The Response of Russian Security Prices to Economic Sanctions: Policy Effectiveness and Transmission

Mark Stone
Stone International Economics

Formerly, Deputy Chief Economist
U.S. Department of State

U.S. Department of State
Office of the Chief Economist
Working Paper 2017-02

About OCE:

The Office of the Chief Economist (OCE) was created in 2011 as an essential tool for advancing economic statecraft as a U.S. foreign policy priority. Our work supports the Department of State's capacity and resources to engage effectively with our partners in a world where economic factors are central to diplomacy. The Chief Economist reports to the Secretary of State through the Under Secretary for Economic Growth, Energy, and the Environment.

Our mission in OCE has three parts: strategic advice, capacity building and outreach. Our primary role is to provide expert analysis and timely advice to the Secretary and other senior leaders across the Department. OCE monitors and explains current economic and financial trends in key countries and regions. We both analyze contemporaneous, high-priority issues where economics and foreign policy intersect and engage in deeper research into longer term global economic trends.

Contact OCE at: OCE@state.gov

The Response of Russian Security Prices to Economic Sanctions: Policy Effectiveness and Transmission[1]

This paper uses a wide array of securities prices as an empirical window into the economic impact of the recent U.S. and EU sanctions on Russia. Relatively little is understood about how modern economic sanctions work, notwithstanding their expanding use in an integrating global economy. The empirical results here show that the arrival of information on sanctions generally decreases the returns on and increases the variance of Russian securities returns. Further, the consequences of sanctions are uncertain based on the similar impacts of sanction announcements on the returns of values of targeted and non-targeted firms within sanctioned sectors. Overall, sanctions can be deemed effective in imposing a clear-cut economic cost on Russia and they appear to transmit to the economy through at least three channels: by lowering expected profits of companies in sanctioned sectors, by boosting uncertainty, and through a negative wealth effect.

[1] Adam Deutsch provided excellent research assistance and Sarah Mattson initiated the work on domestic equities while serving as a summer intern in the Office of the Chief Economist. Rodney Ludema and Anna Maria Mayda provided helpful comments.

I. Introduction

Economic sanctions are fast becoming a standard foreign policy tool. They are used by a sender country or countries to change the geopolitical decision-making of the government of a target country. Recent perceived successes in the context of global economic integration, for example in the case of Iran, have ramped up the use of sanctions in recent years.[2] The United States alone introduced or altered 22 different sanctions programs during 2014 and 2015.[3]

The application of sanctions to Russia brought this tool into new territory. In 2014, sectoral sanctions were applied against Russia by the United States, European Union (EU) and other countries for its actions in Crimea and Ukraine. Russia is by far the largest and most globally integrated country to be subject to sanctions.[4] Russia is a leading energy exporter as well as a nuclear power and the targeted companies are some of the largest in the world. The United States and EU have committed to keeping sanctions in place until Russia complies with the Minsk Agreements and ensures a peaceful settlement of the conflict in Ukraine.[5]

Little is clear on the economic impact of Russia sanctions other than that they seem to have had a meaningful effect on the economy via direct and indirect channels. Sanctions can be seen as imposing economic costs on Russia directly by limiting the provision of credit and energy technology to sanctioned companies, and indirectly by injecting a new source of uncertainty into the long-term decision-making of consumers, companies and the government.

This leaves open important conceptual and empirical questions on Russia sanctions. Little empirical analysis of Russia sanctions has been undertaken, reflecting the lack of a conceptual framework of how sectoral sanctions work in a modern economy, the need to control for the decline in global oil prices that coincided with the advent of the sanctions regime, and the uncertainties that set sanctions apart from other policy shocks. These uncertainties include the unknown duration of sanctions, the possibility of a future round of sanctions, or of countersanctions by the target country, and the largely geopolitical considerations that can drive the decisions of sender and target countries. Further, just how economic sanctions transmit through a large globally integrated economy such as Russia is not well understood.

This paper aims to shed light on these questions by employing the rich tableau of Russia security prices as an empirical window into the economic impact of sanctions. The

---

[2] Recent reviews of sanctions include Drezner, 2015; Blackwill and Harris, 2016; Rosenberg and others, 2016.

[3] http://www.treasury.gov/resource-center/sanctions/Programs/Pages/Programs.aspx. The multilateral financial and energy sanctions on Iran that were followed by the July 2015 agreement to limit its nuclear capabilities can be cited as a potential success.

[4] Russia's GDP is 2½ times that of the combined GDP of the other 15 countries subject to U.S. sanctions. The United States, EU, Canada, Norway and Australia accounted for over half of Russia's trade and three-quarters of its FDI in 2013.

[5] https://www.treasury.gov/press-center/press-releases/Pages/jl0314.aspx.

Russian government and companies have issued a wide array of securities traded by global and domestic investors on liquid secondary markets. The sanctioned companies, by design, are large and important with domestic equity market capitalization equivalent to 20 percent of 2013 GDP. The securities price data allow discrimination between the immediate hit of sanctions on the values of targeted and non-targeted companies and between the responses of domestic and foreign investors. Moreover, daily data provides for the control of the decline in the global price of oil that coincided with the imposition of sanctions.

The well-established relationship between securities prices and future aggregate growth means that Russian securities prices can provide helpful insights into the macroeconomic repercussions of sanctions (Fama, 1990 and Mauro, 2003). Equity and other security prices embody the expected present discounted value of the issuer's profit stream. Thus, changes in these prices in response to the arrival of information on sanctions captures investor expectations of how sanctions will hit the profits of the issuer directly by impacting the targeted company itself, and indirectly via economic channels. According to Mauro (2003), the correlation between equity prices and growth is closer for highly capitalized markets like Russia.

This approach sheds light on two of the important open questions on sanctions. First, have sanctions imposed a clear-cut economic cost on the Russian economy; that is, are they effective? Second, what can we learn about how sectoral sanctions transmit to the Russian economy that can help get a handle on their quantitative impact and guide the formulation of theoretical models? This paper does not aim to address the broader question of how the economic consequences of sanctions shape the geopolitical decision-making of the Russia government. The economic toll of sanctions and their potential political and social implications for Russia do make it easy to imagine that the government would have been more aggressive under the counterfactual of no sanctions. However, the many dimensions of the Russia government's adherence to international norms and commitments are beyond the scope of this analysis.

A look at the yield of Russia's most liquid sovereign bond over those of an average of comparable emerging market economy (EME) oil exporters during 2014 suggests that sanctions indeed had an impact (Chart 1). Investor valuation of Russian securities fell substantially from early March to end-April, then recovered considerably through early July. Financial market participants interviewed by the author said that during May and June investors did not expect sanctions to persevere because "sanctions are not in the interest of the involved countries." However, investor perceptions were shifted for the worse by the beginning of the decline in the price of oil in late June and July, the gathering talk of new sanctions early in July, the downing of Malaysia Airlines flight 117, and the enactment of new sanctions and countersanctions from mid-July to early September. By October, the Russia spread was considerably higher than before the invasion of Crimea.

The general autoregressive conditional heteroscedasticity (GARCH) estimator used here is well suited for analyzing the impact of sanctions on Russian security returns. The

GARCH estimator parameterizes the serial correlation in disturbances (clustering) that is a typical trait of securities prices. This feature is probably even more important for analyzing Russian security returns in 2014 owing to the uncertainties associated with the new sanctions and oil price regimes.

The empirical results of this paper confirm that the arrival of information on sanctions is often associated with a decrease in the returns on, and an increase in the variance of, Russian securities returns. Investors seemed to discriminate between firms in sanctioned and non-sanctioned sectors, but did not fully differentiate between firms within a given sanctioned sector. This suggests either that investors don't expect sanctions to have a qualitatively different impact on targeted versus non-targeted firms – perhaps due to uncertainty over whether future events would warrant the expansion of sanctions to all firms in the targeted sector– or that investors have a hard time distinguishing between the two groups, possibly because of complex economic and financial relationships between targeted and non-targeted firms. Sanctions events also seemed to hit the equity returns of domestic investors harder than those of foreign investors. Finally, Russia's countersanctions barely impacted security prices and so seemed to pose a limited economic cost for Russia.

Two broad implications emerge from the empirical results. First, the adverse impact of sanctions on security values implies that they can be deemed *effective* in imposing a clear cut economic cost. Drilling down, the results shed light on how sanctions on Russia *transmit* to the economy through at least three channels: by lowering expected profits of companies in sanctioned sectors, by boosting uncertainty, and through a negative wealth effect which reduces consumption and investment.

The structure of this paper is as follows. The next section reviews the sanctions literature, Russia sanctions are described in section III, and section IV lays out the empirical methodology. Section V provides the empirical results and section VI concludes.

II. Literature Review

The banning of the citizens of the Greek city of Megara from the marketplaces of Athens by the Athenian leader Pericles around 432 BC is widely cited as the first use of economic sanctions (Hufbauer, 2003). More recently, during the Cold War, the Soviet Union and the United States and its allies employed sanctions to apparently mixed effect. The recent sanctions on Russia reflect recent refinements that seemed to have enhanced their effectiveness.

The theoretical work on the effectiveness of sanctions draws heavily from game and public choice theories. According to the two-party model of Eaton and Engers (1992), the effectiveness of sanctions depends on the relative toughness of the sender and target, which, in turn, follows from their patience and the extent of their suffering from sanctions. The relative economic impact of Russia sanctions and countersanctions has certainly been an important focus (DeGalbert, 2015). The multilateral approach of Martin (1993) stresses the importance of a credibly committed lead sender country,

which seems relevant for the Russia case. Kaempfer and Lowenberg (1988) take a public goods approach that focusses on interest groups within sender and target countries to highlight the importance of the consequences of sanctions for key government-supporting interest groups. The targeting of companies with connections to the Russian government seemed to incorporate this insight.

Most empirical analyses of sanctions are from the political science literature and are either broad cross-country studies or assessments of the social or political impact of sanctions on individual countries. Before 1985, the sanctions literature focused on case studies of high-profile embargoes. The proliferation of post-Cold War sanctions cases prompted the application of more sophisticated theoretical and empirical tools (Baldwin, 1985; Hufbauer, Schott, and Elliott, 1990). This literature tends to conclude that sanctions have mixed results. Aspects of the target country that enhanced the effectiveness of sanctions tended to be the focus of research, as opposed to the transmission and design of sanctions measures. The secondary effects of sanctions on corruption and human rights have been the subject of considerable analysis in the past 10 years (Drezner, 2011). Notably, sanctions on Iraq, Haiti and countries of the former Yugoslavia were seen as imposing a high cost on the civilian population (including via corruption), did not change government behavior, and led to criticism of the United States and the United Nations (UN). The empirical analysis of recent country cases by Rosenberg et al (2016) suggests that sanctions impact the foreign investment, corruption, ease of doing business, governance, and international engagement of target countries.

The collateral damage of sanctions led to a consensus within the United States and UN on the need for better designed sanctions, sometimes termed as "smart." According to Dashti-Gibson et al (1997), financial sanctions are more likely to impact the policy-making elite of the target country and thus are more effective than other sanctions tools.[6] Kirshner (1997) emphasized the differential impact of sanctions on different interest groups and concluded that financial sanctions were more effective than trade sanctions. Smart sanctions also seem to gain the government of the sender country more domestic political support by "doing something." Drezner (2015) argues that smart sanctions have improved target state compliance and lowered humanitarian costs.

