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The Empirical Evidence of EU–Russia Bilateral Trade under Sanctions and Oil Price Shocks

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Abstract: After the annexation of Crimea in 2014, many EU–Russia projects such as the concept of Strategic Partnerships, negotiations on the New Basic Agreement, and the abolishment of visa regime, among other important issues, were suspended. On top of that, the parties involved imposed mutual sanctions which seriously damaged bilateral trade relationships. The present article aims to analyse EU–Russia bilateral trade under the sanctions and low oil prices together with such factors as the growth of Russian and the EU's GDPs per capita, geographical distance between parties and devaluation of Russian currency by applying a gravity model. Moreover, the model allows us to carry out simulations of circumstances as they would likely have unfolded had the sanctions not been imposed and if oil prices had remained at a reasonable level.

Keywords: European Union; Russia; bilateral trade; sanctions; gravity model

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1. Introduction

In March of 2014, after the annexation of Crimea, the EU with its Western partners imposed sanctions against Russia. In the beginning, the sanctions were limited only to restrictions on movement and the freezing of assets of certain Russian and Ukrainian officers involved in the corruption and human rights abuse in Ukraine.

However, shortly after, it was decided that those measures taken to regain the integrity of Ukraine were insufficient, and in July of 2014 it was announced that the EU had also imposed economic sanctions against strategic sectors of Russia's economics such as defence, energy and financial sectors with a view to increase pressure on Russian government. Moreover, these new sanctions restricted access to the European financial market for Russian companies, an embargo was imposed on arms trade and related items, and imports from Crimea were banned (See the Regulation 833/2014 (31 July 2014) by Council of the European Union) (See the Regulation 833/2014 (31 July 2014) by Council of the European Union). In July of 2015, in spite of protests from several Member States, the EU reached an agreement regarding additional sanctions against certain sectors of Russia's industry.

As for Russia's government, in March of 2014 there was a response to EU's sanctions, which implied the imposing of restrictions against EU's high-ranking officers. In August of that year, the Russian President's Executive Order «On Extending Certain Special Economic Measures in the Interest of Ensuring the Security of the Russian Federation», which declared an embargo on imports of agricultural products from the EU was signed (On measures to implement the Russian President´s Executive Order "On Extending Certain Special Economic Measures in the Interest of Ensuring the Security of the Russian Federation [1]. The embargo on fruits, vegetables, fish, meat, milk and dairy products was also spread to Norway, USA, Canada and Australia. Lately, the sanctions were prolonged and new states such as Albania, Ireland, Montenegro, Liechtenstein and Ukraine were added to the

list of the sanctioned countries. Those measures were primarily designed to harm EU's agricultural economics, considering that before the crisis of 2014 Russia was the second agricultural market for the EU, consuming 2.9% of agricultural exports, exceeded only by the USA [2]. Although, the EU tried to introduce its products to the Russian market through unsanctioned countries such as Belarus and Serbia, the flow of sanctioned products and goods was stopped by Russia's authorities by means of strengthening border control.

In spite of the year-to-year prolonging of the sanctions, all parties have continued to negotiate on the necessary conditions for gradual abolition of restrictions. Even though these negotiations have been fruitless so far, the lifting of sanctions is no less urgent today than before, considering that both the EU and Russia continue being the biggest losers because of their mutual sanctions policies. Moreover, in the current situation of deep economic crisis provoked by COVID-19, the progressive abolition of restrictions could be a strong impulse to the recovery of EU's and Russia's national economics.

In addition, it is worth mentioning that the political component probably has not become the decisive factor in the decline of EU–Russia bilateral trade in as much as the recession of Russia's economy provoked by the fall in oil prices could have had the worst effect on parties' trade flow. In this regard and beyond merely the scope of the sanctions, our model took into consideration such factors as oil prices and the devaluation of Russia's currency. Not only did the application of gravity model allow us to estimate the impact of sanctions on parties' trade flow together with other factors such as oil prices, devaluation of Russia's ruble, Russia's and EU's Member States GDPs per capita and distance between them—but also to carry out the simulations of EU–Russia trade in circumstances of a higher oil pricing level had the sanctions not been imposed. Interestingly, it was calculated how much more the oil prices would have to rise in order to cover the losses of EU–Russia trade flow provoked by the imposing of sanctions.

2. Literature Review

According to Giumelli and Paul [3] in theory, the adoption of sanctions usually aims to change the sanctioned state's behaviour (coercive tool), to limit its behaviour (limiting effect) and, finally, to send a message (signalling effect). In this regard, Giumelli [4] argues that the sanctions have been considered as an alternative policy to military force or diplomacy when 'to do nothing' is not an option. However, Veebel and [5] stress that in many cases besides the official demand there is a hidden agenda, which is not suited for an official policy or rather is not supported by all members of multilateral coalition; for instance, it can be a political regime change.

