The Effect of the European Union Customs Union on the Balance of Trade in Turkey

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Abstract

This paper investigates the effect of the customs union between Turkey and the European Union on the balance of trade in Turkey. The framework for analysis is an extended trade gravity model onto which the impact of the customs union is applied. The gravity model of trade is estimated using dynamic panel data which applies the Generalized Method of Moments to a sample of OECD countries. Separate estimates were made for the periods before and after the process of trade liberalization in Turkey – 1980-1995 and 1996-2012, respectively – as well as for the full period – 1980-2012. The main conclusion is that when the European Union is accounted for as an econometric variable, the empirical results are striking: Turkey's gains resulting from taking part in the customs union are noteworthy, with significant improvement in the trade balance with European Union countries. However, the trade flows, and specifically imports, have been mainly with OECD countries that are themselves not members of the EU. The model indicates that external common tariffs are responsible for Turkey's trade growth rather than tariffs abolished in the internal market of the customs union.

JEL: F13; F14; F15

Key Words: Gravity model; GMM; Customs Union; European Union; OECD countries, Turkey.

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1. Introduction

The customs union (CU) between Turkey and the European Union (EU) came into effect on December 31st, 1995. Since then, the EU has become Turkey's largest import/export partner.[2] Turkey is also party to 17 Free Trade Agreements (FTA), but by market size, the customs union with the EU is larger than all of them. As economies have become increasingly globalized, trade liberalization has become popular government policy, the impact of which is not always as expected. Many studies are thus devoted to investigating the implications of trade liberalization for domestic and global trade flow. The methods of measurement vary: some studies consider the episode from the point in time when restrictions are reduced for a wide range of sectors up until the time when significant change levels off (Li, 2003; Wu and Zeng, 2008). Other studies apply dummy variables to indicate the year when trade liberalization was undertaken in a given country (Santos-Paulino and Thirlwall, 2004; Pacheco-Lopez and Thirlwall, 2007).

The count of FTAs is steadily increasing because they are deemed effective for opening foreign markets to domestic exports, as well as a way to take advantage of cheap imports. Correspondingly, the number of studies that consider FTAs as dummy variables in order to investigate their effects on trade flow has also increased (Frankel, 1997; Ghosh and Yamarik, 2004; Baier and Bergstand, 2007; Roy, 2010). The most popular approach in the literature is to apply a gravity model (Frankel et al., 1995; Frankel, 1997; Carrere, 2006; Baier and Bergstrand, 2007; Martinez-Zarzoso et al., 2009; Dai et al., 2014), and the first attempt to evaluate the effects of FTAs on trade using the gravity equation was made by Timbergen in 1962. He postulated a significant, positive effect of the FTA among trade partners in the British Commonwealth, but an insignificant effect among members of the Benelux FTA. Since then, the gravity equation has been widely applied to this question, and while the political expectation is always for a positive impact, empirical studies often suggest mixed results.

Frankel, et al. (1995) examined the impact of FTAs grouped by regions, such as East Asia, the European Community (EC) and North America. They found that in 1990, members of Mercosur were trading with one another at eight times the rate of comparable, neighbouring countries elsewhere in the world. While the effect of EFTA membership was found insignificant, countries of the European Community were claimed to trade three times more than if they had not signed onto the agreement. The authors also found that the East

[2] European Commission.

Asian FTA had been significant, but the effect was decreasing over time. Frankel (1997) examined Mercosur, the Andean Pact and the EC and found a significant, positive effect of Mercosur on members' trade, a significant, negative effect in the case of the EC and an insignificant effect in the case of the Andean Pact. Baier and Bergstrand (2007) examined 96 countries in a regression aimed at answering the question of whether FTAs actually increase the international trade of their parties. Using panel data of unbiased estimates of average treatment effects, the authors found a positive effect and suggested that on average, an FTA will increase two member countries' trade by 100% over 10 years.

