

## The effects of Turkish-Russian political relations on bilateral trade balance: Cointegration and causal analysis<sup>(1)</sup>

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**Abstract.** *The development of political relations between countries usually causes some changes in the volume of countries' foreign trade with each other as well. In this context, every worsening of political relations between the countries is supposed to reduce the foreign trade volume, as well as the betterment of political relations is expected to increase it. Therefore, countries willing to benefit from foreign trade have to maintain good political relations with the other countries. In this paper we examine long run determinants of the trade balance between Turkey and Russia, giving particular thought to the influence of the political relations between two countries on their foreign trade. The model is conducted by using quarterly data over the period from 1996 to 2016. The paper confirms the existence of long run negative relationships between real effective exchange rates, foreign policy crises and trade balance. However, the influence of foreign policy successes turned out to not have any significant effects on the trade balance.*

**Keywords:** trade-politics relationship, trade balance, Turkey-Russia political relations, cointegration analyse.

**JEL Classification:** F14, F50, C50.

## 1. Introduction

Nowadays foreign trade undoubtedly takes an important place in any country's economy. A lot of researches on the factors determining the volume and the structure of foreign trade have been done. Detecting these determinants most of the researchers focuses on the real exchange rate, GDP, relative price and other economic indicators. However, it must be accepted that not only economic factors, but also political relations between involved into the international trade countries has a great influence on their bilateral foreign trade.

In principle, economics and politics are used to be two different sciences, concentrated on absolutely different things. Following the basic theory, economical decisions are been taken without any regard to politics, while politicians, taking economic indicators as given, are developing country's politic strategy. Since the time economic tools have become one of the main leverages on the political arena, economic and political governance are being inextricably linked. Thus, theories of international relations appeared, combining both economic and political aspects of relations between different countries.

Theoretical discussions on international political economy are generally held within the framework of Liberal and Realistic theories. These theories have different points of view on the place of the foreign trade in the international relations system. Focused on both the individual and the state Liberals see foreign trade as a vehicle to achieve state's main goal, which is maximization of social welfare. As the foreign trade takes an important part in the social welfare<sup>(2)</sup>, globalization and peace are strongly supported in order to keep international trade volume on track. In other words, according to the liberals, trade relations induce countries to develop political relations. The basic assumption here is that the importance countries give to trade relations prevents trade partners from entering conflicts and foster improving of political relations between them (Çakmak and Ustaoglu, 2017, pp. 304-305). So we can say that, in Liberals opinion, political relations between countries are determined by economical purposes. As for Realists, the most important actor in international relations is the state. With the main goal of political power maximization, trade is considered as one of many instruments available to states in their pursuit of power. The realist view is that all foreign policy, including trade, exists for the purpose of achieving national security or power, so trade relationships are seen as temporary arrangements that can be easily broken when conditions necessitate other strategies to secure national interests (Barbieri, 2003. pp. 18-19). In this case, economic relations are determined by political decisions of countries. Hence, evaluating two different approaches mentioned above, it can be said that the importance given to the foreign trade determines political relations between countries; at the same time political decisions, including the level of country's national security and power, also affects the bilateral trade balance.

Debates about the relationship between Political Relations and Bilateral Trade are also linked to the democratic peace theory. According to this theory, democracies never appeal to fight each other, and often prefer to resolve all the conflicts by establishing peace (Çakmak and Ustaoglu, 2017, p. 305). According to Polachek (1997, p. 296), it's difficult for democracies to take the decision to fight, but non-democracies such as

dictatorships need less justification to go to war. The fundamental factor of democracies' unwillingness to fight is the level of their foreign trade. Indeed, trading partners are less combative than nations which are not connected with trade relations, as countries are trying to preserve the wealth gained through the international trade. The results of another study made by Oneal and Russett (1999), which applies the dyadic time-series analysis for 1950-1992 years, also confirm that economic interdependence and joint democracy have important pacific benefits.

There are numerous empirical studies trying to define the determinants of bilateral trade between countries. However, the majority of them are concentrated on the dependence of the foreign trade on the currency exchange rates. One such study exploring the correlation between real exchange rate and the export volume using econometric analysis methods was Mookerjee (1997), applied Granger causality analysis for data on India 1970-1992. However, in the long term no causality relationship between India's export volume and RER was found. Similarly Wilson and Tat (2001) didn't come up with any significant results on the correlation between trade balance and RER while applying cointegration analysis to data on Singapore and USA 1970-1996. Another research on the exchange rate effects on the trade balance obtained significant results was Lal and Lowinger (2002), examining the determinants of trade balances of seven East Asian countries, using cointegration technique, error correction model and impulse response function, they confirmed the existence of a positive effect of NEER on the trade balance.

As studies on the effect of the exchange rate on the foreign trade appears not to give unequivocal results, thoughts about other affecting on the foreign trade factors' existence emerges among researchers. Therefore, in following years researches, supplementing the standard model of the trade balance, the exchange rate and the gross domestic product correlation with other variables, arose. However, there is still a limited number of empirical studies defining political relations between countries as one of determinants of the foreign trade. Pollins (1989), in the study examining the relation between international politics and bilateral trade flows for 25 countries, including Turkey and Russia, for the period of 1960-1975, concludes that broad political relations of amity and enmity between nations significantly influence foreign trade flows. Polechek (1997), first exploring the relationship between political events and foreign trade for the period of 1948-1978, later examined the relationship between democracy, conflict and cooperation for the period of 1958-1967. The obtained results confirm that the main factor in causing bilateral cooperation is trade. Countries strive for saving the wealth accumulated from the international trade, therefore trading partners are not willing to fight, unlike nontrading nations. Democratic dyads are more involved into foreign trade comparing to non-democratic dyads, and thus exhibit less conflict and more cooperation. Keshk et al. (2004) design the model applying Maddala's estimator<sup>(3)</sup> to estimate recent histories of dyadic trade and conflict. Results of the study show that political conflict indeed restricts foreign trade while the effect of dyadic interdependence on the likelihood of conflict is statistically insignificant. These results imply the possibility that liberal claims about interdependence and conflict are being controversial. Kim and Rousseau (2005), analysed a dataset consisting 223 international disputes between pairs of countries over a period from 1960 to 1988 years. The results show that liberals who claim that peace is promoted

