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THE FUTURE OF EU-TURKEY RELATIONS:
MAPPING DYNAMICS AND TESTING SCENARIOS

November 2017

FEUTURE Online Paper No.8

Understanding the EU-Turkey Sectoral Trade Flows During 1990-2016: a Trade Gravity Approach

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This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 692976.

ABSTRACT

This paper explores the determinants of bilateral trade flows between Turkey and the EU countries. A trade gravity model is used to analyze annual bilateral trade in general and in five different sectors of trade activity between Turkey, 15 EU countries and 5 non-EU countries during 1990-2016. The model is augmented with non-economic control variables that are relevant in determining the volume and direction of international trade. A dynamic panel GMM method is used for the estimation. The results reveal that the influence of the EU customs agreement on trade has been positive but moderate. The rise in trade volume is primarily driven by the increase in income levels in both Turkey and its trading partners, slightly affected by transport costs and only conditionally affected by average income levels depending on a number of country-level factors. As a whole, Turkey seem to have realized positive gains from trade with the EU, which provides evidence that the bilateral customs agreement has been effective in fostering trade integration and the deepening of the EU-Turkey trade relations. The results imply that policy reform must be committed to raising the trading partners' income growth in both absolute and relative terms; to encourage adjustments in Turkey's productive structures that will speed up alignment in economic development levels; and most importantly to consider the long-term unobservable influence of institutions that mitigate economic relations through their impact on consumer and producer preferences for European and Turkish products.

ÖZET

Bu çalışma Türkiye ve AB ülkeleri arasındaki karşılıklı ticaret akışının bileşenlerini araştırmaktadır. 1990-2015 yılları süresince Türkiye ile 15 AB ülkesi ve beş üye olmayan AB ülkesi arasındaki karşılıklı yıllık ticareti ve beş farklı sektördeki ticari faaliyetleri incelemek için ticari çekim modeli kullanılmıştır. Model, uluslararası ticaretin hacmini ve yönünü belirlemede bağlantılı olan ekonomi dışı kontrol değişkenleri ile genişletilmiştir. Hesaplama için sabit- etkili dinamik panel GMM yöntemi kullanılmıştır. Sonuçlar, AB gümrük anlaşmasının ticarete etkisinin olumlu ancak orta seviyede olduğunu ortaya koymuştur. Ticaret hacmindeki artış en çok, Türkiye'deki ve Türkiye'nin ticari ortaklarındaki gelir seviyesi artışı tarafından tetiklenmiş, taşımacılık maliyetlerinden az seviyede etkilenmiş ve yalnızca belli koşullarda bir kaç ülkesel faktöre bağlı olarak ortalama gelir seviyelerinden etkilenmiştir. Genel olarak Türkiye, AB ile olan ticaretten olumlu kazançlar elde etmiş görünmekte, bu da karşılıklı gümrük anlaşmasının ticari entegrasyonu geliştirmede etkili olduğuna ve AB-Türkiye ticari ilişkilerini derinleştirdiğine dair kanıt sağlamaktadır. Çalışmanın bulguları, birbiriyle ticaret yapan ortakların mutlak ve göreli gelir büyümesinin arttırılmasının, Türkiye'de iktisadi kalkınmayı hızlandıracak üretimsel yapılarda uyumun teşvik edilmesinin politika reformlarında üzerinde durulması gereken hususlar olduğuna ve ekonomik ilişkileri yavaşlatan kurumların uzun dönemli gözlemlenemeyen etkilerinin dikkate alınması gerektiğine işaret etmektedir.

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1. Introduction

The effect of belonging to a regional trade agreement (RTA hereafter) has been largely debated in the economic literature. New projects of commercial integration throughout the world are increasingly observed; improvements in information and communications technology, reductions in transport costs and the existence of economies of scale and scope have all contributed to the integration process and the further globalization of economic activity. The 29-member strong European Union (EU hereafter) has emerged as one of the most important commercial blocks supplemented by a common currency for 19 of its members. Since its creation in 1993, commercial links amongst the Member-States have been reinforced and new contacts with third countries have been established.

In parallel, there has been a notable increase in the number of studies analyzing the consequences of these integration processes. The gravity model, derived from Newton's equation, has been an important tool of analysis and has produced results of considerable precision. It has helped verify empirically certain patterns of trade specialization and explain why neighboring economies show closest trading links. Shorter distances, proximity, a common language, cultural patterns, and relatively similar stages of economic development account for much of the relative intensity of trade among neighbors. The integration process is observed not only among the EU Member-States but also between the EU and third countries, with which it has enacted trade-enhancing agreements. One such important trade agreement is that between the EU and Turkey.

This article analyzes the pattern of Turkey's sectoral trade flows with the EU based on OECD panel data during the period 1990 to 2016. The main contribution of the analysis includes, first, the application of the trade gravity model on a new data set covering a longer 27-year period; second, the analysis of trade flows both in aggregate and by sector using a different classification between intermediate goods, consumption goods, capital goods, mixed-end goods, miscellaneous goods; and, third, the use of a dynamic panel estimation methodology to produce unbiased estimates. To our knowledge, there is no other analysis available based on this sectoral classification, which is very useful for policy decisions. Further, non-economic qualitative country-level control variables are used to account for unobservable country effects and produce more robust estimates.

The empirical model used is an extended version of the gravity model. This study is also a contribution to the current discussion of whether Turkey should be granted full EU membership or a privileged partnership with the EU, which for Turkey would mean improved access to the EU market for its products, among other benefits. The analysis focuses specifically on the likely impact of deepening the customs union between Turkey and the EU and subsequently of having the common EU policy applied to Turkish trade flows. To this end, the impact of the 1996 EU-Turkey customs union covering most industrial goods and processed agricultural goods is evaluated in general and on a sectoral level.

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The results show a considerable and increasing diversification of Turkey's foreign trade between the EU and non-EU countries. They also show that the trade gravity model is a good predictor of bilateral trade between Turkey and its EU and non-EU trading partners. In particular, the levels of income in Turkey and its trading partners are robust drivers of bilateral trade flows. Distance is also a robust predictor of transport costs but with a low quantitative impact. Further, non-economic and qualitative control factors often turn out to be significant predictors of the volume of bilateral trade in general and in each of the five sectors considered. These factors mitigate the robustness of the gravity model variables and particularly that of the average income levels of the countries involved.

From a policy perspective, the results show that emphasis must be given to raising the trading partners' income growth both in absolute (growth) and relative (distribution) terms in the medium- to long-term; to encourage proper adjustments in Turkey's productive structures that will speed up alignment in economic development levels; and tentatively to consider the unobservable effects of social and legal institutions that mitigate economic relations on a long-term basis. It is conceivable that the course of institutional evolution and other path-dependent processes driven by political and other exogenous causes will affect, along cost/price factors, the formation of consumer and producer preferences in all partners, thereby affecting the composition of demand and hence the pattern of trade flows in the future. Such developments may be associated with a higher probability of emergence of scenario other than ongoing EU-Turkey integration, which may plausibly characterize the historically uneasy EU-Turkey relationship. However, policy could be counterfactual in this respect driven by pragmatism on both sides and a commitment to keep all parties on the existing trade integration path.

The rest of the article is organized as follows. Section 2 presents a brief overview of the history of the EU-Turkish trade relationship; Section 3 provides an analysis of the gravity model including the most important related literature; Section 4 outlines the data and model specification; Section 5 presents the empirical results and section 6 concludes the paper.

2. A brief history of EU-Turkish trade relations

In 1963, an Association Agreement was signed between the then European Economic Community (EEC) and Turkey to create a Customs Union (CU) (Ankara Agreement). In November 1970, the EEC and Turkey signed an Additional Protocol that prescribed a timetable for the gradual abolition of tariffs and quotas on goods traded between the parties. In 1996, the EEC introduced the EU-Turkey Association Council Decision 1/95, which established the final phase of the CU and is currently in force. In 1999, Turkey was officially recognized as a candidate country and in October 2005, accession negotiations began.

Turkey did not qualify for EU accession during the EU eastern enlargement in 2004 even though promises of a CU and common market between the EU and Turkey had been made as long ago. Based on the recommendation of the European Commission (EC), in December 2004 the EU heads of state decided to initiate accession negotiations with Turkey, emphasizing that the

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country's chances for potential EU accession would depend rather on political factors (fulfilment of Copenhagen criteria) than on economic ones. This was stated in the EU Commissioner of Enlargement Günter Verheugen's Progress Report (see Presidency Conclusions of Brussels European Council 16–17 December 2004). Further, the European Council of 17 December 2004 decided to open negotiations with Turkey on 3 October 2005 conditional upon the enlargement of the customs union to include Cyprus.

By 2005, the EU and Turkey had already made substantial progress in integrating their economies regarding trade of goods. In January 1996 an incomplete CU between the EU-15 and Turkey was created, which allowed for the free circulation of industrial goods and processed agricultural products. Quotas were not allowed in the CU with the EU. Further, any voluntary restraint agreements (VRA) about trade in textiles were abolished. Turkey's commercial and competition policies would have to be harmonized with those of the EU and a level of intellectual property protection similar to that in the EU was agreed upon.

The CU with the EU-15 focused mainly on manufactured products and ignored agriculture or services. Exemptions applied for iron, steel, and their byproducts, whilst textile trade was controlled by the EU's antidumping policies. However, a commitment on the part of both the EU and Turkey was established to expand and strengthen the CU. It was conceived that agriculture would be included later through ongoing negotiations aiming at establishing a free trade area (FTA). Since then, Turkey and the EU have been moving to extend the CU into services and public procurement.

In preparing for EU accession, Turkey has concluded bilateral free trade agreements with the many EU countries that joined the 2004 enlargement (Ülgen & Zahariadis, 2004). However, based on statements by the then EU Commissioner for Enlargement, Günter Verheugen, and Germany's former Foreign Minister, Joschka Fischer, Turkey would be expected to enter the EU no earlier than 15 years from that time point onwards (Fischer, 2004).

The negotiations over the accession process opened up trade-related issues to be dealt with: first, in the context of the CU (market access, tariff, customs legislation, trade policy and related alignment) and, second, through bilateral trade agreements. Specifically, the EEC Decision 1/98 of the EU-Turkey Association Council focused, within the relevant economic chapters of the accession process (i.e. legislative alignment), on agricultural products and the FTA on coal and steel products, respectively.

Based on the EU Global Trade Negotiations website information, Turkey's principal exports to the EU are textiles and clothing, followed by agricultural products, iron, steel and machinery. Its largest trading partner worldwide has traditionally been Germany, followed by Italy. Turkey's agricultural sector is the largest among the OECD countries, accounting for about 17 per cent of GDP, 20 per cent of exports and 40 per cent of its labor force. Its agricultural production includes tobacco, cotton, grain, olives, sugar beets, pulses, citrus and livestock. More recently, cotton, fruit and vegetable production has increased considerably due to irrigation efforts and government support. The government has provided multiple incentives to promote exports, including output and input subsidies, tax credits, guarantees and insurance programs. With re-

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spect to primary production, Greece, Spain and Italy are important competitors of Turkey in edible vegetables (olives, pulses), fruit (citrus) and processed agricultural products. Greece has proved to be one of the most significant competitors of Turkey both in terms of agricultural and industrial products (ICAP, 2004). With respect to steel and iron, the main competition for Turkey comes from China, India, Russia, Ukraine, Brazil and Australia. Due to lower domestic scale of output, competition in those sectors was quite intense with non-EU countries. As regards textiles and clothing, Turkey has had to cope with the challenges following the expiration of quotas on textiles and clothing in 2005, which benefited non-EU low-cost producers, such as China, whose textile exports represent about a third of global trade in the sector. With respect to the production of machinery, mechanical appliances and vehicles, Turkey's principal competitors outside the EU are the Central and Eastern European countries (CEECs). Turkey also faces stiff competition from Poland in the trade of vehicles.

Based on the EU-Turkey Impact Assessment Unit Report (2015), twenty years later the framework of EU-Turkey bilateral trade relations has become outdated for it has been limited to industrial and certain processed agricultural products, and included some complementary legislative alignment and ad hoc preferential concessions on certain products. The Turkish strategy has been to link the advancement of bilateral trade relations to the accession process. Efforts to extend the scope of the bilateral framework into other sectors of activity failed. Over the last decade, Turkey's position has gradually evolved to further enhancement of bilateral trade relations, subject to EU and Turkish concerns relating to the impact of the current CU functioning on Turkey's position with respect to the FTAs concluded between the EU and third countries and to the absence of an efficient and operational dispute settlement mechanism.

A senior level working group was formed to explore the possibility to address these concerns. The working group recommended that the enhancement of the bilateral trade relations should cover other sectors (i.e. services, public procurement, and further liberalization in agricultural products) and modernize the CU Agreement.

