Spillovers of Western Economic Sanctions against Russia into Transition Economies

Gohar Samvel Sedrakyan[1]

Department of Economics, Finance and Quantitative Analysis
Michael J. Coles College of Business
Bagwell Center for the Study of Markets and Economic Opportunity
Kennesaw State University

Abstract

We analyze the spillovers of Western economic sanctions against Russia into twenty-seven transition economies of the former Soviet Union, and Central and Eastern Europe. These spillovers are measured in terms of their impact on bilateral trade and direct investments. We use gravity models of bilateral trade and direct investment for 2014-2018. A new dataset is constructed to quantify each episode of Western/US sanctions against Russia and the Poisson pseudo-maximum likelihood econometric technique is used to analyze it. We estimate that Western and US sanctions against Russia spilled over into third-party small countries. The effects of spillovers are as follows. Each episode of a Western/US sanction against an individual/entity/sector resulted in the reduction of Russian imports coming from transition economies in the amount of 10.233 million /$20.467 million /$30.700 and $5.671 million /$11.343 million /$17.014 million, respectively. Western/US sanction against an individual/entity/sector impacted the decline of Russian direct investments in transition economies by $2.716 million /$5.432 million /$8.148 million and $2.032 million /$4.065 million /$6.098 million, respectively. These findings suggest that the policy makers of sanction sending countries face a trade-off between addressing and disregarding the negative spillovers of sanctions. The mitigation strategies offered to small economies may preserve their economic stability and independence. The disregard of possible spillovers may result in economic decline of small economies and their further isolation.

JEL classifications: F4; F41; F51; P2; P33

Keywords: Sanctions; Transition economies; Small open economies; Spillover effects; Gravity models; International trade; Direct investments.

[1] Corresponding contact information: Address: 560 Parliament Garden Way, Kennesaw, GA 30144, USA
Email: gsedrak1@kennesaw.edu

1. Introduction

The motivation for this paper is to study whether sanctions imposed against a large open economy can produce spillovers into third-party small countries of the same region. We are using the case of Western sanctions against the Russian Federation during 2014-2018 and analyze their impact on bilateral economic activities, which include trade and foreign investments between Russia and transition economies (TE). Here, the focus is on the twenty-seven countries of the former Soviet Union (FSU), and Central and Eastern Europe (CEE) (Gevorkyan, 2018).

During last decades, various episodes of severe political struggles between foreign powers were resolved by imposing economic sanctions. From the general policy perspective, economic sanctions have been contemplated as more practicable than engagement in military conflicts, as they usually avoid the devastation caused by wars and preserve human lives (Neuenkirch and Neumier, 2016). Since 1960s scholars studied the episodes of sanctions and the causes for imposing them (Hoffmann, 1967; Galtung 1967; Wallensteen 1968; Daoudi and Dajani 1983; Lindsay 1986; Nossal 1989). Hufbauer et al. (1990) paper introduced the first comprehensive dataset of sanctions, also known as the HSE dataset, enabling a more systemized approach to the studies of their economic effects from 1914 to 2000. Later, Morgan et al. (2009) in the Threat and Imposition of Economic Sanctions (TIES) dataset added travel disputes and travel bans during 1945-2005. Then, Biersteker et al. (2018) in the Targeted Sanctions Consortium (TSC) quantitative and qualitative dataset compiled all episodes of UN sanctions in 1991-2013. Despite the comprehensive nature of these datasets, the criteria defining success of sanctions significantly differ (Biersteker et al., 2018). Therefore, the consensus that sanctions achieve successful policy outcomes is frequently challenged in scholarly debates.

Notwithstanding the wide use of sanctions, the general debate about their economic impact is still controversial. On the one hand, a volume of research views sanctions as a tool of political gains and emphasizes their symbolic effect. These scholars estimate that sanctions do not produce the desired democratic outcomes in target countries in about 65-95 percent of all studied cases (Pape, 1997; Baldwin and Pape, 1998; Hufbauer et al., 2009; Whang, 2011; Neuenkirch and Neumeier, 2016). On the other hand, a growing number of researchers agree that the Western sanctions against Russia contributed to this country's economic decline of 2014. Thus, a group of authors estimated a short-term negative shock from these sanctions that significantly contracted Russia's GDP (Gurvich and Prilepskiy, 2015; Tuzova and Qayum, 2016). The quantitative estimates defining the level of the short-term economic contraction are wide-spread. Thus, Tuzova and Qayum (2016) offer a more pessimistic view and assess the fall of quarterly economic activities by 19 percent. An IMF report (2015 a.) estimates a more modest economic decline of 1 to 1.9 percent annually. These two studies reach agreement about the possibilities of more severe economic consequences of sanctions in the medium-term forecast.

Our study goes one step further and focuses on the spillovers of sanctions into third-party countries. We focus on transition economies, which due to their geographic location, shared history, and cultural understanding have developed strong economic ties with the target state, Russia. In macroeconomic terms, this is an attempt to evaluate the medium-term spillovers of sanctions into small open economies that could arise in the aftermath of tensions between large open economies, i.e., the United States, the West and the Russian Federation. This analysis studies the economic shock on transition economies generated by multilateral and unilateral sanctions. The multilateral sanctions are imposed by Western economies including the US (hereinafter, West). The unilateral sanctions are imposed only by the US. The spillovers are

studied in terms of produced shocks in two economic determinants – bilateral trade and direct investments between the Russian Federation and transition countries.

Two gravity models- bilateral trade and bilateral investment flows- are constructed to conduct analysis. The Poisson pseudo-maximum likelihood (PPML) econometric tool is used to analyze the data.

The novelty of this study is threefold. First, we use the Dreger et al. (2016) method applied to one-year estimates of sanctions and develop a dataset which provides a quantitative estimate for each episode of multilaterally imposed Western economic sanctions against Russia extending it to the medium-term perspective from March, 2014 to 2018. Subsequently, the determinant of the unilaterally imposed economic sanctions by the US is disaggregated. Second, we use the divergence found in the literature about the method of computing the sanction variable and estimate it in two ways, as ordinal and continuous. We further discuss that the ordinal variable performs well in a one-year setup, while the continuous variable is useful for time-series. Third, these newly developed data are incorporated into a model which investigates the medium-term spillovers of the sanctions against Russia into transition economies and uses sanctions as a direct explanatory variable. We find that Western and US sanctions against Russia produced significant spillovers on the latter's bilateral trade with transition economies. We also find negative impacts of sanctions on direct investments from Russia to transition economies.

The rest of the paper is structured as follows. Section 2 offers a review of the literature. Section 3 discusses the method used in the computation of the variables of sanctions and describes other variables included in the analysis. Section 4 outlines the empirical strategy applied to the study. Section 5 covers the main results and provides corresponding discussion on policy recommendations. Section 6 concludes the study.

2. Literature Review

Two main schools of thought express widely divergent views about the effectiveness of economic sanctions. On the one hand, a large volume of literature poses a challenge to the true economic effects of sanctions and discusses their rather political role (Pape 1997; Hufbauer et al., 2009; Peksen, 2009; Whang, 2011). These studies emphasize the symbolic effect of sanctions. This assumption is drawn due to a lack of systemic evidence that imposed sanctions may influence political improvements in target states (Eland 1995; Whang, 2011). For instance, Eland (1995) views main effects of sanctions in shaping the global attitude towards specific malicious acts. This study suggests that the sanctions are primarily used for sending symbolic signals, which would mold the policies of third nations in line with their earlier observations. Whang (2011) focuses on the domestic effects of sanctions in the US presidential approval ranking from 1948 to 1999. Martin (2020) refers to the scale of human rights issues that produced a strong pressure in the US to impose sanctions against the violators.

Another school of thought finds that sanctions seriously impinge on the economy of target countries. Hufbauer et al. (2009) review 116 cases of sanctions since World War I and estimate that at least one-third of them were successful. They also assert an adverse relation between the rate of success and the scale of ambition demanded by sanctions, i.e., major policy changes. Neuenkirch and Neumeier (2015) in their study of 160 countries, of which 67 experience sanctions over the period of 1976-2012, estimate that the sanctions imposed by both the United Nations and the United States have had significant contractionary effects on GDPs of target economies leading to a decline of 2 and 0.75-1 percentage point, respectively. In another study, Neuenkirch and Neumier (2016) analyze the outcome of the US economic sanctions from 1982 to 2011. They assess that those living in poverty are most sensitive to the adverse economic

shock caused by the sanctions. They evaluate a striking contrast of 3.8 percentage point higher poverty gap between the sanctioned economies and the one's not being hit by financial restrictions. Caruzo (2003) in his study of bilateral trade between the US and forty-nine other countries estimates negative pressure of economic sanctions on trade. The sanctions are also viewed as a policy instrument that could contract the inflow of international capital, including foreign direct investments, foreign aid and financial grants (Hufbauer et al., 2009; Evenett, 2002). Other adversities of sanctions include a limited access to medicine and healthcare services (Garfield, 2002), reduced life expectancy and increased infant mortality (Daponte and Garfield, 2000).