by international interdependence are incorrect; while international conflict reduces economic interdependence. Goenner (2011), basing on empirical studies of Kim and Rousseau (2005) and Keshk et al. (2004), made his own research emphasizing that both relevant and exogenous tools should be used to achieve consistent results. The results indicate that trade has a negative and significant influence on political conflicts, as well as political conflicts has a negative and significant effect on trade, reducing its likelihood. Armstrong (2012), in his study analyse performance of the trade relationship between Japan and China under conditions of political tension using the gravity model. However, the researcher came up with conclusion that political conflicts do not affect foreign trade to a significant extent. Berger et al. (2013), also applied log gravity model of trade to analyse the trade relations of US with 166 other countries in the 1947-1989 Cold War period. In this study researchers provide evidence that increased political influence of United States during the Cold War was used to establish a larger foreign market for American products. In another study Bove et al. (2013), explored bilateral trade between U.S., as the world's largest trading nation and a global power, and other countries for the period of 1950-2010. Results of the study detect that troop deployments and bilateral foreign military financing tools have significant, positive impacts on the shares of bilateral trade between the U.S and the recipient country. Davis et al. (2015), made an analogous study applying the gravity model of trade for China and India. Results of this research indicate that worsening in the political relations between trade partners decrease imports to China and India respectively. Besides, the magnitude of this change is greater in the state-controlled sector of the economy compared to the private sector. Rasoulinezhad (2016) made a research on sanctions and oil price effects on the Iran-Russia trade by using the gravity model. In addition to the regular variables, such as GDP, GDP per capita and transportation cost, dummy variables, representing financial and non-financial sanctions and global oil price shocks had been added to the model. The negative effects of sanctions and oil price shocks on the bilateral trade volume were proved. Çakmak and Ustaoglu (2017), in their study examine if any significant change in political relations between Turkey and Israel influence on their bilateral trade. Results they achieved show that at times of enhanced diplomatic relations between countries, trade relations were sufficiently strengthened as well, whereas with the worsening of political relations between countries, significant decline was observed in the volume of bilateral foreign trade at some critical points. However, this does not regard to a constant decline and is limited to some serious diplomatic crises in bilateral relations.

When dealing with the course of Turkish-Russian relations, in the early ages foreign trade volumes between Osman Empire and Russia were steadily high despite numerous wars and political disagreements between countries. As politics is about states, but foreign trade is about individuals, no strong connection had been seen between these two aspects. International relations between Turkey and Russia certainly supported the Liberal theory. However, over time, after the wide range of legislative leverages over trade were made available to the government (such as the introduction of quotas, the imposition of sanctions, etc.), foreign trade between Turkey and Russia have become very dependent on political relations. So nowadays it can more likely described from the Realists' view.

In this research the connection between economic and political relations is explored on the example of Turkey and Russia relations in the period from 1996 to 2016. The research consists of 3 main parts. In the first part, titled introduction, theoretical background and empirical literature are discoursed. The second part gives a brief history of political and economic relations between Russia and Turkey. In the third part of the work the econometric cointegration model exploring the dependence of the trade balance on the political relations betterment and worsening was constructed and tested. The main results drawn from both theoretical and practical parts of the work are given in the conclusion. Thus, we will test if the development trend of the Turkey-Russia foreign trade balance has any breakage at the times of important changes in political relations between countries. In case both betterment and worsening events occurred in political relations in the same period, it's important to determine which one of them has a stronger effect.

## 2. Turkey-Russia relations review

The origins of Russian-Turkish relations are deeply rooted in the past. In this part, Turkey-Russia relations will be reviewed first in the political, then in the economic context.

### 2.1. Political relations

#### **The historical background of Turkey-Russia relations (before 1991 period)**

The relations between Turkey and Russia, both of which have many common features, predetermined by their respective histories, geographical locations and cultures, are deeply-rooted. Historians hold that Turkey-Russia political relations began with the formal letter on the maritime trade sent by Russian Czar Ivan III to Sultan of the Ottoman Empire Bayezid II in 1492 (The Encyclopedia Britannica, 1911, p. 446). Official diplomatic relations between countries were established in 1701, when the Embassy of Russia was opened in Constantinople (St. Petersburg Offers, 2015, p. 20).

Since the very beginning, bilateral relations between Turkey and Russia had been tense. In total between the 16th and 20th centuries there were 17 wars fought between the Russian Empire and the Ottoman Empire (Aydintasbas, 2016, p. 2). However, with the collapse of the Ottoman Empire and Russian Tsar Empire in the early 20th century, newly established Soviet Union under Vladimir Lenin and modern Turkey founded by the Turkish General Mustafa Kemal Ataturk were trying to improve good-neighbourly relations and cooperation with each other (Kurban, 2017, pp. 32-34). Nevertheless growing ambitions of the both countries and difficulties appeared during the 2nd World War and the Cold War caused the re-emergence of instability in their relations. In 1952 Turkey joined NATO, placing itself within the Western alliance against the Warsaw Pact (Dumont and Verluise, 2016). So in the political context, the Soviet Union-Turkey relations entered into a secession period.

#### **Turkey-Russia political relations during the 1990s**

Nonetheless, after the dissolution of the USSR in the sake of Boris Yeltsin's victory in 1991 and the recognition of the Russian Federation as the successor of the USSR by the

Turkish government, intense efforts were undertaken to transform Turkey-Russia century-long geopolitical disputes into a geo-economic partnership.

In 1992 the Minister of Foreign Affairs of Turkey Hikmet Çetin made the first in the history official visit from Turkey to Russia. During this visit the “Treaty on the Principles of Relations between the Republic of Turkey and the Russian Federation” was signed (MFA, 2017a). In the short period of 1992-1996 in total 15 agreements and protocols on science and technology, education, culture, economic cooperation and armed forces exchange programs were signed by Turkey and Russia (Özdamar et al., 2013, p. 20).

However, in spite of apparent improvement of Russian-Turkish political relations, Ankara and Moscow continued to tussle over certain political disagreements. In particular, Turkey and Russia supported opposite sides in the conflict between Armenia and Azerbaijan over Nagorno-Karabakh, which arose in 1988 due to territorial claims of Armenia against Azerbaijan. Russia takes a stance in favor of Armenia, which is an important outpost of Russia, while Turkey, for its part, fully supports its strategic partner, Azerbaijan. In May 1994, the conflict parties reached the ceasefire, and so far unsuccessful peace negotiations are still being held without bringing involved parties any closer to a solution of this “frozen” conflict.