Lektzian and Souva [6] point out that autocracies are more vulnerable to sanctions than democracies, and they also highlight that the democratic states impose more sanctions than those of any other regime inasmuch as they pursue democratic objectives and respect Human Rights while representing the interests of different groups, which influence their leaders' decisions.

Dizaji and Van Bergeijk [7] argue that economic sanctions are meaningful in the short term while they are not efficient in long term due to the fact that the countries affected usually adapt to the new situation. Veebel and Markus [8] state that the time works against the effectiveness sanctions because the sanctioned nations simply adapt to them, and if in long term a sanctioned country's economy finds itself in a state of stagnation or even recession, it is not automatic that this result was achieved because of the sanctions.

However, after analysing the cases of sanctions imposed by the EU on Belarus, Iran, Myanmar and Syria, [3] have come to the conclusion that in none of these cases was the goal of changing sanctioned state's behaviour achieved. In this regard, it can be concluded that in practice it is difficult for the EU to force a country outside the Union to meet the standards of international law due to the lack of both the coherence of the opinions within the EU and the cooperation on the part of other actors at the international level. In this regard, Connoly [9] also highlights that sanctions on Russia have not forced its withdrawal from Ukraine, despite contributing to the overall weakness of the Russian economy. According

to Veebel and Markus [8] the sanctions imposed against Russia, despite provoking the stagnation of Russia's economy, did not harm enough its key sectors such as exports of oil, gas and other natural resources, and the EU definitely did not achieve its main objective: to regain the integrity of Ukraine and to end the conflict in the territories of East Ukraine. Therefore, the authors raise the question of whether the initial objectives of sanctions against Russia were unrealistic from the very beginning.

Garashchuk et al. [10] highlight that after the annexation of Crimea, the EU with its West Partners tried to isolate Russia from its principal institutions and restrict access to its financial resources. Thus, Russia was excluded from Group of Eight and the negotiations on its accession to the Organisation for Economic Co-operation and Development were suspended. Moreover, Federica Mogherini [11] announced that Russia was not EU´s strategic partner anymore. Consequently, the majority of EU–Russian projects and events such as annual summit meetings, Road Maps on Four Common Spaces, negotiation on abolishing the visa regime and New Basic Agreement among others, were suspended. Nevertheless, Podadera and Garashchuk [12] have proved empirically by elaborating the Strategic Partner's Attractiveness Index that Russia and the EU continue being strategic entities for each other despite the political crisis and economic sanctions.

However, isolation from the West was not such a big surprise for Russia. In this regard, Kirkham [13] highlights that Russia has always been treated with suspicion and excluded both from the economic and political perspective (The World Bank and International Monetary Fund) and militarily (the expansion of the North Atlantic Treaty Organization towards Russia's borders). Trenin [14], in his turn, points out that Russia has always been viewed in the West as a lesser international actor.

It is worth mentioning that nowadays it is almost impossible to totally isolate any country in our now globalised multipolar world order. When responding to the isolation, Russia tried to diversify its markets by strengthening relations with BRICS, considering them as an alternative to financial resources (in 2014 the New Development Bank of BRICS was established); by promoting the regional integration with post-Soviet states (the Eurasian Economic Union became operational since 2015) and by developing new contacts with Latin America and the Association of South-east Asian.

One of the measures applied by Russia was to strengthen, support and promote domestic production with a view to decreasing its dependence on imports. Although the embargo of European imports contributed to the domestic production growth, particularly of such products as pork, poultry and dairy produce, the promotion of domestic beef was unsuccessful. Nevertheless, the prices on these products increased dramatically due to the high production cost [15].

It is noteworthy that the agricultural imports grew significantly from Belarus, Armenia and Kirghizstan (members of the Eurasian Economic Union). In this regard, according to the European Parliament (2017) [16], while European agricultural exports to Russia dropped sharply in 2014 (−22.3% in agricultural sector and −42.4% all embargoed products), the Eurasian Economic Union's exports increased dramatically (+7.3% and +5.1%, respectively). Besides the Eurasian Economic Union, Russia also augmented the imports from neighbouring countries, especially from Georgia, Serbia and Turkey. All the Russia's measures against EU's sanctions can be summarised as follows: embargo on certain food products; replacement of embargoed products with imports originating from the Eurasian Economic Union, Latin America, China, Turkey, etc.; the establishment of funds for supporting the businesses harmed by sanctions; the promotion of regional integration between the Eurasian Economic Union's Member States; strategic reorientation towards Asia, development of relations with BRICS and regional organizations such as the Association of South-east Asian (ASEAN) and Southern Common Market (Mercosur); devolution of Russia's currency in order to reduce deficits of government budget; replacement of the dollar with national currencies in trade and in supplementing national reserves with gold.

