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## **ANALYSIS OF FOREIGN TRADE BETWEEN TURKEY AND THE BALKAN COUNTRIES WITH GRAVITY MODEL**

### **Abstract**

The aim of this paper is to analyze trade relationship between Turkey and 10 Balkan countries between 2006-2016 period by using gravity model approach. We used both export and import values between Turkey and Balkan countries as dependent variables. Our independent variables are Gross Domestic Product (GDP) (current US\$) and distance between capital cities of Turkey and other Balkan countries. It can be stated that the gravity model of trade between Turkey and Balkan countries holds for 2006 and 2016 period. That means the trade potential between Turkey and Balkan countries increases if the masses, represented by the GDP, of these countries increases. In addition to base gravity model, the other factors effecting trade between Turkey and the Balkans are examined by using dummy variables. According to the findings EU membership of Balkan countries, having common language and colonial past are influential factors on trade between Turkey and the Balkans. Study also indicates that there are unused trade potential especially between Bulgaria, Slovenia, Bosnia Herzegovina and Turkey. Utilization of this potential can provide mutual benefits for Turkey and Balkan countries.

**Keywords:** Balkan Peninsula, Foreign Trade, Trade Potential, Gravity Model, PCSE.

## TÜRKİYE VE BALKAN ÜLKELERİ ARASINDAKİ DIŞ TİCARETİN ÇEKİM MODELİ İLE ANALIZI

### Özet

Bu çalışmanın amacı Türkiye ve 10 Balkan ülkesi arasındaki ticaret ilişkisini 2006-2016 yılları arası verileri kullanarak çekim modeli yardımıyla analiz etmektir. Bu kapsamda Türkiye ile sözkonusu Balkan ülkeleri arasındaki ihracat ve ithalat değerleri bağımlı değişken olarak analize dahil edilmiştir. Çalışmamızın bağımsız değişkenleri kişi başına düşen Gayri Safi Yurtiçi Hasıla (GSYH) (cari US\$) ve Türkiye ile Balkan ülkelerinin başkentleri arasındaki uzaklıklardır. 2006-2016 yılları arası yapılan analiz sonuçlarına bakıldığında Türkiye ile Balkan ülkeleri arasındaki ticaretin açıklanmasında çekim modelinin anlamlı sonuçlar verdiği ifade edilebilir. Bunun anlamı, Türkiye ile Balkan ülkelerinin GSYH'ları ile ifade edilen kütleleri, arttığında aralarındaki ticaret de artmaktadır. Temel çekim modeline ek olarak, Türkiye ile Balkanlar arasındaki ticareti etkileyen diğer faktörleri kukla değişkenler kullanarak incelenmiştir. Bulgulara göre Balkan ülkelerinin AB üyeliği, ortak dile ve kolonyal geçmişe sahip olma, Türkiye ile Balkanlar arasındaki ticarete etkili faktörlerdir. Çalışma ayrıca Bulgaristan, Slovenya, Bosna-Hersek ile Türkiye arasında kullanılmayan bir ticaret potansiyelinin olduğuna işaret etmektedir. Bu potansiyelin değerlendirilmesi durumunda Türkiye ve Balkan ülkeleri karşılıklı olarak menfaat elde edebilecektir.

**Anahtar Kelimeler:** Balkan Yarımadası, Dış Ticaret, Ticaret Potansiyeli, Çekim Modeli, PCSE.

### 1 Introduction:

There is no universal consensus on the boundaries of the Balkan Peninsula and what are the countries that make up the Balkans in the literature. However, the Balkan border that all the geographers, historians, anthropologists and sociologists have agreed to is: the Black Sea in the east, the Aegean in the south, and the Adriatic in the west; The northern boundary of the Balkan geography, dividing it in the east-west direction of Europe's middle line, while narrowing and extending towards the southern Mediterranean, is the northern boundary of the Danube-Sava-Kupa (arbitrarily set as to the geographical characteristics) Tuna and Sava rivers (İnalçık, 2005: 23). In the geographical context, the Balkans appear to be located in the southern part of the continent

that forms the European Continent. For this reason, in some studies the Balkans are also called South East Europe. According to the Britannica Encyclopaedia and The American Heritage, the Balkans generally include Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Montenegro, Romania, Serbia and Slovenia, as are the countries constituting the Balkan peninsula. All or some part of these countries are located within the peninsula. A part of Greece and Turkey is located in the geographical region, which is generally defined as the Balkan Peninsula<sup>1</sup>. Countries in the Balkans have common economic characteristics: small open economies and are highly dependent on external financing. In the post-Cold War era, the Balkan countries seem to have accelerated their efforts to join the European Union and to integrate into the Union (Miljković, 2014:57).

The Balkans region with an area of around 500.000 km<sup>2</sup> has a population estimated at 50 millions. Geographically speaking, it has a strategic position that connects Asia to Europe. From an economic point of view, the Balkans is an underdeveloped region. Several factors such as insufficient natural resources, political and military conflicts over the centuries have contributed to this situation. At present, the region has been the center of the greatest economic and financial conflicts in the global economy since the Second World War and has faced its devastating consequences. However, this region has an important geostrategic position, as during the past centuries, the great powers (Ottoman Empire, Russian Empire and Austro-Hungarian Empire) crossed their interests. Today, the European Union has become the main international actor in this area (Radulescu , 2012: 130).

