log Returns in Medium-term

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-103.32%	-82.35%	-72.10%	-79.28%	-69.48%	-40.15%	-28.37%	-53.78%	-13.19%	-48.26%
				-81.31%					-36.75%
					-44.56%				

Table 43 Results for Analysis of Correlation in Medium-term

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-139.61%	-85.13%	-23.27%	-105.92%	-30.14%	-90.06%	-54.12%	-101.19%	-22.89%	-121.77%

Table 44 Results for Analysis of Beta in Medium-term

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-14.06%	4.62%	1.23%	-7.74%	-6.71%	-1.07%	0.27%	-4.46%	0.00%	-2.94%

Banking

Table 45 Results for Analysis of Log Returns in Medium-term

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-34.20%	-53.87%	6.39%	-33.54%	24.95%	-11.75%	-10.26%	15.63%	7.10%
			-28.81%					5.14%
				-33.94%				

Table 46 Results for Analysis of Correlation in Medium-term

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
11.56%	10.84%	9.38%	47.13%	5.81%	9.51%	0.93%	-41.75%	14.51%

Table 47 Results for Analysis of Beta in Medium-term

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
43.20%	60.69%	-17.88%	77.16%	-14.75%	-21.95%	-4.52%	-43.60%	-9.60%

Retail Trade

Table 48 Results for Analysis of Log Returns in Medium-term

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-5.54%	-11.04%	-26.42%	-15.01%	-17.57%	-13.38%	-3.12%	-2.40%
	-14.33%					-10.29%	
			-4.04%				

Table 49 Results for Analysis of Correlation in Medium-term

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
59.24%	0.17%	20.60%	34.32%	82.48%	79.72%	71.82%	28.18%

Table 50 Results for Analysis of Beta in Medium-term

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-20.56%	-11.52%	-16.05%	11.25%	23.75%	4.92%	2.69%	15.70%

Metals and Mining

Aluminium Spot

Table 51 Results for Analysis of Log Returns in Medium-term

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-54.77%	-47.54%	-23.12%	31.06%	39.56%	13.20%
-54.77%					2.63%
			-57.41%		

Table 52 Results for Analysis of Correlation in Medium-term

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
11.25%	30.76%	36.82%	69.87%	120.98%	9.67%

Table 53 Results for Analysis of Beta in Medium-term

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-32.59%	-3.42%	-18.15%	-23.96%	-5.65%	32.94%

Dow Jones Commodity Nickel

Table 54 Results for Analysis of Log Returns in Medium-term

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-3.59%	-2.25%	32.13%	16.79%	-18.06%	42.15%
-3.59%					14.15%
		-17.75%			

Table 55 Results for Analysis of Correlation in Medium-term

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
92.09%	31.35%	60.85%	-7.77%	15.11%	101.29%

Table 56 Results for Analysis of Beta in Medium-term

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-9.51%	-27.83%	-8.31%	-7.74%	7.83%	-20.85%

US Midwest Domestic Hot-Rolled Coil Steel Futures (Steel benchmark)

Table 57 Results for Analysis of Log Returns in Medium-term

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-64.92%	-84.00%	-48.32%	-45.26%	-11.10%	-1.32%	-13.06%	-17.03%	3.01%	4.70%
				-50.72%					-4.74%
				-45.98%					

Table 58 Results for Analysis of Correlation in Medium-term

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
25.44%	23.64%	-22.79%	9.91%	-108.21%	-11.15%	67.62%	2.15%	-25.84%	-34.99%

Table 59 Results for Analysis of Beta in Medium-term

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-6.72%	-6.65%	33.09%	7.56%	32.99%	-2.66%	-7.26%	1.94%	-9.64%	7.29%

Airlines

Table 60 Results for Analysis of Log Returns in Medium-term

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-59.19%	1.27%	-24.49%	-9.90%	-8.72%	-20.40%	-16.21%
-59.19%						-13.07%
-46.12%						

Table 61 Results for Analysis of Correlation in Medium-term

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-14.06%	-12.95%	33.86%	-4.22%	32.77%	-1.03%	28.51%

Table 62 Results for Analysis of Beta in Medium-term

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
0.35%	9.84%	-11.51%	-5.03%	-54.14%	-18.12%	-10.14%

Air Defence

Table 63 Results for Analysis of Log Returns in Medium-term

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-3.17%	16.15%	-5.81%	9.62%	3.70%	-12.41%
-3.17%					2.25%
-5.42%					

Table 64 Results for Analysis of Correlation in Medium-term

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-53.23%	-96.05%	100.94%	-1.28%	-20.69%	30.18%

Table 65 Results for Analysis of Beta in Medium-term

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-57.78%	3.25%	13.56%	-0.49%	10.97%	-20.46%

5.1.3 Market Rebound

Table 66 Ranked Correction of Russian Sectors

Industry	Gain in relation to the global companies
Oil	24.84%
Gas	13.94%
Air Defence	10.17%
Airlines	9.22%
Steel	1.40%
Banking	-1.36%
Nickel	-1.40%
Trade	-3.83%
Aluminium	-6.54%

The most resilient sectors and industries

The biggest rebound was made by the oil sector. Recall, this measure is the form of difference in difference. So, the difference in gains and losses between Russian and global oil companies between event and control group periods was just a bit short of 25%. Sectors like banking, nickel, trade, and aluminium may have also rebounded. However, when compared to their global counterparts, their gains were actually smaller. There is a pattern of notable rebound for Energy and Defence Industries, but further losses for metals and mining sector.

Table 67 Ranked Correction of Russian Companies

Company	Gain in relation to the global companies
Rosneft || WTI	39.04%
Novatek || Dutch TTF Natural Gas Futures	28.07%
Russneft || WTI	26.58%
Slavneft || WTI	26.20%
Rosneft || Dutch TTF Natural Gas Futures	25.74%
Surgutneftgaz || WTI	18.87%
Tatneft || WTI	18.33%
Magnit	12.69%
Gazprom neft || WTI	12.56%
UNAC	11.68%
Moskovskiy Kreditnyi Bank	11.61%
Gazprom || WTI	9.63%
Lukoil || WTI	8.86%
M.Video	6.32%
Bashneft || WTI	6.23%
Transneft || WTI	5.54%
Sberbank	3.33%
Lukoil || Dutch TTF Natural Gas Futures	1.48%
AEROFLOT	1.29%
TCS Group	-0.46%
X5 Group	-2.22%
Surgutneftgaz || Dutch TTF Natural Gas Futures	-2.85%
Gazprom || Dutch TTF Natural Gas Futures	-5.72%
RUSAL	-7.18%
Mechel	-11.93%
VTB	-14.33%
GMKN	-15.88%
Trubnaya Metallurgicheskaya Kompaniya	-28.20%
Novolipetsk Steel	-51.33%
Magnitogorskiy Metallurgicheskiy Kombinat	-55.33%
Severstal	-60.13%

On a company level, Rosneft rebound the most due to its oil part of business, returning around 39% of previous losses. The bottom 5 companies that went through bigger losses are almost all steel companies.

Oil and Gas

WTI (Oil Benchmark)

Table 68 Results for Analysis of Log Returns during Correction

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
9.63%	8.86%	6.23%	39.04%	26.20%	26.58%	12.56%	18.87%	18.33%	5.54%	-8.50%	0.31%	-14.01%	-5.04%	-11.01%
									17.18%					-7.65%
						24.84%								

Table 69 Results for Analysis of Correlation during Correction

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
44.96%	51.23%	19.29%	56.09%	31.60%	37.40%	44.79%	36.33%	91.07%	25.50%	-32.58%	178.09%	-42.14%	-5.63%	32.00%

Table 70 Results for Analysis of Beta during Correction

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
901.67%	837.05%	681.08%	1511.51%	1185.14%	1543.12%	1009.26%	1106.77%	1263.73%	1003.74%	25.94%	43.32%	-42.75%	0.00%	107.46%

Dutch TTF Natural Gas Futures

Table 71 Results for Analysis of Log Returns during Correction

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-5.72%	1.48%	28.07%	25.74%	-2.85%	-3.88%	1.47%	-11.88%	-7.69%	-1.03%
				9.34%					-4.60%
				13.94%					

Table 72 Results for Analysis of Correlation during Correction

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
4.01%	7.62%	60.50%	12.17%	1.21%	59.81%	150.62%	-51.49%	-16.17%	71.40%

Table 73 Results for Analysis of Beta during Correction

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
58.44%	41.03%	52.10%	77.75%	71.55%	9.20%	-2.89%	-8.60%	0.00%	6.39%

Banking

Table 74 Results for Analysis of Log Returns during Correction

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
3.33%	-14.33%	11.61%	-0.46%	1.73%	0.13%	-2.20%	8.61%	-1.30%
			0.04%					1.39%
			-1.36%					

Table 75 Results for Analysis of Correlation during Correction

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-0.14%	0.82%	-10.04%	-1.98%	-27.30%	-2.71%	-4.14%	-35.11%	0.92%

Table 76 Results for Analysis of Beta during Correction

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-175.81%	-188.81%	5.79%	-161.47%	-21.04%	23.46%	-15.56%	-53.67%	5.91%

Retail Trade

Table 77 Results for Analysis of Log Returns during Correction

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
12.69%	-2.22%	6.32%	7.68%	10.63%	21.29%	-0.78%	8.30%
5.60%			9.42%				
-3.83%							

Table 78 Results for Analysis of Correlation during Correction

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-75.41%	-80.08%	-87.37%	48.13%	-39.82%	-66.18%	-37.26%	-48.77%

Table 79 Results for Analysis of Beta during Correction

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
389.24%	326.31%	225.76%	82.75%	47.98%	175.03%	0.03%	83.67%

Metals and Mining

Aluminium Spot

Table 80 Results for Analysis of Log Returns during Correction

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-7.18%	18.42%	-17.81%	-8.50%	2.01%	2.67%
-7.18%					-0.64%
-6.54%					

Table 81 Results for Analysis of Correlation during Correction

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
17.45%	158.12%	26.30%	48.50%	141.32%	-8.77%

Table 82 Results for Analysis of Beta during Correction

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
404.57%	237.17%	39.23%	99.17%	101.00%	-58.68%

Dow Jones Commodity Nickel

Table 83 Results for Analysis of Log Returns during Correction

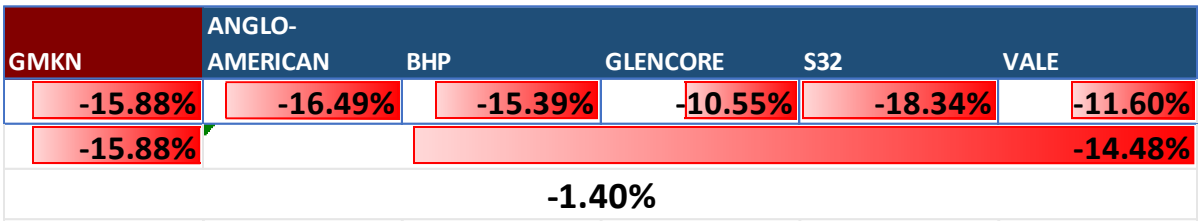


Table 84 Results for Analysis of Correlation during Correction

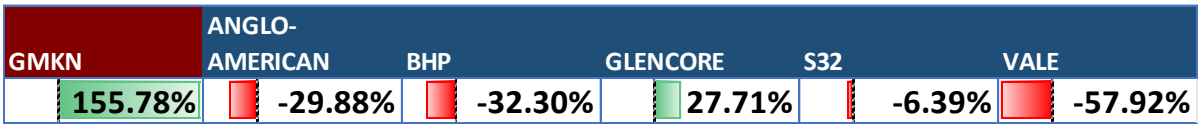
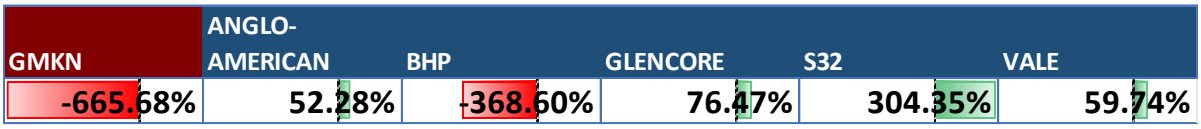


