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Turkish migration to Europe: a modified gravity model analysis

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Abstract: This study specifies and applies a gravity model to provide empirical evidence on determinants of emigration from Turkey to 31 destination European countries over the period between 1960 and 2013. Results under alternative estimation strategies show that economic, demographic and cultural factors have significant influence on migration decision to the destination countries. The model has explanatory power and is useful for testing the given hypothesized determinants of migration from Turkey to 31 European countries from perspective of the country of origin.

JEL Classification: F22, F14, C33

Keywords: Migration, Gravity model, Panel data, Turkey

1 Introduction

According to the Ministry of Foreign Affairs, Turkey (2016a), more than 4.5 million Turkish people call Western European countries home today. In these societies, Turkish migrants are subjects of discussions on integration, citizenship, acculturation, etc. Moreover, Turkey's troublesome relationship with the European Union (EU) complicates these discussions as mobility and migration have become important issues in Turkey-EU relations. Irregular migrants, probability of new waves of migrations from Turkey in the event of full membership and EU's visa requirement for Turkish citizens have been fervently debated in the context of relations. The Syrian refugee crisis, on the other hand, has deepened divisions over these matters.

In this context, the Turkish government and the European Commission are working to introduce visa liberalization. Though the liberalization process had been stalled until very recently, the Syrian refugee crisis and refugees' mass movement to Turkey and to EU via Turkey has led to a change of approach from both parties. EU promised Turkey to introduce visa liberalization in return for fulfilling the necessary requirements set by the Commission. The Turkish government has been working diligently to fulfil the requirements to earn visa liberalization for its citizens. EU public opinion, however, is largely opposed. Public polls have revealed that EU citizens fear new waves of migration from Turkey (Dagdeverenis 2014).

In line with these developments and EU citizens' fears about Turkish migration, this study discusses the determinants of mobility between Turkey and EU via application of an enlarged gravity model. Though gravity models have been widely used for analysing economic issues, data limitations in migration flows have obstructed their use

regarding migration. Constitution of bilateral databases enables the use of gravity models to evaluate migration-related issues such as the effects of visa restriction policies on migration flows (Ramos 2016). We employ gravity model to acquire an intuitive framework that enables us to understand and discuss the determinants of migration between Turkey and the EU countries and their significance in making decisions regarding emigration. The gravity model applied in this study employs nine variables: (1) relative differences in GDP per capita between the destination and the origin country; (2) population in the origin and the destination country; (3) geographical distance between capital cities of origin and destination countries; (4) Urbanization Rate; (5) Contiguity; (7) Network; (8) Landlocked and (9) Area. We believe that the integration of these variables, which previously have not been examined with the already existent variables of the model, enhances the discussion of the determinants of Turkish migration to Europe and its future dynamics. The rest of the paper is organized as follows: Section 2 provides a thorough introduction of Turkish migration to Europe as well as the significance of mobility in Turkey-EU relations. This section is followed by the presentation of the enlarged gravity model, different methods of estimation employed in the analysis, variables and their hypotheses along with the data. Section 4 presents the empirical findings followed by a brief discussion. Lastly, Section 5 provides an analysis of the determinants of Turkish migration to Europe including a humble evaluation concerning the future flows.

2 Turkish migration to Europe

Turkish citizens had no significant history of large-scale emigration (Abadan-Unat 2011; İçduygu 2012a, 2012b). The basis of their large-scale movement to Europe was created by both Turkey and the Western European countries in the early 1960s (Abadan-Unat 2011; Sayarı 1986; İçduygu et al. 2009). In the late 1950s, the number of internal migrants was increasing in Turkey and the economy was not strong and industrialized enough to absorb them. At the same time, Western European economies were in a period of an economic boom that led them seek foreign labour. In this context, Turkish migrants started to migrate to Western European countries through intermediaries in the late 1950s. This period was followed by large-scale Turkish labour emigration to Western Europe through the framework of bilateral labour agreements between Turkey and the European governments (Abadan-Unat 2011; İçduygu and Sert 2009). As Kirişçi (2003a: 1) notes, the first agreement was signed between the Turkish and West German governments in 1961 and its aim was 'to provide the German economy with temporary unskilled labour, "guest workers", while thinning the ranks of Turkey's unemployed'. According to Martin (1991, p.3), the Turkish government promoted emigration to obtain remittances from Turkish workers abroad. Abadan-Unat (2011), on the other hand, points to the 1960 coup in Turkey, the impact of Berlin Wall's construction in 1961 on the Western European labour market and the adoption of the 'First Five-Year Development Plan' by Turkey in 1963 and notes that, following the agreement with West Germany, Turkish emigration to Europe entered a new phase of 'state-controlled surplus labour export'. As she explains, development planners aimed to promote industrialization in Turkey as they hypothesized that 'sending an unskilled work force abroad would secure the return of the necessary skills with which to undertake Turkey's industrialization process' (*ibid*: 12). Bilateral labour agreements with