However, it should be taken into consideration that the sanctions were imposed during the period of the stagnation of Russia's economy, which consequently turned into

a recession due to other external and internal factors such as oil prices shocks, flight of capital, corruption, etc. Thus, many authors claim that the oil price collapses have always had a tremendously negative impact on the Russia's economy [17–19]. In this regard, it is highlighted in European Parliament' (2017) [16] research that to separate the impact of sanctions from other factors which also influence negatively on Russia's economy proves to be quite difficult. It is imperative, but not easy, therefore, to include and observe in the econometric models all the inter-sectorial connections and value chains affected by the sanctions. Gurvich and Prilepskiy [20] stress that the impact of the sanctions was 3.3 time less than of the oil price collapse in 2015. Nevertheless, Tuzova and Qayum [19], Dreger et al. [21] and Ahn and Ludema [22] argue that the impact of sanctions on the devaluation of Russia's rouble is almost insignificant in comparison with oil price shock in 2015.

Regarding the response sanctions imposed by Russia, it is worth mentioning that the EU agricultural sector has been harmed most. Thus, according to the data of European Parliament (2017) [16] if estimating the value of embargoed products in absolute terms it is Lithuania, Poland, German, Netherland, Denmark, Spain, Finland, Belgium and France that have been affected most by Russia's economic sanctions. However, Giumelli [23] points out that the EU Member States experience a wide variation in sharing the burden of imposing sanctions. Moreover, at a sectoral level some Member States experienced gains in exports following the imposition of sanctions [23,24], in her turn, argues that Russia's countersanctions were specifically designed to spare the Member States that Russia sees as the main strategic actors in the EU, particularly France, Germany, Italy and the UK.

In such a situation, the EU mobilized a collective response by means of appropriate market mechanisms and the Common Agricultural Policy with a view to mitigate the negative impact of Russia's economic sanctions and to stabilize the internal market [25]. The European companies affected by sanctions received financial help from the other EU members. Moreover, in search of new markets, the EU promoted the negotiations on free trade zones and agreements on phytosanitary standards with third countries. As a result of these actions by the European Parliament (2017) [16], the agricultural exports of the EU grew by 2% in 2016 compared to that in the previous year. The best results were achieved in trade with the following countries: China (+13.3%), Japan (+7.4%), USA (+5.5%) and Switzerland (+2.4).

As claimed by the European Parliament Report (2015) [26] the losses the sanctions to the EU's economy brought on were 40 billion euros (−0.3% of EU's GDP) in 2014 and 50 billion euros in 2015 (−0.4 of EU's GDP). Havlik [27] estimated the Russia's losses due to sanctions amounted to 20 billion euros in 2014 and 30 billion in 2015. However, Bond et al. [28] argue that the sanctions will have a short-term impact rather than long-term.

Nevertheless, despite sanctions Russia and the EU continue to be the main trade partners due to their strong energy interdependence and the sheer fact that they are essentially neighbours. Moreover, Giumelli [23] highlights that not all the sectors were affected by the sanctions. In this regard, even though Silva and Selden [29] argue that in Russia's case the Members of the European Parliament from many of the more interdependent Member States of the EU were the most forceful proponents of imposing sanctions on Russia, despite the possibility that they would suffer disproportionate economic losses as a result, we can still opt for the optimistic scenario that the parties may move towards rapprochement especially in the circumstances of several economic crisis provoked by the COVID-19. In this regard, under the next heading we will provide the methodology for analysing EU-Russia trade flows in the context of sanctions, low oil prices and the devaluation of Russia's currency.

3. Methodology

Since being introduced by Tinbergen [30], gravity models been used as a workhorse for analysing the determinants of bilateral trade flows for more than 50 years, [31]). In this regard, Leamer and Levinsohn [32] highlight that the gravity model provides some of the clearest and most robust findings in empirical economics. Moreover, Kimura and Lee

point out that not only has been the model applied to trade in goods but also recently been successfully tested to trade in services [33]. As a model shortcoming Shepherd, it can be added that gravity models have been based largely on intuitive ideas as to which variables are likely to influence trade [34].

The basic gravity model can be described in the following manner [35]:

$$T_{ij} = \frac{Y_i Y_j}{D_{ij2}} \quad (1)$$

where:

T_{ij} is the trade from the country of origin i toward the country of destination j.

Y_i, Y_j are the economical size of two countries (countries' GDPs).

D_{ij} is the distance between countries i and j in physical terms.

The traditional gravity model drew on analogy with Newton's Law of Gravitation. A mass of goods or labour or other factors of production supplied at origin i, Y_i, is attracted to a mass of demand for goods or labour at destination j, but the potential flow is reduced by the distance between them, D_{ij} [36]. Subsequently, the researchers started to add other variables to the traditional model interpretation in order to estimate the trade flow of different countries, unions and organisations, in particular economic and political contexts. In this regard, gravity models now routinely include variables far beyond those such as tariffs, which are imposed at the border, to cover behind-the-border barriers as well. Regulatory policies, as well as deep political, economic and institutional characteristics of countries, have been shown to influence trade as modelled in the gravity framework [34]. Thus, for instance, Binh et al. [37] while analysing Vietnam´s trade flows, added the currency exchange rate of Vietnam since, in previous studies, such as Bergstand [38] and Dell'Arricia [39] it was shown that the addition of the exchange rate on the gravity model has helped to explain the trade variation among participating countries. Chen and Hsu [40] have examined whether oil price volatility affects bilateral trade between two countries around the world by using the gravity econometric model. In Andrew Rose's model [41] we can observe such dummy variables as common language and regional trade agreements. Hufbauer and Oegg [42] for instance, included a set of dummy variables to indicate current or previous economic sanctions between two countries to the gravity model with a view toward estimating the impact of economic sanctions on US trade. Garashchuk et al. [43] have recently estimated the Eurasian Economic Union's trade flow with integration groupings including such variables as sanctions and oil price volatility.