### **1. Turkey's Foreign Trade with Balkan Countries**

Despite the growing trade with the Middle East and Russia, European countries are still the most important trading partner of Turkey. In this sense, the Balkan countries together constitute an important transportation corridor for Turkey's land and air trade with the West. As it can be seen in Table 1, Turkey is one of the most important trade partners for Balkan countries. Nevertheless, Balkan countries do not seem to constitute an important part for Turkish foreign trade.

Turkey's most important trade partner in the Balkan countries is Romania which ranks 15th in exports of Turkey and 17th in Imports. While Romania exports Turkey mostly vehicles other than railway or tramway rolling stock, and parts and accessories

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<sup>1</sup> Encyclopaedia Britannica, "Balkans", (Written by: Richard J. Crampton, Loring Danford and John B. Allcock) (last Updated 3-25-2015), Retrieved November 14, 2016 from Dictionary.com website, <https://global.britannica.com/place/Balkans>- The American Heritage® New Dictionary of Cultural Literacy, Third Edition. Retrieved November 14, 2016 from Dictionary.com website, <http://www.dictionary.com/browse/balkan-peninsula>.

thereof and iron and steel products; it imports from Turkey machinery, mechanical appliances, nuclear reactors, boilers and parts thereof. Although other Balkan countries except Romania do not act as important trade partners of Turkey, the situation of Turkey for the Balkan countries is exactly the opposite. Because, Turkey is a trade partner in the top row both in imports and exports for most of the Balkan countries. For instance, Turkey is in 3rd place especially in exports of Greece and Bulgaria, on the other hand Turkey is in the third and fifth rank respectively in Albania's and Bulgaria's import. This indicates Turkey's importance for the Balkan countries' foreign trade.

**Table 1** Ranking of Turkey's Trade Partners in Balkan Peninsula (2015)

	Rank of Turkey in Countries Export	Rank of Turkey in Countries Import	Rank of Balkan Country in Turkey's Export	Rank of Balkan Country in Turkey's Import
<b>Albania</b>	7	3	70	97
<b>Bosnia Herze-govina</b>	8	8	68	60
<b>Bulgaria</b>	3	5	23	19
<b>Croatia</b>	22	18	72	77
<b>Montenegro</b>	5	9	123	124
<b>Greece</b>	3	13	26	24
<b>Romania</b>	6	9	15	17
<b>Serbia</b>	17	7	38	61
<b>Slovenia</b>	21	18	35	54
<b>TFYR of Mace-donia</b>	12	8	64	88

(Source: International Trade Centre, TRADEMAP: <http://www.trademap.org/Bilateral.aspx>)

The total imports of the Balkan countries reached 240 billion dollars in 2016 and the most important trading partners in imports were EU members. The goods that the Balkan countries most import are; raw and refined petroleum, automobiles, packed drugs, animal dyes, copper ore, vehicle parts, platinum.

Considering the export-import balance of Turkey to the Balkan countries, Turkey's exports to the Balkan countries by 2010 amounted to more than imports, but after 2010 this value began to reverse. While the total amount of exports made by the Balkan countries in 2006 was around USD 5.7 billion, in 2014 this amount increased by more than twice and reached USD 11.3 billion. However, Turkey's exports to Balkan countries was around \$ 7 billion in 2006, it reached its highest value \$ 11,5 billion in 2008. After this year, it dropped to 7.4 billion dollars in 2009 and it was 9.4 billion dollars in 2014. In Turkey's trade with the Balkan countries rate of exports meeting imports has tended to rise until 2008. This ratio, which was 1.63 in 2008, dropped to 1 in 2010 and to 0.73 in 2013 then increased to 0.83 in 2014.

Balkan countries, which have an average growth rate of 1.8 per cent between 2006 and 2016, have common economic characteristics: small open economies and are highly dependent on external financing. In the post-Cold War era, the Balkan countries seem to have accelerated their efforts to join and integrate to the European Union. (Miljković, 2014:57). The first Balkan country that became the EU member, was Greece in 1981. Especially with efforts of France at Santa Maria de Feira Summit, Zagreb Summit held in November 2000 and it is emphasized that West Balkan countries are potential candidates for EU membership (Göral, 2013: 106). Afterwards, In May 2004, the EU accepted 10 candidate countries, including Slovenia to the membership although they were inadequate to fulfill the membership criteria. According to the policies of the Union, in order to form a political union that covers the entire geographical region of Europe, the Western Balkans must be rapidly promoted to EU standards and be fully elected. With Croatia's full membership in 2013, the EU reached 28 members. Albania, Macedonia, Serbia, Bosnia and Herzegovina, Turkey and Montenegro are continuing their candidacy status and Kosovo is a possible candidate country (Ağca, 2010: 51-60).

This paper analyzes factor affecting foreign trade between Turkey and Balkan countries and examines whether there are opportunities to improve economic ties and foreign trade between Turkey and some or all Balkan countries. Rest of the paper is organized as follows: Section 2 shows some insights into the empirical studies of gravity model and the Balkan countries. Section 3 and Section 4 presents the data and methodology used in the study, respectively. Estimation results are reported and interpreted in section 5. Finally, section 6 is based on conclusions and recommendations.

## **2 Literature Review**

Studies for Balkan countries are diverse in the literature. While most of them concentrated on trade relationship with EU countries (Herderschee and Qiao, 2007;

Papazoglou, 2007; Nuroglu and Kurtagić, 2012; Fetahu, 2014), there are also many papers that analyzed intra-regional trade flows (Christie, 2001; Chionis et al., 2002; Busière et al., 2005; Gümüşcan and Kahveci, 2013; Trivic and Klimczak, 2014) Common feature of these papers is to use panel data version of gravity model as methodology. However, there is no study allowing for cross sectional dependency among them.