Table 85 Results for Analysis of Beta during Correction



US Midwest Domestic Hot-Rolled Coil Steel Futures (Steel benchmark)

Table 86 Results for Analysis of Log Returns during Correction

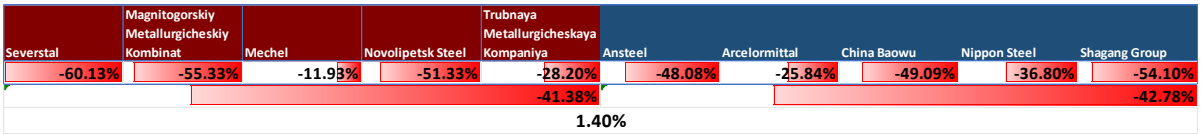


Table 87 Results for Analysis of Correlation during Correction

Table 88 Results for Analysis of Beta during Correction

Airlines

Table 89 Results for Analysis of Log Returns during Correction

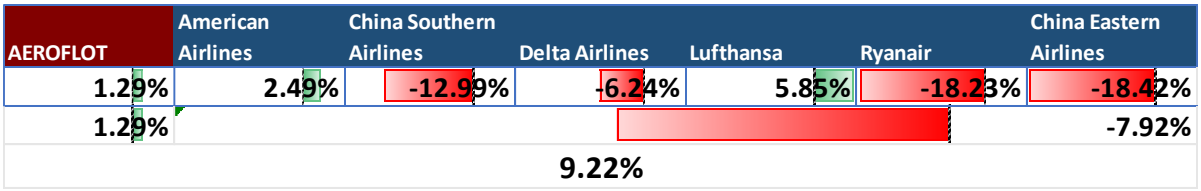


Table 90 Results for Analysis of Correlation during Correction

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-56.04%	3.77%	-50.94%	-4.75%	-15.95%	-33.82%	-68.58%

Table 91 Results for Analysis of Beta during Correction

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-1116.98%	68.22%	-186.70%	-26.01%	-393.76%	-26.11%	-267.44%

Air Defence

Table 92 Results for Analysis of Log Returns during Correction

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
11.68%	4.44%	1.06%	1.86%	3.56%	-3.34%
11.68%					1.52%
		10.17%			

Table 93 Results for Analysis of Correlation during Correction

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
92.00%	-26.29%	25.17%	-37.42%	-40.82%	-96.72%

Table 94 Results for Analysis of Beta during Correction

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
825.91%	-16.55%	50.83%	37.23%	68.05%	26.95%

5.2 Indirect Impact of Sanctions

The following three tables show the regression results of the empirical analysis in indirect impact.

Table 95 Regression Results of The Event Study Method on the Defense Industry

National defense and military ———— ESM				
Number of obs	114	Coefficient	6.125755	
F(0, 113)	0.00	std. err.	.465654	
Prob > F	.	t	13.16	
R-squared	0.0000	P>|t|	0.000	
Root MSE	4.9718	[95% conf. interval]	5.20321	7.0483

Table 96 Regression Results of The Event Study Method on Commodity Trade

Bulk commodity trade ———— ESM				
Number of obs	10	Coefficient	6.116495	
F(0, 9)	0.00	std. err.	3.08572	
Prob > F	.	t	1.98	
R-squared	0.0000	P>|t|	0.079	
Root MSE	9.7579	[95% conf. interval]	-.863889	13.09688

Table 97 Regression Results of The Event Study Method on Commodity Trade

Table 98 Regression Results of Difference-in-Differences Regression Result on Financial Services Companies

Financial services ———— DID				
Number of obs	492	Coefficient	.518752	
F(3, 488)	2658.27	std. err.	.0215801	
Prob > F	0.0000	t	24.04	
R-squared	0.9169	P>|t|	0.000	
Root MSE	.12387	[95% conf. interval]	.4763507	.5611533

For the defense industry, We can reject the original hypothesis of zero cumulative abnormal returns for these 114 companies at the 1% level, so this event has a significant positive impact on the stock price returns of China's defense industry. We find that the cumulative average abnormal returns of these companies are positive after the event, meaning that defense companies outperformed the broader market. We have selected the top six companies in stock code order and the table below shows the expected returns, abnormal returns and cumulative abnormal returns during the estimation window. Due to the large sample size of the estimation, please refer to the Appendix for the complete data details of 114 companies.

Table 99 Top Six Companies' expected returns, abnormal returns and cumulative abnormal returns

id	market_return	return	predicted_return	abnormal_return	cumulative_abnormal_return
1	-2.027449	3.8026	-2.369801	6.1724	10.54342
2	-2.027449	1.6556	-2.553331	4.208931	2.58093
3	-2.027449	1.0485	-1.310634	2.359134	3.01459
4	-2.027449	1.3675	-0.939707	2.307207	4.269824
5	-2.027449	-2.6596	-0.8493658	-1.810234	0.7808401
6	-2.027449	0.9988	-1.254157	2.252957	2.861296

The Russia-Ukraine conflict reminded investors of the importance of the defense industry. China has been very peaceful since the founding of the country, so many Chinese stockholders believe that war is distant, and along with the tension and escalation of the Russia-Ukraine conflict, the defense industry sector has received more attention from investors. The Russia-Ukraine incident has brought a short-term drive to the defense industry sector, leading to a rise in the sector, but the event-driven triggered market is not sustainable, because China's defense industry sector has entered the era of fundamental investment, and only the valuation changes brought by performance growth can drive the sustained rise of China's defense industry sector.

In terms of financial services, we can draw a conclusion from the regression results that the did coefficient is significantly greater than zero, the Russian Ukrainian war has played a significant role in promoting Harbin Bank, and China's banks providing financial services have benefited from European and American sanctions against Russia.

In terms of bulk commodity trade, according to the results of the event study method, we can see that European and American sanctions against Russia have no significant impact on these ten main Sino-Russian trade companies.

Figure 10 Oil Price of China, America and Russia in 09/2021-09/2022

We can see from the above figure that, after the plunge in Russian oil prices, China's oil prices were also lower than the US after March 2022. Even if Chinese oil companies do

not explicitly state that they import cheap Russian oil, Russian oil influences the change of oil prices in the market because it competes with imports from other countries, the price of oil in other countries will be affected because of Russian oil prices. And the data on China's oil trade with Russia show that China has imported more oil from Russia.

We will define relative price as the ratio of China's oil price compared to the U.S. oil price. The data show that the relative price of oil in China did fall after the plunge in the price of Russian oil.

6. Discussion

6.1 Summary

Our analysis reveals significant abnormal losses for Russian firms across different industries in the medium-term (180 days after the invasion). Energy, Metals and Mining, Airlines and Banking show the biggest losses. Trade and Defence suffered the least. The difference between the most susceptible and the least susceptible to sanctions sectors accounted to 53.37% over the period, or XX at an annualized rate. Firm-level analysis shows that the biggest loser is Gazprom, the biggest Russian company. Interestingly, the biggest winners were not any of the Trade companies, but from Banking and Energy. The total difference between the biggest winner and loser was 109.71%.

Our investigation of possible insider trading in January, 2022, shows that most of the largest companies in Russia incurred significant losses even before the war started. By contrast, most of their global counterparts did not suffer the same sell-off. Searching contemporary news sources suggests that the sell-off might have been triggered by a statement made by the Deputy Foreign Minister of Russia, Sergei Ryabkov. According to Rybakov: "The main problem is that the United States and its NATO allies are by no means ... ready to meet our key demands for the non-expansion of NATO, the curtailment of the infrastructure of the alliance and its return to the borders of 1997 and, of course, on topics that are legally related binding guarantees not to place relevant systems in the immediate vicinity of our borders".

The market rebound results show that the increase in stock values happened mostly to Russian companies. This suggests that upswings resulted from corrective initiatives rather than company-specific or global industry factors.

Our analysis of the indirect impact of the war suggests that it had a positive impact on China's military sector stock returns. This need not imply that China is providing military assistance to Russia; indeed, there is no official evidence that China is providing weapons to Russia and China has expressed its firm neutrality in its diplomatic statements. So a reasonable interpretation is that increased global tensions raise the value of all suppliers of military hardware.

In terms of financial services institutions, our study finds that Harbin Bank outperforms its financial services counterparts by providing financial services to Russia during the period of sanctions imposed by Europe and the US on Russia. The limitation of this study is that Harbin Bank is only representative of an individual case and not of the entire financial sector that benefited from the sanctions. It is not possible to make this point more strongly due to data limitations. But Sino-Russian trade has increased the share of transactions in RMB and rubles, with about 17% of trade between China and Russia now settled in RMB, up from 3.1% in 2014.

The research results of China and Russia's commodity trading companies show no significant impact. However, the import and export trade data between China and Russia show that from January to August 2022, the total trade between China and Russia accounts for 2.8% of China's total foreign trade. Russia exports the most mineral products to China, and imports the most base metals and their products from China.

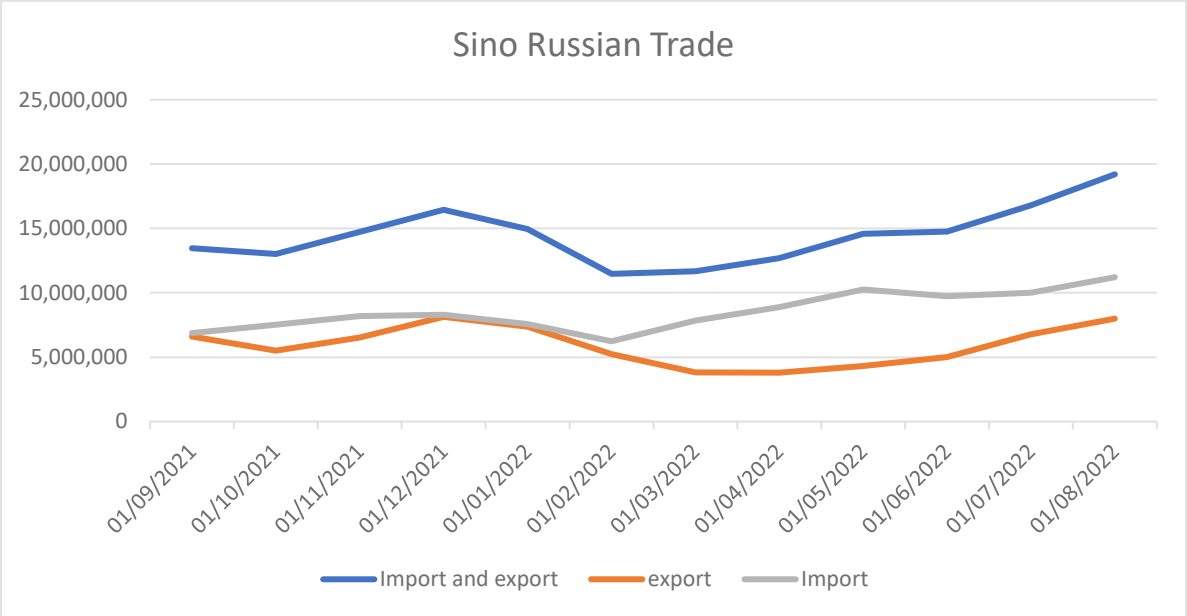


Figure 11 Sino Russian import and export trade volume from September 1, 2021 to August 1, 2022 (USD 1000)

As can be seen from the figure above, after Russia launched the war in February, Sino Russian trade declined sharply, but gradually recovered from March to June. By August, Sino Russian trade volume was far ahead of that of seven months. Therefore, we can conclude that although the stock returns of Sino Russian trade companies have not changed significantly,

the increase of Sino Russian trade volume is significant. It is obvious that Russian energy and commodity exports have shifted to Asia.