other European governments followed this first one (İçduygu et al. 2009). In the wake of these agreements, Turkish migration to Western European countries peaked in the 1960s and in the early 1970s. According to İçduygu et al. (2009, p. 194), 790,017 Turkish workers migrated to European countries between 1961 and 1974.

Emigration from Turkey to Europe continued on the basis of family reunification and education of children (1975–1978). In the 1980s, the introduction of visas for Turkish citizens caused many Turks claim asylum in order to move to Europe (Abadan-Unat 1995, 2011; İçduygu et al. 2009). In addition to these ‘bogus asylum-seekers’, there were also genuine asylum-seekers from Turkey (Kirişçi 2003b). Many leftist Turks and Kurds sought asylum in Europe before and after the 1980 coup d’etat (Abadan-Unat 2011). The 1990s in particular was marked by the asylum applications from Turkish citizens of Kurdish origin, who due to the displacement and the violence in the southeast of the country, lodged asylum applications in European countries (Kirişçi 2003b). As shown in Fig. 1, Turkish citizens’ asylum applications decreased sharply in the 2000s.

As the number of residence permits issued for the first time in European countries is presented in Table 1, every year thousands of Turkish citizens immigrate to Europe for work, education or family reasons, while many others circulate between Turkey and European countries. As Tansel and Güngör (2003) note, Turkey ranked among the top countries sending students and skilled workers abroad. Turkish students prefer Germany, France and UK in addition to the USA (Güngör and Tansel 2008).¹

As these statistics on first permits show, on average more than 57,000 new members are added to the Turkish citizens legally present in EU-28 countries every year. According to Eurostat (2011), more than 1.8 million Turkish citizens had valid residence permits in these countries in 2014. Moreover, there are many naturalized Turks in Europe. Başer (Anti Medya TV 2014) explains that the exact number of Turkish immigrants in Europe is unknown as they might have been recorded under ethnic or religious identities. Eurostat (2011) noted that with 2.1 million persons born in Turkey, the Turkish community was the second largest foreign-born community in the EU in 2011.

As Martin (2012) notes, these migrants from Turkey are subject to two debates on migration in Europe: integration and future migration. For the first debate, it is expressed that the Turkish immigrants have had integration difficulties (Rex 2000; Thrändhardt 2000; Avcı 2006; Wets 2006; Abadan-Unat 2011; İçduygu 2011). The second debate concerning the prospect of future migration from Turkey to Europe in the event of Turkey’s full membership to the EU or via the recognition of visa