The case of Iran may serve as a potentially successful refinement of multilateral financial and energy sectoral sanctions. A large coalition of governments imposed broad sanctions on Iran for reasons related to nuclear activities, support for terrorism, and human rights abuses. These sanctions included restrictions of the sales of energy-related products to Iran, limits on banking and other financial services and transactions, including exclusion from the SWIFT international messaging platform used for payments, and a freeze on Iranian access to a large share of its foreign financial assets.[7] The July 2015 agreement between the P5+1 group of source countries and Iran allows for the removal of most economic sanctions in exchange for limits on Iran's nuclear activities. The binding limits

[6] See Eckert (2008), Loeffler (2009) and Torbat (2005) for assessments of earlier uses of financial sanctions.
[7] https://www.treasury.gov/resource-center/sanctions/Programs/pages/iran.aspx.

imposed on Iran's oil exports and its effective exclusion from the international payment system have had important economic consequences.[8]

Notably absent from the literature on sanctions is empirical analysis of the channels of economic transmission through which sanctions work. One possible reason is that, while the overall geopolitical objective of a sanctions policy is usually clear, sanctions policies rarely specify the intermediate targets connecting the policy instrument and final objective. This is in contrast to monetary, fiscal and regulatory policies.[9] Another possible reason for the paucity of analysis of economic transmission is the concentration of sanctions on less sophisticated economies with limited data, such as less-developed African countries, North Korea, and Myanmar (Burma).

Likewise, the economic impact of the 2014 sanctions on Russia has been subject to little analysis. According to IMF estimates, apparently based on a generic macroeconomic model, sanctions and counter-sanctions could initially reduce Russia's real GDP by 1 to 1.5 percent via weaker investment and consumption, while prolonged sanctions could reduce output over the medium term by 9 percent of GDP. The World Bank assessed that sanctions and counter sanctions hurt the Russian economy by inducing capital outflows and depreciation, excluding sanctioned companies from global credit markets, and further reducing private sector confidence, thereby lowering consumption and investment.[10] Dreger et al (2015) applied a co-integrated VAR model to daily oil price and exchange rate data and a sanctions news index to conclude that the large depreciation during 2014 was driven primarily by declining oil prices, but that unanticipated sanctions matter for the conditional volatility of the exchange rate. The application of standard macroeconomic models to Russia is further limited by the short amount of time that has passed since sanctions were introduced, as well as challenges in embedding geopolitical considerations into these models.[11] This paper appears to be the first comprehensive empirical assessment of both the sanctions against Russia and of modern financial and energy sectoral sanctions.

Considerable research has shown that securities prices are correlated with future economic growth (Fama, 1990; Schwert, 1990, and Mauro, 2003). This is not surprising since security prices capture the expected present discounted value of the issuer's profit stream, implying that price changes will reflect the arrival of new information on economic developments and their impact on company profits. Mauro (2003) concluded that the empirical relationship between equity prices and growth is closer for highly capitalized markets like Russia.

---

[8] https://www.imf.org/external/pubs/ft/reo/2015/mcd/eng/pdf/mreo1015ch5.pdf.

[9] Tinbergen (1952) is the classic reference on the elements of an economic policy framework. Rosenberg et al (2016) stress the lack of sanctions policy framework and limited analysis of the economic impact of sanctions. Gianella et al (2015) discuss some elements of a sanctions policy framework.

[10] See http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/04/12/000333037_20150413141814/Rendered/PDF/956970NWP00PUB0B0WB0RER0No0330FINAL.pdf.

[11] The results of the reduced form VAR for Russia estimated by Tuzovaa and Qayumb (2016) do not seem plausible: a continuation of sanctions during 2015-17 more than halves real GDP and the level of aggregate investment turns negative. These results are far afield from those of other analyses.

III. Russia sanctions

This section provides an overview of the Russia sanctions and describes the two gauges of sanctions used in the empirical work.

Russia Sanctions Overview

Sanctions were prompted by Russia's purported annexation of Crimea and escalating intervention in eastern Ukraine early in 2014 (Table 1). The Saturday, March 1 Duma vote approving a request from President Putin to send a military force to Ukraine marked a key escalation. These actions represented the first time since World War II that one European country used military force to take territory from another. The first sanctions move of the United States was to freeze the assets of Russian government backers of separatists in Crimea on March 6. On March 17, in the context of increased violence in eastern Ukraine, seven Russian officials were targeted. A legal framework for broader action was approved on March 17. On March 20, the United States imposed asset freezes on another 16 Russian government officials and a small Russian bank controlled by Kremlin insiders. Also on March 20, President Obama signed an Executive Order giving the Treasury Department authority to sanction the Russian energy, banking, mining, and other sectors. The United States designated more individuals on March 27, April 11, April 28 and June 20 and the EU introduced sanctions on individuals on April 15, May 12 and June 23.

Sectoral sanctions were introduced in response to the stepping up of Russia-sponsored military activities in Ukraine (Harrell, 2015).[12] The goal was generally articulated as imposing an economic or financial cost on Russia for its actions with respect to Ukraine.[13] The United States introduced financial sanctions on July 16. These sanctions prohibited the provision of new equity or debt of more than 90 days' duration to two Russian banks and prohibited the provision of new debt of more than 90 days' duration to two Russian energy companies (a third was added on July 30). On July 30, the EU prohibited European financial institutions from providing new transferable (equity or bond debt) and money market instruments of more than 90 days' duration to five Russian banks. On September 12, the United States and EU shortened the duration of prohibited

[12] The term "sectoral" denotes the sanctions instrument rather than the institutional target of the sanctions. The prohibition of the issuance of debt and equity to Russian entities is thus labeled as a financial sanction, even if the prohibition applies to both financial and energy companies. "Energy sanctions" refers to the prohibition of energy-related technology and services.

[13] The U.S. Treasury statement accompanying the July 16 sanctions included the following: "By imposing sanctions on entities within the financial services and energy sectors, Treasury has increased the *cost of economic isolation* for key Russian firms that value their access to medium- and long-term U.S. sources of financing." https://www.treasury.gov/press-center/press-releases/Pages/jl2572.aspx. The accompanying statement issued by President Obama on September 11, included the following: "These measures will increase Russia's political isolation as well as the *economic costs* to Russia, especially in areas of importance to President Putin and those close to him." According to Gianella et al (2015), EU sanctions policy against Russia "has a clearly defined economic goal: increasing the *cost of capital* for Russia's leading public banks." The emphasis is added in these quotes. See also de Galbert, (2015).

financial instruments from 90 to 30 days, and several banks were added, including Sberbank, by the United States.[14]

Energy sanctions were implemented on July 30 when the United States and EU prohibited the export of certain high-end technology used for Arctic, deep-water, and shale oil development to Russia. The United States announced the intention to enact this prohibition and designated five Russian energy companies on September 12. The EU sanctions are more general and apply to any Russian entity. Also on September 12, the EU and the United States announced bans on the provision of services to projects in the Russian unconventional energy sector.

U.S. and EU companies have said that the design and implementation of sectoral sanctions have led them to err on the side of caution and over-comply (Gianella et al 2015).[15] The setting of sanctions policies by the European Council and implementation at the national level also may have raised challenges for businesses aiming to adhere to sanctions. The lack of a sunset clause and the changes in sanctions brought on by events during 2014 also may have complicated adherence. These elements of uncertainty, and a desire by companies to minimize any "reputational risk" for potentially breaching sanctions, may have led to a conservative approach to sanctions adherence and avoidance of even legitimate business.

On August 6, Russia introduced counter-sanctions prohibiting the import of a wide range of U.S. and European foods. These included beef, pork, poultry, fish, fruit, vegetables, cheese, milk and other dairy products from the United States, Canada, the European Union, Norway and Australia. The targeted countries supplied over 40 percent of Russia's total imports of the counter-sanctioned products in 2013.

Empirical sanctions gauges

Two sets of gauges of sanctions policies are employed empirically to estimate the independent impact of sanctions. The first set comprises two indicators of the arrival of information on sanctions to investors. One is a daily time series of the number of mentions of Russia sanctions in major newspapers.[16] As shown in Chart 2, the number of news mentions peaked in March, late April, mid-July and early August, and early September. These generally correspond to the times of the announcements of sanctions

[14] Sanctions were also imposed on Russia's defense sector on July 16, July 30, August 6 and September 12, although these are seen by analysts as having a limited economic impact.

[15] According to one corporate risk consultant, "Western sanctions ask investors to step into the shoes of law enforcement to comprehensively research and review all existing business partners for potential ties to the SDNs. This is a mammoth task indeed. ("West's Sanctions Turn Investors into Investigators", The Moscow Times, April 9, 2014). The opacity of sanctions was a recurrent theme cited by banks and fund managers during conversations with the author.

[16] The news time series is the sum of the daily number of mentions of Russia sanctions in leading global newspapers. The following newspapers were surveyed: New York Times, Washington Post, Wall Street Journal, Reuters, the Guardian, the Times of London, the Moscow Times and Le Monde. The source is Dow Jones Factiva. The sanctions news measure is the number of articles per day containing Russia or Russian within 10 words of sanction, sanctions, sanctioning or sanctioned.

policies. In addition, a sanctions surprise time series constructed by Dreger et al (2015) series is used (Chart 3).[17]

The second set of sanction indicators are dummy variables corresponding to a five-day window centered on the day of key events and EU/U.S. sanctions policies announcements, as is standard in the finance event literature (MacKinlay, 1997). This approach is subject to some measurement error, as compiling the precise terms, dates and targets of sanctions policies is complicated owing to the number of implementing government agencies, legal underpinnings of different sanctions, and subtleties such as announcing imminent sanctions on a sector on one date followed by listing of the target companies at a later date.[18]

IV. Empirical methodology

The autoregressive conditional heteroscedasticity (ARCH) family of estimators is well-suited for estimating the impact of sanctions on Russian asset prices. Financial returns are typically characterized by volatility clustering, whereby large changes tend to be followed by large changes i.e. serial correlation in regression residuals. These properties could be especially important during the 2014 estimation period employed here when Russian security returns were largely driven by the long decline in oil prices and by the advent of the sanctions regime. The daily behavior of oil prices and sanctions news and announcements can themselves be viewed as serially correlated and highly uncertain to investors. The virtue of GARCH estimators is that they allow explicit modeling of not just asset returns but also of the variance of returns, which sanctions may influence and serve as a gauge of general economic uncertainty posed by sanctions.

The ARCH estimator is comprised of two equations. The first is the conditional mean equation,

$$(1)\ r_{it} = \alpha_i + \beta_{1i} m_{it} + \boldsymbol{\beta}_{2i} \mathbf{s}_{it} + \varepsilon_{it} \qquad \varepsilon_{it} \sim (0, \sigma_{it}^2)$$

[17] The sanctions surprise time series is from Dreger et al (2015). They compile a composite sanctions news index based on an aggregation of the mention of sanctions in international media (in a way similar to the index used in this paper). The index is normalized by the sum of occurrences and scaled country-specific indices are aggregated to obtain a composite news index as a simple average. The news index is interpreted as a measure of expectations about future sanctions and opinions on sanctions already in place. Expectations on sanctions are extracted from a regression of the news index on the leads of the composite sanction indices. The number of lead periods is determined by the Schwartz-Bayes information criterion. The residuals are interpreted as unanticipated sanctions.

