Do regional trade agreements actually increase Turkey's foreign trade?[*]

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Abstract

After the deadlock of World Trade Organization Doha trade negotiations since 2000, trade agreements like Customs Union (CU) and free trade agreements (FTAs) gained further importance in foreign trade. The aim of this study is to analyze the role of regional trade agreements (RTAs) of Turkey in her foreign trade. Effects of the RTAs on Turkey's foreign trade are analyzed through gravity model in line with the study of Anderson and van Wincoop (2003). The study covers Turkey's trade flows with 126 trade partners for the period 1992-2013. Empirical findings reveal that the CU does not affect Turkey's exports but it increases imports of Turkey. Also, it is found that the FTAs do not have any impact on either exports or imports of Turkey.

Key words: Gravity model, customs union, free trade agreements, foreign trade, Turkey.

JEL codes: F14, F15, C23.

1. Introduction

Through globalization as global economic and trade relations are eased, countries have sought to reduce the obstacles in international trade while ensuring their market power. In this context, initially the General Agreement on Tariffs and Trade, and after that the World Trade Organization (WTO), has paved the way to create a strong, opulent and liberal international trading system to contribute to the global economic growth. Nevertheless, the WTO's Doha trade negotiations have

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been deadlocked since 2001. Accordingly, this has led to the establishment of bilateral and regional trade agreements (RTAs), such as free trade agreements (FTA) to promote trade liberalization. In general, FTAs eliminate tariffs, quotas and non-tariff barriers between the member countries so that members can gain trading advantages and preserve their economic interests.

The framework of Viner (1950) provides the trade creation and diversion effects of customs unions. Bearing in mind that there are various degrees of economic integration, the evaluation of Viner (1950) on customs unions could be generalized to evaluating any type of trade agreements. Viner identifies welfare-improving and welfare-deteriorating trade agreements. He argues that a trade agreement is favorable if it creates trade whereas it is unfavorable if it diverts trade. The welfare-improving effect results from replacing high-cost domestic products with less costly imports from FTA member countries. The welfare deteriorating effect results from replacing less costly imports from non-member countries with high-cost imports from member countries. In this context, this paper provides an assessment of trade creation effects of Turkey's RTAs.

The CU Decision between the European Union (EU) and Turkey which is one of the most important milestones in Turkey's foreign trade policy entered into force on 31 December 1995. The aim of both parties is to promote continuous and balanced strengthening of trade and economic relations between the EU and Turkey, while taking full account of the need to ensure an accelerated development of Turkish economy and to improve the level of employment and living conditions of Turkish people. In addition to the CU, currently Turkey has FTAs in force with 21 countries and ongoing FTA negotiations. Similar to the purpose of the CU Decision, Turkey and her FTA partners aim a gradual liberalization and facilitation in foreign trade to promote the competitiveness of Turkey in the international arena (Republic of Turkey Ministry of Economy, 2015).

The EU-Turkey CU Decision contains vital articles which determine Turkish foreign trade policy. Elimination of some types of tariff barriers and application of common customs tariffs to third countries are among the obligations that Turkey undertook. Additionally, Turkey accepted to apply the Common Commercial Policy of the European Union.

Under these conditions Turkey applies the foreign trade policy of the EU. Therefore, the partners of Turkey in her FTAs are not chosen according to her trade relations with those countries but according to preferences of the EU. Hence, usefulness of these agreements -both the EU-Turkey CU and FTAs- for Turkey's foreign trade becomes questionable.

This paper investigates whether or not Turkey's RTAs[1] including the EU-Turkey CU and the FTAs of Turkey are beneficial to Turkey's foreign trade. In addition to the effects of the RTAs on exports, impacts on Turkey's imports are also investigated. This study covers Turkey's trade flows with 126 trade partners for the period 1992-2013.

In the literature, gravity model estimations are widely accepted and commonly used to assess the effects of RTAs on trade flows. In line with the literature, gravity model framework and recent developments in estimation techniques are adopted in this study. There are several studies that use gravity model for Turkey. However, these studies only take the EU-Turkey Customs Union into consideration. None of them focus on the FTAs of Turkey independently or together with the EU-Turkey CU. To the best of our knowledge, this study is the first attempt to analyze impacts of all RTAs of Turkey on the foreign trade using recent developments in the gravity model estimation.

Our empirical results show that Turkey's RTAs do not affect Turkey's exports. In other words, both the EU-Turkey CU and the FTAs could not be a driving force for Turkey's exports. However, the CU is significant for Turkey's imports despite the fact that the FTAs are not. As a result, the FTAs of Turkey affect neither exports nor imports of Turkey in line with the expectations arisen from the fact that Turkey could not choose her FTA partners independently due to obligations of the CU Decision. Alternatively, we find that the EU-Turkey CU affects Turkey's imports positively but has no effect on Turkey's exports.

The remainder of the study is organized as follows. The next section presents the Turkish foreign trade policy and state of foreign trade in Turkey. Section 3 gives literature review related to the gravity model and empirical applications for Turkey. Section 4 discusses details of the dataset, methodology and empirical results. Finally section 5 concludes the study.

2. Turkish foreign trade

2.1. A Brief look at Turkey's foreign trade policy

Turkey's official foreign trade policy was import substitution policies until 1980. Policy makers had aimed to promote domestic production instead of foreign trade. In this framework, Turkey had applied high tariff rates and quotas in order to protect domestic industries. However, import substitution policies including high tariff barriers applied in Turkey until 1980 could not prevent the deterioration in the ratio of exports to imports (Figure 1).

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[1] The term of RTA used in this study covers both customs unions and free trade agreements. Specifically, Turkey's RTAs are the EU-Turkey CU and the FTAs of Turkey.

Figure 1
Ratio of Exports to Imports in Turkey (%)
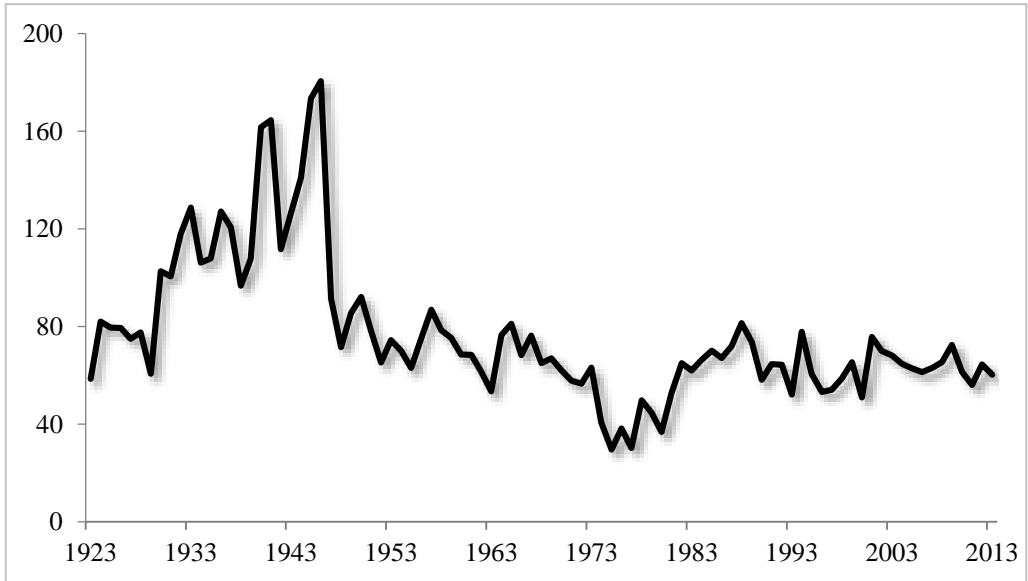
Source: Turkish Statistical Institute.

Economic policies applied until 1980 resulted in economic instabilities and unintended outcomes such as deteriorations in the balance of payments, higher dependence on imported inputs, foreign exchange gap and worsening of terms of trade (Savrul et al.,2013). These policies were abandoned by the decisions of January 24, 1980 which included implementation of more liberalized open economy policies such as the switch in the exchange rate regime, liberalization of foreign trade and implementation of export incentive schemes. The shift in the Turkish economy was observed through the implementation of these decisions towards more liberalized economy especially after the elections in 1983. In line with this shift, Turkey applied to the European Community for full membership in 1987 (Republic of Turkey Ministry of EU Affairs, 2015). The application of Turkey was not accepted due to several reasons. However, the completion of the CU between the European Community and Turkey as the Additional Protocol of November 13, 1970 set out was emphasized and suggested by the European Community. Hence, Turkey accelerated the process by fulfilling the obligations towards the completion of the Customs Union.