Given the framework of free trade agreements between the EU and third countries and notably the EU-US TTIP negotiations, it is conceived that the modernization of the CU and the subsequent enhancement of the EU-Turkey bilateral trade relations will incentivize Turkey to make progress on its economic reforms, improve its competitiveness and acquire a better standing that will facilitate its integration in the TTIP.

The recommendation to enhance bilateral trade relations and to modernize the CU was already part of the 2014 Enlargement Strategy adopted on 8 October 2014, preparing the ground for pursuing this initiative now. This initiative is also connected to the expected Policy Communication on "Trade and Investment Strategy for Jobs and Growth" (2015/TRADE/008) that would provide an overall policy orientation, priorities and identify proposed initiatives.

To achieve the goal, several ad hoc assessments were carried out on the impact of the CU, focusing on the agreement's economic benefits. In April 2014, a further evaluation of the trade arrangements was carried out by the World Bank, which highlighted the rapid increase in the volume of trade over the recent years, the deeper economic integration between EU and Turkey

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and the emergence of the EU as the largest foreign direct investor in Turkey. The evaluation also stressed that the economic integration, while irreversible, has been limited and more trade opportunities need to be explored.

Based on EU accounts, Turkey is the sixth largest EU trading partner and accounts for nearly 4% of its total trade, with bilateral exchange reaching €120 billion. The EU has provided about 75% of FDI inflows to Turkey in mainly the greenfield and services sectors as well as capital injections to more than 16.000 companies in Turkey, some of which aiming at accessing third markets in the region and beyond.

The future EU-Turkey policy challenge requires the addressing of two main issues. First, the deepening of the ongoing economic integration process by enhancing, in line with current liberalization efforts between the EU and third countries, the trade relations to other sectors of economic activity. Second, the modernization of the current functioning of the CU by allowing Turkey to express its view, through wider consultation, on trade policy formulation regarding its legislative and technical alignment with EU rules on customs, external tariffs, the generalized system of preferences and preferential agreements. This will improve the functioning of the CU regarding the effectiveness of surveillance measures, external tariff changes, safeguard measures and other regulatory restrictions. Finally, the establishment of a dispute resolution mechanism is expected to improve the functioning of the CU.

These policy initiatives are envisaged to apply to the entire range of EU-Turkish trade relations, including private sector business (corporate entities, small and medium enterprises, agricultural producers, service providers, traders and intermediaries) and consumers. Turkish private and public institutions will be further encouraged to participate in interdependent institutional and administrative arrangements with the EU, such as those dealing with regulatory alignment, market access, and institutional cooperation.

More specifically, the further deepening of the EU-Turkey relations in a changing economic environment requires concrete policy steps properly sequenced (Erdil and Akçomak, 2016). Based on prevalent patterns of change, these must focus on the trading partners' income growth, both in absolute (output level) and relative terms (income distribution), as important medium- to long-term drivers of trade growth and integration; the role of adjustment in productive structures and capacity that underlie differences in economic development levels; and the role of institutions that mitigate bilateral economic relations on a long-term basis in a largely unobservable way and create some of the causes of uncertainty. This study shows that these factors are conditionally important for predicting trade flows and should be part of policy steps.

3. Trade integration and the gravity model

The study of regional economic integration has become especially important in recent years. From a methodological point of view, there are two alternative methods to estimating its impact on trade. First, ex-ante studies, based on models of partial or general equilibrium, study direct inference into country welfare and provide predictions of the impact of integration sub-

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ject to various assumptions. Second, ex-post studies make use of econometric techniques that permit the estimation of the real effects (not simulated) of the integration agreements. Among the second group of studies, the trade gravity model is widely acknowledged to be a useful tool for explaining international trade flows.

The theoretical foundations of the gravity model were introduced by Tinbergen (1962), Pöyhönen (1963) and Linnemann (1966). Subsequent theoretical and empirical work during the 1970s made them more refined and widely applied. Anderson (1979) made the first attempt to derive the gravity equation from a model that assumed product differentiation. His model was based on the use of Armington's (1972) assumption of specialization in the production of only one good in each nation. Bergstrand (1985, 1989) further explored the theoretical determination of bilateral trade flows based on the use of gravity equations associated with monopolistic competition assumptions and the trade prices in the equation. Helpman and Krugman (1985) introduced a differentiated product framework in the gravity model. Deardorff (1998) showed that the gravity equation could be justified by standard trade theories. More recently, Anderson and van Wincoop (2003) developed a gravity model based on the manipulation of the constant elasticity of substitution function. They used their model to solve the so-called "border puzzle." One of their main contributions was the inclusion of the multilateral resistance terms in the equation as a proxy for the existence of unobserved barriers to trade.

The different approaches to the trade gravity model have since been associated with various specifications and diversity in the results of the empirical applications of the standard model. A large number of studies have contributed to the functional and predictive improvement of the gravity equation. For instance, Mátyás (1997, 1998), Chen and Wall (2005), Breuss and Egger (1999), and Egger (2000) have introduced econometric specifications of the gravity equation that reduced misspecification bias and unobserved heterogeneity. Bergstrand (1985), Helpman (1987), Wei (1996), Soloaga and Winters (1999), Limao and Venables (1999), and Bougheas, Demetriades and Morgenroth (1999), among others, contributed to the refinement of the model's predictors and added new predictors relating to the infrastructure of a country and transport costs. Finally, Jimenez and Narbona (2010) introduced institutional predictors to the gravity equation used to analyze bilateral trade patterns.

Based on these developments, the generalized gravity model proposes that the volume of trade between pairs of countries is a function of their size and income, their population, their geographical distance, and a set of dummy variables that capture other quantitative or qualitative factors. In simpler specifications of the gravity model, bilateral trade flows are found to depend positively on the size of both economies and negatively on the distance between them. In more complex specifications, bilateral trade flows are found to depend in addition to other factors, such as the existence of a common language or colonial links, the proximity of countries, the volatility of the exchange rate, or the existence of monetary agreements, among others.

The impact of the EU-Turkey customs agreement on the Turkish economy is analyzed based on various methodologies. For instance, Mercenier and Yeldan (1997) use a computable general equilibrium model to analyze EU-Turkey trade in an intertemporal setting and observe that the

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removal of custom tariffs due to the CU Agreement could worsen the terms of trade for Turkey. However, they further argue that the removal of non-tariff barriers along with custom tariffs that will follow Turkey's accession to the EU will benefit its economy. Likewise, Harrison *et al.* (1997) used a computable general equilibrium model to quantify the impact of the CU between Turkey and the EU. They find low trade diversion costs due to the low average tariff rate on non-agricultural imports. They argue that improved access of third country markets, through reciprocal preferential EU access agreements, would result in larger gains from the CU. For Turkey, the latter are estimated to be about 1 to 1.5 percent of Turkish GDP. They also find that applying the value-added tax uniformly rather than raising its level to compensate for the tariff revenue loss, would increase the welfare gain from joining the EU. More recently, Neyapt *et al*. (2007) use a conjectural variables methodology to analyze EU-Turkey trade over the period 1980-2001 and conclude that the CU Agreement has been beneficial for Turkey. Aytug *et al*. (2015) used a nonparametric approach to analyze Turkey's performance after the CU Agreement and conclude that post-CU exports and GDP per capita have increased considerably. Focusing on trade competition, Ekmen-Özçelik and Erlat (2013) use extensive and intensive margins analysis to evaluate Turkey's export diversification relative to its main competitors in the EU-15 market. They find that a much larger portion of export growth is generally due to the intensive margin (rather than extensive margin) for Turkey and other countries. Ekmen-Özçelik and Erlat (2015) use the RCA index to evaluate Turkey's competitive position relative to its non-EU competitors in the EU-15 market from both static and dynamic perspectives. They find that the trading partners are more heterogeneous in terms of the variety of products in which they have comparative advantage, whilst they are more homogeneous in terms of the contribution of exports to their total export earnings. Lejour and de Mooij (2005) explore the economic implications of the potential Turkish accession to the EU and documented small but positive macroeconomic implications for EU countries and considerable and positive effects Turkey.

Further, several studies use the gravity model of trade to analyze the impact of the CU on Turkey's export performance. Antonucci and Manzocchi (2006) argue that, given the dynamics of the EU regarding the trade potential of EU enlargement as well as Turkey's near-accession dynamics, a trade gravity model is an appropriate methodology for studying the impact of the CU Agreement on Turkey's economy. They subsequently apply a gravity model to Turkey's trade flows during 1967–2001. They find that the gravity model provides a good fit of Turkey's trade patterns and, despite the 1963 Association Agreement as well as the 1996 CU, there is no evidence of increased trade between Turkey and the EU. Around the same period, Atici and Guloglu (2006) analyze the factors that determined Turkey's fresh and processed fruit and vegetable exports to the EU using a trade gravity model and panel data during 1995-2001 for 13 EU countries. They document that the size of the economy, EU population, Turkish population in the EU, and the consumer preferences of non-Mediterranean countries are significant predictors of Turkish fruit and vegetable exports. They subsequently argue that developing marketing strategies to target the population of Turkish people in EU countries and non-Mediterranean member countries would enhance the export performance of fruit and vegetable exports. Moreover, Nowak-Lehmann *et al.* (2007) analyze Turkey's sectoral trade flows to the EU based

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on panel data during 1988-2002. They find that improvements in Turkish price competitiveness has led to a significant enhancement of Turkish exports in almost all sectors. On the other hand, improvement in price competitiveness of Turkey's competitors hampered its export performance in most sectors, except for plastics and rubber. Differences in transport costs between trade competitors influence Turkish exports in certain sectors but not others. They conclude that strengthening and expanding the CU between Turkey and the EU to other products would lead to a noticeable increase in export levels in the agricultural sector, which is still suffering from EU tariffs or tariff-like protection. Bilici *et al*. (2008) use a trade gravity model to analyze EU-Turkey trade flows during 1992-2006 and conclude that the EU countries have always been important partners for Turkey's trade flows and that the CU has marginally increased the importance of the EU in determining those flows. More recently, Ülengin *et al.* (2015) use panel data from 18 EU countries during 2005-2012 and apply a trade gravity model to estimate road transport costs of Turkey's exports to the EU. They find that quotas have exerted significant negative effects on Turkish total exports via road transport particularly in the textile sector. Finally, Bektasoglu *et al.* (2016) focus on the importance of non-tariff barriers and regional trade agreements on trade costs in Turkey's agro-food sector. They use both aggregated and disaggregated data and a trade gravity model to document an aggregation bias in econometric estimates that affects the results of policy simulations analyzing Turkey's membership to the EU.

Broadly speaking, the trade gravity model has been widely used for analyzing Turkey's overall export performance rather than the performance of the main sectors comprising the broader economy. In what follows, the trade gravity model is applied on panel data during 1990-2016 containing information on bilateral sectoral trade flows between Turkey and most of the EU countries as well as some important non-EU trading partners, to explain overall and sectoral trade performance. Apart from the use of a large time period, the main contribution of the analysis is the use of a broader and more policy-useful classification of sectors relative to those used in other relevant studies. This classification comprises the following five sectors of activity: intermediate goods, consumption goods, capital goods, mix-end goods and miscellaneous goods. Given the different potential for value-added, competition intensity, technological innovation and productivity gains in each sector, this classification is more useful in terms of making policy decisions.

4. Data and methodology

The data used for this study contains information on bilateral annual trade flows between Turkey and 15 different EU countries (Austria, Belgium, Bulgaria, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Spain, Sweden, and UK). These are the most important EU trading partners of Turkey. Further, the data contains trade flow information for additional five non-EU countries with substantial trade relations with Turkey (USA, China, Japan, Russia, and Iran). All data cover a period of 27 years (1990-2016), thus allowing for both cross-section and time series analysis covering all the important periods marking the EU-Turkey agreements. Importantly, the data on trade flows is classified into five economic sectors: inter-

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mediate goods, consumption goods, capital goods, mix-end goods and miscellaneous goods, thus allowing for separate analysis of the sectoral effects along important policy area considerations. All data is extracted from the OECD database on Bilateral Trade in Goods by Industry and End-use (BTDIxE) (ISIC Rev.4), and it is uniformly denominated in current US dollars.

Table 1 provides information on the pattern and relative size of trade among the different sectors between Turkey and its sample EU partners. Further, Table A in the Appendix provides information on the rate of annual change in trade in total and per sector. During the 27-year period, Turkey's global trade volume reached USD 4.88 trillion with an average trade volume of USD 181.01 billion. This represents a 10.4% annual increase in the country's global trade on average and a min-max range of 65.8%. Thus, Turkish exports and imports with the rest of the world have increased year-on-year but with considerable variation. Further, on average over the 27-year period, the total volume of trade between Turkey and the 15 EU sample countries increased to USD 1.95 trillion with a country average trade volume of USD 4.79 billion. This also represents a 12.2% annual increase in the EU-15 trade on average and a large min-max range of 465.0%. Moreover, during the same period, the total volume of trade between Turkey and its five non-EU trading partners was USD 1.11 trillion with a country average trade volume of USD 8.32 billion. This represents a 27.5% annual increase in trade on average and a larger min-max range of 1879.9%. Thus, the value of Turkish imports and exports with the EU-15 is on average lower (almost half) relative to that of the non-EU-5 average; it increased faster than the global average but much more slowly than the non-EU average; but it exhibited considerable less instability than the non-EU average. From this *prima facie* evidence, the volume of trade between Turkey and the EU appears to have evolved in less dynamic but more stable fashion relative to trade between Turkey and the non-EU sample countries.