6.2 Interpretations

The Russian economy has clearly suffered from the war, with the majority of their largest companies in key industries incurring great losses. They have lost around half of their values through six months of conflict. Most of the companies went through the period of steep decline that was later followed by a corrective upswing. The absence of the same pattern among global companies means that those upswings were caused, not by overhauling positive factors within industries in general, but specifically by repositioning in the Russian stock market. Despite the rebound, Russian companies have still declined significantly overall.

The sanctions imposed by Europe and the United States on Russia represent both a challenge and an opportunity for China. For example, it benefits China by helping to lower China's industrial production costs, boosting demand for Chinese goods in Europe and the United States, and increasing China's exports to the world market. On the other hand, China may decline to export “dual-use” goods to Russia, such as silicon chips, that would have been exported in the absence of the conflict.

On the political front, China's lack of active participation in sanctions against the war would exacerbate the confrontation between China and Europe and the United States.

Sanctions also have advantages and disadvantages for Europe and the United States. Firm sanctions in Europe and the United States show a determination to maintain peace, but they also lead to an energy crisis in Europe, soaring electricity costs and even currency devaluation. ExxonMobil said the sanctions led to a loss of $1 billion.

6.3 Implications of results

6.3.1 Presence of insider trading

The presence of insider trading may have a far-reaching implications. For example, in economies with a vertical hierarchical structure, and where the government has a strong grip on stock exchanges and some of the largest companies are state-owned, this pattern of an

unexpected sell-off could easily be repeated again as information can be revealed early and quickly by a small number of well-informed agents. Such a factor could prove to be helpful in prediction of events of similar kind.

Of course, this is a warning to external investors. The first priority of a state-owned enterprise is not the accumulation and preservation investor profit, but rather the geopolitical interests of the state. Rational investors will demand a higher risk premium for purchasing such stocks.

6.3.2 The long-term outlook

The Russian economy is getting severely damaged by the imposed sanctions. Despite of some support in the form of new trade agreements with India or increased purchase of oil by China, the majority of key industries that contribute the most to Russian GDP went through a notable decline in their stocks' prices.

Some news articles and commentators claim that the Russian economy is resilient to sanctions. However, our results undermine this argument. And we believe that the longer the war proceeds, the higher are chances for unsurmountable losses for Russia.

The most recent financial statements of the largest companies are still not available, and we still do not have an information about their profits in the past quarters. This is why evidence from stock prices is so valuable. Given their falling stock prices; the reduction in the purchase of energy products by Europe; the limitation of technologies from the west necessary to support operations and maintain production capacity; it seems certain that Russian firms have lost much of their value.

Material loss in the form of a decreasing profitability, absence of Western products and other are not the only issues that Russia encounters. Perhaps a more lasting impact would the loss in reputation. Even Russian forces withdrew today, prospects for Russia would remain poor because current events serve as a major warning for global companies that investing in Russia is very risky. Breach of partnerships and collaborations with major companies in Russia have brought huge direct losses and huge opportunity costs. Redemption prospects do not see very prominent in the foreseeable future and with that implication it is hard to see the return of the well-known global brands, companies, and foreign investments back to the country.

6.3.3 Market rebound

The market rebound in Russian stocks serves as a warning not to jump to extreme conclusions – even if they are initially consistent with our priors (or prejudices). This warning extends beyond the limits of Ukrainian war and would suggest to treat any news, claims and opinions with some caution.

6.3.4 Neutrals suffer less

The study of indirect effects in this paper can confirm the idea that neutral countries are less affected than sanctioned countries as shown by Helsy et al. (2022).China has firmly stated its view of neutrality in its diplomatic statements but China, as a neighbour of Russia, will certainly increase its trade with Russia. After the sanctions, Russia's economic focus will shift from Europe to Asia. China has already been suffering from U.S. economic sanctions due to the U.S.-China trade war under Trump.

Russian Chinese energy trade is still mainly settled in U.S. dollars. At the beginning of the Russia-Ukraine conflict, most political commentators thought that the Russia-Ukraine conflict would last only a few months, but in fact it has lasted ten months already. Moscow has increased its holdings of yuan in its foreign exchange reserves to ease the pressure of economic sanctions from Europe and the United States. More and more Russian companies are using the the yuan to settle their trade and are increasing their yuan-denominated lending. Many wealthy Russians have settled in the Middle East through investment migration, and Middle Eastern countries are also benefiting from the sanctions as neutral countries.

6.4 Limitations

6.4.1 Low correlation of some companies with respective benchmarks

One element suggesting that our data are reliable is the relatively high correlation of large Russian companies with their respective benchmarks in period characterized in “normal” times. However, small-to-medium sized companies do not share this characteristic. The prices of such companies stem less from global factors, but from idiosyncratic shocks that remain unknown to us. So, it is hard to say with any degree of certainty whether sanctions have had a notable effect on them, since the major component of our calculation requires company to

have a high correlation with the benchmark. This limitation gets further exacerbated by the fact that most of those smaller companies are privately owned.

6.4.2 Inability to distinguish firm-specific from systematic risk

This issue gets well represented by the success of Tatneft, which is one of the largest oil and gas companies in Russia included in the sanction list. Despite tremendous losses endured by its peer companies, Tatneft managed to end up with performance better than in the previous year, when the Russian stock market enjoyed the period of stability and growth. It is not clear whether this success can be attributed to systematic or idiosyncratic factors. While sanction advocates would prefer to see such sign of resilience to come from the company-specific factor, it is possible that company won – not despite the sanctions – but because of them. After 2014, certain sectors abandoned by foreign companies were soon claimed by Russian firms; despite providing the market with possibly inferior products and services, they saw a rise in their profitability and stock prices due to limited alternative supply. Hence it is difficult to put the success of Tatneft down to any particular factor.

One of the bigger limitations of our work was that this war is an ongoing process and every day we are getting news that could support or contradict our findings. While we do not see that findings we have made will change dramatically in the coming months, certain smaller aspects may still have some effect.

6.4.3 Anti-epidemic policy in China blurs results

The indirect impact results and interpretations are somewhat limited, because when we analysis the defense company abnormal return, we selected CSI 300 as the market returns, which is the overall Chinese stock market. However, Due to China's anti-epidemic policy of dynamic clearing, China's economic growth is sluggish and stock market returns are in the doldrums, but China's military industry has been an industry that China has been vigorously developing, and even without the Russia-Ukraine conflict, China's Even without the Russian-Ukrainian conflict, China's military industry would probably have developed better relative to the overall market returns of the Chinese stock market.

6.4.4 Limited scope on financial industry

Another limitation of indirect impact study is that Harbin Bank is only representative of an individual case and not of the entire financial sector that benefited from the sanctions. Therefore, we cannot conclude from the results of the study the impact of sanctions on Chinese financial institutions, but only that for some banks that provide RMB support to Russia benefit from the sanctions.

We selected only China as a representative of neutral countries for our indirect impact study, which does not mean that all neutral countries suffered from sanctions while also benefiting from them. For example, Africa's ability to import food and fertilizer from Russia was severely negatively affected by the sanctions. A comprehensive study of the indirect effects of sanctions would require a lot of data from a large number of countries, which would be a very heavy workload.

6.5 Recommendations

Due to the recent nature of events, not much empirical work has been done in this field. In the future, the analysis could be expanded using other kinds of data such as economic key performance indicators, changes in trade agreements and financial statements of Russian companies.

Additionally, the scope of our research does not encompass assessment on the effect of sanctions on all sides involved in this event. While effect on Russian companies is perhaps the most direct and obvious, there are other stakeholders that have either benefited or lost. Countries that were excessively reliant on trade with Russia, states that could provide Europe alternatives for Russian gas, producers of weapons, different demographic groups within Russia have all been affected to certain extent by an ongoing war. Analysing their gains or losses will provide a valuable input to literature about effects of sanctions on the big players.

Further research can be also dedicated to analysing why some Russian companies like Tatneft and Moskovskiy Kreditnyi Bank performed so well throughout the year. It is not quite clear whether their gains can be attributed to firm-specific factors or some proportion of their business that benefited from systematic influence. Insights will provide policymakers a useful reference to make new sanctions even more effective.

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Appendix

Log Returns, Correlations and Betas

Tables in this section show calculated variables in sequence for logarithmic returns, Pearson's correlation, and Beta. Note that tables with correlation have an additional row on the top that represents correlation for the period between 03/01/2020 – 11/01/2022. That was made to validate the choice of benchmarks as proper.

