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IMPACT OF THE RUSSO-UKRAINIAN WAR ON BLACK SEA TRADE: GEOECONOMIC CHALLENGES

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ABSTRACT. This paper investigates the strategic importance of the Black Sea region in the context of the ongoing conflict in Ukraine. Focusing on trade dynamics, geopolitical actors, and regional cooperation, the study analyzes the region's transformation and the resulting implications for global trade. The paper examines how the conflict has redefined trade relationships among Black Sea nations and major powers. For this purpose, trend models are evaluated for three-time samples for the export and import of products of 7 countries of the Black Sea Basin in both nominal and relative dimensions. In total, the evaluation and analysis encompass 1764 econometric models. Noteworthy trends include the evolving roles of the EU, the Middle East, and Russia, the potential resurgence of Ukraine, and Turkey's mediating role. The post-conflict landscape could witness heightened Western influence and continued Chinese engagement.

Keywords: Black Sea region, trade flows, geopolitical dynamics, conflict aftermath, regional cooperation.

Introduction

The Black Sea connects Asia, Europe, and Africa through the trade flows that pass through the Black Sea waters and its coast states. Therefore, considering its strategic location, it can act as either a facilitator or, on the contrary, a bottleneck for global trade. To better understand the stakes and challenges that the current war in Ukraine poses, our research focuses on assessing the region by primarily looking at the economic flows that the Black Sea allows and how the great powers and coastal states could leverage them to increase the importance of the Black Sea region.

The final declaration of the 2023 NATO summit (NATO, 2023) stated that the Black Sea region is of strategic importance for the Alliance (Borówka, 2020). While this is understood to be due to the war in Ukraine, it also confirms the region's importance as a geopolitical node for Eurasia and, therefore, for Transatlantic security. The blockade imposed by Russia on the Ukrainian coast has affected trade – and in particular Ukraine's grain trade – the most. However, the role of the Black Sea is also significant in view of the energy resources that NATO members Romania and Turkey have discovered offshore in the last decade – such reserves are crucial since they could decrease the European dependency on Russian energy resources. Moreover, should Ukraine have had the chance to explore its offshore resources, more deposits would likely have been found. As it is, Russia's Crimean invasion of 2014 prevented Kyiv from searching, as much of Ukraine's Exclusive economic zone fell under Russia's control (Yotsov, 2019).

Therefore, considering the significant security transformations that have influenced the Black Sea in recent decades, the shifting security perceptions and the interplay of soft and hard power perspectives, a thorough analysis of the fundamental transformations in trade is needed to understand the current and future challenges the region is facing (Shelest, 2022).

Geographically, the Black Sea region includes six coastal states: Bulgaria, Romania, Ukraine, Georgia, Turkey, and the Russian Federation. Occasionally Armenia, Azerbaijan and Moldova are included in this list, calling the formation the Great Black Sea Region or the Wider Black Sea Region, although some researchers question this definition (Dimitrov, n.d.). Most recently, as the corridor allowing for Ukrainian grains to cross the Black Sea was suspended once Russia exited the Black Sea Grain Initiative, NATO Allies said that they are going to improve situational awareness, surveillance and monitoring in the Black Sea, paying particular attention to all threats to shipping routes' security. At the same time, NATO stated that it would grow potential opportunities to work more closely with partners in the region, whenever appropriate (NATO, 2023). With an increased focus on the Black Sea and considering NATO's new Strategic Concept, our paper looks to determine the specific players in the Black Sea when it comes to international trade routes and the trends that have emerged (for them and the region) since the war began in the Black Sea region.

To contextualize the available data, we need to establish a common foundation for understanding the geopolitical balance in the Black Sea area. Therefore, we will consider that Eurasian grand powers – Russia and China, in particular, compete for influence in Europe. Moreover, both aspire to increase their power to match that of the US, the global power. The US has the net advantage of controlling the oceans due to the size of its navy and its victory in the Cold War. This victory allowed Washington to build its influence through the establishment of economic networks and alliances.

The Black Sea is both a geopolitical node and a borderland region, in the sense that both the US and Russia pushing for maintaining and growing their influence, while China is seeking to establish a significant presence (Stavytskyy, 2018). Russia seeks to re-establish itself in what it perceives as its sphere of influence, which it has been losing to the West and the US since the

end of the Cold War, particularly in the former USSR territory along the coast of the Black Sea. Therefore, it regards Ukraine as well as the South Caucasus states of Armenia, Georgia and Azerbaijan as territories it needs to re-establish itself and its rule.

The US and the West in general, comprising the EU and the European powers seek to maintain their influence and project the model of democracy and free trade by engaging in either security (NATO Partnership for Peace) or economic partnerships (Eastern Partnerships). Both NATO and the EU maintain an open-door policy towards neighbouring states. This policy aims to secure internal stability and provide access to resources and trade routes, resulting in increased efficiency in economic production and consumption. Consequently, there is an improvement in the standard of living for their citizens. The Russian invasion of Ukraine challenges Western interests in maintaining a safe supply chain through the Black Sea and undermines their imperative to maintain economic growth and stability.

Based on this foundational understanding of the current powerplay in the Black Sea, we examine the increasing concerns of other players about the events in the neighbourhood by examining the way the regional trade routes have been shaped during the last decade.

First, we will examine the trade relations between the countries of the Black Sea region and the rest of the world. This is a critical issue during times of war, as Russian aggression has significantly reshaped trade flows (Coffey & Kasapoğlu, 2023). The war in Ukraine has had far-reaching effects on the global agricultural commodities market, resulting in record-high prices for grains and vegetable oils since late 2021 (Glauben et al, 2022). The invasion of Russian forces has worsened the situation, causing soaring prices and disruptions in food security. Import-dependent regions such as the Middle East, North Africa (MENA), and sub-Saharan Africa, which heavily rely on Russian and Ukrainian wheat, have been particularly affected. Moreover, these trade disruptions occurred unevenly (Aksu et al, 2022). If Ukraine, for obvious reasons, has almost completely stopped all types of trade with Russia, the EU countries have only limited the purchase of energy carriers and the sale of certain dual-purpose goods. The sanctions that the West has imposed on Russia have been harshest so far – however, the West has allowed itself room of manoeuvre to allow it to continue the economic activity and help Ukraine, while also potentially being able to further pressure Russia should there be a need to do so.

At the same time, Turkey has grown into a regional mediator between Russia and the West, accommodating both sides – helping the Black Sea Grain Initiative take shape while also profiting (even if not officially) from Russia's strategy of avoiding the Western sanctions by implementing the so-called "parallel trade" practices, i.e. smuggling (KSE Institute, 2022). Such changes not only reshaped how Russia and major European powers accessed essential resources for their economies but also effectively transformed the Black Sea into a war zone. The conflict is expected to impact the global economy through three primary channels: financial sanctions, rising commodity prices, and supply chain disruptions (Orhan, 2022). At the regional level, it impacts both future Black Sea security and economic prospects.

Therefore, our research will explore whether the last decade has seen a strengthening of regional cooperation through the prism of trade relations between the countries of the Black Sea region or whether the grand powers, the outsiders of the region are the ones shaping regional relationships when it comes to establishing trade dependencies. Therefore, our main research questions are as follows:

1. Are the main geopolitical players of the world (EU, USA, Great Britain, China, India, Russian Federation) interested in strengthening cooperation within the Black Sea region?
2. Have the countries in the Black Sea region shown increasing interest in strengthening regional cooperation?

3. Given their level of cooperation, can the countries of the Black Sea region truly influence the security of the Black Sea region geopolitically?

4. How is the war that Russia started by invading Ukraine potentially changing the regional balance in the Black Sea region, considering trade interdependencies existing in the region?

5. By considering trade flows alone (and discounting the potential impact of the war on the Ukrainian economy and the reconstruction works needed, or in other words, considering the war to have a limited effect on the Ukrainian trade potential, both from a production and logistical points of view), what changes can be expected for the countries in the Black Sea region after the end of the conflict between Russia and Ukraine?

We will address the aforementioned questions by examining the dynamics of trade flows (both export and import flows) of the countries of the Black Sea region between themselves and with other countries before and after the start of the war in Ukraine.