There is a dual approach in measuring the impact of sanctions. Some studies evaluate adverse economic effects on target countries, while others seek evidence of desired policy changes (Hufbauer et al., 2009; Dreger et al., 2016; Peksen, 2019). The size and self-sufficiency of sanctioned economy, the existence of ties between the target and sanction imposing country, and the scope of sanction imposing unit (unilateral versus multilateral) predetermine the capacity of a state to absorb negative shocks from sanctions (Kaempfer and Lowenberg, 2007; Dreger et al., 2016; Neuenkirch and Neumeier, 2016). Several studies suggest that the impact of sanctions diminishes over time, as target countries develop strategies to overcome these adverse shocks (Gibbons and Garfield, 1999; Neuenkirch and Neumeier, 2015).

The literature has not reached a consensus regarding the depth of the economic shock in Russia from Western sanctions. Thus, Russia's economic decline of 2014 is attributed to two main factors: the plunge of oil prices and the Western sanctions against Russia as a retaliatory measure for the annexation of the Crimean Peninsula. The close attention of researchers to the deterioration of oil prices is driven by the growing importance of commodities in Russia's

export, surging from 50 percent in mid-90s to 70 percent in 2000s. This commodity dependence also affects budget revenues, in which the fraction of proceeds from crude and refined oil comprises almost 50 percent (Dreger, 2016; Fedoseeva, 2018). The studies of Dreger et al. (2016) and Fedoseeva (2018) assert that, due to Russia's heavy dependence on the export of natural resources, the country's 2014 economic slowdown and depreciation of domestic currency was the result of a sharp decline in oil prices. They conclude that economic sanctions were an amplifying but not the primary factor of contraction. On the contrary, a larger volume of studies estimates a direct impact of Western sanctions on the Russian economy. Tuzova and Qayum (2016) study the effects of both -sanctions and falling oil prices- on the main macroeconomic indicators in 1999-2015. They attribute significant sensitivity of the Russian economy to the volatility of oil prices. In addition, they estimate contraction of quarterly real GDP by 19 percentage points for two consecutive years, if sanctions are not lifted by the end of 2017. Gurvich and Prilepskiy (2015) in their comparative analysis of Russia's economic development with and without sanctions estimate that the former produces significant negative effects on gross capital inflow and GDP, and forecast 2.4 percentage points contraction of aggregate output by 2017. The IMF (2015 a.) Article IV report links the economic decline in Russia to the sanctions and forecasts 1-1.5 percentage points reduction in GDP growth rate in the short term, which, in the medium term, can potentially achieve over 9 percentage points.

In terms of the impact of sanctions on sender countries, Crozet and Hinz (2020) use a general equilibrium counterfactual analysis and conclude that the sanctions against Russia not only harmed the receiver's economy, but also resulted in the trade loss of about US$ 114 billion in sender economies of the West.

A comparatively limited literature analyzes the consequences of Western sanctions against Russia on third-party countries. Dreger et al. (2016) assert that the countries with strong economic ties with Russia are more prone to lower growth perspectives. The IMF (2015 b.) report lists potential scenarios of spillovers into neighboring economies through three main channels: trade, remittances and FDI. More recent studies attempted to assess the spillovers of sanctions either into a single economy, a group of countries or transition economies as a whole. Thus, Bayramov et al. (2020) use VAR functions to estimate the shock from sanctions against Russia on CEE and CIS countries. Their model does not use sanctions as a direct explanatory variable. They estimate two coefficients- 0.72 and 0.22- which reflect the cumulative decline in GDPs of CIS and CEE countries, respectively, when Russia's GDP contracts by 1 percent. With the assumption that the 9 percent plunge in Russia's GDP is primarily due to Western sanctions, they apply the estimated coefficients to indirectly assert that the corresponding cumulative level of recession in the CIS countries may reach 6.5 percent. Makhmutova (2019) compiles the macroeconomic data of the Eurasian Economic Union (EAEU) countries in 2015-2018 and reports a sharp decline in GDP in the first two years of sanctions. The same study estimates GDP growth in the two following years; however, the positive outlook is not consistent across all EAEU member-countries. Veebel (2021) focuses on the impact of sanctions against Russia on economic wellbeing of Estonia. This study estimates that the reduced trade between these two countries may diminish the economic sustainability of the newly developed Rail Baltic railway.

3. Data

3.1. Independent variables

3.1.1. Sanctions

During the period from 2014 to 2018, the sanctions against the Russian Federation were imposed on three main grounds. The first and primary reason for sanctions against Russia came as a response to the escalation of political instability in Ukraine and annexation of the Crimean Peninsula. This prompted a large group of countries, including the United States, the European Union, Canada, Australia, Japan, and others, to enact the first round of sanctions in March, 2014. The last sanction related to the Crimean crisis was imposed in August, 2019. It prohibited certain financial transactions with the Russian entities. The second ground for sanctions is related to human rights violations in Russia and is known as Global Magnitsky Act. They are imposed against the individuals who commit offenses prohibited by this law. The third reason for sanctions is the interference in the US 2016 presidential elections, which prompted the US to impose the sanctions unilaterally. The more recent sanctions, which are not a subject of our current analysis, are imposed to restrain harmful activities in the space of cyber capabilities (imposed in April, 2021).

The Russian Federation enacted reciprocal sanctions against the imposing economies through embargoes of certain sectors, and bans on imports of agricultural products and entries of individuals to its territory. Greater details on the development of political conflict in Ukraine are provided in Gurvich and Prilepskiy (2015), and Dreger et al. (2016). Due to the specific objectives of this research, our data collection focuses only on sanctions imposed by US and West against Russia.

Although the research on economic sanctions is an active field, a review of the literature determines a wide divide in the methods of constructing the sanction variable. Thus, in the majority of studies sanctions are considered an ordinal category (Dreger et al., 2016; Biersteker et al., 2018). We find studies of alternative scenarios, which use sanctions as a continuous variable (Neuenkirch and Neumeier, 2016). Tuzova and Qayum (2016), Haidar (2017), Besedeš et al. (2018) in their research use sanctions as a binary variable. In this study we construct a dataset of Western and from there disaggregate U.S. sanctions against Russia and in both cases include two approaches- ordinal and continuous- to the assessment of this determinant. Further, the estimation method factor-in a coefficient of the binary choice if a sanction was imposed, or otherwise. This strategy allows for deriving more comprehensive results of our study.

Thus, to construct the variable, we start building on the Dreger et al. (2016) method, which was developed to fit a one-year analysis. Their approach gives more dimensions to the variable of sanctions. Thus, it includes the combination of weights assigned to harshness on the economy of the target state, the level of pre-indictment economic integration with the sanction imposing country, and a binary indicator of whether an individual country imposed a sanction in a given period. This variable has three components: 1) sanctions against individuals; 2) sanctions against entities; and 3) sanctions against specific sectors of the economy. Similar to Neuenkirch and Neumeier (2016) and other studies in that group, Dreger et al. (2016) recognize varying levels of severity each type of sanctions may present and denote numbers 1, 2 and 3, where the ascending order reflects harsher economic implications. Thus, the sanctions constraining sectoral operations constitute a more profound shock to the economy than the ones imposed against individuals. Finally, this method assumes that the adversity of sanctions may diverge due to the level of pre-indictment economic integration the sanctioning and target countries had developed.

Thus, we continue building on this approach and further adjusting it to our questions and time frame of interest. For this purpose, we estimate the weight of bilateral cooperation as the share of the sanction imposing country in Russia's external trade for five years (2009-2013) preceding the sanctions. The method of constructing the variable of sanctions described in Dreger et al. (2016) is developed to analyze the period from March, 2014 to March, 2015 (one year). Their approach of annual estimation can be considered an estimate of an *ordinal variable* of sanctions for a given year, which can be extended to get corresponding data for consecutive periods $[Eq.1]$. Our dataset of sanctions includes these ordinal estimates of the Western and US sanctions in columns *(l)* and (*m)* of *Table A1*. To adjust the method for *continuous estimate* of sanctions over the five-year period, we introduce a time coefficient (w_k^r). Then we calibrate this coefficient to the month when the sanctions are imposed, since the extent to which a year-end sanction may affect an economy might not be fully reaped during that year and have deeper consequences in following years. Since the governments of sanction imposing countries repetitively extended revocation of existing sanctions and reaffirmed their continuous commitment to them, we make the assumption of a *continuous effect* of sanctions. This allows us to test the full depth of imposed sanctions if they are not lifted officially $[Eq.2]$. We also add an additional category, i.e., expelling diplomats or suspending voting rights of the Russian delegation, to the types of sanctions and assign level 1 for possible economic implications (coefficient w_i). These data are reported in columns *(j)* and *(k)* of *Table A1*. An extended volume of literature, including legislative documents, published articles and online publications were used to compile the information on sanctions against the Russian Federation. The exhaustive list of these sources is reported in the end of References section of this paper.