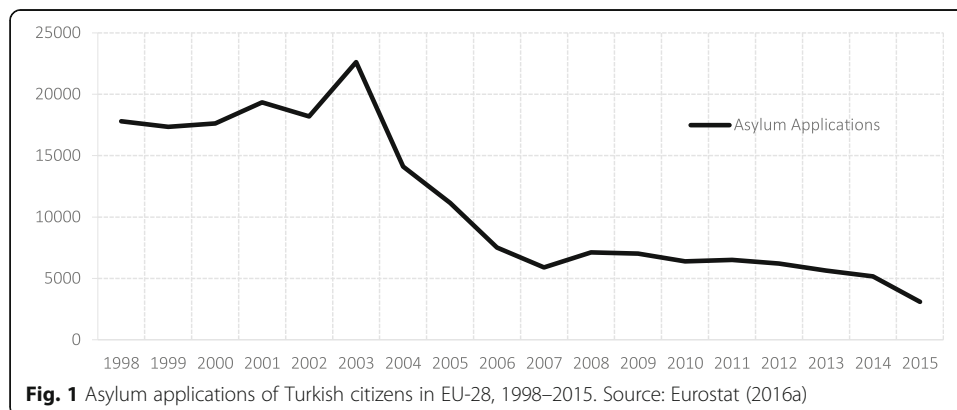


Table 1 Residence permits issued for Turkish citizens in EU-28

	2008	2009	2010	2011	2012	2013	2014
Highly skilled workers	701	694	966	709	558	605	654
Researchers	95	157	192	198	244	263	271
Seasonal workers	100	103	416	76	41	17	62
Other remunerated activities	6044	4842	4849	3985	3962	4273	3897
Education reasons	13,836	15,820	14,320	15,542	15,016	15,674	14,422
Family reasons	29,303	28,902	27,546	24,380	29,357	29,057	27,353
Other reasons	10,982	8412	7168	7206	9882	9804	11,142
Total	61,061	58,930	55,457	52,096	59,060	59,693	57,801

Source: Eurostat (2016b)

liberalization to Turkish citizens has had different dimensions that feed on the fears of the Europeans. Islamophobia and xenophobia are gaining ground in Europe, and Europeans are more concerned about the probability of new migration waves from Turkey.

Although the discussions were on membership and the restrictive transitional arrangements on free movement of labour from Turkey temporarily, the Syrian refugee crisis has altered the context of mobility from Turkey to Europe. Visa liberalization for Turkish citizens came to the fore as a result of strong bargains between the parties. Though it is not certain whether Turkish citizens will be granted the right to visa-free travel to the EU, the handling of this issue will remain controversial. Before the analysis on the determinants of the mobility between Turkey and Europe via the Gravity Models of Migration, the study discusses these different aspects of visa liberalization as well as its history in Turkey-EU relations.

2.1 EU-Europe, Turkey and mobility

In addition to the history and trends of Turkish migration to Europe, Turkey has had a troubled relationship with the EU-Europe. As a result of a long, institutionalized and a sophisticated integration process over almost 60 years, the European Union (EU) has its own migration, asylum and border policies. To manage these policies, the EU has many sophisticated tools such as a common short-term visa (the Schengen visa), various virtual databases to improve information exchange, agencies and centres, regulations and directives on different aspects of migration such as family reunification, carriers' liability, seasonal workers and sanctions for employers. These instruments help EU to filter out undesirable persons, preventing irregular migrants and individuals who might pose a risk to any one of the Member States, yet also aim to facilitate the mobility of students, academics and tourists (Genç 2013). These developments have affected Turkey and Turkish citizens negatively. Since 2001 Turkey has been on the black/negative list of countries,² nationals of whom must acquire a visa before entering EU's internal border-free Schengen Area.

Moreover, apart from this negative impact of the relevant EU policies, Turkey's rocky relationship with the EU adds another dimension to the discussion. Turkey applied to the European Economic Community (EEC) for association as early as 1959. The Ankara Agreement, which laid the terms of the association entered into force in 1963. The Ankara Agreement and the Additional Protocol of 1973 promised Turkey a

reciprocal elimination of barriers to trade, with Turkish workers acquiring free access to the EC labour market by December 1986 (Martin 1991, p. 3). However, the relations between the parties did not proceed as planned in the 1970s and 1980s.³ Rather than pressing for the free movement of workers, Turkey changed course and in 1987 applied for full EU membership, with the intention of eventually providing free movement for all Turkish citizens.⁴ Turkey was finally recognized as a candidate for full membership in 1999, and its status has not changed since.