Structurally, the paper comprises several sections. First, the body of literature on the problems of trade in the Black Sea region is analyzed. Next, data for analysis by the countries of the Black Sea region, along with the research methodology, are presented. The following sections analyze the results and present a discussion, conclusions, and policy recommendations for the Black Sea region

1. Literature review

Geoeconomics is both a concept and a method to understand power, shaped by economic drivers in international relations that have a considerable influence, competing with or complementary to military force in global and regional politics. Military aggression can affect access to resources, infrastructure and markets, thus significantly increasing the power of an actor in international relations, depending on its economic structure (Luttwak, 1984).

At the same time, recent history has shown us that asymmetrical economic interdependencies do not promote stability but create vulnerabilities (Keohane & Nye, 1973; Cu and Nguyen, 2022). This dependence on essential resources makes specific markets vulnerable to political pressure or economic manipulation (Fiszeder & Małecka, 2022; Kozmenko, & Ostapenko, 2022; Kustina et al., 2023; Kozmenko et al., 2023). This type of asymmetric relationship determined the energy decoupling of European states from Russia after the start of the second stage of the Russia-Ukraine War on February 24, 2022, in their desire to avoid political blackmail.

The dynamics of the war provided control levers to Moscow by jeopardising trade flows in the Black Sea and obstructing free navigation while seeking to abusively promote its status quo policy in the northern Black Sea and the Sea of Azov, thus minimising the geoeconomic relevance of the other coastal states.

The importance of political neighbourhoods and geography in geoeconomics are decisive for understanding transformations (Ambroziak & Stefaniak, 2022; Razinkova et al., 2023; Kozlovskyi et al., 2024). Therefore, the geographical location of the Black Sea offers not only the advantage of an east-west trade corridor but is currently vulnerable to this war, being subjected to belligerent behaviour that maximises regional risks. This state fragments the projections of sustainable development and geoeconomic interconnection with the rest of the world, especially with African states whose food security is affected, and implicitly the capacity to import grain from Ukraine. From a theoretical perspective, geoeconomics is an essential method to look at socio-economic sources of power, while economic diplomacy is a crucial tool for supporting the interests of the national economy and, by extrapolation, ensuring the full sovereignty of states. During wartime, economic diplomacy is shattered, and geoeconomics

gets to be understood through the prism of game theory. Thus, geoeconomics points to the potential dangers of a situation where a state cannot produce and control essential resources and goods, reducing a state's power and independence within the international and regional relations system and making it politically and socially vulnerable.

In reality, geoeconomic challenges cannot be seen separately from its interconnections with military power and international politics, being a significant factor in influencing and political direction of states. Still, this study will predominantly analyse the macro-dynamics of economic interdependencies in the Black Sea due to Russia's war in Ukraine. We focus on trade flows, considering the structural impact of the war in Ukraine has yet to be assessed, with the military and political shifts that are undergoing.

From the perspective of Realism, the current state of the Black Sea region is caused by the dominant ambitions of the Russian Federation. Russia's hegemonic decline, which began long ago due to its inability to be a global economic power with a sufficiently weak and ideologically non-persuasive alliance system, has gradually amplified its aggressiveness and the need to avoid the geopolitical collapse it was in (Nate, 2021). Thus, we understand that Russia has become aware of the exhaustion of its specific instruments of global competition, ultimately appealing to military, political and energy powers to preserve its relevance and status as a great power. By blocking the strategic projections of other regional states and problematising European security, Russia would have maintained its indispensable character in the equation specific to the great power competition. This reality of hegemonic decline is associated with instability (Kindleberger, 1997) and conflict, suggesting the need for coordination and cooperation between countries in the region and international partners to ensure financial stability, economic development and security in the Black Sea.

In the competition for power and spheres of influence, the Black Sea has become a crossroads of the interests of great powers, including Russia, China, the EU and the US, being an essential hub on the Eurasian corridor. According to John Mearsheimer's Defensive Realism Theory, this competition is typical in an international system based on power, and states pursue their national interests predictably (Mearsheimer, 2001). The security dilemma brings with it a particular potential for escalation, with the risk that defensive or preventive actions will be misinterpreted as offensive actions, thus increasing regional tensions, especially if crisis management agreements and mechanisms are ineffective.

At the same time, Moscow's extreme reactions amid the failed military campaign were deterred by Ukraine's partners through deterrence mechanisms, and it is eloquent for Russia to calculate the costs and benefits of potential military escalations.

This war has decisively influenced how certain coastal actors in the Black Sea are perceived and how political decisions have been impacted so far. The states directly and indirectly affected by this war have the chance to build sustainable and positive geoeconomic and security projects to stabilise the region.

In the realm of literature concerning the Black Sea region, its security, and trade, a considerable body of work exists. However, there are research gaps in analyzing the period starting from 2022, marked by Russia's full-scale aggression. Many discussions and analyses primarily centre around institutions, state leaders, and media content. This literature review will highlight noteworthy studies that specifically address this period and its implications.

Analyzing statistical data, Glauben et al (2022) discover the conflict in Ukraine has exacerbated tensions in international agricultural commodity markets, leading to increased vulnerability to food insecurity in import-dependent countries. To address potential food shortages, maintaining globally open and competitive agricultural markets with resilient supply chain structures is crucial to ensure food security and mitigate risks associated with supply disruptions. Disruptions to exports from the Black Sea region and high prices further destabilize

food security in these regions. However, global demand for wheat is expected to be met in the current marketing year, with countries like Australia, India, and the USA increasing exports to fill the gap left by Russia and Ukraine. Global food systems and competitive international trade structures are crucial for managing crises and mitigating food shortage risks (Glauben et al, 2022).

Orhan (2022) provides a general overview of the situation and claims that the conflict has impacted global trade, financial markets, and the recovery of the global economy. The article investigates the effects of the war on global trade, focusing on financial sanctions, increased commodity prices, and supply chain disruptions. He states that policymakers should reconsider market design to ensure energy security and create incentives for the green transition. The war's results confirm a worsening global economy, with rising food, fuel, and fertilizer prices, financial volatility, and sustainable development divestment. The reaction of the international business community to Russia's armed aggression against Ukraine was also studied by other scientists (Plastun et al., 2023; Brož et al., 2023; Rohov et al., 2024).

Moreover, various researchers have analyzed Black Sea region trade during the period of war escalation (Hadzhiev, 2020), specifying the situation in the global vegetable oil market (Glauber et al, 2023), sea transport situation (Lutfullaevich, 2023), and energy market (Tutar et al, 2022; Febriandika et al., 2023). The analyses were conducted from the perspective of a statistical overview and critical assessment of the existing tendencies.

Regarding the security and future strength of the Black Sea region, such scholars as Shelest (2022), Khylko & Shelest (2022), and Lanoszka & Rogers (2022) suggest that strengthening security in the region could be achieved by cooperation among Baku, Tbilisi, and Kyiv by enhancing cooperation in defence, resistance to hybrid threats, and joint energy projects. An increase in NATO presence is deemed necessary for regional security, along with greater cooperation with the UK, US, Turkey, and Romania. However, the authors highlight the importance of a favourable strategic location and opportunities in the global environment, such as transit potential, logistics infrastructure, transport capabilities, seaports, and energy projects. The research questions raised by the scholars include the changes in security perception that have changed in the last three decades, whether the OSCE is a security actor, and whether resilience-building can be a smart security response to current challenges.

Similarly, Kaspars (2022) argues that the formation of the Baltic-Black Sea Union raises questions about Europe's defence outpost, as security group formation is crucial in modern conditions, requiring quality justification and identification of key players and capabilities.

Some papers suggest that certain actors, such as Romania (Damian & Toma, 2022) and Turkey (Alim, 2022), are playing an increasingly significant role in the Black Sea region, as opposed to Russia (Bilan et al, 2022; Vlad, 2022).

Therefore, research gaps may be identified in the object and methodology of the analyses. It is crucial to address the strength and future of the Black Sea region with grounded and mathematically reliable analyses.

2. Methodological approach

For the analysis of trade flows, IMF databases were used, containing information on the export and import of Black Sea countries with other countries, their main trade partners (International Monetary Fund, 2023). For this analysis, we have considered the dynamics of export and import flows of the countries of the Black Sea region to other countries of the world from 2011 to 2022 in the annual relative structure in million USA dollars. In choosing the last ten years before the war in Ukraine started, we have also considered the effects of the Crimean invasion and in doing so we have normalized the region to a level of mild aggression. However,

while we have taken into consideration a mild security risk for the last decade, we have not considered the Crimean invasion as a relevant factor in shaping trade flows. We assume that Ukraine was able to conduct trade through the Black Sea considering its main ports on the coast were not in Crimea and therefore flows were not affected by the Russian takeover in 2014. The data reflect the export and import of goods and services to the main countries or regions of the world for each of the countries of the Black Sea region.