Table A1 describes the dataset and summarizes our estimates of sanctions. We start with the original form of the equation described in Dreger et al. (2016) and use the aforementioned steps to adjust it to our analysis. The equations for estimation of sanction S_t^r for *ordinal* variable [1] and for *continuous* variable [2] are given below:

$$S_t^r = \sum_{\tau=1}^{t} \sum_{i=1}^{I} \sum_{j=1}^{J} w_i^r w_j^r s_{\tau ij}^r \qquad [1]$$

$$S_t^r = \sum_{\tau=1}^{t} \sum_{k=1}^{K} \sum_{i=1}^{I} \sum_{j=1}^{J} w_i^r w_j^r w_k^r s_{\tau ij}^r \qquad [2]$$

where,

r reflects two scenarios of sanctions against Russia: the impact of 1) multilateral sanctions by West $\{West, Russia\}$ and 2) unilateral sanctions by US $\{US, Russia\}$.

$t -$ period 2014-2018

w_i^r -the weight of sanction i from the following:

$$w_i^r = \left\{ \begin{array}{c} 1, \text{if against persons: blocking property/suspension of entry} \\ 1, \text{if diplomatic sanctions: expell of diplomats/suspension of voting rights} \\ 2, \text{if against entities: blocking property/suspension of entry} \\ 3, \text{if against industries: restricted access to capital market/exports} \end{array} \right\}$$

w_j^r -the weight of country j integration in the economy of the Russian Federation; estimated as a sum of the mean share of export from Russia to a sanctioning country in total export of Russia and the mean share of import from a sanctioning country to Russia in total import of Russia over the five years preceding the sanctions (2009-2013).

$s_{\tau jt}^r$- individual sanction i by country j belonging to group r, where $s_{\tau ij}^r$ equals 1, if the sanction is imposed and 0, if otherwise.

w_k^r -the weight of time the sanction has been imposed (only in [2])

The time in w_k^r is computed based on the month when a sanction is indicted. This approach allows computation of more realistic coefficient corresponding with the time-frame

when the sanction went into effect and the actual impact on target economy. Thus, a new sanction imposed on December 18, 2014, the twelfth month of the year, would have $1/12 = 0.083$ impact in year 2014 and full-year impact (=1) in the following years until it is revoked. In the context of current analysis, none of the Western/US sanctions against Russia were revoked during the studied period, but rather were extended.

3.1.2. Other independent variables

The composition of exogenous variables in the dataset corresponds with the socioeconomic, demographic, historic and geographic measurements commonly found in the literature on gravity models for bilateral trade and direct investments flows. The data on GDP of transition economies and Russia in constant prices of 2015, population size, exchange rate of the national currency to the Russian ruble are retrieved from the United Nations Conference on Trade and Development (UNCTAD) database.

Google Maps is used to measure the direct distance between the capital cities of bilateral economic activities, where Moscow, the capital of the Russian Federation, is one of the capitals in each pair. The price per barrel of oil and a gallon of gas in USD in corresponding years is obtained from the statistics on crude oil future contract 1 and on regular gasoline future contract 1, respectively, retrieved from the US Energy Information Administration (EIA) website. The quality of governance is controlled by the ratio $\frac{CoC_{it}}{CoC_{Russia,t}}$, which reflects a relative cost of trade/investment associated with corruption in country pairs. Another variable of effective governance is the measure assigned to the level of political stability and absence of violence in the studied economies. These data are retrieved from the World Bank's WGI, where the higher numbers are assigned to economies with more efficient governance practices. Thus, the values below/above 1 reflect the countries with more inferior/superior to the Russian practices of

governance. The exchange rate of the national currency to the Russian ruble is used to reflect the relative cost of trade/investment in country pairs. The model also controls a set of binary regressors. Thus, the dummy variable for contiguity equals 1 if a country shares a border with Russia and 0, if otherwise. The total area of the Russian Federation is 17,098,242 square kilometers of which 22,408 kilometers comprise the borders with neighboring countries. According to the World Factbook, the following nine countries share a boarder with Russia: Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Latvia, Lithuania, Poland, and Ukraine. Another binary variable controls for those transition economies where a share of population speaks Russian. According to the World Factbook, the population in the majority of studied countries can speak Russian to a certain extent. Those countries include Armenia, Azerbaijan, Belarus, Estonia, Georgia, Hungary, Latvia, Lithuania, Kazakhstan, Kyrgyz Republic, Poland, Republic of Moldova, Tajikistan, Ukraine, and Uzbekistan. The World Population Review website serves as the source for obtaining binary variable on landlocked countries. The dummy variable for shared history is 1 if countries are among the fifteen republics of the former Soviet Union and 0, if otherwise.

The database of the World Trade Organization (WTO) is used to control for the regional trade agreements (RTA) with Russia, focusing on two different pairs of relations: RTAs and the WTO membership. The binary variable RTA_{it} covers three main treaties. The Free Trade Agreement in the context of the membership in the Commonwealth of Independent States (CIS), which in the case of selected countries, i.e., Armenia, Belarus, Kazakhstan, Kyrgyz Republic and the Russian Federation, was transformed to the Eurasian Economic Union in 2015. This also includes an RTA between the Russian Federation and Serbia signed on 06/03/2006. The binary variable WTO_{it} equals 1, if both, Russia and a transition economy, are members of WTO and 0,

Table 1. Descriptive statistics and data sources

Variables	Description	Mean	Std. Dev.	Min	Max	Source
Imp_{ijt}	Imports to Russia from TE (million USD)	1,689.429	2,660.43	2.540	13,316.01	World Integrated Trade Solution (WITS), World Bank
Exp_{jit}	Exports from Russia to TE	3352.05	4,540.372	11.748	22,779.8	World Integrated Trade Solution (WITS), World Bank
$Dirinv_{jit}$	Direct Investments from Russia to TE (million USD)	901.75	1,071.296	0.0	3,960.0	CDIS, Table 6, IMF
$Dirinv_{ijt}$	Direct Investments from TE to Russia (million USD)	349.985	633.293	0	3,418.0	CDIS, Table 6, IMF
S_t^{τ}	Sanctions West (unit) (cont.)	19.921	3.996	14.618	26.753	Own computations, Table A1
S_t^{τ}	Sanctions US (unit) (cont.)	4.193	1.191	2.638	6.186	Own computations, Table A1
S_t^{τ}	Sanctions West (unit) (ord.)	10.415	10.730	2.343	31.511	Own computations, Table A1
S_t^{τ}	Sanctions US (unit) (ord.)	2.311	1.294	1.397	4.826	Own computations, Table A1
GDP_{it-1}	Real GDP transition econ. in 2015 prices (million USD)	71,805.1	96,876.09	3,851.477	516,630.1	UNCTAD
GDP_{jt-1}	Real GDP Russia in 2015 prices (million USD)	1,381,851 .0	11,753.57	1,366,410.0	1,394,909.0	UNCTAD
$Dist_{ij}$	Direct distance (km)	1,731.544	638.272	676.89	2,992.61	Google Maps
Pop_{it-1}	Population size (million)	9.841	11.313	0.628	44.883	UNCTAD
$Oilpr_{t-1}$	Oil Price (per barrel/USD)	66.79	23.694	43.4	98.05	The US Energy Information Administration
$Gaspr_{t-1}$	Gas Price (per gallon/USD)	2.026	.590	1.40	2.84	
Er_{ijt-1}	Exchange rate of local currency to ruble	22.106	24.447	.011	74.174	UNCTAD
CoC_{ijt}	Control of corruption (CoC) (rate)	2.014	1.308	.220	5.097	World Governance Indicators (WGI), World Bank
$PolSt_{ijt}$	Political stability	3.618	2.314	0	10.75	
$Land_i$	Landlocked	.519	.502	0	1	World Population Review
$Cont_i$	Contiguity-Common border with Russia	.333	.473	0	1	The World Factbook, CIA
$Comlang_i$	Russian as common language in transition economy	.593	.493	0	1	The World Factbook, CIA
FSU_i	Common history-former Soviet Union	0.519	.502	0	1	Gevorkyan A., 2018
WTO_{it}	WTO	.770	.422	0	1	WTO
RTA_i	Regional Trade Agreements	.422	.496	0	1	WTO
$EU\ mem._i$	Member of the EU	.407	.493	0	1	europa.eu
Rem_{it}	Remoteness (million)	7.782	10.39174	.1783513	40.15935	Own calculations

if otherwise. Russia's accession to WTO took place in August, 2012, which covers the whole period of current analysis. A binary variable also controls whether a country is a member of the European Union (EU).