Due to their relative complexity, the number of CUs is significantly lower than FTAs, a fact that is further reflected in the lower number of studies investigating the effects of CUs. Some studies have been theoretically and empirically devoted to a comparison of the relative effect on trade of FTAs vis-à-vis CUs (Krueger, 1997; Clausing, 2000; Fiorentino et al. 2007; Park and Park, 2009; Roy, 2010; Facchini et al., 2013). Roy (2010), for example, found that a CU accounted for higher increases in trade because it specifically encouraged bilateral trade among members more so than FTAs.

Turkey is the member of the EU customs union and, as noted above, 17 FTAs (see Table 1). However, most of the FTAs are relatively new; it is too early for an empirical investigation into their effects. Most studies on Turkey's trade liberalisation and its impact on trade have therefore concerned its membership in the customs union (Togan, 2000; Lejour and Mooij, 2005; Neyapti et al., 2007; Nowak-Lehman et al., 2007; Adam and Moutos, 2008; Akkemik, 2011; Demirci and Aydin, 2011). Neyapti et al. (2007) employed an unbalanced panel of 150 countries and controlled for the effects of the real exchange rate and income levels. The authors found that the customs union significantly increased Turkish trade, while the elasticity of income from exports and imports was lower for the period after the CU came into effect. At the same time, they discovered that the effects on the real exchange rate in exports from Turkey to EU countries was stronger, suggesting that an overvalued Turkish currency was having a destabilizing effect on trade with the EU. Nowak-Lehman et al. (2007) employed an extended gravity model to evaluate the impact of the CU on Turkey's exports at a sectoral level. Adam and Moutos (2008) found that the CU has had an asymmetric effect on trade between Turkey and the EU-15. Lejour and Mooij (2005) suggested that the CU grants Turkey only a limited access to the EUs internal markets, artificially limiting the apparent effects of the liberalization of trade. Demirci and Aydin (2011) simulated the effects of common external tariffs on trade in Turkey with a computable general equilibrium model. The authors calculated likely gains for Turkey that come about due to Turkey's own

reductions of tariffs on EU imports, as well as due to increased allocative and endowment efficiencies.

This paper investigates the effect of the CU on the balance of trade in Turkey, applying a panel sample of OECD countries and quarterly data from 1980 to 2012. Estimates are made for 3 periods: The first, from 1980-1995, is the period before Turkey joined the European Union CU. The second, from 1996-2012, is the period of CU activity. And the last is the full 32 years, covering both the pre- and post-liberalization periods. Estimates are made using data on bilateral trade flow between Turkey and its partners from the OECD sample. The independent variables include the real exchange rate, partners' incomes and Turkey's own income. The EU dummy variable is used to detect if a country from the OECD sample belongs to the EU. A value of 1 is given to countries belonging to the EU at the start of the corresponding period,[3] and a value of 0 is assigned to those not belonging to the EU. Data were extracted from the official statistical site of the OECD and the Turkish Statistical Institute.

The novelty of this study is the dynamic panel data approach, which distinguishes it from typical static study designs. The remainder of the paper is organized as follows: The second section presents the gravity model applied in this study. Section three presents the applied methodological approach. In the fourth section, the empirical results are reported.

2. The gravity model

The gravity model has been widely employed in international trade analyses for decades since Tinbergen first demonstrated its value in 1962. In addition, he was first to examine the effects of FTAs on international trade flow. A simple panel version of the gravity model has been proposed by recent studies such as Glick and Rose (2002), Cheng and Wall (2005) and Bussiere et al. (2008), which can be expressed as follows:

$$T_{ijt} = \alpha_{ij} + \beta_1 Y_{it} + \beta_2 Y_{jt} + \theta_t + \varepsilon_{ijt} \quad (1)$$

where T_{ijt} represents bilateral trade flows between country i and j at time t; Y_{it} and Y_{jt} correspond to the GDP of the partner and home countries, respectively, α_{ij} stands for time-invariant variables such as distance or geographical position, and θ_t represents dummy variables such as a common language, a common border, cultural belonging and others. This study applies the simple version of the gravity model and uses an output suggested by the

[3] Members of the European Union and the dates of their entrance into the union are given in Table 2.

model itself as the benchmark explanatory variable. Since the study is narrowly focused on the effects of trade liberalization in Turkey's trade with OECD countries, the model has not been extended by dummy variables such as population, income per capita, geographical distance, or a cultural similarity.

