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1. Introduction

During last decades the economic sanctions have been gaining importance as a strategic tool for resolving severe conflicts between foreign powers. The literature provides volumes of studies with assessment of the full-scope economic impact that the sanctions may produce in target countries. Thus, the attention of researchers covers two main debates applied to target countries. In the first case, they assess the effectiveness of imposed sanctions measured as the depth of the economic shock produced in receiver countries. Other studies evaluate the overall improvements in political and/or human rights conditions which had caused the imposition of sanctions against target countries. More recent literature also studies the impact of sanctions on sender economies. However, the literature on possible spillover effects of sanctions into third-

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economists about the causes of this decline were divided. Thus, some studies assessed that the GDP fluctuations were primarily due to a sharp decline in the world price of oil. Other studies estimated that both the change in the price of oil and imposition of Western sanctions were direct

NGOs, social and political lobbying, and commercial and financial investments by diasporans in source countries (Van Hear et al., 2004). However, the lack of relatively precise and recurrent data associated with the listed assistance programs to countries of origin bounds us only to the analysis of private remittance flows. The latter determinant is available through the World Bank and United Nations' corresponding databases.

To proceed with evaluations, we use two gravity models of bilateral migration and bilateral remittance flows. These models enable assessment of the medium-term spillover shocks from the sanctions against Russia into transition economies. To best address the specifics of the dataset, the Poisson pseudo-maximum likelihood (PPML) econometric tool is used for this analysis.

The novelty of this study is twofold. Despite the vast interest of researchers to the topic of sanctionshi (r)3 (m)-s3 0 Td91

econometric methodology used in the paper. The summary of the findings is provided in section 5. Section 6 concludes the study.

2. Literature Review

The existing literature suggests various socio-economic channels through which the sanctions may impact target countries. Traditionally, the research in the field of sanctions assesses the impact of these macroeconomic shocks by evaluating the level of fluctuation in trade of target countries. It is believed that higher economic integration between countries raises the economic cost of sanctions through disrupted flow of commerce for both parties and, therefore, reduces possibilities of imposing sanctions against partner countries ()Tj(10 (im(m)-6 (p)-4 (act)-6 (o)-4(t (el) (

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the US sanctions may be counterproductive particularly for the US firms which, due to the sanctions, forgo their profitable opportunities in targets. In another study, these authors assert

remittances is rather accelerated by an increase in the number of emigrants, who consider sending a share of their earnings to family members left behind to be a self-enforced contract.

We also find that the literature studying the relation between Western sanctions and their effects on migration and remittances associated with transition economies is very limited. Thus, Khitakhunov et al. (2017) discuss political and economic situation in the Eurasian Economic Union (EAEU). Their work particularly focuses on the period when the first Western sanctions were imposed. Although they do not create a direct link between the sanctions and their impact on migration, they talk about the fluctuations in the Russian ruble, which was impacted by sanctions, and relate it to the decline in the value of remittances received by the EAEU partner countries from Russia. In contrast, the literature provides studies on the impact of sanctions on migration associated with other episodes of sanctions. Thus, Schulz and Batalova (2017), and Connell et al. (2021) focus on the effects of the early 1990s US economic sanctions against Haiti, which came as a response to a government coup which ousted then President Jean-Bertrand Aristide. These sanctions had severe implications on Haitian economy in terms of decline in GDP, contraction of trade, and rise in unemployment rate and malnutrition. As a result, during the outlined period, the emigration from Haiti significantly increased with the US becoming the top destination for these migrants. Connell et al. (2021) use the data from the Threat and Imposition of Sanctions (TIES) database and estimate that sanctioned countries are usually associated with much higher levels of emigration in the following years.

3. Data

To analyze the impact of sanctions on bilateral migration and remittance flows between the Russian Federation and transition economies, we construct a dataset with the socio-economic, geographic and demographic determinants, which are commonly used in the literature as explanatory variables in gravity models of migration and remittance flow. The data are summarized in *Table 1* and the corresponding discussion is provided below.