3.2. Dependent variables

The World Bank's dataset of the World Integrated Trade Solutions (WITS) is used to retrieve the data on bilateral trade from transition economies to the Russian Federation and vice versa. The data for inflows/outflows of direct investments from the Russian Federation to transition economies and vice versa is obtained from Table 3 of the Coordinated Direct Investment Survey (CDIS) produced by the International Monetary Fund. This survey presents the data on inward and outward direct investments as combination of equity positions and debt instruments and is cross-classified by the counterpart economy. The dataset of bilateral trade includes twenty-seven transition economies. The data on direct investments compiles information about twenty-six transition economies (except Turkmenistan). Since the data on Turkmenistan is reported as confidential, we choose not to include it and to avoid an assumption of 0 investment, which would not be valid and reflective of real situation. All dependent variables cover the period from 2014 to 2018. The list of transition economies covered in this analysis is provided in *Table 2*.

Table 2. Country Coverage

Former Soviet Union (FSU)		**Central and Eastern Europe (CEE)**	
Armenia	Latvia	Albania	Poland
Azerbaijan	Lithuania	Bulgaria	Romania
Belarus	Moldova	Croatia	Serbia
Estonia	Tajikistan	Czech Republic	Slovak Republic
Georgia	Turkmenistan	Hungary	Slovenia
Kazakhstan	Ukraine	Montenegro	Bosnia and
Kyrgyzstan	Uzbekistan	North Macedonia	Herzegovina

4. Methodology

The data analysis is conducted by using the Poisson pseudo-maximum likelihood (PPML) econometric technique described in Santos-Silva and Tenreyro (2006). As the mentioned article defines, PPML method is consistent in the presence of heteroscedasticity and useful for studies of models where the dependent variable equals zero. Both outlined issues are frequently found in the literature on international trade and investments. Although our dataset does not contain endogenous variables with zero values, here the PPML method allows for mitigation of heteroscedasticity issues. Next, Anderson and van Wincoop (2003), Head (2003), and Baier and Bergstrand (2007) find that correctly specified gravity models should account for the multilateral resistance terms (MRT). To meet these expectations the research may either introduce importer exporter country fixed effects or control for remoteness. Here, the following consideration shaped our choice of strategy. Due to the specifics of this analysis, where Russia is a side of each transaction in all country pairs, introduction of the importer-fixed effect would produce a constant-dummy for Russia and be automatically dropped by the statistical software. To keep consistency in the estimation approach applied to exporter and importer and to meet the required criteria in controlling MRTs, we introduce a determinant of remoteness. In addition, other commonly used time-invariant factors, such as the distance, the dummy for the common border, the dummy for the Russian-speaking population, and the dummy for the former Soviet countries, allow to control for other fixed effects. Our model incorporates the determinant of remoteness (Rem_{it}) estimated according to the approach described in Head (2003). It is a two-step estimate which measures given country's spatially weighted GDP from its trading partners and these weights are computed as the spatially weighted GDP shares in world GDP. Thus, the Head (2003) approach was used to estimate remoteness for this specific analysis and its

descriptive statistics is included in *Table 1* along with other independent determinants. The macroeconomic independent variables are used with one year lag to avoid reverse causality.

Our model follows the Santos-Silva and Tenreyro (2006) approach, which specifies the gravity equation in the level-log format with the natural logarithmic transformation of independent variables. In other words, according to the authors of this technique, the dependent variable is incorporated in the model in level- not logarithmic- form. Thus, the model takes the following form [3]:

$$Dep_{ijt} = \alpha_0 + \alpha_1 lnS_t^r + \alpha_2 lnGDP_{it-1} + \alpha_3 lnGDP_{jt-1} + \alpha_4 lnDist_{ij} + \alpha_5 lnPop_{it-1} + \alpha_6 lnOilpr_{t-1} + \alpha_7 lnGaspr_{t-1} + \alpha_8 lnErate_{ijt-1} + \alpha_9 CoC_{ijt-1} + \alpha_{10} PolSt_{it-1} + \alpha_{11} Rem_{it-1} + \alpha_{11} A_i + \varepsilon_{it} \quad (3)$$

where:

Dep_{ijt} stands for endogenous factors- a) volume of imports from TE (i) to Russia (j) at time (t); b) volume of exports from Russia (j) to TE (i), c) volume of direct investment from Russia (j) to TE (i), and d) volume of direct investments from TE (i) to Russia (j),

S_t^r -sanctions- a) Western sanctions against Russia at time t calculated as continuous variable, b) Western sanctions against Russia -ordinal variable, c) US sanctions against Russia- continuous variable, and d) US sanctions against Russia-ordinal variable

A_i -vector of binary variables, i.e., $Land_i, Cont_i, Comlang_i, FSU_i, WTO_i, RTA_i, EU_i$

Rem_{it} - remoteness,

ε_{it} − cluster robust error (clustered on country pairs).

Additional information on the description and sources of the variables included in the model is provided in *Table 1*. When choosing regressors, the stepwise approach determined a small divergence between the models of bilateral trade and direct investment flows.

To check the adequacy of the method a heteroscedasticity-robust RESET test is performed. Here, we report $p - value > 0$, which suggests that the specifications of the conditional expectation in the gravity models are properly defined. It is evaluated in terms of the significance of an additional regressor constructed as $(xb)^2$, where b is the vector of estimated values.

5. Results

In this paper we developed a dataset of 2014-2018 sanctions against the Russia Federation, which allows to assign a quantitative estimate to each episode of sanctions. The sanctions dataset provided in *Table A1* enables possibility of using these data in daily, quarterly, annual and medium-term studies of the economy of the Russian Federation for the period from 2014-2018. We further explore this newly developed dataset to study the spillovers of sanctions against Russia into transition economies particularly in terms of their impacts on bilateral trade and direct investments. First, we summarize the main takeaway from the explored dataset. Then, we continue with the discussion on obtained macroeconomic results of the spillover effects.

The dataset of sanctions, particularly when ordinal variables are used, performed well when the task was to assess one-year impact of sanctions. This positive performance held for both cases- the multilateral Western sanctions and the disaggregated US sanctions- used in the analysis. However, for more complex time-series the determinants, which were estimated as continuous factors, produced robust results supported by the literature. This can be attributed to the fact that the sanctions not only remained unrevoked but were also revived by the

governments of sanction imposing countries, which used recurrent announcements of their further extensions. In light of this information and to finalize our choice of the variable of sanctions for the medium-term analysis, we drew graphs to compare and contrast both, continuous and ordinal, estimates (*Figure 1*). According to *Figure 1*, the ordinal estimate of Western sanctions sharply fluctuates in the beginning of the period, then it remains stably low. In contrast, the continuous determinant of Western sanctions does not have such a sharp spike in the beginning of the period, but it rather distributes the strength of the accumulated impact more evenly across the studied time horizon. The same effect, on a smaller scale, is observed with the two modes of estimates of the US sanctions. Based on the outlined observations, we proceed with the discussion of our study results obtained with the determinants of sanctions, which are treated as continuous parameters. Upon request, the results with ordinal parameters will be shared.