As regards the EU-15 trade patterns, Turkeys' larger trading partners have been successively Germany, Italy, UK and France. Further, trade in intermediate goods dominates EU-Turkey exchange, since it represents roughly a half of total trade value. Trade on consumption goods comes second, followed by trade in capital goods. Among the sample non-EU countries, Russia has been the largest trading partner of Turkey followed by the USA and China. Interestingly, the share of intermediate goods traded between Turkey and its non-EU partners is relatively higher as compared with that of its EU partners. On the other hand, the share of trade on consumption and capital goods between Turkey and non-EU partners is relatively lower as compared with that of EU partners. It seems that Turkey trades relatively more with the EU on final consumption and capital goods and relatively less on intermediate goods as compared with its non-EU partners. Finally, trade on mixed-end and miscellaneous goods is relatively smaller and concentrated into specific EU countries (France, Germany).

Figure A in the appendix presents the 27-year evolution of both total and sectoral trade patterns of Turkey with each of the sample trading partners. The individual country figures show that in almost all cases trade flows started to rise in 2000-2002, decreased during the 2007-8 crisis and subsequently exhibiting considerable volatility until today. Among the EU-15 countries, the volatility has been less pronounced for Germany and the Nordic countries and more so for Greece

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and the UK. Among the non-EU-5 countries, the volatility has been relatively higher than that in the EU countries, more pronounced for Iran and Russia and less so for Japan and the US. Remarkably, Turkish-Chinese trade growth while exhibited a start delay is progressing in dynamic and stable manner. This evidence shows that Turkish trade flows with non-EU countries increases faster and exhibits a more dynamic trend relative to that with the EU.

In order to provide an explanation of these trade developments, econometric analysis is deployed. The specification of the gravity model used to estimate the effect of integration on Turkey's trade with the EU and non-EU countries draws on Anderson and van Wincoop (2003) and it is expressed in the following form:

$$\ln X_{Tjt} = b_0 + b_1 \ln Y_{it} + b_2 \ln Y_{jt} + b_3 \ln D_{ij} + OTHER_{Tj}\, b_{4T} + \eta_{ij} + k_t + e_{ijt} \quad (1)$$

The dependent variable, X_{ijt}, is the logarithm of the annual bilateral trade value between Turkey and country *j* in year *t*, measured in current USD, from the OECD. The first and second independent variables, Y_{it} and Y_{jt}, are the logarithms of GDP (in current USD) in Turkey and each trading partner, respectively; they are obtained from the CHELEM database (CEPII). These variables capture the effect of the size of the economy on trade. They are expected to have positive coefficient signs for larger countries are expected to trade more. The third independent variable, D_{Tj}, represents the population-weighted distance between Turkey and trading country *j*, and is obtained from the CEPII database. It is a proxy for transport costs and it is expected to have a negative influence on trade. The vector $OTHER_{Tj}$ includes other T exogenous variables (obtained from the CEPII database), designed to capture factors that may influence the volume of trade between Turkey and trading country *j*. They are meant to capture other observable and unobservable country effects between Turkey and its trading patterns. All variables are detailed in the appendix. Finally, η_{ij} is a country-pair fixed effect that captures those unobservable and time-invariant characteristics that are specific to each pair of countries, and k_t is a time effect that captures the unobservable characteristics that vary over time. Finally, ε_{ijt} is the error term, which is taken to be independent and identically distributed.

Table 2 provides descriptive statistics of the variables. The average annual value of total trade between Turkey and both its EU and non-EU partners is USD 5.5 bn with a considerable dispersion of USD 7.4 bn. Most of Turkey's total trade value with its trading partners concentrates on intermediate goods with a mean value of USD 3 bn and USD 4.4 bn dispersion. Trade in consumption goods comes next with a lower mean value and dispersion, followed by trade on capital goods with a large dispersion among its trading partners. Further, Table 3 provides the correlation matrix between the independent variables. Since pair-wise correlations are not very severe (less than 0.50), they can all be included in the regression analysis. However, correction for collinearity among certain variables will be performed.

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 692976.

Table 1: Bilateral trade of Turkey, by sector, 1990-2015 (million USD)

Country	1990-2016	Total Trade	Intermediate Goods	Consumption Goods	Capital Goods	Mixed-End Goods	Miscellaneous Goods
Austria	Mean	1,503.4	802.9	292.3	317.6	84.6	5.9
	Sum	40,600.0	21,700.0	7,893.2	8,575.7	2,284.3	160.6
Belgium	Mean	3,209.5	1,947.8	515.9	424.8	262.8	58.2
	Sum	86,700.0	52,600.0	13,900.0	11,500.0	7,096.6	1,570.8
Bulgaria	Mean	1,364.0	1,001.9	175.6	70.5	25.5	150.6
	Sum	36,800.0	27,100.0	4,742.1	1,903.8	689.0	4,067.4
Denmark	Mean	948.6	305.8	350.8	177.1	103.9	11.1
	Sum	25,600.0	8,255.5	9,470.6	4,780.9	2,805.3	299.1
France	Mean	8,438.6	3,921.0	1,714.5	1,581.5	1,100.9	120.7
	Sum	228,000.0	106,000.0	46,300.0	42,700.0	29,700.0	3,257.9
Germany	Mean	20,400.0	9,124.8	5,072.6	4,010.0	2,025.6	148.3
	Sum	550,000.0	246,000.0	137,000.0	108,000.0	54,700.0	4,004.9
Greece	Mean	1,968.5	941.9	286.3	100.0	47.4	591.7
	Sum	53,200.0	25,400.0	7,730.0	2,699.7	1,279.7	16,000.0
Hungary	Mean	997.3	463.1	156.2	139.2	235.3	3.5
	Sum	26,900.0	12,500.0	4,218.3	3,757.6	6,351.8	94.3
Ireland	Mean	787.5	370.0	138.4	97.1	177.6	4.5
	Sum	21,300.0	9,989.3	3,735.7	2,621.1	4,795.6	120.7
Italy	Mean	10,800.0	5,419.1	1,677.0	2,371.3	619.3	679.1
	Sum	291,000.0	146,000.0	45,300.0	64,000.0	16,700.0	18,300.0
Netherlands	Mean	3,818.5	1,930.0	1,066.1	548.5	142.0	131.8
	Sum	103,000.0	52,100.0	28,800.0	14,800.0	3,835.2	3,559.3
Poland	Mean	2,137.9	1,033.0	543.4	296.3	260.8	4.4
	Sum	57,700.0	27,900.0	14,700.0	7,999.4	7,042.8	118.0
Spain	Mean	5,056.0	2,522.7	1,048.4	593.0	778.8	113.1
	Sum	137,000.0	68,100.0	28,300.0	16,000.0	21,000.0	3,052.5
Sweden	Mean	1,752.9	844.4	306.6	350.5	228.4	22.9
	Sum	47,300.0	22,800.0	8,278.5	9,463.9	6,166.4	619.0
UK	Mean	8,946.0	4,098.8	2,523.9	1,310.8	856.7	155.8
	Sum	242,000.0	111,000.0	68,100.0	35,400.0	23,100.0	4,206.8
Total I	*Mean*	*4,796.6*	*2,310.9*	*1,055.6*	*824.9*	*462.7*	*146.4*
	Sum	*1,950,000.0*	*938,000.0*	*429,000.0*	*335,000.0*	*188,000.0*	*59,400.0*
China	Mean	9,076.3	4,482.2	1,641.4	1,856.9	1,085.9	9.9
	Sum	245,000.0	121,000.0	44,300.0	50,100.0	29,300.0	267.1
Iran	Mean	5,500.5	4,906.7	360.8	142.7	63.2	27.1
	Sum	149,000.0	132,000.0	9,741.9	3,852.9	1,705.3	731.0
Japan	Mean	2,681.7	1,176.3	206.5	1,070.9	221.7	6.2
	Sum	69,700.0	30,600.0	5,370.3	27,800.0	5,764.3	160.7
Russia	Mean	14,000.0	10,600.0	1,070.6	276.3	185.0	1,800.6
	Sum	377,000.0	287,000.0	28,900.0	7,460.4	4,993.8	48,600.0
USA	Mean	10,200.0	5,972.9	1,712.9	1,663.6	432.6	375.0
	Sum	274,000.0	161,000.0	46,200.0	44,900.0	11,700.0	10,100.0
Total II	*Mean*	*8,317.4*	*5,465.4*	*1,004.4*	*1,001.6*	*399.0*	*447.0*
	Sum	*1,110,000.0*	*732,000.0*	*135,000.0*	*134,000.0*	*53,500.0*	*59,900.0*
World	*Mean*	*181,000.0*	*105,000.0*	*31,700.0*	*23,700.0*	*12,100.0*	*8,245.0*
	Sum	*4,880,000.0*	*2,840,000.0*	*856,000.0*	*641,000.0*	*326,000.0*	*223,000.0*

Source: OECD statistics.

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Table 2: Descriptive statistics of variables

Variable	N	Mean	S.D.	Min	0.25%	Mdn	0.75%	Max
TXM	515	5,500,000.0	7,400,000.0	20,430.7	900,000.0	2,400,000.0	6,500,000.0	38,000,000.0
IXM	515	3,000,000.0	4,400,000.0	19,319.2	500,000.0	1,400,000.0	3,500,000.0	29,000,000.0
HXM	515	1,000,000.0	1,400,000.0	261.9	150,000.0	440,000.0	1,300,000.0	7,800,000.0
CXM	515	840,000.0	1,300,000.0	71.8	94,179.9	320,000.0	960,000.0	7,700,000.0
XXM	515	420,000.0	720,000.0	0.0	21,434.7	160,000.0	430,000.0	4,800,000.0
MXM	515	220,000.0	670,000.0	0.0	2,896.4	24,770.1	120,000.0	6,200,000.0
GDP_O	520	26.6	0.7	25.6	25.9	26.4	27.3	27.4
GDP_D	519	27.0	1.6	23.0	26.0	26.8	28.2	30.5
GDPCAP_O	520	8.6	0.5	7.7	8.0	8.4	9.1	9.3
GDPCAP_D	519	9.7	1.2	5.8	9.2	10.1	10.5	11.1
DIST	520	3,071.7	2,426.0	712.0	1,709.1	2,437.7	2,941.0	9,705.8
COMBRD	520	0.2	0.4	0.0	0.0	0.0	0.0	1.0
POP_D	520	116.2	274.1	3.5	9.8	38.8	79.3	1,371.2
TDIFF	520	2.2	2.5	0.0	1.0	1.0	2.0	9.5
COMLNG	520	0.1	0.2	0.0	0.0	0.0	0.0	1.0
CONFLICT	520	0.3	0.5	0.0	0.0	0.0	1.0	1.0
COMRELIG	520	0.1	0.2	0.0	0.0	0.0	0.0	1.0
COMLR_PR	520	0.4	0.5	0.0	0.0	0.0	1.0	1.0
COMLR_PS	520	0.4	0.5	0.0	0.0	0.0	1.0	1.0
GATT_D	520	0.9	0.3	0.0	1.0	1.0	1.0	1.0
FTA_MBR	340	0.5	0.5	0.0	0.0	0.0	1.0	1.0
GSP_D	520	0.8	0.4	0.0	0.5	1.0	1.0	1.0
EU_D	520	0.8	0.4	0.0	0.5	1.0	1.0	1.0

Author's own compilations

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Table 3: Correlation matrix[1]

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
TXM (1)	1									
COMBRD (2)	-0.142**	1								
COMLNG (3)	-0.112*	0.511**	1							
DIST (4)	0.109*	-0.327**	-0.203**	1						
POP_O (5)	0.505**	-0.0255	-0.0316	0.00843	1					
POP_D (6)	0.193**	-0.129**	-0.082+	0.556**	0.0226	1				
GDP_O (7)	0.538**	-0.0280	-0.0431	0.0100	0.934**	0.0219	1			
GDP_D (8)	0.443**	-0.210**	-0.117**	0.774**	0.203**	0.342**	0.207**	1		
GDP-CAP_O (9)	0.536**	-0.0289	-0.0470	0.0106	0.917**	0.022	0.997**	0.204**	1	
GDP-CAP_D (10)	0.186**	-0.405**	-0.273**	0.189**	0.436**	-0.29**	0.462**	0.294**	0.46**	1
N	514									
Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
TDIFF (1)	1									
CONFLICT (2)	-0.24**	1								
COM-RELIG (3)	-0.057	-0.0650	1							
COMLR_PR (4)	-0.36**	-0.0229	0.290**	1						
COMLR_PS (5)	-0.24**	0.134*	0.304**	0.899**	1					
GATT_D (6)	-0.21**	-0.138*	-0.63**	0.0147	-0.23**	1				
FTA_MBR (7)	-0.45**	0.0565	-0.25**	0.115*	0.0144	0.401**	1			
GSP_D (8)	-0.110*	-0.38**	-0.49**	0.182**	0.0023	0.728**	0.320**	1		
EU_D (9)	-0.83**	0.126*	-0.43**	0.182**	0.0012	0.613**	0.551**	0.467**	1	
N	340									

Author's own compilations

Given their advantages, dynamic panel estimation methods have dominated the relevant literature. The specific estimation technique depends on the hypothesis made prior to the analysis of the data. One option would be to ignore the panel structure and run a pooled least square regression in which each observation is independent of the rest. In this case, the regression is made over 520 pairwise observations assuming that they are independent from each other, without identifying the variation resulting from spatial and temporal factors. In other words, it is

[1] Note: pairwise correlation between exogenous variables; t statistics in parentheses; + p < 0.1, * p < 0.05, ** p < 0.01.