3. Methodology

3.1.Unit root tests

Several tests for the panel unit root have been undertaken in this study. These are the Levin, Lin and Chu (LLC) test (Levin et al., 2002), the Im, Pesaran and Shin (IPS) test (Im et al., 2003), the Fisher-type ADF and PP tests (Maddala and Wu, 1999 and Choi, 2001) and the Hadri (Hadri, 2000) test. The LLC test is based on orthogonalized residuals and on a correction by the ratio of the long-run to the short-run variance of each variable. Although the LLC test has become a widely accepted panel unit root test, it has a homogeneity restriction, allowing for heterogeneity only in the constant term of the ADF regression. The IPS test, which was proposed by Im et al. (2003) to resolve the homogeneity issue, is a heterogeneous panel unit root test based on individual ADF tests. It allows for heterogeneity in both the constant and slope terms of the ADF regression. Maddala and Wu (1999) and Choi (2001) proposed an alternative approach using the Fisher test, which combines the P-values from individual unit root test statistics such as ADF and PP. One of the advantages of the Fisher test is that it does not require a balanced panel. Finally, the Hadri test is a heterogeneous panel unit root test that extends the KPSS (Kwiatkowski–Phillips–Schmidt–Shin) test (Kwiatkowski et al., 1992) to a panel with individual and time effects and deterministic trends, which has as its null hypothesis the stationarity of the series.

3.2. GMM

This study employs the GMM (Generalized Method of Moments) for a dynamic analysis of the impact of the CU on trade flows between Turkey and OECD countries. The GMM method was applied because trade flows are postulated to be dynamic rather than static in nature and affected by lagged bilateral trade dynamics. To illustrate, a company that has been exporting products to a partner country will continue the cooperation and introduce new distribution and service networks, which is more efficient than the plight of a new company, for which start-up costs will increase the price of its products (Pllaha 2012). Another reason for the dynamism of trade flows may be explained by "habit formation," a thesis argued by several authors (Eichengreen and Irwin 1997; Bun and Klaassen 2002). Customers become accustomed to a

specific imported product if they have been purchasing it for several years, and such consumer behaviour has an impact on future trade flows. Finally, trade cooperation between partner countries – such as Free Trade Agreements – of course have a significant impact on future trade flows (Krugman, 1993; Baldwin, 1996).

This study estimates equation (1) for bilateral flows of trade in Turkey, for exports and imports separately, and for Turkey's bilateral trade balance with a focus on the impact of FTAs. In the GMM, the framework equation (1) takes the following forms corresponding to the aforementioned periods:

$$\log(X_{ijt}) = a_0 + a_1 \log(X_{ijt-1}) + a_2 \log(Y_{it}) + a_3 \log(Y_{jt}) + a_4 \log(RER_{ijt}) + a_5 EU_{ijt} + \varepsilon_{ijt} \quad (2),$$

$$\log(M_{ijt}) = \beta_0 + \beta_1 \log(M_{ijt-1}) + \beta_2 \log(Y_{it}) + \beta_3 \log(Y_{jt}) + \beta_4 \log(RER_{ijt}) + \beta_5 EU_{ijt} + u_{ijt} \quad (3)$$

and

$$\log(TB_{ijt}) = \delta_0 + \delta_1 \log(TB_{ijt-1}) + \delta_2 \log(Y_{it}) + \delta_3 \log(Y_{jt}) + \delta_4 \log(RER_{ijt}) + \delta_5 EU_{ijt} + \epsilon_{ijt} \quad (4)$$