Oil

		WTI	GAZPROM	LUKOIL	BASHNEFT	ROSNEFT	SLAVNEFT	RUSSNEFT	GAZPROM NEFT	SURGUTNEFT GAZ	TATNEFT	TRANSNEFT	CHINA PETROLEUM	EXXON	PETROCHINA	SAUDI ARAMCO	TOTAL ENERGIES
15/07/2021	11/01/2022	13.08%	20.51%	5.82%	-1.40%	8.70%	12.78%	7.38%	21.33%	16.45%	1.71%	-12.60%	3.07%	19.09%	7.29%	3.10%	26.14%
13/01/2021	19/01/2021	0.81%	-1.62%	2.35%	-0.06%	4.97%	2.16%	-11.65%	1.06%	-3.38%	-2.92%	1.36%	-1.19%	0.86%	1.91%	-0.69%	-0.78%
12/01/2022	18/01/2022	4.59%	-14.31%	-10.76%	-10.39%	-14.16%	-3.11%	-13.65%	-7.16%	-10.99%	-7.56%	-1.73%	0.46%	2.69%	3.85%	1.20%	2.73%
17/02/2022	24/02/2022	4.76%	-43.21%	-37.02%	-33.09%	-69.33%	-44.16%	-66.05%	-37.84%	-50.13%	-46.05%	-34.94%	0.92%	-3.16%	3.34%	9.10%	-6.17%
17/02/2022	30/03/2022	17.06%	-40.40%	-27.00%	-32.79%	-35.06%	-24.55%	-39.16%	-19.14%	-44.45%	-21.68%	-32.55%	-0.69%	6.85%	0.00%	9.95%	-7.54%
17/02/2022	16/08/2022	-4.67%	-57.91%	-51.62%	-31.99%	-45.68%	-34.41%	-65.28%	-24.94%	-28.12%	-11.65%	-40.00%	-5.43%	15.62%	-21.59%	14.81%	1.66%

		GAZPROM	LUKOIL	BASHNEFT	ROSNEFT	SLAVNEFT	RUSSNEFT	GAZPROM NEFT	SURGUTNEFT GAZ	TATNEFT	TRANSNEFT	CHINA PETROLEUM	EXXON	PETROCHINA	SAUDI ARAMCO	TOTAL ENERGIES
03/01/2020	11/01/2022	82.99%	82.19%	-52.68%	93.85%	44.27%	-78.17%	75.15%	-1.38%	-4.93%	65.09%	18.85%	76.28%	68.36%	71.34%	66.74%
15/07/2021	11/01/2022	71.08%	85.63%	57.33%	90.36%	47.05%	58.41%	63.65%	40.44%	78.67%	-20.42%	27.55%	79.47%	70.26%	87.70%	71.52%
13/01/2021	19/01/2021	15.88%	35.51%	54.85%	-22.59%	-47.59%	12.47%	6.92%	50.30%	57.53%	25.50%	5.14%	95.50%	31.99%	34.43%	80.20%
12/01/2022	18/01/2022	-89.35%	-81.36%	-75.45%	-85.36%	-58.43%	-83.49%	-95.19%	-72.59%	-80.50%	-14.99%	-21.38%	99.94%	75.74%	50.30%	99.62%
17/02/2022	24/02/2022	-99.83%	-99.08%	-96.46%	-97.12%	-94.04%	-95.38%	-97.66%	-98.82%	-99.76%	-94.81%	15.87%	-89.91%	70.47%	89.43%	-93.88%
17/02/2022	30/03/2022	-54.86%	-47.85%	-77.17%	-41.03%	-62.44%	-57.98%	-52.87%	-62.48%	-8.68%	-69.31%	-16.71%	88.18%	28.32%	83.80%	-61.88%
17/02/2022	16/08/2022	68.74%	-10.09%	8.09%	14.46%	-21.39%	4.01%	23.92%	-65.50%	6.34%	25.19%	33.25%	44.77%	61.44%	33.68%	38.39%

		GAZPROM	LUKOIL	BASHNEFT	ROSNEFT	SLAVNEFT	RUSSNEFT	GAZPROM NEFT	SURGUTNEFT GAZ	TATNEFT	TRANSNEFT	CHINA PETROLEUM	EXXON	PETROCHINA	SAUDI ARAMCO	TOTAL ENERGIES
15/07/2021	11/01/2022	27.92%	41.94%	17.33%	47.57%	6.01%	32.56%	23.81%	30.79%	46.09%	11.39%	1.67%	50.60%	22.85%	0.00%	38.67%
13/01/2021	19/01/2021	13.59%	41.90%	15.29%	0.72%	-0.05%	-13.90%	16.31%	41.32%	47.78%	26.83%	-28.30%	131.68%	8.17%	0.00%	34.99%
12/01/2022	18/01/2022	-65.37%	38.55%	81.41%	-18.53%	-48.11%	37.88%	-51.94%	101.67%	22.20%	65.28%	-38.20%	61.41%	-17.33%	0.00%	59.55%
17/02/2022	24/02/2022	-970.07%	-834.56%	-802.61%	-1451.63%	-1392.33%	-1697.52%	-1099.27%	-1145.13%	-1234.60%	-1214.67%	-20.90%	-7.44%	58.82%	0.00%	-138.84%
17/02/2022	30/03/2022	-68.40%	2.48%	-121.53%	59.88%	-207.19%	-154.40%	-90.02%	-38.36%	29.13%	-210.93%	5.04%	35.88%	16.07%	0.00%	-31.39%
17/02/2022	16/08/2022	-7.01%	-12.40%	-29.28%	-9.47%	-60.91%	-34.97%	-22.87%	-19.32%	-2.49%	-48.78%	6.65%	51.02%	23.90%	0.00%	23.47%

Natural Gas

		Dutch TTF Natural Gas Futures	GAZPROM	LUKOIL	NOVATEK	ROSNEFT	SURGUTNEFTGAZ	BP	EXXON	PETROCHINA	SAUDI ARAMCO	SHELL
15/07/2021	11/01/2022	91.93%	20.51%	5.82%	13.43%	8.70%	16.45%	22.19%	19.09%	7.29%	3.10%	21.68%
13/01/2021	19/01/2021	-28.50%	-1.62%	2.35%	-3.45%	4.97%	-3.38%	-0.88%	0.86%	1.91%	-0.69%	-0.02%
12/01/2022	18/01/2022	-2.78%	-14.31%	-10.76%	-13.47%	-14.16%	-10.99%	3.68%	2.69%	3.85%	1.20%	3.29%
17/02/2022	24/02/2022	34.54%	-43.21%	-37.02%	-43.22%	-69.33%	-50.13%	-8.53%	-3.16%	3.34%	9.10%	-3.88%
17/02/2022	30/03/2022	43.08%	-40.40%	-27.00%	-6.62%	-35.06%	-44.45%	-3.88%	6.85%	0.00%	9.95%	3.63%
17/02/2022	16/08/2022	116.84%	-57.91%	-51.62%	-33.77%	-45.68%	-28.12%	6.94%	15.62%	-21.59%	14.81%	-1.67%

		GAZPROM	LUKOIL	NOVATEK	ROSNEFT	SURGUTNEFTGAZ	BP	EXXON	PETROCHINA	SAUDI ARAMCO	SHELL
03/01/2020	11/01/2022	87.79%	65.53%	79.92%	72.46%	-3.04%	14.28%	55.24%	63.12%	48.95%	41.18%
15/07/2021	11/01/2022	67.41%	34.06%	12.54%	45.87%	67.11%	70.97%	55.36%	45.58%	26.87%	60.68%
13/01/2021	19/01/2021	56.67%	-61.81%	81.48%	-91.96%	88.24%	57.63%	11.18%	-56.82%	97.33%	28.10%
12/01/2022	18/01/2022	10.55%	11.17%	1.12%	17.36%	11.59%	21.76%	34.21%	-26.53%	-3.32%	26.62%
17/02/2022	24/02/2022	-86.12%	-92.98%	-90.95%	-94.24%	-92.05%	-97.13%	-86.85%	94.17%	84.55%	-96.79%
17/02/2022	30/03/2022	-82.11%	-85.37%	-30.45%	-82.07%	-90.85%	-37.32%	63.77%	42.68%	68.38%	-25.39%
17/02/2022	16/08/2022	-72.20%	-51.07%	-10.73%	-60.05%	36.97%	-19.09%	1.25%	-55.61%	3.98%	-61.10%

		GAZPROM	LUKOIL	NOVATEK	ROSNEFT	SURGUTNEFTGAZ	BP	EXXON	PETROCHINA	SAUDI ARAMCO	SHELL
15/07/2021	11/01/2022	2.84%	-4.26%	-1.83%	-2.35%	3.78%	-1.49%	-0.29%	3.12%	0.00%	2.39%
13/01/2021	19/01/2021	-2.07%	-1.89%	13.09%	2.35%	0.25%	-1.09%	2.95%	17.94%	0.00%	-6.70%
12/01/2022	18/01/2022	24.21%	20.33%	19.96%	29.26%	20.61%	0.41%	4.63%	-9.77%	0.00%	3.14%
17/02/2022	24/02/2022	-130.57%	-111.67%	-130.98%	-199.42%	-156.58%	-21.27%	-0.82%	9.79%	0.00%	-6.64%
17/02/2022	30/03/2022	-72.13%	-70.64%	-78.88%	-121.67%	-85.02%	-12.07%	-3.70%	1.18%	0.00%	-0.26%
17/02/2022	16/08/2022	-11.22%	0.36%	-0.60%	-10.09%	-2.93%	-2.56%	-0.02%	-1.34%	0.00%	-0.55%

Banking

		KBW Nasdaq Global Bank	SBERBANK	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
15/07/2021	11/01/2022	13.38%	-3.32%	6.30%	8.95%	-7.27%	0.00%	23.69%	23.82%	17.36%	7.45%
13/01/2021	19/01/2021	-1.42%	-1.99%	-2.78%	0.22%	12.21%	2.73%	-2.08%	-2.06%	-0.22%	-1.66%
12/01/2022	18/01/2022	-1.14%	-21.30%	-13.84%	-10.25%	-27.16%	-0.64%	-5.47%	1.04%	-0.01%	-10.75%
17/02/2022	24/02/2022	-8.64%	-67.87%	-71.74%	-28.22%	-52.67%	-1.69%	-5.51%	-11.85%	-2.20%	-4.65%
17/02/2022	30/03/2022	-10.16%	-66.06%	-87.58%	-18.13%	-54.65%	-1.48%	-6.90%	-15.57%	4.89%	-7.46%
17/02/2022	16/08/2022	-21.46%	-72.35%	-82.41%	-19.51%	-75.65%	-9.89%	-22.90%	-21.28%	-1.84%	-20.28%

		SBERBANK	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
03/01/2020	11/01/2022	92.61%	88.05%	88.81%	84.42%	-16.71%	97.07%	98.56%	96.06%	98.80%
15/07/2021	11/01/2022	46.40%	53.55%	57.88%	35.58%	30.01%	84.16%	83.89%	67.24%	83.28%
13/01/2021	19/01/2021	93.11%	82.92%	2.62%	-77.25%	-88.24%	99.35%	86.80%	67.99%	99.65%
12/01/2022	18/01/2022	53.46%	43.51%	69.68%	58.71%	11.33%	78.72%	57.19%	75.03%	67.85%
17/02/2022	24/02/2022	92.19%	94.26%	83.61%	97.79%	91.50%	97.71%	99.72%	69.27%	96.13%
17/02/2022	30/03/2022	92.05%	95.09%	73.58%	95.80%	64.20%	95.00%	95.57%	34.16%	97.05%
17/02/2022	16/08/2022	57.96%	64.39%	67.26%	82.71%	35.82%	93.67%	84.83%	25.49%	97.79%

		SBERBANK	VTB	Moskovskiy Kreditnyi Bank OAO	TCS Group	Industrial ar	Bank of Am	BNP	Mitsubishi U	JPMorgan
15/07/2021	11/01/2022	0.85977251	1.00027841	0.50224824	0.58786204	0.18069315	1.28118325	1.16368967	0.56982771	1.08873324
13/01/2021	19/01/2021	1.28666784	0.36013371	0.30465805	-1.6034901	-0.3760381	1.74650298	0.68167778	0.63755561	0.94075863
12/01/2022	18/01/2022	2.0611983	0.47750011	2.07462389	4.46667758	-0.0318323	1.10433491	1.04157917	0.65553953	1.87088548
17/02/2022	24/02/2022	5.99878444	7.51626904	0.81351278	5.33078631	0.29350959	0.55740039	1.43244027	0.03115292	0.77502321
17/02/2022	30/03/2022	4.24072631	5.628132	0.87136575	3.71604629	0.08312103	0.79195822	1.27685965	-0.5055209	0.83407806
17/02/2022	16/08/2022	1.2917885	1.60716015	0.32341433	1.35941694	0.03318558	1.06167799	1.11851722	0.13379761	0.99269554