[18] The window for the July 16 sanctions announcement overlaps with the July 17 shooting down of Malaysia Airlines Flight 117, which ultimately led to an investigation of the Russia-supported military forces in Ukraine as the perpetrators. Asset prices did generally fall on July 18 as markets digested the conflicting accounts of the crash, and any impact of market perceptions of the MH117 crash on asset prices are difficult to completely separate from the impact of the sanction announcement. The market impact of the September 12 joint U.S.-EU announcement of sectoral sanctions is dated on September 1, which is the date that the EU leadership directed that sanctions be undertaken and was broadly seen as the key decision that drove market behavior.

where r_{it} is the return or spread on security i in day t, α_i is a constant, m_{it} is a market index intended to control for the impact on r of the arrival of daily non-sanctions information, $\mathbf{s}_{it}$ is a sanctions news indicator or a vector of event dummy(s)—and ε is the conditional variance.[19]

The second equation is for the conditional variance of the return. A variety of conditional variance equation estimators are available. The basic specification for capturing the clustering of returns is the first order (one lag period) GARCH(1,1):

$$(2)\ \sigma_{it}^2 = \omega_i + \gamma_{1i}\varepsilon_{it-1}^2 + \gamma_{2i}\sigma_{it-1}^2 + \gamma_{3i}s_{it} + z_{it}$$

where ω_i is a constant and ε_{it-1}^2 is the squared lagged residual from the mean equation—the ARCH term—which captures news about volatility from the previous period. Last period's forecast variance, σ_{it-1}^2, is the general ARCH (GARCH) term. Finally, s denotes sanctions news as a potential source of variance. The starting assumption is that conditional variance ε follows a normal distribution.[20]

Analysis of the impact of sanctions news and announcements on securities returns is made easier by the single direction of causality. Sanctions are not prone to the two-way causality problem endemic to empirical analysis of the reaction of securities prices to a specific class of news: prices and their underlying fundamentals drive the news of interest, not just the other way around. For example, there is a large literature on the impact of earnings announcements on stock prices. The problem is that not only will earnings announcements drive stock prices but that stock prices may lead earnings announcements and so the direction of causality can be difficult to disentangle. But two-way causality is less of a concern here because the daily ups and downs of Russian asset prices can be safely assumed to not influence the design and timing of sanctions by sender country policymakers.

V. The impact of sanctions news and announcements on Russia securities

The wide array of liquid Russian securities and the GARCH framework provide answers to five empirical questions on economic sanctions:

1. <u>Do sanctions reduce returns on Russian securities?</u> The ability of financially sanctioned energy firms to tap funding markets for capital expenditures and working capital is limited by financial sanctions. Likewise, financial sanctions on banks limit their external funding and shrink their balance sheets, thus reducing their lending and compelling them to drop projects at the margin. Energy sanctions that limit the transfer of specialized services and technology can be expected to directly reduce the profitability of extant and prospective energy

[19] The simple approach is supported by the classic study of Brown and Warner (1980) who conclude "…beyond a simple, one factor market model, there is no evidence that more complicated methodologies convey any benefit [to event studies]." See also Brown and Warner (1985).

[20] The normal distribution seemed to perform as well as or better than alternative distributions (student's t, generalized error) in exploratory regressions.

projects over the long run. Empirical verification of a negative impact of sanctions on security prices would constitute evidence that sanctions indeed impose an economic cost on Russia.

2. Do sanctions raise the variance of returns? Chart 4 shows the abrupt increase in the Russian Trading Series (RTS) volatility after March 1, and increases during March and April. Volatility than settled down, with surges during July and early September around the time of sanctions announcements. Volatility ended the sample period higher than at the beginning. This increase in volatility may be related to the uncertain duration of sanctions, depending as it does on geopolitical tradeoffs of sender and target country policymakers that are exceedingly hard to price. Further, the conditions or even the existence of sanctions against specific targeted entities is not always clear, as stressed to the author by market participants. Thus, sanctions measures may be seen as less transparent than other shocks such as changes to monetary policy, earnings reports, or input and output price changes. Empirical verification that security variance increased after the introduction of sanctions indicates that they are associated with an elevated level of uncertainty, which amounts to another economic cost of sanctions. A higher risk premium from elevated return variance would reduce the consumption of durables, aggregate investment and induce capital outflows and may also reflect the perceived willingness of the government to repay its debt in all states of the world.
3. Do investors discriminate between sanctioned and non-sanctioned firms? Most of the important sectoral sanctions are targeted at specific companies. This leads to the expectation that announcement of a new sanction on company A would have a bigger impact on its returns compared to those of non-sanctioned company B, even if the two firms are otherwise identical. Alternatively, investors may not have enough information on, or understanding of, sanctions to be able to separate the effect on the two firms.
4. Do foreign and domestic investors respond differently to sanctions? Russian securities are owned by both foreign investors—most of which can be safely assumed to be from sender countries—and by domestic Russian investors. A wedge between the valuations of Russian securities by foreign and domestic investors provides some potential insights into sanctions costs faced by one class of investor and not the other.
5. Did Russian countersanctions reduce security values? The countersanctions were appeared to be aimed at target country exporters, but may have also impacted domestic companies.

The empirical work is organized into four sets of results: (i) benchmark returns, (ii) globally traded corporate credit default swaps (CDS) and bonds, (iii) domestically traded equities, and (iv) globally traded equities. Each provides an answer to a subset of the main empirical questions.

Benchmark regressions

The analysis begins with a set of benchmark returns to get a general sense of how investor valuations of Russian securities reacted to sanctions and to guide the empirical strategy. According to market traders in Moscow and London interviewed by the author, the most liquid globally traded securities are: the sovereign dollar-denominated bonds due in 2030 ("Russia 30s") and the five year sovereign CDS ("5-year CDS") (Chart 5). Their price behavior supports the view that they are highly liquid and thus capture the views of investors.[21] Returns on these securities capture the perspective of well-informed global investors. The simple spreads of the 5 year CDS and Russia 30s over their U.S. Treasury counterparts are the dependent variables in the first two sets of regressions because they are widely followed by the press and investors. However, the Russia 30s spread may embody both the riskiness of oil prices and of EMEs generally, in addition to Russia-specific risk. Thus, the third set of regressions uses the spread of the Russia 30s over an average of the four comparable EME oil exporters shown in Chart 1 in order to isolate the Russia sovereign risk premium. The closely followed Russia Trading System (RTS) equity index is the dependent variable in the fourth set of regressions. The Moscow Interbank Currency Exchange (MICEX) is the leading domestic financial exchange and its RTS is a weighted index of the 50 most active stocks (Chart 6). The RTS is denominated in U.S. dollars.

The analysis is conducted over January 1, 2014 to October 31, 2014. The beginning date is just ahead of the initiation of Russia's aggressive actions in Crimea and Ukraine and the end-date is set by the advent of general market volatility associated with exchange rate instability and culminating in the mid-December financial crisis (Chart 1). The extreme movements of security prices in November and December may cloud the relationships of interest here. The dependent variables are in first differences except for log first differences for the RTS and other stock prices.[22] [23] Control equations provide a baseline relationship between asset returns and a broad EME market indicator (Table 2). The estimated coefficients for the EME equity index are significant at the 1 percent level in all the regressions.[24]

The main benchmark results are as follows:

- *Sanctions news induces investors to discount Russian security prices*—The square of news mentions was significant at the 1 percent level across all four benchmark securities. The seemingly quicker adoption of sanctions news into CDS pricing vis-à-vis bond prices is consistent with the empirical literature (Coudert and Gex, 2010).

[21] This is based on author interviews with managers of hedge funds that specialize in emerging market and Russian securities, as well as other private sector analysts and economists that closely follow Russia security markets.
[22] Henry (2000) supports this choice for EMEs.
[23] All of the returns are stationary according to the augmented Dickey-Fuller test.
[24] Likewise, Saleem and Vaihekoski (2008) found that Russian equity prices are significantly influenced by global equity prices.

- *Sanctions news increases the conditional variance of investor pricing*—The news surprise series is significant at the 1 or 5 percent levels for all four benchmark returns, even with the inclusion of sanctions in the conditional mean equation.
- *The March 3 aggression generally reduced returns*—The March 3 event dummy was associated with a significant increase in the bond spread and reduction in equity index returns. In contrast, the March 3 coefficient was not significant in the CDS spread regressions, although the spread widened just before and after the 5-day window.
- *Individual sanction announcements have almost no impact*—Only a few of the coefficient estimates for the individual sanction announcements were significant, with several associated with a counterintuitive increase in prices. Owing to these weak results, only individual sanctions on specific companies will be assessed from now on.
- *Sanctions announcements generally reduce returns*—The most robust mean equation result is for the announcement of the July 16 U.S. sanctions, which lowers prices across the board. The similar package of sanctions announced by the EU two weeks later had no discernible effect on returns, possibly because this measure had been signaled well ahead of implementation and thus already priced in by the investors, as indicated by the sanctions news measure (Chart 2). The signaling of joint sanctions on September 1 hit the CDS spread at the 1 percent level of significance but had less of an effect on bond spreads. Comparison of the July 16 and September 1 coefficients for the CDS spread and RTS index regressions suggest that the earlier event had a bigger impact on prices.
- *The influence of ongoing sanctions news and that of the discrete events are not empirically independent*—Either the sanctions news index or several of the event dummies are significant in separate regressions, but not both in a single specification. This suggests that the discounting of ongoing daily sanctions news during the sample period was concentrated around the time of the four sanctions events.
- *Countersanctions seemed to have had a limited impact*—The signs of the coefficients for the August 6 countersanction announcement are positive as expected, but none of the estimates are significant.
- *Russian security returns are clustered*—The conditional variance equation estimates show that returns are clustered, with significant estimates for either or both of the ARCH and GARCH terms. This result supports the use of the GARCH estimator.

In sum, the benchmark results shed light on four of the key empirical questions: (i) sanction news and announcements generally reduce Russian securities prices, (ii) sanctions raise the variance of returns, and (iii) Russia countersanctions had a limited impact on prices.

Globally Traded Russian Corporate Securities

Globally traded Russian corporate security returns are assessed next. The approach allows analysis of how global investors price corporate risk over and above sovereign risk.

Eleven internationally traded and dollar-denominated bonds and CDS issued by Russian corporations can be deemed as liquid. According to market participants, trading in these securities is dominated by foreign investors, although there may be some offshore Russian investor participation. Used here are those with price changes on at least 95 percent of trading days during 2013 and 2014 and with no warrants or available options that might distort their price.[25] These turn out to be a useful dataset for assessing the impact of sanctions: returns are available for securities issued by two sanctioned energy companies, three sanctioned banks, and a railway company not subject to sanctions. The independent impact of sanctions on the values of securities issued by specific companies is gauged by taking the spread of company security returns over that of sovereign bonds at a matching maturity.[26]

A visual inspection of the spreads of the internationally traded Russian securities (e.g. Chart 7 for the Gazprom bonds) is striking in two respects. First, several of the securities trade at yields below that of the sovereign. This seems counterintuitive given that the Russian government exacts specific taxes on the energy sector (Shiells, 2005), temporarily imposed informal foreign exchange controls on large exporters early in 2015,[27] and has been known to influence the ownership of important firms.[28] However, negative spreads for state-owned companies, especially in the energy sector, are common according to Durbin and Ng (2015). They report that negative spreads are more common for firms that earn revenue in foreign exchange and enjoy close company-government ties. This is especially germane to the large Russian energy companies who benefitted from the sharp depreciation of the ruble during 2014 because their revenues were mainly in U.S. dollars and their costs denominated in rubles. The energy companies and banks studied here are not only strategically important but in most cases also have personal ties to the government (Hill and Gaddy, 2015).

[25] Bloomberg provides daily price data for 277 bonds issued by Russian companies. Of these, 37 had daily price changes for at least 95 percent of the sample period days and were used to construct the maturity buckets. Only 1 of the corporate CDS with daily prices reported by Bloomberg was liquid.

[26] To better match company and sovereign maturities along the yield curve, the multiplicity of sovereign securities are divided into 2, 5, 10, and 30 year maturity buckets, with yields for each bucket averages of the constituent issues.