What is more, mobility and migration have become essential issues in Turkey-EU relations in the last decade (Erzan and Kirişçi 2006; İçduygu 2011; Aydın-Düzgüt and Tocci 2015). According to İçduygu (2011), mobility and migration issues left their imprint on the membership talks for two reasons. Firstly, the increasing number of irregular migrants who entered EU through Turkey contributed to the perception that Turkey had lost control of its borders. Secondly, many politicians, who were staunch opponents of Turkey's EU membership, spoke frequently of 'EU's invasion' by the migrants from Turkey or a 'flood of Turkish nationals' in the event of full membership (Kaya and Kentel 2005; Erzan and Kirişçi 2006, 1; İçduygu 2011, p. 2). Aydın-Düzgüt and Tocci (2015: 134) note that 'the tensions generated by the EU's requirement of Schengen visas for Turkish citizens' and 'the issue of integration [...] of Turkish migrants into host EU member states' are other critical concerns that made mobility and migration a paramount issue in the membership talks.

In line with these reasons and the integration difficulties of the earlier Turkish immigrants in Europe, compounded by a rise in Islamophobia, public opinion on Turkish citizens' acquisition of the right to free movement has been negative (İçduygu 2011; Dagdeverenis 2014). It is feared that the right to free movement will trigger significant migration from Turkey to EU countries (Erzan and Kirişçi 2006). The same fear also underscores the visa liberalization talks, and Turkey's removal from the black/negative list of countries has been a contentious debate. Along with China, Russia and Ukraine, Turkey is among the top visa applicant countries (European Commission Directorate General for Migration and Home Affairs 2013a). Every year hundreds of thousands of Turks apply to EU consulates for visas and wait long hours in front of the consulates and their intermediary agencies (European Stability Initiative 2016). They spend time and huge sums of money merely to be evaluated for travel to the EU. Many applications, as many as half of them, are granted single-entry visas valid only for a few days, while more than 30,000 applications are rejected every year. The number of Schengen visa applications and refusals between 2009 and 2014 are presented in Table 2.

Table 2 Turkish citizens' Schengen visa applications and refusals

	Applications	Refusals (% of applications)
2009	484,209	–
2010	559,946	6.59
2011	624,361	5.03
2012	668,835	4.51
2013	779,464	4.68
2014	813,339	4.42
2015	900,789	3.88

Source: European Commission Directorate General for Migration and Home Affairs (2010, 2011, 2012, 2013a, 2013b, 2014, 2015)

Free or facilitated access to the EU territory has long been sought by many Turkish citizens as this would be the most tangible benefit of European integration for ordinary citizens. EU, on the other hand, assumes a rational and a pragmatic approach to the issue. Since the early 2000s, it has instrumentalised visa and visa liberalization in its migration management. It offers visa-free or facilitated access to the Schengen Area to citizens of third countries when they conclude readmission agreements with the EU. Most of these countries are either source and/or transit countries for irregular migration to the EU.⁵ Candidate countries, on the other hand, are already obliged to make their borders impermeable against irregular migrants and other undesirable persons. These countries prepare themselves for Schengen Area by complying with the EU's *acquis* on migration, borders and asylum. Their territory becomes a part of the Schengen Area once they succeed in internalizing this *acquis*.

Considering the depth of political and economic relations as well as the status of candidacy, maintenance of visa requirements for Turkish citizens has been unjust and unsustainable (Aktar 2016). In the mid-2000s, the EU was willing to negotiate visa liberalization in return for a readmission agreement. However, the Turkish side was reluctant as the officials feared that Turkey would become a buffer zone and a dumping ground for irregular migrants if they signed the readmission agreement (Bürgin 2012, 2013). Moreover, the officials thought that the EU's approach to Turkey was paradoxical—visa facilitation was considered as a tool for third countries and/or ENP members but not for future member states (Kirişçi 2008, p. 20). For all these reasons, the negotiations over visa facilitation in return for readmission agreement were interrupted in 2006. However, in January 2011, the European Commission announced that it reached an agreement with the Turkish government on the readmission of irregular migrants who had entered EU irregularly via Turkey. The text of the readmission agreement was initialled on 21 June 2012 and signed on 13 December 2013.