Retail Trade

		S&P Retail Select Industry Index	MAGNIT	X5 GROUP	M.Video	Carrefour	CostCo	Kroger	Seven Eleven	Wallmart
15/07/2021	11/01/2022	-6.46%	3.65%	-19.60%	-28.24%	10.01%	23.71%	20.57%	-0.97%	1.78%
13/01/2021	19/01/2021	1.11%	-4.28%	0.07%	3.45%	-15.64%	-3.46%	4.97%	-0.90%	-2.79%
12/01/2022	18/01/2022	-5.09%	-12.28%	-13.39%	-14.90%	-1.24%	-7.45%	3.03%	1.98%	-0.64%
17/02/2022	24/02/2022	-3.37%	-45.58%	-36.81%	-51.03%	-2.08%	-1.85%	-1.76%	-0.53%	-3.18%
17/02/2022	30/03/2022	-0.88%	-30.40%	-36.53%	-42.21%	8.10%	11.27%	22.02%	1.18%	7.62%
17/02/2022	16/08/2022	-5.48%	-0.91%	-29.67%	-53.69%	-4.02%	7.12%	8.17%	-3.11%	0.35%

		MAGNIT	X5 GROUP	M.Video	Carrefour	CostCo	Kroger	Seven Eleven	Wallmart
03/01/2020	11/01/2022	86.39%	-1.88%	59.34%	68.20%	76.15%	78.53%	86.49%	68.70%
15/07/2021	11/01/2022	31.61%	47.03%	47.97%	0.33%	-9.38%	-18.32%	-6.69%	47.92%
13/01/2021	19/01/2021	14.64%	17.35%	-14.49%	-1.47%	-23.06%	33.61%	21.41%	13.49%
12/01/2022	18/01/2022	95.17%	97.23%	97.07%	76.34%	99.73%	-33.51%	-69.35%	45.80%
17/02/2022	24/02/2022	61.02%	49.71%	63.91%	11.27%	99.98%	71.47%	99.11%	80.05%
17/02/2022	30/03/2022	-14.40%	-30.37%	-23.46%	59.40%	60.16%	5.29%	61.85%	31.28%
17/02/2022	16/08/2022	-27.63%	47.20%	68.57%	34.65%	73.09%	61.41%	65.13%	76.10%

		MAGNIT	X5 GROUP	M.Video	Carrefour	CostCo	Kroger	Seven Eleven	Wallmart
15/07/2021	11/01/2022	0.16	0.19	0.04	0.03	0.32	0.23	0.11	0.13
13/01/2021	19/01/2021	0.43	0.35	-0.40	-0.64	-0.30	0.33	0.01	0.23
12/01/2022	18/01/2022	0.76	1.77	1.51	-0.46	1.66	3.19	-3.37	1.63
17/02/2022	24/02/2022	-4.49	-5.03	-4.41	-0.44	0.38	-0.13	0.32	-0.39
17/02/2022	30/03/2022	-0.60	-1.77	-2.15	0.39	0.86	1.62	0.33	0.45
17/02/2022	16/08/2022	-0.05	0.08	-0.12	0.15	0.55	0.28	0.14	0.29

Aluminium

		Aluminium Spot	RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
15/07/2021	11/01/2022	16.51%	43.50%	58.82%	5.14%	-12.74%	-14.75%	19.12%
13/01/2021	19/01/2021	-2.46%	-1.72%	-5.68%	-5.97%	-0.58%	-0.20%	-2.48%
12/01/2022	18/01/2022	1.40%	-11.08%	-3.00%	-6.45%	-2.33%	-0.45%	0.52%
17/02/2022	24/02/2022	3.80%	-21.34%	-4.23%	-0.74%	0.75%	-1.66%	6.90%
17/02/2022	30/03/2022	8.31%	-24.01%	18.70%	-14.04%	-3.25%	4.86%	14.08%
17/02/2022	16/08/2022	-31.20%	-58.99%	-36.43%	-65.69%	-29.40%	-22.91%	-15.39%

		RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
03/01/2020	11/01/2022	95.82%	97.69%	94.88%	82.65%	61.65%	97.90%
15/07/2021	11/01/2022	73.94%	66.00%	56.70%	18.19%	-29.61%	85.52%
13/01/2021	19/01/2021	85.45%	81.39%	92.55%	74.16%	37.24%	71.32%
12/01/2022	18/01/2022	-72.01%	-36.12%	-76.18%	-77.30%	16.83%	62.26%
17/02/2022	24/02/2022	-73.06%	-82.81%	4.89%	2.20%	-78.66%	93.88%
17/02/2022	30/03/2022	-55.62%	75.31%	31.19%	50.70%	62.66%	85.12%
17/02/2022	16/08/2022	85.19%	96.76%	93.52%	88.06%	91.36%	95.19%

		RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
15/07/2021	11/01/2022	78.40%	119.38%	73.96%	72.32%	49.66%	96.14%
13/01/2021	19/01/2021	36.83%	93.30%	223.31%	51.11%	-86.33%	78.26%
12/01/2022	18/01/2022	-69.29%	36.91%	-161.83%	-147.36%	30.08%	60.00%
17/02/2022	24/02/2022	-262.53%	-90.60%	-104.79%	-95.01%	-104.12%	189.37%
17/02/2022	30/03/2022	142.04%	146.57%	-65.56%	4.16%	-3.11%	130.69%
17/02/2022	16/08/2022	45.82%	115.96%	55.81%	48.36%	44.01%	129.08%

Nickel

		Dow Jones Commodity	GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
15/07/2021	11/01/2022	15.28%	-7.66%	10.38%	-14.33%	20.09%	31.35%	-39.14%
13/01/2021	19/01/2021	3.01%	-0.58%	-3.72%	-0.76%	-1.27%	-3.00%	-3.02%
12/01/2022	18/01/2022	0.09%	-14.99%	0.34%	3.44%	3.08%	1.46%	-0.26%
17/02/2022	24/02/2022	3.91%	-17.93%	2.02%	-6.90%	0.37%	0.88%	2.79%
17/02/2022	30/03/2022	31.50%	-6.21%	13.13%	5.30%	17.41%	10.14%	18.78%
17/02/2022	16/08/2022	-7.81%	-34.35%	-14.96%	-5.29%	13.79%	-9.80%	-20.08%

		GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
03/01/2020	11/01/2022	66.21%	87.18%	64.36%	89.58%	85.90%	68.36%
15/07/2021	11/01/2022	-11.82%	34.44%	-10.43%	57.25%	54.40%	-31.49%
13/01/2021	19/01/2021	37.49%	9.64%	-35.05%	30.16%	-39.85%	22.87%
12/01/2022	18/01/2022	2.63%	-83.45%	66.52%	-22.09%	77.94%	-88.53%
17/02/2022	24/02/2022	-77.78%	88.31%	-63.08%	32.52%	-19.23%	83.13%
17/02/2022	30/03/2022	78.00%	58.43%	-95.39%	60.23%	-25.61%	25.21%
17/02/2022	16/08/2022	80.27%	65.79%	50.42%	49.49%	69.51%	69.80%

		GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
15/07/2021	11/01/2022	24.69%	50.30%	27.70%	38.64%	13.72%	48.35%
13/01/2021	19/01/2021	78.94%	160.72%	-44.68%	81.40%	-5.43%	231.08%
12/01/2022	18/01/2022	537.53%	97.18%	110.77%	60.34%	160.55%	33.75%
17/02/2022	24/02/2022	690.61%	-37.43%	389.53%	-47.01%	-285.58%	-34.92%
17/02/2022	30/03/2022	24.92%	14.85%	20.93%	29.46%	18.77%	24.82%
17/02/2022	16/08/2022	15.18%	22.47%	19.39%	30.91%	21.55%	27.50%

Steel

		US Midwest Domestic Hot-Rolled Coil Steel Futures	SEVERSTAL	Magnitogorskiy Metallurgicheskiy Kombinat	MECHEL	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	ANSTEEL	ARCELORMITTAL	CHINA BAOWU	NIPPON STEEL	SHAGANG GROUP
15/07/2021	11/01/2022	-24.01%	-6.63%	10.73%	46.98%	-10.40%	15.72%	-13.97%	14.69%	-5.10%	11.96%	-24.54%
13/01/2021	19/01/2021	0.47%	1.87%	4.70%	-5.03%	2.08%	-0.98%	-3.66%	-3.68%	-4.56%	-7.36%	0.00%
12/01/2022	18/01/2022	-0.49%	-8.58%	-11.54%	-16.94%	-6.98%	-12.14%	-2.28%	-4.52%	0.66%	-1.98%	-1.34%
17/02/2022	24/02/2022	-11.67%	-25.48%	-25.22%	-77.77%	-23.05%	-44.03%	-2.37%	-8.16%	-3.72%	0.30%	4.42%
17/02/2022	30/03/2022	31.79%	-42.16%	-37.09%	-46.25%	-30.92%	-28.78%	-6.99%	9.45%	-9.36%	6.95%	-6.22%
17/02/2022	16/08/2022	-34.01%	-81.54%	-83.26%	-11.33%	-65.66%	-5.37%	-25.28%	-8.37%	-32.12%	4.99%	-29.83%

		SEVERSTAL	Magnitogorskiy Metallurgicheskiy Kombinat	MECHEL	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	ANSTEEL	ARCELORMITTAL	CHINA BAOWU	NIPPON STEEL	SHAGANG GROUP
03/01/2020	11/01/2022	94.71%	95.22%	64.60%	85.78%	81.32%	89.07%	95.94%	85.80%	90.93%	-62.84%
15/07/2021	11/01/2022	33.50%	48.24%	18.67%	47.31%	68.16%	68.52%	-2.83%	53.18%	55.81%	66.20%
13/01/2021	19/01/2021	3.76%	43.06%	-85.14%	10.94%	-73.93%	-58.57%	-75.92%	-79.83%	-91.72%	-76.83%
12/01/2022	18/01/2022	85.24%	89.27%	75.81%	82.11%	70.11%	26.45%	96.80%	-58.91%	86.26%	23.39%
17/02/2022	24/02/2022	99.74%	93.87%	97.39%	98.84%	97.62%	62.42%	70.91%	70.84%	28.80%	2.57%
17/02/2022	30/03/2022	-30.70%	-23.67%	6.06%	-19.64%	2.23%	-27.01%	36.67%	-29.31%	24.70%	-38.52%
17/02/2022	16/08/2022	58.94%	71.88%	-4.12%	57.22%	-40.05%	57.36%	64.79%	55.33%	29.98%	31.20%

		SEVERSTAL	Magnitogorskiy Metallurgicheskiy Kombinat	MECHEL	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	ANSTEEL	ARCELORMITTAL	CHINA BAOWU	NIPPON STEEL	SHAGANG GROUP
15/07/2021	11/01/2022	9.29%	10.46%	19.32%	3.61%	4.17%	1.43%	18.65%	-1.46%	8.07%	-6.37%
13/01/2021	19/01/2021	-94.70%	264.57%	-817.33%	-41.47%	25.80%	39.11%	-72.49%	-1030.58%	-419.36%	-1210.81%
12/01/2022	18/01/2022	181.98%	95.20%	339.01%	161.25%	216.22%	-56.81%	316.22%	-112.81%	152.38%	-16.61%
17/02/2022	24/02/2022	202.96%	107.87%	483.46%	149.29%	269.40%	38.69%	57.71%	29.21%	0.92%	106.06%
17/02/2022	30/03/2022	34.94%	29.23%	113.98%	41.01%	78.78%	3.76%	13.87%	6.06%	-7.56%	3.67%
17/02/2022	16/08/2022	2.58%	3.81%	52.42%	11.18%	37.16%	-1.24%	11.40%	0.48%	-1.57%	0.91%