There are a number of studies used gravity model to explain international trade patterns of Turkey (Lejour and Mooij, 2005; Antonucci and Manzocchi, 2006; Karagöz and Saray, 2010; Genç et al., 2011; Bilici et al., 2011; Sandalcılar, 2012; Ülengin et al., 2015; Akan and Balin, 2016) but very few paper focused on Balkan countries.

Antonucci and Manzocchi (2006) applied the gravity model to Turkey's trade flows over 1967-2001 for 45 countries including EU countries. Main goal of the study is to demonstrate whether EU membership makes difference in trade relationship with Turkey. There is only Bulgaria, Greece, Romania and former Yugoslavia in the sample as Balkan countries. According to the results gravity model fits Turkey's merchandise trade, but despite the 1963 Association agreement, and the customs union launched in 1996, there is no robust evidence indicates special trade relationship with EU countries.

Karagöz and Karagöz (2009) used cross section data for 2005 and investigated Turkey's global trade potential with a large sample that consists of 169 countries. They added cultural/historical proximity, having same religion, having border and EU membership into the model as dummy variable. Results showed that cultural/historical proximity, religion and EU membership factors have significant effects on trade. In addition, Turkey's trade potential is calculated for all Balkan countries in the study. According to the calculations, while Turkey over-trades with Romania, Bulgaria, Macedonia, and Slovenia, trade remains under its potential with Montenegro, Albania Serbia, Bosnia and Herzegovina, and Greece.

Tatlıcı and Kızıltan (2011) applied gravity model on Turkey's export with 46 selected partner countries by using panel data from 1994 to 2007. Five (Bosnia and Herzegovina, Bulgaria, Greece, Romania, and Slovenia) Balkan countries are included in the sample. The explanatory variables are Turkey's and its partner countries' GDP's, populations and distances between capitals. Besides these variables, custom union membership and sharing a common border are used as dummy variables in their models. According to estimated coefficients, Turkey's and partner countries' GDP's has positive and distance among them has negative and significant coefficients. Moreover, populations of countries, custom union membership and sharing a common border show insignificant coefficient estimates.

**Table:** Studies Applied Gravity Model for Foreign Trade of Balkan Countries

<b>Author(s)</b>	<b>Focus Countries</b>	<b>Partner Countries</b>	<b>Period</b>
<b>Kurtovic and Talovic (2015a)</b>	CEFTA 2006	EU	2007-2013
<b>Bjelić and Mitrović (2012)</b>	Serbia	CEFTA 2006, EU,ABD	2001-2010
<b>Trivić and Klimczak (2014)</b>	Western Balkan (Albania, Bosnia and Herzegovina, Croatia, Macedonia and Serbia and Montenegro)	Western Balkan (Albania, Bosnia and Herzegovina, Croatia, Macedonia and Serbia and Montenegro)	1995-2012
<b>Begović (2011)</b>	CEFTA 2006 member countries (Kosovo is not included because of a lack of data)	13 countries which are the main exporting partners of the CEFTA member countries.	1999-2007
<b>Bussière et al. (2005)</b>	Central and Eastern European countries (CEECs)	61 countries (Some countries – particularly the economies in transition – enter the dataset only in the 1990s after the fall of the iron curtain and when some countries were established.	1980-2003
<b>Peci et al. (2010)</b>	Kosovo	EFTA member countries	2001-2008
<b>Sandalcılar (2012)</b>	Turkey	BRIC countries	2002-2009
<b>Ilic (2012)</b>	Serbia	40 Countries	2004-2007
<b>Chionis et.al. (2002)</b>	Greece	9 Balkan Countris	1990-

			1999
<b>Özkaya (2011)</b>	Turkey	113 partner countries	1996-2006
<b>Fetahu (2014)</b>	Albania	EU	2012
<b>Spaseski (2016)</b>	Macedonia	Main trading partners (Germany, Italy, Bulgaria, Greece, Serbia and Turkey)	2000-2013
<b>Asllani (2013)</b>	Albania	Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Slovenia, Greece, Turkey and two other major partners: Italy and Germany.	1998-2011
<b>Tatlıcı and Kızıltan (2011)</b>	Turkey	46 partner countries	1994-2007
<b>Karagöz and Karagöz (2009)</b>	Turkey	169 partner countries	2005 Cross Section
<b>Nuroglu and Kurtagić (2012)</b>	SEE (Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, and Serbia).	EU-15 (Bulgaria and Romania are not included in the EU-15)	2010
<b>Shimbov et al. (2013)</b>	Western Balkan: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro and Serbia	EU-15: (10 countries) EU-10: Bulgaria, Czech Republic, Hungary, Slovenia EFTA: Switzerland East Asia Others: Turkey	2000-2010
<b>Babecká et al. (2010)</b>	SEE (7) and the CIS (12)	82 countries	1997-2004