It is noteworthy that gravity models also have been regularly applied for analysing the effects of integration groupings and multilateral international agreements in international trade [41,44,45] implemented the model for estimating the trade between Mercosur and the EU with a view to sign a potential free trade agreement. Chernov [46] in his turn, estimated the trade flow of Russia with different integration groupings by applying the model.

For our model we used the standard variables for gravity models such as GDPs per capita of Russia and the EU nations to measure the size of their markets and the distance between their capitals. Based on the above-mentioned literature and other authors' research we added variables related to the geopolitical situation such as oil-price volatility, exchange rates (EU Member States' currency to Russian ruble) and 'dummy' variable, which reflects the current situation of economic sanctions between Russia and the EU.

We have estimated two static panels during the period 2001–2020: the first panel, estimated by fixed-effects model, explains the EU–Russia trade flow in goods (TRADE) as a function of Russia's GDP per capita (GDP_RUS/POP_RUS) differentiating between the years under the sanctions and the years without them through the dummy variable (SANCT), while the second one estimated by random effects model explains trade flow per capita of EU Member States (TRADE/POP_P) in terms of GDP per capita of EU Member States (GDP_P/POP_P), oil prices volatility (PP), the distance (DIST) between Moscow and EU Member States' capitals and the currency exchange rates (EXCH) corrected by price indices of every country. The detailed description of the variables is presented in Table 1.

Table 1. Variables.

Abbreviations	Description	Data Base
$Log(TRADE_{it})$	Dependent variable. Trade flow in goods (export and import) between the EU Member States and Russia	Trade Map
$Log(DIST_i)$	Independent variable. Distance between Moscow and EU members´ capitals.	World Distance Calculator (https://distancecalculator.globefeed.com/World_Distance_Calculator.asp, accessed on 15 March 2022)
$Log(GDP\_RUS_{it}/POP\_RUS_{it})$	Independent variable. Russia´s GDP per capita.	World Bank
$Log(GDP\_P_{it}/POP\_P_{it})$	Independent variable. EU members´ GDPs per capita.	World Bank
$Log(PP_t)$	Independent variable. The Brent crude oil price per barrel.	Statista (https://es.statista.com/ accessed on 15 March 2022)
$Log(EXCH_{it})$	Independent variable. Exchange rates from EU Member States' currency (mostly euro) to ruble, corrected by price indices of every country	European Commission
$SANCT_{it}$	Independent dummy variable. Sanctions between Russia and the EU. If there are sanctions 1, if there are not sanction 0.	Official Information

Source: Own Elaboration. QUITAR.

Following Wooldridge [47] and Hill et al. [48] while working with static panels it is important to ensure the estimators´ robustness of standard error coefficients. And in this regard, the White´s Matrix of variance and covariance for temporal units (corrected according to the degrees of freedom) has been used. Likewise, the fixed-effects panel has been estimated by generalised least squares (GLS weights: cross-section weights) in order to adjust the heteroskedasticity in cross-sectional units. Both procedures ensure the robustness of the results regarding the possible autocorrelation in temporal units and/or heteroskedasticity in cross-sectional units.

According to the theory, first, we expect to estimate the positive impact of both EU's and Russia's growth of GDPs per capita, the oil price increase, the devaluation of Russia's currency and the negative impact of geographical distance and sanctions on bilateral trade. Second, we will provide the model simulations of EU–Russia trade flows under the scenario of higher oil prices and the lifting of sanctions. The results of estimation are presented under the next heading.

4. Results and Discussion

Part of the static panel results (including the estimated coefficients, t-statistic and *p*-value) is shown in Tables 2 and 3. In all cases, the coefficients are significantly non-zero to 5% under a bilateral contrast (see Tables 2 and 3) except the variable GDP per capita of the EU Member States (see the first variable in Table 3).

Table 2. Fixed effects model.