[27] On December 23, 2014, after the sharp depreciation of the ruble, the Russian government gave large state exporting companies until March 1, 2015 to bring their net foreign exchange assets back to the levels of October 1, 2014, and directed that they report to the central bank their foreign exchange holdings on a weekly basis (see the Reuters article "Informal capital controls arrest Russian ruble's slide" (December 23, 2014)).

[28] For example, the Russian government effectively took control of Bashneft, the sixth largest oil producer, from Vladimir Yevtushenkov, a billionaire who was put under house arrest (the Economist, The Russian economy, "The end of the line", November 22, 2014).

The increase in the spreads of the company bonds over the sovereign bonds around the times of the announcements of sanctions is the second notable aspect of the spreads. Moreover, the increase in the relative risk of companies after sanctions applies not just to the energy companies, which might be expected given the fall in oil prices during mid- and late 2014, but also for the banks and the railway company. Thus, the values of a wide range of company-issued securities appear to be more vulnerable to sanctions compared to sovereign securities.

The empirical impact of sanctions news and announcements on the company spreads is gauged next. The dependent variables are the first difference of the spreads of the security prices during January-October 2014. The (lagged) value of the Dow Jones EME Titan index for the company's sector is used as a control, in addition to the sovereign return, to better isolate the impact of sanctions on the company security returns. A GARCH(1,1) model with the conditional variance equation conditioned on sanction news surprises is employed for all the securities. The sovereign yield coefficient is significant at the 5 percent level or more for all but two of the securities. The sectoral index is generally not significant with the expected sign.

The main sanctions results from Table 3 are as follows.

- *Sanctions news almost uniformly reduces security values*—The sanctions news coefficients were negative and significant at 5 percent or higher for all of the company securities with the exception of the Sberbank bond.

- *Sanctions news increases the conditional variance of returns*—The sanctions news surprise entered the conditional variance equation with a positive and significant coefficient for most of the securities.

- *The impact of sanctions announcements is mixed:*
    - The July 16 event had no impact, according to the event dummy coefficients, across the board.
    - The July 29 event impacted all but Sberbank. The 2-year bond coefficient for non-sanctioned RZD is significant, albeit smaller than the average of the energy companies and banks, suggesting some investor discrimination between sanctioned and non-sanctioned companies.
    - The September 1 event dummy was significant for some of the securities issued by non-sanctioned companies and not significant for some of the sanctioned company securities.
    - The August 6 countersanctions dummy was positive and significant for the Gazprom CDS spread, but did not seem to impact any of the bond spreads.

- *Sanctions news and events had a smaller impact on longer maturity bonds*—The declining values of the sanctions news and events coefficients along the yield curve suggest investors applied a smaller discount to impact of sanctions farther off in the future (Chart 8).

In sum, the arrival of information on sanctions generally lowers the returns on securities issued by Russian companies and raises their variance. There is limited evidence that sanctions lead investors to apply larger discounts to targeted companies in response to sanctions.

Domestic RTS Equity results

This section discusses sanctions announcement event study regression results for the Russian companies that comprise the RTS index. These are the most liquid of the largest Russian issuers with economic activities related to the main sectors of the Russian economy and listed on the MICEX. According to market participants in London and Moscow, trading is dominated by domestic investors. Aggregate RTS company equity value was equivalent to an economically important one-third of GDP as of end-2013. These data allow systematic comparison of company returns from a unified and liquid secondary market. Indeed, returns are available across sanctioned and non-sanctioned companies and for seven sectors—two of which include sanctioned companies.

The empirical strategy is as follows. The forty-one companies available for the analysis are grouped into seven sectors to allow for sector-specific market index control variables.[29] Company daily returns for January-October 2014 are regressed on their respective global EME market indices in individual regressions using a GARCH(1,1) estimator. This means that the estimated impact of sanctions on the value of Russian companies controls for global sectoral developments, albeit not for the potential indirect sanctions channels transmitting through the national economy. The Dow Jones EME Titan sectoral indices are employed for the corresponding RTS sectors: energy, financial, industrial, consumer, communications, metals and mining, electric utilities.[30] Again the sample interval covers January 1, 2014 to October 31, 2014.

Two regressions are done for each company. The first includes the square of the sanctions news indicator in addition to the sectoral market index. The second specification includes dummy variables for the five individual sanctions related events. The sanctions news index is included as an explanatory variable in the conditional variance equation (2) in both sets of regressions. To save space, the individual company regression results are not reported here but are available from the author. The sectoral market index was positive and significant at the 5 percent level for 38 of the 41 companies.

The main sanctions results are as follows:

[29] Four companies were dropped out of the RTS 50 because their prices were not available over the entire sample period (Lenta Ltd, Yandex, United Co Rusal, and Polyus Gold International). Five had dual common and preferred stock listings, and so their preferred share prices were dropped as well (Surgutneftegas, Bashneft, Sberbank, Tatneft, and Rostelecom).

[30] The Russian energy companies make up 30 percent of the weight of the EME Titan oil and gas index and so including this index as a regressor could bias the coefficient estimate. Thus, an adjusted index exclusive of the Russian companies was used in the regressions.

- *Sanctions news has a surprisingly limited impact on RTS company values.* RTS equity prices respond much less to sanctions news compared to the CDS and global bonds. Of the eight energy companies, sanctions news only entered with a significant coefficient for four, two of which were sanctioned.
- *Investors reduced prices around March 3 with little distinction between firms that were subsequently sanctioned and those that were not*. This result matches the sharp acceleration in capital outflows from Russia during March and April 2014. A smaller share of sanctioned firms (63 percent) had the March 3 coefficient significant at the 1 percent level compared to the non-sanctioned firms (76 percent). Further, over the five day window, prices were reduced by a median of 10.6 percent for the sanctioned firms and 14.9 percent for the non-sanctioned (Chart 9). These results indicate that investors were not able to successfully anticipate which firms would be sanctioned over the subsequent months.
- *Countersanctions had a limited impact*—The August 6 dummy entered at the 1 percent level for just two companies, and with opposite signs. The countersanctions thus seemed to have minimal implications for stock market valuations.
- *Sanctions news lifted the conditional variance of equity returns mainly around the time of sanctions events*—For the first set of sanctions news regression results, the sanctions news surprise index entered the conditional variance equation with a positive and at least 1 percent level significant coefficient for 24 companies. Meanwhile, the second set of sanctions event regression results were more mixed, with sanctions news entering the variance equations positively significant at the 5 percent level or less in 16 equations and negative in 10. Again, controlling for sanctions events in the expectations equations muted the impact of sanctions news in the corresponding variance equations. In other words, the impact of sanctions news on the variance of RTS company equity returns seems to be concentrated around the time of sanctions events.

In order to determine whether investors discriminated between those firms which were sanctioned and those that were not, the sample of sanctions announcement date windows is partitioned into three groups. The 41 companies and July 16, July 29 and September 1 announcements provide 123 sanctions event windows. For reporting purposes, the 123 windows are partitioned into three groups as follows:

1. Sanctioned energy companies and banks (18)—These comprise the three energy companies sanctioned on July 16, July 29 and September 1, and five energy companies together with two banks sanctioned on July 29 and September 1.
2. Non-sanctioned energy companies and banks (21)—Sanctions were not applied to these energy and financial companies during these windows.
3. Companies in non-sanctioned sectors (84)—All the 28 firms in the non-sanctioned sectors over the three event windows.

The two key results for investor discrimination between sanctioned and non-sanctioned firms are:

- *For July 16, investors discriminated between firms in sanctioned and non-sanctioned sectors, but did not differentiate among firms within the sanctioned sectors.* The returns on companies in the non-sanctioned sectors did not budge during the July 16 window, indicating that investors understood immediately that these firms were not sanctioned (Chart 10). Moreover, the returns of the two sanctioned firms were discounted at a significant level. Notably, about half of the non-sanctioned firms in the sanctioned sectors did experience lower returns, indicating that investors at least partially discriminated between firms in sanctioned and non-sanctioned sectors, but only partially differentiated between targeted and non-targeted firms within the sanctioned sectors.
- *The July 29 and September 1 events had generally little impact on equity values across all sectors, whether sanctioned or not*—None of the sanctioned companies were impacted on those two dates, and the share of non-sanctioned firms with significant equity declines was very low at 10 and 3 percent, respectively.

To summarize, equity returns did not respond to daily sanctions news, but investors did substantially discount prices around March 3 and to a lesser extent around July 16. The variance of equity prices was increased for some firms by sanctions news with the impact concentrated around key sanctions events. There is some evidence that investors discriminated between firms in sanctioned and non-sanctioned sectors, but did not fully differentiate firms within the sanctioned sectors. Finally, Russian countersanctions had no discernible impact on equity returns.

Differential Responses of Foreign and Domestic Investors

The final set of results compares domestic and internationally traded equity returns to discern any differences between the responses of foreign and domestic investors to sanctions.

- Foreign investors: Financial sanctions impose an obvious cost on the foreign investors subject to the laws and regulations of the sender countries by prohibiting from them buying new securities from targeted firms. Further, foreign investors must factor in a possible future tightening of sanctions. For example, sender country investors could in the future be compelled to sell their existing holdings of Russian securities. Indeed, investors often cite the reputational risk they face. In contrast, domestic Russian investors are not subject to the laws of sender countries and thus do not face such constraints.
- Domestic investors: However, Russian investors may face their own unique sanctions costs. First, collecting information on the targets and details of sanctions likely is more costly for them because they will not be privy to the investor meetings regularly conducted by sender country governments to explain how sanctions work. Further, domestic investors almost surely have a larger share of their portfolio invested in sanctioned companies, and so they may have a harder

time diversifying away the increased risk of a large share of their portfolio from sanctions.[31]

Compared here are the returns on the five Russian companies that are both included in the RTS and trade in a liquid American Depository Receipts (ADRs) secondary market. Returns on the RTS securities are taken here as reflecting the views of domestic investors who, according to market participants, dominate trading. ADRs are dollar-denominated stocks issued or sponsored by an international bank or brokerage and by design available only to foreign investors. Five of the 50 ADRs of Russian companies with data available on Bloomberg had price changes for at least 95 percent of the days during 2014 and are matched by a RTS listing. Three are sanctioned energy companies, one is a sanctioned bank, and one is a communications company.

Table 4 compares the previously discussed RTS results for the five companies with the same specification for their ADR returns. Interestingly, the RTS return "beta" coefficients for their sectoral market index are larger and have relatively smaller standard errors compared to the ADR betas. Domestic investors seem to be more sensitive to general sectoral market developments than their foreign counterparts.

The main sanctions results on the difference between RTS and ADR returns are as follows:

- *Domestic investors were more sensitive to the March 3 event.* All but one of the RTS coefficients were significant at the 1 percent level (the fifth at the five percent level) compared to just two of the ADR returns, and all of the RTS coefficients were larger in absolute value than their foreign comparators. Investors applied a 1.6 to 14.5 percent larger discount to the RTS-listed equities compared to the ADR prices over the five-day March 3 event window, according to the coefficient estimates. This squares with reports that capital outflows in March and April were dominated by Russian companies and households over foreigners.[32]
- *The July 16 announcement had a somewhat bigger impact on domestic valuations.* Four of the five estimated coefficients were larger for the RTS returns, with the five-day window discount differences ranging from 0.3 to 6.9 percent.
- *The July 29, September 1 and August 6 events had little impact on returns.* The Mobile RTS and ADR September 1 coefficients were the only significant estimates for these three events across the five companies.
- *Sanctions news surprises had a bigger impact on the conditional variance of RTS returns.* The sanctions coefficients in the conditional variance equation (the

[31] Kinnunen and Martikainen (2015) found that industry-specific idiosyncratic risk for the Russian equity market commands a risk premium of some 8 percent since 2009 due to the limited number of actively traded stocks in Russia and the high market-weight of the oil and gas sector.
[32] See for example the Reuters article "Surge in Russian capital outflows adds to economic woes" (April 9, 2014).

results are not reported in Table 4 but are available from the author) were larger and with higher t-statistics for the RTS sanctioned companies in the sanction news specifications compared to ADRs. Sanctions news seemed to lead to more elevated levels of uncertainty for domestic investors compared to foreigners.