Airlines

		Nasdaq Global Smart Airlines	AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
15/07/2021	11/01/2022	-0.97%	-6.97%	-7.30%	20.02%	-0.29%	6.01%	7.16%	9.91%
13/01/2021	19/01/2021	1.54%	0.30%	2.79%	0.86%	-0.35%	2.86%	1.98%	1.08%
12/01/2022	18/01/2022	-1.22%	-11.85%	-3.30%	0.98%	-2.67%	0.17%	-1.24%	0.57%
17/02/2022	24/02/2022	-4.70%	-48.67%	-7.17%	-2.81%	-7.13%	-12.83%	-7.77%	-3.23%
17/02/2022	30/03/2022	-0.97%	-43.64%	-0.94%	-12.07%	-9.64%	-3.25%	-22.27%	-17.92%
17/02/2022	16/08/2022	-11.11%	-76.30%	-16.17%	-14.61%	-20.34%	-12.85%	-23.39%	-16.45%

		AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
03/01/2020	11/01/2022	40.28%	94.64%	65.09%	97.81%	82.80%	76.99%	58.50%
15/07/2021	11/01/2022	75.76%	92.61%	-26.29%	83.67%	52.84%	81.69%	-6.50%
13/01/2021	19/01/2021	5.45%	99.86%	-5.36%	77.06%	70.73%	64.68%	34.64%
12/01/2022	18/01/2022	77.44%	84.75%	-82.46%	84.81%	74.00%	92.03%	-80.29%
17/02/2022	24/02/2022	98.80%	93.65%	81.92%	97.10%	93.23%	98.80%	73.48%
17/02/2022	30/03/2022	42.77%	97.42%	30.99%	92.35%	77.28%	64.98%	4.90%
17/02/2022	16/08/2022	61.70%	79.66%	7.57%	79.45%	85.61%	80.65%	22.01%

		AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
15/07/2021	11/01/2022	41.52%	158.87%	19.93%	148.75%	134.49%	110.95%	15.05%
13/01/2021	19/01/2021	22.03%	196.33%	5.29%	122.31%	74.20%	60.10%	18.22%
12/01/2022	18/01/2022	249.97%	252.16%	-222.24%	132.81%	129.47%	84.69%	-90.34%
17/02/2022	24/02/2022	1500.77%	52.04%	218.17%	151.15%	519.70%	235.86%	285.77%
17/02/2022	30/03/2022	383.79%	120.27%	31.47%	125.14%	125.94%	209.76%	18.33%
17/02/2022	16/08/2022	41.87%	168.72%	8.42%	143.71%	80.35%	92.83%	4.91%

Air Defence

		S&P Aerospace & Defense Select Industry Index	UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
15/07/2021	11/01/2022	-5.44%	-20.99%	6.88%	11.10%	-3.80%	9.55%	6.54%
13/01/2021	19/01/2021	3.44%	-0.67%	-1.63%	0.33%	-1.16%	-0.48%	-1.63%
12/01/2022	18/01/2022	-1.67%	-7.24%	4.30%	-0.36%	4.13%	1.53%	-0.35%
17/02/2022	24/02/2022	0.23%	-56.65%	6.10%	1.91%	1.77%	-0.66%	-0.12%
17/02/2022	30/03/2022	10.32%	-34.88%	20.63%	13.06%	13.72%	12.99%	6.63%
17/02/2022	16/08/2022	1.16%	-17.56%	29.63%	11.89%	12.42%	19.85%	0.73%

		UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
03/01/2020	11/01/2022	56.07%	36.75%	83.80%	-1.68%	47.93%	86.52%
15/07/2021	11/01/2022	53.01%	50.18%	-14.76%	63.24%	1.30%	55.18%
13/01/2021	19/01/2021	-86.43%	-3.61%	76.28%	-27.46%	20.01%	-2.40%
12/01/2022	18/01/2022	51.57%	-88.31%	79.21%	-58.30%	-21.16%	63.03%
17/02/2022	24/02/2022	-39.40%	45.65%	4.58%	51.70%	94.88%	94.12%
17/02/2022	30/03/2022	52.61%	19.36%	29.75%	14.28%	54.06%	-2.60%
17/02/2022	16/08/2022	-0.22%	-45.87%	86.17%	61.96%	-19.39%	85.36%

		UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
15/07/2021	11/01/2022	15.43%	32.12%	51.78%	52.61%	51.36%	90.99%
13/01/2021	19/01/2021	-97.04%	30.00%	27.44%	-8.48%	19.91%	59.46%
12/01/2022	18/01/2022	-111.67%	-110.77%	69.36%	35.07%	68.93%	93.44%
17/02/2022	24/02/2022	-973.75%	157.04%	10.63%	57.88%	31.90%	28.65%
17/02/2022	30/03/2022	-147.84%	140.49%	61.45%	95.11%	99.95%	55.60%
17/02/2022	16/08/2022	-42.35%	35.37%	65.34%	52.11%	62.33%	70.53%

Results for 03/01/2022 – 11/01/2022

The following findings in search of insider trading were not included in the main body of paper due to New Year effect. They represent what-if scenario where instead of period 13/01/2022 – 19/01/2022 we would have used 03/01/2022 – 11/01/2022. Shown results sequentially represent log returns, analysis of correlation and betas.

Oil

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-9.37%	-10.65%	-11.84%	-12.52%	-1.74%	-12.66%	-5.19%	-10.70%	-4.07%	2.78%	1.60%	-6.82%	-0.20%	2.30%	-0.83%

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-57.24%	-138.69%	-125.75%	-99.61%	-111.00%	-72.84%	-62.90%	-101.14%	-53.18%	32.96%	-46.52%	3.65%	12.73%	6.74%	10.64%

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-139.51%	2.28%	98.09%	-87.32%	-48.34%	21.98%	-69.47%	36.90%	-24.07%	6.06%	10.37%	8.03%	111.26%	0.00%	71.98%

Natural Gas

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
12.55%	11.26%	10.22%	9.40%	11.21%	22.51%	15.09%	21.72%	24.21%	19.01%

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
67.02%	25.08%	48.35%	71.60%	50.77%	48.89%	-20.63%	-54.61%	24.79%	-24.29%

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
33.87%	30.97%	40.67%	45.88%	39.13%	19.25%	19.35%	5.74%	0.00%	18.57%

Banking

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-8.80%	-7.52%	-3.51%	-12.40%	5.61%	-3.88%	3.94%	-0.19%	-6.33%

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
120.22%	26.43%	61.83%	127.75%	-81.15%	-17.17%	-34.96%	-22.24%	-12.32%

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
52.29%	-113.05%	83.14%	230.86%	-13.85%	-86.21%	25.58%	-13.70%	13.67%

Retail Trade

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-11.97%	-13.52%	-19.80%	-11.20%	1.00%	-2.16%	5.57%	-0.09%

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
44.29%	84.03%	113.07%	155.37%	7.95%	60.95%	-113.32%	91.75%

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-61.67%	64.39%	58.03%	-59.63%	91.33%	321.90%	-311.28%	209.38%

Aluminium

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-12.14%	-2.89%	-11.61%	-5.84%	-8.24%	2.31%

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-137.49%	-103.54%	-130.04%	-136.08%	-64.85%	104.92%

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
15.20%	19.32%	87.57%	-0.39%	54.41%	42.48%

Nickel

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-13.83%	-1.22%	1.17%	5.98%	4.89%	-9.07%

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-71.46%	-96.09%	20.02%	18.89%	24.82%	-138.81%

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
511.53%	105.30%	101.48%	57.30%	132.57%	24.55%

Steel

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-8.61%	-11.48%	-18.72%	-8.45%	-6.39%	-10.34%	-12.11%	-6.96%	-11.02%	-5.84%

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
6.67%	56.97%	93.37%	58.19%	-2.51%	118.88%	185.24%	29.59%	182.14%	99.36%

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
134.65%	-147.67%	339.31%	187.54%	-790.77%	18.67%	402.52%	-58.46%	292.92%	-163.04%

Airlines

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-10.48%	-2.08%	0.06%	-3.02%	-1.40%	-1.64%	1.02%

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
30.69%	-3.89%	-60.48%	7.16%	78.53%	80.19%	-118.16%

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
80.61%	114.48%	-250.32%	36.40%	-139.32%	-51.56%	-162.25%

Air Defence

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-6.69%	4.27%	0.59%	4.33%	0.62%	-1.65%

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
25.14%	-112.17%	21.00%	-120.44%	-56.59%	13.92%

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-111.45%	-143.08%	8.34%	-29.65%	2.76%	-16.96%

Results regressed against MSCI

Insider Trading

Oil

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftg az	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-10.12%	-10.54%	-7.76%	-16.56%	-2.69%	0.57%	-5.65%	-5.04%	-2.07%	-0.52%	4.22%	4.40%	4.51%	4.46%	6.08%
						-6.04%								4.73%
						-10.77%								

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftg az	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
90.15%	122.01%	79.21%	173.18%	147.70%	33.52%	143.31%	28.79%	31.41%	87.22%	-34.48%	-146.07%	-115.11%	-123.05%	-165.02%

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftg az	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
521.25%	338.49%	229.40%	647.09%	183.57%	153.39%	256.98%	229.06%	103.76%	81.05%	-23.52%	-506.06%	-224.11%	0.00%	-63.99%

Natural Gas

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftg az	BP	Exxon	Petrochina	Saudi aramco	Shell
-10.12%	-10.54%	-7.45%	-16.56%	-5.04%	7.13%	4.40%	4.51%	4.46%	5.89%
				-9.94%					5.28%
				-15.22%					

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
90.15%	122.01%	19.35%	173.18%	28.79%	-147.35%	-146.07%	-115.11%	-123.05%	-160.06%

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
521.25%	338.49%	100.45%	647.09%	229.06%	-46.46%	-506.06%	-224.11%	25.46%	-255.60%

Banking

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-16.74%	-8.49%	-0.80%	-0.82%	5.67%	2.78%	-6.52%	-7.90%	-36.80%
			-6.71%					-8.56%
				1.85%				

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
23.76%	71.59%	85.06%	39.37%	-60.63%	-30.43%	28.13%	151.34%	181.58%

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
252.45%	402.08%	-20.58%	-62.92%	-22.12%	-4.89%	21.19%	340.26%	1363.01%

Retail Trade

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-5.44%	-10.89%	-15.78%	16.97%	-1.42%	0.63%	5.45%	4.72%
		-10.70%					5.27%
			-15.97%				

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
22.98%	4.52%	149.64%	22.33%	78.06%	23.56%	9.15%	-17.68%

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
175.36%	49.14%	671.52%	152.08%	242.39%	16.63%	365.45%	-30.48%

Aluminium

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-6.79%	5.25%	2.09%	0.82%	2.32%	5.57%
-6.79%					3.21%
-10.00%					

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
52.92%	17.38%	35.08%	15.07%	-21.87%	-77.32%