<b>Kurtovic and Talovic (2015b)</b>	Bosnia and Herzegovina	EU-27	2005-2013
<b>Klimczak (2014)</b>	Western Balkan countries: Albania, Bosnia and Herzegovina, Croatia, Serbia and Montenegro and Macedonia.	Western Balkan intra-regional	1995-2007
<b>Mojsoska-Blazevski and Petreski (2010)</b>	Macedonia	EU and CEFTA-2006	1999:Q1-2009:Q4.
<b>Christie (2001)</b>	SEE-7: Southeast Europe is defined as Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Romania and FR Yugoslavia. SEE-11: This group is referred to as include Slovenia and Hungary in the northwest, and Greece and Turkey in the southeast.	16 partner countries: Albania, Austria, Bosnia-Herzegovina, Bulgaria, Germany, Greece, Croatia, Hungary, Italy, Macedonia, Romania, Russia, Slovenia, Turkey, Ukraine, FR Yugoslavia	1996-1999 cross-section
<b>Herderschee and Qiao (2007)</b>	Western Balkan countries and Ukraine	EU	1990-2005
<b>Gencer (2012)</b>	Turkey	EU-2004, EXSOVIET, ISLAMIC, Asian Turkic countries	1993-2008
<b>Josheski and Apostolov (2013)</b>	Macedonia	10 Balkan countries i.e. Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Romania, Slovenia, Turkey and Serbia and Monte-	1993-2006

		negro.	
<b>Sejdini and Kraja (2014)</b>	Albania	27 partner countries (including Turkey)	1993-2012
<b>Papazoglou (2007)</b>	Greece	EU-15 and 12 major trading partners (including Turkey)	1993-2003
<b>Akan and Balin (2016)</b>	Turkey	EU-15	1980-2013
<b>Antonucci and Manzocchi (2006)</b>	Turkey	45 partner countries	1967-2001
<b>Rivero and Said (2008)</b>	Turkey	55 partner countries	1995-2005
<b>Saray and İnan (2015)</b>	Macedonia	33 partner countries: EU-27, CEFTA partners (except Kosovo) and Turkey	2004-2013

One of most important study draws our attention in the literature belongs to Özkaya (2011). His study focused on effects of bilateral and multilateral trade and economic agreements on Turkey's export. Gravity Model is tested for 113 countries between 1996 and 2006. Results show that except for bilateral agreements, customs union membership and multilateral agreements have statistically significant and positive effect on Turkey's export.

To the best of our knowledge, the only study which applied gravity model on trade between Turkey and Balkan countries carried out by Gümüştan and Kahveci (2013). They conducted gravity model and tested Linder hypothesis to estimate the bilateral trade relation between Balkan States and Turkey for the period of 2004-2011. They also added control variables such as cultural proximity, trade agreement and common border into the model. The results supported the theory of gravity model. While GDP has positive and significant effect on trade, distance has negative effect on trade flows. In addition, cultural proximity and sharing a common border with Turkey show insignificant effect.

### **3 Data and Methodology**

Traditional gravity model in economics, which relies on Newton’s Law of Gravitation, is developed independently from each other by Tinbergen (1962) and Pöyhönen (1963). In its early stages, gravity model was presented only with two variables, which can be called as push and pull factors. While push factor was measured by gross domestic products (GDP) of trading countries and was an incentive for trade between two countries, pull factor was the distance between countries and was a disincentive for trade. According to this basic form of the model, trade between two countries is proportional to the national incomes of these units and inversely proportional to the distance between them. Following the work of Tinbergen and Pöyhönen, Hans Linnemann (1966) stated that population is an additional indicator for measuring the economic size of the country. Over the time many scholars contributed to gravity model of trade literature by adding more variables in order to analyze trade activities between countries. Among these variables sharing a common border, bilateral free trade agreements, sharing a common language, common currency are the most used variables.

While there is no doubt on the theoretical model of gravity model of trade, there are some great deal of debate and discussions going for the subject of appropriate estimation technique. For the last two decades researches has begun to use panel data approach to estimate gravity model of trade. The two main reason behind this development is increasing availability of data and the improvements in the econometric estimation techniques. But most of the panel studies do not take cross sectional dependency into account which can produce biased estimates and spurious inference.

Due to the data availability, our sample restricted to with 10 trade partner countries of Turkey located in Balkan Peninsula over 2006-2016 period which generates 110 observations. These countries are Albania, Bosnia Herzegovina, Bulgaria, Croatia, Montenegro, Greece, Romania, Serbia, Slovenia and Macedonia. We used both export and import values of Turkey to Balkan countries as dependent variables of our estimated models. Data for dependent variables were taken from United Nations Commodity Trade Statistics Database. Our independent variables are GDP (current US\$) and distance between capital cities of Turkey and other Balkan countries. GDP data were taken from the World Bank and distance variable was taken from CEPII Research Center ([www.cepii.fr](http://www.cepii.fr)). We used log transformed versions of the variables in our analysis. Descriptive statistics of explanatory and dependent variables are given in Table 2.

**Table 2** Descriptive Statistics

	lo- gEXP <sub>ij</sub>	lo- gIMP <sub>ij</sub>	Log- Y <sub>i</sub>	Lo gY <sub>j</sub>	logDist <sub>ij</sub>
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<b>Mean</b>	19.96	19.05	27.38	24.25	6.61
<b>Maximum</b>	22.10	22.15	27.58	26.59	7.16
<b>Minimum</b>	15.86	11.96	27.03	21.71	6.09
<b>Std. Dev.</b>	1.29	2.06	.16	1.24	.33
<b>Number of Observations</b>	110	110	110	110	110

We also used five dummy variables,  $D_i$ , in our analysis. These dummies are proxies for common language, European Union (EU) membership, colonial history, sharing a common border and 2008 Crisis. The definitions of the variables are given below.

$D_1$ : takes the value '1' if the country shares a common border with Turkey, '0' otherwise.

$D_2$ : takes '1' if the country is a member of EU and '0' otherwise.

$D_3$ : takes '1' if common language is used and '0' otherwise common language<sup>2</sup> data are taken from <http://www.cepii.fr/cepii/>.