where X_{ijt}, M_{ijt} and TB_{ijt} are the dependent variables of equations 2, 3, and 4 respectively. X_{ijt} is the value of export from Turkey, i, to its trade partner, j, in a given period t; M_{ijt} is the value of import to Turkey, i, from its trade partner, j, in a given period, t; and TB_{ijt} is the value of Turkey's trade balance, i, with its trade partner, j, in a given period, t. The value of the trade balance is defined as the ratio of Turkey's exports to imports for a trade partner. The following variables are independent: X_{ijt-1}, M_{ijt-1} and TB_{ijt-1} are the lagged dependent variables that used as explanatory variables; Y_{it} is the domestic output, i, during a given period; Y_{jt} is the output of Turkey's trade partner, j, during a given period, t. RER_{ijt} is the real exchange rate, which is calculated by the following formula: $(P_{jt}xe_t)/P_t$, where P_{jt} is the price level in the jth trade partner; e_t is the nominal bilateral exchange rate represented in Turkish Lira per foreign currency during a given period, t; and P_t is the domestic price level during the same period. Finally, EU is the dummy variable representing European Union status: if a trade partner is a member of the EU, then a value of 1 is assigned, or otherwise a value of 0. The values of the dummy variable are assigned considering the dates of entry into the EU (Table 2). All variables except the dummy variable are expressed in the natural logarithm.

Higher domestic income, Y_{it}, encourages consumers to increase their spending on goods, including imported goods, therefore negatively affecting the trade balance of the country. The effect of higher domestic income on exports is unpredictable because foreign

income must be assumed to be constant. Thus β_2 is expected to be positive, while δ_2 is expected to be negative. Similarly, higher foreign income, Y_{jt}, increases the exports of the domestic country and positively affects its trade balance, but its effect on domestic imports is indeterminant. Therefore α_3 and δ_3 are expected to be positive. Depreciation of domestic currency – i.e., an increase in the real exchange rate – is expected to increase exports and decrease imports, positively affecting the domestic trade balance. Thus, α_4 and δ_4 are expected to be positive, as well, while β_4 is expected to be negative. Finally, while trade liberalization is expected to have positive effects on imports and exports, the effect on the trade balance is not defined by theory nor made clear in empirical analyses (Santos-Paulino and Thirlwall, 2004).

4. Empirical results

4.1. Unit root tests

GMM estimations require stationary data, and so it is necessary to investigate the integration order of the panel series. Five alternate unit root tests, consisting of the LLC, IPS, ADF, PP and Hadri tests, were employed. The LLC test has a null hypothesis of the common unit root process presence; the IPS, ADF and PP tests each test for the presence of individual unit root process in series; and the Hadri test's hypothesis has no unit root in the common unit root process. The results of the unit root tests are presented in Table 3. With the exception the TB series, all of the remaining series – Export, Import, RER, Y_f and Y_{tur} – demonstrated the presence of the unit root in levels and no unit root process in their first differences. The TB series was found to be stationary in level and in the first difference. The LLC test rejected the hypothesis of the unit root presence in the levels of all series except Y_{tur}. The IPS test rejected the presence of the individual unit root process in the RER and TB series. However, Banerjee et al. (2004, 2005) illustrated in their studies that if common sources of non-stationarity exist, tests such as the LLC and IPS tend to over-reject the null hypothesis of non-stationarity in series. The LLC test is based on pooled regressions and therefore may not perform well compared to other tests in cases where there is no need for pooling in series. Im et al. (2003) demonstrated that the LLC test tends to over-reject the null hypothesis in the case of models with serially correlated errors, and Breitung (2000) demonstrated that if individual specific trends are included in pooled series, the LLC and IPS tests are less robust. Therefore, based on the results of the alternate unit root tests, it may be safely concluded that all the series with the exception of the TB series are generated by a non-stationary, stochastic process. In further estimations, first differences were used for non-stationary variables.

4.2 GMM estimations

The results of GMM estimates for export, import and trade balance series for the period 1980-1995, 1996-2012 and 1980-2012 are presented in Tables 4, 5 and 6, respectively. All models pass the Sargan test, the *p* values of which are provided beneath the estimation results. Moreover, all estimated variables are statistically important at a 5% level of significance.