3.1. Endogenous variables

Bilateral migration

Both, the World Bank and the United Nations report data on bilateral migration. We use the dataset of the international migration stock, which reports the data on migrant population by destination and origin, compiled by the United Nations (United Nations, 2012). The

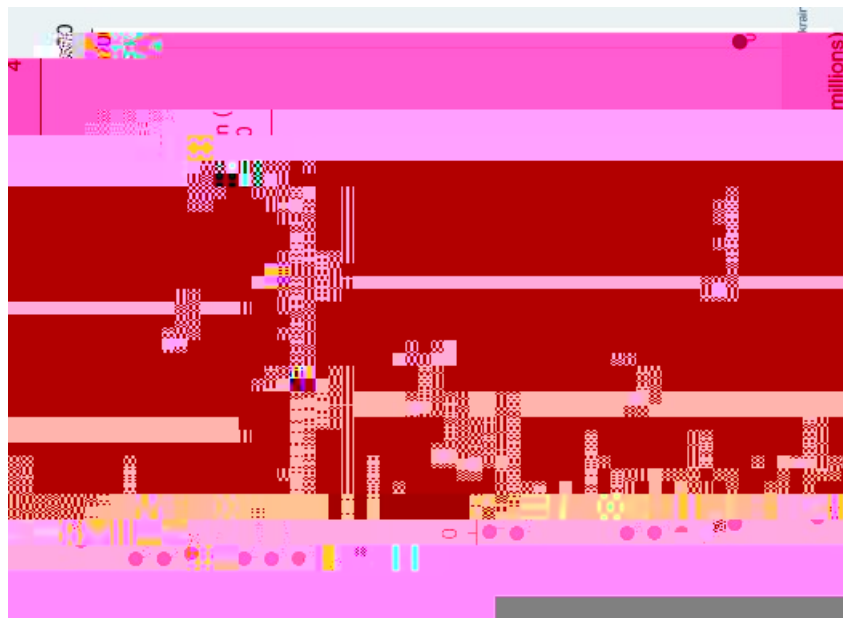
The newest UN dataset on migration in addition to the five-year distribution also includes the data on 2019. The archived data on

Figure 2. Total number of immigrants from

migrants residing in the host country over one year. We extract the information on bilateral remittance flows from the Russian Federation to another transition economy, and vice versa.

Figure 3 represents the distribution of remittances sent from Russia to transition economies in 2017. During that year, of the total volume of remittances sent from the Russian Federation to the world (USD 16,503 million), of which 93 percent went to the countries of this study.

Figure 3. Remittances sent from the Russian Federation to transition economies (2017)

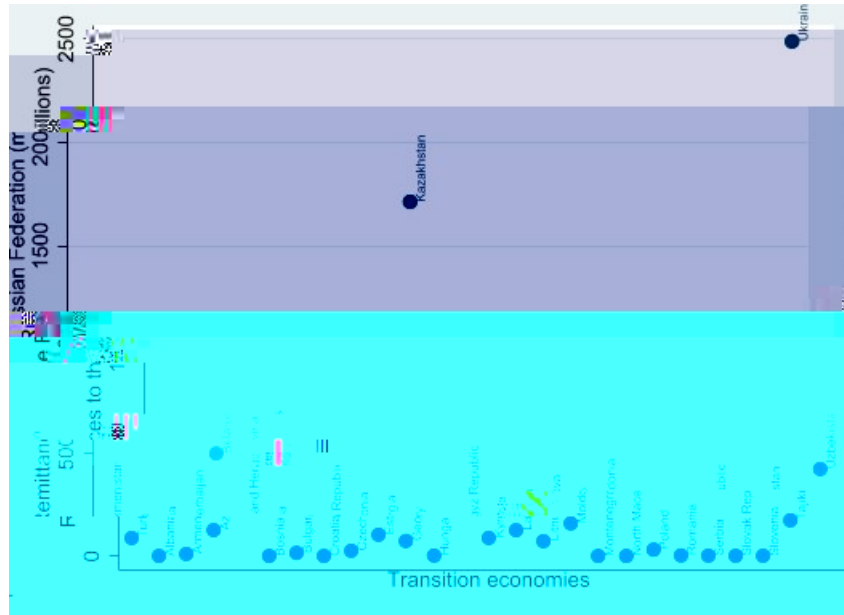


In contrast, *Figure 4* represents the flow of remittances from transition economies to the Russian Federation in 2017.