In parallel to the readmission agreement, EU launched the Visa Liberalisation Dialogue, based on 'the Roadmap towards a visa-free regime with Turkey', which laid out the requirements to be met by Turkey (Kirişçi 2014).⁶ During 2014 and 2015, Turkey was unable to make any progress in complying with the requirements of the Roadmap. However, the course of events in 2015—the Syrian refugee crisis and the mass movement of refugees from Turkey to EU territory—prompted the parties to approach their relationship and the issues of readmission and visa liberalization differently. They decided to re-energize the accession negotiations, activated the EU-Turkey Joint Action Plan, and Turkey committed to accelerate the fulfilment of the Visa Roadmap benchmarks, including the requirements for the EU-Turkey Readmission Agreement (European Council 2015).⁷ Following these developments and the commitments of both parties to cooperate in return for new incentives, Turkey initiated strenuous efforts to fulfil the requirements of the Roadmap for Visa Liberalization.

Following the European Commission's positive report on Turkey, on 18 March 2016, in a joint EU-Turkey statement, the EU Heads of State committed to lifting the visa requirements for Turkish citizens by the end of June 2016 if Turkey fulfilled all requirements in the roadmap. Following this statement, the readmission agreement between Turkey and the EU entered into force on 20 March 2016 and Turkey started to readmit irregular migrants (European Commission, 2016f).⁸ The European Commission released its third report on 4 May 2016 which was appeared to be another positive step.⁹

Though Turkish citizens have never been so close to acquiring visa-free access to the EU's internal border-free Schengen Area, political problems and the debates on the remaining requirements, in particular regarding anti-terror laws, have thrown another obstacle in their path.¹⁰ European and Turkish newspapers now report that the EU-Turkey visa deal is on the brink of collapse.¹¹ Yet, Turkey-EU relations never cease to surprise. The Turkish government may decide to fulfil the remaining requirements, which would earn visa liberalization for its citizens in a very short time.

These developments, deals and the discussions around them show that mobility and migration have indeed become critical and challenging issues in Turkey-EU relations, issues which will undoubtedly persist (Aydın-Düzgüt and Tocci 2015). Following this thorough introduction on Turkish migration to Europe and the significance of migration from and through Turkey to Europe, the following section introduces the gravity models, including the enlarged one with different variables, to facilitate a rigorous discussion on the determinants of Turkish migration to Europe.

3 Model, data and estimation method

International migration has many different faces—i.e. migrant workers, refugee movements, high skilled migrants, lifestyle migration, remittances, diasporas and others. This diversity cannot be captured in a single theory. Different theories, models and approaches attempt to explain and conceptualize the reasons why people migrate. King (2013, 30) notes a fundamental division between these theories and approaches: the ones that try to explain and discuss the causal processes of migration—the *initiation* of migration and those that try to understand the *perpetuation* of migration once started. As not only King (2013) but many others (Massey et al. 1999, Arango 2004, Morawska 2007, etc.) have observed, a very large part of the literature on international migration seeks to make sense of the migration between low-income and high-income countries. Migration between Turkey and Europe fits well within the parameters of these theoretical approaches from which gravity models can easily be derived.

The use of gravity models has grown considerably since Tinbergen (1962) used them for the first time to explain international trade. After Flowerdew and Salt (1979) adopted them to analyse migration, gravity models have become a widely used tool to analyse migration flows because of their relatively good performance (Fertig and Schmidt 2000; Karemera et al. 2000 or Kim and Cohen 2010). Very simply, 'following Newtonian physics, the gravity model of migration puts forth that the volume of movement between two places is directly proportional to the product of their masses (i.e. populations) and inversely proportional to the square of the distance between them' (King 2013: 12). Though simplest versions of gravity models relate migration between two countries or geographies to the relative size of the origin and destination countries and the distance between them, the ones enlarged with new variables covering various factors as well as push and pull factors, safer conditions, linguistic proximity, etc., are able to articulate a more comprehensive analysis about the migration flows between two geographies (Ramos 2016). The number of such studies based on gravity models enlarged with these kinds of new factors is increasing (Karemera et al. 2000; Beine et al. 2014; Ramos 2016).

