

The Impact of Foreign Sanctions on Firm Performance in Russia

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We assess the economic effects of almost two decades of recent sanctions on Russian firms. We find that foreign sanctions leave energy firms in Russia unaffected but do undermine firm performance in the other (non-energy) sectors. In these other sectors, sanctions have a negative impact on capital expenditures and R&D intensity. The cost of capital and firm-level political risk also increase in sanctions. While firms with connections to Russian oligarchs linked to Putin are unaffected, sanctions do not differentiate in their impact between firms with Russian and foreign origin. Finally, Russian firms seemingly were prepared for the Crimea event and the Ukraine war.

Keywords: firm performance; sanctions; Russia; political connection.

JEL Codes: G20; O16.

Russia's unprovoked invasion of Ukraine started on February 24, 2022. Since then, the United States, Europe, and many other countries have imposed slates of new financial and economic sanctions on Russia.¹ In this paper, we assess the economic effects of almost two decades of sanctions, i.e., from 2000 to 2019, on Russian firms. We focus on the impact the sanctions had on affected non-energy firms versus mostly unaffected energy firms during that period.

The reason for our focus is that the sanctions in early March 2022 imposed by the European Union did bar several Russian banks from SWIFT. However, in line with previous sanctions the EU ignored Russian banks that handle energy transactions between EU businesses and Russian energy firms. Concomitantly, there are some conflicts within the European Union when it comes to putting in place economic sanctions on Russia, i.e., depending on the sanction being discussed there is hesitation coming from Germany, Hungary, and/or Italy, among others.

This salient observation motivates us to investigate the impact of foreign sanctions placed on Russian firms and how Russian firms' performance react to those sanctions. We argue that such an impact is very likely to vary across different groups of firms and that currently (as of the date of this paper) foreign sanctions still do not affect the main sector of the Russian economy, i.e., the energy sector.

¹ The current sanctions are discussed in, e.g., Berner, Cecchetti and Schoenholtz (2022). Deng, Leippold, Wagner and Wang (2022) estimate their effect on world financial markets.

Using various regression analyses, including a difference-in-differences approach preceded by propensity score matching, we find that foreign sanctions leave energy firms in Russia unaffected, but do undermine firm performance in the other (non-energy) sectors. These sanctions have a negative impact on capital expenditures and R&D intensity. The cost of capital and firm-level political risk also increase in sanctions. While firms with connections to Russian oligarchs linked to Putin are also unaffected, sanctions do not differentiate in their impact between firms with Russian origin and firms with foreign origin.

With our work we complement a recent literature on sanctions (see, e.g., Felbermayr, Kirilakha, Syropoulos, Yalcin and Yotov (2020) for a review). Compared to Ahn and Ludema (2020) for example, we focus on Russian firm performance, including capital expenditures, R&D intensity, cost of capital and firm-level political risk, during almost two decades of sanctions imposed by all relevant countries across the world and further differentiate sanction impact by firm ownership by oligarchs or by country of origin (see an Appendix for a more detailed comparison between their and our paper). Mamonov, Pestova and Ongena (2021) focus on financial sanctions imposed between 2014 and 2019 on Russian banks, and similarly find a differential impact and/or anticipation across banks by physical proximity to the Kremlin (see also Mamonov and Pestova (2021) who find only modest macroeconomic effects of the Crimea sanctions). While a number of other papers have focused on the impact of sanctions at the country, sector and/or firm-level (see Appendix Literature), none of these papers have considered firm performance across the energy versus other sectors, as these are affected during a two-decade time period and dozens of sanctioning countries. None of

these papers have investigated in that much detail the relevance of oligarch and foreign ownership.

The rest of the paper proceeds as follows. Section I introduces the data. Section II introduces the methodology, while Section III discusses the results. Section IV concludes.

I. Data

The initial sample for this study covers all firms listed on Russian stock exchanges from 2000 to 2019. Annual financial data on Russian firms comes from the Bloomberg database. We exclude firms from the financial sector (GICS code 10) because of the differences in their business nature compared to other firms.

Foreign sanction data are gleaned from the Global Sanctions Data Base (Felbermayr, Kirilakha, Syropoulos, Yalcin and Yotov (2020); Kirilakha, Felbermayr, Syropoulos, Yalcin and Yotov (2021)), a dataset of global economic sanctions covering all bilateral, multilateral, and plurilateral sanctions from 1950 to 2019. From this dataset, we sort the sanctions by sanctioned country (see Figure 1 for the aggregated number of sanctions by sanctioning country over the period from 2000 to 2019) and focus on the economic sanctions placed on the Russian economy and entities during the study period only. As seen, most sanctions originated in the United States and European economies, while the Middle East, Asia, and African economies were more likely to stand aside in this matter.

For each year, we count the number of foreign sanctions placed upon Russia, the portions of each type of sanctions, such as financial sanctions, export sanctions, import sanctions, and travel sanctions.

We collect other macroeconomic data from the open databases of World Bank and policyuncertainty.com.

After excluding all missing values in the data, we obtain a sample of 788 Russian firms during 2000-2019. The end sample consists of 8,486 firm-year observations available for the baseline regression. All continuous firm-level variables are winsorized at the 1st and the 99th percentiles.

II. Methodology

The empirical model for investigating the impact of foreign sanctions on the performance and activities of Russian firms is as follow:

$$Y_{i,t} = \alpha + \beta Sanctions_t + \sum Control_{i,t} + \gamma_i + \varepsilon_{i,t}$$

where $Y_{i,t}$ is firm performance measure (e.g., ROA) of firm i in year t ; $Sanctions_t$ stands for the various foreign sanctions imposed upon Russian economy during year t ; $\sum Control_{i,t}$ is the vector of control variables at the firm level across years and the control variables at macroeconomic determinants. Since all Russian firms are subject to the same foreign sanctions in a given year, we do not control for year fixed effects in the baseline model because they will absorb most of explanatory power of foreign sanctions. To validate our findings, we control for firm or industry fixed effects and time-varying macroeconomic conditions, with standard errors clustered by year. Appendix Table 1 lists all variable names, definitions, units, and data sources, while Appendix Table 2 reports all summary statistics.

The results can be confounded by a third omitted variable that might simultaneously affect sanctions and firm performance. To establish a causal interpretation of the baseline results, we employ the endogeneity identification strategy: An instrumental variable (IV) approach. In our IV approach, we use Ukraine's geopolitical risk (Caldara and Iacoviello (2022)) and the score of Americans' favorable opinion about Russia (from the Global Attitudes Survey 2019) as the plausibly instrumental variables. We underpin the relevancy assumption of our instrumental variables. Accordingly, Ukraine's geopolitical risk is associated with the number of foreign sanctions imposed on Russia's economy to avoid a potential war. However, this index affects Russian firms directly but differentially. In addition, due to the propaganda and media, the sanctions imposed on Russia should have correlated with the Americans' attitudes towards Russia. However, their favorable choices do not exhibit any direct relationship with Russian firm performance because Russia and the US seem to be not strategic trading partners based on the amount of importing and exporting values. While the current literature

We also employ a difference-in-differences (DID) specification where we compare the non-energy firms, which were treated by sanctions, and energy firms, as the control group and not treated, before and after the 2014 Crimea sanctions. We use a propensity score matching approach to generate matched sample for the DID analysis. We match each observation from the treated group so that those observations are identical in terms of firm size, financial leverage, the level of fixed assets relative to total assets, cash holdings, and financial constraints. The DID model is then as follows:

$$Y_{i,t} = \alpha + \beta Post\ event_t \times Treated_i + \theta Post\ event_t + \vartheta Treated_i + \sum Control_{i,t} + \gamma_i + \varepsilon_{i,t}$$

where $Post\ event_t$ is the dummy variable that equals one if the year is from 2014 onwards, zero otherwise; $Treated_i$ is the treatment effect in the form of a dummy variable that equals one if firm i is not an energy firm, zero otherwise.

III. Results

A. *Impact of Sanctions on Firms: Main Estimates*

Table 1 reports the estimated coefficients from the baseline regressions. The dependent variable is the ROA, which is the firm's return on assets, in percentage. The main independent variable of interest is Sanctions, which is the number of foreign sanctions placed on Russia during the year (so this is the stock of sanctions in place, not the flow of new sanctions). As control variables in column 2 we include Firm size, Financial leverage, Fixed assets, Cash holdings and Financial constraints, which is the SA index from Hadlock and Pierce (2010), and firm fixed effects. We also include GDP Growth, Inflation, and the average crude oil price which in columns 2 and 3 to capture the confounding effects from macroeconomic conditions.

The estimated coefficient on Sanctions in the latter most saturated specification equals -0.048**,² which implies that a one standard deviation change in the number of foreign

² As in the Tables we indicate statistical significance in the text as follows: *** p<0.01, ** p<0.05, * p<0.1.

sanctions, which equals almost 20, decreases ROA by 3.4 percentage points (pp), a large effect which equals almost 30 percent of ROA's standard deviation.³

From the Tobit analyses in Table 2, we find that average Russian firms invest less, both in capital investment and R&D investment, and must bear higher cost of capital under increasing foreign sanctions. An increase in sanctions by one unit marginally reduces capital expenditures (Capex) by 2.6 pp and reduces R&D investment by 1.1 pp.⁴ As R&D creates long-term growth opportunities, a decrease in R&D investment means lower growth prospect in the future.

In column 3, Table 2, we seek to answer the question: How do foreign sanctions affect firm-level political risk? We turn to the recent firm-level political risk measure by Hassan, Hollander, van Lent and Tahoun (2019)) and find that foreign sanctions on Russia increase firm-level political risk there. An increase in the number of sanctions by one unit increases Russian firms' political risk (reflected in trade-related concerns) by approximately 0.4 pp.

Finally, a standard deviation change in number of sanctions increases the weighted average cost of capital (WACC) by almost 2 pp. As a large portion of foreign sanctions placed on Russia are in the forms of financial and trade sanctions (or both), it increases uncertainty, thus hindering corporate investment and causing more market frictions. Our research settings for this table are relevant to the baseline model. Our findings also explained the

³ We find qualitatively similar findings when investigating only the Russian firms listed on the London Stock Exchange. The results are available up on request.

⁴ Because Capex, R&D intensity, and firm-level political risk are not normally distributed with their values left-censored at 0, while most of the observations concentrate near 0, we employ the Tobit estimator for those estimations. WACC's distribution is somehow normally distributed, so we employ OLS estimator for it.

effects of trade sanctions on targeted economic agents. Levy (1999) provides evidence that foreign firms might withdraw from the sanctioned country; thus, it has long-term consequences on the economy towards trade sanctions in South Africa.

Table 3a shows robustness using alternative measures of firm performance, i.e., sales growth in column 1 and profit margin in column 2. The estimated coefficients on Sanctions equal -0.171^* and -0.224^{***} , respectively, which imply that an increase in Sanctions by 20 decreases sales growth by 8.8 pp and the profit margin by 13 pp.

B. Impact on Firms, By Sanction Type

Since the impact of sanctions on Russian firms may differ across different sanctioning nations, we construct two measures of sanctions by weighting each sanction with Russia's dependence on import from and export to the sanctioning nation during the year of sanction. We then aggregate the weighted sanctions by year, thus generating the import-weighted sanction and export-weighted sanction indexes. The two indexes are able to capture the economic impact of sanctions regarding trade relationship between Russia and the sanctioning nations. Columns 3 and 4 in Table 3 represent the effects of import-weighted and export-weighted sanctions on Russian firm performance. The coefficients of import and export weighted sanctions are -0.041^{***} and -0.036^{***} , respectively, implying that a standard deviation increase in Sanction lowers ROA of general Russian firms by approximately 3.9 pp and 3.2 pp, respectively.

In column 5, Table 3a, we replace our Sanctions with the Russian geopolitical risk index taken from Caldara and Iacoviello (2022). This index aims to measure foreign threats to Russia,

instead of foreign sanctions. The estimated coefficient on this index equals -0.046^{***} , which for a one standard deviation increase in the index which equals 0.242, implies that firm ROA decreases by almost 2.5 pp. Our interpretation of this finding is that foreign sanctions, and our measurement of it, are the materialization of foreign threats, and the way it is measured by Caldara and Iacoviello (2022). Hence this finding provides support for our measure.

Alternatively, in Appendix Table 3 we distinguish between policy-change-based sanctions versus geopolitical-based sanctions: The former set is to prevent wars, the latter set is to end wars in which Russia is involved. We see that the size of effect of the latter type of sanctions is much larger than that of the former, confirming a foreign threat-based interpretation.

In Column 6, Table 3a, we control for serial correlation in sanctions with the Prais-Winsten estimator and in column 7 for cross-sectional dependence of sanctions with the Driscoll-Kraay estimator. Notice that the estimates approximate earlier estimates in Table 1, thus making our baseline estimate conservative.

Finally, in Table 3b columns 1 and 2 we pursue an IV approach as sanctions may be endogenous. In the first stage we regress Sanctions on Ukraine's geopolitical risk index (from Caldara and Iacoviello (2022)) and on America's favorable opinion about Russia (from Spring 2019 onwards; source: Global Attitudes Survey - Q8a & Q8c). Our reasoning is that an increase in Ukraine's geopolitical risk should be correlated with foreign sanctions placed on Russia, but not differentially affect Russian firms directly.