Dependent Variable: $log(TRADE_{it})$			
Independent Variable	**Coefficient**	**t-Statistic**	**Prob.**
$LOG(GDP\_RUS_{it}/POP\_RUS_{it})$	**0.7875**	**28.6029**	**0.0000**
$SANCT_{it}$	**−0.1527**	**−2.8760**	**0.0000**
LATVIA	0.2805	22.4759	0.0000
BELGIUM	0.2746	22.0036	0.0000
PORTUGAL	0.1649	13.2122	0.0000

Table 2. *Cont.*

Dependent Variable: log($TRADE_{it}$)			
Independent Variable	**Coefficient**	**t-Statistic**	**Prob.**
DENMARK	0.1279	10.2472	0.0000
IRELAND	0.1067	8.5461	0.0000
SLOVENIA	0.0757	6.0648	0.0000
ROMANIA	−0.0260	−2.0815	0.0487
ESTONIA	−0.0305	−2.4456	0.0225
CROATIA	−0.0333	−2.6680	0.0137
LUXEMBOURG	−0.0640	−5.1304	0.0000
GERMANY	−0.0857	−6.8656	0.0000
GREECE	−0.0962	−7.7055	0.0000
BULGARIA	−0.1777	−14.2390	0.0000
AUSTRIA	−0.1791	−14.3478	0.0000
POLAND	−0.1890	−15.1405	0.0000
SPAIN	−0.2133	−17.0936	0.0000
FRANCE	−0.2357	−18.8887	0.0000
UNITED KINGDOM	−0.2556	−20.4796	0.0000
SLOVAKIA	−0.2899	−23.2254	0.0000
FINLAND	−0.3332	−26.6948	0.0000
ITALY	−0.3800	−30.4501	0.0000
SWEDEN	−0.4578	−36.6850	0.0000
LITHUANIA	−0.4666	−37.3831	0.0000
HUNGARY	−0.5133	−41.1301	0.0000

Note: Cluster-Robust Standard Errors (White period) and Cross-section Weight. R^2 = 0.9595.

Table 3. Random effects model.

Dependent Variable: log($TRADE_{it}$/POP_P_{it})			
Independent Variable	Coefficient	t-Statistic	Prob.
Log(GDP_P_{it}/POP_P_{it})	**0.2782**	**1.8891**	**0.0716 ***
Log($DIST_i$)	**−1.7212**	**−13.2960**	**0.0000**
Log($EXCH_{it}$)	**0.1200**	**2.9245**	**0.0076**
Log(PP_{it})	**0.7009**	**13.7278**	**0.0000**
ROMANIA	0.4941	9.6273	0.0000
PORTUGAL	0.5944	4.4874	0.0002
POLAND	0.6097	7.3233	0.0000
AUSTRIA	0.6136	10.2665	0.0000
LUXEMBOURG	0.6179	6.3041	0.0000
FRANCE	0.6205	7.3349	0.0000
UNITED_KINGDOM	0.6222	7.1955	0.0000
SWEDEN	0.6234	7.3500	0.0000
LATVIA	0.6339	3.1951	0.0040
SPAIN	0.6483	5.4048	0.0000
GERMANY	0.6699	11.5824	0.0000
GREECE	0.6764	11.2163	0.0000
DENMARK	0.6821	9.0620	0.0000
LITHUANIA	0.6842	5.0235	0.0000
CROATIA	0.6885	15.3353	0.0000
IRELAND	0.7132	6.5984	0.0000
BULGARIA	0.7557	16.7499	0.0000
SLOVENIA	0.7764	15.8484	0.0000
FINLAND	0.7887	7.1449	0.0000
ESTONIA	0.8055	6.6960	0.0000
ITALY	0.8077	10.6177	0.0000
BELGIUM	0.8478	11.1413	0.0000
SLOVAKIA	0.8944	19.8436	0.0000
HUNGARY	0.9540	13.4453	0.0000

Note: Cluster-Robust Standard Errors: (White period). Prob (Hausman-Test) = 0.9999. R^2 = 0.7409. * In this special case the elasticity between trade flows and the GDP per capita of the EU Member States it would also be significant under a unilateral contrast understanding that this elasticity should be positive.

The Table 2 (Fixed Effects Model (We applied the fixed-effect model as we studied the entire population of the EU countries. Therefore, we consider a fixed heterogeneity by country, avoiding possible asymptotic biases in the estimation of slopes. In addition, the observed elements are not considered randomly (a random-effects panel))) shows the positive effect of Russia's GDP per capita on the trade flow with EU Member States. On the other hand, the model proves the negative evidence of sanctions on EU–Russia bilateral trade (it is supposed to reduce, on average, about 15% the trade flow). However, having analysed the trade flow by country, the significant difference regarding the negative impact of sanctions on bilateral trade has been highlighted. Thus, for instance, the largest reductions in trade with Russia due to the sanctions are noted with Hungary, Lithuania, Sweden, Italy and Slovakia. On the opposite side, in spite of sanctions Russia has increased bilateral trade on average terms with Latvia, Belgium Portugal Denmark, Ireland and Slovenia. The results of the second panel are shown in Table 3.