Figure 1. Western and U.S. sanctions, continuous vs. ordinal estimates (2014-2018)

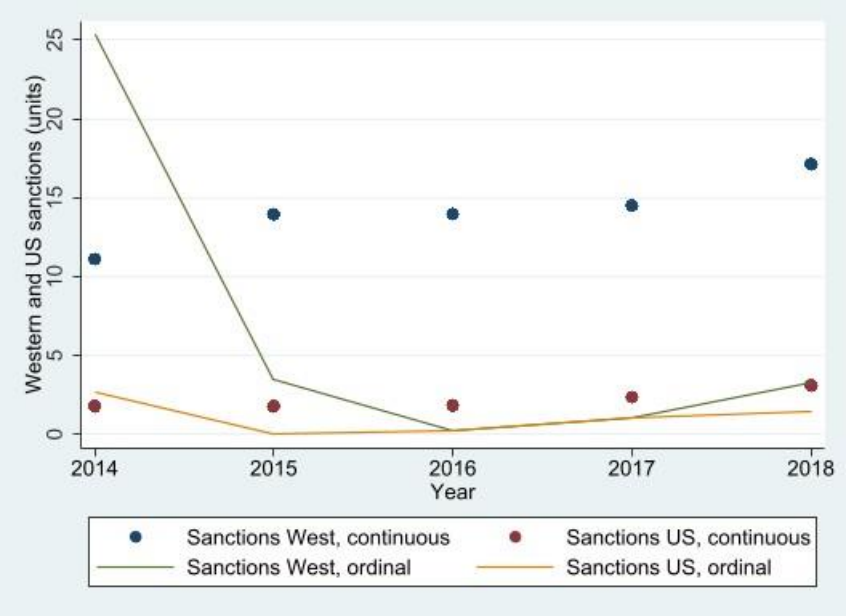

Table 3 below summarizes the results of our analysis concerning the impact of Western and US sanctions on bilateral trade between the Russian Federation and transition economies for

the period from 2014 to 2018. Both sanctions-multilateral and unilateral- had significant negative impact on Russian *imports* from transition economies and Russian *exports* to transition economies. Thus, our analysis suggests that the 1 percent rise in multilaterally imposed Western sanctions, with all other explanatory variables held constant, contracted Russian imports from transition economies by 0.081 million dollars. The unilaterally imposed U.S. sanctions also significantly affected imports. The impact was somewhat weaker, as an increase of U.S. sanctions by 1 percent resulted in 0.069 million dollars decline in imports. Sanctions also negatively impacted Russian exports to transition economies. The analysis assessed that 1 percent increase in Western sanctions reduced Russian exports to transition economies by 0.047 million dollars. U.S sanctions alone had a strong impact and their increase by 1 percent contracted Russian exports to transition economies by 0.04 million dollars. The models suggest that, other factors also impacted bilateral trade between the Russian Federation and transition economies. Thus, Russia's economic growth and having signed regional trade agreements resulted in a significant rise in bilateral trade. Surging oil prices significantly contracted both, imports and exports, between transition economies and Russia. Some factors had a stronger impact either on imports or on exports. Thus, with the depreciation of the national currency to the Russian ruble, the level of Russian imports from transition economies increased. Russian imports were positively impacted by a surge of products from landlocked countries. In contrast, Russian imports from the WTO member countries, on average, were lower. The Russian exports were higher in the countries with an adjacent boarder, and of the European Union. The models of exports and imports which have the US sanctions as one of the explanatory variables also suggest that an increase in the price of gas resulted in a decline of bilateral trade.

Table 3. The impact of sanctions on bilateral trade between the Russian Federation and Transition Economies 2014-2018

	Imports from TE to Russia		*Exports from Russia to TE*	
lnS_{jt} (Sanctions West)	-8.058*** (1.379)		-4.673** (1.751)	
lnS_{jt} (Sanctions US)		-6.935*** (1.187)		-4.022** (1.507)
$lnGDP_{it-1}$	-.238 (.465)	-.238 (.465)	-.617 (.778)	-.617 (.778)
$lnGDP_{jt-1}$	155.044*** (28.156)	170.649*** (30.817)	93.306* (39.323)	102.356* (42.696)
$lnDist_{ij}$	-.885 (.969)	-.885 (.969)	-1.267 (.841)	-1.267 (.841)
$lnPop_{it}$	-.020 (.998)	-.020 (.998)	.984 (3.067)	.984 (3.067)
$lnOilpr_{t-1}$	-5.570*** (1.097)	-4.155*** (.867)	-3.397* (1.453)	-2.576* (1.157)
$lnGaspr_{t-1}$	.090 (.368)	-3.212*** (.379)	.086 (.416)	-1.828*** (.494)
$lnErate_{it-1}$	-.269* (.122)	-.269* (.122)	-.242 (.207)	-.242 (.207)
$Land_i$	1.102* (.500)	1.102* (.500)	1.331 (1.682)	1.331 (1.682)
$RusLang_i$	.084 (1.978)	.084 (1.978)	-.349 (.580)	-.349 (.580)
$Cont_i$	-.577 (2.848)	-.577 (2.848)	1.858* (.868)	1.858* (.868)
WTO_i	-.254** (.081)	-.254** (.081)	.017 (.092)	.017 (.092)
EU_i	.119 (2.184)	.119 (2.184)	2.213* (1.049)	2.213* (1.049)
COC_{it}	-.026 (.047)	-.026 (.047)	.094 (.086)	.094 (.086)
$PolStab_i$	.012 (.025)	.012 (.025)	.053 (.030)	.053 (.030)
RTA_i	.768*** (.122)	.768*** (.122)	.374* (.148)	.374* (.148)
Rem_{it}	-.183 (.120)	-.183 (.120)	.010 (.034)	.010 (.034)
Const.	-2127.996*** (391.459)	-2366.594*** (432.147)	-1272.068* (545.309)	-1410.431* (596.908)
N groups/observations	27/135	27/135	27/135	27/135
Pseudo log-likelihood	-1885.218	-1885.218	-6760.918	-6760.918
RESET p-value	0.185	0.185	0.036	0.036

*Note: clustered robust standard errors in parenthesis; *, ** and *** indicate significance at 0.05, 0.01 and 0.001, respectively.*

Table 4 summarizes the impact that the Western and US sanctions had on direct investment flows from the Russian Federation to transition economies and vice versa. The analysis shows that during 2014-2018 Russian direct investments in transition economies significantly declined as a result of both- Western and US-sanctions. Thus, holding other explanatory variables constant, a 1 percent increase in Western sanctions, on average, reduced the Russian direct investments to transition economies by 0.0258 million dollars. An increase of the US sanctions by 1 percent contracted Russian direct investments in transition economies by 0.0222 million dollars. Other factors also played a significant role in fluctuations of direct investment flows. Thus, Russia's economic expansion sharply increased the outflow of direct investments to transition economies. Economic contraction in transition economies led to an increase of Russian investment flows to these countries. The Russian investment flow was higher in the transition economies, which were landlocked, members of the European Union, members of WTO, or had a larger population size. The appreciation of the national currency to the Russian ruble was another significant factor to attract direct investments from Russia. The transition economies with signed regional trade agreements and with the majority of population speaking Russian received lower volumes of Russian direct investments.

In contrast, the sanctions had a significant positive impact and resulted in an increase of direct investments from transition economies to the Russian Federation. Thus, a 1 percent increase in Western sanctions resulted in a rise of direct investments from transition economies to Russia in the amount of 0.081 million dollars. In case of the US sanctions, a 1 percent increase in the US sanctions increased the direct investments from transition economies to Russia 0.0697 million dollars. The economic recession in Russia increased direct investment flows from transition economies. Thus, Russia's economic decline by 1 percent resulted, on average, in

1.644 - 1.801 million dollars increase in inward direct investments from transition economies. Interestingly, the levels of corruption and political stability also strongly impacted direct investments. The countries with inferior governance efficiencies in terms of controlling for corruption and with a higher level of political stability had tendency to direct more investments to Russia. Finally, the price of gas had a significant impact on direct investments in the models with US sanctions. Thus, the decline in the price of gas resulted in an increase of Russian direct investments to transition economies. In contrast, rising gas prices increased the flow of direct investments from transition economies to Russia. Overall, a sharp percentage increase of Russia's inward direct investments can be attributed to Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Serbia and Ukraine. This rise in direct investments from transition economies was observed in 2016 and remained flat afterwards. In terms of the volume, the largest inflow of direct investments to Russia came from the transition economies included in *Figure 2*.