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assumed that the coefficients of each variable are identical for all countries and years (imposing homogeneity on the parameters of the model). Although this assumption could be realistic in some cases, it is generally too restrictive. For that reason, we use a panel data method, which allow the analysis of both cross-section and temporal effects on trade flows. Depending on the assumptions established, two different models on fixed and random effects are defined. The fixed effects model assumes the existence of some unobservable characteristics specific to each unit of the sample, which are not captured by any of the variables. This is known as unobserved heterogeneity and, if present, there are two ways to account for it. The first, known as least square dummy variable (LSDV), consists of including a dummy variable for each country to capture its specific characteristics. The main disadvantage of this method is that the number of dummy variables may be very high, thereby causing a loss of degrees of freedom. The second alternative, known as within-group estimation, consists of subtracting from each variable its temporal mean. This procedure eliminates the unobserved heterogeneity by transforming the model with variables differentiated with respect to the temporal means, so all of the variation related to time is eliminated. This method is easier to apply and has lower computational costs. However, it has the disadvantage that all of those variables that do not vary over time would be eliminated from the model, which would prevent their effects from being accounted for. The importance of this problem would vary depending on which variables we want to account for. In our case, the analysis is focused on the effect of EU trade agreements on EU-Turkey trade flows, and since these related variables are time varying, this disadvantage does not represent a significant drawback.

On the other hand, the random effects model assumes that the constant terms and the slope do not vary for any of the observations. In this case, the differences between the units or periods are attributed to the variance of the error term and not to the constant term. Consequently, the changes only affect the variance–covariance matrix, and the estimation can be performed using a generalized least squares method. Therefore, if it were assumed that the unobserved heterogeneity is correlated to the independent variables, then it would be more appropriate to use the fixed effects model. However, if this type of correlation does not exist, it is more efficient to use a random effects model. As previously mentioned, our sample contains 20 countries and there are some quantitative and qualitative factors with considerable variation among countries. Consequently, it is reasonable to assume the existence of unobserved heterogeneity. In order to apply the most suitable model, the Hausman test was performed. The chi-squared statistic was 30.25 associated with a p-value of 0.000. Hence, the null is rejected and the fixed effects estimator is preferred to the random effects estimator.

Further, the estimation analysis must deal with a number of potential econometric problems. First, there is a possibility that trade flows may endogenously influence national macroeconomic variables (e.g. GDP, GDP per capita, etc.) giving rise to a problem of reverse causation. This, in turn, may cause regressors to be correlated with the error term. Second, time-invariant country characteristics, such as geography and demographics, may be correlated with the regressors.

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The associated fixed effects are contained in the error term that includes both unobserved country-specific effects and observation-specific errors. Third, the panel dataset has a short time dimension (T =27) and a larger country dimension (N =20). These problems may be solved with the use of a fixed-effects instrumental variables estimation. In large-T panel data, a shock to the country's fixed effect would decline with time and hence the correlation of the lagged dependent variable with the error term would be insignificant (Roodman, 2006). Thus, we use the Arellano & Bond (1991) difference GMM estimator for dynamic panel data with robust standard errors and fixed effects for the estimation. Lagged values of the main gravity variables are used as instruments. This makes a potentially endogenous regressor pre-determined and therefore not correlated with the error term. This method overcomes several potential problems of endogeneity and unobservable influences but at the cost of estimation efficiency, especially given the rather small sample size.

5. Empirical results

Tables 4 to 9 present the results of the regression analysis of the gravity model for the total volume of bilateral trade between Turkey and its EU and non-EU trading partners, as well as for each of the five sectors: intermediate goods, consumption goods, capital goods, mix-end goods and miscellaneous goods. Table 4 reports the results of Equation (1) for the total volume of bilateral trade (models A.1 to A.5). The first model (A.1) is the standard gravity model. As expected the levels of income in both Turkey and its trading partners are positive and significant predictors of the volume of trade. The result implies that trading with higher GDP countries may offer Turkey higher external demand for its products and more chances to import. On the other hand, the result shows that an increase in Turkey's foreign trade volume is conditional upon its production capacity. The magnitude of the effect is large: a 1 percent increase in GDP of Turkey will cause a 1.18 percent increase in bilateral trade, whilst a 1 percent increase in GDP of its trading partners will cause a 0.92 percent increase in bilateral trade. Further, the effect of GDP per capita is found to be positive and significant for Turkey but not for its trading partners. Its positive sign suggests that bilateral trade flows between Turkey and its trading partners are directly related to inter-country differences in the level of technological progress. This suggests that Turkey's domestic demand structure differs from that of its trading partners. Therefore, the Linder hypothesis is not supported and the result differs from those found in other setting, such as the new industrial countries in East Asia (Chow *et al*., 1999). In effect, this implies if Turkey is to benefit more from trade it must aim to increase its overall economic development level. Moreover, distance is also a significant negative predictor, but it only exercises a small effect: an increase of 1% in distance entails a small decline in trade of approximately 0.01%.

The second model (A.2) extends the baseline model to account for the impact of non-economic factors, such as the existence of a common border (COMBRD), the population of the trading partner (POP_D), the difference in the timing of exports and imports (TDIFF), the existence of a

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common ethnic language (COMLNG), the existence of past CONFLICTs between Turkey and its trading partners (CONFLICT) and the existence of common religion (COMRELIG). The basic gravity variables remain robust predictors and all control factors are shown to be significant predictors of the total bilateral volume of trade, except for the existence of common border and the size of population. Among the controls, only the import-export timing difference and the common language turn out to be significant. The third model (A.3) extends the baseline model to account for the impact of legal factors, such as the existence of a common legal origin before (COMLR_PR) and after (COMLR_PS) the economic transition phases of the Turkey. Surprisingly, the legal origin seems to affect the robustness of the gravity variables. In this case, the post-transition legal origin becomes a significant predictor of Turkey's bilateral trade flows but the exporter and importers' level of economic development turn insignificant. Indeed, Jones and Martin (2012) argue that trade flows are affected by the rules of the country of origin of a product, such as tariffs, trade remedies enforcement (e.g., antidumping and countervailing duties) or quantitative restrictions (tariff quotas) as well as labeling origin and government procurement regulation. This result might be also interpreted as implying a significant change in Turkish trade legislation brought about by EU technical assistance programs designed to advance regulatory alignment. The fourth model (A.4) extends the baseline model to account for the impact of institutional factors, such as the existence of membership in GATT/WTO (GATT_D), membership in FTA agreements (FTA_MBR), offering donor funding (GSP_D) or being a member of the EU (EU_D). The gravity variables remain robust predictors of the total trade volume. On the other hand, engaging in donor funding, and getting membership in GATT/WTO and FTA agreements does not seem to matter. However, when all control variables are included in the analysis, only the size of the economy among the gravity model variables remains robust, as well as the common language, the legal origin and the membership in FTA agreements. Overall, the analysis shows a robust role for the level of income of Turkey and its trading partners, whereas the impact of the remaining gravity model variables seems to be significantly mitigated by non-economic and other institutional factors. The latter deserves a separate analysis.

Further, Tables 5 to 9 report the results for each of the five separate sectors of foreign trade activity: intermediate goods, consumption goods, capital goods, mixed-end goods and miscellaneous goods, respectively. Table 5 reports the results for the intermediate goods sector (models B.1 to B.5). Similarly, as expected, the levels of income in both Turkey and its trading partners are positive and significant predictors of the total volume of trade (B.1). The magnitude of the effect is large: a 1 percent increase in GDP of Turkey will cause a 1.33 percent increase in bilateral trade, whilst a 1 percent increase in GDP of its trading partners will cause a 0.98 percent increase in bilateral trade. GDP per capital of Turkey matters but that of its trading partners. Distance is also a significant negative predictor, but it only exercises a small effect: an increase of 1% in distance entails a small decline in trade of approximately 0.01%. The expanded models (B.2 to B.5) broadly confirm similar findings for the intermediate goods sector. When all control variables are included in the analysis, gravity model variables remains partly robust and the ma-

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jority of control factors turn out to be significant. Among the gravity model variables, the levels of income for Turkey and its trading partners as well as the distance between them are broadly robust predictors of the volume of trade. However, the predictive power of the levels of economic development of both depends on the model used and the choice of controls.

Tables 6 to 9 report the results of Equation (1) for bilateral trade in consumption goods, capital goods, mix-end and miscellaneous goods sectors, respectively, (models C.1 to C.5, D.1 to D.5, E.1 to E.5 and F.1 to F.5, respectively). In all these sectors, the robustness of the standard gravity model is confirmed as regards the levels of incomes and geographical distance. The levels of income in both Turkey and its trading partners are positive and significant predictors of the volume of trade; distance is a significant negative small-size predictor. Similarly, economic development in each trading partner matters sometimes positively sometimes negatively. The inclusion of control factors does not significantly affect the sign of the gravity model variables, but it often affects their magnitude.

In summary, the results for the total volume of trade and the trade in the five different sectors between Turkey and its trading partners show the following: first, the standard gravity model is a fair predictor of bilateral trade volume between Turkey and its trading partners. Second, there are few differences in trading patterns between the different sectors. Perhaps the sectors of capital goods, mix-end and miscellaneous goods are those where the potential impact of expanded trade may be relatively greater. Third, among the gravity model trading variables, those that are robust include the level of income and the population-weighted distance between Turkey and its trading partners. However, the latter's effect is very small and it would be expected that transport costs may not prohibit trade opportunities. Fourth, the level of economic development may or may not be a significant predictor of the volume of trade. It depends on the model used and the various controls included in the analysis. Further, when it is a significant predictor it concerns relatively more Turkey than its trading partners do. This implies that Turkey is facing a challenge of catching up with the productive structures of its trading partners, which is different among the different sectors of trade activity considered. Fifth, non-economic factors, especially legal institutions directly or indirectly affecting the incentive and the volume of trade, may be significant predictors of trade flows between Turkey and its trading partners and should be given due consideration.

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Table 4: Regression results for the total bilateral volume of trade[2]

Variables / models	A.1	A.2	A.3	A.4	A.5
GDP_O	1.175**	1.303**	1.054**	0.516**	0.412+
	(-10.08)	*(-10.50)*	*(-7.42)*	*(-4.83)*	*(-1.78)*
GDP_D	0.917**	0.960**	0.775**	0.888**	0.854**
	(7.94)	*(10.49)*	*(5.68)*	*(8.83)*	*(3.69)*
GDPCAP_O	2.693**	2.478**	2.548**	0.002	0.002
	(13.33)	*(9.56)*	*(12.21)*	*(0.005)*	*(0.001)*
GDPCAP_D	-0.126	0.311	0.021	0.696*	-0.130
	(-0.68)	*(1.33)*	*(0.12)*	*(2.12)*	*(-0.64)*
DIST	-0.001**	-0.001**	-0.001*	-0.001**	-0.001
	(-4.56)	*(-5.21)*	*(-2.35)*	*(-3.28)*	*(-0.21)*
COMBRD		0.881			-0.170
		(1.33)			*(-0.16)*
POP_D		0.001			-0.001
		(0.35)			*(-1.57)*
TDIFF		0.529**			0.158
		(3.77)			*(0.64)*
COMLNG		1.724*			2.345*
		(2.41)			*(2.46)*
CONFLICT		-0.251			-0.061
		(-0.76)			*(-0.13)*
COMRELIG		0.453			2.710
		(0.67)			*(1.51)*
COMLR_PR			-1.508		-2.557+
			(-1.66)		*(-1.80)*
COMLR_PS			2.169*		3.350*
			(2.11)		*(2.33)*
GATT_D				0.235	1.028+
				(0.69)	*(1.94)*
FTA_MBR				0.204	0.635+
				(0.60)	*(1.81)*
GSP_D				-2.038	-0.022
				(-1.50)	*(-0.04)*
EU_D				-0.928	1.246
				(-0.76)	*(0.75)*
Year dummies	Yes	Yes	Yes	Yes	Yes
N	514	514	339	339	339
F-stat	262.27	156.68	133.37	203.26	55.29
Hansen's J	0.000	0.000	0.000	2.320	0.000
Sargan test	1996.12	1429.91	664.75	706.24	483.96

Author's own compilations.