$D_4$ : takes "1" if the country has a colonial history with Turkey and "0" otherwise. Data are taken from <http://www.cepii.fr/cepii/>

$D_5$ : takes "1" for the year 2008 and takes "0" for other years.

Gravity model for trade is analogous to Newton's law of gravitation. According to Newton's law, gravitational force between two physical entities is proportional to the multiplication of these two entities' masses divided by the square of the distance between them. The analogy for trade is something very similar. Gravitation for trade between two countries is proportional to their masses, generally measured by GDP of each country, divided by the distance between two countries. From this point of view, McCallum (1995) and Anderson and Wincoop (2003) formalized the trade model of gravitation as follows:

$$Trade_{ij} = \alpha \frac{G_i G_j}{Distance_{ij}^2} \quad (1)$$

<sup>2</sup> Cepii data defines (Comlng) attributes a common language to a country pair if at least 20% of the population of both countries speaks the same language. <https://www.parisschoolcolonialofeconomics.eu/IMG/pdf/CEPII-PSE-paper1-060710.pdf>, s. 26.

In equation (1);  $Trade_{ij}$  is the bilateral trade between country  $i$  and  $j$ ,  $Y_i$  and  $Y_j$  stand for the magnitude of the trade partner countries and represented by GDP of each country.  $Distance_{ij}$  variable in the denominator represents the geographical distance between capital cities of country  $i$  and  $j$ .  $\alpha$  is the constant term. Following McCallum (1995) and Anderson and Wincoop (2003), we estimated two base models. By taking natural logarithms of equation (1) and organizing it with our own variables. We get the following two linear equations.

$$\log EXP_{ij} = \alpha_1 + \beta_1 \log Y_i + \beta_2 \log Y_j + \delta_1 \log Dist_{ij} + \varepsilon_1$$

(2)

$$\log IMP_{ij} = \alpha_2 + \beta_3 \log Y_i + \beta_4 \log Y_j + \delta_2 \log Dist_{ij} + \varepsilon_2$$

(3)

In equation (2) and (3),  $\log EXP_{ij}$  and  $\log IMP_{ij}$  represent the natural logarithm of exports and imports between Turkey and trade partner country, respectively.  $\log Y_i$  is the natural logarithm of GDP values of Turkey and  $\log Y_j$  corresponding country.<sup>3</sup> And finally,  $\log Dist_{ij}$  is the natural logarithm of geographical distance between capital cities of Turkey and its trade partner. In addition to our base gravity models shown in equation (2) and (3), we also estimated five extra models based on equation (2) and equation (3). These extra models are obtained by adding a dummy variable to the base models. Thus, we estimated 12 models in total. The effects of a number of factors such as sharing a common border, European Union membership, common language, Colonial link and 2008 crisis are considered to have an impact on foreign trade volume and represented with a dummy variable,  $D_i$ .

Thus, the models with a dummy variable takes the form in equation (4) and (5) below.

$$\log EXP_{ij} = \alpha_3 + \beta_4 \log Y_i + \beta_5 \log Y_j + \delta_3 \log Dist_{ij} + \theta_3 D_i + \varepsilon_1$$

(4)

$$\log IMP_{ij} = \alpha_4 + \beta_6 \log Y_i + \beta_7 \log Y_j + \delta_4 \log Dist_{ij} + \theta_4 D_i + \varepsilon_2$$

(5)

We first checked for the presence of cross sectional dependency in panel structure. Early literature assumed cross sectionally independent panel data structure but today, presence of cross sectional dependency in panel structure is likely to be a rule than an exception and ignoring cross sectional dependency can have serious consequences such as biased estimates and spurious inference (Chudik and Pesaran, 2003; Chudik et

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<sup>3</sup> There is no "zero-valued" observation in both imports and exports data.

al., 2009). We used four different cross section dependency tests namely Breusch-Pagan LM test, Pesaran scaled LM test, Bias corrected scaled LM test and Pesaran CD test in order to check for the robustness of our results.

After cross section dependency tests, we employed Modified Wald panel heteroscedasticity and Wooldridge panel autocorrelation tests. According to test results there is autocorrelation and heteroscedasticity in the series<sup>4</sup>. So we have to employ robust estimators in order to have efficient OLS estimates. There are three types of panel data estimators which allow for cross sectional dependence in the series. First method was proposed by Parks (1967) and made popular by Kmenta (1986) (Hoechle, 2007). But, this method produces unacceptably small standart errors. To mitigate this problem, Beck and Katz (1995) proposed a panel corrected standart errors (PCSE) method which can be used for small panels with cross sectional dependence. But it is shown that PCSE performs poor when N is large and T is small (Hoechle, 2007). So, Driscoll and Kraay (1998) proposed an approach which performs well for large N and small T panels with cross sectional dependency (Driscoll and Kraay; 1998). Both PCSE and Driscoll-Kraay estimators produce robust estimators to disturbances such as heteroscedasticity and autocorrelation (Hoechle, 2007). Since we have 90 observations with N=10 and T=9, which can be interpreted as small N and T. It is convenient to use Beck-Katz PCSE method to estimate gravity model between Turkey and Balkan countries. Further to that, Driscoll-Kraay estimators only produce pooled Ordinary Least Square (OLS)/Weighted Least Square (WLS) and Fixed Effect (within) estimations, not random effect estimations (Hoechle, 2007). So, inclusion of time-invariant variables such as distance between countries becomes problematic with fixed effect estimation.