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
285.22%	-311.08%	218.39%	-24.13%	-297.19%	-79.58%

Nickel

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-11.84%	6.63%	6.77%	6.92%	7.02%	5.33%
-11.84%					6.53%
-18.37%					

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
36.64%	-69.30%	-68.88%	-98.92%	-84.22%	-62.76%

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
294.36%	-205.40%	197.02%	30.59%	-45.96%	-326.99%

Steel

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-7.88%	-13.67%	-9.34%	-6.50%	-8.60%	3.95%	1.73%	7.80%	7.94%	1.23%
	-9.20%								4.53%
-13.73%									

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
112.36%	122.34%	23.56%	105.42%	102.68%	16.33%	89.13%	-74.90%	-44.26%	74.55%

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
464.46%	847.29%	-821.33%	486.67%	256.26%	-194.81%	402.62%	-585.72%	-362.84%	-1059.02%

Airlines

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-9.58%	-3.52%	2.68%	0.25%	-0.12%	-0.65%	2.05%
-9.58%						0.11%
-9.70%						

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
18.01%	33.92%	-88.35%	1.76%	23.69%	65.41%	-85.80%

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
109.72%	-485.62%	-297.89%	-357.56%	34.93%	102.63%	-218.06%

Air Defence

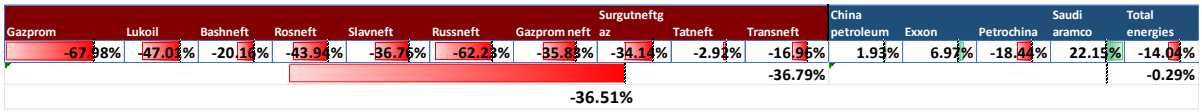
UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-3.99%	8.50%	1.88%	7.86%	4.58%	3.85%
-3.99%					5.33%
-9.33%					

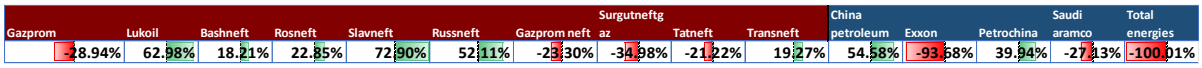
UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
77.43%	-121.50%	26.16%	-71.03%	-71.74%	-53.32%

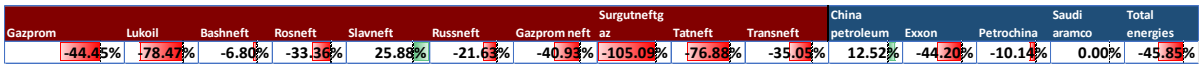
UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-583.02%	-194.13%	-28.56%	-234.71%	-200.54%	-7.33%

Medium-term effect of sanctions

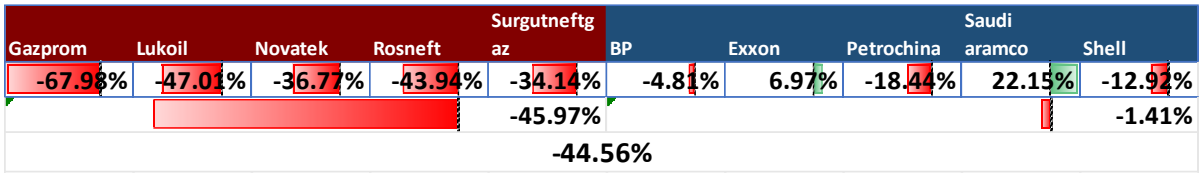
Oil

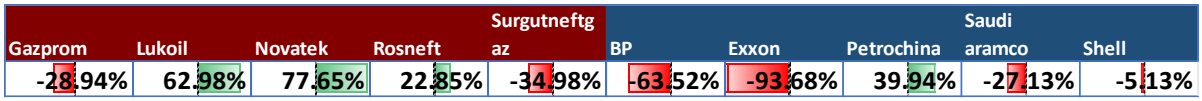


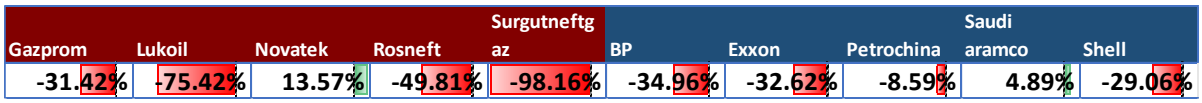




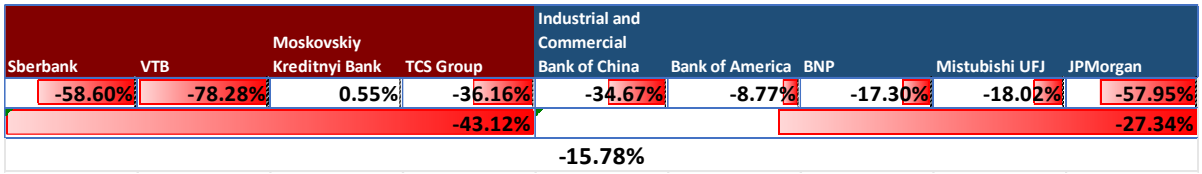
Natural Gas







Banking



Retail Trade

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
5.87%	0.37%	-15.01%	-3.60%	-6.16%	-1.97%	8.29%	9.01%
	-2.92%					1.12%	
			-4.04%				

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-56.04%	90.75%	113.73%	26.94%	-4.28%	17.75%	57.44%	32.08%

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-52.10%	18.40%	-16.27%	34.68%	33.31%	88.13%	-11.59%	28.06%

Aluminium

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-92.05%	-84.82%	-60.40%	-6.22%	2.28%	-24.08%
-92.05%				-34.65%	
			-57.41%		

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
22.70%	34.26%	118.61%	119.29%	127.88%	56.83%

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-128.52%	-47.43%	-1.82%	-3.94%	-10.91%	-29.42%

Nickel

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-16.25%	-14.91%	19.47%	4.13%	-30.72%	29.49%
-16.25%					1.50%
			-17.75%		

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
82.07%	48.85%	88.79%	-13.24%	24.11%	127.99%

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-63.07%	-58.82%	8.55%	-19.89%	27.22%	7.13%

Steel

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-64.47%	-83.56%	-47.87%	-44.82%	-10.66%	-0.88%	-12.62%	-16.59%	3.46%	5.14%
		-50.28%							-4.30%
-45.98%									

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
61.75%	73.23%	-48.77%	85.97%	32.43%	101.41%	34.75%	91.36%	65.18%	133.70%

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-133.76%	-77.75%	-32.07%	-75.51%	-71.01%	40.90%	-18.44%	9.72%	-14.16%	-8.94%

Airlines

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-58.90%	1.56%	-24.19%	-9.61%	-8.43%	-20.11%	-15.92%
-58.90%						-12.78%
-46.12%						

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
105.05%	97.59%	-54.37%	82.32%	75.34%	69.27%	3.08%

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-26.87%	30.28%	-37.42%	-4.90%	-17.44%	-76.43%	-8.15%

Air Defence

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
13.86%	33.18%	11.23%	26.65%	20.73%	4.63%
13.86%					19.28%
-5.42%					

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
39.84%	-51.98%	18.53%	89.49%	-51.74%	58.61%

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-78.24%	26.91%	8.56%	17.76%	16.92%	6.87%

Market Rebond

Oil

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
12.73%	11.96%	9.32%	42.13%	29.29%	29.68%	15.65%	21.96%	21.43%	8.63%	-5.41%	3.40%	10.92%	-1.95%	-7.92%
									20.28%					-4.56%
24.84%														

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-119.30%	-109.27%	-127.55%	-86.44%	-95.40%	-112.30%	-96.62%	-121.11%	-70.23%	-132.66%	21.21%	-95.07%	53.65%	99.50%	-61.41%

Gazprom	Lukoil	Bashneft	Rosneft	Slavneft	Russneft	Gazprom neft	Surgutneftgaz	Tatneft	Transneft	China petroleum	Exxon	Petrochina	Saudi aramco	Total energies
-837.08%	-642.83%	-908.54%	-663.41%	-1326.99%	-1553.65%	-1131.21%	-775.82%	-808.32%	-1403.11%	-120.34%	214.87%	132.59%	0.00%	-295.62%

Natural Gas

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-3.54%	3.66%	30.24%	27.92%	-0.67%	-1.70%	3.65%	-9.70%	-5.51%	1.15%
				11.52%					-2.42%
13.94%									

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-122.00%	-113.16%	-28.79%	-95.73%	-126.94%	-37.57%	-102.65%	54.17%	92.21%	-20.51%

Gazprom	Lukoil	Novatek	Rosneft	Surgutneftgaz	BP	Exxon	Petrochina	Saudi aramco	Shell
-527.88%	-445.30%	-506.22%	-450.46%	-565.16%	-77.81%	211.09%	88.58%	-1.32%	28.40%

Banking

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-4.54%	-22.20%	-6.14%	-7.74%	-10.07%	0.73%	-9.17%	3.73%	-8.33%
-10.16%								-4.62%
-5.54%								

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-131.89%	-141.90%	-52.89%	-22.39%	-45.66%	6.83%	-17.99%	-91.41%	-125.63%

Sberbank	VTB	Moskovskiy Kreditnyi Bank	TCS Group	Industrial and Commercial Bank of China	Bank of America	BNP	Mistubishi UFJ	JPMorgan
-1387.48%	-1840.71%	-106.97%	-455.25%	-448.78%	181.84%	-507.90%	478.53%	-1262.77%

Retail Trade

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
16.48%	-2.56%	6.10%	2.45%	8.10%	21.21%	-3.23%	7.04%
6.67%			7.11%				
-0.44%							

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-106.59%	-121.62%	-135.98%	40.10%	-14.43%	-76.06%	10.04%	-50.19%

Magnit	X5 Group	M.Video	Carrefour	CostCo	Kroger	Seven & I Holdings	Wallmart
-966.95%	-1160.26%	-1319.52%	390.19%	339.01%	292.63%	-120.24%	510.79%

Aluminium

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-9.03%	16.57%	-19.66%	-10.35%	0.16%	0.82%
-9.03%					-2.49%
-6.54%					

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-112.36%	-16.18%	-30.28%	69.86%	5.82%	128.50%

RUSAL	Alcoa	Chalco	China Hongqiao Group	RIO Tinto	Norsk Hydro
-453.60%	12.54%	306.06%	-144.54%	-445.42%	82.15%

Nickel

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
5.36%	4.75%	5.84%	10.68%	2.89%	9.63%
5.36%					6.76%
-1.40%					

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-173.03%	-5.88%	10.55%	-9.80%	-2.12%	85.04%

GMKN	ANGLO-AMERICAN	BHP	GLENCORE	S32	VALE
-477.51%	-120.41%	-43.61%	-2.25%	308.74%	-457.46%

Steel

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-19.91%	-15.84%	34.97%	-15.44%	23.75%	-3.59%	8.13%	-1.78%	-3.37%	-8.02%
		1.51%							-1.73%
				3.23%					

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-146.93%	-142.02%	-112.48%	-139.20%	-110.87%	-74.95%	11.05%	-97.96%	32.97%	-22.05%