Based on the research questions and available data, we formulated several research hypotheses.

Hypothesis 1: The main geopolitical players, all the great powers besides Russia, are interested in strengthening the Black Sea region due to its strategic importance for trade, energy security and geopolitical influence, that is, they increase the volume of trade with this region.

Hypothesis 2: The interest of the states of the Black Sea region in strengthening the formation is growing, because they understand the importance of stability, security and economic development of this region for their national interests, and therefore increase the volume of trade between them.

Hypothesis 3: The countries of the Black Sea region have the opportunity to geopolitically influence the security of the Black Sea region by building cooperation, and dialogue and establishing effective security mechanisms, that is, the size of their trade mutual influence promotes interest in greater cooperation.

Hypothesis 4: The war launched by Russia against Ukraine changes the rules of the game in the Black Sea region. It created new challenges and threats to geopolitical stability and security, and therefore changes the structure and volumes of trade of the Black Sea states.

We will test the given hypotheses with the help of regression analysis. Given the available range of time series, the simplest linear regression model with a trend of the type will be analyzed

$$TradeValue_t = BaselineCoef + GrowthCoef \cdot Trend_t + \varepsilon_t, t \in S_j, j = \overline{1,3},$$

where $TradeValue_t$ is the dependent variable, which will be used as either the absolute or relative value of export or import of a certain country or group of countries, $Trend_t$ - year number, $BaselineCoef$ and $GrowthCoef$ – coefficients of the model, ε_t - residuals of the model. It is important to emphasize that in the research process, there is no need to guarantee the fulfilment of all econometric conditions for constructing a regression. An important aspect of the research is precisely the tracking of the direction of change of the corresponding indicator of the dependent variable without proving that this particular nature of the change is optimal. For this reason, no dummy variables were included to explain COVID-19 in 2020. Accordingly, the main attention will be paid to the value of the coefficient for the year variable, as well as the significance of this coefficient. The work does not specifically focus on issues of data stationarity, the presence or absence of autocorrelation or heteroscedasticity, and other requirements for regression models due to a lack of data.

To test the hypotheses, we will separately examine 3 periods S_j: 2011-2021 (the base period), 2011-2022 (the war-adjusted period), and 2012-2022 (the war-adjusted period, which contains the same number of observations as the first).

We will conduct the analysis on three types of data, i.e. for all 3 hypotheses and all 3 periods everywhere. First, we will use nominal trade indicators. It is clear that such indicators cannot be considered very significant due to the impact of inflation, especially in recent years when the impact of COVID-19 was observed. However, the given samples can be applied to highlight the trend to have only an initial idea of its change in the last year. Secondly, we will use the share of trade with a certain country for analysis. This value is more stable, less prone to the external influence of inflation or COVID-19, and therefore can be used to determine the

change in the geographic structure of the economy. Thirdly, we will classify countries depending on the degree of increase in the share of trade in comparison with the increase in the volume of total trade. Those countries for which the volume of trade is growing at a faster-than-average rate can be considered as increasing their influence (Veebel & Markus, 2018; Wolszczak-Derlacz & Lu, 2022).

To test hypothesis 1, we will study the changes in the trade influence of the major countries of the world, the USA, China, Great Britain, France, Germany, France, Italy, India, the countries of the Black Sea region, as well as certain regions of the world for each state of the Black Sea region. We will pay special attention to the Middle East, Central Asia, Africa, the EU and the countries of the Eurozone. This choice is connected with the fact that the countries of the Black Sea region are considered precisely as a bridge between Asia, the Middle East, partly Africa and Europe.

To test hypothesis 2, we will investigate the change in trade influence on other countries of the Black Sea region.

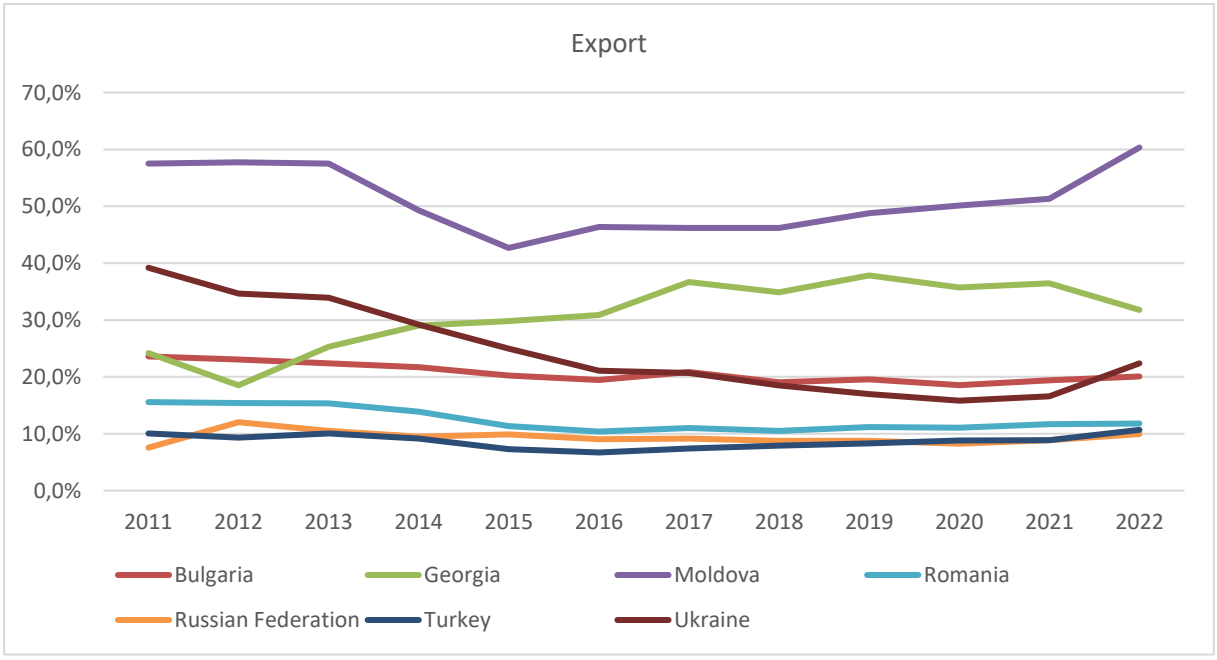
To test hypothesis 3, we will examine the changes in the share of trade within the Black Sea region in comparison with the shares of the main trading partners.

To test hypothesis 4, we will compare trend models on different samples, including the years before and after the start of the war.

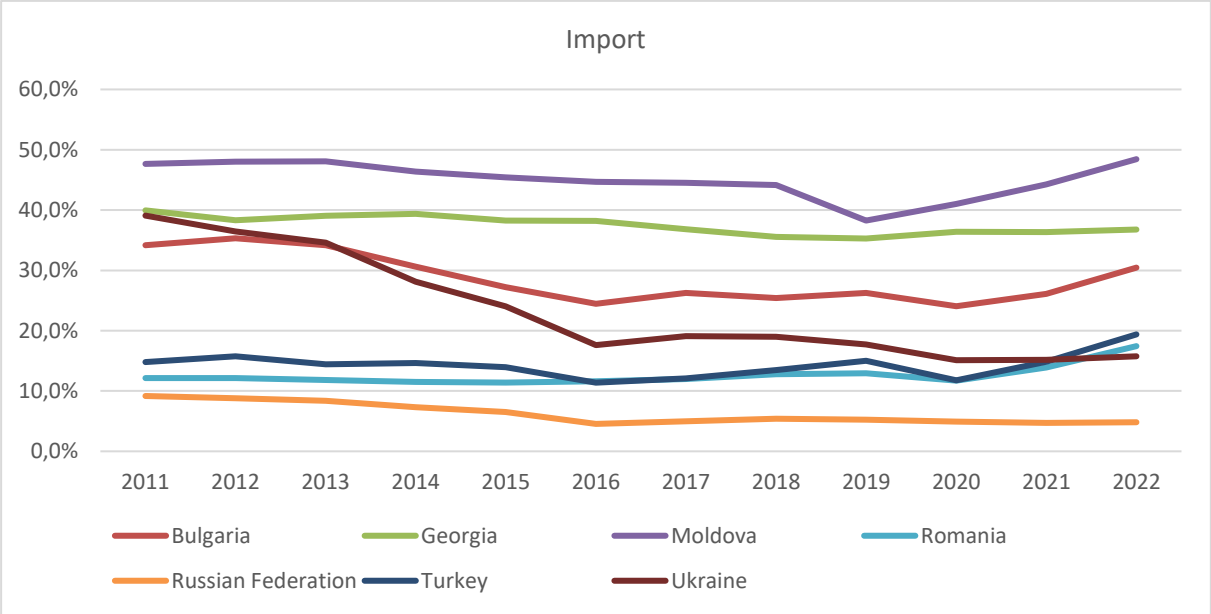
The validity of the models will be tested employing Fisher criteria on adequacy, R-sq coefficient on the part of dispersion that is explained and forecasted by the model, and t-statistics for coefficient diagnostics on significance (0,9; 0,95, 0,99 levels of significance).