Finally, we also examined the potential and actual trade between Turkey and trade partner countries. Following the study carried out by Karagöz and Karagöz (2009) we estimated potential trade volumes (P), according to our base gravity models in equation (1) and (2). Actual trade volume (A) is the actual volume of goods and services exchanged or traded between two countries in a spesific year. Batra (2004) and Ram and Prasad (2007) proposes two approaches for examination of trade potential between two countries. First approach relies on the ratio between potential (P) and actual (A) trade between two countries. If the  $P / A$  ratio is greater than 1, then trade flows between two countries are said to be below their potential. But, if  $P / A$  ratio is smaller than 1, then it can be said that the trade flows are above their potential. Second approach relies on the difference between P and A. If  $P-A$  is greater than 0 (or a positive number), than trade flows are below their potential. If  $P-A$  is a negative number,

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<sup>4</sup> Test results are available from the corresponding author upon request.

than trade flows are said to be above the potential. We employed both approaches in our analysis.

### 5 Estimation Results

Cross section dependency tests for variables and the models are given below.

**Table 3** Cross Section Dependency Tests for Variables.

	Lo- gEXPIj	logIMPIj	logYi	logYj
<b>Breusch-Pagan LM</b>	193.13*** (0,00)	211.19*** (0,00)	495.00*** (0,00)	282.24*** (0,00)
<b>Pesaran scaled LM</b>	14.56*** (0,00)	16.46*** (0,00)	46.38*** (0,00)	23.95*** (0,00)
<b>Bias Corrected scaled LM</b>	14.06*** (0,00)	15.96*** (0,00)	45.88*** (0,00)	23.45*** (0,00)
<b>Pesaran CD</b>	12.28*** (0,00)	13.55*** (0,00)	22.24*** (0,00)	14.82*** (0,00)

\*, \*\*, \*\*\* represent significance at 0,10, 0,05 and 0,01, respectively. Probabilities are in paranthesis.

**Table 4** Cross Section Dependency Tests for Models.

Model	$\log EXPI_{ij} = \alpha_1 + \beta_1 \log Y_i + \beta_2 \log Y_j + \delta_1 \log Dist_{ij} + \varepsilon_1$	$\log IMPI_{ij} = \alpha_2 + \beta_3 \log Y_i + \beta_4 \log Y_j + \delta_2 \log Dist_{ij} + \varepsilon_2$
<b>Breusch-Pagan LM</b>	147,49*** (0,00)	101,25*** (0,00)
<b>Pesaran scaled LM</b>	9,74*** (0,00)	4,87*** (0,00)
<b>Pesaran CD</b>	9,71*** (0,00)	4,28*** (0,00)

\*, \*\*, \*\*\* represent significance at 0,10, 0,05 and 0,01, respectively. Probabilities are in paranthesis.

As it can be seen from the Table 3 and Table 4 both models and our variables show cross section dependency. Since  $\log Dist_{ij}$  variable is a time invariant variable cross section dependency tests can not be carried out for this variable in Table 3.

As we stated in data and methodology section, we used two dependent variables. One is the natural logarithm of total exports of Turkey to trade partner countries ( $\log EXP_{ij}$ ) and the other one is natural logarithm of total imports of Turkey from trade partner countries ( $\log IMP_{ij}$ ). In Table 5 below, in where the dependent variable is the  $\log EXP_{ij}$ , we first show the estimation results for our base model and other four alternative models with dummy variables.

**Table 5** Panel Corrected Standart Error (PCSE) Estimation Results (Dep. Variable:  $\log EXP_{ij}$ )

	<b>Model 1</b> (Base Model) AR1	<b>Model 2</b> (Base Model+D1) AR1	<b>Model 3</b> (Base Model+D2) AR1	<b>Model 4</b> (Base Model+D3) AR1	<b>Model 5</b> (Base Model+D4) AR1	<b>Model 6</b> (Base Model+D5) AR1
<b>Constant term</b>	-16,68** (7,71)	-16,56** (7,72)	-17,06** (7,82)	-18,57*** (7,61)	-17,54*** (7,61)	-12,81 (8,76)
<b>logY<sub>i</sub></b>	0,80*** (0,28)	0,89*** (0,28)	0,80*** (0,28)	0,80*** (0,27)	0,75*** (0,27)	0,68*** (0,31)
<b>logY<sub>j</sub></b>	0,87*** (0,09)	0,79*** (0,26)	0,88*** (0,10)	0,85*** (0,28)	0,93*** (0,08)	0,85*** (0,08)
<b>LogDist<sub>ij</sub></b>	-0,98*** (0,23)	-1,02*** (0,26)	-0,97*** (0,24)	-0,65*** (0,18)	-0,94*** (0,21)	-1,00*** (0,22)
<b>D1</b>		-0,09 (0,20)				
<b>D2</b>			-0,04 (0,11)			



D3				0,94** (0,21)		
D4					0,56** (0,22)	
D5						0,07 (0,08)
R <sup>2</sup>	0,98	0,98	0,98	0,99	0,99	0,99
Observations	110	110	110	110	110	110

D1: common border, D2: EU membership, D3: Common language, D4: Colonial History, D5: Crisis \*, \*\*, \*\*\* represent significance at 0,10, 0,05 and 0,01, respectively. Robust standart errors are in paranthesis.

As it can be seen from Table 5 above  $\text{LogDist}_{ij}$  variable, which represents the distance between the capital cities of Turkey and corresponding trade partner in Balkan peninsula, is highly significant for all models and has a negative sign. Also  $\text{log}Y_i$  and  $\text{log}Y_j$  variables, which represents the masses of the countries, has a positive sign and has a high statistical significance. For Turkey's exports, coefficient of Turkey's GDP is 0.80, while coefficient of GDP of the partner countries is 0.87. The effect of the distance is negative as expected and coefficient is -0,98.