The availability of the data on bilateral remittance flows is also limited. Although, the annual aggregate data on inflows and outflows of remittances per country is publicly available; currently, the disaggregated data on bilateral remittance flows between country pairs is not.

Thus, for this analysis we are using archived datasets on bilateral remittances, which covers the period of 2014-2017. They were retrieved from the World Bank database in September, 2019.

Figure 4. Remittances sent from transition economies to the Russian Federation (2017)



3.2. Exogenous variables

3.2.1 Sanctions

The first Western and US sanctions against the Russian Federation were imposed on 6th March, 2014. This came as a response to the Russia’s activities in Ukraine and, in particular, annexation of the Crimean Peninsula. Initially, the sanctions took a more targeted approach in the form of visa restrictions and asset freezes imposed against the Russian and Crimean individuals. The early sanctions by the European Union and the US were imposed against 21 and 11 individuals, respectively. During the same month, more individuals were added to that list. Very soon, the sanctions became more severe, as, first, they captured a wider scope including targeted entities, such as Bank Rossia and Crimean Chernomorneftegaz oil company. Then, the whole sectors of economy were targeted by sanctions, e.g., the US sanctions on Russia’s imports of the US goods contributing to the former’s military capabilities (28th April, 2014). In addition to the Crimean crisis, the sanctions against Russian individuals were imposed for human rights

violations, also known as Global Magnitsky Act. Finally, the US unilaterally imposed sanctions against Russia for interference in the 2016 US presidential elections. As a response to the imposed sanctions, Russia retaliated and enacted reciprocal sanctions against sanction imposing countries. They targeted certain sectors, e.g., imports of agricultural products, and individuals. In this analysis, due to the objective of our study, the focus is on the Western sanctions against Russia.

We are using the dataset of the Western sanctions against Russia constructed in Sedrakyan (2021). This dataset compiles the information on all sanctions imposed against Russia for the period from 2014-2018. It assigns a value to each episode of sanction and this estimate reflects several characteristics of the episode. The value ranges from 0 to 1, where 0 indicates no sanction and 1 indicates a full sanction. The dataset includes information on the type of sanction, the target, and the duration. The dataset is available at <https://doi.org/10.21203/3.11111111>.

Table 1 includes the descriptive statistics defining both the Western sanctions and the disaggregated US sanctions.

3.2.2 Other exogenous variables

The macroeconomic data included in this analysis as control variables is mostly available through the World Development Indicators (WDI) online database produced by the World Bank. These data include GDP per capita of transition economies and Russia, population size, population density, unemployment rate, Gini coefficient, enrollment ratio in secondary education, and life expectancy. We use the United Nations conference on trade and development database (UNCTAD) to collect information on two ratios measuring the dependence

Table 1. Descriptive statistics and data sources

Variables	Description	Mean	Std. Dev.	Min	Max	Source
Dependent variables						
	Emigration from TE to Russia (stock) (million)	0.419	0.779	0.00	3.272	United Nations
	Immigration from Russia to TE (stock) (million)	0.305	0.762	0	3.310	United Nations
	Remittances from Russia to TE (millions)	568.755	1021.728	0	5,653.000	World Bank, Migration and Remittances Data
	Remittances from TE to Russia (million)	210.723	510.460	0	2,489.817	World Bank, Migration and Remittances Data
Independent variables						

absence of violence/terrorism is included from the World Governance Indicators database produced by the World Bank. The model also includes a set of binary variables, which control parameters such as whether a country is a member of the European Union, Eurasian Economic Union, former Soviet Union, shares a boarder with Russia, and is landlocked. Here we assign 1 if the country belongs to the listed groups, and 0, if otherwise. We are also using a binary variable which controls for being a member of the Commonwealth of Independent States (CIS), an

-population density measured by number of people per square kilometer

-population size

-remoteness

-share of population over 25 years with a secondary education

rate of consumer inflation

life expectancy in transition economies

-vector of binary variables which control whether a country is a member of the European Union, Eurasian Economic Union, former Soviet Union, shares a border with Russia and is landlocked.