3. Conducting research and results

Let's consider the results of the econometric analysis (*Annex A1-A7*). Estimates of trade shares for each country are presented in *Graphs 1-2*, where the ratio of the Black Sea region for each country participant is indicated.



Graph 1. The ratio of the Black Sea region for countries (export)
Source: *calculated by authors*



Graph 2. The ratio of the Black Sea region for countries (import)
Source: *calculated by authors*

As mentioned earlier, trend models were estimated for three-time samples for the export and import of products in both nominal and relative dimensions. Thus, the trend of 21 global indicators (different countries and groups of countries) was estimated for 7 countries, which made it necessary to build 7*2*2*3*21=1764 econometric models. Each of these models has an estimate of the coefficients and a test of their significance. Since similar models have been estimated for different time samples, comparing the changes in these coefficients is an important step for understanding the trends in trade of a certain respective country.

First (hypothesis 1), we will analyze the absolute change in the trade routes of the countries of the Black Sea region. Various processes took place in the countries of the Black Sea region. In particular, according to the evaluation data, the export of products in Turkey, Georgia, Bulgaria, Romania, and Moldova increased almost constantly. At the same time, the evaluation data, taking into account the year of the war, showed a significant increase in exports. For example, the growth rate in Bulgaria, Georgia, Romania, and Turkey increased by almost 1.5 times, and in Moldova - by 2 times. It is obvious that this is because part of the goods began to be substituted from these countries instead of traditional supplies. For example, Ukraine traditionally bought oil and oil products from Russia and Belarus, but after the beginning of the aggression, this was prohibited. Instead, through various schemes, Russian oil was sent to Bulgaria, from where the fuel already went to Ukraine (UNIAN, 2023). Such schemes have been developed for various goods, which makes such changes not surprising. At the same time, for the above-mentioned countries, all coefficients remained significant, which indicated that the change in exports truly occurs at a sufficiently significant level. At the same time, for Ukraine and Russia, it can be noted that the trend coefficients for exports were negative and insignificant, which indicated that the changes were not fundamental, fluctuating at approximately the same level. For Ukraine, two main factors can be identified here. On the one hand, the state tried to increase export flows by increasing the efficiency of the economy. On the other hand, the occupation of Crimea and territories in the east of Ukraine with large enterprises led to the collapse of the export of metal and other resources.

Imports for the countries of the Black Sea region are more stable. In particular, significant coefficients were observed only for Bulgaria and Romania, as well as, partially,

Moldova. For these countries, we see an increase in the trend coefficient of about 1.5 times, which is comparable to the corresponding coefficient for exports. Thus, these countries remained bases for the processing of goods and the resale of products. The absence of significant coefficients for Turkey, Ukraine and Russia indicates only approximately constant values of total imports (the flat trends).

Thus, we can see that most of the countries of the Black Sea region have positive changes in the overall export and import of products. Obvious exceptions to the rule are Ukraine and Russia, as well as partly Turkey, which has a generally negative trend in imports.

If you analyze the connection between the countries of the Black Sea region and other regions of the world (hypothesis 2), you can notice significant differences. Most countries have the EU as their main trading partner, and its share is constantly increasing. The share of other regions, as a rule, does not exceed 5%, and exports outweigh imports. The exception is Georgia, which sends a third of its exports to Central Asia, and imports 11.2% from there, as well as Turkey. Turkey can really be considered a connector between Asia and Europe, its exports in 2022 to the EU and Asia are 40.5% and 15.9%, and its imports are 25.6% and 8.9%, respectively. If we analyze the relative indicators, then positive trends are observed for trade with the EU and negative trends with the countries of Asia and Africa. The exception is Russia, for which the trends have the opposite form: it has a negative trend for its trade with the EU and a positive trend with the countries of Asia and Africa. Thus, it can be said that the countries of the Black Sea region are currently reducing their level of globalization, forming an increasingly European regional trade cluster. At the same time, the data shows that Russia has shifted its trade away from the West (notably from Europe) throughout the last decade, preparing to invade Ukraine and ensure limited repercussions for its economy.

To test hypothesis 3, we should look at changes in the intra-regional trade of each Black Sea region country. Unfortunately, the results show that the countries' interest in international trade is quite low. For example, an increase in the share of exports within the region is observed only in Georgia, and the share of imports - only in Romania. Turkey shows almost unchanged indicators of the share of trade within the Black Sea region, but all other countries show a negative trend in the share of trade within the Black Sea region. The situation is a little more optimistic when analyzing nominal indicators. Growth in nominal export volumes is observed in almost all countries, except for Romania and the Russian Federation. Nominal imports are growing in Georgia, Romania and Ukraine, while the Russian Federation is showing a general decline. At the same time, it should be noted that the lion's share of all imports of the Russian Federation comes from Turkey, but due to the decrease in the volume of imports from other countries of the region, the general trend is negative. In general, it should be stated that from the point of view of the analysis, only a few countries in the region consider the Black Sea region as a truly strategic platform for trade. First of all, we are talking about Moldova and Georgia, whose dependence on the countries of the region is from a third to a half of trade. However, these countries have small enough trade volumes to have a real impact on the situation in the region. Other countries within the region trade with a share that does not exceed a fifth of their total trade, which cannot be considered strategic. As a result, we can conclude that currently there are no prospects for deepening cooperation in the Black Sea region because all countries are focused on solving mostly their own internal, local problems.

Regression coefficients for different samples should be carefully analyzed (*Annex A1-A7*). For Bulgaria, it can be seen that the war reduced the fall in the share of exports to the countries of the Middle East, and slightly increased the growth of imports from the USA and Central Asia. For Georgia, relative imports from Italy decreased, and those from the USA and the EU increased. For Moldova, the war has changed the trend of trade with Ukraine: the negative trend is flat, and the share of imports from the EU increased significantly as well.

Romania decreased the share of exports to Africa, and the share of exports to the EU increased, but the share of imports from Germany, the Middle East and Asia, and the Eurozone countries decreased. The Russian Federation significantly increased the trend of the share of exports to Central Asia, and the negative trend to the EU and the Eurozone intensified. The biggest changes were observed in the growth of the negative trend in imports from the EU and Ukraine for obvious reasons – western sanctions have contributed widely to this trend.

Turkey can be considered one of the beneficiaries of the war. Its trend in the share of exports decreased to the countries of the Middle East and Asia, Africa, but the trend in the share of exports to the EU and Romania increased significantly. The share of imports decreased from Italy, Germany, the Middle East and Asia, but increased fantastically from the Russian Federation. For Ukraine, the share of exports to China and the Middle East fell but significantly increased to the EU, Romania, Bulgaria, and Moldova. The share of imports grew from EU countries, and slightly fell from the USA and the Russian Federation. At the same time, an increase in export and import nominal trends was observed for all countries, primarily due to the significant inflation of the dollar. Thus, it can be noted that the war in 2022 has not yet had time to make fundamental changes in trade in the Black Sea region. An exception should be considered the trade flow between Turkey and the Russian Federation, which actually doubled due to schemes to circumvent EU sanctions.