After the significant attempts and efforts of Turkey, the CU Decision between the EU and Turkey which is one of the most important milestones in the Turkish

foreign trade policy entered into force on December 31, 1995. The CU Decision provides elimination of custom tariffs and quantitative restrictions in industrial goods and processed agricultural products between the EU members and Turkey but not in unprocessed agricultural products and coal and steel products. The importance of the CU Decision for the Turkish economy is clearly stated in the Ankara Agreement. It is stated that the aim is to promote the continuous and balanced strengthening of trade and economic relations between the Parties, while taking full account of the need to ensure an accelerated development of Turkish economy and to improve the level of employment and living conditions of Turkish people.

In line with the requirements of the CU Decision, Turkey applies common custom tariffs to third countries applied by the EU. Besides the elimination of some types of tariff barriers and application of common customs tariffs to third countries, Turkey also accepted to implement the Common Commercial Policy of the European Union. In this context, according to 16th article in the Decision (Official Journal of the European Union, 1996), Turkey accepted to sign RTAs with non-EU countries which had already have a FTA with the EU within five years starting from the date of entry into force of the Customs Union Decision (31 December 1995). Consequently Turkey has to sign FTAs with non-EU countries which would sign a FTA with the EU in addition to existing FTAs of the EU. Moreover, Turkey agreed to not signing any RTAs without the permission of the EU according to the 57th article of the Customs Union Decision. As a result of these obligations, Turkey cannot sign a FTA with her trade partners without the permission of the EU; however, Turkey has to sign FTAs with the trade-agreement-partners of the EU with a good or bad grace. This aspect of the agreement suggests that Turkey's international trade policy may have lost independence; thus, Turkey is subject to the foreign trade policy of the EU. Therefore, the FTA partners of Turkey are not chosen according to her trade relations with those countries but according to preferences of the EU. Hence, benefits of these agreements to Turkey's foreign trade are debatable. There are clearly benefits of the EU-Turkey CU like elimination of trade barriers and other benefits arisen from the application of economic and social reforms such as the promotion of continuous and balanced economic relations and strengthening of trade between the partners. However, a problematic issue that arises due to the CU decision is that Turkey is subject to the rules determined in a platform in which she is not able to take part in decision making process.

In addition to the provisions mentioned above, it is important to emphasize that each RTA of the EU poses a risk for Turkish economy due to unwillingness of some trade agreement partners of the EU in signing FTA with Turkey such as the USA, Canada, Thailand, India, Indonesia and Algeria. This risk arises from

different principles of customs union and free trade agreements: free movement and rule of origin. Since the partnership between the EU and Turkey is a customs union, the goods covered in the EU-Turkey CU are traded freely between Turkey and the EU without any internal frontier. In this free movement, origins of goods do not affect any process. However, the rule of origin is applied in FTAs in order to avoid tariff evasions. For instance, any member countries of the EU-Turkey CU can export a good made in a third country (outside of the European CU) to Turkey under the same conditions of exporting of a good made in any member countries to Turkey. In contrast, any European CU member cannot export a good made in Turkey to a FTA partner of the EU under special treatments defined in the FTAs. In the light of this information, each FTA of the EU of which Turkey could not be a part of generates asymmetric special treatment to the disadvantage of the Turkish economy.

Currently, Turkey has FTAs in force with 21 countries (Table 1). After the CU Decision, Turkey signed FTAs with twenty eight countries in line with obligations mentioned above; however, eleven of them[2] are repealed due to membership of those countries in the EU.

Table 1
Free Trade Agreements of Turkey in Force

Countries	Date of Entry into Force	Countries	Date of Entry into Force
Liechtenstein[3]	01.04.1992	Egypt	01.03.2007
Norway[3]	01.04.1992	Albania	01.05.2008
Switzerland[3]	01.04.1992	Georgia	01.10.2008
Iceland[3]	01.09.1992	Montenegro	01.03.2010
Israel	01.05.1997	Serbia	01.09.2010
Macedonia	01.09.2000	Chile	01.03.2011
Bosnia-Herzegovina	01.07.2003	Jordan	01.03.2011
Palestine	01.06.2005	South Korea	01.05.2013
Tunisia	01.07.2005	Mauritius	01.06.2013
Morocco	01.01.2006	Malaysia	01.08.2015
Syria[4]	01.01.2007		

Source: The Ministry of Economy of the Republic of Turkey (2015).

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[2]   Romania, Lithuania, Hungary, Estonia, Czech Republic, Slovakia, Bulgaria, Poland, Slovenia, Latvia, Croatia.

[3]   FTA is signed in the context of the Turkey-EFTA states FTA.

[4]   The Association Agreement Establishing a Free Trade Area between the Republic of Turkey and the Syrian Arab Republic was suspended by the member states on 6 December 2011.

2.2. State of foreign trade in Turkey

Parallel to the developments in the Turkish economy, Turkey's foreign trade has been growing in the last decades. Exports and imports of Turkey have an upward trend both in nominal and real terms (Figure 2 and 3). The increases in trade flows become higher especially after 2000s. As of 2014, Turkey has 158 Billion US Dollar exports and 242 Billion US Dollar imports in nominal terms. The most dominant characteristic of Turkish foreign trade is persisting trade deficit. Moreover, trade deficit has been widening in general except in some crisis years, where the economic activity has declined significantly.

Figure 2
Nominal Trade Flows and Trade Balance in Turkey (Million US Dollar)
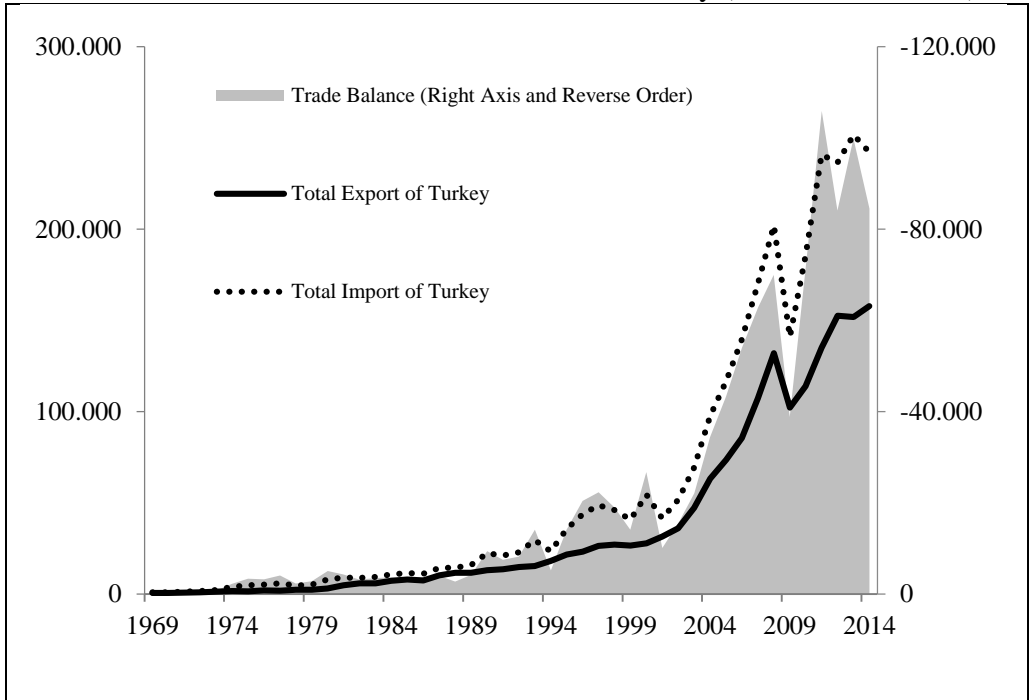
Source: Turkish Statistical Institute.