It can be asserted from these findings that exports between Turkey and Balkan countries positively proportional to their GDP's and negatively proportional to their distances. Our findings above also reveal that sharing a common border and EU membership doesn't affect exports between Turkey and Balkan countries. Instead, having colonial history and having a common language have a positive and significant effect on exports between Turkey and Balkan countries. Dummy created for 2008 crisis have positive sign but insignificant prob value. The R<sup>2</sup> values for all models for Turkey's exports are over 0.98, thus it can be said that variables used in our gravity model explains for a large part of Turkey's exports to the Balkan countries.

Results for the other dependent variable,  $\text{logIMP}_{ij}$ , are given in Table 6 below. It can be said that the results are much the same as our previous analysis.  $\text{LogDist}_{ij}$  variable is statistically very significant and has a negative sign for all five models. Also  $\text{log}Y_i$  and  $\text{log}Y_j$  variables is highly significant and has a positive sign for all models. For Turkey's imports, coefficient of Turkey's GDP is 1.22, while coefficient of GDP of the part-

ner countries is 1.21. The effect of the distance is negative as expected and coefficient is -1,61. Sharing a common border, EU membership and having a common language and colonial past affect imports between Turkey and Balkan countries. The 2008 crisis has not any significant effect on Turkey's import same as export models. For all models created for Turkey's imports, the R2 values are 0.93 and above. The variables used in our gravity models explain a large part of Turkey's imports from the Balkan countries.

From the analysis results given above in Table 5 and Table 6, we can state that the gravity model of trade between Turkey and Balkan countries holds for 2006 and 2014 period. That means the trade potential between Turkey and Balkan countries increases if the masses, represented by the GDP, of these countries increases. Or it can be stated that the richer the countries becomes, the more trade will be created.

**Table 6** Panel Corrected Standard Error (PCSE) Estimation Results (Dep. Variable:  $\log IMP_{ij}$ )

	<b>Model 1</b> (Base Model) AR1	<b>Model 2</b> (Base Model+D1) AR1	<b>Model 3</b> (Base Model+D2) AR1	<b>Model 4</b> (Base Model+D3) AR1	<b>Model 5</b> (Base Model+D4) AR1	<b>Model 6</b> (Base Model+D5) AR1
<b>Constant term</b>	-32,97** (15,61)	-35,16* (15,36)	-30,16* (15,90)	-40,57*** (15,60)	-36,32** (15,71)	-41,62*** (15,94)
<b>logY<sub>i</sub></b>	1,22*** (0,96)	1,27*** (0,56)	1,21** (0,57)	1,28** (0,57)	1,27** (0,27)	1,52*** (0,58)
<b>logY<sub>j</sub></b>	1,21** (0,57)	1,15*** (0,10)	1,08*** (0,11)	1,24*** (0,08)	1,27*** (0,09)	1,22*** (0,10)
<b>LogDist<sub>ij</sub></b>	-1,61*** (0,20)	-1,34*** (0,20)	-1,59*** (0,20)	-0,96*** (0,17)	-1,57*** (0,18)	-1,61*** (0,21)
<b>D1</b>		0,56*** (0,15)				
<b>D2</b>			0,50** (0,20)			