Table 3 (Random Effects Model) proves that the trade flow in terms per capita increases with higher level of EU Member States' GDP per capita, showing an elasticity of 0.29%. The estimation of the model allows verification of the negative influence of the variable 'distance' (The distance is a variable, which takes a constant value over time for every cross-sectional unit for what is impossible to estimate in its impact on trade flow by Fixed Effects Model, but it is viable to put it into practice by means of Random Effects Model. The appropriateness of the model has been proved by applying Hausman Test) (estimation of −1.76%). The devaluation of Russian rouble compared to the euro and other European currencies benefits the trade flow between parties that can be explained by Russia's trade

account surplus with EU Member States. Furthermore, the elasticity between trade flow and oil price is 0.73%. Likewise, Table 3 shows that the elasticity with regard to oil price differs by country (These coefficients were estimated using Ordinary Least Squares because the Panel of Random Effects Model does not allow these estimations while requiring a higher number of cross-sectional units than the number of coefficients to estimate. However, the robustness of the estimations was confirmed by comparing them with those that were obtained using Random Effects Model) (from half of point in Romania to almost one point in Slovakia).

Finally, the simulation exercise has been conducted to estimate the impact on the trade flow between Russia and EU Member-States if the oil price had increased by 15% and the sanctions between parties had been lifted during the period 2014–2020. The simulations have been carried out by means of two panel models previously described: the first one estimates the impact of the sanction lifting for every country (see the coefficients from the Table 2) while the second estimates the impact of oil price volatility by country (see the coefficients from the Table 3). The results are shown in Table 4.

Table 4. Average annual trade flow in goods during 2014–2020.

	Billion Dollars	**%**
Observed Trade Flow	196.3	
Impact (Sanction Lifting)	39.9	20.3%
Impact (Oil Price Increase by 15%)	20.7	10.5%
Total impact	60.5	30.8%

Source: own calculations.

Observing Table 4 we can conclude that a 15% oil price growth during the period 2014–2020 would have increased the average annual trade flow in goods by almost 21 billion dollars (it is 10.5% regarding the trade flow). The lifting of sanctions would have increased the average annual trade flow by almost 40 billion dollars, representing more than 20% regarding observed trade flow (It has been estimated that the EU–Russia trade flow was reduced by 16% due to the COVID-19 in 2020 (about 35 billion dollars), i.e. practically by the same amount of money that would have been made if the sanctions had not been imposed. It means that the phasing-out lifting of sanctions could notably mitigate the negative impact of COVID-19). The total impact would have reached 60.5 billion dollars, surpassing 30% of annual observed trade.

The distribution of total and relative average impact by country is shown in Figures 1 and 2 where the biggest beneficiaries are presented in light grey and countries less sensitive to oil price shocks and sanctions in dark grey.

Belgium	-2.15%
Latvia	-1.81%
Denmark	-0.16%
Portugal	-0.13%
Ireland	0.00%
Luxembourg	0.05%
Slovenia	0.06%
Croatia	0.25%
Romania	0.53%
Estonia	0.65%
Greece	1.09%
Bulgaria	1.36%
Austria	1.72%
Spain	3.26%
Lithuania	4.04%
Slovakia	4.14%
Sweden	5.14%
Hungary	7.24%
Poland	8.06%
France	8.26%
United Kingdom	8.58%
Finland	10.30%
Germany	14.54%
Italy	24.98%

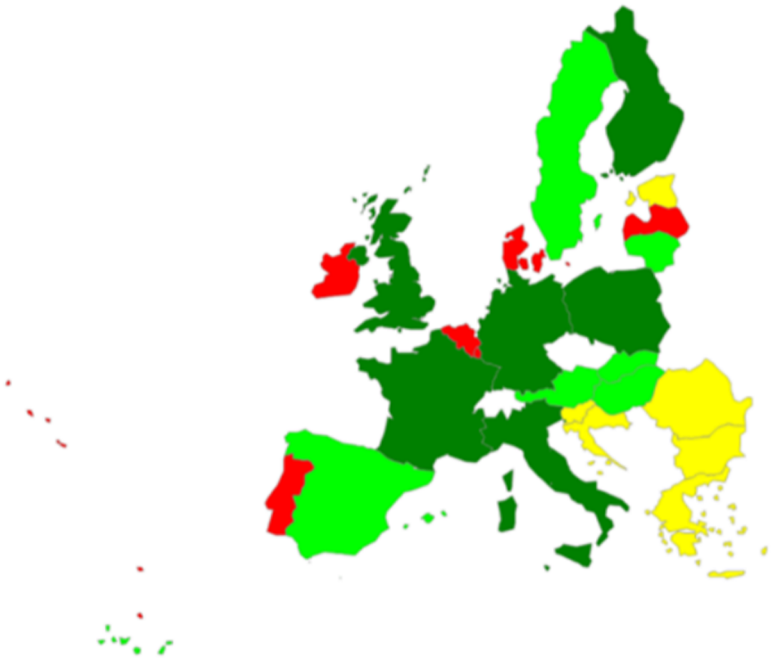


Figure 1. Total average impact of the EU–Russia trade flow in goods by country: Oil price increase by 15% and lifting of sanctions. Source: Own Elaboration.