Figure 3
Real Trade Flows and Real Trade Balance in Turkey (Million, 1998 US Dollar)
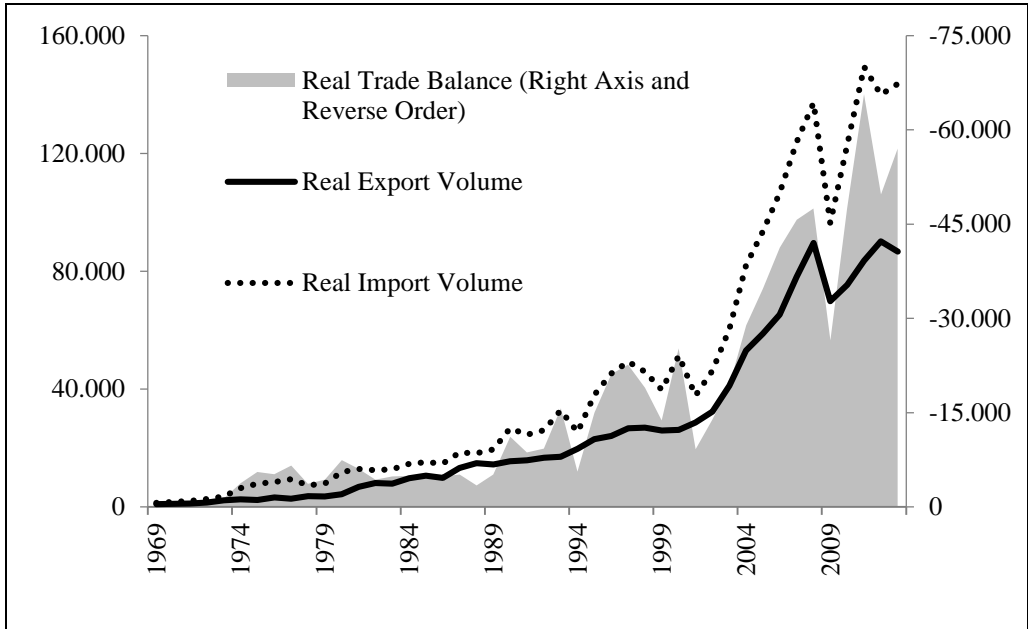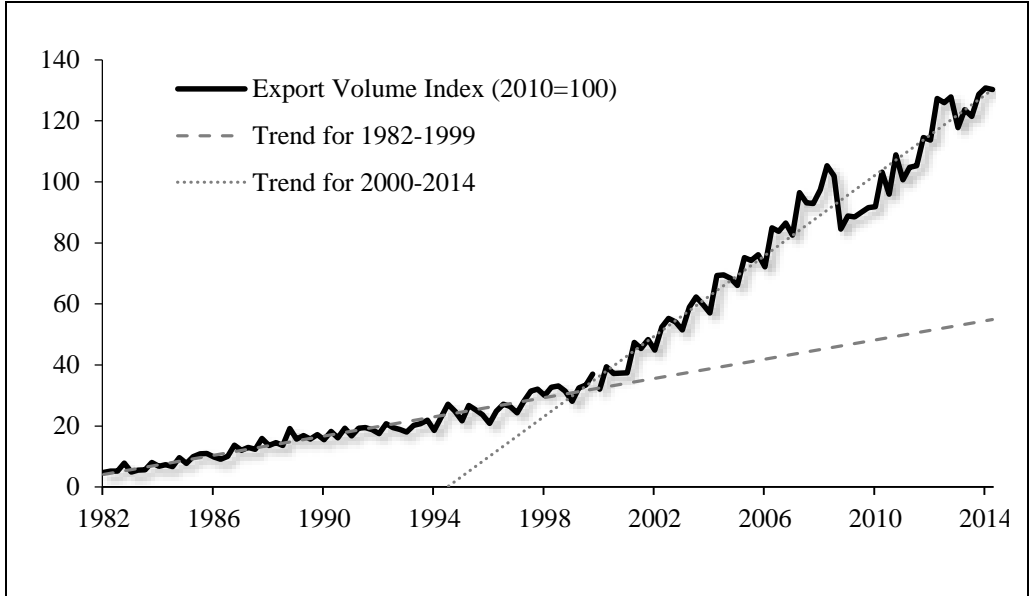

Source: Turkish Statistical Institute.

Figure 4 provides export volume index of Turkey. It is seen that the rate of increase in the export volume has increased especially after 2000 in line with the global export volume expansion. Parallel to this increment in the export volume, unit value of export also has an upward trend since 2000 (Figure 5). These developments correspond to the period after 2001 financial crisis, in which Turkey experienced high growth rates until 2005. Additionally, the negative impact of global financial crisis of 2008-2009 which radically lowered international trade at the global level is evident through figures 2-5.

In addition to increases in volume and unit value of exports in Turkey, shares of exports and imports of goods and services in GDP have risen since 1987[5] (Figure 6). From figure 6, it is observed that Turkey's participation in international trade relative to the Turkish economy is growing. Therefore, importance of trade flows has increased as contributions of export and import become higher. It is also evident that the growth in imports have a higher trend than the growth in exports, hence the increase in trade deficit emerges, as mentioned before.
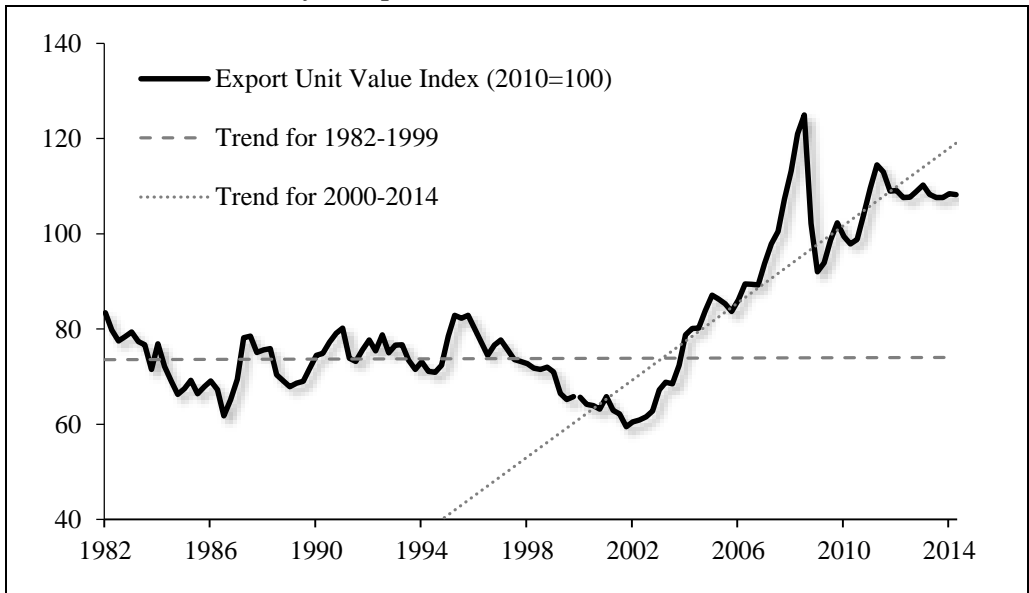
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[5]   Since Turkish Statistical Institute does not provide GDP series before 1987, the shares of export and import of goods and services could not be calculated for the period before 1987.

Figure 4
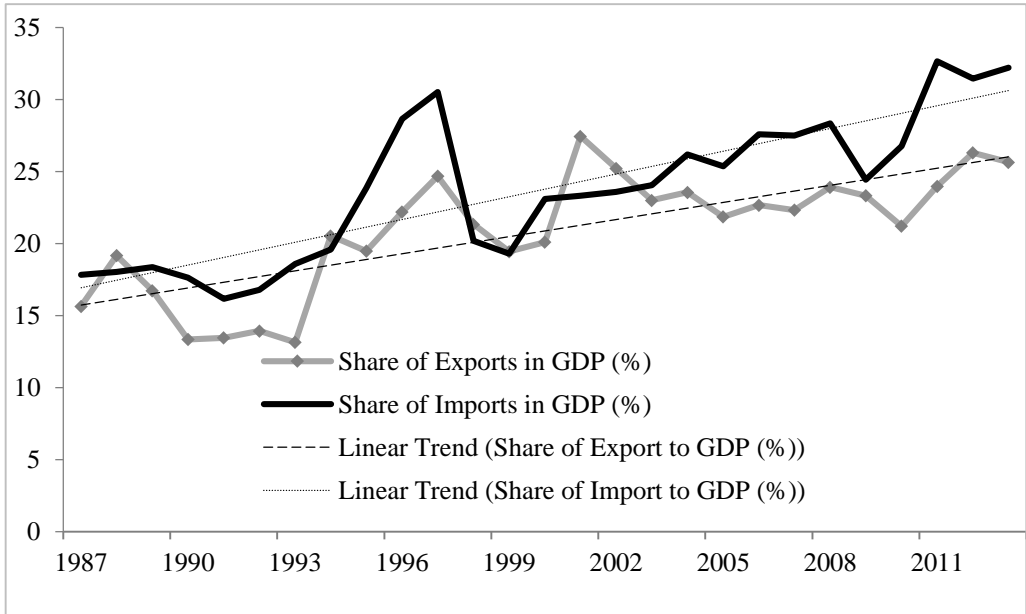Turkey's Export Volume Index (2010=100)

Source: Turkish Statistical Institute.

Figure 5
Turkey's Export Unit Value Index (2010=100)

Source: Turkish Statistical Institute.

Figure 6
Exports and Imports of Goods and Services to GDP (%)[6]

Descriptive statistics show that the importance and volume of trade flows in Turkish economy has risen especially through economic liberalization policies since 1980. The role of the RTAs of Turkey in this increase is the main research question of this study.

In order to analyze the importance of the RTAs of Turkey, it is essential to analyze whether the share of exports from Turkey to the RTA partners in total exports increases after the Agreements become effective or not. In order to observe this impact, annual exports to the RTA partners in total exports are calculated using quarterly data. The shares of RTA partners in Turkey's total exports are equalized to 1 in the quarter 0 –the quarter of entry into force– for each agreement and then series are clustered according to the RTA entry date.