Severstal	Magnitogorskiy Metallurgicheskiy Kombinat	Mechel	Novolipetsk Steel	Trubnaya Metallurgicheskaya Kompaniya	Ansteel	Arcelormittal	China Baowu	Nippon Steel	Shagang Group
-700.86%	2.57%	-1152.02%	-278.71%	-668.10%	-185.46%	9.83%	-187.07%	-6.17%	-1058.29%

Airlines

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-1.33%	-0.13%	-15.62%	-8.87%	3.23%	-20.86%	-21.05%
-1.33%						-10.55%
			9.22%			

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-137.92%	-14.63%	-81.14%	-34.19%	-18.42%	-68.93%	-87.09%

AEROFLOT	American Airlines	China Southern Airlines	Delta Airlines	Lufthansa	Ryanair	China Eastern Airlines
-802.74%	-24.48%	-528.43%	-157.07%	-126.11%	-298.93%	-633.30%

Air Defence

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
15.42%	8.17%	4.80%	5.60%	7.29%	0.39%
15.42%					5.25%
		10.17%			

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
-118.42%	63.62%	93.33%	44.67%	-54.34%	4.40%

UNAC	BAE Systems	General Dynamics	Lockheed Martin	Northrop Grumman	Raytheon Techonologies
1431.60%	-111.56%	18.03%	-23.02%	-10.66%	-39.37%

Chinese Defense companies' AR and CAR data

id	market_return	return	predicted_return	abnormal_return	cumulative_abnormal_return
1	-2.027449	3.8026	-2.369801	6.1724	10.54342
2	-2.027449	1.6556	-2.553331	4.208931	2.58093
3	-2.027449	1.0485	-1.310634	2.359134	3.01459
4	-2.027449	1.3675	-0.939707	2.307207	4.269824
5	-2.027449	-2.6596	-0.8493658	-1.810234	0.7808401
6	-2.027449	0.9988	-1.254157	2.252957	2.861296
7	-2.027449	-0.5903	-1.618541	1.028241	4.108675
8	-2.027449	2.9593	-1.364832	4.324132	8.540426
9	-2.027449	2.465	-1.970116	4.435116	15.06833
10	-2.027449	-1.2841	-2.445343	1.161243	3.487813
11	-2.027449	0	-1.887529	1.887529	3.389327
12	-2.027449	0.2567	-1.651219	1.907919	15.327

13	-2.027449	5.0372	-1.274059	6.311259	5.170419
14	-2.027449	0.8615	-1.295859	2.157359	6.409684
15	-2.027449	0.4606	-2.203268	2.663868	7.020462
16	-2.027449	1.2474	-1.324063	2.571463	8.188604
17	-2.027449	0.4639	-2.223863	2.687763	4.963813
18	-2.027449	10.043	-1.020445	11.06345	-5.782038
19	-2.027449	2.2857	-2.396291	4.681991	8.769698
20	-2.027449	1.4623	-2.458006	3.920306	14.6695
21	-2.027449	0	-1.841485	1.841485	2.857032
22	-2.027449	2.2915	-2.15847	4.44997	9.378972
23	-2.027449	4.1868	-1.366176	5.552976	6.345531
24	-2.027449	0.1826	-2.674565	2.857165	5.274939
25	-2.027449	-2.1407	-1.581181	-0.5595195	-0.3360044
26	-2.027449	0	-1.693929	1.693929	2.436631
27	-2.027449	1.62	-2.192953	3.812953	3.980679
28	-2.027449	-1.1881	-2.691321	1.503221	4.556897
29	-2.027449	-0.2789	-2.285582	2.006682	6.85768
30	-2.027449	-1.1812	-2.194443	1.013243	-2.116935
31	-2.027449	0.1954	-2.285544	2.480944	9.391056
32	-2.027449	3.3641	-2.227648	5.591747	7.91947
33	-2.027449	-1.5043	-2.92277	1.41847	4.093111
34	-2.027449	5.5104	-1.732597	7.242996	8.584929
35	-2.027449	10.6157	-1.010561	11.62626	10.20262
36	-2.027449	2.3053	-2.610611	4.915911	6.418057
37	-2.027449	-0.8955	-2.416754	1.521254	1.279532
38	-2.027449	-6.0319	-2.345261	-3.686639	-2.465535

39	-2.027449	3.4555	-2.3077	5.7632	7.349846
40	-2.027449	0.8525	-1.875524	2.728024	2.555457
41	-2.027449	2.458	-1.714285	4.172285	5.816094
42	-2.027449	9.2233	-1.10212	10.32542	10.23311
43	-2.027449	0	-2.11341	2.11341	7.264499
44	-2.027449	-0.6192	-1.740506	1.121306	4.808529
45	-2.027449	3.1383	-1.474039	4.612339	4.03453
46	-2.027449	19.9849	-0.6607816	20.64568	22.58073
47	-2.027449	3.1979	-1.679004	4.876904	6.778065
48	-2.027449	-0.3476	-2.037777	1.690177	10.32695
49	-2.027449	3.5322	-2.679332	6.211532	11.02091
50	-2.027449	7.0346	-1.450021	8.48462	10.35525
51	-2.027449	11.165	-0.650247	11.81525	6.483023
52	-2.027449	7.2584	-1.469204	8.727604	5.906405
53	-2.027449	3.5752	-1.589402	5.164602	8.203188
54	-2.027449	3.3106	-1.335896	4.646496	3.710559
55	-2.027449	0.5345	-1.608515	2.143015	5.8946
56	-2.027449	-1.5418	-1.7484	0.2065998	7.754119
57	-2.027449	6.8659	-1.417074	8.282974	7.102966
58	-2.027449	15.2926	-0.9501717	16.24277	12.0496
59	-2.027449	-0.2503	-1.869873	1.619573	2.816883
60	-2.027449	0.2959	-2.408907	2.704807	5.787135
61	-2.027449	-0.4906	-1.501224	1.010624	7.431482
62	-2.027449	-1.1877	-1.349027	0.1613269	15.44071
63	-2.027449	3.5777	-1.612835	5.190535	7.585254
64	-2.027449	2.6555	-1.965882	4.621382	10.87923

65	-2.027449	4.563	-1.892081	6.455081	8.392426
66	-2.027449	8.959	-1.383345	10.34235	9.129573
67	-2.027449	4.2815	-0.5483164	4.829816	3.532789
68	-2.027449	3.175	-2.337197	5.512197	7.732247
69	-2.027449	0.9969	-2.316222	3.313122	9.721356
70	-2.027449	1.5789	-1.436241	3.015141	3.590125
71	-2.027449	2.4006	-1.495592	3.896192	4.548969
72	-2.027449	1.1655	-2.317332	3.482832	6.235614
73	-2.027449	1.4665	-1.476687	2.943187	1.518363
74	-2.027449	5.9546	-1.93736	7.891959	10.35065
75	-2.027449	5.3556	-1.634276	6.989876	4.319872
76	-2.027449	1.5033	-1.32928	2.832581	10.81491
77	-2.027449	1.8568	-2.062597	3.919396	9.992613
78	-2.027449	5.3419	-1.413277	6.755177	7.138368
79	-2.027449	1.1179	-1.531047	2.648947	5.377113
80	-2.027449	0.119	-1.726963	1.845963	6.193985
81	-2.027449	-0.4219	-1.955094	1.533194	4.773705
82	-2.027449	3.9195	-1.633442	5.552942	6.97826
83	-2.027449	4.067	-1.304936	5.371936	7.85168
84	-2.027449	4.9294	-2.124795	7.054195	10.14493
85	-2.027449	0.3315	-2.840169	3.171669	8.650738
86	-2.027449	2.0543	-1.562673	3.616973	10.06197
87	-2.027449	1.8868	-1.645136	3.531936	4.659416
88	-2.027449	1.7683	-2.16139	3.92969	10.21763
89	-2.027449	1.0329	-1.26404	2.29694	1.038732
90	-2.027449	-1.1069	-2.614693	1.507793	8.965089

91	-2.027449	6.699	-0.9586964	7.657696	8.170837
92	-2.027449	1.4771	-1.789238	3.266338	4.435405
93	-2.027449	1.524	-1.179072	2.703072	5.001559
94	-2.027449	0.7335	-0.9398104	1.67331	1.909423
95	-2.027449	-3.1967	-1.759702	-1.436998	10.40652
96	-2.027449	-1.9014	-2.680458	0.7790576	-3.011233
97	-2.027449	-1.0532	-1.198092	0.1448921	-14.11682
98	-2.027449	-1.8459	-2.551419	0.705519	5.360473
99	-2.027449	-0.2794	-2.445291	2.165891	-0.6671494
100	-2.027449	4.1054	-1.621363	5.726763	7.312973
101	-2.027449	-5.1906	-2.053183	-3.137417	13.00872
102	-2.027449	0.3787	-2.012475	2.391175	6.232705
103	-2.027449	1.6869	-1.576388	3.263288	7.483237
104	-2.027449	0.3747	-1.498114	1.872814	9.170102
105	-2.027449	1.4056	-1.627265	3.032865	1.883163
106	-2.027449	-2.0746	-2.094711	0.0201106	6.424937
107	-2.027449	-2.0376	-2.845183	0.8075829	1.844827
108	-2.027449	2.8195	-1.871057	4.690557	5.957172
109	-2.027449	-1.6937	-2.327182	0.6334819	-10.19747
110	-2.027449	0.8881	-1.316486	2.204587	2.776446
111	-2.027449	-0.0641	-2.340398	2.276298	19.24223
112	-2.027449	1.8519	-1.783931	3.635831	10.37898
113	-2.027449	-3.3293	-1.31566	-2.013639	0.123832
114	-2.027449	0.0088	-2.551169	2.559969	-0.9363391

Sino Russia import and export trade volume From September 2021 to August 2022, (USD 1000).

Month	Import and export		export		Import		±% over the same period of last year		
	X	From January to x	X	From January to x	X	From January to x	Import and export	export	Import
08/22	19,210,323	117,205,551	7,995,731	44,256,607	11,214,592	72,948,944	31.4	8.5	50.7
07/22	16,790,085	97,714,357	6,770,821	36,266,637	10,019,265	61,447,720	29.0	5.2	48.8
06/22	14,750,797	80,675,090	5,002,533	29,550,038	9,748,264	51,125,052	27.2	2.1	48.2
05/22	14,593,076	65,812,979	4,324,095	24,559,076	10,268,980	41,253,903	28.9	7.2	46.5
04/22	12,691,230	51,092,688	3,801,747	20,240,934	8,889,483	30,851,754	25.9	11.3	37.8
03/22	11,669,201	38,173,167	3,825,255	16,441,398	7,843,946	21,731,769	28.7	25.9	31.0
02/22	11,475,723	26,431,155	5,237,091	12,617,708	6,238,633	13,813,447	38.5	41.5	35.8
01/22	14,955,432	14,955,432	7,380,617	7,380,617	7,574,814	7,574,814	52.7	55.2	50.4
12/21	16,443,682	146,887,244	8,136,777	67,565,332	8,306,905	79,321,912	35.8	33.8	37.5
11/21	14,744,050	130,428,090	6,540,936	59,440,407	8,203,115	70,987,683	33.6	31.3	35.5
10/21	13,026,639	115,663,247	5,504,575	52,903,998	7,522,064	62,759,249	30.9	30.6	31.2
09/21	13,468,878	102,529,482	6,601,057	47,401,168	6,867,821	55,128,314	29.8	32.4	27.6