[2] Note: Dependent variable is *Total volume of trade* (total imports plus total exports). A dynamic panel GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01.

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Table 5: Regression results for bilateral trade in intermediate goods[3]

		B.1	B.2	B.3	B.4	B.5
GDP_O		1.156**	1.330**	0.971**	0.462**	0.800**
		(-8.89)	*(-9.50)*	*(-5.78)*	*(-4.51)*	*(-3.10)*
GDP_D		0.933**	0.977**	0.720**	0.866**	1.102**
		(7.17)	*(9.22)*	*(4.42)*	*(7.19)*	*(4.83)*
GDPCAP_O		2.689**	2.398**	2.503**	0.001	0.001
		(12.74)	*(8.89)*	*(11.77)*	*(0.01)*	*(0.01)*
GDPCAP_D		-0.282	0.325+	-0.106	0.607*	-0.326
		(-1.30)	*(1.79)*	*(-0.56)*	*(2.35)*	*(-0.94)*
DIST		-0.001**	-0.001**	-0.002	-0.001**	0.001
		(-3.99)	*(-7.73)*	*(-1.55)*	*(-4.07)*	*(1.18)*
COMBRD			0.658			1.527
			(0.98)			*(1.40)*
POP_D			0.001			-0.001
			(0.94)			*(-0.92)*
TDIFF			0.532**			-0.220
			(5.32)			*(-0.74)*
COMLNG			2.247**			0.770
			(3.57)			*(0.71)*
CONFLICT			0.043			0.346
			(0.16)			*(0.53)*
COMRELIG			1.680*			5.964+
			(2.42)			*(1.87)*
COMLR_PR				-1.517+		-6.935*
				(-1.85)		*(-2.15)*
COMLR_PS				2.162*		6.988*
				(2.52)		*(2.43)*
GATT_D					0.242	0.856+
					(0.86)	*(1.77)*
FTA_MBR					0.193	0.646
					(0.59)	*(1.62)*
GSP_D					-1.871	-0.830
					(-1.42)	*(-1.44)*
EU_D					-1.533	5.404+
					(-1.32)	*(1.78)*
Year dummies		Yes	Yes	Yes	Yes	Yes
N		514	514	339	339	339
F		156.06	207.14	115.66	348.02	337.71
Hansen's J		0.000	0.000	0.000	0.000	0.000
Sargan		2700.83	1282.22	892.49	930.35	497.73

Author's own compilations.

[3] Note: Dependent variable is *Trade in Intermediate Goods*. A dynamic panel GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01

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Table 6: Regression results for bilateral trade in consumption goods[4]

	C.1	C.2	C.3	C.4	C.5
GDP_O	1.315**	1.425**	1.380**	0.717**	0.493+
	(-8.67)	*(-8.55)*	*(-9.65)*	*(-4.75)*	*(-1.79)*
GDP_D	0.943**	0.955**	1.012**	0.956**	0.782*
	(6.97)	*(7.40)*	*(10.88)*	*(7.21)*	*(2.64)*
GDPCAP_O	2.522**	2.166**	2.522**	0.001	0.001
	(10.22)	*(5.89)*	*(8.61)*	*(0.01)*	*(0.01)*
GDPCAP_D	0.178	0.794	0.208	0.775	0.267
	(1.03)	*(1.36)*	*(1.02)*	*(1.65)*	*(0.74)*
DIST	-0.001**	-0.001**	-0.001**	-0.001**	-0.001+
	(-4.09)	*(-2.96)*	*(-4.05)*	*(-2.88)*	*(-1.99)*
COMBRD		0.176			-1.239
		(0.23)			*(-1.37)*
POP_D		0.001			-0.001
		(0.70)			*(-0.09)*
TDIFF		0.593+			1.230*
		(1.96)			*(2.74)*
COMLNG		3.008**			3.582**
		(2.88)			*(2.94)*
CONFLICT		-0.261			0.061
		(-0.37)			*(0.06)*
COMRELIG		0.972			2.439
		(0.63)			*(1.02)*
COMLR_PR			-1.485**		1.636
			(-3.66)		*(0.58)*
COMLR_PS			1.391*		-0.756
			(2.28)		*(-0.33)*
GATT_D				1.074	1.461*
				(1.56)	*(2.37)*
FTA_MBR				-0.637	-0.302
				(-1.16)	*(-0.81)*
GSP_D				-1.859	0.816
				(-1.29)	*(0.86)*
EU_D				-0.337	0.608
				(-0.23)	*(0.25)*
Year dummies	Yes	Yes	Yes	Yes	Yes
N	514	514	339	339	339
F	84.88	198.36	133.69	357.93	159.54
Hansen's J	0.670	0.000	0.000	0.000	0.000
Sargan	2104.40	2041.30	786.13	825.04	551.08

Author's own compilations.

[4] Note: Dependent variable is *Trade in Consumption Goods*. A dynamic panel GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01.

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Table 7: Regression results for bilateral trade in capital goods[5]

	D.1	D.2	D.3	D.4	D.5
GDP_O	1.505**	1.765**	1.564**	0.945**	0.608*
	(-9.72)	*(-10.20)*	*(-10.76)*	*(-5.20)*	*(-2.74)*
GDP_D	0.912**	1.036**	0.973**	0.979**	0.886**
	(5.97)	*(7.95)*	*(6.76)*	*(8.57)*	*(3.60)*
GDPCAP_O	2.790**	2.640**	2.770**	0.001	0.001
	(13.11)	*(6.22)*	*(11.51)*	*(0.01)*	*(0.01)*
GDPCAP_D	0.454**	0.924	0.510*	1.295*	0.771+
	(3.37)	*(1.64)*	*(2.63)*	*(2.41)*	*(1.96)*
DIST	-0.001**	-0.001	-0.001**	-0.001	-0.001
	(-3.78)	*(-1.15)*	*(-3.95)*	*(-1.20)*	*(-1.13)*
COMBRD		-0.499			-1.982
		(-0.48)			*(-1.24)*
POP_D		0.001			-0.001
		(0.47)			*(-1.69)*
TDIFF		0.201			0.108
		(0.55)			*(0.27)*
COMLNG		3.580**			4.183*
		(3.12)			*(2.82)*
CONFLICT		0.584			-0.123
		(0.94)			*(-0.14)*
COMRELIG		1.712			-0.838
		(1.10)			*(-0.36)*
COMLR_PR			-1.341		1.833
			(-1.57)		*(0.83)*
COMLR_PS			1.195		-1.030
			(1.41)		*(-0.57)*
GATT_D				1.111	0.966
				(0.87)	*(1.28)*
FTA_MBR				0.107	0.371
				(0.19)	*(0.96)*
GSP_D				-3.162	-0.646
				(-1.63)	*(-0.66)*
EU_D				-0.076	-3.131
				(-0.03)	*(-1.68)*
Year dummies	Yes	Yes	Yes	Yes	Yes
N	514	514	339	339	339
F	154.96	138.53	131.00	159.50	59.81
Hansen's J	0.000	0.000	0.000	0.000	0.000
Sargan	984.95	804.09	326.83	346.06	236.06

Author's own compilations.

[5] Note: Dependent variable is *Trade in Capital Goods*. A dynamic panel GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01

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Table 8: Regression results for bilateral trade in mixed-end goods[6]

	E.1	E.2	E.3	E.4	E.5
GDP_O	1.930**	2.008**	2.144**	1.477**	1.532*
	(-9.20)	*(-7.62)*	*(-7.78)*	*(-4.16)*	*(-2.30)*
GDP_D	0.815**	0.804**	1.030**	1.153**	1.324*
	(4.38)	*(3.37)*	*(4.47)*	*(4.62)*	*(2.53)*
GDPCAP_O	4.028**	3.755**	4.065**	0.001	0.001
	(8.89)	*(6.23)*	*(7.73)*	*(0.01)*	*(0.01)*
GDPCAP_D	0.655*	1.180+	0.743**	2.099*	0.621+
	(2.72)	*(1.97)*	*(3.39)*	*(2.67)*	*(1.98)*
DIST	-0.001*	-0.001	-0.001**	-0.001	0.001
	(-2.68)	*(-1.46)*	*(-3.17)*	*(-0.27)*	*(1.04)*
COMBRD		-1.239			1.124
		(-0.61)			*(0.45)*
POP_D		0.001			-0.002
		(0.78)			*(-1.39)*
TDIFF		0.594			-0.294
		(1.10)			*(-0.43)*
COMLNG		3.997*			0.450
		(2.54)			*(0.19)*
CONFLICT		0.363			-1.046
		(0.27)			*(-1.08)*
COMRELIG		-0.090			5.117
		(-0.04)			*(0.99)*
COMLR_PR			-3.042+		-10.581
			(-2.01)		*(-1.68)*
COMLR_PS			1.003		9.778+
			(0.66)		*(2.06)*
GATT_D				1.400	2.142
				(0.73)	*(1.07)*
FTA_MBR				0.208	1.379*
				(0.29)	*(2.76)*
GSP_D				-6.606*	-4.650*
				(-2.62)	*(-2.79)*
EU_D				1.973	8.429
				(0.83)	*(1.50)*
Year dummies	Yes	Yes	Yes	Yes	Yes
N	508	508	333	333	333
F	32.20	93.08	35.16	259.81	12.95
Hansen's J	0.000	0.000	0.000	0.040	0.000
Sargan	1184.63	815.43	351.41	441.37	309.01

Author's own compilations.

[6] Note: Dependent variable is *Trade in Mixed-end Goods*. A dynamic panel GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01.

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Table 9: Regression results for bilateral trade in miscellaneous goods[7]

	F.1	F.2	F.3	F.4	F.5
GDP_O	2.977**	3.711**	2.493**	1.572**	0.709
	(-4.55)	*(-7.75)*	*(-4.01)*	*(-3.22)*	*(-0.55)*
GDP_D	1.546**	1.816**	0.949*	1.646**	0.506
	(3.31)	*(5.17)*	*(2.10)*	*(3.70)*	*(0.47)*
GDPCAP_O	6.042**	5.820**	5.562**	0.001	0.001
	(5.63)	*(5.53)*	*(5.20)*	*(0.01)*	*(0.01)*
GDPCAP_D	-0.296	1.226+	0.249	1.193	1.788
	(-0.53)	*(1.87)*	*(0.46)*	*(1.00)*	*(1.62)*
DIST	-0.001*	-0.003**	0.001	-0.001	-0.005
	(-2.53)	*(-6.55)*	*(-1.13)*	*(-1.55)*	*(-1.64)*
COMBRD		7.248*			0.786
		(2.46)			*(0.14)*
POP_D		0.001			0.006+
		(0.68)			*(2.06)*
TDIFF		1.828**			4.138*
		(5.02)			*(2.54)*
COMLNG		2.608			12.079*
		(0.89)			*(2.26)*
CONFLICT		-1.176			-0.760
		(-0.91)			*(-0.25)*
COMRELIG		-4.774			-5.391
		(-1.27)			*(-0.40)*
COMLR_PR			-5.609+		11.327
			(-1.95)		*(0.76)*
COMLR_PS			10.257*		-5.505
			(2.72)		*(-0.43)*
GATT_D				-2.522	0.117
				(-0.91)	*(0.16)*
FTA_MBR				-0.533	-0.298
				(-0.64)	*(-0.41)*
GSP_D				-2.670	4.878
				(-0.58)	*(1.36)*
EU_D				-0.094	-5.752
				(-0.02)	*(-0.45)*
Year dummies	Yes	Yes	Yes	Yes	Yes
N	499	499	324	324	324
F	25.80	178.68	108.61	42.70	95.36
Hansen's J	1.630	0.000	0.000	0.040	0.000
Sargan	659.75	443.17	505.63	549.49	228.79

Author's own compilations.

[7] Note: Dependent variable is *Trade in Miscellaneous Goods*. A GMM estimation model is used. T statistics in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01.