One may be concerned that Ukraine's geopolitical risk is mostly generated by tensions and policy conflicts with Russia, thus may somehow affect Russian firms' performance. If that is

the case, the exclusion restriction of Ukraine's geopolitical risk as the IV might not hold. To mitigate this potential problem, we run a regression of Ukraine's geopolitical risk index on Russia's geopolitical risk index and economic policy uncertainty index and use the residual of the regression as the "cleaner" version of the intended IV. We are not the first to employ such a procedure as it has been mentioned in previous studies by Hausman and Taylor (1983), Hansen, McDonald and Newey (2010), and Gulen and Ion (2015) for example.

Moreover, Americans' favorable opinion about Russia reflects the tensions between the West and Russia. In the second stage we run ROA on the instrumented Sanctions variable. To prove the validity of the IVs used in this two-stage regression, we report several identification test results, including: (i) the Olea and Pflueger (2013)'s F-test of excluded instrument as it provides reliable inferences on weak instrument bias with the presence of clustered standard errors; (ii) the Kleibergen-Paap weak identification test statistics; (iii) the Anderson-Rubin Wald test and confidence interval; and (iv) the Hansen-J over-identification test statistics. The test results indicate the relevance of our IVs for Sanctions.

The results of this instrumentation exercise (with salient test statistics, see, e.g., Keane and Neal (2021)) support the baseline finding from Table 1. The estimated coefficient in the second stage is only slightly larger in size relative to the corresponding OLS estimate (-0.083*** compared to -0.064*** from Column 2, Table 1) also provides us with a reassurance (e.g., Jiang (2017)).

Table 4 emphasizes the test results show that different types of foreign sanction correlate Russian firms' performance differently. Specifically, financial, trade (both export and import), and travel sanctions exert a significant negative impact on firm performance. This

evidence shows a robust negative impact of foreign economic sanctions on performance of Russian firms.

C. Sanctions: Shock in March 2014

Table 5 reports the difference-in-differences (DID) estimation results of how Russian firms' performance changes after the sanction shock in March 2014. In March 2014, Russia annexed the Crimea peninsula from Ukraine, leading to many foreign sanctions on the Russia government, Russian businesses, and entities. The sanction shock following the event of Russia annexing Crimea is therefore used as a quasi-natural experiment to investigate the impact of foreign sanctions on Russian firms' performance. While the Russian economy heavily relies on the energy sector, the European countries, which are the countries that placed most sanctions on Russian economy, are also dependent on oil and gas supply from Russia. This interesting setting suggests that the Russian energy sector was kept immune from sanctions amidst the Crimea crisis. Therefore, we use the industry classification, i.e., non-energy versus energy firm, as the treatment effect in this DID analysis.

In column 1 in Table 5, we perform the DID regression using a propensity score matched (PSM) sample with the treatment effect considered is whether the Russian firm do not belong to the energy sector (following Global Industry Classification Standards - GICS). In other words, treated dummy equals to one if the firm is not an energy firm (treatment group), and zero otherwise (control group). Each observation from the treatment group is matched with one observation in the control group using the nearest-neighbor matching by their characteristics such as firm size, leverage, market value, fixed assets, and financial

constraints, so that they are identical in terms of firm-level financial traits. The DID regression results show that the performance of Russian non-energy firms decreases significantly following the foreign sanction shock in 2014, but that this is not the case for energy firms. The results are in line with those reported in the baseline regression and alleviate the concern about potential endogeneity problem in our model.

Column 2 in Table 5 shows the parallel trend assumption test where we document no parallel trend in treated firms' and control firms' ROA in the four-year period before the Crimea event (2014).

Overall, the findings support our argument that foreign sanctions do not significantly affect the energy sector in Russia.

D. Impact on Firms, by Profitability, Geography, Ownership?

Next in Table 6 we turn to quantile regressions. The estimates show that the negative prediction of foreign sanctions on firm performance is pronounced in most quantile ranges, but not for the top 10 percentile of the dependent variable, i.e., for the highly profitable firms. Hence, we suggest despite sanctions, highly profitable firms remain profitable for some reasons. In other words, certain firms may be shielded against sanctions.

Next, we wonder what could further shield firms from being affected. We start with firm origin. We surmise that firm origin could matter, in that sanctioning nations may try to shield their own firms from a detrimental impact of sanctions. In Appendix Table 4 we test whether the impact of foreign sanctions on firm performance is sensitive to firm origin, i.e., having a Western or foreign parent firm (Western = European, US, or US allies; foreign = non-

Russian). But we find the significance of such an impact does not meet the significance threshold, i.e., the p-value is much higher than 0.1. These estimates suggest that the sanctions do not differentiate between Russian firms and foreign-originated firms, possibly because in Russia it is difficult to differentiate between firms along origin.

The impact of sanctions may further be affected by political proximity to the Kremlin, in that firms close to the Kremlin may be shielded from the sanctions. Following Mamonov, Pestova and Ongena (2021), we start by measuring the physical distance to the Kremlin (Moscow) and test whether geographical location matters for the impact of foreign sanctions on firm performance. Mamonov, Pestova and Ongena (2021) find that this distance matters for the way banks anticipate financial sanctions. Here, as Appendix Table 4 shows, we find no evidence of any clear statistical impact of the distance to Moscow on the sanctions-firm performance nexus.

But physical distance to the Kremlin may be a poor proxy for political connections. Hence, we turn to the so-called "Putin list" which was released by the US Treasury Department on January 30, 2018,⁵ and we hand-collect data of firms that are related to Russian oligarchs who have connections to Putin. We find 21 firms in our sample with those oligarchs as founders or major shareholders. Among 21 firms, only six are oil firms (29 percent of firms with connections to oligarchs).⁶ Using the sample of those firms, in Table 7 we find that foreign sanctions do not have a significant impact on their performance. The finding implies

⁵ See for example the reporting on CNN by McKenzie, Gaouette and Borak (2018).

⁶ Table Appendix 7 reports the mean-difference test results of firm-level financial traits between firms with connections to Russian oligarchs and energy firms compared to other firms.

that the presence of Russian oligarchs in those firms (e.g., "connection to Vladimir Putin") plays a role as a profitability shield protecting those firms from the negative impact of foreign sanctions.

Finally, in Table 8 we use the data of Grigoriev and Zhirkov (2020) to analyze the impact of foreign sanctions on the changes in the wealth of the top 500 richest Russians during our sample period. We control for connection types to the government, sector-fixed effects, and cluster standard errors by year to account for potential confounding effects. We do not find that changes in the number of foreign sanctions have a clear impact on the wealth of Russian rich people. Unfortunately, Grigoriev and Zhirkov (2020) merely covers the pre-Crimea period of 2003-2010 period during which only minor sanctions were imposed.

E. The Preparedness of Russian Firms?

Table 9a shows the estimation results of Russia's import of the pre-Crimea event dummies for three periods (one, two, and three years). Findings in the literature (Aidt, Albornoz and Hauk (2021)) confirm that most actual sanctions are imposed after sanction threats, resulting in an increase in trade flows as a preparedness of stockpiling. This increase in flows also has happened in the case of Russia (Afesorgbor (2019)). Table 9b shows that general Russian firms retrench investment in 2013 – the year right before the Crimea event by 4.5 pp relative to total assets (equivalent to approximately 80 percent of Capex's mean by looking at coefficients of Pre-Crimea, i.e., in 2013). However, there is a difference between energy firms, oligarch-related firms relative to general firms. The evidence suggests that Russian firms, except for energy and oligarch firms, may have perceived a degree of

uncertainty that prevented them from making investment decisions. Exemplified by the typical case of Nord Stream 2, the energy projects were more likely to be unstoppable, albeit subject to future sanctions.

To provide some further analysis on the preparedness for the Crimea event, we explore Russian firms' behavior before the Crimea annexation event regarding their stockpiling and repurchasing activities. Table 9c shows that while the effect is not pronounced in general firms and firms with connections to oligarchs, energy firms seem to accelerate stockpiling (i.e., holding more inventories) by 3.3 pp, which is 17 times higher than its mean, right before the Crimea event. Although energy products have been more likely to be sanctioned products by most Western countries, this respond was more likely to manipulate the energy prices after threatened sanctions. Although firms are more likely to replace inventories with cash in the wartime (Jola-Sanchez and Serpa (2021)), we observe that there is no clear pattern in cash holdings among Russian firms. Thus, Russian energy products seemed to be insensitive to the 2014 war. In addition, Table 9d indicates that while the effect is absent in general firms and energy firms, oligarch-connected firms significantly repurchased more shares in during the pre-Crimea period (in 2013). Specifically, oligarch-related firms increased their repurchases by approximately 37 pp in 2013. We show that Russian oligarch firms repurchased more shares in 2013 compared to other firms. We contribute this to a precautionary move (i.e., a poison pill strategy in advance) to protect their control rights over their firms before the sanction threat is realized on the stock market. Again, in 2013, the sanction-triggering event (i.e., the Crimea annexation) had not happened yet. Both

tables suggest that those firms had been exposed to some sort of information that made them prepare, thus neutralizing the impact of later sanctions on their performance.

Interestingly, we also find similar abnormal patterns of changes in inventories of energy and oligarch firms in 2021 relative to the 2015-2020 period, while the magnitude of inventories is much smaller in other firms. As Russia invaded Ukraine in early 2022, such patterns imply the preparedness of Russia firms as they sense the possibility of an upcoming war.

F. Robustness with Dynamic DID

To test whether an increase of sanctions affected the firms' performance, a panel event study was designed with lag and lead terms (Freyaldenhoven, Hansen and Shapiro (2019)). This method is also known as the dynamic DID. The existence of post-event indicators across all period's posterior to the occurrence of an event (i.e., application of sanctions) between two groups (treated and control groups) can be defined as follows:

$$ROA_{it} = \alpha + \sum_{j=2}^J \beta_j (\text{Lag } j)_{it} + \sum_{k=2}^K \gamma_k (\text{Lead } k)_{it} + \mu_i + \lambda_t + X'_{it} \Gamma + \varepsilon_{it} \quad (1)$$

where ROA represents the firm performance for firms i having industrial classification in two groups (energy – treated; non-energy – control group) at year t . In addition, μ_i , λ_t , and ε_{it} are the firm effect, time effect, and residual term, respectively. X_{it} is the vector of control variables. The lag and lead to the event of interest can be defined as follows:

$$(\text{Lag } j)_{it} = 1[t = \text{Event}_i - j] \text{ for } j \notin \{1, \dots, J - 1\} \quad (2)$$

$$(\text{Lead } k)_{it} = 1[t = \text{Event}_i + k] \text{ for } k \notin \{1, \dots, J - 1\} \quad (3)$$

Typical lag and lead periods are 14 and 5 years, given our data availability, respectively. These terms were used to consider the temporal and geographic fixed effects in Equation (1), as suggested by Duflo (2004). More importantly, the Equation (1) only holds two parameters (Lag and Lead) for the treated group while the control group will ignore the effects of them. This approach is widely applied in the current literature on economics (Stevenson and Wolfers (2006); Angrist and Pischke (2008); Freyaldenhoven, Hansen and Shapiro (2019); Clarke and Tapia-Schythe (2021); Goodman-Bacon (2021)).

Figure 2 pictures the changes in ROA of energy firms following the foreign sanction shock in 2014, while Appendix Table 6 reports the estimated coefficients.

Observing ROA of those firms during the 2014-2019 period, we see that there was a slight decline in ROA compared to the previous period, however, the trend is not clear. To assess our hypothesis whether the energy firms 's performance does not significantly change after the critical year of massive sanction introduction, we formally test the joint significance of all the estimated coefficients of the post period 2014-2019, compared to 2013, which is $H_0: \beta_{+1} = \beta_{+2} = \beta_{+3} = \beta_{+4} = \beta_{+5} = \beta_{+6} = 0$. For this test, $F_{\text{after}}(6, 2086) = 0.75$ ($p > 0.1$), implying a null effect of economic sanctions on energy firms following the sanction shock in 2014.

G. *Market Reactions to the Crimea Annexation*

As mentioned previously, foreign sanctions seem to hinder Russian firm performance in general, notwithstanding the case of energy and oligarch firms. We started from the hypothesis that the investors should have expected the wave of economic sanctions and its

impact on the Russian economy. Tables 10a-c show the comparative analyses of stock market reactions and Russian firm performance surrounding the Crimea Annexation event in 2014.

We calculate the Cumulative Abnormal Returns (CARs) of Russian firms surrounding three important events: (i) February 20, 2014, as the date of Crimea Annexation; (ii) March 17, 2014, as the announcement date of the first set of sanctions against specific Russian authorities and businesspeople; and (iii) May 12, 2014, the date of the strengthened sanctions from the European countries on Russia.⁷ We use simple t-test to test whether the CARs of Russian firms are statistically significant surrounding those event dates. The t-test results for CARs surrounding the events (i), (ii), and (iii) are presented in Tables 10a, 10b and 10c, respectively.