Exports of Turkey to first four RTA partners –Iceland, Norway, Switzerland and Israel-[7] in total exports of Turkey are illustrated in Figure 7. Exports to Switzerland in total export increase gradually after the Agreement but the upward

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[6] Export and import of goods and services are from components of expenditure on the GDP at current prices.
[7] The RTA partners in Figure 7 to 10 are grouped according to chronological order of entry into force of the related agreements.

movement loses its momentum around 63th quarter which coincides with the global crisis in 2008. Export shares of other three countries do not increase significantly; in contrast, there are quarters they decrease to quite low levels. Overall last observations all take values below 1 indicating that the shares of these four RTA partners in total exports of Turkey are below the levels at which the RTAs became effective.
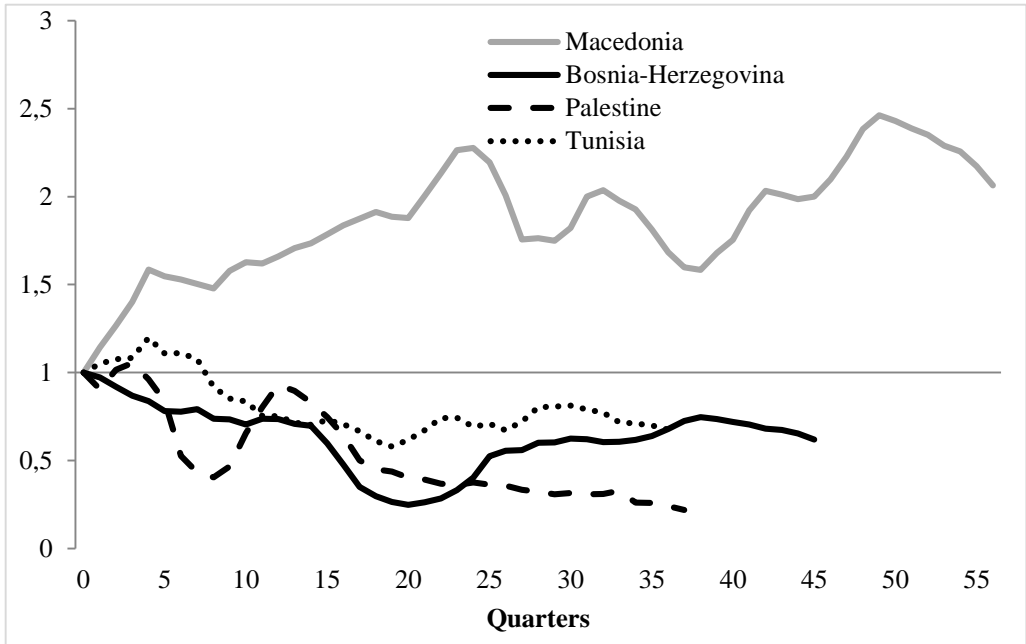
Figure 7
Export Shares of Iceland, Norway, Switzerland and Israel in Total Exports (Index)
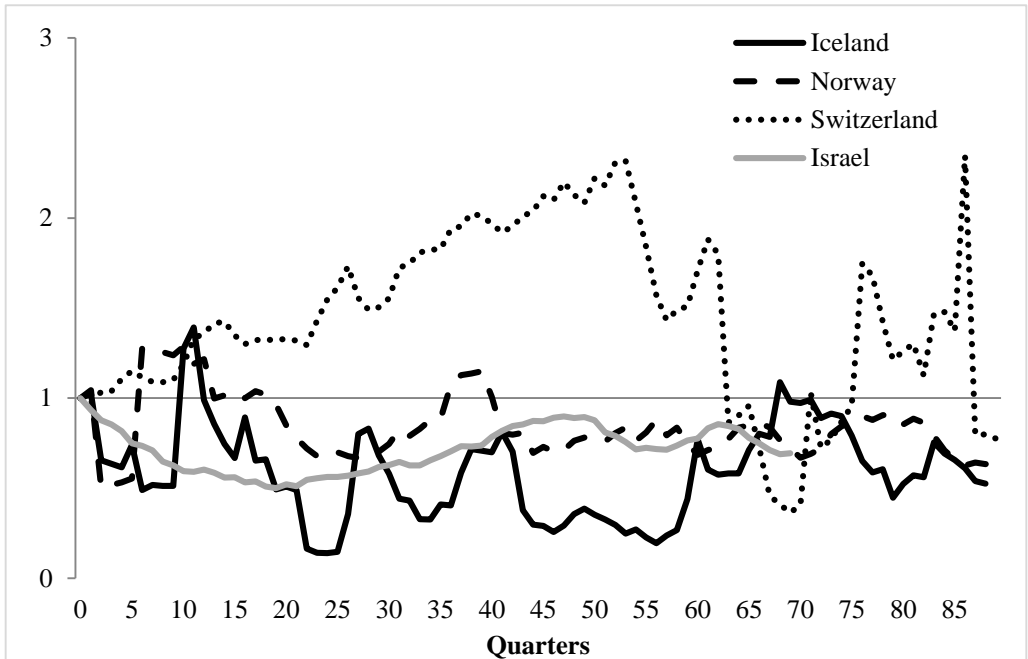
Source: Turkish Statistical Institute and Authors' Calculations.

The same index calculated for the following four RTA partners –Macedonia, Bosnia-Herzegovina, Palestine and Tunisia– are provided in Figure 8. Similar to Switzerland in the previous figure, an increment in the export share index is observed in Macedonia. However, export shares of the other three RTA partners in total exports of Turkey decline after the entry into force of the RTAs. Among the countries presented in Figure 8, only Macedonia's export share in total exports of Turkey is greater than 1 and around 2. In other words, export share of Macedonia in total exports of Turkey doubles compared to the quarter at which the Turkey-Macedonia FTA entered into force.

Figure 8

Export Shares of Macedonia, Bosnia-Herzegovina, Palestine and Tunisia in Total Exports (Index)

In Figure 9, the export share index is depicted for the following four RTA partners -Morocco, Syria, Egypt and Albania-. Except Albania, export shares of Morocco, Syria and Egypt goes down after the quarter 0. Although Syria reaches higher values greater than 1 around 20th quarter, a dramatic fall below 1 is observed in the remaining period. According to the latest data available, only Albania has a higher share of export in total exports of Turkey compared to the date of entry into force of the agreements.

Figure 9

Export Shares of Morocco, Syria, Egypt and Albania in Total Exports (Index)
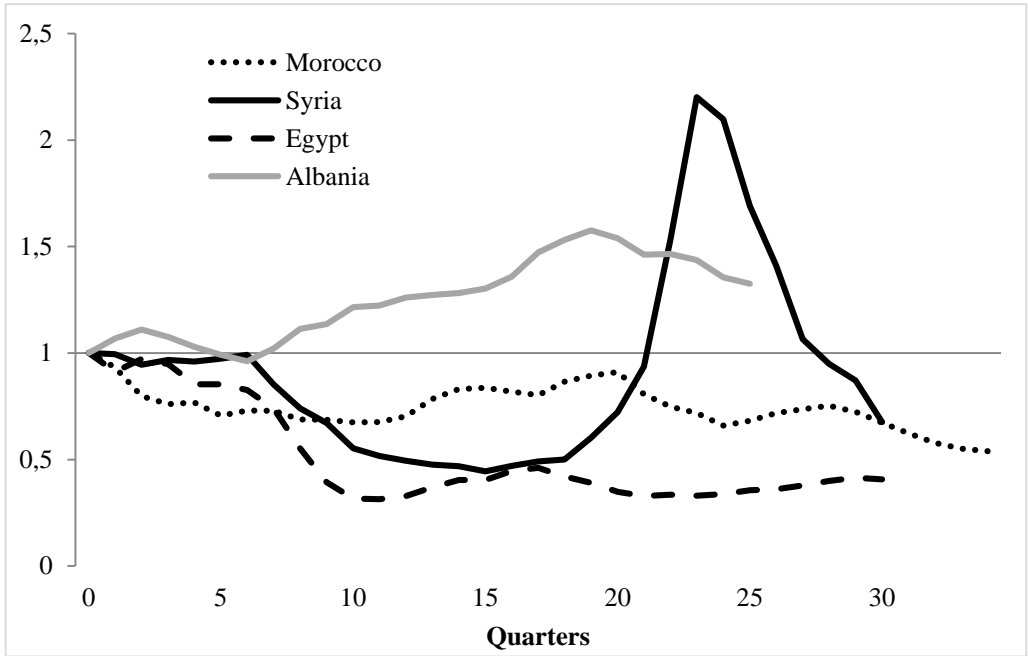
Source: Turkish Statistical Institute and Authors' Calculations.

Export shares indices for the last RTA partners of Turkey are depicted in Figure 10. The export shares of Jordan and Serbia-Montenegro rise right after the RTAs but it could not be sustained and they fall down in later periods. Although it is early to conclude that those FTAs could not create additional shares in Turkey's export, the latest available data shows that Turkey did not observe increase in exports shares of those countries.