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6. Conclusions and the future of EU-Turkish relations

This article analyzes the impact of the EU-Turkey trade agreements on the bilateral trade between Turkey and its main EU and non-EU trading partners for the period 1990-2016. This effectively includes 15 EU and 5 non-EU countries, which are important trading partners to Turkey. The data on trade flows used for the analysis is drawn from the OECD trade database. The analysis is carried out for the total volume of bilateral trade as well as for the trade in each of the five different sectors: intermediate goods, consumption goods, capital goods, mixed-end goods and miscellaneous goods. A trade gravity equation is estimated using a dynamic panel GMM estimation method with lagged variables as instruments, country fixed effects and robust standard errors. This method overcomes several potential problems of endogeneity but at the cost of efficiency of estimations.

The results for the total volume of trade and the trade in the five different sectors between Turkey and its trading partners show that the standard gravity model is a conditional predictor of bilateral trade flows between Turkey and its trading partners. There are few differences in trading patterns between the different sectors. Perhaps the sectors of capital goods, mix-end and miscellaneous goods are those where the potential impact of expanded trade may be relatively greater. The level of income and the population-weighted distance between Turkey and its trading partners are robust predictors of trade volume in all sectors. The role of economic development may or may not be important, depending on several economic and non-economic conditions in Turley and its trading partners. This implies that Turkey is facing a challenge of catching up with the productive structures of its trading partners, which differ among the sectors of trade activity considered. It also implies that Turkey is facing the challenge of dealing with non-economic influences on the volume of foreign trade, institutional, social or otherwise.

A process of broadening EU-Turkey trade relations is under way. Negotiations on free-trade agreements between Turkey and its trading partners are on track. Concerning the effect of EU-Turkey trade agreements, there is evidence of a positive effect of this agreement on trade flows, driven primarily from the rise in the general level of income and less from the average level of income. This raises the issue of income distribution in Turkey and its trading partners. However, the positive effect is not as strong as it would be expected if compared with other integration processes of similar nature. Since the EU-Turkey trade relations are progressing, further analysis is warranted that takes into consideration the role of income distribution, structural change and the role of institutions in affecting foreign trade performance. Further, more work is needed on the differential impact of EU trade relations of Turkey vis-à-vis other new members in the EU that will shed more light on the nature and pace of the integration process and the ability of the trade gravity model in capturing it. The results of this paper imply that the emphasis of policy reform must be given to raising the trading partners' income growth both in absolute and relative terms, encourage adjustments in Turkey's productive structures that will speed up alignment in economic development levels; and consider the long-term unobservable influence of institutions that mitigate economic relations.

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More specifically, as regards the future course of the EU-Turkey trade relation, the following arguments cum scenarios may be tentatively contemplated. The value of trade flows between Turkey and the EU appears to have evolved in less dynamic but more stable fashion relative to that between Turkey and the non-EU sample countries. This implies that any factors that may disrupt the trade process, including political instability, are expected to more likely influence non-EU rather EU trade in either direction. Further, the fact that bilateral trade flows have become increasingly volatile implies that causes of uncertainty, including political uncertainty, exert a persistent and just a transient influence on trade flows. This shows that the EU remains a more stabilizing, albeit less dynamic, factor for Turkish trade flows. Thus, given that EU-Turkish trade flows are already high enough both partners would have a lot to lose by any future decrease in those flows. Further, to the extent that Turkish trade policy is committed to maintaining higher but also stable levels of foreign trade, a scenario of (voluntary or merely pragmatic) cooperation between EU and Turkey is more likely to occur in the coming years.

Further, most of Turkey's trade volume concentrates on intermediate goods. However, given that the share of intermediate goods traded between Turkey and its non-EU partners is higher relative to that with its EU partners, semi-processed materials are increasingly obtained from non-EU countries, which implies that either the latter have a significant cost-advantage. On the other hand, given that the share of trade on consumption and capital goods between Turkey and non-EU partners is lower relative to that with EU partners, consumer preferences in Turkey seem to favor European quality goods and businesses seem to meet their capital needs with European technological products. To the extent that Turkish trade flows are driven mainly by cost/price factors a diversion of trade against the EU may be expected, which would make a scenario of potential confrontation more likely as EU exporters, facing a loss of business, would tend to lend support to stricter EU membership policy. If, however, Turkish consumers and businesses remain strong supporters of European quality consumer and capital goods, a scenario of overall mild cooperation may actually prevail.

Moreover, it appears that the value of EU-Turkey trade will benefit more by raising income levels in Turkey than its EU trading partners. Further, trade will benefit more by implementing policies that will bring faster technological progress in Turkey, facilitate the adjustment of the composition of overall demand and help further align institutional and legal infrastructure relevant to trade. To the extent that domestic Turkish policy is committed to raising income levels and establishing more equitable income distribution in Turkey, a scenario of cooperation is more likely to occur as Turkish consumers and businesses will be better able financially to stand by their preferences for European quality goods.

Finally, the predictions of the gravity model are conditional upon a significant mitigating role of institutional factors in both the EU and Turkey. It should be expected that the role of non-economic and other institutional factors would be more pronounced over the coming years. Their overall impact on trade flows in general and between EU and Turkey in particular, will be determined by their specific effect on consumer and producer preferences and the overall composition of domestic demand. For example, while foreign direct investment is mainly EU funded,

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foreign portfolio investment is recently more strongly based on Islamic funds driven by religious and political affinity. Accounting for the institutional evolution in Turkey and its role for the level and composition of demand is a key element in the future scenario development that warrants further analysis.

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Appendices

Table A. Definition of Variables

Variable	Definition and source
TXM	Natural logarithm of total bilateral trade value, from the OECD, ISIC Rev.4
IXM	Natural logarithm of bilateral trade value in intermediate goods, from the OECD
HXM	Natural logarithm of bilateral trade value in consumption goods, from the OECD
CXM	Natural logarithm of bilateral trade value in capital goods, from the OECD
XXM	Natural logarithm of bilateral trade value in mixed-end goods, from the OECD
MXM	Natural logarithm of bilateral trade value in miscellaneous goods, from the OECD
COMBRD	Dummy variable that take the value of 1 if the two countries have common border, from the CEPII database
COMLNG	Dummy variable that take the value of 1 if the language is spoken by at least 9% of the population
DIST	Weighted distance (pop-wt,km) , from the CEPII
POP_O	Population, total (mn) , from CEPII
POP_D	Population, total (mn) , from CEPII
GDP_O	Natural logarithm of GDP (current US$) of the country of origin, from CEPII
GDP_D	Natural logarithm of GDP (current US$) of the country of destination, from CEPII
GDPCAP_O	Natural logarithm of GDP per capita (current US$) of the country of origin, from CEPII
GDPCAP_D	Natural logarithm of GDP per capita (current US$) of the country of destination, from CEPII
TDIFF	Num of hours difference between Exports and Imports, from CEPII
CONFLICT	Dummy variable that take the value of 1 if the two countries were ever in war, from CEPII
COMRELIG	Dummy variable that take the value of 1 if the two countries share common religion, from CEPII
COMLR_PR	Dummy variable that take the value of 1 if the two countries had common legal origin before transition
COMLR_PS	Dummy variable that take the value of 1 if the two countries had common legal origin after transition
GATT_D	Dummy variable that take the value of 1 if the country of destination is a GATT/WTO member, from CEPII
FTA_MBR	Dummy variable that take the value of 1 if the country is an FTA member, from Head, Mayer and Ries (2010)
GSP_D	Dummy variable that take the value of 1 if the country of destination is a donor, from CEPII
EU_D	Dummy variable that take the value of 1 if the country of destination is an EU member, from CEPII

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Table B. Bilateral trade of Turkey by sector, 1990-2015 (annual percent change)

Country	1990-2016	Total trade (Δ%)	Intermediate goods trade (Δ%)	Consumption goods trade (Δ%)	Capital goods trade (Δ%)	Mixed-end goods trade (Δ%)	Miscella-neous goods trade (Δ%)
Austria	Mean	8.4%	8.3%	5.1%	15.7%	40.0%	72.6%
	Range	66.9%	69.1%	34.3%	201.1%	362.2%	1225.0%
Belgium	Mean	9.4%	9.1%	7.1%	15.2%	26.4%	40.0%
	Range	76.7%	67.9%	47.2%	174.8%	222.3%	445.9%
Bulgaria	Mean	39.6%	31.6%	41.9%	172.0%	37.8%	120.4%
	Range	430.8%	288.4%	516.3%	3131.1%	211.5%	1614.9%
Den-mark	Mean	10.8%	11.1%	10.0%	16.3%	19.0%	1492.6%
	Range	103.3%	92.7%	77.0%	195.7%	220.2%	19477.9%
France	Mean	8.6%	8.0%	6.1%	14.3%	19.3%	31.8%
	Range	60.6%	51.7%	56.3%	167.7%	142.9%	470.3%
Germa-ny	Mean	7.7%	8.5%	4.2%	10.0%	18.3%	90.7%
	Range	64.1%	72.5%	42.0%	94.2%	188.2%	2109.9%
Greece	Mean	11.7%	10.6%	12.4%	24.4%	107.1%	23.8%
	Range	91.5%	103.9%	91.9%	300.2%	1137.9%	244.5%
Hungary	Mean	10.7%	9.7%	9.0%	36.0%	265.9%	3075.9%
	Range	77.7%	125.2%	142.2%	351.7%	4727.0%	39663.0%
Ireland	Mean	15.0%	13.3%	13.7%	44.4%	21.2%	996.8%
	Range	112.3%	134.9%	112.5%	378.1%	132.6%	12996.4%
Italy	Mean	8.7%	7.8%	9.6%	10.8%	26.4%	13.4%
	Range	80.8%	85.6%	65.4%	86.2%	355.9%	177.8%
Nether-lands	Mean	8.6%	8.0%	7.8%	12.5%	20.5%	127.5%
	Range	60.0%	54.7%	59.8%	119.1%	253.4%	2036.2%
Poland	Mean	13.7%	13.5%	14.1%	36.6%	97.9%	24535.2%
	Range	107.2%	109.8%	87.3%	293.4%	912.9%	293983.3%
Spain	Mean	13.8%	11.3%	16.6%	20.1%	48.8%	33.5%
	Range	78.5%	90.0%	99.6%	216.7%	521.4%	287.4%
Sweden	Mean	12.2%	10.6%	9.4%	18.3%	26.2%	29.0%
	Range	122.6%	78.4%	68.4%	275.1%	325.1%	218.9%
UK	Mean	10.7%	9.8%	9.4%	14.6%	23.0%	59.1%
	Range	76.0%	114.3%	46.9%	161.2%	211.4%	896.4%
Total I	Mean	12.2%	11.1%	11.3%	28.3%	52.8%	1906.9%
	Range	465.0%	305.7%	524.4%	3165.2%	4769.8%	293983.3%
China	Mean	130.1%	79.4%	563.1%	591.1%	29882.0%	955.8%
	Range	1879.9%	962.7%	9289.9%	9789.9%	487660.8%	14662.1%
Iran	Mean	15.2%	14.8%	29.5%	34.2%	1429.2%	744.8%
	Range	143.7%	155.8%	235.1%	542.1%	26338.1%	5089.2%
Japan	Mean	6.8%	6.7%	5.3%	8.9%	11.8%	4722.7%
	Range	74.7%	73.4%	75.5%	106.4%	232.4%	65077.5%
Russia	Mean	12.8%	13.7%	10.7%	16.2%	16.3%	39.7%
	Range	121.1%	136.1%	127.8%	180.2%	224.0%	393.5%
USA	Mean	8.0%	8.0%	5.1%	17.8%	10.2%	43.7%
	Range	63.8%	71.6%	43.0%	150.4%	134.0%	530.0%
Total II	Mean	27.5%	20.4%	90.0%	99.6%	4513.6%	1327.0%
	Range	1879.9%	962.7%	9336.5%	9829.5%	487688.9%	65078.3%
World	Mean	10.4%	10.0%	8.9%	12.0%	19.1%	19.3%
	Range	65.8%	69.9%	44.3%	79.4%	115.7%	212.4%

Source: OECD statistics. Trade volumes are the sum of bilateral exports and imports in total and per sector.