Surprisingly, Russian stock market reactions were not significant surrounding the dates of the annexation (Feb 20, 2014) and the first wave of sanctions (March 17, 2014). Specifically, CARs are negative but remain statistically insignificant in all tests in Tables 10a and 10b; the findings apply to our full sample, energy firm group, oligarch firm group, and by different CAR windows from 3-day to 20-day.

Interestingly, we find that Russian stock market reacted strongly and negatively to the strengthened set of sanctions on Russia on May 12, 2014. The t-test results indicate a significant reduction in the Cumulative Abnormal Returns for the 3-day to 20-day window

⁷ We calculate CARs using tercile portfolios of the factors from Fama-French three-factor model. Similar results obtained when we sort factors by quintile portfolios and calculate the factor premiums from the returns of the top and bottom quintiles of each factor.

horizons surrounding May 12, 2014, for Russian energy firms and oligarch firms. More noticeably, oligarch firms' CARs are the largest, with a constant decline of 4.0 percent over 20 days on average while it is only -1.6 percent for energy firms during the same windows. Surprisingly, the negative market reaction only last in the 3-day window for our full sample t-test, implying that the market reaction to the Crimea event was heterogeneous and was only realized when strong measures against Russia were in place.

In sum, our results are economically meaningful applied to the pessimistic market expectations that these Russian firms might suffer from economic sanctions, but only when strong measures are undertaken. In other words, Russian markets did not seem to react to intimidation (e.g., the first wave of sanctions – which only targets certain Russian politicians and businesspeople) but reacted strongly when the intimidation is translated into stronger measures.

When it comes to firm performance, we find that there is no difference between the 2013 and 2014 performance of energy firms. The energy firms seemed immune to the 2014 shocks in terms of performance (although there is a negative change, it is not significantly different from zero). For oligarchs the same seems true. The sudden impact of sanctions caused a marginally significant reduction in the ROA of oligarchs (of around 4.4 percent) in 2014; however, it bounced back and becomes insignificant after two years. However, the remaining firms suffered in the first two years and experienced a reversal in 2016.

To sum up, we find that the investors and market exhibit pessimistic expectations about sanctions consequences. However, it turns out that energy and oligarchs firms had no

change in performance compared with 2013, while other firms experienced a performance reduction after two sanction years.

IV. Conclusion

We assess the economic effects of almost two decades of recent sanctions on Russian firms by a couple of dozen sanctioning countries. We suggest that foreign sanctions leave energy firms in Russia unaffected. However, sanctions do undermine firm performance in the other (non-energy) sectors. In these other sectors sanctions have a negative impact on capital expenditures and R&D intensity.

The cost of capital and firm-level political risk also increase in sanctions. While firms with connections to Russian oligarchs linked to Putin are unaffected, sanctions do not differentiate in their impact between firms with Russian or foreign origin. We also find preparedness among Russian firms one year prior to the Crimea event and the year before the Ukraine war.

Overall, these estimates suggest that sanctions may have an effect on firms in sanctioned countries but that the impact may be very heterogenous and therefore in the end somewhat limited at the country level.

References

- Afesorgbor, Sylvanus Kwaku.** 2019. "The Impact of Economic Sanctions on International Trade: How Do Threatened Sanctions Compare with Imposed Sanctions?" *European Journal of Political Economy*, 56, 11-26.
- Ahn, Daniel P. and Rodney D. Ludema.** 2020. "The Sword and the Shield: The Economics of Targeted Sanctions." *European Economic Review*, 130, Forthcoming.
- Aidt, Toke S.; Facundo Alborno and Esther Hauk.** 2021. "Foreign Influence and Domestic Policy." *Journal of Economic Literature*, 59(2), 426-87.
- Angrist, Joshua D. and Jörn-Steffen Pischke.** 2008. *Mostly Harmless Econometrics: An Empiricists Companion*. Princeton NJ: Princeton University Press.
- Berner, Richard; Stephen Cecchetti and Kim Schoenholtz.** 2022. *Russian Sanctions: Some Questions and Answers*. London UK: VoxEU.org, Blog, March 21.
- Caldara, Dario and Matteo Iacoviello.** 2022. "Measuring Geopolitical Risk." *American Economic Review*, 112(4), 1194-225.
- Clarke, Damian and Kathya Tapia-Schyte.** 2021. "Implementing the Panel Event Study." *Stata Journal*, 21(4), 853-84.
- Deng, Ming; Markus Leippold; Alexander F. Wagner and Qian Wang.** 2022. *Stock Prices and the Russia-Ukraine War: Sanctions, Energy and Esg*. Zürich ZH: Swiss Finance Institute, Research Paper, 22-29.
- Duflo, Esther.** 2004. "The Medium Run Effects of Educational Expansion: Evidence from a Large School Construction Program in Indonesia." *Journal of Development Economics*, 74(1), 163-97.
- Felbermayr, Gabriel; Aleksandra Kirilakha; Constantinos Syropoulos; Erdal Yalcin and Yoto V. Yotov.** 2020. "The Global Sanctions Data Base." *European Economic Review*, 129, Forthcoming.
- Freyaldenhoven, Simon; Christian Hansen and Jesse M. Shapiro.** 2019. "Pre-Event Trends in the Panel Event-Study Design." *American Economic Review*, 109(9), 3307-38.
- Goodman-Bacon, Andrew.** 2021. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics*, 225(2), 254-77.
- Grigoriev, Ivan S. and Kirill Zhirkov.** 2020. "Do Political Connections Make Businesspeople Richer? Evidence from Russia, 2003–2010." *Research and Politics*, 7(4), Forthcoming.
- Gulen, Huseyin and Mihai Ion.** 2015. "Policy Uncertainty and Corporate Investment." *Review of Financial Studies*, 29(3), 523-64.
- Hadlock, Charles J. and Joshua R. Pierce.** 2010. "New Evidence on Measuring Financial Constraints: Moving Beyond the Kz Index." *Review of Financial Studies*, 23(5), 1909-40.
- Hansen, Christian; James B. McDonald and Whitney K. Newey.** 2010. "Instrumental Variables Estimation with Flexible Distributions." *Journal of Business and Economic Statistics*, 28(1), 13-25.
- Hassan, Tarek A.; Stephan Hollander; Laurence van Lent and Ahmed Tahoun.** 2019. "Firm-Level Political Risk: Measurement and Effects." *Quarterly Journal of Economics*, 134(4), 2135-202.
- Hausman, Jerry A. and William E. Taylor.** 1983. "Identification in Linear Simultaneous Equations Models with Covariance Restrictions: An Instrumental Variables Interpretation." *Econometrica*, 51(5), 1527-49.
- Jiang, Wei.** 2017. "Have Instrumental Variables Brought Us Closer to the Truth?" *Review of Corporate Finance Studies*, 6(2), 127-40.
- Jola-Sanchez, Andres F. and Juan Camilo Serpa.** 2021. "Inventory in Times of War." *Management Science*, 67(10), 6457-79.
- Keane, Michael and Timothy Neal.** 2021. *A Practical Guide to Weak Instruments*. Sydney AU: University of New South Wales School of Economics, Discussion Paper, 05.
- Kirilakha, Aleksandra; Gabriel Felbermayr; Constantinos Syropoulos; Erdal Yalcin and Yoto Yotov.** 2021. "The Global Sanctions Data Base: An Update That Includes the Years of the Trump Presidency," P. A. G. van Bergeijk, *The Research Handbook on Economic Sanctions*. London UK: Edward Elgar Publishing, 62-106.
- Levy, Philip I.** 1999. "Sanctions on South Africa: What Did They Do?" *American Economic Review*, 89(2), 415-20.
- Mamonov, Mikhail and Anna Pestova.** 2021. "Sorry, You're Blocked." *Economic Effects of Financial Sanctions on the Russian Economy*. Prague CZ: CERGE-EI, Working Paper, 704.

- Mamonov, Mikhail; Anna Pestova and Steven Ongena.** 2021. "*Crime and Punishment?*" *How Russian Banks Anticipated and Dealt with Global Financial Sanctions.* London UK: Centre for Economic Policy Research, Discussion Paper, 16705.
- McKenzie, Sheena; Nicole Gaouette and Donna Borak.** 2018. "The Full 'Putin List' of Russian Oligarchs and Political Figures Released by the Us Treasury," *CNN.* Atlanta GA:
- Olea, José Luis Montiel and Carolin Pflueger.** 2013. "A Robust Test for Weak Instruments." *Journal of Business and Economic Statistics*, 31(3), 358-69.
- Stevenson, Betsey and Justin Wolfers.** 2006. "Bargaining in the Shadow of the Law: Divorce Laws and Family Distress." *Quarterly Journal of Economics*, 121(1), 267-88.

Figure 1. Number of sanctions, by sanctioning country

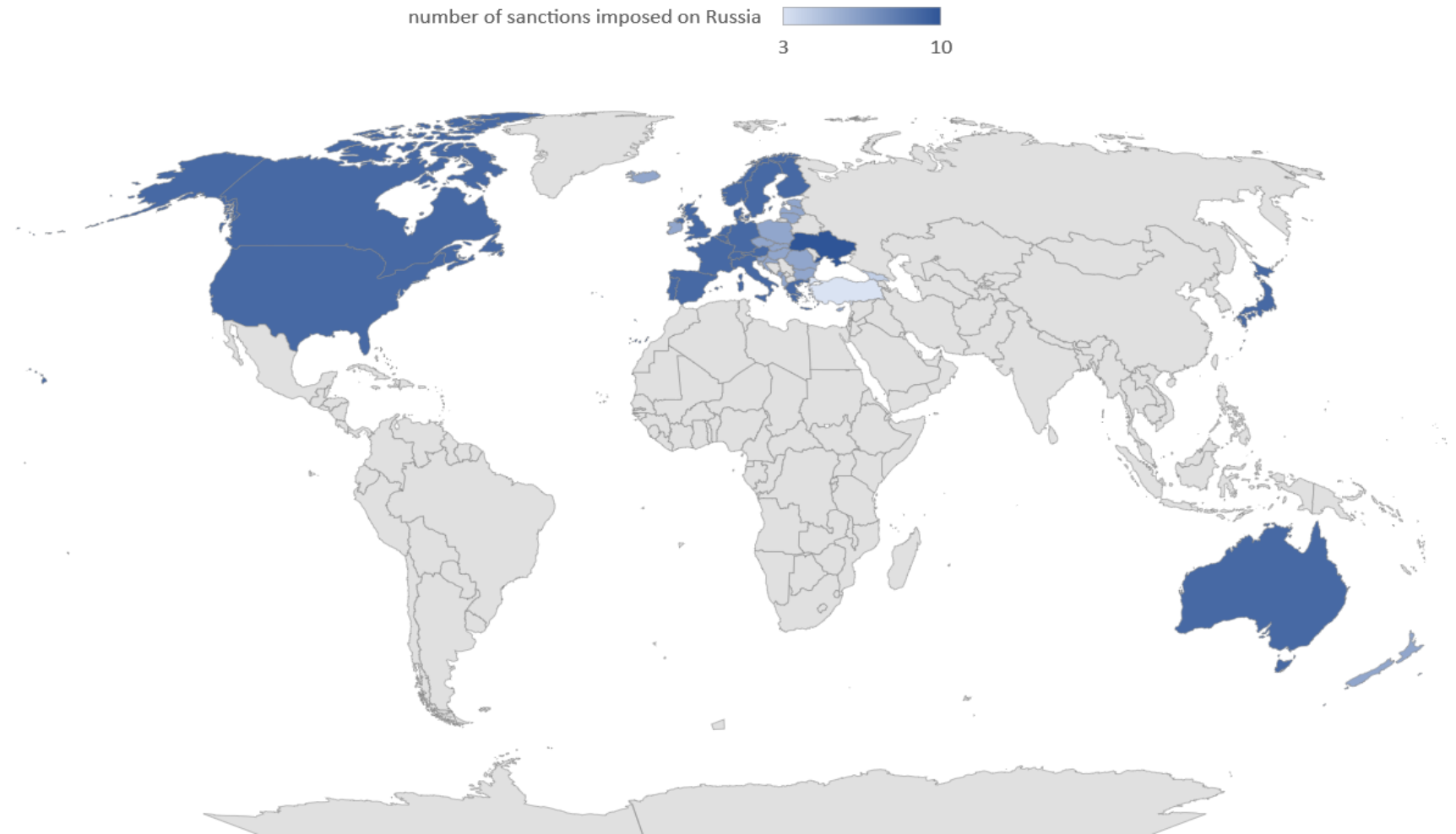
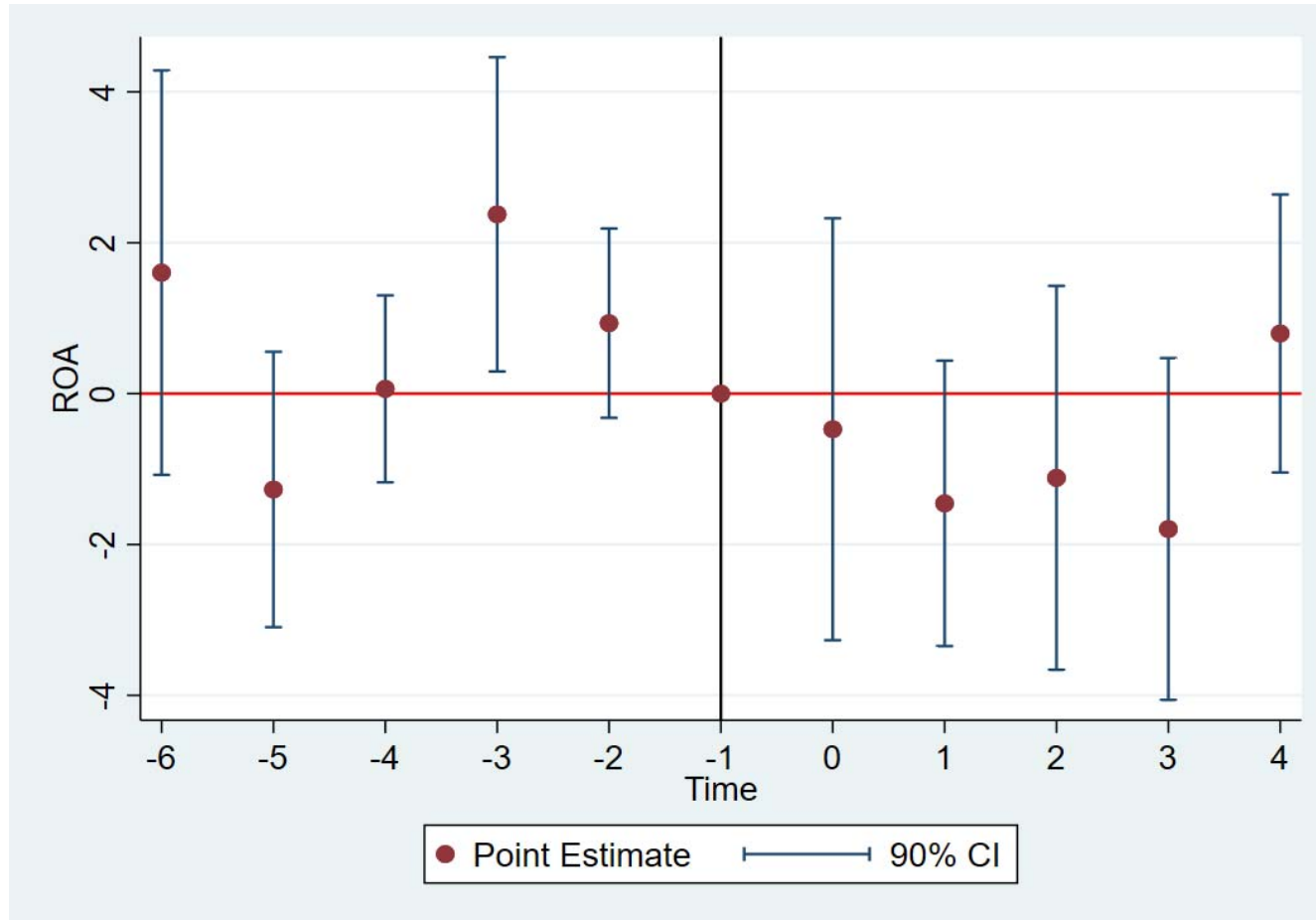