As indicated in Table 4, which presents estimations of the CU's effects on Turkey's exports, imports and trade balance for the period from 1980-1995, if the first lagged dependent variable is included in the model, it has highly significant, positive coefficient intercept. This shows that trade flows in one quarter have a significant, positive effect on trade flows in the immediate, subsequent quarter. The effect is significantly higher in the flow of exports as compared with the flow of imports. The real exchange rate has the expected effects in all cases: depreciation of the domestic currency leads to an increase in exports and improves the balance of trade. At the same time, it makes foreign goods relatively more expensive, leading to a decrease in imports. The real exchange rate also has a more significant effect on the flow of exports vis-à-vis imports. Counter to expectation, estimations of the effect of foreign output, Y_f, on exports and the trade balance are not positive. Higher foreign income brought about a significant decrease in Turkish exports. As the income of Turkey's trade partners from OECD countries increases, they imported less from Turkey in favor of other trading partners. Together with the positive effect on imports, the negative effect of foreign income growth on exports has led to a deterioration of Turkey's balance of trade. Estimations indicate that domestic income was positively correlated to trade flow. But while it was predicted that higher domestic income would have an adverse effect on the trade balance due to an increase in spending on imported goods, the estimations suggest that the positive effects of increased domestic income on exports outweigh the negative, and the trade balance actually improved. The EU dummy variable indicates whether or not a country from the OECD sample belonged to the EU. Keeping in mind that the CU agreement between Turkey and the European Union came into effect on December 31st, 1995, and the data from Table 4 present estimations prior to this, the EU dummy suggests a negative effect on Turkish exports. That is, export levels from Turkey to countries that belong to the EU are lower than to other countries in the OECD sample. Conversely, Turkish imports were higher from EU countries. Both facts are unfavorable for the trade balance.

Table 5 presents results of GMM estimations for the period from 1996-2012, after trade was liberalized. Again, all variables are highly significant. Lagged dependent variables have a significant, positive effect on subsequent quarter trade flows in all the models considered: exports, imports and the trade balance. As expected, the real exchange rate after trade liberalization continued to have a positive effect on exports. Depreciation of the domestic currency also continued to increase Turkish exports, but the correlation was stronger in the period before the CU with the EU came into play. This may be explained by the higher value placed on contractual obligations: the volume of trade became relatively less flexible vis-à-vis the real exchange rate. In contrast with the period before trade liberalization, estimates of the real exchange rate suggest a substantial, positive effect on imports, despite the fact that depreciation of the Lira makes foreign products more expensive. Again, this may be explained by an increase in the force of contractual agreements after liberalization, whereby the real exchange rate increases the value of imports, but does not affect the volume. Consequently, the trade balance deteriorates as a result of depreciation. For much of its history, Turkey's trade policies were based on import substitution and protectionism. Only in the early 1980s did Turkey begin to promote exports. In order to be competitive on the international market after the liberalization of trade, Turkey began exporting goods containing a high proportion of imported inputs. Thus, the share of exports in Turkey's GDP increased from 4.2% in 1980 to 20.3% in 2005, while share of imports increased from 11.4% to 32.2% (Akkemik, 2012). Due to the fact that the new exports contain such a high degree of imported material, the real exchange rate has had a negative effect on the trade balance overall. Therefore, the correction of trade imbalances and the exchange rate becomes more difficult to untangle (Gros and Selçuki, 2013).

After Turkey became party to the CU with the European Union, the effect of foreign income on Turkish trade flows with OECD countries changed. Higher income among Turkish trade partners now leads to a significant increase in Turkish exports, which notably increases the trade balance. The elasticity of income levels of exports and imports are found to be lower compared with the pre-liberalization period, a finding in line with Neyapti et al. (2007). The effect of Turkey's domestic income levels on trade flow also changed after the liberalization of trade. Increases in domestic income lead to increases in both imports and exports, but in comparison with the pre-liberalization period, the responsiveness of imports increases and the responsiveness of exports decreases. Thus, Turkey's trade balance is adversely affected by increases in domestic income. The EU dummy has a negative effect on Turkey's exports and

imports, which means that Turkey continues to have lower trade flows with countries that belong to the EU compared with other countries in the OECD. However, the EU dummy variable's high negative effect on imports is a boon for the trade balance, and the evidence suggests that liberalization has effected an overall improvement in the balance of trade.