-cluster robust error, clustered by country pairs.

Usually, the basic gravity model of migration uses logarithmic values of three main variables: population of migrant sending country, population of migrant receiving country and distance between the country-pair (Poot et al., 2016). The basic gravity model of remittances uses logarithmic transformation of the following: GDP of remitting country, GDP of remittance receiving and the distance between this country pair (Lueth and Ruiz-Arranz, 2007). We are trying to create a link between these two models and as the basic component use the logarithmic transformation of GDP per capita of both countries and the distance. Then, additional explanatory variables are added.

To assess the impact of sanctions on bilateral private remittance flow between Russia and transition economies, we build the following model described in

1	2	3	-1	4	-1	5	-1		
	6	-1	7	-1	8	-1	9	-1	
	10	-1	11	-1	12	-1	13	-1	14
	15	-1	16						-1

The majority of determinants controlled in model are similar to those we used for testing the impact of sanctions on bilateral migration. However, according to the stepwise test outcomes, the variable of population density is replaced by two other variables which control for old-age dependence (-1) and child dependence (-1). Both variables are added with log transformation. Another macroeconomic determinant added to this model is the exchange rate (-1). In terms of binary variables, which are combined in vector , two binary variables which control for being a member state of the Eurasian Economic Union and a country of the former Soviet Union are replaced by a binary determinant which controls for being a member of the Commonwealth of Independent States (). The rest of binary variables is similar to those described in Eq. . The most recent annual data on bilateral remittance flow between countries is limited to 2017. Since the first sanctions were imposed in 2014, our analysis captures four-year period from 2014 to 2017. In this model, to be able to test a longer time horizon (four years), the data on sanctions is not lagged.

corresponding datasets. In current analysis, the PPML technique allows for mitigation of heteroscedasticity issues. In addition, this econometric method also performs well with the gravity models that include limited time series, which is reflective of both datasets used in this analysis. Here, we also follow the recommendations of Anderson and van Wincoop (2003) about the need to control for multilateral resistance terms (MRT) when constructing gravity models. Thus, there are two main approaches to address this point. First, some authors choose to address MRT by introducing sender receiver country fixed effects. Due to the specifics of the datasets used in this analysis, where only one country, Russia, is one side of either migrant (or remittance) receiving or sending relation in each country pair, controlling for sender or receiver country fixed effects would not be useful. Therefore, to control for the multilateral resistance

the income disparity and inequality among different groups of population was the only significant ground among the controls used in our analysis that resulted in immigration of Russian individuals to transition economies (*Table 3*).

Our research estimates that both, Western and US, sanctions had a strong negative impact on inward remittances from Russia received in transition economies. Thus, 1% increase in Western sanctions contracted the remittances from Russia to transition economies by \$0.014 million. We observed that the US sanctions alone reduced the remittances by a lower extent, of about \$0.01 million, than Western sanction. This divergence was expected, as, usually, multilaterally imposed sanctions produce more profound effect than the unilateral ones. The model estimated that the remittance flow was much higher to the countries with lower life expectancy. Thus, an additional 1% lower life expectancy in a transition economy corresponded with an increase in the remittance inflow from Russia, on average, by \$0.19 million. The depreciation of the local currency to the Russian ruble led to an increase in the volume of remittances received in transition economies. This outcome may also suggest that the cost of the depreciated currency in countries of origin was partially redistributed to the remitting individuals. Politically stable and low violence transition economies also determined higher levels of remittance inflow.

Table 3. The impact of sanctions on bilateral migration between the Russian Federation and Transition Countries 2015-2019

Emigration from TE to Russia	Emigration from TE to Russia	Immigration from Russia to TE	Immigration from Russia to
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6. Conclusions

This analysis assessed the spillovers of Western and US sanctions against the Russian Federation into transition economies. These are twenty-seven small economies of the Former Soviet Union, and Central and Eastern Europe, which due to their geographic proximity, shared history or culture had developed strong economic integration with Russia.

Our analysis assessing the change in bilateral migration for the period of 2014-2019. It

welfare programs there might be a step in smoothening out the unwanted effects from spillovers of sanctions.

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