Figure 2. The effects of sanctions on energy firm performance with base-year (2013)



The figure reports the estimates from the panel event study. Point estimates are represented along with their 90% confidence intervals as described in the model equation in specific time intervals and controlling for firm characteristics and the number of sanctions. The baseline (omitted) base period (solid vertical line) was 1 year prior to the adoption of sanctions (2014). The event year was 2014.

Table 1. Baseline regression: Return on Assets

VARIABLES	(1) ROA	(2) ROA	(3) ROA
Sanctions	-0.068*** (0.018)	-0.064*** (0.009)	-0.048*** (0.014)
Firm size		0.540*** (0.085)	0.530* (0.274)
Financial leverage		-13.844*** (1.226)	-13.802*** (2.177)
Fixed assets		4.735*** (0.754)	1.447 (1.141)
Cash holdings		18.454*** (1.822)	20.081*** (3.221)
Financial constraints		-1.614*** (0.351)	-0.988 (0.951)
GDP Growth		0.288*** (0.060)	0.342*** (0.057)
Inflation		0.050 (0.037)	-0.079* (0.043)
Crude oil price		-0.033*** (0.010)	-0.042*** (0.014)
Constant	4.894*** (0.606)	-3.853 (2.478)	1.314 (6.453)
Firm FE	Yes	Yes	No
Industry FE	No	No	Yes
S.E. clustered by year	Yes	Yes	Yes
Observations	9,157	8,513	2,473
Adjusted R-squared	0.013	0.149	0.236

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Do foreign sanctions hinder investment and financing?

VARIABLES	(1)	(2)	(3)	(4)
	Tobit Capex	Tobit R&D intensity	Tobit Firm-level political risk	OLS WACC
Sanctions	-0.038*** (0.014)	-0.011*** (0.004)	0.053*** (0.015)	0.102*** (0.017)
Firm size	0.696*** (0.171)	0.131 (0.089)	-1.642* (0.908)	-0.423*** (0.147)
Financial leverage	-0.986 (0.667)	-0.126 (0.326)	1.945 (2.202)	-11.035*** (0.955)
Fixed assets	8.947*** (1.133)	0.140 (0.309)	-0.613 (2.724)	0.260 (0.391)
Cash holdings	3.613** (1.558)	0.135 (0.453)	0.157 (3.696)	1.332 (0.795)
Financial constraints	-1.952 (1.268)	-1.653*** (0.228)	0.872 (3.153)	-1.004 (1.161)
GDP Growth	0.328** (0.139)	0.059*** (0.021)	-0.141** (0.060)	-0.130* (0.069)
Inflation	0.186*** (0.071)	0.033** (0.015)	-0.131** (0.058)	0.172 (0.118)
Crude oil price	0.009 (0.010)	-0.008*** (0.002)	0.039*** (0.010)	0.003 (0.015)
Constant	-12.424* (7.040)	-7.115*** (1.585)	24.736 (19.439)	9.414* (5.094)
Firm FE	Yes	Yes	Yes	Yes
S.E. clustered by year	Yes	Yes	Yes	Yes
Observations	5,577	4,131	251	8,089
Pseudo R-squared	0.124	0.638	0.022	
Adjusted R-squared				0.564

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. Columns 1-3 report Tobit regression (lower bound: zero, upper bound: +infinity) results of Capex, R&D intensity and Firm-level political risk on sanctions. Column 4 reports the OLS estimation results of cost of capital on sanctions. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Robustness tests
Panel A. Sensitivity tests

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Sales growth	Profit margin	ROA	ROA	ROA	Prais-Winsten estimator ROA	Driscoll-Kraay estimator ROA
Sanctions	-0.171* (0.084)	-0.224*** (0.069)				-0.087*** (0.018)	-0.057*** (0.008)
Import-weighted sanctions			-0.041*** (0.010)				
Export-weighted sanctions				-0.036*** (0.010)			
Geopolitical risk index/100					-0.046*** (0.013)		
Firm size	4.268* (2.057)	7.411*** (1.339)	0.593** (0.267)	0.596** (0.268)	1.699*** (0.375)	1.982*** (0.400)	0.708*** (0.088)
Financial leverage	-7.986** (3.409)	-40.051*** (4.862)	-13.574*** (2.167)	-13.574*** (2.169)	-15.721*** (1.532)	-15.440*** (1.265)	-15.516*** (0.662)
Fixed assets	-15.437** (6.351)	-7.563* (4.021)	1.469 (1.141)	1.463 (1.144)	-4.877*** (1.427)	-5.204*** (1.224)	1.777** (0.713)
Cash holdings	27.612*** (6.674)	24.219*** (5.733)	19.573*** (3.162)	19.546*** (3.164)	14.711*** (2.593)	15.115*** (2.722)	12.262*** (1.781)
Financial constraints	-4.506 (5.158)	-5.022 (3.082)	-1.210 (0.931)	-1.218 (0.934)	0.129 (1.599)	-1.218 (1.605)	-1.395*** (0.468)
GDP growth	2.475*** (0.147)	0.590*** (0.170)	0.355*** (0.065)	0.356*** (0.065)	0.356*** (0.098)	0.350*** (0.068)	0.263*** (0.029)
Inflation	1.131*** (0.202)	0.330 (0.198)	-0.059 (0.047)	-0.057 (0.048)	0.120 (0.072)	0.127** (0.046)	0.006 (0.031)
Crude oil price	-0.093 (0.060)	-0.059 (0.056)	-0.042*** (0.014)	-0.043*** (0.015)	-0.030** (0.011)	-0.046*** (0.011)	-0.031*** (0.007)
Constant	-39.169* (19.329)	-64.273*** (14.609)	-0.322 (6.301)	-0.318 (6.328)	-2.008 (7.985)	-9.721 (7.746)	-2.485 (2.042)
Firm FE	Yes	Yes	Yes	Yes	Yes	No	Yes
S.E. clustered by year	Yes	Yes	Yes	Yes	Yes	No	Yes
Observations	7,474	8,439	2,431	2,431	8,486	8,513	8,513
Adjusted R-squared	0.097	0.336	0.243	0.243	0.395		

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Robustness tests
 Panel B. Instrumental variable regression

VARIABLES	(1) First stage Sanctions	(2) Second stage ROA
Sanctions		-0.083*** (0.024)
Ukraine's geopolitical risk (free of Russian threats)	35.095*** (9.506)	
Americans' favorable opinion about Russia	-1.040*** (0.177)	
Firm size	1.380** (0.545)	2.536*** (0.367)
Financial leverage	2.032*** (0.725)	-16.471*** (1.395)
Fixed assets	-2.533** (1.244)	-6.796*** (1.181)
Cash holdings	1.202 (1.337)	12.196*** (2.971)
Financial constraints	-15.582** (7.502)	-0.773 (3.219)
GDP growth	0.450 (0.470)	0.324** (0.126)
Inflation	-0.890* (0.460)	0.129 (0.099)
Crude oil price	-0.531*** (0.116)	-0.046** (0.020)
Constant	24.520 (39.269)	-19.085 (12.769)
Firm FE	Yes	Yes
S.E. clustered by year	Yes	Yes
Observations	6,405	6,405
R-squared	0.455	0.498
First stage F-statistic of excluded instrument	69.26	
Anderson-Rubin Wald test	8.65	
Kleibergen-Paap weak identification test	69.262	
Anderson-Rubin confidence interval	[-0.130, -0.037]	
Over-id [p-value]	0.554	

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Impact of different types of sanctions

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA
Financial sanctions	-0.086*** (0.018)			
Trade (export) sanctions		-0.025*** (0.006)		
Trade (import) sanctions			-0.035*** (0.007)	
Travel sanctions				-0.091*** (0.019)
Firm size	1.979*** (0.387)	1.979*** (0.387)	1.979*** (0.387)	1.979*** (0.387)
Financial leverage	-15.439*** (1.503)	-15.439*** (1.503)	-15.439*** (1.503)	-15.439*** (1.503)
Fixed assets	-5.201*** (1.415)	-5.201*** (1.415)	-5.201*** (1.415)	-5.201*** (1.415)
Cash holdings	15.112*** (2.534)	15.112*** (2.534)	15.112*** (2.534)	15.112*** (2.534)
Financial constraints	-1.226 (1.435)	-1.226 (1.435)	-1.226 (1.435)	-1.226 (1.435)
GDP growth	0.353*** (0.073)	0.353*** (0.073)	0.353*** (0.073)	0.353*** (0.073)
Inflation	0.126** (0.060)	0.126** (0.060)	0.126** (0.060)	0.126** (0.060)
Crude oil price	-0.047*** (0.014)	-0.047*** (0.014)	-0.047*** (0.014)	-0.047*** (0.014)
Constant	-19.661*** (7.497)	-19.661*** (7.497)	-19.661*** (7.497)	-19.661*** (7.497)
Firm FE	Yes	Yes	Yes	Yes
S.E. clustered by year	Yes	Yes	Yes	Yes
Observations	8,486	8,486	8,486	8,486
Adjusted R-squared	0.454	0.452	0.454	0.454

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Difference-in-differences analysis