Figure 10
Export Shares of Georgia, Serbia-Montenegro, Chile, Jordan, South Korea and
Mauritius in Total Exports (Index)
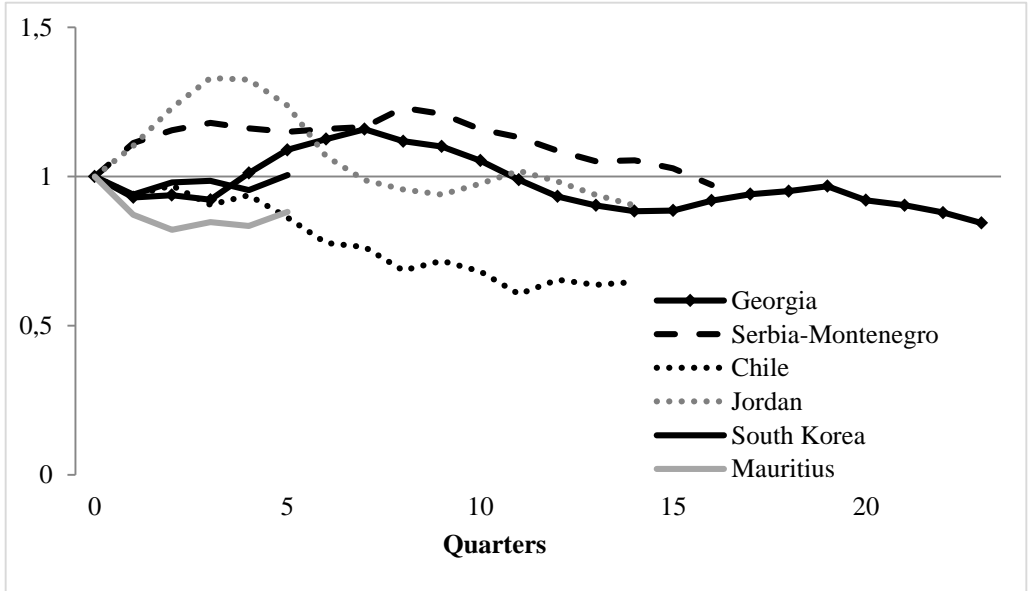
Source: Turkish Statistical Institute and Authors' Calculations.

Finally, the export share index for the RTAs partners of Turkey is computed for fifteen EU countries and reported in Figure 11. As is shown in the figure, share of exports to EU-15 in total exports show an increment throughout the period especially after 45th quarters. The last value of the index takes value of around 1.4. This means that share of EU-15 in total exports of Turkey increases almost 40 percent compared to the date of entry into force of the CU Decision.

Figure 11
Export Shares of EU-15 in Total Export (Index)
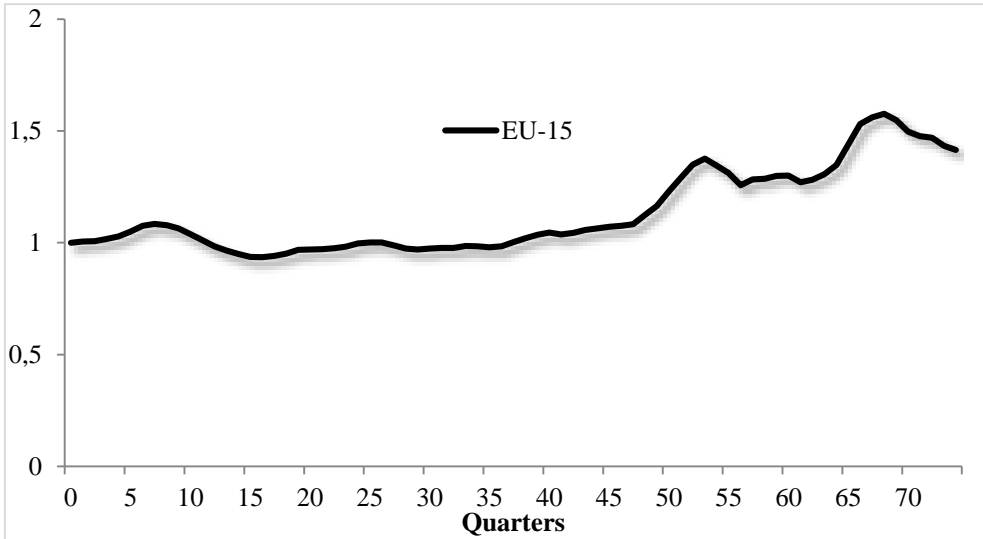
Source: Turkish Statistical Institute and Authors' Calculations.

Although RTAs are the agreements which countries tend to sign in order to achieve higher trade flows with partner countries, it can be concluded that exports to the FTA partners of Turkey do not increase significantly in overall assessment except outliers in the light of share indices calculated for all FTAs partners of Turkey. However, exports to the EU-15 shows an increase compared to the other RTAs partners.

In conclusion, the descriptive statistics show that Turkey's international trade expands during the study period to a large extend however, the share of FTA partners in Turkey's exports does not increase markedly. This result combined with the observation that Turkey could not choose her FTA partners independently as mentioned before makes the FTA's role in improving trade potential questionable.

3. Literature review

The gravity equation initially introduced to the international trade literature by Jan Tinbergen (1962), followed by the other early studies of Pöyhönen (1963) and by Linnemann (1966). Initial studies were purely empirical, the theoretical background of the gravity equation is developed later by studies such as Anderson (1979), Krugman (1980), Bergstrand (1985 and 1989), Deardorff (1998), Eaton and Kortum (2002) and Anderson and van Wincoop (2003).

The gravity model is widely used to analyze the ex-post effects of RTAs on trade flows as in the case of the first example of the gravity model estimation by Tinbergen (1962). However, findings of many studies are conflicting in terms of the effects of the RTAs on trade flows; in other words, the significant and positive impacts of the regional trade agreements on the trade flows are not a common and usual finding in the empirical gravity literature. For instance, studies of Bayoumi and Eichengreen (1997) and Soloaga and Winters (2001) end up with opposite results about the effects of the European Free Trade Association (EFTA). Other conflicting results are suggested by Bayoumi and Eichengreen (1997), Endoh (1999) and Soloaga and Winters (2001) related to the European Economic Community. There are mixed results related to the Association of Southeast Asian Nations (ASEAN) FTA. For example, studies of Soloaga and Winters (2001) and Carrère (2006) provide contradictory evidences regarding impacts of the ASEAN FTA on trade flows among member states.

These three RTAs are a few examples among many studies in the literature which show conflicting results using the gravity equation. These conflicting results might be due to differences in estimation techniques as well as endogeneity bias inherent in the functional form of the gravity equation. Baier and Bergstrand (2007) aim to solve estimation problems related to the effects of RTAs in the gravity model. Their study paves the way to many gravity studies that adopt the suggested techniques[8]. Details to the technique applied in the study of Baier and Bergstrand (2007) is introduced in the next section and applied in this study. They analyze trade flows among 96 countries covering 52 RTAs between 1960 and 2000. The study suggests that bilateral trade of RTA members increases 100 percent after 10 years.

Regarding the Turkish case, the literature mainly focuses on the EU-Turkey CU decision; there exist empirical studies which use different versions of gravity equations with different estimation approaches and data about the EU-Turkey CU Decision. For instance, the study of Antonucci and Manzocchi (2006) investigates whether the CU Decision provides additional foreign trade for these two parties – Turkey and the EU members. They use a balanced panel data for 45 countries starting from 1967 until 2001. Firstly, the study shows that the gravity model approach is an appropriate method in order to explain international trade flows of Turkey. Moreover, the empirical results in this study show that there is not enough evidence to claim that the EU-Turkey CU provided additional foreign trade between parties of this agreement.

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[8]   Some examples for those studies are Vincard (2011), Yang and Martinez-Zarzoso (2014) and Moser and Rose (2014).

Table 2
Summary of Studies about the Customs Union between Turkey and the EU

Study	Estimation Method	Result
Antonucci and Manzocchi (2006)	Gravity Model with panel data for 45 countries between 1967 and 2001	No effect
Adam and Moutos (2008)	Gravity Model with panel data for 24 countries between 1988 and 2004	Positive effect
Bilici, Erdil and Yetkiner (2008)	Gravity Model with panel data for 42 countries between 1992-2006	Positive but not significant effect
Nowak-Lehmann, Herzer, Martinez-Zarzoso and Vollmer (2007)	Gravity Model with panel data between 1988-2002	Positive effect
Neyaptı, Taşkın, and Üngör (2007)	Panel data estimation with 150 countries between 1980-2001	Positive effect
Mercenier and Yeldan (1997)	Intertemporal general equilibrium analysis	Negative effect
Harrison, Rutherford and Tarr (1997)	Computable general equilibrium analysis	Positive effect

Another study on the effects of the EU-Turkey CU is conducted by Adam and Moutos (2008). They investigate the effects of the CU on manufacturing export of both Turkey and 15 EU member countries. They use the gravity model covering 24 countries for 17 year up to 2004. Empirical results in their study suggest that inclusion of Turkey in the European CU decreases exports among 15 European countries; however, it has a positive impact on exports of Turkey to the EU and exports of the EU to the Turkey (Turkey's import from the EU). Bilici et al. (2008) also utilize the gravity model in order to evaluate effects of the CU on Turkey's trade flow. The study estimates the gravity equation using panel data with 42 countries starting from 1992 until 2006. The estimated results suggest that the EU has been important in trade flow of Turkey both before and after the CU Decision. They conclude that the distance between the EU and Turkey has lost importance after the CU Decision which leads authors to conclude that the European CU has increased the EU's importance in Turkey's trade flow. However, they suggest that the Decision did not cause a significant change in the foreign trade of Turkey.