Table 6 presents estimation results for the full thirty-two years, including both the pre- and post-liberalization periods. All variables are significant. The effects of the estimation results for the full period correspond to those of the liberalization period. Trade flows have significant, positive effects from one quarter to the next, just as they did when the pre- and post-liberalization periods were considered separately. Over the full period, the effects of the real exchange rate were as expected. Depreciation of domestic currency makes domestic goods relatively cheaper and foreign goods relatively more expensive; therefore, exports increase and imports decrease, leading to an improvement in the trade balance. Even though the direction of the real exchange rate effects was as expected, the sensitivity of export and import changes was very low, while trade balance responsiveness to domestic currency depreciation proved elastic. The estimations of trade flow for the full period reflected a similar level of responsiveness to the real exchange rate to the pre-liberalization period. Trade flows for the period after Turkey became member of the custom union behaved differently. After Turkey's market liberalization, depreciation of the domestic currency still positively affects exports, but does not negatively affect imports, even though depreciation makes foreign goods more expensive. On the contrary, the effect is positive and elastic. This is indicative of Turkey's dependence on imports after trade liberalization.

The As in the case of the pre-liberalization estimations, the direction of the effects of foreign output, Y_f, on export and the trade balance was not positive, contrary to expectation. Higher foreign incomes prompted significant decreases in Turkish exports and a deterioration of the trade balance. When OECD trade partners experienced increases in income, they favored import partners other than Turkey, but this result is a holdover of the pre-liberalization period. Entrance into the CU turned this trend around, and Turkey's exports and the trade balance improve when foreign partners experience increases in income (Table 5). Over the full period, there is positive effect of domestic income on trade flow. Similar to the pre-liberalization period, the effect of increased domestic income on exports is significantly higher than on imports, which leads to an improvement of the balance of trade. But pre-liberalization estimations indicate a higher sensitivity of imports to increases in domestic income when compared with exports, which conversely leads to deterioration of the trade

balance (Table 5). Full period estimations show that trade with EU members has an adverse effect on the Turkish trade balance: exports are lower and imports are higher with EU members compared with other OECD countries. These results are similar to those of the pre-liberalization period. Results of the post-liberalization period indicated lower exports with EU members, but even lower imports, resulting in an improved trade balance with EU members after Turkey became a member of the CU.

Estimations of trade flow in Turkey for the three different periods show that to considered only the expanded period will lead to spurious results and incorrect conclusions. Considering the periods in isolation, the study found evidence for unique characteristics in the post-liberalization period that are not evident in the estimations for the full period. In the post-liberalization period, depreciation of the domestic currency does not decrease imports, as observed in the pre-liberalization period. With CU activity, the high dependence of Turkey on imported inputs materials cause the trade balance to deteriorate. Before the CU came into play, Turkish exports were negatively affected by increase in foreign income. Increases in the income the OECD countries led them away from Turkish exports, but after liberalization, this trend reversed in favor of Turkish products.

Trade flows were positively affected by changes in domestic income both before and after trade liberalization. However, the elasticity of the relative effects for imports and exports in the different periods differed: before trade liberalization, the elasticity of change for exports was significantly higher compared with the elasticity of change for imports. As a result, Turkey's trade balance before trade liberalization improved when domestic income increased, a tendency also evident in the analysis of the full period. Estimations for just the CU period demonstrate that the opposite is occurring: the elasticity of change for imports is higher compared with the elasticity of change for exports, which adversely affects the trade balance.