A bigger challenge was the 1st and the 2nd Chechen wars, fought from December 1994 to August 1996 and from August 1999 to April 2009, where Russia accused Turkey of backing separatist rebels. Thus, Chechen anti-government groups had begun receiving military assistance from Turkey before the first fight was opened in Chechnya (Gorsky, 1997, pp. 49-53). Later, on January 16, 1996, in Trabzon, Turkey a ferry *Avrasya* carrying 255 Russian passengers was taken over by Turkish gunmen who were seeking to publicize the Chechen cause. Luckily, the incident was resolved through negotiations and the hijackers surrendered without any fatalities being inflicted (New York Times, 1996). The second sensational terrorist attack carried out by Chechen and strongly connected with Russia-Turkey relations, happened on 15-16 March 2001 during the 2nd Chechen war. In this attack Tu-154M plane, belonging to Russian “Vnukovo Airlines”, on a flight from Istanbul to Moscow was hijacked by three Chechens, who had the crew fly the aircraft to Saudi Arabia. Three people – believed to be one of the hijackers, a Russian air stewardess and a Turkish passenger – were killed (BBC News, 2001). In addition to the three hijackers, there were up to 5 accomplices of terrorists among the passengers of the aircraft. One of accomplices was later identified as a Turkish terrorist Ertan Coşkun, who took part in the terroristic attack on the ferry “*Avrasya*” in 1996 (FSB, 2001).

However, despite obvious political differences on geo-political issues, both countries understood the importance of economic cooperation with each other. This fact did not allow Russia and Turkey to step into the open confrontation and facilitated generally positive disposition last throughout the Russian President Boris Yeltsin system (1991-1999). On 5-6 November 1999 during an official visit of Turkish Prime Minister Bulent Ecevit to Moscow on the eve of the Russian storm of Grozny (Chechnya), several important agreements were signed. The agreements included a “Joint declaration on anti-terrorism” and a formal commitment to the Blue Stream project, an ambitious effort to pipe Russian natural gas to Turkey under the Black Sea (Reynolds, 2002). The Blue

Stream Pipeline Project played an important role in comforting the political relations between Turkey and Russia.

Thus, it can be concluded that at the end of decade, Russia and Turkey became important for each other states, whose relations were based on common regional interests and energy politics.

### **Turkey-Russia political relations: the current situation**

After Vladimir Putin was elected as the President of the Russian Federation in January 2000 and the Justice and Development Party (AK Party) came to power in Turkey at the end of 2002, remarkable improvements had been achieved in the political relations between Turkey and Russia. In this period, two countries relations that have historically seen each other as rivals have turned to partners, increasing multilateral co-operation by means of the governments' initiatives and the rapidly expanding commercial relations (Özdal et al., 2013, p. 21).

Willingness of Russia to lead political relations with Turkey to a new stage became clear yet in October 2000 during the official meeting of Russian Prime Minister Mikhail Khazyanov to Ankara, where he claimed that: "Our main mutual conclusion is that Russia and Turkey are not rivals but partners, and from now on our governments will be built on this basis" (Freedman, 2002). Later the Russian Foreign Minister Igor Ivanov and the Turkish Foreign Minister Ismail Cem signed the "Action Plan to Develop Cooperation between the Russian Federation and Turkey" in November, 2001 (Arafat and Alnuaimy, 2011), which also ensured settling close cooperation on Russia and Turkey in Eurasia. The reformed position of Turkish government first of all appeared in the party program, claiming that "the relations established with the Russian Federation, Central Asia and the Caucasus will be based on friendly cooperation rather than competition" (Ak Parti Kalkınma and Demokratikleşme Programı, 2002, p. 107).

The positive trend in Russian-Turkish relations was supported by the visit of the President of Russian Federation Vladimir Putin to Ankara on 5-6 January 2004. As through the history of Russian-Turkish relations it was the first visit of the Russian leader of such a caliber to Turkey, this visit had a great historic significance. During this official visit 7 important agreements on various sectors (such as oil and gas, nuclear power industries) were signed and adopted, one of them was a "Joint Declaration on increasing friendship and multilateral partnership between the Russian Federation and the Republic of Turkey" (Russia Presidential Executive Office, 2004).

Nonetheless, despite the apparently serene and exceptionally positive attitude of Russia and Turkey to each other, fundamental geo-political disagreement had still been staying unsolved. So, in addition to already mentioned above the Chechen war issue, the Cyprus dispute arose between the countries. Turkey's military actions was followed by the negative reaction of UN, and, thereafter, of Russia as one of UN's members (Belokrenitsky et al., 2010). In 2004 Russia has declared support for the plan put forward by UN Secretary General Kofi Annan to create a new state of the United Republic of Cyprus, divided into two autonomies, what was an inconsistency with the foreign policy of Turkey. In addition, in April 2004, Russia used its veto to block a resolution that

sought to outline new UN security arrangements in Cyprus in case of positive results of Cyprus referendum (Lederer, 2004).

The meeting of the Turkish President Abdullah Gul (elected in 2007) and the Russian President Dmitry Medvedev (elected in 2008) in Moscow in 2009 was a sign of further development Turkey-Russia relations. During this meeting a “Joint Declaration between the Republic of Turkey and the Russian Federation on Progress towards a New Stage in Relations and Further Deepening of Friendship and Multidimensional Partnership” has been issued (MFA, 2009). In a response to the Turkish President Abdullah Gul’s visit to Moscow, the Russian President Dmitry Medvedev paid a three-day official visit to Turkey in May 2010. During this visit, Medvedev held meetings with both the Turkish President Abdullah Gul and the Prime Minister Erdogan, and signed 17 agreements, including agreements on the lifting of visa requirements, trade, agriculture, customs, transportation, tourism and the construction of a nuclear power plant in Turkey (<http://www.mfa.gov.tr>). The final step towards the visa-free travel scheme admission were implemented on the 16 March 2011, during the visit of the Turkish Prime Minister Erdogan to Moscow, the entry into force of an agreement between the Government of the Russian Federation and the Government of the Republic of Turkey on the conditions of mutual trips of citizens was declared (Russian MFA, 2011). This step is recognized as one of the greatest achievements in the Russian-Turkish relations in recent years.

However, not just positive agreements, but also one more conflict (albeit not public, but quite significant) happened between Turkey and Russia during those years. In August 2008 the Russia-Georgia war happened. During this war, when NATO and US ships made attempts to enter the Black Sea, making the excuse of wanting to take aid to Georgia, Turkey vice versa earned Russian recognition for remaining neutral, for making peace efforts. It’s obvious that Turkish Prime Minister Recep Tayyip Erdogan played key role in restraining of this war (Torbakov, 2008). Talking about reasons of such an involvement of the Turkey into this war, it must be admitted that as its two essential partners were involved into this conflict, situation became a particular challenge for Turkey. Although Russia’s invasion of Georgia destroyed the Caucasus precarious status quo that Ankara was deftly taking exploiting in pursuing its political and economic ends in the region, Turkey was not in a position to openly confront Moscow (Torbakov, 2008). Still, even though Turkey's apparent dissatisfaction with Russia's actions in Georgia was not avowedly expressed, it had certain influence on the relations between the two countries.