In addition to those studies, Nowak-Lehmann et al. (2007) investigate trade flows between Turkey and the EU in 16 important export sectors of Turkey using

gravity equation and panel data for the period starting from 1988 until 2002. The estimation results suggest that trade in industrial goods –only some of them covered in the study- has increased very little after the CU. However, it is indicated that if agricultural products are covered in the EU-Turkey CU, authors expect significant increase in Turkey's agricultural product exports to the EU.

Alongside the studies using gravity model, there exist other empirical papers which try to figure out the impacts of the CU Decision on Turkish economy. One of the studies is of Neyaptı et al. (2007). They use an econometric model including conjectural variables other than the gravity model for Turkey's foreign trade over the period 1980-2001. They conclude that the Customs Union Decision between Turkey and the EU affected Turkey's trade flow positively.

In addition to the econometric studies about the impacts of the Customs Union, there are also computable general equilibrium (CGE) analyses for ex-ante forecasts. In the study of Mercenier and Yeldan (1997), an intertemporal general equilibrium model is applied. They indicate that negative consequences for Turkish economy can be observed since the Custom Union Decision can deteriorate terms of trade of Turkey arisen from removal of custom tariffs of Turkey against the EU. On the other hand, the study of Mercenier and Yeldan (1997) also argues that if Turkey becomes a member of the EU, then the overall impact on Turkish economy becomes positive since membership of the EU brings elimination of non-tariff barriers together with removal of customs tariffs. Another ex-ante study is conducted by Harrison et al. (1997). They use a computable general equilibrium model and forecast possible impacts of the Turkey-EU Customs Union on Turkish economy. The study shows that the European Customs Union can generate positive impacts on Turkish economy; specifically welfare gains which is equal to 1 – 1.5 percent of GDP. Authors also argue that this dramatic increase in welfare of Turkey is arisen from small trade diversion effects faced by Turkey.

As explained above, there exist many studies on the impacts of the EU-Turkey CU on Turkey's trade flows. However, our study becomes distinct from this literature in several aspects. In our study we also use the gravity model to focus on the ex-post effects of the CU due to advantages mentioned before. However, recent techniques in gravity model estimation developed by Anderson and van Wincoop (2003) and Baier and Bergstrand (2007) are used in this study differing from the earlier studies in order to solve the endogeneity bias of RTAs. In addition, this study does not only concentrate on the CU Decision due to the fact that the FTAs are an important part of the CU because of the obligations mentioned in section 2. Therefore, the novelty of this study is to evaluate impacts of all RTAs of Turkey – the CU with the EU and all FTAs in force or revealed-. Furthermore, the current study uses broader data set; larger number of countries and longer time period compared to the previous studies.

4. Model, data and empirical results

In previous sections, it is shown that Turkey's exports and imports volume have increased. In this section the role of the RTAs in the expansion of trade flows in Turkey is examined empirically using a gravity model. The baseline gravity equation is as follows:

$$X_{ijt} = \beta_0 Y_{it}^{\beta_1} Y_{jt}^{\beta_2} D_{ij}^{\beta_3} e^{\beta_4 L_{ij}} e^{\beta_5 CB_{ij}} e^{\beta_6 RTA_{ijt}} \varepsilon_{ijt} \tag{1}$$

where X_{ijt} denotes trade flow from the exporter country i to the importer country j at time t, Y_{it} is the gross domestic product (GDP) of the exporter country i at time t, Y_{jt} is the GDP of the importer country j at time t, D_{ij} denotes the distance between exporter country i and importer country j, L_{ij} is a dummy variable for common language as stated in Equation (2).

$$L_{ij} = \begin{cases} 1, & country\ i\ and\ j\ share\ a\ common\ language \\ 0, & otherwise \end{cases} \tag{2}$$

Similarly, another dummy variable CB_{ij} is a dummy variable for the common land border as in Equation (3).

$$CB_{ij} = \begin{cases} 1, & country\ i\ and\ j\ share\ a\ common\ land\ border \\ 0, & otherwise \end{cases} \tag{3}$$

Moreover, RTA_{ijt} is another binary variable which provides the information whether countries i and j have a RTA such as preferential trade agreement, free trade agreement and customs union at time t (Equation 4).

$$RTA_{ijt} = \begin{cases} 1, & country\ i\ and\ j\ has\ a\ RTA\ at\ time\ t \\ 0, & otherwise \end{cases} \tag{4}$$

The idea behind this model is that a country's export supply and import demand depends on its economic size (Y_i, Y_j respectively) and trade flow between any country is affected by trade costs. In gravity models, distance is used as a proxy for transportation costs, other dummy variables for common language and common border are used as proxies for other types of trade costs. Finally a RTA dummy is included in the model to test the impact of trade agreements.

A frequently estimated gravity equation is displayed in Equation (5) which is the logarithmic form of Equation (1) given above.

$$lnX_{ijt} = \beta_0 + \beta_1(lnY_{it}) + \beta_2(lnY_{jt}) + \beta_3(lnDIST_{ij}) + \beta_4(L_{ij}) + \beta_5(CB_{ij}) +$$
$$\beta_6(RTA_{ijt}) + \varepsilon_{ijt} \tag{5}$$

Due to the fact that this study only focuses on the RTAs of Turkey and their impacts on Turkey's trade flows, country i denotes Turkey. The gravity equation is modified in this study is shown in Equation (6).

$$lnX_{TRjt} = \beta_0 + \beta_1(lnRGDP_{TRjt}) + \beta_2(lnDIST_{TRj}) + \beta_3(L_{TRj}) +$$

$$\beta_4(CB_{TRj}) + \beta_6(RTA_{TRjt}) + \varepsilon_{ijt} \qquad (6)$$

X_{TRjt} is the real trade flow from Turkey to partner country j at time t. Instead of separate real GDP of two trade partners (Y_{it} and Y_{jt}), total real GDP levels of Turkey and country j is used and denoted as $lnRGDP_{TRjt}$. The reason behind this is the fact that Turkey's real GDP is the same for all cross section; in other words, it is not a cross-variant variable. Hence, perfect multicollinearity problem arises when fixed effects are included in the model. Therefore, the sum of the real GDP of Turkey and her trade partners are used in Equation 6. Similar to the Equation 5, $DIST_{TRj}$ denotes the distance between Turkey and her trade partner country j, L_{TRj} is a dummy variable taking value of 1 (one) when Turkey and her trade partner country j share a common language[9]. Similarly, another binary variable CB_{TRj} takes value of 1 (one) when Turkey and her trade partner country j share a land border. RTA_{TRjt} is the last dummy variable which provides the information whether Turkey and country j has a RTA or not. In other words, RTA_{TRjt} takes the value of 1 when Turkey and country j are members of a RTA in force at time t.[10]

In an attempt to analyze impacts of Turkey's FTAs and European CU separately, RTA_{TRjt} is split into two: CU_{TRjt} and FTA_{TRjt} as explained in Equation (7) and (8).

$$CU_{TRjt} = \begin{cases} 1, & Turkey\ and\ country\ j\ are\ members\ of\ a\ CU\ at\ time\ t \\ 0, & otherwise \end{cases} \qquad (7)$$

$$FTA_{TRjt} = \begin{cases} 1, & Turkey\ and\ country\ j\ has\ a\ FTA\ at\ time\ t \\ 0, & otherwise \end{cases} \qquad (8)$$

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[9]   Common language variable does not fit in Turkish case due to the fact that Turkey has a common language only with Bulgaria and Cyprus. Since Turkey has limited trade relations with Cyprus after the EU membership due to political reasons, the dummy variable defined for a common language does not show economically meaningful results. Therefore, the binary variable for a common language is not used in estimations.

[10] If the RTAs enter into force after the end of June at year t, then the dummy variable RTA_{TRjt} takes the value of 0 (zero) in year t but the value of 1 (one) in year $t+1$ in order to see accurate impacts of RTAs. Similarly, if the RTAs enter into force before the end of June in year t, the RTA_{TRjt} takes the value of 1 (one) in year t. This rule is also applied for the dummy variables CU_{TRjt} and FTA_{TRjt}.