In sum, domestic investors appear to have priced in a larger discount on equity prices relative to foreign investors in response to two of the important sanctions announcements. This is a somewhat surprising result because domestic investors are not subject to the sender country sanctions. One possible explanation for this difference is the larger information costs in understanding sanctions that domestic investors must pay. A second explanation could be that domestic Russian investors are less able to diversify away from large sanctioned Russian companies and thus new sanction measures would make Russian equities less attractive for them compared to foreign investors with a larger and more diversified portfolio.

IV. Conclusion

This paper aimed to shed light on sanctions by tapping the rich tableau of Russia security prices as an empirical window into the economic impact of sanctions. Today, Russia is by far the largest and most globally-integrated economy subject to multilateral sanctions. The economic consequences of sanctions and how they have impacted target country governments are not generally well understood, and there has been scant empirical analysis of the recent Russia sanctions. Moreover, sectoral sanctions as applied to Russia are a relatively new and untested instrument.

Two broad implications can be gleaned from the empirical results. First, the arrival of information on sanctions generally reduces the rate of return on, and increases the variance of returns of, a broad range of securities issued by Russian entities. Based on this result, Russia sanctions can be deemed as generally *effective* in that they impose a clear-cut economic cost on the target country.

Second, drilling down, the results suggest that Russia sanctions *transmit* to the economy through at least the following channels:

1. Lower expected profits: Security returns embody changes in the expected present discounted value of the issuer's profit stream. The adverse impact of sanctions on Russian security prices look to lower expected profits from, at a minimum, the direct impact of sanctions; for example, via reduced availability of credit and energy technology and services to targeted companies.
2. Elevated uncertainty: The first uncertainty result is the significance of sanctions news surprises in the conditional variance equation of the CDS and bond regressions. The second is the apparent inability of investors to fully discriminate between the impacts of sanctions announcements on sanctioned and non-sanctioned companies within targeted sectors. A possible third piece of evidence would be the extra cost of information collection for domestic investors, as suggested by the bigger hit they took from sanctions events compared to foreign

investors. Sender country companies subject to sanctions laws and regulations may over-comply by limiting even legitimate business to ensure that they do not run afoul of the law (Gianella et al 2015). But uncertainty can also exacerbate the economic hit on the target country, as evidenced by the post-sanctions drop in domestic demand in Russia and increase in outflows.

3. Negative wealth effect: Russia is financially developed enough that the lower asset prices triggered by sanctions can have material effects on aggregate spending. In particular, the sum of reductions in equity values of the nine RTS-listed sanctioned companies over the four five-day event windows add up to a meaningful 4.4 percent of 2014 GDP.

These transmission channels provide some insights into the sharp fall in Russian domestic demand and the surge of capital outflows after sanctions. Household consumption and gross fixed capital formation each declined by about 9.5 percent from the fourth quarter of 2013 to the second quarter of 2015 (seasonally adjusted). Of course, the bulk of these declines are attributable to lower oil prices and the halving of oil export revenues. But, as noted earlier, the IMF and World Bank have taken the view that sanctions have significantly reduced Russia's consumption and investment. The results here suggest that the lower and more variable income streams, elevated uncertainty and reduced wealth associated with sanctions help explain lower household consumption and corporate investment. Likewise, lower expected profits of the large Russian companies and generally higher risk premia could have helped drive the $95 billion of capital outflows during the second half of 2014 and first half of 2015.

References

Allen, Susan. 2008. The Domestic Political Effects of Economic Sanctions. *Journal of Conflict Resolution* 52(6): 916-44.

Baldwin, David A. 1985. *Economic Statecraft*. Princeton, NJ: Princeton University Press.

Blackwill, Robert D. and Jennifer M. Harris. 2016. *War by Other Means: Geoeconomics and Statecraft*, Cambridge, MA: Belknap Press.

Brown, Stephen J. and Jerold B. Warner. 1980. Measuring Security Price Performance. *Journal of Financial Economics* 8(3): 205-58.

Brown, Stephen J. and Jerold B. Warner. 1985. Using Daily Stock Returns: The Case of Event Studies. *Journal of Financial Economics* 14(1): 3-31.

Coudert, Virginie and Mathieu Gex. 2010. Credit Default Swap and Bond Markets: Which Leads the Other? *Banque de France Financial Stability Review - Derivatives, Financial Innovation and Stability*, No. 14.

Dashti-Gibson, Jaleh, Patricia Davis and Benjamin Radcliff. 1997. On the Determinants of the Success of Economic Sanctions: An Empirical Analysis. *American Journal of Political Science*,
41(2): 608-18.

Dreger, Christian, Jarko Fidrmuc, Konstantin A. Kholodilin, and Dirk Ulbricht. 2015. The Ruble between the Hammer and the Anvil: Oil Prices and Economic Sanctions. DIW Berlin Discussion Paper No. 1488.

Drezner, Daniel. 1999. *The Sanctions Paradox*. Cambridge, UK: Cambridge University Press.

Drezner, Daniel. 2015. Targeted Sanctions in a World of Global Finance. *International Interactions: Empirical and Theoretical Research in International Relations* 41(4): 755-64.

Eaton, Jonathan and Maxim Engers. 1999. Sanctions: Some Simple Analytics. *American Economic Review* 89(2): 409-414.

Eckert, Sue. 2008. The Use of Financial Measures to Promote Security. *Journal of International Affairs* 62(1):103–11.

Engle, Robert. 1982. Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica* 50(4): 987–1008.

Fama, Eugene F. 1990. Stock Returns, Expected Returns, and Real Activity. *The Journal of Finance* 45(4): 1089–108.

de Galbert, Simond. 2015. A Year of Sanctions against Russia—Now What? A European Assessment of the Outcome and Future of Russia Sanctions. Center for Strategic and International Studies Europe Program Report.

Gianella, Christian, Magali Césana, Audrey Cézard-Assouad, Vincent le Biez, Olivier Salvador, and Carole Gauthier Schweitzer. 2015. Economic Sanctions: What Have We Learned from the Recent and Not So Recent Past? Directorate General of the Treasury (France), Background Paper No. 150.

Harrell, Peter. 2015. *Lessons from Russia for the Future of Sanctions*. Economic Statecraft Series. Center for a New American Security.

Henry, Peter B. 2000. Stock Market Liberalization, Economic Reform, and Emerging Market Equity Prices. *The Journal of Finance* 55(2): 529-64.

Hill, Fiona and Clifford G. Gaddy. 2015. *Mr. Putin: Operative in the Kremlin*. Washington D.C.: Brookings Institutional Press.

Hufbauer, Gary, Jeffrey C. Schott, Kimberly A. Elliott, and Barbara Oegg. 2007. *Economic Sanctions Reconsidered.* Washington, DC: Peterson Institute for International Economics.

Kaempfer, William H. and Anton D. Lowenberg. 1989. The Theory of International Economic Sanctions: A Public Choice Approach. *The American Economic Review* 78(5): 786-93.

Kinnunen, Jyri and Minna Martikainen. 2015. Expected Returns and Idiosyncratic Risk: Industry-Level Evidence from Russia. BOFIT Discussion Paper 30.

Kirshner, Jonathan. 1997. The Microfoundations of Economic Sanctions. *Security Studies* 6(3): 32–64.

MacKinlay, A. Craig. 1997. Event Studies in Economics and Finance. *Journal of Economic Literature* 35(1): 13-39.

Mauro, Paolo. 2003. Stock Returns and Output Growth in Emerging and Advanced Economies. *Journal of Development Economics* 71(1): 129-53.

Marinov, Nikolay. 2005. Do Sanctions Destabilize Country Leaders? *American Journal of Political Science* 49(3): 564-76.

Martin, Lisa L. 1993. Credibility, Costs, and Institutions: Cooperation on Economic Sanctions. *World Politics* 45(3): 406-32.

Miyagawa, Makio. 1992. *Do Economic Sanctions Work?* New York, NY: St. Martin's Press.

Nooruddin, Irfan. 2002. Modeling Selection Bias in Studies of Sanctions. *International Interactions* 28(1): 59-75.

Rosenberg, Elizabeth, Zachary K. Goldman, Daniel Drezner, and Julia Solomon-Strauss. 2016. The New Tools of Economic Warfare: Effects and Effectiveness of Contemporary U.S. Financial Sanctions. Center for a New American Security.

Saleem, Kasheef, and Mika Vaihekoski. 2008. Pricing of Global and Local Sources of Risk in Russian Stock Markets. *Emerging Markets Review* 9(1): 40–56.

Schwert, William. 1990. Stock Returns and Real Activity: A Century of Evidence. *Journal of Finance* 45(4): 1237–257.

Shiells, Clinton R. 2005. VAT Design and Energy Trade: The Case of Russia and Ukraine. *IMF Staff Papers* 52(1) 103–19.

Tinbergen, Jan. 1952. *On the Theory of Economic Policy*. Contributions to Economic Analysis, Amsterdam: North-Holland.

Torbat, Akbar. 2005. Impacts of the U.S. Trade and Financial Sanctions on Iran. *The World Economy* 28(3):407–34.

Tuzovaa, Yelena and Faryal Qayumb. 2016. Global Oil Glut and Sanctions: The Impact on Putin's Russia. *Energy Policy* 90(1): 140–51.

Table 1

Table, Event Dates of Sanctions Impacting Securities-Issuing Russian Companies

	Event Summary			Sanctions Policy Dates								
				16-Jul	30-Jul				12-Sep			
				Financial	Financial		Energy		Financial		Energy	
	16-Jul	30-Jul	12-Sep	US	US	EU	US	EU	US	EU	US	EU
Banks												
Gazprombank	**F**	**F**	f	**F**		**F**			f	f		
Sberbank		**F**	**F**			**F**			**F**	f		
Vnesheconombank	**F**	**F**	f	**F**		**F**			f	f		
VTB Bank		**F**	f		**F**	**F**			f	f		
Energy companies												
All								e				e
Novatek	**F**	**e**	**F/e**	**F**						**F**		
Gazprom		**e**	**E**								**E**	
Gazprom Neft		**e**	**F/E**						**F**		**E**	
Lukoil		**e**	**E**								**E**	
Rosneft	**F**	**e**	**F/E**	**F**						**F**	**E**	
Surgutneftegas		**e**	**E**								**E**	
Transneft		**e**	**F/e**						**F**	**F**		

Notes: F and E denote event dates of financial and energy sanctions, repectively. Capital letter denotes major sanctions.