The positive dynamic in development of Russian-Turkish relationships was confirmed by the Turkish Prime Minister Recep Tayyip Erdogan by expressing an acute interest in the membership of Shanghai Cooperation Organisation (SCO) for further expansion of Turkey’s state interest. The Shanghai Cooperation Organisation approved Turkey’s application to become a Dialogue Partner in June, 2012 (MFA, 2011). Turkey understands the need to have a constructive dialogue with Russia, a major member of the organization.

Nevertheless, the Syrian conflict undermined all the efforts in maintaining friendly relations between countries made by Russian and Turkish leaders throughout the 21st



century. Turkey and Russia have totally opposite view points on the Syrian issue. On 24 November 2015, Turkish-Russian bilateral relations were totally destroyed after Turkey shot down Russian Su-24 warplane close to the Turkish-Syrian border (BBC News, 2015). In the result of this incident, sanctions against Turkey were imposed, including the abolition of charter flights between Russia and Turkey and suspending the visa-free regime for Turkish citizens, traveling to Russia. However, after the President of Turkey Recep Tayyip Erdogan officially apologized for this shot down in June, 2016, the relations between Russia and Turkey got under way to the betterment.

Though relations between leaders Vladimir Putin and Recep Tayyip Erdogan began mending their differences, in December, 2016 Russian-Turkish relations faced one more crisis. Russia's Ambassador to Turkey Andrei Karlov was killed in a gun attack in Ankara at the opening of a photographic exhibition. After this attack The Turkish President Erdogan said: "This is a provocation to damage the normalisation process of Turkish-Russian relations. But both the Russian and Turkish administrations have the determination not to fall for this provocation" (ABC News, 2016).

**Table 1.** *Turkey-Russia political relations overview*

Turkey-Russia political relations	
Positive events	1992 – The first in the history official visit from Turkey to Russia made by Hikmet Çetin 1999 – commitment of the Blue Stream project 2001 – Signing of the "Action Plan to Develop Cooperation between the Russian Federation and Turkey" 2004 – the visit of the President of Russian Federation Vladimir Putin to Ankara 2009 – the meeting of the Turkish President Abdullah Gul and the Russian President Dmitry Medvedev 2010 – Dmitry Medvedev's official visit to Turkey 2011 – admission of the visa-free travel scheme between Turkey and Russia 2012 – The Shanghai Cooperation Organisation approved Turkey's application to become a Dialogue Partner 2016 – Recep Tayyip Erdogan officially apologized for the Russian plane shot down
Negative events	1994 – the conflict between Armenia and Azerbaijan over Nagorno-Karabakh. 1996 – hijacking of the "Avrasya" ferry 2001 – hijacking of the Tu-154M Russian plane 2004 – the Cyprus dispute 2008 – Russia-Georgia war 2015 – Turkey shot down Russian Su-24 warplane i 2016 – Russia's Ambassador to Turkey Andrei Karlov was killed

Source: Developed by authors.

In conclusion, we can say that diplomatic relations between Turkey and the Russian Federation has been improving since the early 2000's. The increasing number of official visits, and the meetings held at Presidential or Prime Ministers level show that a huge importance is given to the relations between the two countries. However, numerous geopolitical crises have become a factor regarded as the decisive criterion in assessing the authenticity of the expanding relations between Turkey and Russia. Only time will tell whether Turkey and Russia allow the crises to affect their relationship or despite their dissents continue to strengthen bilateral relations.

## 2.2. Economic relations

Towards the end of the 20th century Turkey and Russia gathered sufficiently important experiences in trade and economic cooperation. Thanks to the economic relations, the traditional persuasion about Turkish-Russian bilateral relations being conflictual was replaced. The main drivers for the establishment of good economic relations between

Turkey and Russia were mutual economic interests and scientific-technical potential of the both countries.

Modern Russia-Turkey economic relations are based on the “Agreement on Trade and economic Cooperation” signed in 1991. Another critical agreement for the economic relations between Turkey and Russia was the “Agreement on Avoidance of Double Taxation” signed in December, 1997 (Arafat and Alnuaimy, 2011, p. 117). After 1998 financial crisis in Russia the bilateral trade relations have been moved to a negative direction for Turkey. Looking at the data in the Table 2, the level of Turkey export to Russia sharply decreased in 1999, while the level of import from Russia is consistently increasing through the late 90’s. The trade balance of Turkey badly fell down from 0.62 in 1998 to 0.24 in 1999. Though, beginning from the year 2000, Turkish exports to Russia again tended to increase, till now countries bilateral trade balance couldn’t reach the level of 1998.

**Table 2.** *Turkish-Russian foreign trade volumes (1996-2016)*

Years	Turkey's export to Russia volume		Turkey's import from Russia volume		Total trade between Turkey and Russia		Trade Balance Turkey's export to Russia/Turkey's Import to Russia
	Volume (thousand USD)	Share in the Total Exports of Turkey (%)	Volume (thousand USD)	Share in the Total Imports of Turkey (%)	Volume (thousand USD)	Share in the Total Trade of Turkey (%)	
1996	1,510,005	6.50	1,921,139	4.40	3,431,144	5.13	0.785995
1997	2,056,547	7.83	2,174,258	4.48	4,230,805	5.65	0.945862
1998	1,348,002	5.00	2,155,006	4.69	3,503,008	4.81	0.625521
1999	588,664	2.21	2,374,133	5.84	2,962,797	4.41	0.247949
2000	643,903	2.32	3,886,583	7.13	4,530,486	5.51	0.165673
2001	924,107	2.95	3,435,673	8.30	4,359,779	5.99	0.268974
2002	1,172,039	3.25	3,891,721	7.55	5,063,760	5.78	0.301162
2003	1,367,591	2.89	5,451,315	7.86	6,818,906	5.85	0.250874
2004	1,859,187	2.94	9,033,138	9.26	10,892,325	6.78	0.205818
2005	2,377,050	3.24	12,905,620	11.05	15,282,670	8.03	0.184187
2006	3,237,611	3.79	17,806,239	12.76	21,043,850	9.35	0.181825
2007	4,726,853	4.41	23,508,494	13.82	28,235,347	10.18	0.20107
2008	6,483,004	4.91	31,364,477	15.53	37,847,480	11.33	0.206699
2009	3,189,607	3.12	19,450,086	13.80	22,639,693	9.31	0.163989
2010	4,628,153	4.06	21,600,641	11.64	26,228,794	8.76	0.21426
2011	5,992,633	4.44	23,952,914	9.95	29,945,548	7.97	0.250184
2012	6,680,777	4.38	26,625,286	11.26	33,306,063	8.56	0.250919
2013	6,964,209	4.59	25,064,214	9.96	32,028,423	7.94	0.277855
2014	5,943,014	3.77	25,288,597	10.44	31,231,611	7.81	0.235008
2015	3,588,331	2.49	20,401,757	9.84	23,990,088	6.83	0.175883
2016	1,733,035	1.22	15,162,363	7.63	16,895,398	4.95	0.114298