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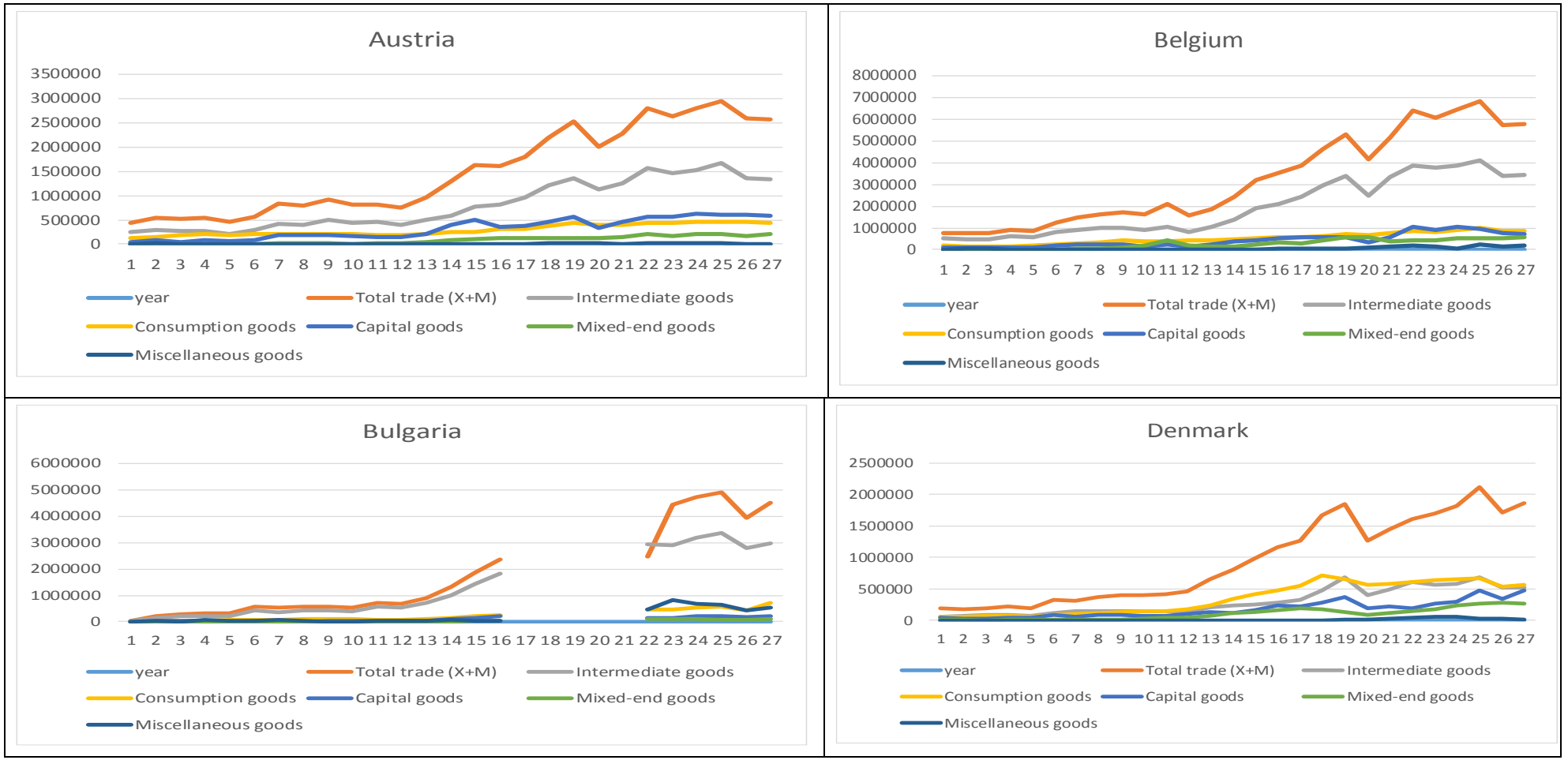
Figure A. Bilateral trade of Turkey, by country and sector, 1990-2015 (million USD)



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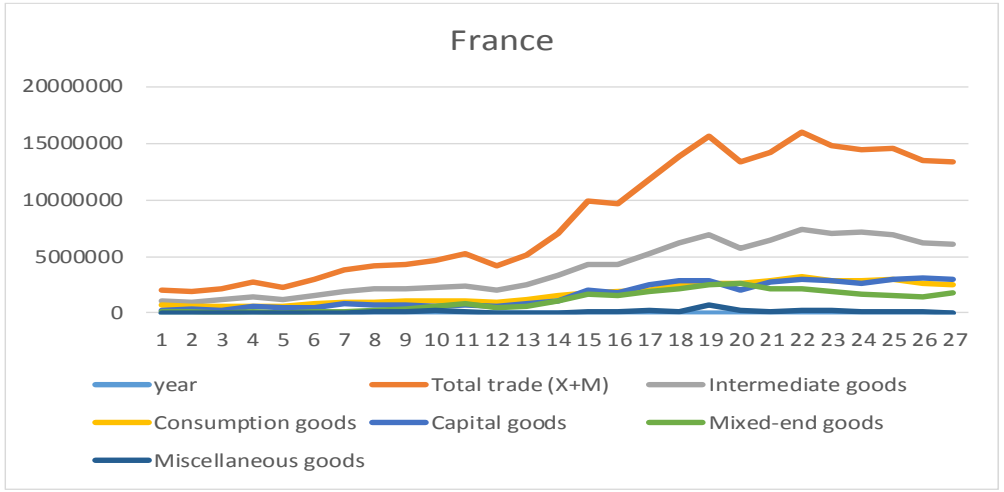

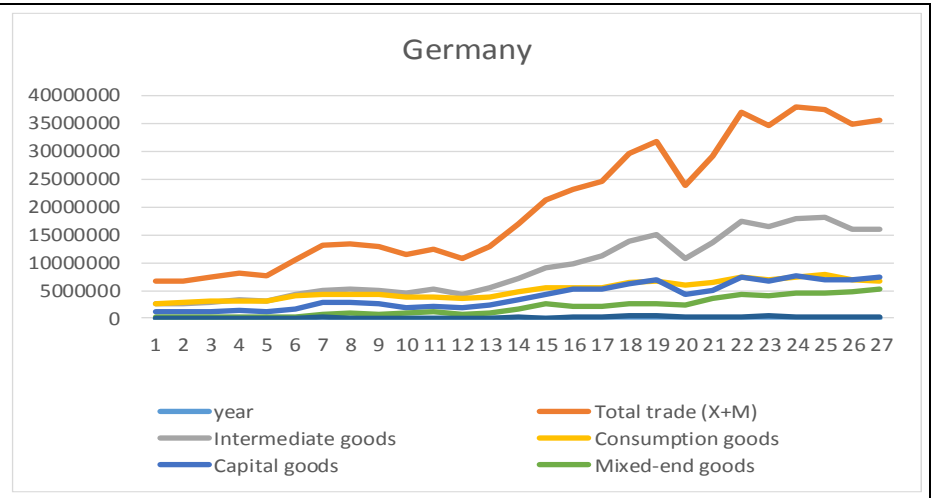

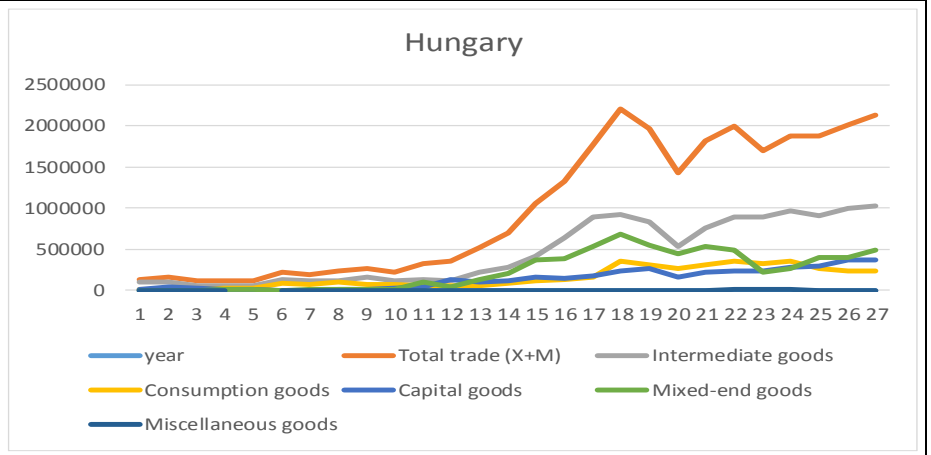

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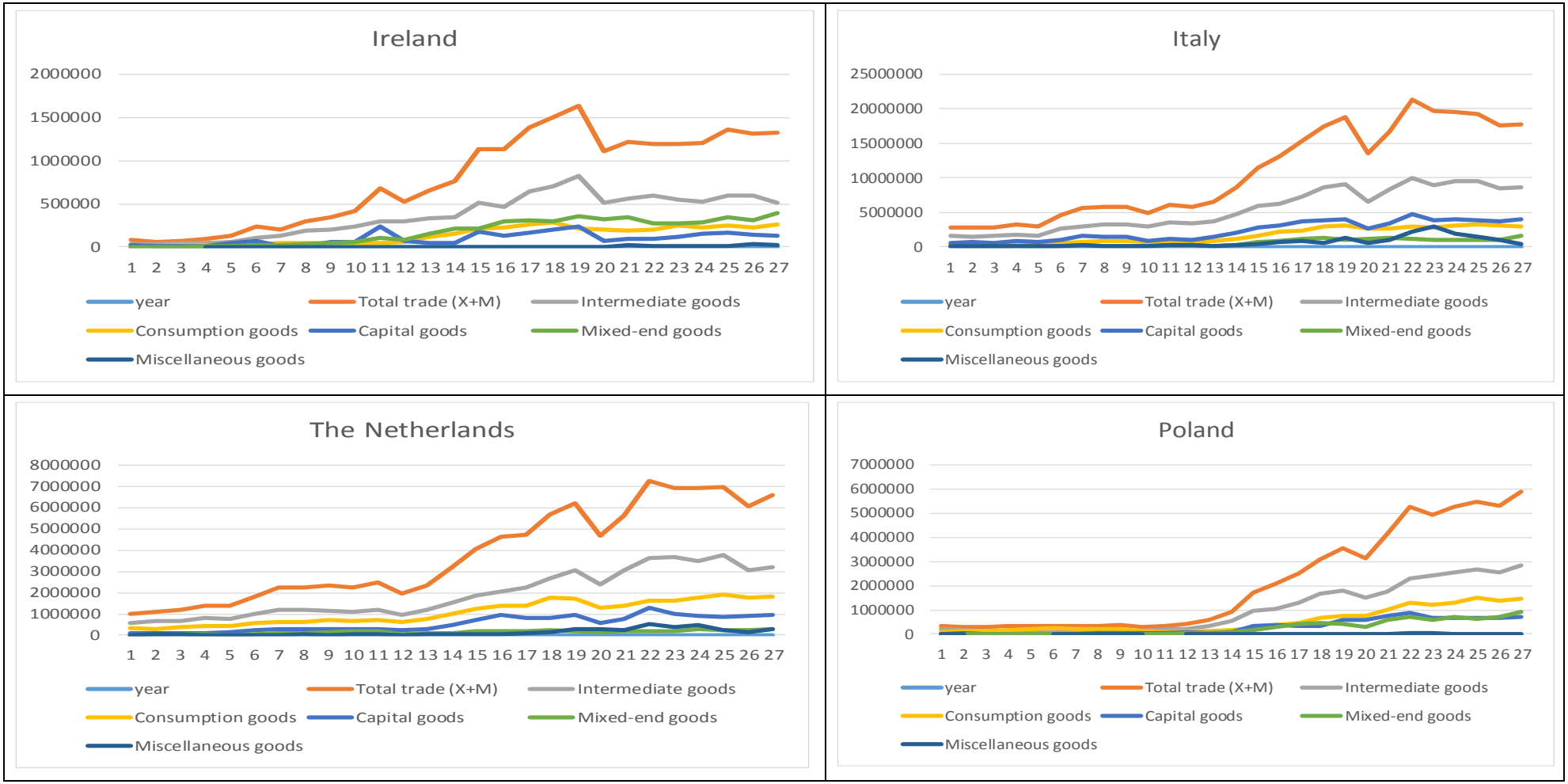

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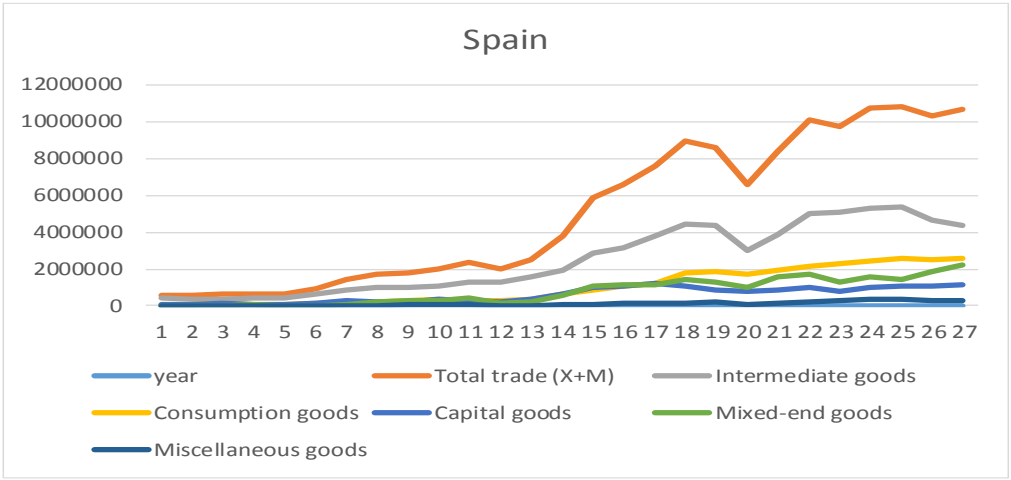