Figure 2. Direct investment inflow to Russia sent from transition economies

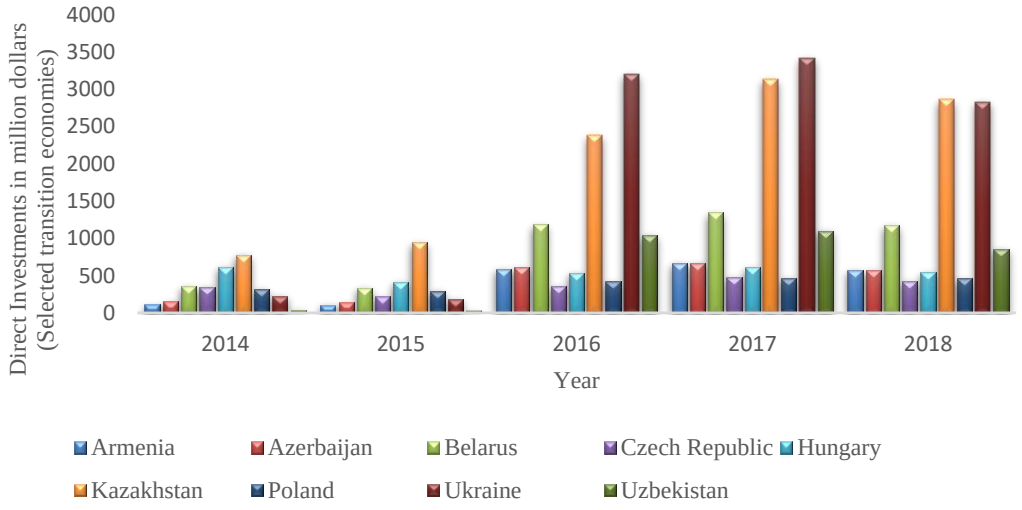

Table 4. The impact of sanctions direct investment flows between the Russian Federation and Transition Economies 2014-2018

	Direct Investments from Russia to TE		*Direct Investments from TE to Russia*	
lnS_{jt} (Sanctions West)	-2.581** (.838)		8.103** (3.083)	
lnS_{jt} (Sanctions U.S.)		-2.221** (.721)		6.974*** (2.653)
$lnGDP_{it-1}$	-2.064*** (.524)	-2.064*** (.524)	-.381 (1.980)	-.381 (1.980)
$lnGDP_{jt-1}$	58.077*** (17.726)	63.075*** (19.339)	-164.371* (66.560)	-180.064* (72.510)
$lnDist_{ij}$	.510 (.756)	.510 (.756)	-.401 (.579)	-.401 (.579)
$lnPop_{it}$	2.864** (1.025)	2.864** (1.025)	.241 (1.273)	.241 (1.273)
$lnOilpr_{t-1}$	-1.341 (.977)	-.888 (.845)	2.098 (2.169)	.675 (1.656)
$lnGaspr_{t-1}$	-.611 (.585)	-1.669*** (.443)	.849 (.668)	4.169*** (1.074)
$lnErate_{it-1}$	.387* (.154)	.387* (.154)	-.304 (.221)	-.304 (.221)
$Land_i$	2.924** (1.115)	2.924** (1.115)	1.431 (1.684)	1.4312 (1.684)
$RusLang_i$	-2.661** (.895)	-2.661** (.895)	-1.457 (1.345)	-1.457 (1.345)
$Cont_i$	1.925 (1.304)	1.925 (1.304)	-.185 (1.980)	-.185 (1.980)
WTO_i	.119* (.054)	.119* (.054)	-.004 (.186)	-.004 (.186)
EU_i	2.600** (.824)	2.600** (.824)	.536 (2.523)	.536 (2.523)
FSU_i	1.982 (1.397)	1.982 (1.397)	3.194* (1.273)	3.194* (1.273)
COC_{it}	.036 (.030)	.036 (.030)	-.329** (.126)	-.329** (.126)
$PolStab_i$	.002 (.012)	.002 (.012)	.259*** (.067)	.259*** (.067)
FTA_i	-.469*** (.077)	-.469*** (.077)	-1.052*** (.245)	-1.052*** (.245)
Rem_{it}	.031 (.016)	.031 (.016)	-.091 (.104)	-.091 (.104)
Const.	-791.103*** (241.909)	-867.523*** (266.570)	2302.015* (915.155)	2541.944* (1006.186)
N groups/observations	26/130	26/130	26/130	26/130
Pseudo log-likelihood	-1210.999	-1210.999	-1220.072	-1220.072
RESET p-value	0.828	0.828	0.062	0.062

*Note: clustered robust standard errors in parenthesis; *, ** and *** indicate significance at 0.05, 0.01 and 0.001, respectively.*

6. Policy Implications

Our analysis assessed a significant distortionary effect of sanctions on bilateral trade flow between transition economies and the Russian Federation, which declined over the medium term. The Western sanctions inversely impacted the outflow of Russian direct investments to transition economies which fell during the same period of 2014-2018. Interestingly, the sanctions stimulated the inflow of direct investments sent from transition economies to the Russian Federation. In this section we further discuss the results of our analysis in terms of the incremental costs of sanctions on transition economies, since sanctions are not imposed in percentages. They are mainly imposed against individuals, entities, and sectors as categorized by types in *Table A1*. For the purpose of this analysis, we will assess the overall incremental cost associated with the contraction of Russian imports sent from transition economies and the reduction of Russian direct investments to transition economies. The same logit can be applied to estimate the impact of sanctions on reduction of Russian exports to and inward direct investments from transition economies. Overall, the decline of Russian exports should trigger macroeconomic concerns for the latter country. We certainly recognize that the net-importer transition economies may have adjusted tax systems so they would collect higher customs duties/VAT revenues from imports; but this topic is beyond the scope of current analysis. The higher inward direct investments from transition economies in Russia, when this country undergoes severe recession, will largely benefit the latter. The investing transition economies may capture gains in the long term, which is also beyond the scope of current analysis. Therefore, to further quantify the depth of the spillovers and estimate the incremental cost of transition economies associated with each type of sanction *Table 1* is used to get the corresponding mean values. Thus, the mean values of the Western/ US sanctions using

continuous approach is 19.921/4.193, therefore their 1 percent equals to 0.199/0.042, respectively. *Table A1* helps in further assessment of the cost associated with each type of sanction. For transition economies the *contraction of their share in Russian imports associated with e*ach episode of individual/entity/sectoral sanction imposed in the beginning of a year will translate into about 5/9/14 times over $80,580 and 3/6/9 times over $69,350 for the Western and U.S. sanctions, respectively. Since there are 27 small economies involved, combined they will bear an overall incremental cost of $10.233 million /$20.467 million /$30.700 and $5.671 million /$11.343 million /$17.014 million, respectively, when each episode of individual/entity/sectoral Western/U.S. sanction is imposed. For transition economies *the combined incremental cost of sanctions from the reduction in direct investment flows from Russia* is estimated as 5/9/14 times over $25,810 and 3/6/9 times over $22,210. Then, these estimates are multiplied by twenty-six, which is the number of transition economies included in this part of the study. Thus, the spillover driven overall incremental cost associated with each episode of individual/entity/sectoral Western/U.S. sanction is $2.716 million /$5.432 million /$8.148 million and $2.032 million /$4.065 million /$6.098 million, respectively. Here, the estimated incremental costs of Western sanctions do not factor in the assessed values of U.S. sanctions.

The outlined results suggest that the decision to impose sanctions may address only a small part of the issue, which is to send restraining signals and possibly cause economic shocks to a country-violator of universally accepted rules of sovereignty, peace and human rights. However, the globalization and accelerated international trade have created highly integrated implicit economic zones where one large influential state ensures economic well-being of small open countries of the same region. The economic shocks sent to the core state of an implicit

economic zone may produce significant spillovers into smaller countries. In the described environment of highly integrated economic zones, the policy makers of sanction imposing countries are left to consider two options. The first one is to address the spillovers into small economies, to provide solution for softening the spillovers and, as a consequence, to enable their more independent from the core-country economic and public policies. The second option is to leave the spillovers into smaller countries unnoticed and to allow their deeper economic decline with the subsequent economic and political isolation within the already existing implicit economic zones.

7. Conclusions

In this paper we constructed a dataset which assigned quantitative values to each episode of Western sanctions against the Russian Federation from 2014-2018. It disaggregated the determinant of the US sanctions for the same period. This newly developed dataset was utilized to study possible spillovers of Western and US sanctions into twenty-seven transition economies of the former Soviet Union, and Central and Eastern Europe. This dataset allows to directly control for the determinants of sanctions in the models and can benefit researchers whose work align within the broad topic of the studies on Russian economy of 2014-2018.

Our analysis estimated that both- Western and US- sanctions significantly reduced bilateral trade between the Russian Federation and transition economies. Sharp contractions of both imports and exports were assessed. Thus, according to our estimates each episode of imposed individual/entity/sectoral Western/U.S. sanction produced an incremental cost of 10.233 million /$20.467 million /$30.700 and $5.671 million /$11.343 million /$17.014 million, respectively, for twenty-seven transition economies which came from a reduction of Russian

imports from these countries. We also studied the impact of sanctions on direct investments between the Russian Federation and transition economies. Here, we assessed that the imposed sanctions had a contractionary impact on Russian direct investments in transition economies. Twenty-six transition economies combined bore an overall incremental cost associated with each episode of individual/entity/sectoral Western/U.S. sanction in the amount of $2.716 million /$5.432 million /$8.148 million and $2.032 million /$4.065 million /$6.098 million, respectively. In contrast, the sanctions significantly increased the direct investments from transition economies to the Russian Federation.