Now let's analyze how exactly each of the countries changed trade flows with the countries of the Black Sea region. The ratio of the trend coefficient to the total exports and imports of each country was studied for the analysis, and this value was compared to the total turnover. If the value of the ratio for a certain nation is more than the value for total turnover, it signifies that the country's trade growth is bigger than the average trade growth of all Black Sea area members. If the value was smaller, then, accordingly, the growth was smaller than the average. The work examined the periods from 2011 to 2015, from 2011 to 2016, etc. The final period was the sample of 2011-2022. For each state or region, the number of periods with above-average growth was calculated. The obtained results are shown in *Table 1* for the Black Sea region in different ways. For example, Ukraine rapidly increased its exports to EU countries, China, India, Moldova, Georgia, Africa, and the Middle East. At the same time, imports from EU countries, China, Bulgaria, and Turkey grew faster. In turn, Bulgaria developed exports to Germany and Great Britain at a faster pace, and imports from China, India and the Eurozone. Moldova focused its exports more on Germany, the Middle East, Africa, and the EU, and its imports on France, China, Africa, and the Middle East. Turkey focused on exports to Great Britain, the USA, the EU, and Moldova, and on imports to Moldova and Great Britain. Romania rapidly developed exports to Moldova and China, and imports from Germany, Moldova and Turkey. Georgia tried to export more to China, the EU, and the Russian Federation, and to import from France, the USA, China, Moldova, and the Russian Federation. Finally, the Russian Federation increased the speed of exports with China, India, the Middle East and Asia, Moldova, Romania, and Georgia, and the speed of imports with the USA, China, India, the Middle East, and Georgia.

4. Discussion

Let's consider the scenarios of the end of the war in Ukraine and possible changes in trade flows according to various options (Khotynska-Nor, 2022). However, an important disclaimer is necessary: we will consider trends observed as major factors for future trade in the region, along with potential shifts in the direction of trade, given the current war. We are not taking into account the effects of the war on Ukrainian capabilities (Kaluzhna & Shunevych, 2022) to operationalize international trade nor will we discuss the potential for the West to help

Ukraine maintain or grow such capabilities through its rebuilding programs that are being discussed as we are writing the article. We will also consider that, given the kinetic warfare evolution until the summer of 2023, it seems unlikely that Russia will emerge victorious in the war.

In observing the results of our investigation, there are however several obvious trends that cannot be changed: an increase in the role of the EU for the countries of the Black Sea region, as well as a decrease in the import role of the countries of the Middle East. This is due to the wide implementation of alternative technologies for electricity production, which reduces the demand for energy resources. Of course, the EU countries in 2023 will likely complete the path of a broad restructuring of energy trade flows, which may temporarily increase the role of the Middle East and the USA in trade flows. However, the rapid development of the economies of the Black Sea region after the war should neutralize this influence, especially when considering the potential of the Black Sea's offshore resources.

At the same time, our data analysis also highlights that the influence of the Russian Federation, which will try to increase its presence in Central Asia and the Middle East, will continue to be limited in the Black Sea region. This has been a pillar of the Russian economic diplomacy in the region and is likely to be continued, in light of the current developments. With favourable oil prices, the Russian Federation's trade balance may eventually equalize, forcing it to reduce costly imports from EU countries and the Black Sea region. It is also clear that the systems of "parallel imports" (in effect, smuggling) through Turkey and other states will also be significantly curtailed, especially after the Black Sea Grain Initiative has been ended.

At the same time, the end of the war would see Ukraine giving a significant positive impetus to the region, considering Kyiv would restore its economic and political control over about 20% of the territory, and significant investments from the West would aim to stabilize and grow the economy after the war. This, in turn, will cause an increase in imports from neighbouring countries and the West, notably from the EU. The rate of growth of exports and imports from Ukraine will increase significantly at least during the next 3-4 years due to the provision of various preferences and the demands for reform of economic relations, reduction of shadow turnover, etc. Even if a transition period that would allow for the shadow and black economy to continue may overshadow the positive impact of the rebuilding process, it is unlikely that this will limit trade flows within the Black Sea region.

Conclusion

According to the models, Turkey's trade volume should decrease by the amount of smuggling from the Russian Federation, but this change will occur gradually. At the same time, Turkey will try to significantly strengthen ties with the West, notably with the EU, which means intensifying trade with European countries. Turkey is, after all, going to continue its connector role between Europe, Asia, the Middle East and Africa and, given political and economic stability, it may grow its regional role in maintaining a balance between the growing powers of the three continents.

Bulgaria, Romania, Moldova and Georgia will receive additional incentives for increasing their trade between themselves and Ukraine, including through the rebuilding programs currently under discussion, which will grow coordination between themselves and trade among the Black Sea region states. Should the West win – which we consider the basis of our scenario and given the data analysis results, Russia will diminish its role in the Black Sea region, something that will likely increase that of the West. This increases the region’s role as a geopolitical node, in the sense that it becomes part of the Western containment line and effectively, a significant Western-dominated borderland.

At the same time, it is notable that the role of China in the countries of the Black Sea region is gradually increasing. This is something that will continue, also considering that China is likely to consider the Black Sea a safer route to ship its goods on land to Europe, given the logistical complications of shipping them through Russia and Ukraine. A particular growth trend during the last decade is currently observed in Bulgaria, with a gradual increase in both exports and imports from China. While India - the other growing economic power in Asia remains an insignificant partner for the countries of the Black Sea region, it remains to be seen how China shapes its ways through the Black Sea after the war ends.

Guaranteeing freedom of navigation in the Black Sea is a crucial precondition for ensuring trade flows. There is a need to closely monitor Russia's movements in the region and respond appropriately to any attempt to undermine stability and security. Strengthen regional cooperation and relations with Western partners to reduce Russia's negative influence. At the same time, China is directly interested in promoting diplomacy and cooperation to reduce the risk of conflicts and economic disruptions in the Black Sea region. Close monitoring of the regional trade and investment flows would lead to an understanding of both Russian and Chinese strategies with regard to the area, providing early warning signs for potential future crises.

Romanian railway, road and multimodal platforms infrastructure modernisation with the European Union support, as well as capitalisation of the river route on the Danube, would be a tremendous regional strategic achievement. The Danube River trade route is only a longer alternative but four times cheaper due to the cost of insurance for ships and cargo loaded at Ukrainian ports.

With the support of partners and allies, states in the region can better analyse the geopolitical impact of developments and develop strategies to manage complex situations. Streamlining communication channels with regional and international actors can prevent tensions from escalating.

A draft joint vision between Romania and Turkey for recovering trade flows in the Black Sea in the context of Ukraine's reconstruction could include an initiative entitled "Black Sea Economic Corridor".

The two countries can cooperate to ensure naval security, develop transport, energy and telecommunications infrastructure, facilitate cargo transit and improve regional connectivity.

Romania and Turkey could contribute to developing port infrastructure and increased connectivity to manage geoeconomic challenges more effectively. Growing port infrastructure and land and rail transport networks would facilitate efficient transit of goods to the European Union and the Mediterranean.

The development of a Romanian-Turkish energy and natural gas hub could include the exploitation of hydrocarbons in the Black Sea, the development of liquefied natural gas (LNG) terminals and transport infrastructure to support Ukraine, Moldova and Georgia, but also facilitate natural gas exports from the region to European markets. In addition, coastal states can work together to develop and promote renewable energies in the area, including by sharing renewable technology and expertise.

Increasing the relevance of the Organization of the Black Sea Economic Cooperation (BSEC), which encompasses most Black Sea coastal countries, can be revitalised and strengthened to promote cooperation in regional economics, culture, and politics.

From the perspective of multilateral formats, forums and platforms for economic dialogue with the involvement of external partners can contribute to promoting investment, trade and economic development in the region, with a focus on reforms and infrastructure projects.