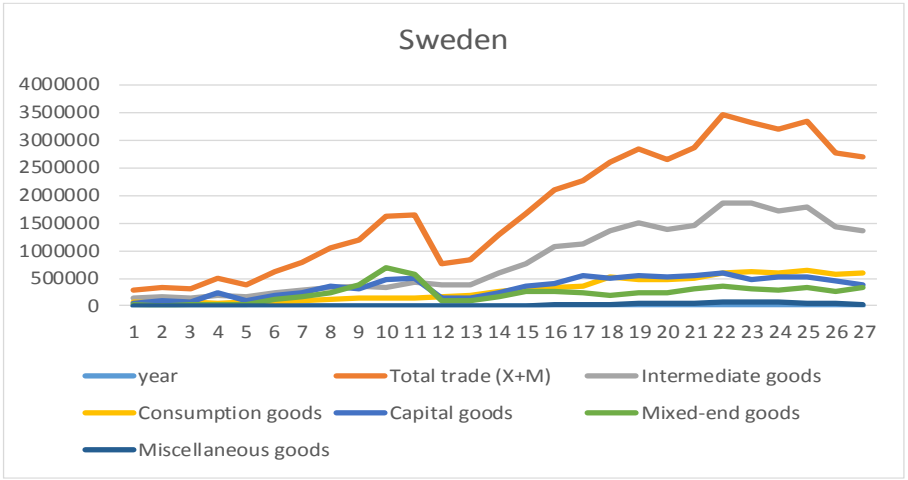

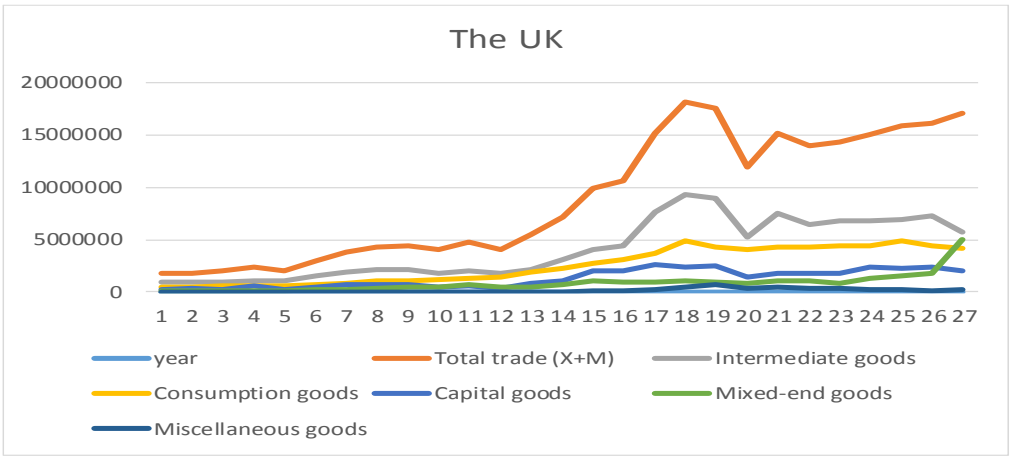

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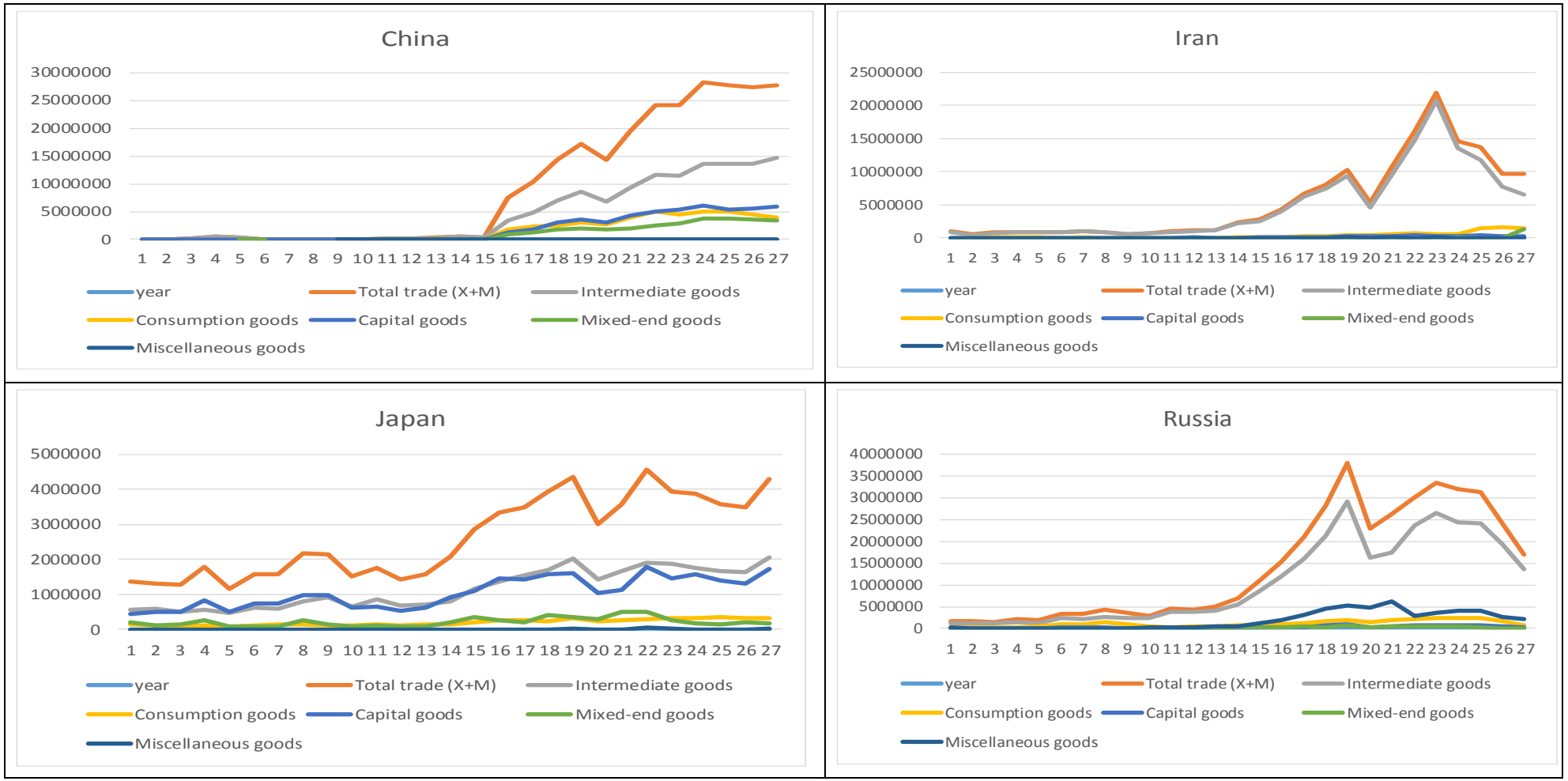

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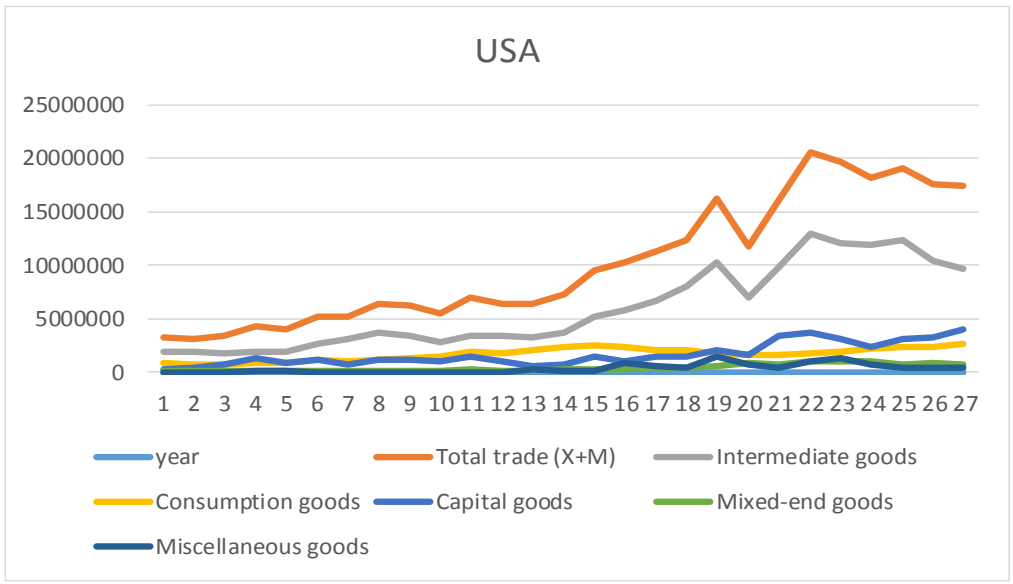

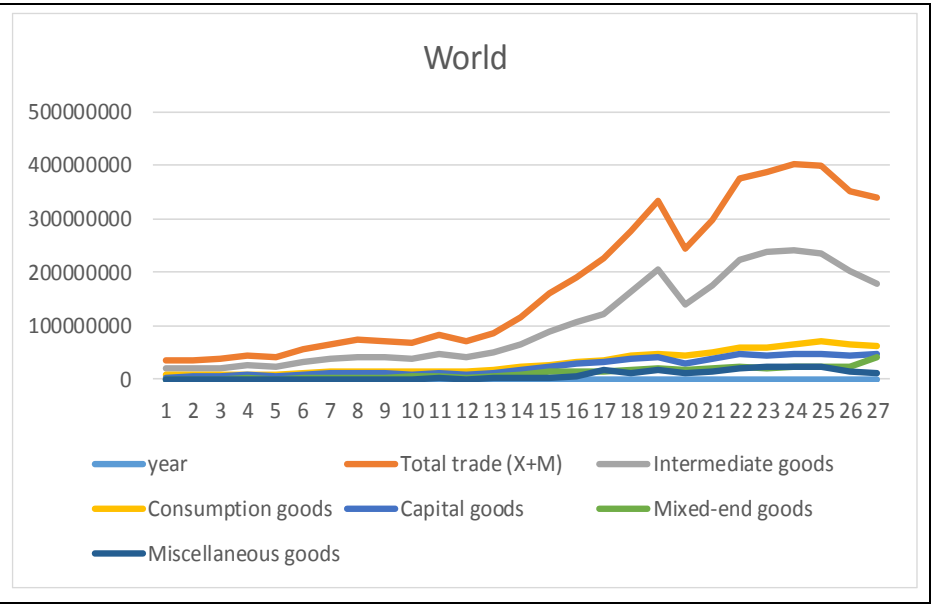

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This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 692976.

ABOUT FEUTURE

FEUTURE sets out to explore fully different options for further EU-Turkey cooperation in the next decade, including analysis of the challenges and opportunities connected with further integration of Turkey with the EU.

To do so, FEUTURE applies a comprehensive research approach with the following three main objectives:

1. Mapping the dynamics of the EU-Turkey relationship in terms of their underlying historical narratives and thematic key drivers.
2. Testing and substantiating the most likely scenario(s) for the future and assessing the implications (challenges and opportunities) these may have on the EU and Turkey, as well as the neighbourhood and the global scene.
3. Drawing policy recommendations for the EU and Turkey on the basis of a strong evidence-based foundation in the future trajectory of EU-Turkey relations.

FEUTURE is coordinated by Prof. Dr. Wolfgang Wessels, Director of the Centre for Turkey and European Union Studies at the University of Cologne and Dr. Nathalie Tocci, Director of Istituto Affari Internazionali, Rome.

The FEUTURE consortium consists of 15 renowned universities and think tanks from the EU, Turkey and the neighbourhood.

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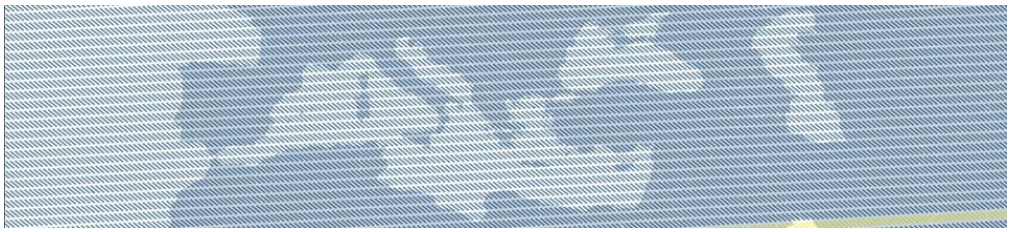

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