VARIABLES	(1) ROA	(2) ROA
Post event x Treated (Non-energy)	-2.658***	
[t]	(0.835)	
Post event	-2.509***	
[t]	(0.615)	
Post event x Treated (Non-energy)		-0.289
[t-1]		(1.811)
Post event		-3.151*
[t-1]		(1.700)
Post event x Treated (Non-energy)		-3.209
[t-2]		(2.388)
Post event		2.451
[t-2]		(2.049)
Post event x Treated (Non-energy)		1.391
[t-3]		(2.477)
Post event		-1.466
[t-3]		(1.513)
Post event x Treated (Non-energy)		0.099
[t-4]		(2.588)
Post event		0.544
[t-4]		(1.153)
Treated (Non-energy)	1.972	-1.370
	(5.309)	(1.927)
Firm size	-7.104***	1.094***
	(1.377)	(0.262)
Financial leverage	1.038***	-12.534***
	(0.317)	(1.724)
Fixed assets	-14.417***	3.716**
	(3.715)	(1.735)
Cash holdings	2.184	19.669***
	(1.330)	(4.932)
Financial constraints	20.877***	-2.855***
	(4.220)	(0.941)
GDP growth	-3.149***	0.550***
	(0.758)	(0.089)
Inflation	0.279***	0.073
	(0.078)	(0.154)
Crude oil price	-0.099	-0.073***
	(0.060)	(0.026)
Constant	-0.060***	-14.165**
	(0.013)	(6.584)
Industry FE	Yes	Yes
S.E. clustered by year	Yes	Yes
Observations	4,236	1,592
Adjusted R-squared	0.434	0.298

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Quantile regression: ROA

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA	(6) ROA	(7) ROA
<i>Quantile</i>	<i>p05</i>	<i>p10</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>	<i>p90</i>	<i>p95</i>
Sanctions	-0.154*** (0.034)	-0.090*** (0.017)	-0.045*** (0.007)	-0.035*** (0.006)	-0.037*** (0.009)	-0.044*** (0.016)	-0.008 (0.028)
Firm size	2.265*** (0.244)	1.324*** (0.126)	0.487*** (0.050)	0.233*** (0.041)	0.186*** (0.065)	-0.165 (0.114)	-0.649*** (0.202)
Financial leverage	-27.919*** (2.037)	-21.287*** (1.047)	-10.451*** (0.414)	-7.349*** (0.338)	-10.355*** (0.544)	-11.936*** (0.954)	-14.270*** (1.681)
Fixed assets	6.231*** (2.097)	3.758*** (1.078)	1.993*** (0.426)	3.858*** (0.348)	4.073*** (0.560)	2.234** (0.982)	6.079*** (1.731)
Cash holdings	7.756 (6.535)	4.332 (3.359)	3.099** (1.327)	12.468*** (1.085)	27.225*** (1.746)	39.548*** (3.061)	47.931*** (5.394)
Financial constraints	-7.587*** (1.331)	-3.916*** (0.684)	-0.873*** (0.270)	-0.307 (0.221)	-0.255 (0.356)	0.719 (0.623)	1.140 (1.098)
GDP growth	0.341** (0.140)	0.253*** (0.072)	0.160*** (0.028)	0.175*** (0.023)	0.272*** (0.037)	0.366*** (0.066)	0.551*** (0.116)
Inflation	0.045 (0.144)	-0.005 (0.074)	-0.002 (0.029)	0.053** (0.024)	0.120*** (0.039)	0.054 (0.068)	0.100 (0.119)
Crude oil price	-0.012 (0.028)	-0.019 (0.014)	-0.017*** (0.006)	-0.017*** (0.005)	-0.029*** (0.008)	-0.073*** (0.013)	-0.078*** (0.023)
Constant	-52.188*** (6.501)	-25.714*** (3.342)	-4.558*** (1.320)	0.798 (1.079)	6.183*** (1.737)	22.832*** (3.045)	31.468*** (5.365)
Observations	8,513	8,513	8,513	8,513	8,513	8,513	8,513

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Do connections to Russian oligarchs matter?

VARIABLES	(1) ROA	(2) ROA
Sanctions x Oligarch		0.057 (0.044)
Sanctions	-0.078 (0.058)	-0.091*** (0.020)
Oligarch		11.924** (4.415)
Firm size	2.441* (1.310)	1.954*** (0.386)
Financial leverage	-13.826*** (4.473)	-15.497*** (1.488)
Fixed assets	-5.140 (5.035)	-5.229*** (1.418)
Cash holdings	31.180** (14.201)	15.009*** (2.549)
Financial constraints	-5.192 (3.723)	-1.542 (1.581)
GDP growth	0.396*** (0.120)	0.353*** (0.075)
Inflation	-0.024 (0.102)	0.133** (0.063)
Crude oil price	-0.068 (0.043)	-0.047*** (0.014)
Constant	-35.140 (22.384)	-20.388* (10.193)
Firm FE	Yes	Yes
S.E. clustered by year	Yes	Yes
Observations	329	8,513
Adjusted R-squared	0.281	0.399

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 8. How do foreign sanctions affect the rich in Russia?

VARIABLES	(1) Wealth growth
Sanctions	-0.330 (0.644)
Federal executive formal	-0.759* (0.359)
Federal executive past	-0.294** (0.112)
Federal executive informal	3.900 (3.249)
Federal legislature formal	0.227 (0.211)
Federal legislature informal	0.970 (0.780)
Regional executive formal	-0.333** (0.121)
Regional executive informal	-0.110 (0.448)
Regional legislature formal	-0.299** (0.113)
Constant	0.929*** (0.066)
Sector FE	Yes
S.E. clustered by year	Yes
Observations	2,542
Adjusted R-squared	0.028

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 9a. Abnormal pattern in Russia's import from EU exporters before the Crimea event

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Russia's import	Russia's import	Russia's import	Russia's import	Russia's import	Russia's import
Pre-Crimea (2011-2013) x EU exporters	7.514*** (0.933)	7.514*** (0.959)				
Pre-Crimea (2011-2013)	10.467*** (1.628)	10.467*** (1.675)				
Pre-Crimea (2012-2013) x EU exporters			7.484*** (0.920)	7.484*** (0.947)		
Pre-Crimea (2012-2013)			10.045*** (1.642)	10.045*** (1.689)		
Pre-Crimea (2013) x EU exporters					6.980*** (0.972)	6.980*** (1.000)
Pre-Crimea (2013)					9.408*** (1.655)	9.408*** (1.702)
EU exporters	7.555*** (0.872)		7.976*** (0.919)		8.420*** (0.972)	
Constant	13.827*** (1.619)	15.091*** (1.751)	14.455*** (1.642)	15.790*** (1.791)	15.049*** (1.655)	16.458*** (1.820)
Exporter FE	No	Yes	No	Yes	No	Yes
SE clustered by year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,194	4,194	4,194	4,194	4,194	4,194
Adjusted R-squared	0.000	0.831	0.000	0.831	0.001	0.832

The table reports regression estimates of the indicated dependent variable on pre-Crimea event dummy and its interaction terms with EU exporter dummy. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 9b. Pattern of capital expenditure of Russian firms before the Crimea event

VARIABLES	(1) Capex	(2) Capex
Pre-Crimea (2013) x Energy	-0.015 (0.014)	
Energy	-0.005 (0.008)	
Pre-Crimea (2013) x Oligarchs		-0.001 (0.015)
Oligarchs		0.007 (0.008)
Pre-Crimea (2013)	-0.013** (0.006)	-0.013** (0.006)
Firm size	0.002 (0.002)	0.003 (0.002)
Financial leverage	-0.004 (0.008)	-0.009 (0.008)
Fixed assets	0.097*** (0.023)	0.098*** (0.022)
Cash holdings	0.133*** (0.009)	0.129*** (0.009)
Financial constraints	-0.000 (0.006)	-0.011* (0.006)
GDP Growth	0.004*** (0.000)	0.004*** (0.000)
Inflation	0.001*** (0.000)	0.002*** (0.000)
Crude oil price	-0.000*** (0.000)	-0.000*** (0.000)
Constant	-0.025 (0.034)	-0.102*** (0.038)
Observations	1,976	1,976

The table reports regression estimates of the indicated dependent variable on pre-Crimea event dummy, its interaction with energy or oligarch firm dummy, and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 9c. Abnormal pattern of Δ Inventories of energy and oligarch-related firms before the Crimea event

VARIABLES	(1) Δ Inventories	(2) Δ Inventories
Pre-Crimea (2013) x Energy	0.014*** (0.003)	
Energy	-0.001 (0.003)	
Pre-Crimea (2013) x Oligarchs		0.001 (0.003)
Oligarchs		0.001 (0.002)
Pre-Crimea (2013)	0.002 (0.003)	0.001 (0.003)
Firm size	-0.001 (0.000)	0.001* (0.001)
Financial leverage	0.002 (0.004)	-0.011*** (0.003)
Fixed assets	-0.043*** (0.013)	-0.044*** (0.012)
Cash holdings	-0.002 (0.003)	-0.001 (0.003)
Financial constraints	0.003* (0.002)	-0.002 (0.002)
GDP Growth	0.000 (0.000)	0.001* (0.000)
Inflation	-0.000 (0.000)	0.000 (0.000)
Crude oil price	-0.000 (0.000)	0.000 (0.000)
Constant	0.025* (0.012)	-0.018 (0.011)
Industry FE	Yes	Yes
SE clustered by year	Yes	Yes
Observations	2,223	2,223
Adjusted R-squared	0.006	0.005

The table reports regression estimates of the indicated dependent variable on pre-Crimea event dummy, its interaction with energy or oligarch firm dummy, and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9d. Pattern of share repurchases of Russian firms before the Crimea event

VARIABLES	(1) Repurchases	(2) Repurchases
Pre-Crimea (2013) x Energy	0.003 (0.016)	
Energy	-0.007 (0.008)	
Pre-Crimea (2013) x Oligarchs		0.030*** (0.012)
Oligarchs		0.019*** (0.007)
Pre-Crimea (2013)	0.014* (0.008)	0.002 (0.006)
Firm size	0.008*** (0.001)	0.007*** (0.002)
Financial leverage	0.046*** (0.006)	0.054*** (0.011)
Fixed assets	0.077*** (0.021)	0.121*** (0.035)
Cash holdings	-0.017** (0.007)	-0.037*** (0.012)
Financial constraints	0.000 (0.004)	0.002 (0.007)
GDP Growth	0.007*** (0.001)	0.008*** (0.001)
Inflation	0.003*** (0.000)	0.004*** (0.001)
Crude oil price	0.000*** (0.000)	0.000 (0.000)
Constant	-0.222*** (0.026)	-0.200*** (0.044)
Observations	1,588	1,588

The table reports regression estimates of the indicated dependent variable on pre-Crimea event dummy, its interaction with energy or oligarch firm dummy, and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 10a. The comparison between stock return reactions and firm performance in the context of the Crimea Annexation event.

Firm types		Stock returns' reactions during 2014					Firm performance: Post-Crimea minus Pre-Crimea		
		[1] CAR [-1;1]	[2] CAR [-7;7]	[3] CAR [0;5]	[4] CAR [0;10]	[5] CAR [0;20]	[6] 2013-2014	[7] 2013-2015	[8] 2013-2016
Energy	Value	0.085	-0.285	-0.125	-0.201	-0.313	-3.825	-4.079	-3.349
	t-stat	0.371	-0.839	-0.641	-0.596	-0.693	-1.136	-1.368	-1.265
Oligarch	Value	0.495	-0.680	-0.144	-1.081	-0.758	-4.470*	-0.913	1.013
	t-stat	0.938	-0.809	-0.319	-1.763	-1.355	-1.84	-0.449	0.47
All firms	Value	0.043	0.002	-0.154	-0.202	-0.167	-1.762***	-1.401**	-0.682
	t-stat	0.494	0.029	-1.399	-1.517	-0.984	-2.911	-2.55	-1.293

The first five columns show the stock returns reactions of Russian firms in three groups, such as energy, oligarch, and all firms, by using the Cumulative Abnormal Return (CAR) with different windows. CARs are calculated using the SMB and HML tercile portfolios. The t-test captures the hypothesis of whether the CARs were different from zero. The event date is February 20, 2014 - the first date of the Crimea Annexation event. Columns 6-8 show the differences in the Russian firms' performance before and after 2014. * p < 0.1; ** p < 0.05; *** p < 0.01.

Table 10b. The comparison between stock return reactions and firm performance in the context of the Crimea Annexation event.

Firm types		Stock returns' reactions during 2014					Firm performance: Post-Crimea minus Pre-Crimea		
		[1] CAR [-1;1]	[2] CAR [-7;7]	[3] CAR [0;5]	[4] CAR [0;10]	[5] CAR [0;20]	[6] 2013-2014	[7] 2013-2015	[8] 2013-2016
Energy	Value	-0.191*	-0.233	-0.338	-0.577	-1.052	-3.825	-4.079	-3.349
	t-stat	-1.767	-0.795	-1.574	-1.642	-1.654	-1.136	-1.368	-1.265
Oligarch	Value	-0.022	0.201	-0.538	-1.198	-1.163*	-4.470*	-0.913	1.013
	t-stat	-0.699	0.337	-1.291	-1.437	-2.035	-1.84	-0.449	0.47
All firms	Value	-0.024	0.031	0.017	0.049	0.060	-1.762***	-1.401**	-0.682
	t-stat	-0.457	0.290	0.278	0.498	0.373	-2.911	-2.55	-1.293

The first five columns show the stock returns reactions of Russian firms in three groups, such as energy, oligarch, and all firms, by using the Cumulative Abnormal Return (CAR) with different windows. CARs are calculated using the SMB and HML tercile portfolios. The t-test captures the hypothesis of whether the CARs were different from zero. The event date is March 17, 2014 - the announcement date of the first set of sanctions. Columns 6-8 show the differences in the Russian firms' performance before and after 2014. * p < 0.1; ** p < 0.05; *** p < 0.01.