Latvia	-17.2%
Belgium	-13.6%
Portugal	-7.4%
Denmark	-2.8%
Ireland	0.1%
Slovenia	2.9%
Rumania	8.9%
Croatia	11.9%
Estonia	12.7%
Luxembourg	16.0%
Germany	18.3%
Greece	20.1%
Austria	27.1%
Poland	28.9%
Bulgaria	30.4%
Spain	34.1%
United Kingdom	35.9%
France	36.9%
Slovakia	47.6%
Finland	52.8%
Italy	59.5%
Sweden	67.8%
Lithuania	68.5%
Hungary	79.8%

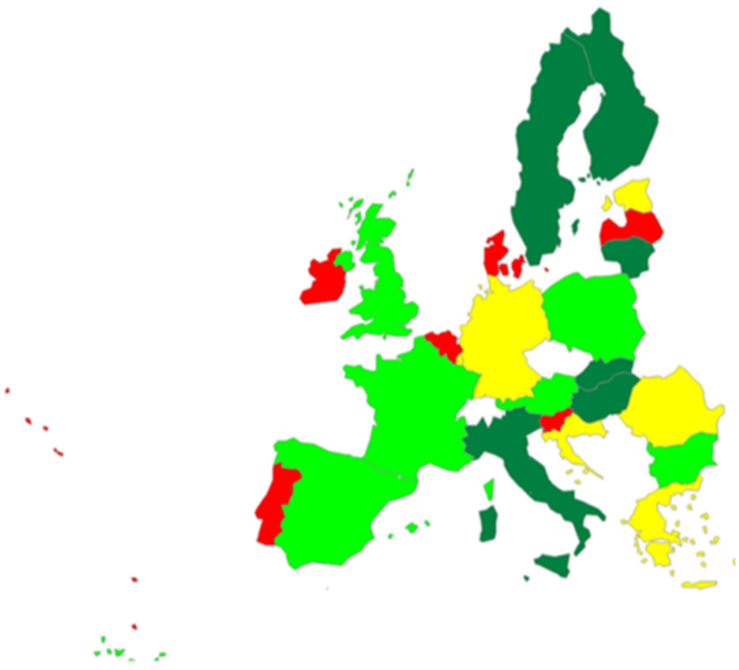


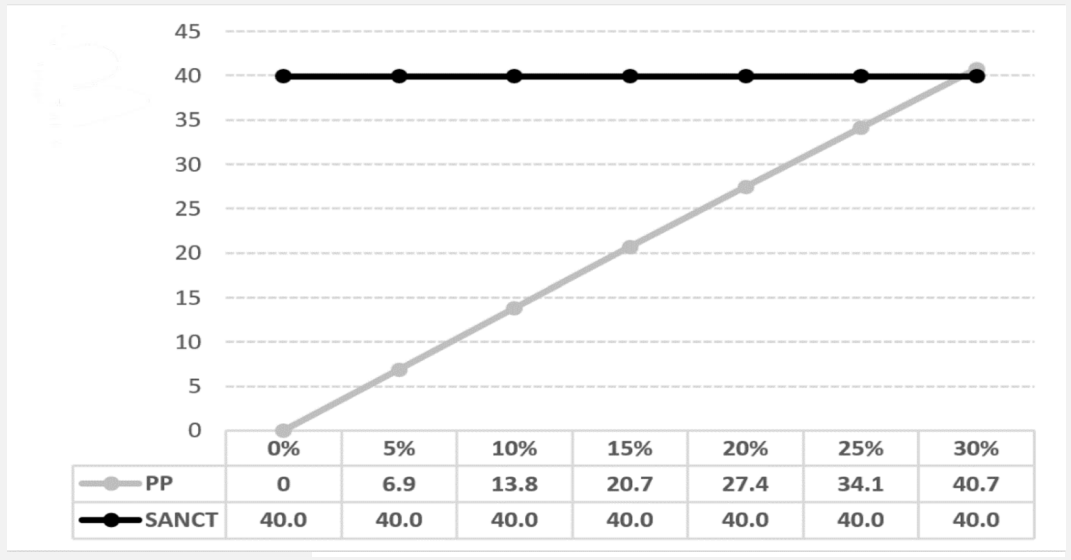
Figure 2. Relative average impacts of the EU–Russia trade flow by country: oil price increase by 15% and lifting of sanctions. Source: Own Elaboration.

By observing Figure 1, it can be assumed that the biggest beneficiaries on total average impact of sanction lifting would be Italy, Germany, Finland, the United Kingdom, France and Poland. The relative average impact by country is shown in Figure 2.

By observing Figure 2, it can be observed that, for example, the average trade flow per year could have increased by 50–80% with the following countries: Hungary, Lithuania, Sweden, Italy and Finland and Slovakia.