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Annex

Table 1. Number of periods of faster growth for counties' trade

	Exports							Imports						
Country	Bulgaria	Moldova	Russian Federation	Ukraine	Turkey	Romania	Georgia	Bulgaria	Moldova	Russian Federation	Ukraine	Turkey	Romania	Georgia
France	2	7	0	8	0	1	2	2	8	6	8	1	1	8
Italy	2	5	2	7	5	1	3	5	3	3	7	1	1	2
Germany	8	8	6	8	6	8	4	7	5	2	8	5	8	0
United Kingdom	8	4	5	8	8	7	3	6	3	2	6	7	2	2
United States	6	1	5	4	8	5	1	7	1	8	8	0	0	8
China, PR: Mainland	6	8	8	8	1	8	8	8	8	8	8	6	6	8
India	6	0	8	8	4	0	1	8	2	8	4	4	0	1
Middle East and Central Asia	3	2	8	2	2	3	1	8	4	4	1	1	0	3
Middle East	3	8	8	3	2	3	7	8	8	8	8	1	7	2
Central Asia	1	2	8	1	3	3	1	6	4	4	0	2	0	5
Africa	6	8	8	8	3	4	4	8	8	8	8	5	7	1
European Union	6	8	2	8	8	7	8	7	5	2	8	3	4	1
Euro Area	5	8	2	8	8	6	4	4	3	2	8	2	6	4
BSR	1	0	2	0	1	0	8	1	1	1	0	1	3	2
Bulgaria	-	7	2	3	8	1	8	-	2	6	8	5	4	0
Moldova, Rep . of	1	-	8	6	8	8	0	8	-	2	4	7	8	8
Russian Federation	0	0	-	0	0	1	8	0	1	-	0	2	1	8
Ukraine	0	0	1	-	1	0	0	0	1	0	-	0	1	0
Turkey	2	6	7	3	-	0	2	8	0	3	8	-	8	3
Romania	0	8	8	8	7	-	7	4	7	7	1	1	-	2
Georgia	0	3	8	4	4	1	-	6	5	8	3	6	1	-

Source*: calculated by authors*

Table A1. Regression coefficients for Bulgaria

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	1017.65*	1552.15*	1794.14*				900.17^	1586.92^	1833.13^			
France	22.04^	33.35*	38.92*	-.0006^	-.0007*	-.0008*	13.02	19.12^	25.3^	-.0004^	-.0006*	-.0006^
Italy	29.81	70.9^	82.17#	-.0017^	-.0016*	-.0019*	61.98^	84.15*	94.66*	.	-.0005	-.0006
Germany	285.13*	333.25*	375.*	.0048*	.0039*	.0042*	154.05*	198.66*	213.08*	.0013#	.0005	.0001
United Kingdom	28.48*	25.11*	23.4*	.0003	-.0001	-.0003	-6.93	-9.05	-12.05	-.0005	-.0007^	-.0008^
United States	46.88*	56.05*	61.6*	.0008*	.0008*	.0008*	13.28^	30.42^	35.34^	.0002	.0003#	.0004#
China, PR: Mainland	59.26*	46.17^	38.29#	.001#	.0004	-.0001	128.3*	174.32*	194.14*	.0025*	.0026*	.0028*
India	10.46*	19.39*	23.38*	.0002*	.0004*	.0004*	11.52*	12.59*	11.82*	.0002^	.0002^	.0001
Middle East and Central Asia	-13.75	42.6	36.89	-.0023^	-.0017#	-.0024^	87.21*	102.51*	113.65*	.0017*	.0014^	.0015^
Middle East	-23.27	9.02	1.58	-.0018^	-.0014^	-.002*	55.95^	50.39*	49.13^	.0012^	.0008	.0007
Central Asia	9.52	33.57#	35.31	-.0005	-.0002	-.0004	31.26^	52.12*	64.52*	.0005^	.0006*	.0008*
Africa	25.84	62.55^	64.15#	-.0003	.0001	-.0002	73.42*	64.03*	61.05 ^	.0017^	.0012#	.001
European Union	879.76*	1184.95*	1375.33*	.0077*	.0066*	.0079*	665.58*	939.26*	1049.51*	.0036#	.0008	-.0001
Euro Area	575.2*	791.15*	913.31*	.0032*	.0023^	.0027^	367.17^	563.82*	640.93*	-.0005	-.0023	-.0029
BSR	63.85	196.77#	256.94^	-.0047*	-.0039*	-.0035*	-130.58	199.56	290.84	-.011*	-.0077^	-.007^
Moldova, Rep . of	-1.69	2.22	2.42	-.0001*	-.0001	-.0001	4.77*	7.87*	8.13^	.0001#	.0001^	.0001#
Russian Federation	-25.02#	-23.27#	-22.	-.0014*	-.0015*	-.0015*	-371.63*	-207.33	-197.71	-.0134*	-.0109*	-.0113*
Ukraine	- 4.09	30.72	41.18	-.0005	.0001	.0003	- 27.13	21.53	54.91	-.0014^	-.0006	.0002
Turkey, Rep . of	-14.37	8.	6.18	-.0029*	-.0031*	-.0037*	147.92*	219.45*	241.26*	.0025*	.0028*	.0029*
Romania	123.54^	188.94*	237.05*	.001	.0013#	.0021*	91.37^	130.33*	152.06*	.0007*	.0005^	.0007*
Georgia	-14.52*	-9.83#	-7.9	-.0007*	-.0007*	-.0006*	24.13*	27.7*	32.2*	.0005#	.0004#	.0004#

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A2. Regression coefficients for Georgia

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	167.16*	231.23*	248.38*				211.99^	367.29*	386.36^			
France	1.12	1.18#	1.42^	-.0002	-.0002	-.0002	8.81^	9.18^	8.77^	.0006	.0004	.0003
Italy	-3.4^	-2.67#	-2.76#	-.0022*	-.0022*	-.0022*	.29	2.66	1.01	-.0006	-.0007^	-.001^
Germany	.58	.7	.23	-.0008	-.001	-.0013	-2.9	5.76	7.36	-.0018*	-.0017*	-.0015*
United Kingdom	.17	-.06	-.44	-.0003#	-.0004^	-.0006*	-1.14	-.54	-1.3	-.0004	-.0005#	-.0006#
United States	-3.81	1.76	1.75	-.0043^	-.0034^	-.0036^	46.9*	60.64*	68.51*	.0043*	.0045*	.0052*
China, PR: Mainland	50.49*	59.56*	65.74*	.0126*	.0124*	.0131*	31.86*	41.53*	43.3*	.0018*	.0014^	.0014^
India	-1.39^	-.15	.19	-.0007^	-.0004	-.0003	-.67	.94	1.01	-.0003	-.0002	-.0002
Middle East and Central Asia	7.64	39.	41.58	-.0171*	-.0138*	-.0142^	30.89^	54.38*	58.27^	-.0003	-.0003	-.0002
Middle East	3.69	3.2	2.	-.0007	-.0013	-.0019	-2.92	7.98	9.87	-.0013^	-.0008	-.0007
Central Asia	3.95	35.8	39.58	-.0164^	-.0125^	-.0122#	33.81*	46.4*	48.4*	.001	.0005	.0005
Africa	-.04	1.43	.69	-.0004	-.0003	-.0006	-2.05	-.86	-.7	-.0004^	-.0003^	-.0003#
European Union	35.72*	37.35*	36.73*	.0016	-.0009	-.0022	6.64	39.76	36.64	-.0057*	-.0059*	-.0066*
Euro Area	4.36	3.78	1.48	-.0042#	-.0055^	-.0065^	17.46	35.99^	33.92#	-.0023#	-.0029^	-.0034^
BSR	102.3*	111.39*	119.18*	.0169*	.0134*	.0137*	44.55	107.23^	115.18^	-.0042*	-.0035*	-.0033*
Bulgaria	21.61*	25.34*	26.26*	.0039^	.0034^	.003#	-12.01*	-8.44 ^	-7.08#	-.0021*	-.0019*	-.0017*
Moldova, Rep . of	.23	.34	.51	-.0002	-.0001	-.0001	.5^	.29	.09	.	.	.
Russian Federation	53.9*	54.99*	55.51*	.0129*	.0107*	.0096*	62.48*	90.88*	94.95*	.0054*	.006*	.0059*
Ukraine	12.3#	11.9^	13.67^	.0004	-.0002	.0002	-24.83*	-27.5*	-23.77*	-.0046*	-.0051*	-.0044*
Turkey, Rep . of	6.88	13.91^	17.94^	-.0019	-.0013	-.0001	29.01#	57.26^	59.76^	-.001	-.0009	-.0009
Romania	7.37	4.93	5.29	.0018	.001	.0011	-10.6#	-5.27	-8.78	-.0019*	-.0016*	-.0021*

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A3. Regression coefficients for Moldova