**Source:** Constructed based on TÜİK (Türkiye İstatistik Kurumu), Ülkelere Göre İhracat and Ülkelere Göre İthalat.

In terms of Turkish export to Russia at the end of the 20th century, knitted or un-knitted wearing apparels were the first for all times until 1999, also electrical materials, plastics and plastic materials, food sector (especially the cereals) have tended to comprise the majority of the export volume. Talking about import from Russia, doubtless, the main part of its volume was formed from the natural gas. Besides natural gas specifically, mineral fuels, mineral oils and derivatives and iron-steel formed the huge part of Turkey’s import from Russia in 90’s. In summary, “following the boom in trade relations, Turkey has been exporting to Russia mainly services and consumer products and

importing from Russia products of heavy industry, inclusive of military equipment, in addition to fuel materials” (Yanık, 2007, p. 361).

Vladimir Putin’s official appointment as the President of Russia in 2000 had a positive impact on economic relations between Russia and Turkey by reflecting the picture of mutual friendship and trust. In Putin period, the level of bilateral trade has increased to enormous numbers. The main reasons of the foreign trade between Turkey and Russia volume growth were increasing dependence of Turkey from Russian gas and oil, developing of tourism sector in Turkey and expending investments. In 2002, the Russian Federation was the sixth among countries Turkey exports goods to and the third among countries Turkey imports goods from (Arafat and Alnuaimy, 2011, p. 118). In 2008 Turkey’s export to Russia reached 6.5 billion dollars, while import from Russia mounted up to the 31.4 billion dollars, what was the apogee of Turkey-Russia trade in Putin period. There were plans to further increase the total trade volume between Turkey and Russia to 100 billion dollars (Kolobov et al., 2006). However, the issue of the Five Day War in Georgia in August, 2008 and the world economic crisis didn’t let this intentions come true.

In 2009 Turkey’s export to Russia decreased for more than 50% to 3.2 billion dollars, while Turkey’s import from Russia sharply fell to 19.5 billion dollars. Still both countries understood each other’s importance on the economical arena of the region and as bilateral trade between two countries had been based on strategic goods such as energy, arms, agriculture and food, both of the countries were willing to recover cooperation despite political disputes (Yanık, 2007). The countries had been successfully augmenting the bilateral trade volumes till the next crisis in their political relations took a place in 2015.

The shooting down of a Russian Su-24 jet on November 24, 2015 was interpreted as the primary cause of the most spectacular crisis in Russian-Turkish both political and economic relations in the 21st century. Russia’s government took a firm decision to inflict economic punishment on Turkey. As of January 1, 2016, Turkish citizens can no longer travel visa-free to Russia. Russia has banned charter flights between Turkey and Russia and agents were forbidden to sell tours to Turkey, a hugely popular destination among Russian tourists. Turkish firms have been denied access to public contracts, notably in the construction sector, which goes second when it comes to Turkey’s export to Russia. Russian nationals are also prohibited from taking pilot courses in Turkey. Rosselkhoznadzor, Russia’s ubiquitous food safety agency, has barred a good deal of Turkish agricultural imports, from tomatoes and apricots to poultry and salt. Russian companies were no longer allowed to recruit Turkish citizens. In addition, Russia has suspended work on Turkish Stream (a new Black Sea pipeline) that was to boost Russian gas exports to Turkey (Girit, 2016). Deputy Prime Minister Mehmet Şimşek estimated the potential loss for Turkey at 9 billion USD, or 0.3 to 0.4% of Turkish GDP (Hurriyet Daily News, 2015). Indeed, a dramatic drop of 30% of the bilateral Turkey-Russia trade volume (including over 50% decrease of Turkey’s export) can be seen in 2016.

An apology of the President of Turkey Recep Tayyip Erdogan for the jet incident made in June, 2016 not only accelerated the advancement of political relations, but also

contributed to improving the bilateral trade between Russia and Turkey. Sanctions on Turkey were partly lifted, what caused 60% export increase for Turkey at the last quarter of 2016 (based on the data of TÜİK). However, the process of complete rebuilding Turkey-Russia bilateral relations will take many more years.

**Table 3.** Turkish Export to Russia structure (2016)

Category	Value (million USD)	Share in the total export to Russia (%)
Edible fruits, nuts, peel of citrus fruit, melons	344.01	20
Machinery, nuclear reactors, boilers	185.83	11
Vehicles other than railway, tramway	170.24	10
Electrical, electronic equipment	93.75	6
Plastics	86.31	5
Articles of apparel, not knit or crocheted	57.60	3
Articles of iron or steel	55.23	3
Articles of apparel, knit or crocheted	45.59	3
Miscellaneous articles of base metal	41.37	2
Fish, crustaceans, molluscs, aquatics invertebrates	40.05	2
Other	602.01	35

**Source:** Constructed based on United Nations Comtrade Database, International Trade in Goods.

As of the Turkish-Russian trade structure in 2016, fruits head the list of Turkey's exported goods to Russia (20%), followed by machinery (11%) and vehicles (10%). It's clearly seen that the majority of the goods exported by Turkey are manufactured with a high elasticity, except for iron-steel products (Table 3). In this regard, Turkey is more receptive to any changes in economic relations with the Russian Federation.

Talking about Turkey's import from the Russian Federation, mineral fuels and oils are undoubtedly the centerpiece of this trade with 56% of the total Turkey's import from Russia volume. Iron and steel also takes an important place in this trade, making its 15%. Oils and fats, aluminum, copper and cereals are other significant import positions (Table 4). So in the majority Turkey demands from Russia natural resources and raw materials, goods produced by just a limited amount of countries. This fact makes Turkey even more sensitive to any bilateral relations changes due to the deficit of countries supplying the natural resources and increasing demands it. In this respect, Turkey is compelled to firmly set a course towards friendly relations with the Russian Federation.

**Table 4.** Turkish import from Russia structure (2016)

Category	Value (million USD)	Share in the total export to Russia (%)
Mineral fuels, oils, distillation products	8,450	56
Iron and steel	2,240	15
Animal, vegetable fats and oils, cleavage products	728.73	5
Aluminum	626.85	4
Cereals	598.33	4
Copper	511.09	3
Fertilizers	271.98	2
Residues, wastes of food industry, animal fodder	270.60	2
Wood and articles of wood, wood charcoal	220.51	1
Paper and paperboard, articles of pulp, paper and board	159.36	1
Other	1,020	7

**Source:** Constructed based on United Nations Comtrade Database, International Trade in Goods.

The largest Turkish companies operating in Russian Federation are Zorlu Energy, Enka, Ramenka, Şişecam, BEKO and Vestel. Turkish contracting companies definitely have always been the most active players in the Russian construction business. Turkish contractors have taken over more than 1,920 infrastructural and superstructural projects in Russia worth \$62 billion since 1988. According to The Turkish Contractors Association (TCA) data, Turkish contractors top Russia's list of foreign contractors at 19.4 percent (Dailysabah, 2016).