Table 10c. The comparison between stock return reactions and firm performance in the context of the Crimea Annexation event.

Firm types		Stock returns' reactions during 2014					Firm performance: Post-Crimea minus Pre-Crimea		
		[1] CAR [-1;1]	[2] CAR [-7;7]	[3] CAR [0;5]	[4] CAR [0;10]	[5] CAR [0;20]	[6] 2013-2014	[7] 2013-2015	[8] 2013-2016
Energy	Value	-0.251**	-1.071**	-0.719**	-0.943**	-1.558**	-3.825	-4.079	-3.349
	t-stat	-2.406	-2.211	-2.497	-2.530	-2.417	-1.136	-1.368	-1.265
Oligarch	Value	-1.142**	-2.409*	-1.677**	-3.434**	-4.020***	-4.470*	-0.913	1.013
	t-stat	-2.508	-2.155	-2.272	-2.756	-3.702	-1.84	-0.449	0.47
All firms	Value	-0.180***	-0.117	-0.124	-0.171	-0.224	-1.762***	-1.401**	-0.682
	t-stat	-3.188	-1.014	-1.563	-1.362	-1.284	-2.911	-2.55	-1.293

The first five columns show the stock returns reactions of Russian firms in three groups, such as energy, oligarch, and all firms, by using the Cumulative Abnormal Return (CAR) with different windows. CARs are calculated using the SMB and HML tercile portfolios. The t-test captures the hypothesis of whether the CARs were different from zero. The event date is May 12, 2014 - the announcement date of the second set of sanctions. Columns 6-8 show the differences in the Russian firms' performance before and after 2014. * p < 0.1; ** p < 0.05; *** p < 0.01.

Appendix

Appendix Literature: Summary of related papers

Authors (Year)	Title	Sanctioned Country	Analysis	Level of Analysis	Content	Journal	Other
Impact of Sanctions on Firms							
Crozet et al. (2021)	Worth the pain? Firm's exporting behaviour to countries under sanctions	RU, IR	E	Firm	The study covers 2 country samples of Russia and Iranian markets. There is a heterogeneity in the effects sanctions on exporting firms' behaviors. Firms relying on trade finance are negatively affected. Firms, specialized to serve the crisis countries, could be immune to the sanctions. Firms doing business in the sanctioned countries could export indirectly to the neighboring countries.	<i>European Economic Review</i>	VOXEU
Cheratian et al. (2022)	Survival strategies under sanctions: Firm-level evidence from Iran	IR	E	Firm	Iranian firm adopted strategies in reducing R&D expenditures, marketing costs, and fixed costs during the sanction period. Firms were more likely to survive if investing in the IT field. Shrinking the production and reducing employees' salary could be associated with the firms' survival during sanctions. Micro-firms were more likely to have the better resilience.		<i>CESifo WP 9568</i>
Sun et al. (2022)	Economic sanctions and shared supply chains: A firm-level study of the contagion effects of smart sanctions on the performance of nontargeted firms	ZW	E	Firm	The effects of targeted economic sanctions on the performance of non-targeted firms match with the sample of targeted firms related to supply chain aspects in Zimbabwe. Non-targeted firms operating in the supply chain with the sanctioned firms underperformed the other nontargeted firms. Mediating roles are found from sales reduction, an increase in cost. There is a heterogeneity in terms of exporting/importing classification in firms' operation.		<i>European Management Review</i>
Lafoigne-Joussier et al. (2022)	Beyond macro: Firm-level effects of cutting off Russian energy	RU	E	Firm	The media coverage item explores the impacts of cutting Russian energy imports as sanctions in production networks. Firms are more likely to adjust their operations (particularly, technology even in the short run) to mitigate the effects of this shocks. However, there is a heterogeneity in terms of shock exposure across firms (i.e., market shares shaped the differences in distributional consequences).		VOXEU
Keerati (2022)	The unintended consequences of financial sanctions	RU	E	Firm	This paper studies the economic impact of the U.S. financial sanctions against Russian companies in the aftermath of Russia's annexation of Crimea in 2014. It shows that the sanctions produced an unintended consequence of strengthening the sanction targets (firms) relative to their unsanctioned peers. The spillover impact of the sanctions resulted in these targets shrinking in size by less than unsanctioned Russian firms. The findings highlight the limitation of "targeted sanctions" and identifies factors for policymakers to consider in calibrating future sanctions programs.		SSRN
Besedes et al. (2021)	Cheap talk? Financial sanctions and non-financial firms	DE	E	Firm	This study explores the impacts of financial sanctions on the nation imposing them by drawing the German data. Accordingly, there are 23 countries (1999-2014) imposing sanctions on Germany. There is a reduction in financial indicators of German firms which do business in the sanctioned countries. There is an alternative business opportunity for German firms. There is a shift of doing business from sanction countries to non-sanctioned countries of German firms. There is no effect of foreign sanctions on firm performance.	<i>European Economic Review</i>	
Ebadi (2022)	Adapting to Sanctions: Evidence from Firm Response and Market Reallocation in Iran	IR	E	Firm	The microeconomic effects of U.S. and EU trade are explored due to imposing sanctions against Iran in terms of nuclear program. Iran exporting and importing firms suffer by 50% and 30% reduction, respectively. Firm-level productivity, profit, revenue, and employment are hurt. Exporting firms focused on the domestic market, transmitting shocks to non-exporting firms. Importing firms find alternative choices in the domestic market. Exporting sanctions correlates with an increase in consumer welfare by 4.35% while importing sanctions are associated with 7.5 welfare losses.		SSRN
Firm performance under economic sanctions with other explanatory factors (political connection, state-owned enterprises, geopolitical risk, etc.)							
Davydov et al. (2022)	Who cares about sanctions? Observations from annual reports of European firms	RU	E	Firm	This study analyses the text on annual reports of 11,500 firms from 2014 – 2017. There is a variant in the perception of the Russia-related sanctions in the cross-country scope after controlling the rigorous determinants. The macroeconomic determinants could explain these differences.		<i>Post-Soviet Affairs</i>
Aflatooni et al. (2022)	Sanctions against Iran, political connections and speed of adjustment	IR	E	Firm	This study looks at the economic sanctions on Iranian firms over the period from 2001 to 2018. Sanctions and firm leverage are correlated. Intensification and the speed of adjustment of firms are associated. In addition, there is a moderating role of political connection.	<i>Emerging Markets Review</i>	
Sun et al. (2021)	Externalities of economic sanctions on performance of intra-industry non-sanctioned firms: Evidence from Zimbabwe	ZW	E	Firm	This study explores the impacts of sanctions in Zimbabwe from 2009-2018 on non-sanctions firms. Non-sanctioned companies in the same industry as sanctioned firms are more likely to outperform ordinary non-sanctioned firms. The market share can be found as the mediating role.		<i>Scottish Journal of Political Economy</i>
Altuğ & Yesiltas (2022)	The impact of uncertainty on investment by Russia firms: A parable from 2014	RU	E	Firm	There is a decrease in investment towards to non-financial sector when economic sanctions are effective. The relevant mechanisms are foreign-debt exposure, oil-cost dependence, and exposure of production inputs.		CEPR DP 16646 VOXEU
Kim (2021)	The impact of economic sanctions on audit pricing	RU	E	Firm	There is an association between business risk and audit pricing in Russia after 2014. Audit fee for the Russian state-owned companies increase significantly after the year of 2014. The Russian state-owned companies were advised to terminate the auditing activities with foreign auditing companies (i.e. Big4 firms)	<i>Journal of Contemporary Accounting & Economics</i>	
Ghasseminejad & Jahan-Parvar (2021)	The impact of financial sanctions: The case of Iran	IR	E	Firm	There is the unique event of the nuclear deal in 2015 to see whether sanctions could be lifted earlier or not. Firms having a political connection are more likely to be suffered than ordinary firms under economic sanctions (i.e., the slowly bouncing back in prices after sanctions). Firms experience the lasting effects of sanctions on their performance. Firms tend to reduce the level of financial leverage and increase the cash holding during this difficult time.	<i>Journal of Policy Modeling</i>	
Draca et al. (2022)	On target? Sanctions and the economic interests of elite policymakers in Iran	IR	E	Firm	The study focuses on explaining the benefits from news about diplomatic progress after sanctions in the firm-level data. Iranian firms exhibit the positive reactions to the better diplomatic negotiations. In which, target firms (e.g., political connection) are more pronounced. The US sanction policies went "off target" after the Trump's era.		<i>Warwick RP1400</i>
Economic sanctions and sectoral and market studies							
Larch et al. (2021)	Quantifying the impact of economic sanctions on international trade in the energy and mining sector			Sector	Mining trading industry has been adversely affected by sanctions (i.e., the reduction in bilateral mining trade is around 44%). There is a significant heterogeneity in the effects of sanctions on mining trade across mining industries and across sanction episodes/cases. These effects depend on the sanctioning and sanctioned countries, the type of sanctions, and the direction of trade flows.		<i>CESifo WP 8878</i>
Kelishomi & Nisticò (2022)	Employment effects of economic sanctions in Iran	IR	E	Sector	Iran's manufacturing employment shrank by 16.4 percentage points under economic sanctions. Trade openness is the moderating factor for employment reallocation across industries. The industries which have the labor intensity and importing dependence drive the previous findings.	<i>World Development</i>	
Huang & Lu (2022)	The cost of Russian sanctions on the global equity markets	RU	E	Market	While the average equity market loss of a country that impose sanctions on Russia is close to 3% of its total GDP, the number for Russia is between 16% and 43%. Firms which declared to withdraw their business operation from Russia suffer additional 2.3% drop in equity prices.		SSRN
Kim (2020)	Finding loopholes in sanctions: Effects of sanctions on North Korea's refined oil prices	NK	E	Market	The North Korean oil market prices were only temporarily affected by the sanctions. However, they are persistently stable in the long run no matter what restrictions were applied. The North Korean authorities attempted to find loopholes in the sanctions to provide refined petroleum products as the minimum level of demand.	<i>KDI Journal of Economic Policy</i>	SSRN
Crozet & Hinz (2020)	Friendly fire: the trade impact of the Russia sanctions and counter-sanctions	RU	E	Sector	This study evaluates the economic cost, related to export losses, for the political crisis between Russia and 37 countries, starting in 2014. Russia experienced a loss up to 7.4% of its GDP (53 billion USD) within one year, starting 2014 while the Western economies suffer marginally (0.3% of their GDP). There is no change in customers' preference, supposedly considered as a reduction in Western import. It stems from country risk	<i>Economic Policy</i>	

Economic sanctions and their consequences on the economy

Mamonov & Pestova (2021)	Sorry, you're blocked.' Economic effect of financial sanctions on the Russian economy	RU	E	Country	The study employs the Bayesian VAR model to measure the negative impacts of the sanctions imposed on the Russian economy. The Russian companies are likely to decrease their external debt, leading to an increase in country spread. However, their effects were confounded by a reduction in crude oil prices during the period of 2014s and a increase in prices in 2017. The theoretical framework about spread shocks in open economies support the previous empirical evidences.	SSRN	SSRN
Langot et al. (2022)	Strength in unity: The economic cost of trade restrictions on Russia	RU	E	Country	The Russian economy would suffer three times as much as the European economies do when imposing an embargo. The losses can be up to 13 times when imposing the EU and other countries' unfriendly' punish to Russia.		VOXEU
Sturm (2022)	The simple economics of a tariff on Russian energy export	RU	T	Country	A theoretical discussion of tariffs on Russian energy export.		VOXEU, WP
Sturm & Menzel (2022)	The simple economics of optimal sanctions: The case of EU-Russia oil and gas trade	RU	T	Country	A theoretical discussion of using embargo as an effective tariff on EU-Russia oil and gas trade to hurt the Russian economy.		WP
De Jong (2022)	Too little, too late? US sanctions against Nord Stream 2 and the transatlantic relationship	RU	E	Country	The US sanctions imposed on Russia were initially effective, leading to the acting of ending contracts related to the offshore natural gas pipelines in Europe (Nord Stream 2). Notwithstanding these difficulties, Russian made every efforts to keep the project afloat by using voluminous countermeasures.	<i>Journal of Transatlantic Studies</i>	VOXEU
Federle et al. (2022)	Economic spillovers from the war in Ukraine: The proximity penalty	RU	E	Country	There is a geographical correlation between the distance to Ukraine and the amount of penalty, meaning 'proximity penalty' (2.6 percentage points per 1,000 kilometers). Two-thirds of penalty is relevant to the international trade.		CEPR DP 17185 VOXEU
Andermo & Kragh (2021)	Sanctions and dollar dependency in Russia: resilience, vulnerability, and financial integration	RU	E	Country	Russia has implemented debt placements strategically to mitigate the negative impacts in response to sanctions to promote its economic sovereignty.	<i>Post-Soviet Affairs</i>	
Pestova & Mamonov (2021)	Should we care? The economic effects of financial sanctions on the Russian economy	RU	E	Country	This study estimates the negative effects on the Russian economy from Western financial sanctions started in 2014. The amount of out-standing corporate external debt decreases. However, it occurred during a period of falling oil prices. Two-thirds of density related to economic losses in the Russia economy is observed.		BOFIT DP 13
Kwon et al. (2022)	The extraterritorial effects of sanctions	224 countries	E	Country	There is an intercorrelation between economic sanctions, trade, welfare, and extraterritorial effects. The effects are heterogeneous between sanctioning, sanctioned, and third countries.		CESifo WP 9578
González (2022)	International sanctions and development: Evidence from Latin America and the Caribbean (1950-2019)	29 countries	E	Country	This study examines the impact of international sanctions on the economic development of sanctioned countries in the Latin American and Caribbean regions from 1950 to 2019. Sanctions significant worsens development in sanctioned countries, including lowering growth, worsening inequality, reducing access to credit	<i>Economic Affairs</i>	

Notes. BOFIT = Bank of Finland Institute for Emerging Economies; CEPR = Centre for Economic Policy Research; DP = Discussion Paper; E = Empirical; RP = Research Paper; SSRN = Social Science Research Network; T = Theory; WP = Working Paper. Countries: DE = Germany; IR = Iran; NK = North-Korea; RU = Russia; ZW = Zimbabwe.