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	76.51^	132.5*	152.44*				123.75	246.1^	296.43^			
France	.64	.51	-.07	-.0001	-.0004	-.0007#	6.67*	7.62*	8.21*	.0007*	.0005^	.0004#
Italy	5.07	7.86^	9.14^	-.0007	-.0013	-.0014	7.87#	9.44^	11.76^	.	-.0007	-.0008
Germany	17.54*	16.16*	17.71*	.0051*	.0034^	.0036^	13.33^	16.4*	19.37*	.0007#	-.0001	-.0002
United Kingdom	-5.3#	-5.26^	-6.21^	-.0031#	-.0034^	-.004^	-1.05	-.32	-.11	-.0004#	-.0005^	-.0005^
United States	-.16	.88	1.12	-.0004^	-.0003	-.0003	.38	2.72	3.71	-.0003	-.0002	-.0001
China, PR: Mainland	1.13^	.79#	.6	.0003#	.0002	.	35.03*	43.35*	47.83*	.004*	.0033*	.0031*
India	-.39^	-.33^	-.2^	-.0002^	-.0002*	-.0001^	.65	8.96#	10.88#	.	.0008	.001
Middle East and Central Asia	-2.29	1.3	1.07	-.0024^	-.0019^	-.0024^	11.08	11.39	13.41	.0016	.0013	.0015
Middle East	2.93^	5.23*	5.53^	.0006	.0009#	.0008	6.39	5.04	5.48	.001	.0007	.0008
Central Asia	-5.22*	-3.93^	-4.45 ^	-.003*	-.0028*	-.0032*	4.69	6.35	7.94#	.0006	.0006	.0008
Africa	1.15^	1.22*	1.07^	.0003^	.0002#	.0001	1.9	2.11^	2.24#	.0002	.0002	.0002
European Union	104.49*	125.69*	137.37*	.0252*	.0205*	.0204*	71.68^	129.46^	146.52^	.003	.0028	.0016
Euro Area	37.69*	39.75*	42.56*	.0079*	.0045	.0038	36.43#	51.5*	60.8*	.0012#	-.0005	-.0009
BSR	19.7	68.88#	86.3^	-.0082#	-.0025	.0003	15.43	92.64	116.82	-.0073*	-.0042	-.004
Bulgaria	4.36^	6.83*	7.5*	.0011	.0013^	.0013#	-1.07	2.16	2.27	-.0005^	-.0003	-.0004
Russian Federation	-45.84*	-42.04*	-39.7*	-.0235*	-.0224*	-.0218*	.47	16.94	25.99	-.0032^	-.0029^	-.0024#
Ukraine	-6.82 ^	18.95	25.17	-.004*	.0018	.0035	-7.12	6.89	13.43	-.0035^	-.003^	-.0026#
Turkey, Rep . of	16.74*	19.88*	22.31*	.0048^	.0045*	.005*	5.78	16.46#	20.96#	-.0006	-.0002	.
Romania	51.08*	65.22*	71.32*	.0135*	.0126*	.0127*	17.18	49.79^	53.73#	.0004	.0021	.0013
Georgia	.19	.04	-.31	-.0002	-.0003	-.0005*	.2#	.41^	.43^	.	.^	.

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A4. Regression coefficients for Romania

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	2147.86*	2682.98*	3005.83*				3734.79*	4708.22*	5463.78*			
France	117.1^	128.86*	156.92*	-.0004#	-.0007^	-.0005#	62.51#	76.4^	96.07*	-.0014*	-.0017*	-.0018*
Italy	126.04#	159.36^	201.1*	-.0017*	-.0019*	-.0018*	141.29#	199.59^	260.28*	-.0027*	-.0028*	-.0029*
Germany	757.23*	762.26*	815.69*	.0046*	.0032^	.003#	994.12*	1036.02*	1126.7*	.0032*	.0019#	.0012
United Kingdom	49.09	41.37	19.02	-.0003	-.0006	-.0011^	-23.58	-44.06#	-49.94	-.001*	-.0013*	-.0015*
United States	47.72^	78.71*	88.5*	.0001	.0003#	.0003#	17.15	30.37#	34.58#	-.0003	-.0002	-.0003#
China, PR: Mainland	35.8*	44.22*	46.51*	.0002#	.0002^	.0002#	399.77*	442.07*	519.9*	.0024*	.0022*	.0027*
India	-6.58#	-3.25	-3.33	-.0002*	-.0002*	-.0002*	4.44	18.32	29.53^	-.0002	-.0001	.
Middle East and Central Asia	-19.9	34.48	25.49	-.0021*	-.0017*	-.0021*	-54.43	86.07	146.45	-.0023*	-.0013	-.0009
Middle East	5.83	26.96	26.76	-.001^	-.001^	-.0011^	43.24*	64.53*	74.16*	.0003^	.0004*	.0004*
Central Asia	-25.73	7.53	-1.27	-.001*	-.0008^	-.001*	-97.67	21.53	72.29	-.0025*	-.0017#	-.0013
Africa	12.21	30.39	.66	-.0009	-.0008#	-.0015*	35.56^	56.65*	61.26*	.0001	.0002#	.0002
European Union	2098.99*	2406.39*	2699.37*	.0083*	.0072*	.0081*	2821.52*	3407.07*	3858.05*	.0014	.0003	-.0009
Euro Area	1520.15*	1664.07*	1864.55*	.005*	.0032#	.0036#	1958.93*	2216.49*	2481.97*	.0001	-.0019	-.0034#
BSR	-76.96	47.67	114.23	-.0051*	-.0042*	-.0037^	584.56*	937.22*	1101.63*	.0012#	.003^	.0036^
Bulgaria	86.58^	117.55*	137.66*	.0001	.0002	.0003	180.72*	391.86^	462.05^	.0007#	.002^	.0024^
Moldova, Rep . of	66.44*	99.64*	108.47*	.0005*	.0007*	.0007*	54.*	60.66*	61.49*	.0003*	.0003*	.0002*
Russian Federation	-55.62#	-76.81^	-90.24*	-.0014*	-.0016*	-.0018*	25.74	65.75	79.55	-.0013^	-.0011^	-.0013^
Ukraine	-50.88#	-7.6	8.71	-.0011^	-.0007	-.0005	57.83^	97.05*	130.74*	.0002	.0004#	.0007*
Turkey, Rep . of	-103.34#	-72.46	-35.13	-.0028*	-.0025*	-.0021*	264.17*	319.41*	364.39*	.0013*	.0014*	.0015*
Georgia	-20.14*	-12.66#	-15.25#	-.0004*	-.0003*	-.0004*	2.09#	2.49^	3.42*	.	.#	.*

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A5. Regression coefficients for the Russian Federation

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	-11003.5	-2911.16	-472.98				-5837.29	-6473.35	-5802.64			
France	-332.79	-52.36	83.41	-.0003	-.0001	.0001	-168.84	-210.6	-314.91	.0002	.0001	-.0003
Italy	-2312.98*	-1606.91^	-1799.47#	-.0039*	-.0031*	-.0038*	-268.87	-334.3#	-341.29	.	-.0002	-.0004#
Germany	-587.22	-394.27	-835.46	.0002	-.0004	-.0017^	-1093.56#	-1220.24^	-1437.95^	-.0016^	-.002*	-.0031*
United Kingdom	725.54	848.87#	914.15	.0026#	.0022#	.0022#	-375.78 ^	-347.64 ^	-450.9*	-.0009^	-.0008^	-.0012*
United States	127.87	268.3	513.37^	.0009^	.0007#	.0011*	18.68	-52.8	-219.36	.0011	.001	.0003
China, PR: Mainland	3115.59*	3395.65*	3734.61*	.0092*	.0077*	.008*	1497.89	1396.61#	1536.55	.0094*	.0102*	.0104*
India	229.17#	396.35^	333.84#	.0008*	.0009*	.0006*	123.49^	86.58#	88.85	.0007*	.0006*	.0006*
Middle East and Central Asia	1190.29^	1968.95^	2046.94^	.0049*	.0046*	.0042*	-13.2	-48.27	-7.56	.0009^	.0009*	.001^
Middle East	619.89*	900.83*	955.43*	.0019*	.0019*	.0019*	71.21^	50.06	50.54	.0004*	.0003*	.0003*
Central Asia	570.4	1068.12^	1091.52#	.003*	.0027*	.0023*	-84.4	-98.33	-58.1	.0005	.0006^	.0007#
Africa	828.15*	1158.52*	1188.95*	.0024*	.0024*	.0023*	28.94	-2.	-3.84	.0003#	.0002	.0002
European Union	-10221.24^	-6680.15	-7420.9	-.012*	-.0113*	-.0149*	-3385.6#	-3809.37^	-4432.74^	-.0045#	-.0058^	-.0088*
Euro Area	-8764.63^	-5738.34	-6699.16	-.0107*	-.0099*	-.0135*	-2655.78#	-2979.24^	-3453.88^	-.0034#	-.0043^	-.0067*
BSR	-1687.39	-648.54	-1045.16	-.0014	-.0009	-.0021^	-1743.4*	-1606.9*	-1476.02^	-.0048*	-.0043*	-.0039*
Bulgaria	-66.36	-3.93	28.18	.	.	.0001	-14.91 ^	-19.6*	-20.81 ^	.	.	.
Moldova, Rep . of	29.79	77.48#	52.56	.0001#	.0002^	.0001#	-5.67	-6.74	-2.71	.	.	.
Ukraine	-1774.12*	-1430.52*	-1603.56^	-.0031*	-.0027*	-.0031*	-1618.8*	-1455.82*	-1286.09*	-.005*	-.0045*	-.0039*
Turkey, Rep . of	-101.64	483.03	251.33	.0008	.0011#	.0004	-127.13	-125.29	-145.36	.	.	.
Romania	172.59*	171.65*	175.98*	.0005*	.0004*	.0004^	- 29.08	-48.34	-69.55^	.	-.0001	-.0001
Georgia	52.36*	53.74*	50.34*	.0002*	.0001*	.0001^	52.19*	48.89*	48.5*	.0002*	.0002*	.0002*