In light of our findings, we recommend revisiting the concept of sanctions as a targeted tool of intervention. As we saw in this analysis, that the accelerated international trade created highly integrated implicit economic zones with one large influential economy ensuring economic stability of small open countries of the same region. A significant targeted shock to this core country of an implicit economic zone may spillover and produce sharp volatilities in small open countries of the same region. As a result, the policy makers of sanction sending countries may face a trade-off between addressing and disregarding the spillovers from sanctions. Mitigation strategies, implemented simultaneously to the sanctions, would help these small open economies to preserve their economic and, as a consequence, political stability. The strategies disregarding possible spillovers will further isolate these small economies within the implicit economic zones and deepen their economic and political dependence from that core economy.

Acknowledgements

The author would like to thank the attendees of the 2020 SEA (Southern Economic Association) and 2021 ASSA (Allied Social Science Associations) meetings for interesting discussions in the early development of the paper. The author also would like to thank two anonymous referees of the Coles Working Paper Series for valuable comments. The regular disclaimer applies.

References

Baldwin D.A, Pape R.A., 1998. Evaluating economic sanctions. *International Security*. 23(2), 189-198.

Bapat N. A., Morgan C.T., 2009. Multilateral versus Unilateral Sanctions Reconsidered: A Test Using New Data. *International Studies Quarterly*, 53 (4), 1075–1094.

Bayramov V., Rustamli N., Abbas N., 2020. Collateral damage: The Western sanctions on Russia and the evaluation of implications for Russia's post-communist neighbourhood. *International Economics*, 162, 92-109.

Besedeš T., Goldbach S., Nitsch V., 2018. You're banned! The effect of sanctions on German cross-border financial flows. *Economic Policy*, 32 (90), 263–318.

Biersteker T.J., Eckert S.E., Tourinho M., Hudáková Z., 2018. UN targeted sanctions datasets (1991–2013). *Journal of Peace Research*, 55(3), 404-412.

Crozet M., Hinz J., 2020. Friendly fire: the trade impact of the Russia sanctions and counter-sanctions. *Economic Policy*, 35 (101), 97–146.

Daponte B., Garfield R., 2000. The effect of economic sanctions on the mortality of Iraqi children prior to the 1991 Persian Gulf War. *American Journal of Public Health*, 90, 546–552.

Daoudi M., Dajani M., 1983. Economic Sanctions: Ideal and Experience. Boston, MA: *Routledge*.

Dreger C., Kholodilin K., Ulbricht D., Fidrmuc J., 2016. Between the hammer and the anvil: The impact of economic sanctions and oil prices on Russia's ruble. *Journal of Comparative Economics*, 44 (2), 295–308.

Drezner D., 2003. The Hidden Hand of Economic Coercion. *International Organization*, 57 (3), 643–659

Early B. R., Spice R., 2015. Economic Sanctions, International Institutions, and Sanctions Busters: When Does Institutionalized Cooperation Help Sanctioning Efforts? *Foreign Policy Analysis*, 11 (3), 339–360.

Eland I. (1995) Economic sanctions as a tool of foreign policy. In smart sanctions: Targeting economic statecraft, edited by Cortright David Lopez George. Lanham: Rowman and Little Field.

Fedoseeva S., 2018. Under pressure: Dynamic pass-through of oil prices to the Rub/USD exchange rate. *International Economics*, 156, 117-126.

Galtung J., 1967. On the Effects of International Economic Sanctions: With Examples from the Case of Rhodesia. *World Politics*, 19 (3), 378–416.

Gevorkyan A. V., 2018. Transition economies: Transformation, development, and society in Eastern Europe and the former Soviet Union. *Oxford: Routledge*.

Gibbons E., Garfield R., 1999. The impact of economic sanctions on health and human rights in Haiti 1991–1994. *American Journal of Public Health*, 89, 1499–1504.

Gurvich E., Prilepskiy I., 2015. The impact of financial sanctions on the Russian economy. *Russian Journal of Economics.* 1, 359-385.

Haidar J.I., 2017. Sanctions and export deflection: evidence from Iran. *Economic Policy*, 32 (90), 319-355.

Head K. (2003), "Gravity for beginners", mimeo, University of British Columbia.

Hoffmann F., 1967. The Functions of Economic Sanctions: A Comparative Analysis. *Journal of Peace Research*, 4 (2), 140–160.

Hufbauer G., Schott J., Elliott K.A., Oegg B., 1990. Economic sanctions reconsidered: History and current policy. *Peterson Institute*, vol. 1.

Hufbauer G., Schott J., Elliott K.A., Oegg B., 2009. Economic sanctions reconsidered: History and current policy. third ed. *Institute for International Economics*, Washington, DC.

IMF, 2015 a. Russian Federation: 2015 article IV consultation-Press release and staff report. *IMF Country Report*, 15/211.

IMF, 2015 b. The spillover effects of Russia's economic slowdown on neighboring countries. Washington, D.C.: *International Monetary Fund*, 2015.

Kaempfer W.H., Lowenberg A.D., 2007. The Political Economy of Economic Sanctions. *Handbook of Defense Economics*, chapter 27, 2, 867–911.

Lindsay J. M., 1986. Trade Sanctions as Policy Instruments: A Re-Examination. *International Studies Quarterly*, 30 (2), 153–173.

Makhmutova E., 2019. Sanctions against Russia and their impact on the Eurasian economic union. *International Organizations Research Journal*, 14 (3), 99-116

Martin L. L., 2000. Democratic commitments: Legislatures and international cooperation. *Princeton University Press*.

Miers A., Morgan T.C., 2002. Multilateral Sanctions and Foreign Policy Success: Can Too Many Cooks Spoil the Broth? *International Interactions*, 28 (2), 117–136.

Morgan, T.C., Bapat N., Krustev V., 2009. The threat and imposition of economic sanctions, 1971—2000. *Conflict Management. Peace Science*. 26 (1), 92–110.

Neuenkirch M., Neumeier F., 2015. The impact of UN and US economic sanctions on GDP growth. *European Journal of Political Economy*, 40 (A), 110-125.

Neuenkirch M., Neumeier F., 2016. The impact of US sanctions on poverty. *Journal of Development Economics*, 121, 110–119.

Nossal K. R., 1989. International Sanctions as International Punishment. *International Organization*, 43 (2), 301–322.

Pape R.A., 1997. Why economic sanctions do not work. *International Security*, 22 (2), 90-136.

Peksen D., 2009. Better or worse? The effect of economic sanctions on human rights. *Journal of Peace Research*, 46(1), 59–77.

Peksen D., 2019. When Do Imposed Economic Sanctions Work? A Critical Review of the Sanctions Effectiveness Literature, *Defence and Peace Economics*, 30 (6), 635-647.

Santos-Silva J.M.C., Tenreyro S., 2006. The log of gravity. *The Review of Economics and Statistics*, 88 (4), 641–658.

Tuzova Y., Qayum F., 2016. Global oil glut and sanctions: The impact on Putin's Russia. *Energy Policy*, 90, 140-151.

Veebel V., 2020. From the EU Membership to the Sanctions Against Russia: Factors Behind the Collapse of Estonian Transit Sector. *Problems of Economic Transition*, 62:1-2, 108-132

Wallensteen P., 1968. Characteristics of Economic Sanctions. *Journal of Peace Research*, 5 (3), 248–267.

Whang T., 2011. Playing to the home crowd? Symbolic use of economic sanctions in the United States. *International Studies Quarterly*, 55 (3), 787–801.