Despite the recent attention to these models by scholars in different countries, the number of studies on empirical analysis of international migration flows from Turkey

using gravity models is very limited. Karagöz (2011) investigated whether there is a relationship between the amounts of emigrants and the volume of trade using a panel data-based augmented gravity model for the period of 2000–2005. The variables of economic size, distance of the partner country and number of Turkish emigrants were employed as covariates in order to explain the bilateral trade volume in terms of exports and imports. They found a positive and robust relationship between migration and trade with regard to Turkey. Dinçer and Muratoğlu (2014) examined the immigration to the 20 OECD countries from Turkey over the period between 1960 and 2010 using an augmented/enlarged gravity model. They found that gravity model explains the immigration to OECD countries effectively and elaborately. Their findings are consistent with the literature. Durmaz and Boz (2016) analysed the effect of emigration from Turkey to 20 European countries on trade between these countries and Turkey using augmented/enlarged gravity model over the period of 2004 to 2013. They found that migration to these countries from Turkey affects Turkish imports positively. Although these studies provide information on various aspects of emigration from Turkey to different countries, there is a lack of analysis on the influence of various factors such as economic, social, cultural and historical factors which may affect the decision to immigrate to European countries. Unlike these earlier studies, this study investigates international migration flows from Turkey to destination countries by comprising European countries through rigorous qualitative as well as empirical analysis using a gravity model to reveal different factors affecting the choice of emigration to destination countries.

As briefly explained in the previous paragraphs, the primitive/simple gravity model is specified as Eq. (1).

$$\text{Migration}_{ij} = \frac{\text{GDP}_i \cdot \text{GDP}_j}{\text{Distance}_{ij}} \quad (1)$$

If we transform the gravity model into log linear form by taking natural logarithms, we obtain Eq. (2).

$$\ln(\text{Migration}_{ij}) = \ln(\text{GDP}_i) + \ln(\text{GDP}_j) - \ln(\text{Distance}_{ij}) \quad (2)$$

Equation (2) can be easily estimated by using the regression given in Eq. (3).

$$\ln(\text{Migration}_{ijt}) = \beta_0 + \beta_1 \ln(\text{GDP}_{it}) + \beta_2 \ln(\text{GDP}_{jt}) + \beta_3 \ln(\text{Distance}_{ij}) + \varepsilon_{ijt} \quad (3)$$

Similar to the model specification of Tinbergen's gravity model of trade (Tinbergen 1962), the base gravity model of immigration includes population of the sending and destination country.

Equation (4) represents the base gravity model of migration.

$$\begin{aligned} \ln(\text{Migration}_{ijt}) = & \beta_0 + \beta_1 \ln(\text{GDP}_{it}) + \beta_2 \ln(\text{GDP}_{jt}) + \beta_3 \ln(\text{Population}_{it}) \\ & + \ln(\text{Population}_{jt}) + \beta_3 \ln(\text{Distance}_{ij}) + \varepsilon_{ijt} \end{aligned} \quad (4)$$

Besides, the most common practice in empirical analyses is augmenting/enlarging the basic gravity model to control for demographic, geographic, social, historical, cultural, economic and political factors (Gallardo-Sejas et al. 2006; Mayda 2010; Ortega and Peri 2013; Ramos and Suriñach 2013).

$$\begin{aligned} \ln(\text{Migration}_{ijt}) = & \beta_0 + \beta_1 \ln(\text{GDP}_i) + \beta_2 \ln(\text{GDP}_j) + \beta_3 \ln(\text{Population}_{it}) \\ & + \beta_4 \ln(\text{Population}_{jt}) + \beta_5 \ln(\text{Distance}_{ij}) + \beta_6 \text{Urbanization Rate}_{jt} \\ & + \beta_7 \ln(\text{Land Area}_j) + \beta_8 \text{Contiguity}_{ij} + \beta_9 \text{Community}_j + \beta_{10} \text{Landlocked}_j + \varepsilon_{ijt} \end{aligned} \quad (5)$$

In the analysis we estimate the following model specification¹²:

$$\begin{aligned} \ln(\text{Migration}_{ijt}) = & \beta_0 + \beta_1 \ln(\text{GDP}_{jt}/\text{GDP}_{it}) + \beta_2 \ln(\text{Population}_{it}) \\ & + \beta_3 \ln(\text{Population}_{jt}) + \beta_4 \ln(\text{Distance}_{ij}) + \beta_5 (\text{Urbanization Rate}_{jt}) \\ & + \beta_6 \ln(\text{Land Area}_j) + \beta_7 \text{Contiguity}_{ij} + \beta_8 \text{Community}_j \\ & + \beta_9 \text{Landlocked}_j + \varepsilon_{ijt} \end{aligned} \quad (6)$$