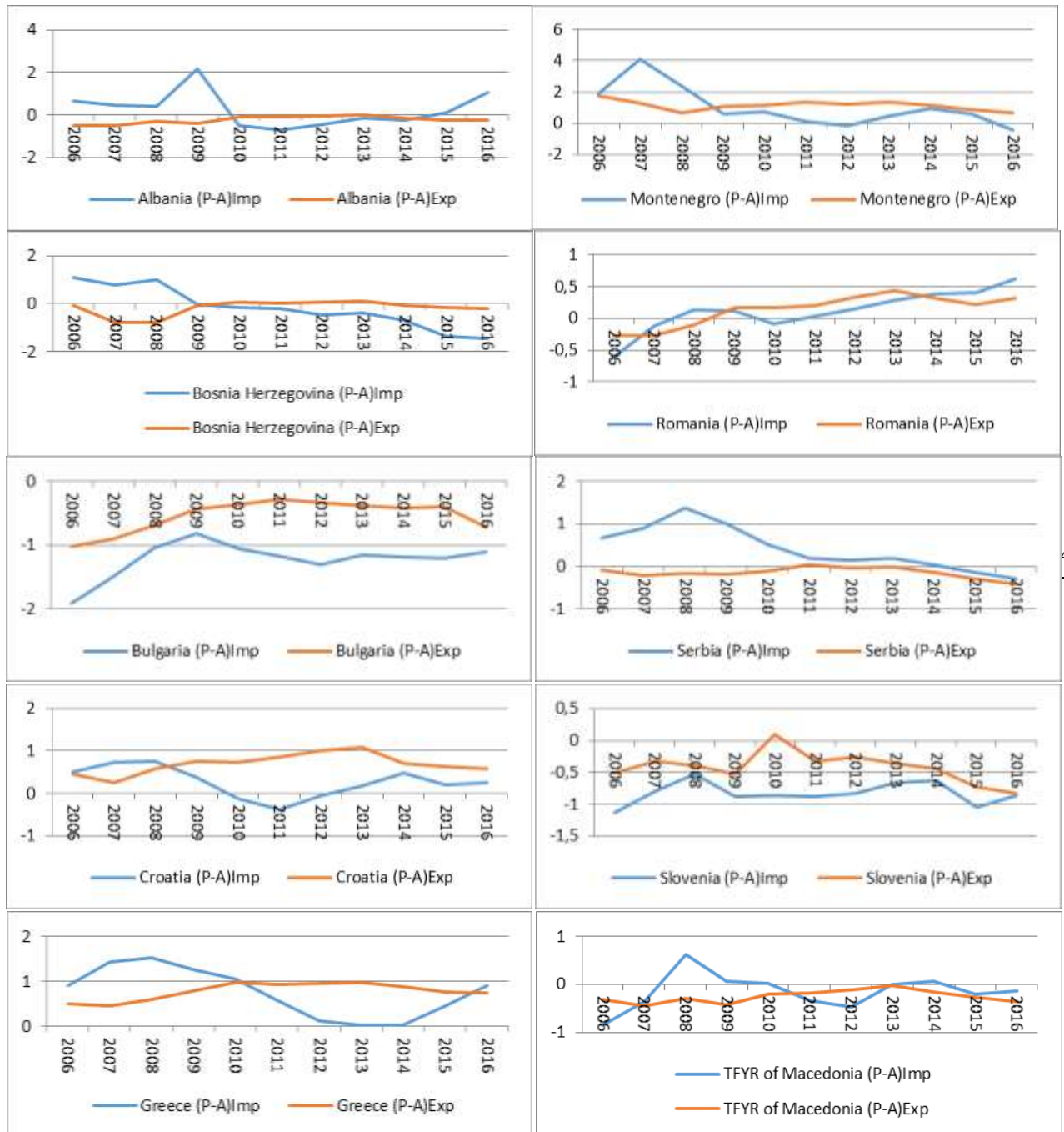
<b>D3</b>				1,74*** (0,15)		
<b>D4</b>					0,26* (0,15)	
<b>D5</b>						-0,26 (0,18)
<b>R<sup>2</sup></b>	0,93	0,93	0,93	0,94	0,93	0,94
<b>Observations</b>	110	110	110	110	110	110

D1: common border, D2: EU membership, D3: Common language, D4: Colonial history, D5: Crisis \*, \*\*, \*\*\* represent significance at 0,10, 0,05 and 0,01, respectively. Robust standart errors are in paranthesis.

The results show us that the gravity model holds for the foreigh trade relations between Turkey and Balkan countries. Foreign trade between Turkey and Balkan countries increases when Gross Domestic Product (GDP) of Turkey and corresponding Balkan country increases.

By gravity model of trade we can also analyze whether the countries are trading above or below their potential. As we have clarified in data and methodology section, potential and actual trade between Turkey and Balkan countries are examined and given in Table 7.

**Table 7** Potential and Actual Export and Import Values Between Turkey and



Balkan Countries

*P-Aexp* represents the difference between potential and actual exports between Turkey and corresponding Balkan country. Similarly, *P-Aimp* represents the difference between potential and actual imports between Turkey and corresponding Balkan co-

untry. It can be seen from the Table 7 above, both actual export and import between Turkey and Slovenia, Montenegro, Greece and Macedonia are below potential levels. The actual values of export and import can be improved to potential levels. Besides, we also show that there is some unused trade potential in terms of export especially between Bulgaria, Slovenia, Bosnia-Herzegovina. Utilization of this potential can provide mutual benefits for Turkey and Balkan countries.

## **6. Conclusions and Recommendations**

Turkey has played an important role in the Balkans for many years, both culturally and historically. In the last century, an important reason for the strong ties between Turkey and the Balkan countries is the Turkish population living in the Balkan geography. Despite the efforts of the Balkan countries to join the European Union in the post-Cold War era and to integrate into the Union, Turkey still has a great influence in the Balkans. Nevertheless, economic relations, future opportunities, expectations and cooperation between Turkey and the Balkan countries are expected to be greater than the results achieved so far. This anticipation has as much geo-strategic as economic reasons.

The aim of this paper is to analyze foreign trade relations between Turkey and 10 Balkan countries in the context of the new power balance in the global economy. For this purpose, extended gravity equations are calculated for Turkey's import and export variables. In these models, Turkey's exports and imports with the Balkan countries are considered as dependent variables separately. Base models are estimated with independent variables such as Turkey's GDP, partner's GDP and physical distance to each other. In addition, existence of the common border with Turkey and the partner country, the EU membership of the partner country, the use of Turkish in partner countries, having colonial history and 2008 crisis are used as dummy variables.

The results show that the Balkan countries' GDP and GDP of Turkey are significant and positive impacts on both exports and imports of Balkan countries consistent with the literature. The geographical distance has a negative and significant effect on both import and export models as expected and coefficients gives similar results with literature. While common language and colonial past influential variables in Turkey's exports to the Balkan countries, Turkey imports from the Balkan countries is effected positively by EU membership, common language presence and having colonial past dummy variables. The 2008 crisis has not any significant effect on export and import models. These findings are important with aspect that it shows other factors that are influential on the import and export flows between Turkey and the Balkan countries.

Turkey should pay particular attention to the commercial relations with the Balkan countries for many reasons. First of all, the Turkish market for Balkan countries is quite large. Beyond that, it is one of the fastest growing emerging market economies. In this context, it may be beneficial for Turkey to focus on the food industry, the chemical industry, the industry together with the construction industry, the metal working and textile industries, some woodworking industry sectors and other industries in order to get more shares from the Balkan market.

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