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A6. Regression coefficients for Turkey

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	5575.34*	7655.78*	7822.98*				-740.82	4410.91	5507.25			
France	197.69*	246.98*	295.8*	-.0003	-.0004	-.0001	-178.4*	-84.54	-52.3	-.0006^	-.0008*	-.0008*
Italy	350.2*	422.89*	502.15*	.0004	.0002	.0007#	-382.79*	-201.58	-175.67	-.0014*	-.0015*	-.0016*
Germany	432.68*	539.49*	577.75*	-.0005	-.0008	-.0006	-257.#	-131.41	-141.8	-.0007	-.0017#	-.0021#
United Kingdom	418.27*	414.25*	394.04*	.0005	-.0001	-.0003	-4.86	-10.01	-24.66	.0001	-.0003	-.0004
United States	747.89*	909.*	945.61*	.0028*	.0028*	.0028*	-269.67^	-117.1	9.68	-.0009^	-.0012*	-.0009^
China, PR: Mainland	34.34	39.76	24.6	-.0004#	-.0005^	-.0006^	284.79	887.3#	949.76	.0013	.0015	.0012
India	54.77*	71.79*	83.83*	.0001	.0002#	.0002^	36.31	192.56	235.34	.0002	.0003	.0003
Middle East and Central Asia	-56.38	484.14	-9.74	-.0091*	-.0087*	-.0119*	-207.58	139.25	236.86	-.0004	-.0009	-.0009
Middle East	-351.11	-6.99	-460.43	-.0082*	-.0081*	-.0109*	-238.53	-99.97	-85.03	-.0006	-.0013	-.0014
Central Asia	294.73	491.13^	450.68#	-.0008	-.0007	-.001	30.96	239.22	321.89#	.0002	.0004	.0006^
Africa	600.82^	814.77*	792.75^	.0006	.0008	.0004	141.43	224.71^	293.1*	.0007^	.0005#	.0006^
European Union	3343.93*	3993.02*	4386.72*	.0066^	.0055^	.0075*	-1071.94#	-323.16	-187.44	-.0033^	-.0059*	-.0066^
Euro Area	2482.88*	2926.39*	3236.61*	.0041#	.003	.0047^	-1017.27#	-396.89	-297.74	-.0033*	-.0053*	-.0059*
BSR	274.6	708.45#	825.08#	-.0014	-.0003	.0004	-480.18	1090.72	1412.45	-.0017	.0009	.0014
Bulgaria	178.21*	224.97*	237.67*	.0006*	.0006*	.0006*	-34.14	-20.11	-30.07	-.0001	-.0002^	-.0003*
Moldova, Rep . of	16.58*	26.77*	28.27*	.^	.0001*	.0001^	6.7	7.54	10.23	.	.	.
Russian Federation	-225.66	2.23	48.7	-.0024^	-.0016#	-.0012	-227.22	1211.15	1472.8	-.0007	.0019	.0024
Ukraine	55.88	88.58#	101.91#	-.0001	.	.	-163.33#	-93.29	-59.76	-.0007^	-.0006*	-.0005^
Romania	212.05*	298.78*	342.86*	.0005*	.0007*	.0009*	-75.47	-47.57	-22.82	-.0003^	-.0004*	-.0003^
Georgia	37.55^	67.13*	65.67^	.	.	.	13.29#	33.^	42.06^	.0001^	.0001*	.0001*

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.

Table A7. Regression coefficients for Ukraine

Country	Exports						Imports					
	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22	Trend_11-21	Trend_11-22	Trend112_22
World	-1275.66	-1311.04	-825.69				- 1991.4	-1734.77	-1025.39			
France	11.24	9.38	12.	.0004^	.0004*	.0003^	9.86	-2.23	-.79	.0008	.0005	.0003
Italy	-3.41	-32.88	-6.31	.0008	.0003	.0003	38.66	26.8	42.32	.0015*	.0012*	.0011*
Germany	98.29^	91.11*	111.02*	.0024*	.0024*	.0025*	-86.19	-110.44	-75.24	.0013	.0005	-.0001
United Kingdom	32.56#	20.2	22.42	.0007*	.0005*	.0005^	-18.22	-19.06	-11.36	.0002	.0001	.
United States	32.49	24.23	42.57	.0009^	.0008*	.001*	73.61	41.52	57.54	.0023*	.0016*	.0015^
China, PR: Mainland	469.73^	329.51#	370.12#	.009*	.0066^	.0069^	302.7	296.11#	336.79#	.0077*	.0074*	.0072*
India	14.68	-33.42	-26.69	.0011	.0001	-.0002	-7.79	31.35	41.9	.0002^	.0009^	.001#
Middle East and Central Asia	-564.95 ^	-643.89*	-674.77*	-.0055*	-.0075*	-.0097*	-85.68	-51.2	60.27	-.0001	.0004	.0015*
Middle East	-285.11^	-346.62*	-372.83*	-.0024#	-.0039^	-.0054*	7.36	18.6	20.11	.0003^	.0005^	.0004^
Central Asia	-279.84 ^	-297.27*	-301.95 ^	-.0031*	-.0036*	-.0043*	-93.04	-69.8	40.16	-.0004	-.0001	.0011^
Africa	19.73	-73.56	-150.24	.0019	.	-.002	11.2	1.41	11.3	.0005*	.0003	.0003
European Union	625.79#	885.68^	1104.75*	.0172*	.0245*	.026*	96.34	258.79	450.61	.0112*	.013*	.0122*
Euro Area	341.3#	317.38^	399.62^	.0099*	.0101*	.01*	-16.92	-14.83	88.98	.0064*	.0055*	.0046^
BSR	-1793.54*	-1519.99*	-1238.88^	-.0241*	-.0194*	-.0172*	-2322.83*	-2048.11*	-1716.61^	-.0253*	-.0227*	-.021*
Bulgaria	-4.4	30.44	46.9#	.0001	.0009#	.0012#	15.64	79.75#	94.35#	.0003^	.0015#	.0017#
Moldova, Rep . of	-8.72	.7	7.72	.0002	.0004#	.0004#	-1.43	1.19	3.41	.	.0001#	.0001#
Russian Federation	-1734.05*	-1621.16*	-1426.75*	-.0251*	-.0243*	-.0227*	-2418.66*	-2283.03*	-2012.28*	-.0281*	-.028*	-.0269*
Turkey, Rep . of	-90.79	-73.73	-57.2	-.0005	-.0001	-.0003	117.48#	151.71^	174.49^	.0026*	.0032*	.0034*
Romania	65.16*	167.87^	210.18^	.0014*	.0038^	.0045^	-35.68	3.85	25.1	-.0002	.0005	.0007
Georgia	-20.73*	-24.1*	-19.72*	-.0002	-.0002#	-.0003#	-.19	-1.57	-1.69	.0001	.	.

Source: *calculated by authors*

* significant at 99.9%, ^ significant at 95%, # significant at 90%.