One more important sector in Russian-Turkish economic relations is tourism. Turkish market has fed the tourism sector for decades, going back to the first investments made in the 1960's. Before shooting down of the Russian jet by Turkey in 2015, the Turkish coast was one of the most favorite destinations for Russian tourists. However, after the total number of Russian tourists visiting Turkey peaked in 2014 at 4,479,049 people, in 2015 it fell to 3,537,428, and was only 766,871 for the 2016 season (Özen, 2016). Fortunately, with the normalization of relations, the Turkish tourism sector now has higher hopes about Russia. Turkish tourism sector leaders are expecting the number of Russian tourists visiting Turkey to peak in 2017 due to competitive prices and the normalization of relations between the two countries (Eraz, 2017).

So, despite Turkey having a deficit of the bilateral trade balance with Russia, mostly caused by the import of energy resources, its income from Russian tourists and civil engineering projects in Russia assist closing the gap. A special attention must be paid to the fact that, as bilateral trade between Russia and Turkey has been always based on strategic goods such as natural resources and food, both of the countries obliged to be more prudent while building their political relations.

### 3. Empirical application

#### 3.1. Dataset

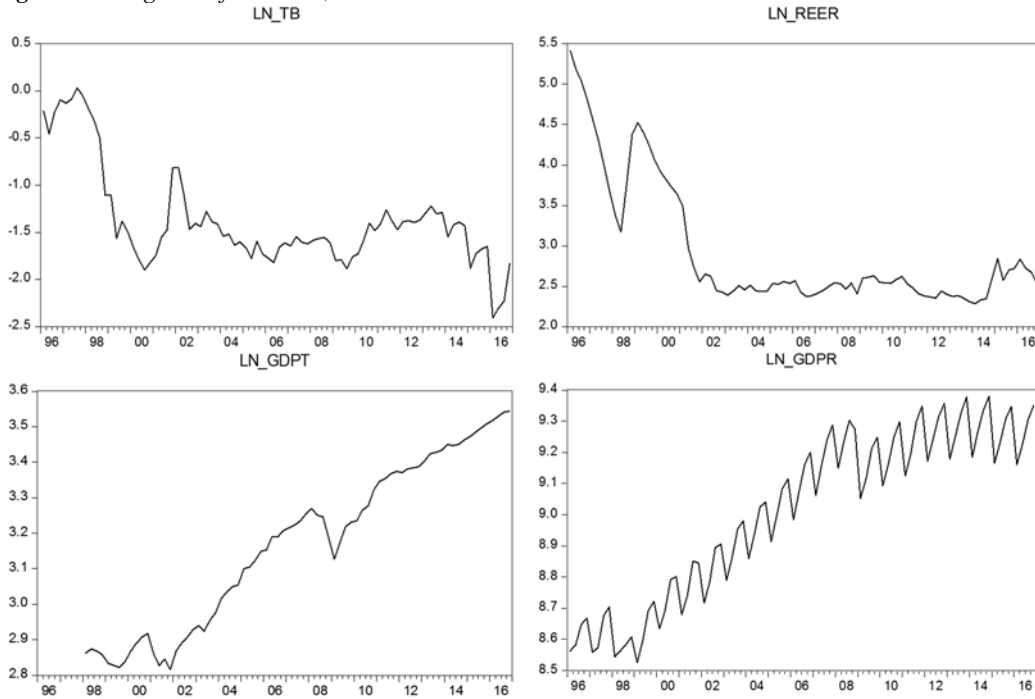
In this research 1996-2016 quarterly data of the Turkey-Russia bilateral trade balance (Turkey's export to Russia divided to Turkey's import from Russia) in thousand U.S. dollars, real effective exchange rate of Turkish Lira and Russian Ruble (counted using TRY/USD and USD/RUR real effective exchange rates as the dollar is the currency payment between Russia and Turkey is made in), real GDP in Turkey and Russia in current million U.S. dollars, and two dummy variables describing betterment or worsening of political relations between countries is analyzed. All the definitions and units of all the variables can be found at the Table 5. TRY/RUR real effective exchange rate was counted basing on the data retrieved from the Organization for Economic Cooperation and Development (OECD) and Russian Federal State Statistics Service (RosStat). Turkey-Russia trade balance was counted basing on Turkish Statistical Institute (TÜİK) data. Real GDP of Turkey data was retrieved from OECD, while Real GDP of Russia data was received from RosStat. As for dummy variables, political events from the Table 1 were used in its generation.

**Table 5.** Definitions of variables

Variable	Definition	Unit
TB <sub>t</sub>	Turkey-Russia bilateral trade balance (Turkey's export to Russia/Turkey's import from Russia)	–
REER <sub>t</sub>	Real Effective Exchange Rate of Turkish Lira to Russian Ruble	TRY/RUR
GDPT <sub>t</sub>	Real Gross Domestic Product of Turkey	Billion TRY
GDPR <sub>t</sub>	Real Gross Domestic Product of Russia	Billion RUR
D1 <sub>t</sub>	Dummy variable, equal to 1 in case of political relationships betterment, and 0 in case of no betterment	0/1
D2 <sub>t</sub>	Dummy variable, equal to 1 in case of political relationships worsening, and 0 in case of no worsening	0/1

Source: Developed by authors.

As the Jarque-Bera test showed that all of the variables are not normally distributed, its logarithms were used in the model to compose Gaussian distribution. Histograms of the obtained variables are shown at the Figure 1.

**Figure 1.** Histograms of variables, used in the model

### 3.2. Methodology and model specification

In this research an AR(1) cointegration model was established using the method of least squares. Using of the an autoregression model lets us work with the data stationary at first level I(0). All the tests were performed using EViews 7 software.

The initial model takes the following form:

$$\begin{aligned}
 \ln(TB_t) = & \beta_1 \ln(REER_t) + \beta_2 \ln(GDPT_t) + \beta_3 \ln(GDPR_t) + \beta_4 (D1_t) \\
 & + \beta_5 (D2_t) + [\beta_6 = p = const] \ln(TB_{t-1}) + \varepsilon_t.
 \end{aligned} \quad (1)$$

It should be noted that both of the dummy variables have been added to the model as exogenous variables.