The expected effect of a CU is to increase trade flow among members. As trade flows are diverted to new partners as the result of each, new customs union, repercussions for global trade flows follow. The CU with the EU, however, provided Turkey with the opportunity to create a more liberal trade regime overall, due to lower levels of common customs tariffs (Togan, 2012). The post-liberalization period has been characterized by lower imports from customs union members compared with non-member states, which has led to an improvement in Turkey's trade balance with member states, in turn. Estimations for the post-liberalization period support the hypothesis that the custom union has a creative effect on trade, whereby

Turkey has managed not to decrease imports from non-member states, indeed has increased them while at the same time enjoying lower prices on imports from accustomed suppliers.

5. Conclusion

This study examines the effects of membership in the European Union CU on trade flows and the balance of trade in Turkey. A panel sample of OECD countries has been employed using quarterly data for the period from 1980-2012. To measure effects on trade flows, a gravity model has been adopted. Because international trade flows are affected by lagged bilateral flows, trade flows are assumed to be dynamic rather than static in nature, and the study employs the GMM method to account for such dynamics in the gravity model for trade. Three different periods were estimated: 1980-1995, which is the period before Turkey entered the CU; 1996-2012, which is the period of CU activity; and the full period from 1980-2012, which includes both the pre- and post-trade liberalization phases. The evidence points to a trade balance improvement in the pre-liberalization period that resulted from the depreciation of domestic currency, but the post-liberalization epoch was characterized by a deteriorating balance of Turkish trade as a consequence of domestic currency depreciation. After Turkey entered the CU, imports became more responsive to changes in the exchange rate as currency depreciation reversed the demand for imported in favor of domestic goods. However, after the liberalization of trade in Turkey, currency depreciation significantly raised the overall rate of imports due to export-oriented policies and a high dependence on imported inputs. During the time of CU activity, increases in foreign income have been associated with higher levels of export activity from Turkey, which has improved the country's balance of trade. In contrast, before trade liberalization foreign income was negatively correlated to Turkish exports and resulted in the deterioration of the trade balance. The abolition of tariffs among CU members and a decrease in external tariffs have significantly increased the attractiveness of Turkish products.

There are no changes in the relationship between domestic income and trade flows before and after trade liberalization. Imports and exports are both positively related to domestic income. However, because the responsiveness level has changed, the effect of an increase in domestic income on the balance of trade has changed as well. Responsiveness of imports to changes in domestic income increased significantly. Export responsiveness decreased, causing the balance of trade to deteriorate after trade liberalization. Finally, the results demonstrate that the CU improved Turkey's trade balance with the EU countries, but that the improvement was marked by lower rates of import from EU countries compared to

other countries in the OECD sample. Turkey gained from being a member of the European Union CU, but the gains were related to trade flows with non-EU OECD countries with whom Turkey's trade balance actually deteriorated, even as it improved with EU countries. The limited effect of the CU on trade with EU countries is explained by limited access of Turkey to the EU's internal market (Lejour and Mooij, 2005). Therefore, the lower external tariffs of the CU have had a more significant effect on Turkey than the abolished tariffs of the CU's internal market.

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Table 1. FTAs of Turkey currently in force.

Country	*Start date*	*Country*	*Start date*
Albania	01.05.2008	Mauritius	01.06.2013
Bosnia-Herzegovina	01.07.2003	Montenegro	01.03.2010
Chile	01.03.2011	Morocco	01.06.2006
EFTA	01.04.1992	Palestine	01.06.2005
Egypt	01.03.2007	Republic of Korea	01.05.2013
Georgia	01.11.2008	Serbia	01.09.2010
Israel	01.05.1997	Syria	01.07.2007
Jordan	01.03.2011	Tunisia	01.07.2005
Macedonia	01.09.2000		

Source: Official website of Republic of Turkey Ministry of Economy.

Table 2. Entrance dates into the EU.

Country	*Year of Entry*	*Country*	*Year of Entry*
Austria	1995	Latvia	2004
Belgium	1952	Lithuania	2004
Bulgaria	2007	Luxemburg	1952
Cyprus	2004	Malta	2004
Czech Republic	2004	Netherland	1952
Denmark	1973	Poland	2004
Estonia	2004	Portugal	1986
Finland	1995	Romania	2007
France	1952	Slovakia	2004
Germany	1952	Slovenia	2004
Greece	1981	Spain	1986
Hungary	2004	Sweden	1995
Ireland	1973	UK	1973
Italy	1952		

Source: Official site of the European Union.