Table 2: Benchmark Return Regression Results

	CDS spread			30-yr sov bond spr ov US Tre			30-yr sov bond spr over EMEs			RTS equity index			
Expectation equation													
Oil EME Stock index	***-0.729***	***-0.736***	***-0.768***	***-0.0094***	***-0.0094***	***-0.0095***	**-0.00357**	**-0.004**	**-0.004**	***1.665***	**2.022**	**2.044**	**2.043**
	0.112	0.104	0.114	0.00126	0.001	0.001	0.001	0.001	0.001	0.231	0.339	0.320	0.317
Sanctions news sqed	***0.056***			**0.00411**			**0.007**			***-0.113***	-0.470		
	-0.018			1.77E-03			0.001			0.044	0.459		
March 3 Crimea intervention		0.000	0.000		0.047	*0.047*		**0.099**	**0.079**			**-42.523**	**-40.317**
		0.000	0.000		0.038	0.037		0.014	0.020			5.098	4.243
Individual sanctions													
March 6		7.594			-0.005			**-0.045**				5.041	
		4.248			0.011			0.024				12.709	
March 17		3.529			-0.002			-0.018				8.043	
		2.809			0.061			0.069				6.422	
March 20		-2.131			-0.004			-0.019				-3.317	
		4.134			0.057			0.058				14.522	
April 28		3.609			0.048			**0.087**				-1.258	
		2.594			0.030			0.017				6.959	
June 20		-1.447			-0.005			**-0.070**				12.299	
		2.430			0.035			0.016				6.374	
Sectoral sanctions													
July 16		***6.493***	***7.216***		**0.088**	**0.047**		**0.078**	**0.060**			**-21.952**	**-22.330**
		2.245	2.209		0.031	0.031		0.009	0.012			8.982	9.398
July 29		4.799	4.819		0.020	0.088		0.009	0.011			-5.797	-6.533
		4.266	5.186		0.038	0.038		0.038	0.041			7.290	7.359
September 1		**5.617**	**4.626**		0.046	0.046		**0.054**	**0.052**			-10.915	-9.761
		2.863	2.463		0.040	0.041		0.020	0.025			7.993	7.878
Russia cntersnctns, August 6		6.568	5.143		0.065	0.065		**0.076**	0.076			-8.935	-9.032
		4.597	5.803		0.047	0.047		0.027	0.039			9.673	10.193
Constant													
Variance equation													
Constant	**0.000**	**22.368**	**19.914**	**0.010**	**0.009**	**0.009**	**0.001**	**0.000**	**0.001**	21.573	**476.36**	**217.37**	**243.89**
	0.000	11.131	8.019	0.002	0.002	0.001811	0.000	0.000	0.000	17.846	117.78	87.82	70.43
Lagged expectations residual sqed				0.115	0.136	0.146	0.122	**0.217**	0.096		0.08	0.24	**0.24**
				0.077	0.089	0.078235	0.064	0.077	0.066		0.06	0.10	0.09
Lagged conditional varia	**0.000**	**0.480**	***0.547***	-0.422	-0.395	**-0.413**	**0.704**	**0.669**	**0.702**	***0.943***	-0.55	0.03	-0.05
	0.000	0.239	0.169	0.238	0.231	0.209995	0.062	0.072	0.088	0.054	0.30	0.31	0.21
Sanctions news surprise	***0.000***	***54.558***	***51.139***	**0.017**	**0.016**	**0.017**	**0.004**	0.002	**0.003**		**537.07**	193.32	239.13
	0.000	19.976	15.248	0.003	0.003	0.003042	0.001	0.001	0.001		79.379	159.89	145.06
R-squared	0.000	0.221	0.221	0.216	0.241	0.239	0.085	0.151	0.171	0.226	0.229	0.273	0.253
Adjusted R-squared	0.000	0.187	0.204	0.212	0.204	0.221	0.081	0.110	0.151	0.223	0.225	0.237	0.235
Log likelihood	0.0	-790.5	-796.5	219.8	224.4	223.8	280.1	290.5	284.2	-997.3	-991.8	-904.6	-906.2
Durbin-Watson stat	0.0	1.974	1.962	1.858	1.976	1.978	1.443	1.589	1.579	2.165	2.159	2.308	2.296
N	216	216	216	216	216	216	216	216	216	212	212	212	212
Dates	1/03/2014 to 10/31/2014			1/09/2014 to 10/31/2014			1/09/2014 to 10/31/2014			1/09/2014 to 10/31/2014			

Notes: CDS and bond spreads are in first differences and RTS index is in log first differences. Estimates significant at the 1 percent level are in bold italics, bold denotes significance at the 5 percent level, and estimates significant at the 1 percent level are underlined.

Table 3. Regressions Results for Russia Corporate Globally Traded CDS and Bond Yields

	Energy										Finance								Railway			
	Gazprom								Gazpromneft		Sberbank 1/		Gazprombank		VEB				RZD			
	5-year CDS		2-yr bond		5-yr bond		10-yr bond		2-yr bond		5-yr bond		2-yr bond		2-yr bond		10-yr bond		2-yr bond		10-yr bond	
Controls																						
Sovereign yield	-0.036	**-0.220**	**0.781**	**0.691**	**0.658**	**0.676**	**0.428**	**0.437**	**1.019**	**0.752**	**0.404**	**0.422**	**0.819**	**0.902**	0.213	**0.352**	0.086	0.045	**0.885**	**0.686**	**0.602**	**0.575**
	0.069	0.025	0.033	0.033	0.030	0.029	0.018	0.016	0.061	0.039	0.149	0.151	0.070	0.049	0.165	0.141	0.083	0.118	0.062	0.045	0.052	0.014
Sectoral equity index	**-3.848**	**-4.634**	-0.001	-0.005	0.003	0.003	0.002	0.002	-0.002	**-0.009**	0.021	0.021	-0.006	0.003	0.002	0.004	-0.001	-0.002	**0.031**	**0.011**	**0.016**	**0.016**
	0.846	0.438	0.003	0.003	0.002	0.003	0.002	0.002	0.004	0.005	0.019	0.019	0.006	0.006	0.012	0.010	0.006	0.010	0.008	0.003	0.007	0.006
Sanctions news^2	**9.5E-04**		**6.6E-06**		**4.8E-06**		**3.1E-06**		**1.4E-05**		2.2E-07		**3.0E-05**		**1.1E-05**		**1.2E-05**		**2.8E-06**		**7.0E-06**	
	2.4E-04		9.9E-07		8.0E-07		7.1E-07		1.4E-06		5.9E-06		1.4E-06		2.3E-06		1.6E-06		1.3E-06		1.2E-06	
Sanctions events																						
March 3		**8.577**		**0.056**		**0.031**		**0.023**		0.022		-0.025		**0.119**		-0.013		-0.002		-0.005		-0.073
		4.652		0.008		0.018		0.012		0.020		320		0.027		0.172		0.156		0.014		6.268
July 16		0.662		0.014		0.003		0.000		0.036		-0.005		0.002		0.018		-0.013		0.001		0.007
		9.534		0.015		0.011		0.007		0.026		0.182		0.035		0.028		0.019		0.092		0.033
July 29		-1.603		**0.126**		**0.053**		0.022		**0.061**		0.014		**0.145**		**0.360**		**0.188**		**0.065**		**0.154**
		5.251		0.028		0.016		0.014		0.026		0.329		0.064		0.045		0.077		0.017		0.013
September 1		4.882		**0.090**		0.012		**0.024**		-0.021		-0.022		**0.121**		**0.202**		**0.126**		0.050		**0.056**
		4.312		0.021		0.010		0.008		0.019		0.174		0.054		0.065		0.037		0.033		0.019
August 6		**6.651**		0.017		0.039		0.021		0.044		-0.024		-0.104		0.037		0.059		0.019		0.046
		3.472		0.022		0.030		0.023		0.028		0.154		0.091		0.099		0.180		0.071		0.041
R-squared	0.18	0.12	0.58	0.58	0.69	0.69	0.62	0.62	0.47	0.48	0.08	0.08	0.28	0.43	0.05	0.18	0.05	0.15	0.42	0.42	0.49	0.51
Adjusted R-squared	0.17	0.09	0.57	0.57	0.69	0.68	0.62	0.61	0.46	0.47	0.07	0.05	0.27	0.41	0.04	0.16	0.04	0.13	0.42	0.40	0.49	0.49
Log-likelihood	-737.3	-728.5	326.2	333.6	378.0	375.9	457.2	455.3	255.9	250.0	150.7	151.2	191.8	196.6	148.1	162.8	234.4	227.7	241.4	302.7	266.4	277.7
Durbin-Watson Statistic	1.80	1.78	1.34	1.42	1.63	1.67	1.78	1.84	1.62	1.71	1.91	1.92	1.31	1.78	1.63	1.80	1.77	1.75	1.80	1.81	1.66	1.83
N	208	208	209	209	209	209	209	209	209	209	168	168	209	209	209	209	209	209	209	209	209	209

Notes: Regressions are GARCH(1,1) including media surprise indicator in the conditional variance equation. Estimation interval is January-October 2014. Yields are daily first difference, equity indices are in log first difference. Standard errors are reported in parentheses. Coefficient estimates that are significant for one-tailed test at 5 percent (10 percent) level or higher are in bold (underlined). Results bordered by a box denote dates for which santions were applied a company, with a light box denoting relatively weak sanctions and a bold box denoting strong sanctions.

1/ Sample interval begins March 5.

Table 4. Regressions Result for RTS and ADR Equity Returns

	GAZPROM		LUKOIL		SURGUTNEFTEGAS		SBERBANK		MOBILE TELESYSTEM	
	RTS	ADR	RTS	ADR	RTS	ADR	RTS	ADR	RTS	ADR
Sectoral equity index	**0.954**	**1.234**	**0.955**	**0.865**	**0.797**	**0.642**	**1.328**	**1.225**	**1.814**	**1.518**
	0.151	0.118	0.115	0.114	0.104	0.110	0.139	0.166	0.239	0.182
Sanctions events										
March 3	**-5.180**	**-2.512**	**-1.400**	**-0.913**	**-1.003**	**-0.677**	**-2.821**	**-2.226**	**-3.237**	**-0.340**
	0.560	0.590	0.510	0.550	0.553	0.686	0.390	0.817	0.562	0.615
July 16	**-1.905**	**-1.836**	**-1.978**	**-1.209**	**-2.105**	**-2.050**	-1.480	-1.804	-1.597	-0.218
	0.753	0.550	0.360	0.400	0.843	0.566	0.812	0.778	1.596	1.122
July 29	-0.592	-0.213	0.241	-0.033	-0.223	-0.032	-1.589	-1.575	0.475	-0.195
	0.816	1.054	0.750	0.955	0.855	1.214	1.028	1.237	0.975	1.104
September 1	-0.119	-0.432	-0.474	-0.606	**-0.958**	**-0.448**	-0.021	-0.304	-2.916	-1.543
	0.665	0.804	0.421	0.608	0.682	0.524	0.546	0.706	0.546	0.663
August 6	-1.201	-0.581	-0.921	-0.892	-0.559	-0.028	-0.512	-0.332	0.451	0.087
	0.805	0.490	1.187	1.095	0.573	0.786	1.146	1.051	1.043	0.782
R-squared	0.28	0.28	0.30	0.25	0.24	0.17	0.30	0.25	0.22	0.27
Adjusted R-squared	0.26	0.26	0.29	0.23	0.22	0.15	0.29	0.24	0.20	0.26
Log-likelihood	-413.7	-458.2	-376.3	-388.7	-381.9	-396.7	-454.2	-468.1	-470.1	-423.2
Durbin-Watson Statistic	2.31	2.42	2.25	2.31	2.23	2.34	2.12	2.18	2.32	2.31
N	213	213	213	213	213	213	213	213	213	213

Notes: Dependent variables are in log first differences. Estimates significant at the 1 percent level are in bold italics, bold denotes denotes significance at the 5 percent level, and estimates significant at the 1 percent level are underlined. Results bordered by a box denote dates for which santions were applied to a company, with a light box denoting relatively weak sanctions and a bold box denoting strong sanctions.