When analyzing the model, it is assumed that political and economic relations are strongly dependent on each other. Furthermore, we pay attention to the fact that in Turkey-Russia bilateral economic relations, Turkey is rather more sensitive to any political shocks due to the high elasticity of demand for goods exported by this country, while the majority of goods exported by Russia, natural fuel and raw materials, have a low elasticity of demand. Therefore, it is expected that any betterment in political relations between Russia and Turkey will rather affect the export from Turkey, what will increase the Turkey-Russia trade balance. Thus, Hypothesis 1 has been put forward as following:

*H<sub>I</sub>: The betterment in bilateral political relations between Russia and Turkey has a positive effect on Turkey-Russia trade balance*

Besides, following the same logic, it is assumed that any worsening of political relations between Turkey and Russia first of all will has its negative effect on Turkey's export rather than on import, what will negatively affect the Turkey-Russia trade balance. Hence, Hypothesis 2 is as follows:

*H<sub>II</sub>: The worsening of political relations between Russia and Turkey has a negative effect on Turkey-Russia trade balance*

Before applying the model, we need to find out the order of integration of all the variables by implementing unit root Augmented Dickey-Fuller (ADF) test, defined as following:

$$\Delta Y_t = \beta Dt + \pi Y_{t-1} + \sum_{j=1}^p \varphi_j \Delta Y_{t-j} + \varepsilon_t, \quad (2)$$

where  $Dt$  indicates the deterministic term vector (constant, trend etc.). The  $\varepsilon_t$  represents the error term which is serially uncorrelated and also consider as homoscedastic (Said and Dickey, 1984: 605-606). ADF test results are shown at the Table 6.

**Table 6.** Augmented Dickey-Fuller (ADF) test results

Variable	ADF Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Stationary	H <sub>0</sub>
ln(TBt)	-2.3370	-3.5112	-2.8967	-2.5856	No	Accept
Dln(TBt)	-8.7789	-3.5122	-2.8972	-2.5858	Yes (1%)	Reject
ln(REERt)	-3.0014	-3.5122	-2.8972	-2.5858	Yes (5%)	Reject
Dln(REERt)	-5.4142	-3.5122	-2.8972	-2.5858	Yes (1%)	Reject
ln(GDPTt)	0.1689	-3.5203	-2.9006	-2.5876	No	Accept
Dln(GDPTt)	-6.6588	-3.5215	-2.9012	-2.5879	Yes (1%)	Reject
ln(GDPRt)	-1.5796	-3.5166	-2.8991	-2.5868	No	Accept
Dln(GDPRt)	-4.0122	-3.5166	-2.8991	-2.5868	Yes (1%)	Reject

We can conclude that all the variables are stationary through doing the first difference, i.e. all the time series  $I(0)$ . Correlograms of variables give us the same result. Therefore, as the dependent variable is also stationary just at the first level, we will apply AR(1) Time Series to exclude autocorrelation in the model. The AR(1) process is a first order autoregressive time series and most commonly defined by the following equation:

$$X_k = \rho X_{k-1} + \varepsilon_k \quad k = 0, \pm 1 \pm 2, \dots \quad (3)$$

where the  $\varepsilon_k$ 's are regarded as random variables and are referred to as the error terms, and  $p$  is the constant.  $X_k$  is obtained from knowing the value of  $X_{k-1}$ , and in turn  $X_{k-1}$  is obtained from knowing  $X_{k-2}$  and so on (Horvath and Johnston, 2017, pp. 3-4).

### 3.3. Empirical results

With the next step the model was estimated by the method of least squares. Results of the estimation are displayed in Table 7. Referring obtained results, at first we should pay attention to the explanatory power of both the model itself, checking  $R^2$  index, and variables included to the model, checking its probabilities.

**Table 7.** LS estimation results for the initial model

Variable	Ln(REER <sub>t</sub> )	Ln(GDPT <sub>t</sub> )	Ln(GDPR <sub>t</sub> )	D <sub>1t</sub>	D <sub>2t</sub>
Coefficient	-0.4578	-1.1693	0.3702	0.0142	-0.1987
T-statistic	-3.5548	-2.8381	2.5177	0.3683	-3.3389
P-value	0.0007	0.0060	0.0141	0.7138	0.0014
R <sup>2</sup>	0.782070				

As it can be seen, the model is significant by itself, however, the dummy-variable  $D_{1t}$ , indicating betterments in political relations between Turkey and Russia is not significant at any level, what means that the betterment in political relations has no effect on the Turkey-Russia trade balance. It means that the Hypothesis 1 is rejected. Thus the model was restructured to the following form:

$$\begin{aligned} \ln(TB_t) = & \beta_1 \ln(REER_t) + \beta_2 \ln(GDPT_t) + \beta_3 \ln(GDPR_t) + \beta_4 (D_{2t}) \\ & + [\beta_5 = p = const] \ln(TB_{t-1}) + \varepsilon_t \end{aligned} \quad (4)$$

The newly formed final model was also estimated by the method of least squares. Results of this estimation can be found in Table 8. As may be seen, both the model and variables have a strong explanatory power. All the variables, except for Real GDP of Turkey are significant on the 1% level, while Real GDP of Turkey is significant on the 5% level.

**Table 8.** LS estimation results for the final model

Variable	Ln(REER <sub>t</sub> )	Ln(GDPT <sub>t</sub> )	Ln(GDPR <sub>t</sub> )	D <sub>2t</sub>
Coefficient	-0.4491	-1.1358	0.3562	-0.1982
T-statistic	-3.6186	-2.8469	2.5256	-3.3480
P-value	0.0006	0.0058	0.0138	0.0013
Adjusted R <sup>2</sup>	0.784757			

In Ordinary least-squares (OLS) model we make an assumption that the variance of the error term is constant (homoscedasticity). That is,  $V(\varepsilon_i) = \sigma^2$  for all  $i$ . With the following step, the model will be tested for heteroscedasticity, to make sure our assumption is confirmed. The Breusch-Pagan test will be applied for this purpose. Breusch-Pagan tests the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. (Williams, 2015, pp. 3-4). The results of the Breusch-Pagan test are following:

**Table 9.** The results of the Breusch-Pagan test

F-statistic	1.921426	Prob. F(4,70)	0.1164
Obs*R-squared	7.419998	Prob. Chi-Square(4)	0.1153
Scaled explained SS	8.724399	Prob. Chi-Square(4)	0.0684



As the probability of  $F(4,70) = 0.1164 > 0.05$ , the null hypothesis is accepted and the heteroscedasticity is not found in the model.