Table 3. Panel unit root tests.

	LLC[a]		**IPS**[b]		**ADF**[b]		**PP**[b]		**Hadri**[c]	
	Level	*Δ*	*Level*	*Δ*	*Level*	*Δ*	*Level*	*Δ*	*Level*	*Δ*
X	-4.83*	-	0.99	-	47.02	1465.04*	62.97	1454.03*	31.17*	1.75
	I(0)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)
M	-3.19*	-	0.82	-	58.59	1361.56*	87.40(0.04)	1693.77*	28.46*	-0.85
	I(0)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)
TB	-8.96*	-	-9.99*	-	263.53*	1475.43*	344.46*	1522.97*	14.63*	0.04
	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(0)
RER	-3.56*	-	-1.98*	-	87.79*	1148.73*	76.33	1313.94*	21.89*	-1.74
	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)	I(0)
Y	-9.53*	-	-2.89	-	116.01	799.11*	119.18	864.43*	33.14*	8.13*
	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
Ytur	2.29	-	8.56	-	5.34	1005.41*	6.54	1005.41*	34.39*	-4.17
	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)

Notes: Estimations are made with the inclusion of constant and trend and with 1 specified lag: With the increase of lag, the length of the power of tests increases in favour of the unit root presence in level estimations.
* denotes significance at a 5% significance level
a. tests the hypothesis of the presence of the common unit root process
b. tests the hypothesis of the presence of the individual unit root process
c. tests the hypothesis of no unit root in the common unit root process

Table 4. GMM Estimations, 1980-1995.

	Exports	**Imports**	**Trade Balance**
X(-1)	0.372* (0.012)	0.039* (0.004)	0.241* (0.012)
Rer	0.891* (0.255)	-1.709* (0.453)	1.069* (0.403)
Y_f	-5.238* (0.255)	2.793* (0.329)	-3.562* (0.376)
Y_{tur}	5.090* (0.188)	1.237* (0.369)	1.527* (0.249)
EU	-2.209* (0.371)	0.509* (0.216)	-1.747* (0.534)
Number of instruments	*9*	*10*	*10*
Sargan test	*0.261*	*0.225*	*0.263*

* Indicates significance level at 5%. Standard errors for the coefficient estimates are given in parenthesis. Sargan *p* values are reported.

Table 5. GMM Estimations, 1996-2012.

	Exports	**Imports**	**Trade Balance**
X(-1)	0.215* (0.005)	0.051* (0.013)	0.166* (0.007)
Rer	0.227* (0.037)	1.605* (0.125)	-1.409* (0.163)
Yf	1.502* (0.095)	0.577* (0.123)	2.011* (0.159)
Ytur	2.258* (0.059)	3.012* (0.104)	-1.061* (0.097)
EU	-0.562* (0.052)	-0.870* (0.114)	0.597* (0.191)
Number of instruments	*11*	*12*	*12*
Sargan test	*0.289*	*0.257*	*0.279*

* Indicates significance at 5% level. Standard errors for the coefficient estimates are given in parenthesis. Sargan *p* values are reported.

Table 6. GMM Estimations, 1980-2012.

	Exports	**Imports**	**Trade Balance**
X(-1)	0.296* (0.005)	0.093* (0.006)	0.352* (0.012)
Rer	0.166* (0.066)	-0.376* (0.072)	1.728* (0.231)
Yf	-1.202* (0.093)	0.616* (0.311)	-2.175* (0.219)
Ytur	2.923* (0.134)	1.915* (0.253)	2.413* (0.231)
EU	-0.963* (0.167)	0.328* (0.128)	-3.427* (0.424)
Number of instruments	*9*	*10*	*9*
Sargan test	*0.299*	*0.267*	*0.265*

* Indicates significance at 5% level, Standard errors for the coefficient estimates are given in parenthesis. Sargan *p* values are reported.