Chart 1

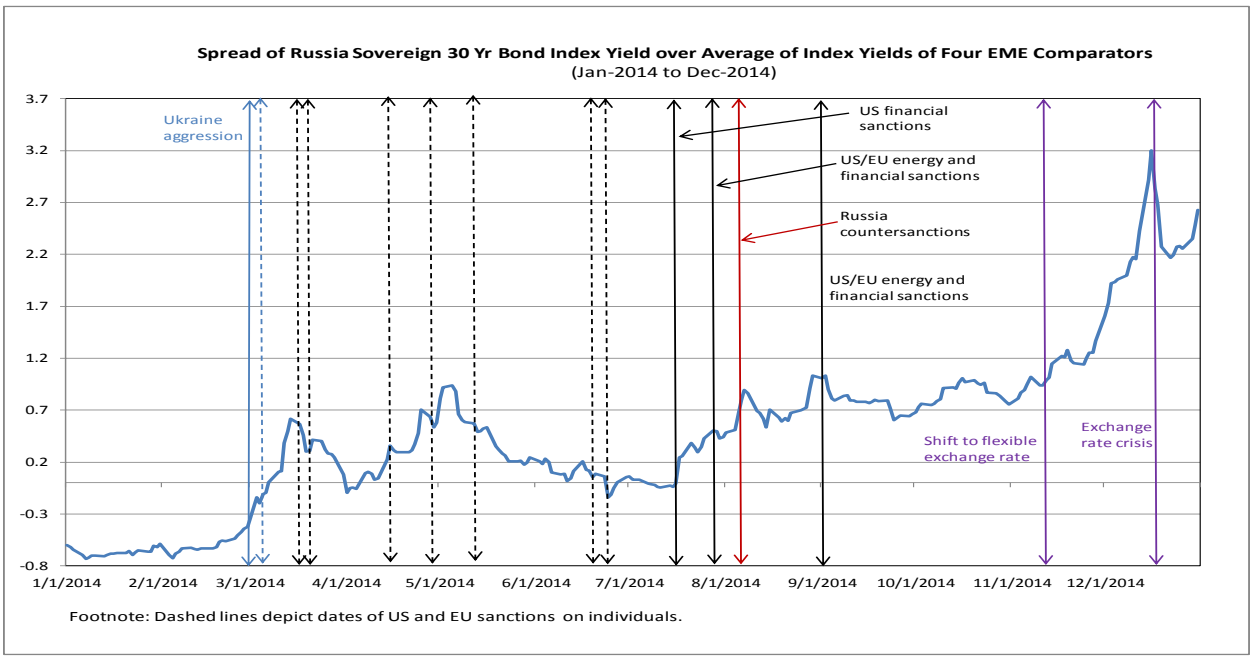

Chart 2

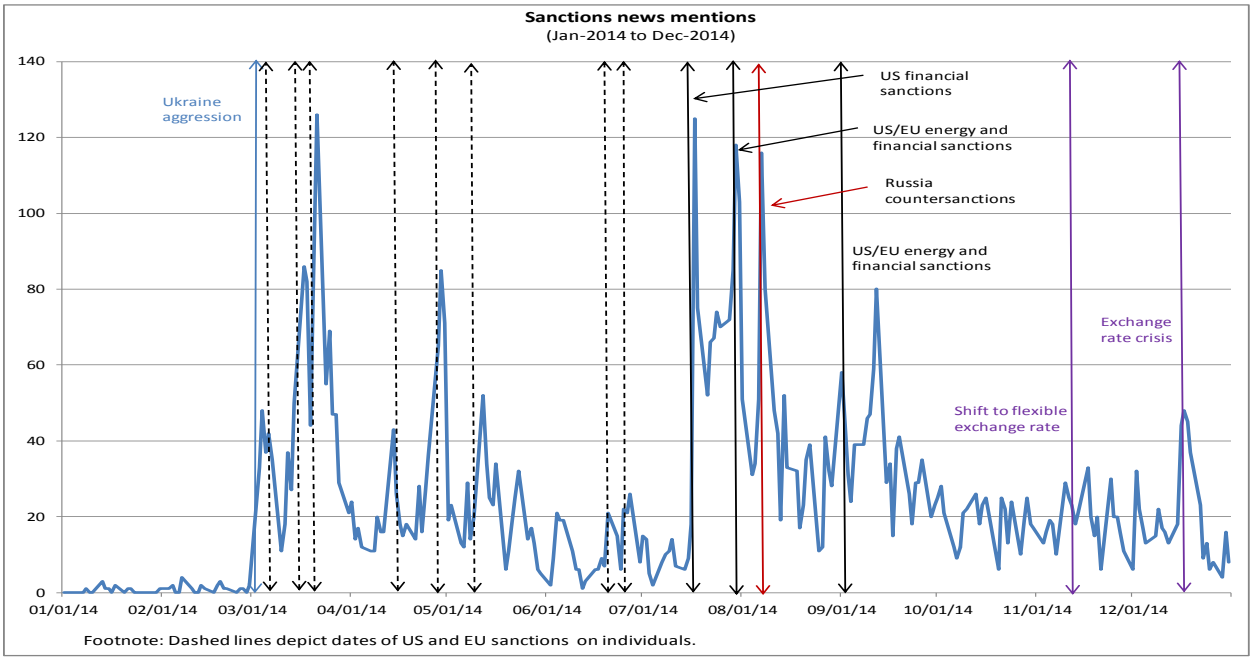

Chart 3

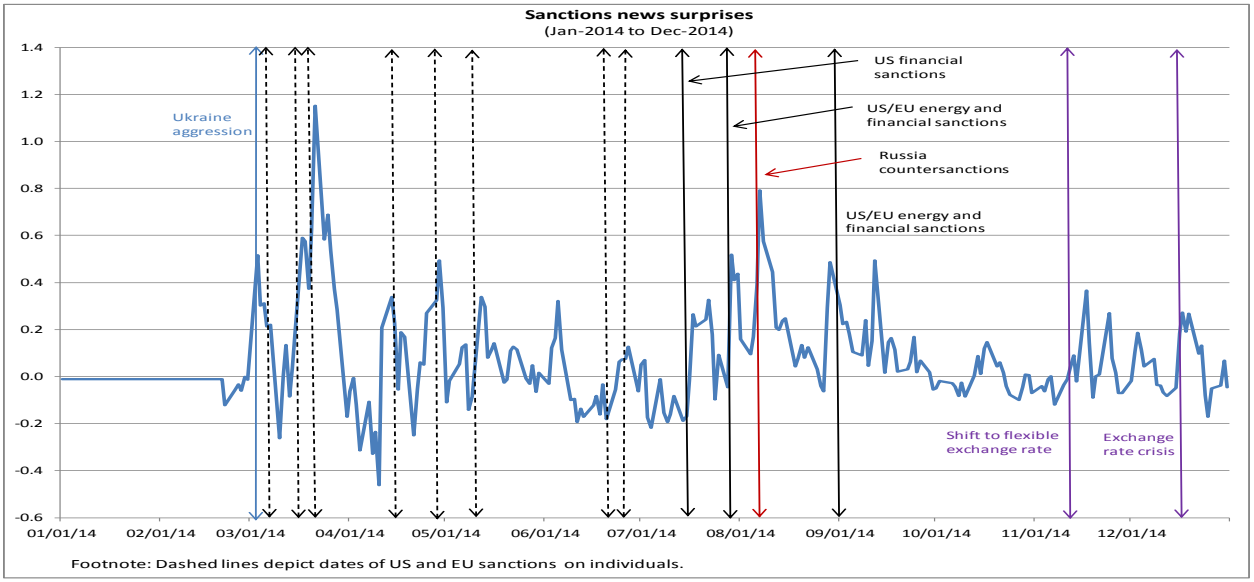

Chart 4

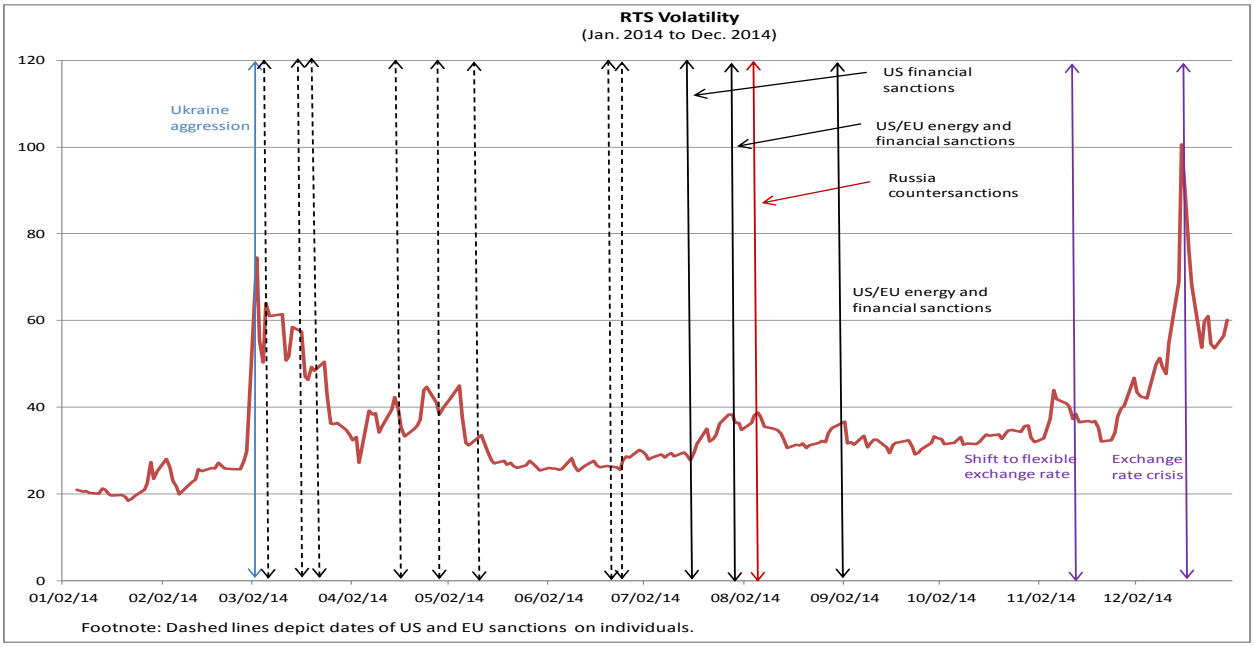

Chart 5