Furthermore, autocorrelation should be tested in the model to exclude skew of the regression results due to the dependency of error terms. We apply the Durbin-Watson test, considering the absence of autocorrelation in the model as the null hypothesis and the presence of autocorrelation in the model as the alternative hypothesis. The test statistic for the Durbin-Watson test on a data set of size  $n$  is given by:

$$D = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=1}^n e_t^2},$$

where  $e_t = y_t - \hat{y}_t$  are the residuals from the ordinary least squares fit (Young, 2017). The closer this statistic to 2, the stronger the evidence of the autocorrelation absence is. Durbin-Watson statistic for our model  $DW=2.0735$ , what means the null hypothesis is accepted and autocorrelation is not presented in the model.

Based on the above tests, it can be said that the regression has a high explanatory power and well reflects the real situation.

Looking at the results obtained from the model estimation, we can conclude that Hypothesis 2 is confirmed, and the deterioration of political relations does have a negative effect on the Turkey-Russia trade balance. Detailed results of testing the initial hypotheses of the study are reflected in Table 10.

**Table 10.** *Hypotheses of the research*

Hypothesis			Variable	Predicted sign	Estimated sign	Result
H <sub>I</sub>	H <sub>0</sub>	The betterment in bilateral political relations between Russia and Turkey has a positive effect on Turkey-Russia trade balance	D <sub>1t</sub>	Positive	Insignificant	H <sub>0</sub> rejected
	H <sub>1</sub>	The betterment in bilateral political relations between Russia and Turkey doesn't have a positive effect on Turkey-Russia trade balance	D <sub>1t</sub>			
H <sub>II</sub>	H <sub>0</sub>	The worsening of political relations between Russia and Turkey has a negative effect on Turkey-Russia trade balance	D <sub>2t</sub>	Negative	Negative	H <sub>0</sub> accepted
	H <sub>1</sub>	The worsening of political relations between Russia and Turkey doesn't have a negative effect on Turkey-Russia trade balance	D <sub>2t</sub>			

**Source:** Developed by authors.

As can be seen from the regression results, each crisis in political relations between Russia and Turkey causes a decrease in the trade balance by, on average, 0.19 points, which means a 19% decrease in the level of Turkey's exports comparing to imports. It must be admitted that 19% decrease in a trade balance is a quite significant recession for any country's economy. Therefore, countries willing to benefit from foreign trade have to maintain good political relations with the other countries to avoid negative effects of political relations worsening on the trade balance.

Paying attention to the coefficient of the TRY/RUR Real Effective Exchange Rate, it is clearly seen that the growth of the REER has a negative effect on the trade balance. The result we have achieved is expected and confirmed by basic theoretical frameworks. On

the assumption that Real Effective Exchange Rate increase means appreciation of the local currency, the price of exported from Turkey to Russia goods increases for Russian customers, therefore, exports from Turkey to Russia decreases. The same way, meanwhile the nominal price of imported to Turkey from Russia goods remains the same for Russian sellers, for Turkish customers it decreases in terms of Turkish Lira. Therefore, a prerequisite for the growth of imports from Russia to Turkey appears.

In terms of Turkey's Real GDP coefficient, we can see its negative effect on the Turkey-Russia trade balance. It can be explained by the fact that with the growth of the GDP, country accumulates more prosper to spend, what gives more opportunities for increasing of the import. Similarly, Russia's GDP growth positively affects Turkey-Russia trade balance, increasing the volume of exports from Turkey to Russia.

#### 4. Conclusion

In this paper, trade relations between Russia and Turkey were examined through the prism of political relations. We concluded that political and economic relations are inextricably linked.

Through the saturated political relations between the countries, several positive and negative aspects were highlighted. The conflict between Armenia and Azerbaijan, Chechen wars, Cyprus issue, Russia-Georgia war and Syrian conflict are the main political events complicating relations between the two countries. The betterments in relations between Turkey and Russia are mostly caused by frequent bilateral visits at the level of Presidents and Prime-Ministers, numerous political and economic agreements and joint economic projects, such as the Blue Stream.

As for economic relations, Turkey and Russia gathered sufficiently important experiences in trade and economic cooperation. Even though Turkey has a deficit of the bilateral trade balance with Russia, mostly caused by the import of energy resources, its income from Russian tourists and civil engineering projects in Russia assist closing the gap. A special attention must be paid to the fact that, as bilateral trade between Russia and Turkey has been always based on strategic goods such as natural resources and food, what makes both of the countries be more prudent while building their political relations.

It is also worth noting that even in the political relations worsening period, the trade between countries, although significantly reduces, but never trails off. Moreover, in case of the imposition of sanctions, traders find circumvention routes to import prohibited goods through third countries. In case of Russia imposing sanctions against Turkey, the Turkish company established a transfer of vegetables to Russia through neighbouring countries such as Kazakhstan and Belarus. Meanwhile, Russian citizens are keep on buying prohibited to sale and purchase in the Russian Federation tours to Turkey, benefiting from the services of Ukrainian and Belarus travel agencies (Papernaya, 2016).

Having an econometric model built, we confirmed the hypothesis that worsening in relations between Turkey and Russia negatively affects their trade relations. However, betterments in relations between countries do not have a significant impact on trade

relations in the model. It can be explained by the fact that in the relations between Turkey and Russia, negative and positive events are often very close to each other by dates: sometimes they occurred in the same period, or with just a year break. Thus, it can be presumed that the negative effect caused by political relations worsening suppresses the positive effect of political relations betterment. Results obtained in this study bear a resemblance to findings of Pollins (1989), Polechek (1997), Keshk et al. (2004), Rasoulinezhad (2016) and Çakmak and Ustaoglu (2017) studies, mentioned in empirical literature. The findings verified that the realistic approach is dominant in the relationships between Turkey and Russia. That is to say, Turkish and Russian sides should tend to keep their political relations good when they appreciate the importance of each other politically and economically.

When considering these all together and taking into account the damages of negative and tense relationships to the trade, both countries should keep the relationships good, avoid tense political disputes and repair the worsened relationship all of a sudden as this fact is essential for their welfare and security.

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## Notes

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- (1) This paper had been presented in International Economics, Finance, and Econometrics Symposium (EFEOS) in 17-18 May 2017.
- (2) In more detail, the effects of international trade on social welfare generated from: 1) The export of the surplus product manufactured in the country at the external market and the possibility to import necessary for production tools and equipment from abroad, which increase both employment and income of the country. 2) Other visible and invisible contributions such as expanding the market volume, gaining from the division of labor and economies of scale, acquaintance with new information, ideas and production methods, increment of competition, elimination of domestic monopolies, enabling the production of new goods by stimulating domestic demand (Seyidoğlu, 2013).
- (3) Maddala's estimator is a technique of dealing with an equation system consisting of one continuous endogenous variable and dichotomous endogenous variable (Keshk et al., 2004).

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