The Impact of Foreign Sanctions on Firm Performance in Russia

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January 9, 2023

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We thank Guido Friebel, Tony Klein, Nikolaos Antonios Kalyvas, Mikhail Mamonov, Tapas Mishra, Duc Duy (Louis) Nguyen, Harvey Nguyen, Anna Pestova, Hieu Phan, Trung Vu, and Thomas Walther, as well as seminar participants at University of Southampton, Queen's University Belfast, and University of Aberdeen for helpful comments. We thank Duy Duong and Trung Thong Nguyen for excellent research assistance.

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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. There 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 measures 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 re-assurance (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:

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

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:

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

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

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, $F_{after}(6, 2086) = 0.75$ ($p > 0.1$), 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.

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