In estimation of the model in (6), the time period is determined as 1992 – 2013, since yearly data is used in the analysis the time span is 22 years. Also, trade flows with 126 trade partners of Turkey[11] are used in the data set. There are missing trade flows for some countries in some years. For example, some countries do not exist in certain period of time, or there is zero trade flow in specific years. In the estimation, non-zero trade flows are taken into consideration similar to the methodology of Baier and Bergstrand (2007). Therefore, the unbalanced panel data is obtained for 126 country or country groups in 22 years.

In the analysis, not only exports of Turkey to her trade partners but also imports from them are used. Nominal exports and imports statistics of Turkey are taken from the Turkish Statistical Institute in terms of US Dollar. In order to obtain real series, nominal export and import values are transformed using the US consumer price index taken from the Federal Reserve Bank of St. Louis. Moreover, the real GDP series of Turkey and her trade partners are taken from World Bank - World Development Indicators. Real GDP series are measured in 2005 US Dollar.

The Center for International Prospective Studies (Centre d'Études Prospectives et d'Informations Internationales, CEPII) provides variables of distance and dummies for common language and border. Bilateral distance is calculated according to great circle formula using geographic coordinates of the most important and crowded cities of those countries. Information about the FTAs of Turkey is taken from the Turkish Ministry of Economy.

In the gravity literature most of the studies which provided theoretical explanations for the gravity model emphasized the role of some kind of price levels. The contribution of Anderson and van Wincoop (2003) solves the problem of price levels in the model and they introduced multilateral price terms, the barriers to trade that each country faces with all its trading partners. In line with the developments in gravity model theory, the methodology suggested by Baier and Bergstrand (2007) is applied in this study, so that estimation techniques integrate the information provided by the missing price terms in the gravity model: using both time and country specific fixed effects. They show that implementation of country specific fixed effects in gravity model estimation can be used to capture the effect of multilateral price terms and to solve the endogeneity bias of RTAs[12].

In the following discussion we present empirical results from different estimation techniques, estimation results using pooled OLS (no fixed effects), time specific fixed effects, country specific fixed effects and both time and country specific fixed effects are provided in each table from 3 to 8.

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[11] The list of countries is provided in Appendix.

[12] For details related to estimation techniques using both time and country specific fixed effect, see Baier and Bergstrand (2007). Baier and Bergstrand (2007) also include a discussion of superiority of their approach to estimation using probit function, instrumental variables and control functions.

Table 3 shows baseline gravity model estimation results for exports of Turkey to her trade partners. In each estimation technique, main gravity model variables are statistically significant and economically meaningful. The coefficients of total real GDP of Turkey and her trade partners have positive and significant impacts on Turkey's exports. The bilateral distance between Turkey and her trade partners has negative and significant impacts on exports of Turkey as expected. In other words, when the distance between Turkey and her trade partner increases, exports of Turkey to those countries decrease due to rise in transportation costs. The dummy for common border seems to be positive and significant. In other words, exports of Turkey to the countries which have a common border with Turkey is higher compared to the other countries.

The similar results are observed in the baseline gravity model estimations for Turkey's imports and these are presented in Table 4. The coefficients of major gravity variables, $lnRGDP_{TRjt}$, lnD_{TRj} and CB_{TRj}, are statistically significant and economically meaningful. Similar to the previous estimation results calculated for exports of Turkey, total real GDP and shared border affect imports of Turkey positively and bilateral distance affects negatively.

In order to measure impacts of RTAs, the dummy variable defined for the RTAs of Turkey is used in estimations provided in Table 5 and 6. In Table 5, it is observed that the major gravity variables ($lnRGDP_{TRjt}$, lnD_{TRj} and CB_{TRj}) still strongly explains Turkey's exports. However, the additional variable for the RTAs are statistically insignificant in all estimation techniques. This result suggests that Turkey's exports to her RTA partners are not different than her exports to other countries. In other words, it seems that the RTAs are not the driving force for Turkey's exports to her RTA partners.

In contrast to the case of exports of Turkey, the RTAs seem to have an impact on Turkey's imports. The results displayed in Table 6 shows that the three basic gravity variables ($lnRGDP_{TRjt}$, lnD_{TRj} and CB_{TRj}) are statistically and economically meaningful in explanation of Turkey's imports. Besides, the RTAs are statistically significant in three estimation technique out of four –except the model including only country specific fixed effects. This result is not surprising due to the fact that country-specific impacts are captured by the fixed effects and so the impacts of RTAs are weakened. Most importantly, the coefficient of the variable of RTAs is significant in the final estimation technique including both time and country fixed effects which is the suggested estimation methodology by the Baier and Bergstand (2007). Hence, it can be suggested that there is positive and significant impact of the RTAs on imports of Turkey to her trade partners. Accordingly, the results reveal that Turkey's imports from her RTA partners are higher compared to her other trade partners.

In addition to the overall impact of the RTAs on Turkey's exports and imports, the marginal impacts of the EU-Turkey CU and the FTAs are estimated in Table 7 and 8. Table 7 shows the regression results for Turkey's exports. In all estimations in Table 7, the main gravity model variables are significant. However, the coefficients for the CU and the FTAs are insignificant and so they do not have any impact on Turkey's exports to her trade partners. Our findings show that this result is robust to the alternative estimation techniques utilized in this study. Moreover, the insignificant impacts of the CU and the FTAs on Turkey's exports are parallel to the result of insignificant impacts of the RTAs on Turkey's exports provided in Table 5 since the variable of RTAs compromises of variables for the CU and FTAs.

The estimation results in Table 8 shows the impacts of the CU and FTAs on Turkey's imports. The main gravity model variables are both economically meaningful and statistically significant. In contrast to the case of exports, the coefficient for the CU is statistically significant and positive in all estimations techniques displayed in Table 8. In other words, the EU-Turkey CU has a significant and positive impact on Turkey's imports. This means that Turkey's import from the CU members are higher than her other trade partners. However, Turkey's FTAs are not one of the driving forces of Turkey's imports due to insignificant coefficients in all estimations. This finding supports the implication of estimations in Table 6 that Turkey's imports from her RTA partners are higher than other trade partners. In addition, the results show that positive impacts of the RTAs on imports arise from the positive impacts of the CU not from the insignificant effects of the FTAs. As a result, it can be inferred that Turkey's exports to the EU members and FTA partners are not different than the other countries. However, the Turkey's imports to the EU members is higher compared to the all other trade partners of Turkey.

Table 3
Baseline Gravity Model Estimation for Export[13]

lnX_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	2.566*** (0.284)	2.317*** (0.265)	3.844*** (0.172)	2.804*** (0.970)
lnD_{TRj}	-1.197*** (0.115)	-1.180*** (0.115)		
CB_{TRj}	1.152*** (0.398)	1.116*** (0.384)		
RMSE	1.4071	1.3368		
R^2	0.62	0.64	0.66	0.68
Number of Observation	2697	2697	2697	2697

Table 4
Baseline gravity model estimation for import

lnM_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	3.329*** (0.378)	3.438*** (0.482)	3.230*** (0.194)	2.799*** (0.360)
lnD_{TRj}	-0.948*** (0.194)	-0.956*** (0.193)		
CB_{TRj}	1.384*** (0.492)	1.393*** (0.491)		
RMSE	2.2318	2.2278		
R^2	0.47	0.47	0.4033	0.42
Number of Observation	2643	2643	2643	2643

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[13] In Table 3 to 8, the values in parenthesis are robust standard errors. Coefficients for time and country specific fixed effects are not included in the table. *significant at 90% confidence level, **significant at 95% confidence level, ***significant at 99% confidence level.