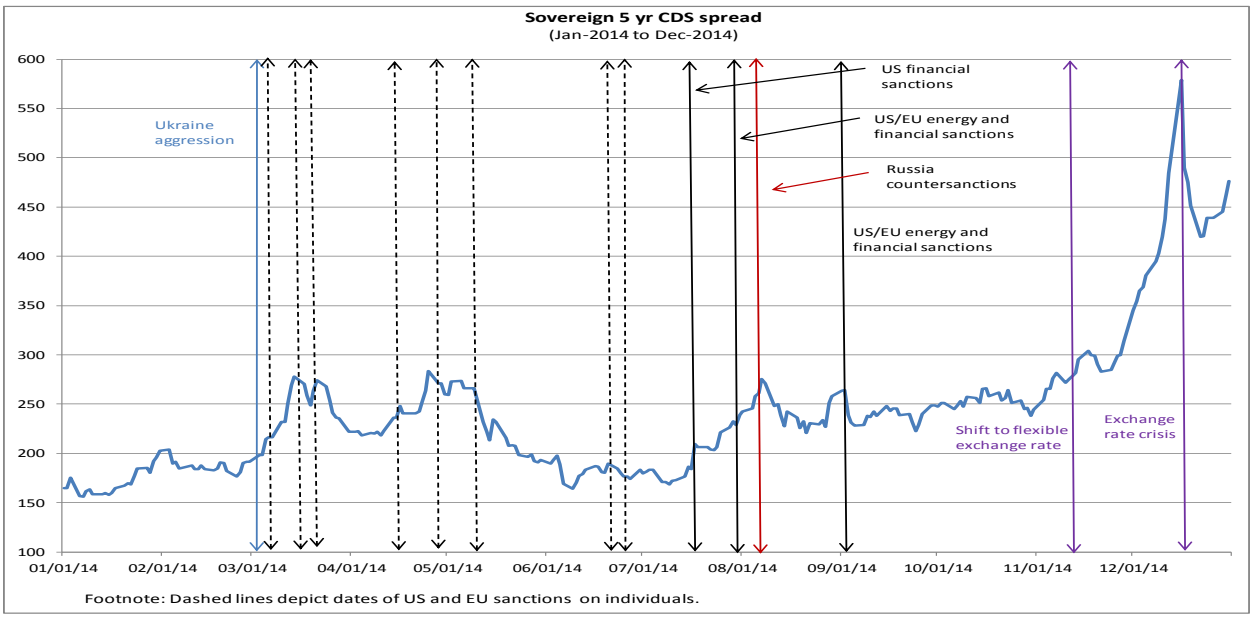

Chart 6

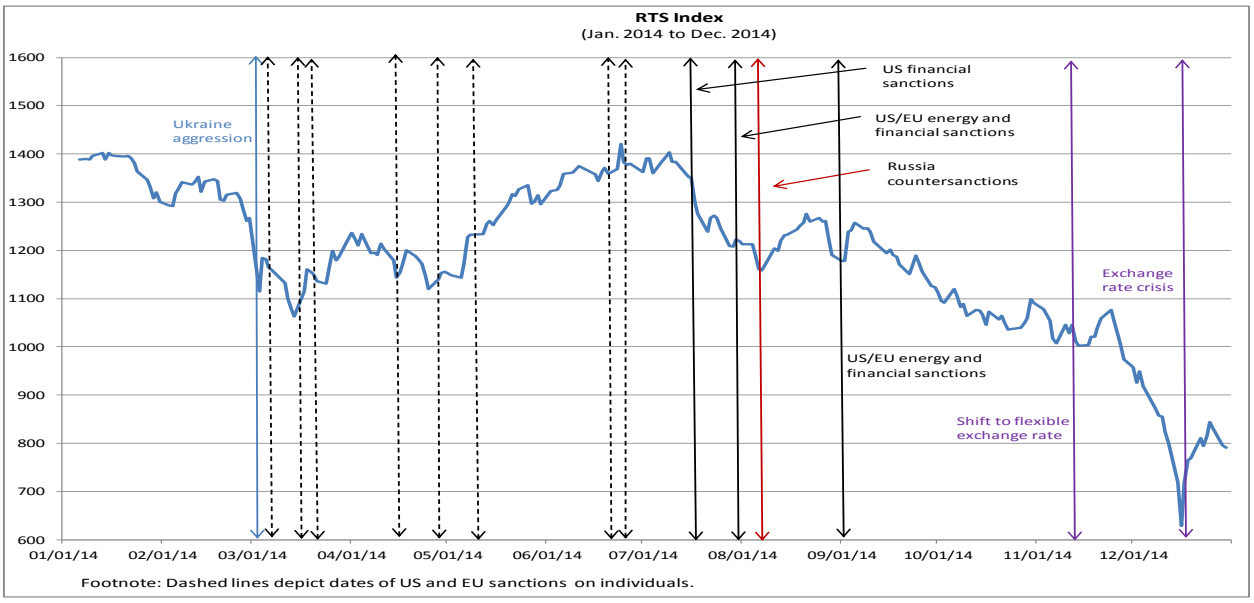

Chart 7

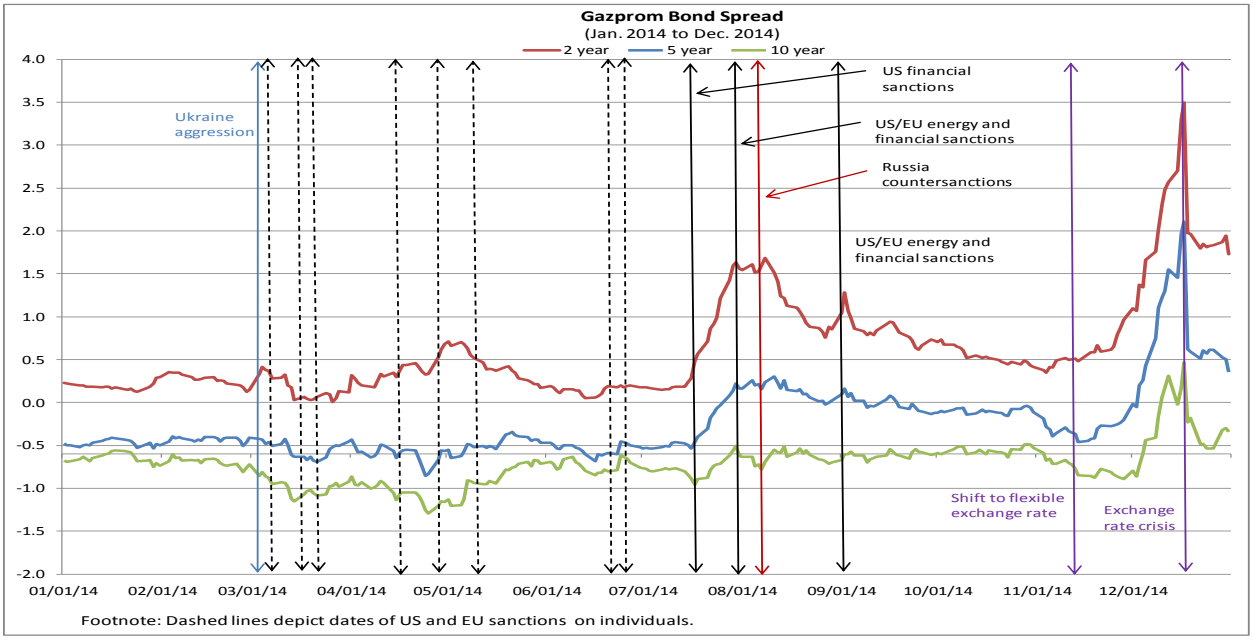

Chart 8

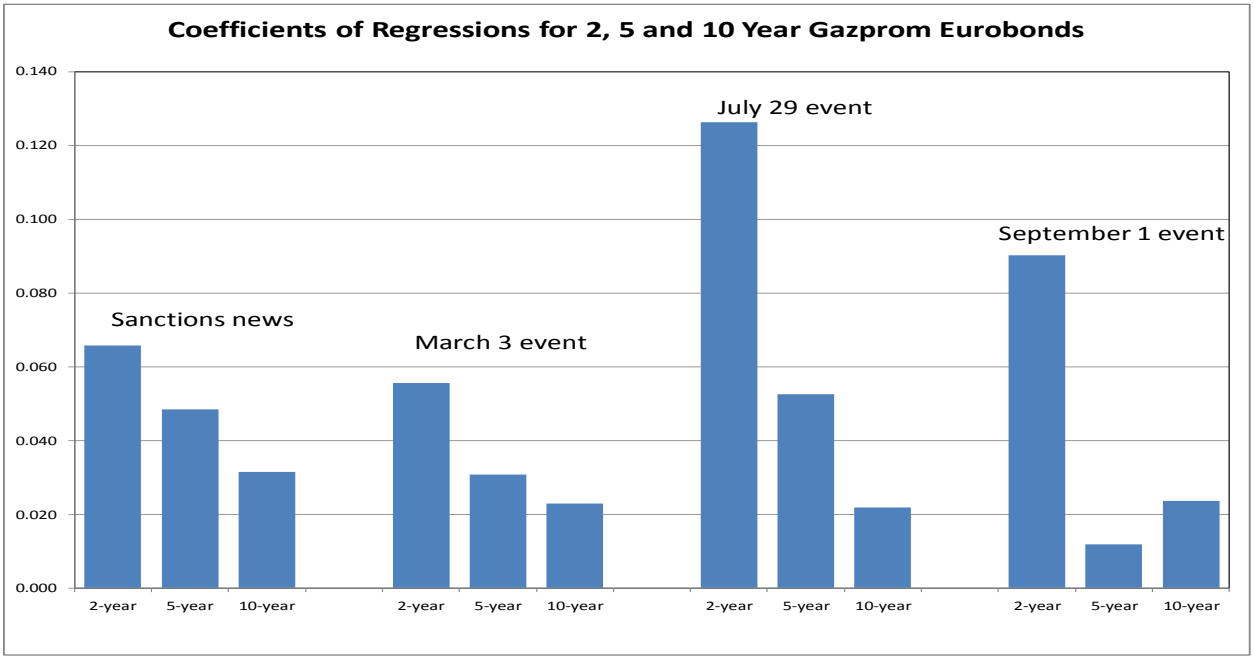

Chart 9

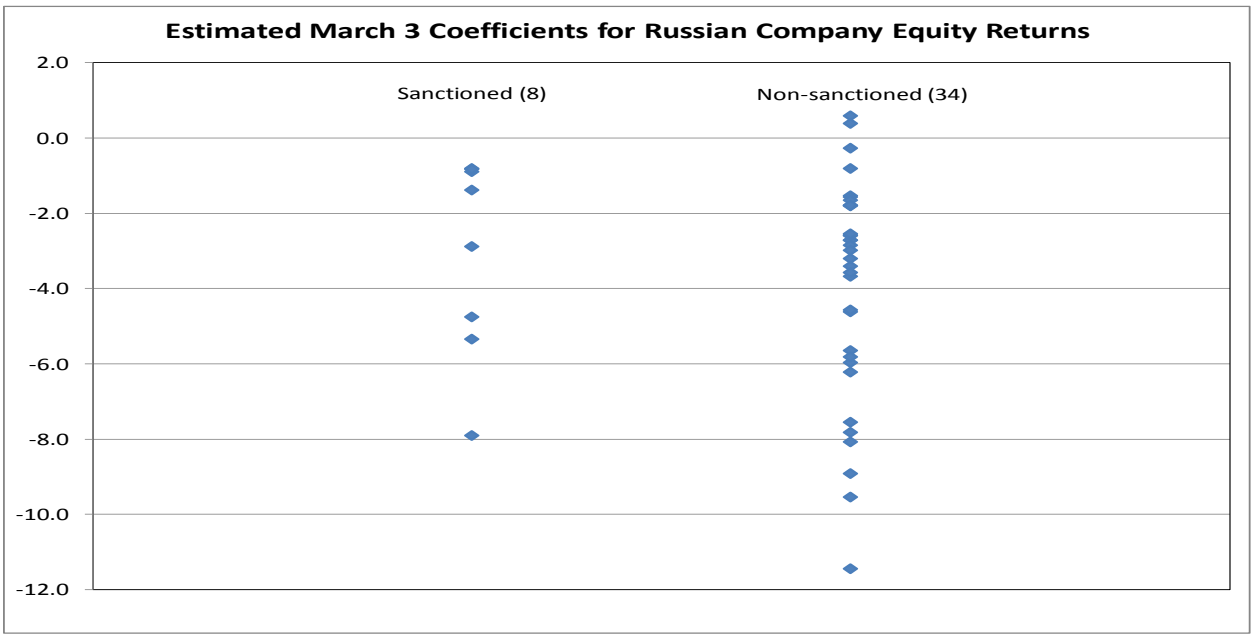

Chart 10