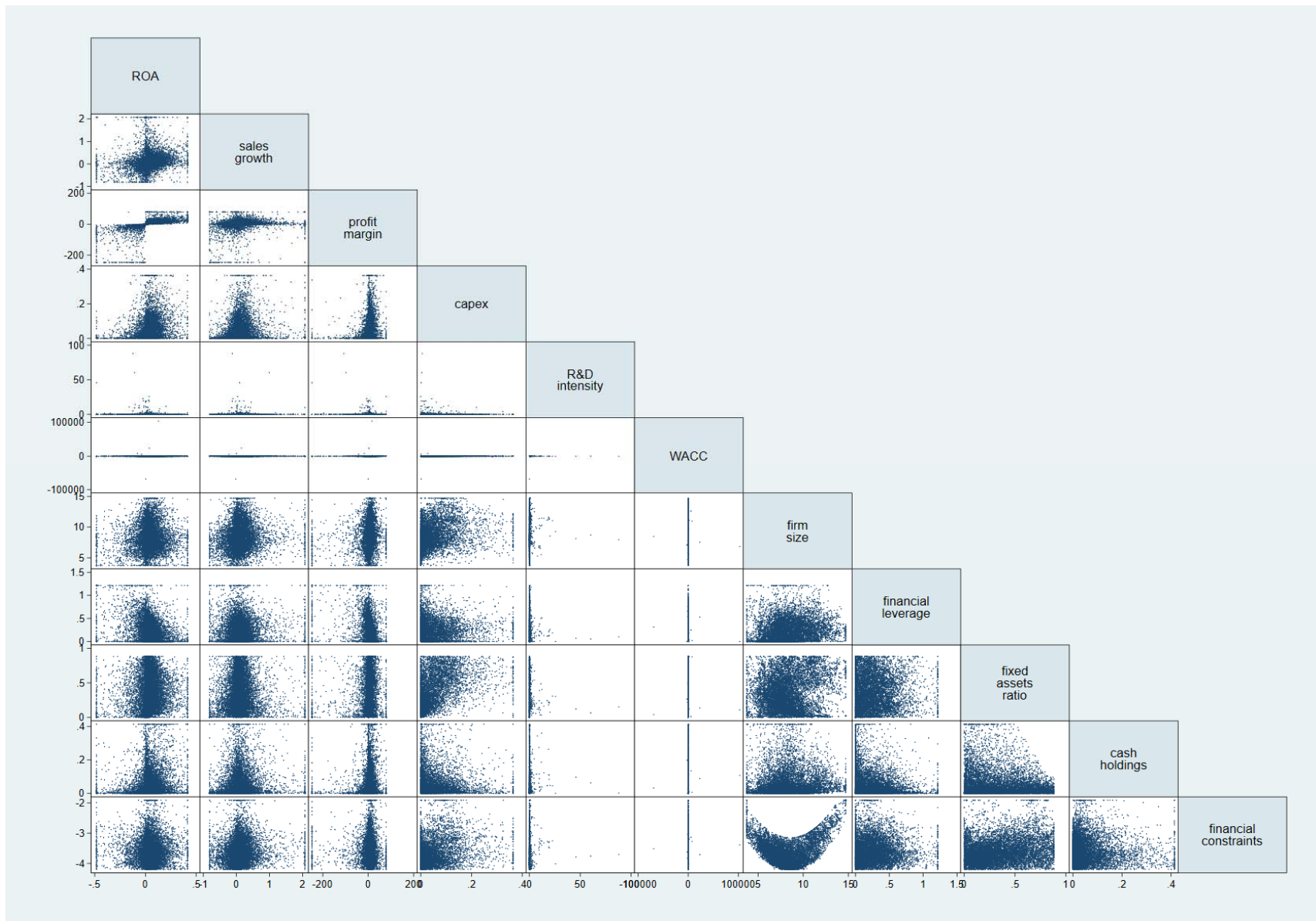
Appendix. Comparison of Ahn and Ludema (2020) and Our Paper

Both papers empirically investigate the impact of foreign economic sanctions on Russian firm performance, and both find a negative impact of sanctions on the performance of Russian firms. Our paper extends and complements their findings in many directions.

Ahn and Ludema (2020)	Our Paper
Various empirical exercises to inform a theoretical model	Exclusive focus on empirical estimations
Sanctions	Expanded range of sanctions
Sanctioning countries: <ol style="list-style-type: none"> 1. European countries 2. United States 	More sanctioning countries: <ol style="list-style-type: none"> 1. EU countries 2. United States 3. Australia 4. Canada 5. Montenegro, Iceland, Albania, Liechtenstein, Norway, Ukraine 6. Japan 7. New Zealand 8. Switzerland
Sample period: 2014-2016 Covers a period of declining oil prices; in 2016 there were the lowest oil prices during last decade	Much longer sample period (including pre-period): 2000-2019 We looked at a much longer sample including the 2016-2018 period when the oil prices bounced back in the period. In addition, we note that the sanctions are still ongoing.
Mechanisms: ownership and sector <ul style="list-style-type: none"> • Oil companies seek to be nationalized to obtain protection against sanctions. 	More direct mechanisms: capital investment, R&D investment, and cost of capital → The political connection between firms and Putin studied. → The exploration of mechanisms, more noticeably, the increase in political risk.

<p>Estimation strategy:</p> <p>Most estimations are based on a dummy variable equals one when a firm faces any of our three categories of targeted sanctions by either U.S. or EU authorities (or both).</p> <p>They compare Russian domestic firms and international firms.</p>	<p>More complete estimation strategy:</p> <p>We study firm performance controlling for many firm characteristics. We employ a wide range of PSM, DiD, and dynamic DiD as further robust checks with longer horizons to explore if the number of sanctions may affect Russian firms.</p> <p>We focus on the local Russian firms listed on the stock exchange only.</p>
<p>They focus on the impact of foreign smart sanctions, i.e., trade sanctions imposed on specific Russian firms such as military firms, or firms having products as high priority from government perspectives</p>	<p>We focus on the overall impact of foreign economic sanctions, and distinguish further between financial, trade, travel, and other sanctions.</p> <p>→ Difference in types of sanctions studied. → Spillover of foreign sanctions on general firms' performance.</p>
<p>Sample: cross-country, however, focusing on Russian firms as the treated group, then evaluate the impact on strategic firms versus non-strategic firms. Strategic firms of Russia include arm manufacturers, certain banks, and certain other firms. Most of the strategic firms are firms that the Russian government would rather nationalize than do without. So, because of the sanctions there may be bailouts and subsidy support packages from the government to those firms.</p>	<p>Sample: single country, focusing on non-energy firms as the treated group in the DiD analysis, and energy firms as the treated groups in the robustness test.</p> <p>→ Difference in treatment effect.</p>

Appendix Figure 1. Correlation matrix



Appendix Table 1. Variable descriptions

Variable names	Variable definitions	Units	Data sources
Dependent variable			
ROA	Return-on-assets ratio	%	Bloomberg
Sales growth	Changes in total sales scaled by preceeding years' total sales	%	Bloomberg
Profit margin	Net profit scaled by total revenues	%	Bloomberg
Capex	Capital expenditure scaled by beginning balance of total assets	%	Bloomberg
R&D intensity	R&D expenditure scaled by net sales	%	Bloomberg
WACC	Weighted average cost of capital	%	Bloomberg
Firm-level political risk	Mean of quarterly firm-level political risk (trade-related topics) measure scaled by 1000	-	www.firmlevelrisk.com; Hassan et al. (2019)
ΔInventories	changes in inventories scaled by the beginning balance of inventories	%	Bloomberg
Repurchases	Number of share repurchased scaled by number of share outstanding	%	Bloomberg
Russia's import	Russia's import by country in billion USD	%	COMTRADE
Explanatory variable			
Sanctions	Number of foreign sanctions placed on Russia during the year	-	Felbermayr et al. (2020); Kirilakha et al. (2021)
Import-weighted sanctions	We weight each sanction with Russia's import from the sanctioning nation scaled by total import of Russia during the year of sanction. We then taking the sum of all weighted sanctions for each year and multiply it by 100	-	Felbermayr et al. (2020); Kirilakha et al. (2021); UN COMTRADE
Export-weighted sanctions	We weight each sanction with Russia's export to the sanctioning nation scaled by total export of Russia during the year of sanction. We then taking the sum of all weighted sanctions for each year and multiply it by 100	-	Felbermayr et al. (2020); Kirilakha et al. (2021); UN COMTRADE
Financial sanctions	The portion of foreign financial sanctions in total sanctions placed on Russia during the year	%	Felbermayr et al. (2020); Kirilakha et al. (2021)
Trade (export) sanctions	The portion of export sanctions in total sanctions placed on Russia during the year	%	Felbermayr et al. (2020); Kirilakha et al. (2021)
Trade (import) sanctions	The portion of import sanctions in total sanctions placed on Russia during the year	%	Felbermayr et al. (2020); Kirilakha et al. (2021)
Travel sanctions	The portion of travel sanctions in total sanctions placed on Russia during the year	%	Felbermayr et al. (2020); Kirilakha et al. (2021)
Post event	Dummy variable that equals one if the year is from 2014 onwards, zero otherwise	1/0	
Treated	Dummy variable that equals one if the firm is a non-energy firm, zero otherwise	1/0	Bloomberg
Energy	Dummy variable that equals one if the firm is an energy firm, zero otherwise	1/0	Bloomberg
Oligarchs	Dummy variable that equal one if the firm has connections to Russia oligarchs in the CNN "Putin list", zero otherwise.	1/0	
Sanctions (policy changes)	Number of foreign sanctions imposed on Russia solely because of policy changes but not the geopolitical conflicts	-	Felbermayr et al. (2020); Kirilakha et al. (2021)
Sanctions (geopolitical conflicts)	Number of foreign sanctions imposed on Russia solely because of geopolitical conflicts (to end wars in which Russia involves)	-	Felbermayr et al. (2020); Kirilakha et al. (2021)
Pre-Crimea (2011-2013)	Dummy variable that equals one if the year is from 2011 to 2013, zero otherwise	1/0	
Pre-Crimea (2012-2013)	Dummy variable that equals one if the year is from 2012 to 2013, zero otherwise	1/0	
Pre-Crimea (2013)	Dummy variable that equals one if the year is 2013, zero otherwise	1/0	
EU exporter	Dummy variable that equals one if the country exporting to Russian is from EU, zero otherwise	1/0	COMTRADE
Distance	Distance from the city where the firm's headquarter locates to Moscow	km	Bloomberg and Google Maps
Western origin	Dummy variable that equals one if the firm's parent firm has a Western origin (European countries, United States or its Western allies), zero otherwise	1/0	Bloomberg
Foreign origin	Dummy variable that equals one if the firm's parent firm has a foreign origin, zero otherwise	1/0	Bloomberg
Geopolitical risk	The annual mean of the monthly geopolitical risk index during the year	-	www.policyuncertainty.com; Caldara and Iacoviello (2021)
Controls			
Firm size	Natural logarithm of total assets	US\$	Bloomberg
Financial leverage	Debt-to-assets ratio	%	Bloomberg
Fixed assets	PPE to total assets ratio	%	Bloomberg
Cash holding	Cash and cash equivalents scaled by total assets	%	Bloomberg
Financial constraints	SA (Size-Age) index	-	Bloomberg; Hadlock and Pierce (2010)
Economic Policy Uncertainty of Russia	The annual mean of economic policy uncertainty index of Russia	-	www.policyuncertainty.com; Baker et al. (2016)
GDP growth	GDP growth rate	%	World Bank
Inflation	Consumer price index	%	World Bank
Crude oil price	Average crude oil price during the year	US\$	Macro trends