However, such countries as Belgium, Latvia, Denmark and Portugal seem to have suffered a negative impact. This can be explained by the fact that during the period of mutual sanctions they increased the trade flow with Russia. Moreover, their trade flow with Russia is not sensitive to oil price changes. In this regard, we can conclude that especially with these countries there is a positive current trend regarding the trade relations with Russia in circumstances of the sanctions and low oil prices.

Nevertheless, despite the significant losses for both parties, the EU seems to be reluctant to lift the sanctions. In this regard, Figure 3 shows the rising impact on the EU–Russia trade flow to the extent that the oil prices keep growing although the sanctions are not lifted.



	0%	5%	10%	15%	20%	25%	30%
PP	0	6.9	13.8	20.7	27.4	34.1	40.7
SANCT	40.0	40.0	40.0	40.0	40.0	40.0	40.0

Figure 3. The impacts of rising oil prices under the sanctions on EU–Russia trade flow (in billion dollars). Source: Own Elaboration.

As we can observe in Figure 3, the oil prices would have to increase approximately by almost 30% during the period 2014–2020 in order to compensate for the sharp fall of EU–Russia trade flow due to the sanctions. Finally, according to the simulation exercise, it has been shown that an increase of 1% oil prices would have augmented the trade flow approximately by one and a half billion dollars.

5. Conclusions

As we could observe, the embargo of EU's products, especially in agricultural, meat, fish and dairy industries, provoked a sharp fall in EU's exports to Russia. Nevertheless, both the EU and Russia seem to have successfully adapted to the sanctions. Thus, the EU managed to increase its agricultural exports by the diversification of markets with the help of the Common Agricultural Policy while Russia substituted the embargoed issues partly with domestic products and partly with imports from other countries, particularly proceeds from the Eurasian Economic Union and other neighbouring countries. As a result, while decreasing the trade flows with the EU, the Russian domestic production increased as well as the trade turnover with the Eurasian Economic Union.

It can be concluded that although the sanctions against Russia damaged the Russian economy, its main objective of regaining the integrity of Ukraine was not achieved. Moreover, it is difficult to separate the impact of the sanctions from the effect of the oil price collapse, which had definitely a larger influence on the Russia's economy. Moreover, in the

globalised world it turns out to be almost impossible to isolate a sanctioned state and to exclude it from alternative markets of suppliers and capital borrowers.

By applying the Gravity Model, the positive effects of the rising of Russia's and EU's GDPs per capita, increase in oil prices and the devaluation of Russia's currency on EU-Russia trade flow were estimated. The positive impact of Russian rouble devaluation can be explained by the fact that Russia has a positive trade balance with the EU. On the other hand, the negative effect both of geographical distance between Moscow and EU Member States' capitals and of the sanctions imposed in 2014 on bilateral trade were calculated and factored in. In order to carry out the simulation exercise under the lifting of sanctions and oil price growth by 15%, we used two static panels: the first panel was estimated by the Fixed Effects Model and the second one by the Random Effects Model.

As far as the results obtained are concerned, the absolute and relative impacts under these favourable conditions for EU–Russia trade relations were presented. It turns out that not all countries would have had a positive impact, but currently these countries are not suffering losses because of sanctions and their trade flow with Russia is not sensitive to oil prices. However, the impact of sanction lifting on EU–Russia trade turnover is very significant: it is more than 20% regarding the average observed trade flow. If the oil prices increased by 15% together with lifting of sanctions, the total impact would surpass 30% regarding the average observed bilateral trade flow. In this regard, it was calculated that in order to compensate the losses in trade flow due to the sanctions, the oil prices would have to increase by almost 30%.

It is noteworthy that the phasing-out of sanctions could have mitigated, at least on a small scale, the negative impact of economic crises provoked by COVID-19. Thus, it was estimated that the EU–Russia trade flow was reduced by USD 35 billion due to COVID-2019, i.e., practically the same amount of money that would have been made if the sanctions had not been imposed.

Nevertheless, despite the economic losses for both parties and its inefficiency, in light of recent events the sanctions war between Russia and the EU is assuming new insidious dimensions, its consequences are unforeseeable, and all EU–Russia relations and bilateral trade are endangered. A shred of hope that sooner or later the parties will be able to reach agreement on gradual lifting of sanctions appears to be completely lost after the Russia's military intervention to Ukraine.

Since the war began, the EU have approved six packages of sanctions. The latest package includes a ban on imports of crude oil and refined petroleum products, a Swift ban for an additional Russian banks and suspension of broadcasting in EU for additional Russian state-owned outlets (See Timeline—EU restrictive measures against Russia over Ukraine—Consilium (europa.eu)). However, a temporary exception is allowed for those EU Member States that have a strong dependence on Russian crude oil supplies. Moreover, some EU Member States continue buying Russian gas. In this regard, we can conclude that despite all the efforts, Russia has not been totally excluded from the EU production chain yet. As a future research line, it is planned to estimate the impact of six sanction packages both on EU's and Russian economies and probably to provide a comparative analysis with other countries, sanctioned by the EU.

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