List of sources used to compile information on sanctions imposed against the Russian Federation from 2014 to 2018:

European External Action Service: <http://eeas.europa.eu/cfsp/sanctions/index _en.htm>

European Council, Council of the European Union: <EU sanctions against Russia over Ukraine - Consilium (europa.eu)>

US Department of the Treasury:

<https://www.treasury.gov/resource-center/sanctions/Programs/Pages/ukraine.aspx>

Wikipedia.org: <International sanctions during the Ukrainian crisis - Wikipedia>

Radio Free Europe, Radio Liberty: <A Timeline Of All Russia-Related Sanctions (rferl.org)>

Australia, Minister for Foreign Affairs:

<Australia imposes autonomous sanctions connected to Kerch Strait Railway | Australian Minister for Foreign Affairs Minister for Women (foreignminister.gov.au)>

Norway:

<https://www.bloomberg.com/news/articles/2014-08-12/norway-ready-to-act-as-russian-sanctions-trigger-fallout-probe>

Switzerland:

<https://web.archive.org/web/20140908113316/https://www.news.admin.ch/message/index.html?lang=en&msg-id=54221>

Japan:<Overview of Russian sanctions implemented by Japan – Sanctions & Export Controls Update (bakermckenzie.com)>

Canada: <Canada Gazette – Regulations Amending the Special Economic Measures (Russia) Regulations>

APPENDICES

Table A1. Estimates of Western and U.S. economic sanctions against Russia (2014-2018)

Country	Econ Integration (w_j^r)	Coeff. of time (w_τ^r)	Date	Type of sanctions against:				Total number (w_i^r)	Sanction continuous $\{West, Rus\}$ (S_t^r)	Sanction continuous $\{\text{US}, Rus\}$ (S_t^r)	Sanction ordinal $\{West, Rus\}$ (S_t^r)	Sanction ordinal $\{\text{US}, Rus\}$ (S_t^r)
				political	individuals	entities	sectors					
(a)	*(b)*	*(c)*	*(d)*	1	1	2	3	*(i)*	*(j)*	*(k)*	*(l)*	*(m)*
United States	0.127	0.833	3/3/2014	yes				1	0.106	0.106	0.127	0.127
United States	0.127	0.833	3/17/2014		yes			1	0.106	0.106	0.127	0.127
European Union	0.937	0.833	3/17/2014		yes			1	0.781		0.937	
Canada	0.011	0.833	3/17/2014		yes	yes		3	0.028		0.033	
Japan	0.014	0.833	3/17/2014	yes	yes	yes		4	0.047		0.056	
Australia	0.002	0.833	3/19/2014		yes			1	0.002		0.002	
United States	0.127	0.833	3/20/2014		yes	yes		3	0.318	0.318	0.381	0.381
European Union	0.937	0.833	3/20/2014	yes				1	0.781		0.937	
United States	0.127	0.833	3/21/2014		yes			1	0.106	0.106	0.127	0.127
Norway	0.013	0.833	3/21/2014		yes			1	0.011		0.013	
United States	0.127	0.833	3/27/2014	yes				1	0.106	0.106	0.127	0.127
United States	0.127	0.833	3/28/2014	yes				1	0.106	0.106	0.127	0.127
Switzerland	0.09	0.750	4/1/2014		yes			1	0.068		0.09	
European Union	0.937	0.750	4/10/2014	yes				1	0.703		0.937	
Albania	0	0.750	4/11/2014		yes			1	0.000		0	
Iceland	0	0.750	4/12/2014		yes			1	0.000		0	
Montenegro	0	0.750	4/13/2014		yes			1	0.000		0	
Ukraine	0.082	0.750	4/14/2014		yes			1	0.062		0.082	
United States	0.127	0.750	4/28/2014		yes	yes	yes	6	0.572	0.572	0.762	0.762
European Union	0.937	0.750	4/28/2014		yes	yes		1	0.703		0.937	
Australia	0.002	0.667	5/21/2014		yes	yes		3	0.004		0.006	
United States	0.127	0.583	6/20/2014		yes			1	0.074	0.074	0.127	0.127
European Union	0.937	0.500	7/12/2014		yes			1	0.469		0.937	
United States	0.127	0.500	7/16/2014		yes	yes	yes	6	0.381	0.381	0.762	0.762
European Union	0.937	0.500	07/18/201			yes		3	1.406		2.811	
Canada	0.011	0.500	7/24/2014			yes		2	0.011		0.022	
European Union	0.937	0.500	7/26/2014		yes	yes		3	1.406		2.811	
United States	0.127	0.500	7/29/2014			yes	yes	5	0.318	0.318	0.635	0.635
European Union	0.937	0.500	7/29/2014		yes	yes		3	1.406		2.811	

European Union	0.937	0.500	7/31/2014			yes	yes	5	2.343		4.685	
Japan	0.014	0.417	8/5/2014		yes	yes	yes	6	0.035		0.084	
United States	0.127	0.417	8/6/2014				yes	3	0.159	0.159	0.381	0.381
Australia	0.002	0.417	8/8/2014				yes	3	0.003		0.006	
Norway	0.013	0.417	8/12/2014				yes	3	0.016		0.039	
Switzerland	0.09	0.417	8/14/2014		yes	yes	yes	6	0.225		0.54	
Ukraine	0.082	0.417	8/14/2014		yes	yes		3	0.103		0.246	
European Union	0.937	0.333	9/8/2014				yes	3	0.937		2.811	
United States	0.127	0.333	9/12/2014		yes	yes	yes	6	0.254	0.254	0.762	0.762
Canada	0.011	0.333	9/16/2014		yes	yes		3	0.011		0.033	
Japan	0.014	0.333	9/24/2014			yes	yes	5	0.023		0.068	
European Union	0.937	0.083	12/18/2014			yes	yes	5	0.390		4.685	
United States	0.127	0.083	12/19/2014				yes	3	0.032	0.032	0.381	0.381
Canada	0.011	0.083	12/19/2014		yes	yes	yes	6	0.006		0.066	
Total 2014									**14.609**	**2.635**	**31.511**	**4.826**
European Union	0.937	0.917	2/16/2015		yes	yes		3	2.578		2.811	
Australia	0.002	0.917	2/16/2015		yes	yes	yes	6	0.011		0.012	
Canada	0.011	0.917	2/18/2015		yes	yes		3	0.030		0.033	
United States	0.127	0.833	3/11/2015		yes	yes	yes	6	0.635	0.635	0.762	0.762
Australia	0.002	0.833	3/31/2015			yes	yes	3	0.005		0.006	
Canada	0.011	0.583	6/18/2015		yes	yes		3	0.019		0.033	
United States	0.127	0.500	7/30/2015		yes	yes		3	0.191	0.191	0.381	0.381
United States	0.127	0.417	8/7/2015			yes		2	0.106	0.106	0.254	0.254
Ukraine	0.082	0.333	9/2/2015	yes	yes	yes		4	0.110		0.329	
Ukraine	0.082	0.333	9/16/2015		yes	yes		3	0.082		0.246	
United States	0.127	0.083	12/22/2015		yes	yes		3	0.032	0.032	0.381	0.381
Total 2015									**18.407**	**3.598**	**5.248**	**1.778**
Lithuania	0.009	0.750	4/1/2016		yes			1	0.006		0.009	
United States	0.127	0.333	9/1/2016		yes	yes		3	0.127	0.127	0.381	0.381
United States	0.127	0.333	9/1/2016			yes		2	0.085	0.085	0.254	0.254
European Union	0.937	0.167	11/9/2016		yes			1	0.156		0.937	
United States	0.127	0.167	11/15/2016		yes			1	0.021	0.021	0.127	0.127
United States	0.127	0.083	12/20/2016		yes	yes		3	0.032	0.032	0.381	0.381
United States	0.127	0.083	12/23/2016			yes		2	0.021	0.021	0.254	0.254
Total 2016									**18.855**	**3.884**	**2.343**	**1.397**
United States	0.127	1.000	1/9/2017	yes	yes			2	0.254	0.254	0.254	0.254
United States	0.127	0.583	6/20/2017		yes	yes		3	0.222	0.222	0.381	0.381
United States	0.127	0.417	8/1/2017		yes	yes		3	0.159	0.159	0.381	0.381
European Union	0.937	0.417	8/4/2017		yes	yes		3	1.171		2.811	
European Union	0.937	0.167	11/21/2017		yes			1	0.156		0.937	

United States	0.127	0.333	9/29/2017				yes	3	0.127	0.127	0.381	0.381
Total 2017									**20.945**	**4.646**	**5.145**	**1.397**
European Union	0.937	1.000	1/1/2018		yes			2	1.875		1.874	
United States	0.127	1.000	1/26/2018		yes	yes		3	0.381	0.381	0.381	0.381
United States	0.127	1.000	1/30/2018	yes				1	0.127	0.127	0.127	0.127
United Kingdom	0.045	0.833	3/14/2018	yes				1	0.045		0.045	
United States	0.127	0.833	3/15/2018		yes	yes		3	0.318	0.318	0.381	0.381
United States	0.127	0.833	3/26/2018		yes			1	0.106	0.106	0.127	0.127
European Union	0.937	0.833	3/26/2018		yes			1	0.781		0.937	
United States	0.127	0.750	4/6/2018		yes	yes		3	0.286	0.286	0.381	0.381
European Union	0.937	0.667	5/14/2018		yes			1	0.625		0.937	
European Union	0.937	0.500	7/31/2018			yes		2	0.937		1.874	
United States	0.127	0.417	8/27/2018		yes	yes	yes	6	0.318	0.318	0.762	0.762
Total 2018									**26.742**	**6.181**	**7.826**	**2.159**