Definition of variable used in the wealth analysis

Wealth growth	Changes in total assets of the individual scaled by previous year's total assets	%	Grigoriev and Zhirkov (2020)
Federal executive formal	Dummy variable that equals one if the individual has a formal connection with a federal executive, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Federal executive past	Dummy variable that equals one if the individual used to have a connection with a federal executive, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Federal executive informal	Dummy variable that equals one if the individual has an informal connection with a federal executive, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Federal legislature formal	Dummy variable that equals one if the individual has a formal connection with a federal legislature, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Federal legislature informal	Dummy variable that equals one if the individual has an informal connection with a federal legislature, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Regional executive formal	Dummy variable that equals one if the individual has a formal connection with a regional executive, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Regional executive informal	Dummy variable that equals one if the individual has an informal connection with a regional executive, zero otherwise	1/0	Grigoriev and Zhirkov (2020)
Regional legislature formal	Dummy variable that equals one if the individual has a formal connection with a regional legislature, zero otherwise	1/0	Grigoriev and Zhirkov (2020)

Appendix Table 2a. Descriptive statistics of firm-level variables

Variable	Obs	Mean	p50	Std. Dev.	Min	Max
ROA	9,157	3.691	2.784	11.622	-48.183	41.405
Sales growth	7,949	12.163	7.729	38.543	-77.832	207.196
Profit margin	9,090	1.061	3.264	33.954	-247.354	78.952
ΔInventories	7,534	-0.002	-0.001	0.060	-0.621	0.498
Repurchases	4,302	0.003	0.000	0.023	0.000	0.712
Firm size	9,157	8.256	7.990	2.130	3.749	14.701
Financial leverage	8,773	0.230	0.165	0.248	0.000	1.214
Fixed assets	9,068	0.359	0.323	0.245	0.001	0.882
Cash holdings	9,132	0.054	0.023	0.078	0.000	0.414
Financial constraints	8,991	-3.587	-3.657	0.413	-4.196	-1.913
Capex	5,787	5.620	3.121	6.856	0.000	36.359
R&D intensity	4,273	0.188	0.000	2.105	0.000	87.946
WACC	8,740	10.464	9.725	5.231	-1.645	26.683
Treated	9,157	0.242	0.000	0.428	0.000	1.000
Firm-level political risk	251	119.621	87.649	132.089	0.000	1,009.530
Distance	7,964	1,329.280	733.000	1,756.313	0.000	10,031.000
Western origin	9,157	0.082	0.000	0.274	0.000	1.000
Foreign origin	9,157	0.089	0.000	0.285	0.000	1.000

Descriptive statistics of annual macro-level variables from 2000 to 2019

Variable	Obs	Mean	p50	Std. Dev.	Min	Max
Sanctions	20	17.594	1.000	19.616	0.000	40.000
Import-weighted sanctions	18	17.581	0.075	25.559	0.000	56.367
Export-weighted sanctions	18	15.587	0.016	22.709	0.000	51.213
Financial sanctions	20	0.444	0.000	0.487	0.000	1.000
Trade (export) sanctions	20	0.360	0.000	0.480	0.000	1.000
Trade (import) sanctions	20	0.434	0.000	0.496	0.000	1.000
Travel sanctions	20	0.412	0.000	0.471	0.000	0.950
Sanctions (policy changes)	20	0.733	1.000	0.458	0.000	1.000
Sanctions (geopolitical conflicts)	20	0.400	0.000	0.507	0.000	1.000
Geopolitical risk	20	0.670	0.572	0.242	0.386	1.142
Economic Policy Uncertainty of Russia	20	161.386	169.250	58.971	56.333	284.083
GDP growth	20	2.523	2.033	3.899	-7.800	10.000
Inflation	20	8.455	7.823	3.842	2.878	21.477

Descriptive statistics of variables used in the Russian rich people's wealth analysis

Variable	Obs	Mean	p50	Std. Dev.	Min	Max
Wealth growth	2,542	0.811	0.300	2.518	-0.992	58.286
Federal executive formal	3,689	0.002	0.000	0.049	0.000	1.000
Federal executive past	3,689	0.025	0.000	0.155	0.000	1.000
Federal executive informal	3,689	0.010	0.000	0.101	0.000	1.000
Federal legislature formal	3,689	0.072	0.000	0.258	0.000	1.000
Federal legislature informal	3,689	0.004	0.000	0.066	0.000	1.000
Regional executive formal	3,689	0.011	0.000	0.106	0.000	1.000
Regional executive informal	3,689	0.016	0.000	0.125	0.000	1.000
Regional legislature formal	3,689	0.033	0.000	0.177	0.000	1.000

Appendix Table 2b. Pairwise correlation matrix of variables in the baseline model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ROA	1.000									
(2) Sanctions	-0.115***	1.000								
(3) Firm size	0.049***	0.114***	1.000							
(4) Financial leverage	-0.311***	0.068***	0.149***	1.000						
(5) Fixed assets	0.076***	-0.082***	0.166***	0.044***	1.000					
(6) Cash holdings	0.156***	0.064***	0.062***	-0.192***	-0.202***	1.000				
(7) Financial constraints	0.027**	-0.334***	0.179***	0.038***	0.184***	-0.005	1.000			
(8) GDP growth	0.127***	-0.381***	-0.044***	-0.035***	0.055***	-0.019*	0.182***	1.000		
(9) Inflation	0.044***	-0.304***	-0.063***	-0.036***	0.070***	-0.034	0.243***	-0.123***	1.000	
(10) Crude oil price	-0.011	-0.435***	-0.050***	-0.003	-0.022**	-0.016	0.040***	0.243***	-0.093***	1.000

This table presents the pairwise correlation matrix of variables used in the baseline model. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Appendix Table 3. Policy sanctions versus geopolitical sanctions

VARIABLES	(1) ROA	(2) ROA
Sanctions (policy changes)	-0.088*** (0.018)	
Sanctions (geopolitical conflicts)		-1.269* (0.629)
Firm size	1.979*** (0.387)	1.599*** (0.352)
Financial leverage	-15.439*** (1.503)	-15.989*** (1.606)
Fixed assets	-5.201*** (1.415)	-4.851*** (1.427)
Cash holdings	15.112*** (2.534)	14.269*** (2.484)
Financial constraints	-1.226 (1.435)	1.756 (1.875)
GDP growth	0.353*** (0.073)	0.324** (0.150)
Inflation	0.126** (0.060)	0.164 (0.100)
Crude oil price	-0.047*** (0.014)	-0.016 (0.012)
Constant	-9.754 (7.363)	1.094 (9.080)
Firm FE	Yes	Yes
S.E. clustered by year	Yes	Yes
Observations	8,486	8,486
Adjusted R-squared	0.397	0.390

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 4. Does firm origin matter?

VARIABLES	(1) ROA	(2) ROA
Sanctions x Western origin	-0.031 (0.035)	
Western origin	1.220 (0.863)	
Sanctions x Foreign origin		-0.023 (0.033)
Foreign origin		0.960 (0.802)
Sanctions	-0.044*** (0.013)	-0.045*** (0.013)
Firm size	0.524* (0.279)	0.524* (0.279)
Financial leverage	-13.786*** (2.177)	-13.786*** (2.175)
Fixed assets	1.349 (1.141)	1.355 (1.143)
Cash holdings	20.162*** (3.173)	20.125*** (3.191)
Financial constraints	-0.952 (0.962)	-0.951 (0.964)
GDP growth	0.342*** (0.057)	0.342*** (0.057)
Inflation	-0.078* (0.042)	-0.078* (0.042)
Crude oil price	-0.042*** (0.014)	-0.042*** (0.014)
Constant	-1.410 (6.827)	-1.343 (6.837)
Firm FE	Yes	Yes
S.E. clustered by year	Yes	Yes
Observations	8,513	8,513
Adjusted R-squared	0.236	0.236

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 5. Geographical difference analysis

VARIABLES	(1) ROA
Sanctions x Distance	0.000 (0.000)
Distance	0.001 (0.005)
Sanctions	-0.094*** (0.019)
Firm size	2.017*** (0.407)
Financial leverage	-15.828*** (1.626)
Fixed assets	-5.209*** (1.413)
Cash holdings	14.678*** (2.819)
Financial constraints	-0.746 (1.490)
GDP growth	0.330*** (0.082)
Inflation	0.107 (0.067)
Crude oil price	-0.047*** (0.014)
Constant	-15.243* (8.143)
Firm FE	Yes
S.E. clustered by year	Yes
Observations	7,383
Adjusted R-squared	0.392

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 6. The dynamic DID estimation results

VARIABLES	(1) ROA
2008	1.604 (1.629)
2009	-1.271 (1.109)
2010	0.064 (0.753)
2011	2.377* (1.266)
2012	0.934 (0.763)
2014	-0.472 (1.700)
2015	-1.455 (1.150)
2016	-1.117 (1.546)
2017	-1.795 (1.377)
2018	0.798 (1.120)
Firm size	-0.578 (0.484)
Financial leverage	-20.466*** (2.220)
Fixed assets	-1.459 (3.002)
Cash holdings	18.886*** (5.491)
Financial constraints	2.016 (1.965)
Constant	21.847** (9.827)
Firm FE	Yes
Observations	2,265
Adjusted R-squared	0.345

The table reports regression estimates of the indicated dependent variable on sanction measures and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 7. Differences between firms with connections to Russian oligarchs and energy firms compared to other firms

Panel A. Firms with connection to Russian oligarchs versus other firms

Variable	Firms with connections to Russian oligarchs		Other firms	Difference
		(1)	(2)	(3) = (1) - (2)
Firm size	value	11.689	8.128	3.561***
	t-statistic			(31.377)
Financial leverage	value	0.260	0.293	-0.033***
	t-statistic			(-2.387)
Fixed assets	value	0.541	0.352	0.189***
	t-statistic			(13.883)
Cash holdings	value	0.063	0.054	0.009**
	t-statistic			(2.152)
Financial constraints	value	-3.030	-3.608	0.578***
	t-statistic			(25.871)

Panel B. Energy firms versus other firms

Variable	Energy firms		Other firms	Difference
		(1)	(2)	(3) = (1) - (2)
Firm size	value	11.482	9.669	1.813***
	t-statistic			(15.650)
Financial leverage	value	0.261	0.293	-0.032***
	t-statistic			(-2.387)
Fixed assets	value	0.514	0.436	0.078***
	t-statistic			(5.307)
Cash holdings	value	0.049	0.057	-0.008**
	t-statistic			(-1.915)
Financial constraints	value	-3.064	-3.419	0.355***
	t-statistic			(13.360)

This table presents the mean-difference test results between indicated firm groups using the full sample. All variables are defined in Appendix Table 1. t-statistics are listed in parentheses below the mean differences. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 8. Russian firms cash holdings right before the Crimea event

VARIABLES	(1) Cash holdings	(2) Cash holdings
Pre-Crimea (2013) x Energy	0.007 (0.012)	
Energy	-0.007 (0.012)	
Pre-Crimea (2013) x Oligarchs		-0.007 (0.013)
Oligarchs		0.013 (0.013)
Pre-Crimea (2013)	-0.009* (0.005)	-0.007 (0.005)
Firm size	0.001 (0.001)	0.000 (0.001)
Financial leverage	-0.027*** (0.007)	-0.027*** (0.007)
Fixed assets	-0.096*** (0.009)	-0.096*** (0.009)
Financial constraints	0.019*** (0.006)	0.018*** (0.006)
GDP Growth	0.000 (0.000)	0.000 (0.000)
Inflation	0.000 (0.000)	0.000 (0.000)
Crude oil price	0.000 (0.000)	0.000 (0.000)
Constant	-0.222*** (0.026)	-0.200*** (0.044)
Observations	1,588	1,588

The table reports regression estimates of the indicated dependent variable on pre-Crimea event dummy, its interaction with energy or oligarch firm dummy, and control variables. All variables are defined in Appendix Table 1. Robust standard errors are listed in parentheses below the coefficient estimates. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix Table 9. Patterns of Δ inventories and Share repurchases of Russian firms before the Ukraine war

Variable		2015-2020 (1)	2021 (2)	Difference (3) = (2) - (1)
Δ Inventories (all firms)	value	0.016	0.189	0.173***
	t-statistic			(5.595)
Δ Inventories (energy firms)	value	0.004	0.248	0.244**
	t-statistic			(6.050)
Δ Inventories (oligarch firms)	value	0.004	0.334	0.330***
	t-statistic			(9,842)
Share repurchases (all firms)	value	0.002	0.007	0.005
	t-statistic			(0.829)
Share repurchases (energy firms)	value	0.031	0.105	0.074
	t-statistic			(0.852)
Share repurchases (oligarch firms)	value	0.045	0.102	0.057
	t-statistic			(0.695)

This table presents the mean-difference test results of Δ inventories and Share repurchases across different firm groups and periods. All variables are defined in Appendix Table 1. t-statistics are listed in parentheses below the mean differences. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$