Table 5
Gravity Model Estimation with a Variable for the RTAs for Export

lnX_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	2.502***	2.284***	3.844***	2.793***
	(0.298)	(0.272)	(0.195)	(0.968)
lnD_{TRj}	-1.119***	-1.132***		
	(0.135)	(0.139)		
CB_{TRj}	1.207***	1.151***		
	(0.425)	(0.404)		
RTA_{TRjt}	0.318	0.195	-0.002	-0.029
	(0.282)	(0.274)	(0.103)	(0.107)
RMSE	1.4031	1.3655		
R^2	0.62	0.65	0.66	0.68
Number of Observation	2697	2697	2697	2697

Table 6
Gravity Model Estimation with a Variable for the RTAs for Import

lnM_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	3.159***	3.273***	3.192***	2.876***
	(0.378)	(0.465)	(0.222)	(0.354)
lnD_{TRj}	-0.740***	-0.713***		
	(0.218)	(0.216)		
CB_{TRj}	1.530***	1.568***		
	(0.524)	(0.530)		
RTA_{TRjt}	0.847**	0.995**	0.102	0.215*
	(0.390)	(0.398)	(0.112)	(0.121)
RMSE	2.2126	2.2018		
R^2	0.48	0.49	0.40	0.42
Number of Observation	2643	2643	2643	2643

Table 7

Gravity Model Estimation with Variables for the CU and FTAs for Export

lnX_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	2.505*** (0.310)	2.284*** (0.284)	3.838*** (0.197)	2.803*** (0.973)
lnD_{TRj}	-1.119*** (0.134)	-1.132*** (0.138)		
CB_{TRj}	1.207*** (0.424)	1.151*** (0.404)		
CU_{TRjt}	0.304 (0.319)	0.196 (0.293)	0.043 (0.126)	-0.012 (0.13)
FTA_{TRjt}	0.338 (0.369)	0.194 (0.388)	-0.048 (0.101)	-0.046 (0.108)
RMSE	1.4033	1.3657		
R^2	0.62	0.65	0.66	0.68
Number of Observation	2697	2697	2697	2697

Table 8

Gravity Model Estimation with Variables for the CU and FTAs for Import

lnM_{TRjt}	No fixed effects	Time specific fixed effects	Country specific fixed effects	Both time and country specific fixed effects
$lnRGDP_{TRjt}$	3.146*** (0.389)	3.264*** (0.481)	3.167*** (0.223)	2.967*** (0.371)
lnD_{TRj}	-0.737*** (0.218)	-0.712*** (0.215)		
CB_{TRj}	1.529*** (0.528)	1.567*** (0.532)		
CU_{TRjt}	0.911** (0.444)	1.038** (0.454)	0.269* (0.142)	0.377** (0.150)
FTA_{TRjt}	0.758 (0.496)	0.934* (0.501)	-0.069 (0.154)	0.059 (0.152)
RMSE	2.2128	2.2021		
R^2	0.48	0.49	0.41	0.42
Number of Observation	2643	2643	2643	2643

In addition to estimations provided in Table 3 to 8, other alternative estimations using different gravity model explanatory variables are carried. For instance, a binary variable for a common language is used. However, the common language variable is not suitable for the Turkish case due to the fact that Turkey has a common language only with Bulgaria and Cyprus[14]. Since Turkey has limited trade relations with Cyprus after the EU membership due to political reasons, the dummy variable defined for a common language does not show economically meaningful results. Therefore, the common language dummy is not used in estimations. Alternatively, a dummy variable for common ethnic origin is also used. In this case, similar ethnic origin appears in Germany, Holland and France due to the fact that Turkish citizens mostly live in these European countries. The binary variable created for common ethnic origin also created bias in estimations since Turkey has strong trade relations with these countries and the number of observation (three) is quite small in the total sample of 126 countries. In addition to those variables, other explanatory variables are used to capture relative endowments and similarity of country sizes. However, those variables are not shown as they do not contribute to the model.

One of the major issues in gravity model estimations is the existence of zero trade variables. Reported estimation results in the study exclude zero trade flows in the data set in line with study of Baier and Bergstand (2007). However, we make a robustness check using zero trade flows and results do not differ to a large extend[15]. Additionally, we check the stationarity of the time variant variables (*lnX, lnM, lnRGDP*), Fisher-type unit root tests suggest that variables are stationary. Usual diagnostics checks are carried for the models estimated as well. Heteroscedasticity is detected and heteroskedasticity consistent estimators are used in the reported results. No first order autocorrelation is detected in the models.

Finally, cross sectional dependence is also checked using Pesaran's test for cross sectional dependence. Test results suggest that there is no cross sectional dependence for exports at 90% confidence level but cross sectional dependence is detected for imports. In line with this finding, the models are also estimated using Driscoll-Kraay standard errors which are not reported in here due to space considerations. These estimations suggest the same findings as the reported models.

5. Conclusion

The EU-Turkey CU Decision is one of the most important milestones in the Turkish foreign trade policy for 20 years. There are several debates on positive and

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[14]   Greek Cypriot Administration of Southern Cyprus.
[15]   These estimations suggest that Turkey's imports are not affected by the RTAs different than the results discussed in the paper. However, using zeros in missing trade variables can provide misleading results.

negative effects of the CU on Turkey's trade flows. Besides the impacts of the CU itself, the impacts of the FTAs which are actually signed to promote the trade relations become controversial since Turkey cannot choose her FTA partners independently.

It is known that there is a lack of consensus among empirical studies on ex-post effects of the CU on Turkey's trade flows. Furthermore, the FTAs of Turkey are not taken into consideration in the other studies. Therefore, our study aims to answer whether or not RTAs including both the EU-Turkey CU and FTAs increase Turkey's foreign trade. In order to answer this question, the gravity model framework is used in line with the literature and the recent estimation techniques in the model estimations are applied.

Empirical results of this study reveal that Turkey's RTAs do not affect Turkey's exports. In other words, both the EU-Turkey CU and the FTAs are not driving forces for Turkey's export. This means that Turkey's exports to RTA partners are not significantly different than the one to other trade partners. However, the European CU is significantly important on Turkey's import despite the fact that the FTAs do not affect Turkey's import. This suggests that Turkey's imports from the EU members are higher than the ones from other trade partners. As a result, the FTAs of Turkey affect neither exports nor imports in line with the fact that Turkey could not choose her FTA partners due to obligations of the CU Decision. Although the expected gains from the CU for Turkish economy are considerably high, it seems that those expectations could not be met. In other words, the results lead us to conclude that the CU Decision could not create an effective trade policy to promote Turkey's exports.

This study covers aggregated trade data between Turkey and her trade partners. Therefore, the inferences depend on this analysis only reflects overall trends. However, the impacts of the RTAs may be different in each industry or industry groups according to scope and depth of the agreements. Hence, a further analysis based on industry-specific trade data which enables analysis in sector level can be conducted to understand how trade in different industries are affected by the RTAs.

APPENDIX

Table 9

List of Countries Covered in the Data Set

Albania	Equator	Kirghizstan
Algeria	Equatorial Guinea	Kuwait
Angola	Estonia	Latvia
Argentina	Ethiopia	Lebanon
Australia	Finland	Liberia
Austria	France	Libya
Azerbaijan	Gabon	Lithuanian
Bahrain	Gambia	Macedonia
Bangladesh	Georgia	Madagascar
Belarus	Germany	Malaysia
Belgium-Luxembourg	Ghana	Malta
Benin	Greece	Marshall Islands
Bosnia and Herzegovina	Guatemala	Mauritania
Brazil	Guinea	Mauritius
Bulgaria	Haiti	Mexico
Cameroon	Hong Kong	Moldova
Canada	Hungary	Mongolia
Chile	Iceland	Morocco
China	India	Mozambique
Colombia	Indonesia	Netherlands
Congo	Iran	New Zealand
Costa Rica	Iraq	Niger
Croatia	Ireland	Nigeria
Czech Republic	Israel	Norway
Democratic Republic of Congo	Italy	Oman
Denmark	Ivory Coast	Pakistan
Djibouti	Japan	Panama
Dominican Republic	Jordan	Paraguay
Egypt	Kazakhstan	Peru
England	Kenya	Philippines
Poland	South Africa	Trinidad and Tobago
Portugal	South Cyprus	Tunis

Table 9 cont'd: List of Countries Covered in the Data Set

Qatar	South Korea	Turkmenistan
Rumania	Spain	Uganda
Russian Federation	Sri Lanka	Ukraine
Saudi Arabia	Sudan	United Arab Emirates
Senegal	Sweden	United States of America
Serbia-Montenegro-Kosovo	Switzerland	Uruguay
Sierra Leone	Tajikistan	Uzbekistan
Singapore	Tanzania	Venezuela
Slovakia	Thailand	Vietnam
Slovenia	Togo	Yemen

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Özet

Bölgesel ticaret anlaşmaları Türkiye'nin dış ticaretini artırıyor mu?

Çıkmaza giren Dünya Ticaret Örgütü Doha ticaret müzakerelerinin sonrasında, gümrük birliği (GB) ve serbest ticaret anlaşmaları (STA) dış ticarette daha da önem kazanmıştır. Bu çalışmanın amacı, Türkiye'nin dış ticaretinde bölgesel ticaret anlaşmalarının (BTA) rolünü analiz etmektir. BTA'ların Türkiye'nin dış ticaretine etkileri Anderson ve van Wincoop (2003) çalışmasına göre oluşturulan çekim modeli çerçevesinde incelenmektedir. Çalışma 1992-2013 döneminde Türkiye'nin ticaret ortağı olduğu 126 ülkeye ait ticaret verilerini kapsamaktadır. Ampirik bulgular GB'nin Türkiye'nin ihracatını etkilemediğini ancak ithalatını artırdığını göstermektedir. Ayrıca, STA'ların Türkiye'nin hem ihracatı hem de ithalatı üzerinde bir etkisi bulunamamıştır.

Anahtar kelimeler: Çekim modeli, gümrük birliği, serbest ticaret anlaşmaları, dış ticaret, Türkiye.

JEL kodları: F14, F15, C23.