In Eq. (6) $\ln(\text{Migration}_{ijt})$ denotes the logarithm of the migrant stock¹³ from country i in country j at time t ; $\ln(\text{GDP}_{jt}/\text{GDP}_{it})$ represents relative differences in GDP per capita between the destination and the source country at time t .¹⁴ $\ln(\text{Population}_{it})$ and $\ln(\text{Population}_{jt})$ stand for the logarithm of the population in the source and destination countries at time t , respectively. $\ln(\text{Distance}_{ij})$ is the logarithm of geographical distance between capital cities of source and destination countries. $\text{Urbanization Rate}_{jt}$ is the urban population as a percentage of total population in the destination country. $\ln(\text{Land Area}_j)$ denotes the logarithm of the area of the destination country. Contiguity_{ij} is a dummy variable indicating whether the source and the destination country are contiguous. Community_j is a dummy variable indicating the existence of community in the destination country. Landlocked_j is a dummy variable indicating whether the destination country is landlocked or not. ε_{ijt} denotes the normally distributed random error term. Evidence from the literature review has sought to confirm the effect of various factors on migration such as (1) relative differences in GDP per capita between the destination and the origin country; (2) population in the origin and the destination country; (3) geographical distance between capital cities of origin and destination countries; (4) Urbanization Rate; (5) Area; (6) Contiguity; (7) Community; (8) Landlocked.

According to the labour market theory of immigration, a higher per capita income at sending country leads to a decrease in propensity to emigrate while a higher per capita income of destination country increases the propensity to immigrate (Ullah 2012; Ramos and Suriñach 2013). As a measure of labour market size in a country, population increase in the source country induces emigration whereas population increase in the destination country induces immigration (Lewer and Van den Berg 2008; Ramos and Suriñach 2013). Distance increases migration costs therefore migration has a negative function of distance (Praussello 2011; Ramos and Suriñach 2013). If urbanization is expected to promote economic growth as reported in Henderson (2003) and Brülhart and Sbergami (2009), it becomes a pull factor for migration. Relatively more urbanized destination countries provide greater opportunities such as wider variety of jobs available, higher standard of living, among others, which in turn increase the propensity to emigrate (Royuela 2013). The land area in destination country tends to induce migration (Ramos and Suriñach 2013, among others). Contiguity is expected to lead to higher migration flows (Kim and Cohen 2010;

Beine and Parsons 2012, among others). The size and breadth of migrant social networks are expected to affect international migration flows (Massey 1990; Massey and España 1987). The networks encourage and facilitate migration flows by providing information and assistance to potential migrants (Vandererf and Heering 1995). Being landlocked is seen as an impediment for trade and is expected to decrease trade flows (Overman et al. 2003). When either origin or destination country is landlocked, migration flows tend to decrease (Kim and Cohen 2010).¹⁵ According to the literature, the expected signs of the variables are as follows: $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 > 0, \beta_6 > 0, \beta_7 > 0, \beta_8 > 0, \beta_9 < 0$

Our panel data consists of annual data regarding the abovementioned variables of 31 European countries over the period 1960–2013. The Bilateral Migration Data are gathered from the World Bank. We completed the data with the most recent World Bank Bilateral Migration Matrix 2013. Destination Country’s Total Population, Origin Country’s Total Population, Destination Country’s GDP (PPP (constant 2011 international \$)), Origin Country’s GDP (PPP (constant 2011 international \$)) and Urban Population data are collected from World Bank. The data for Contiguity, Simple distance between capitals (capitals, km) and Landlocked are gathered from CEPII Geodist dyadic database. The data for the existence of Turkish community is collected from Eurostat. The descriptive statistics and correlations matrix is provided in Tables 3 and 4, respectively.¹⁶

In estimating gravity models using panel data, a number of issues such as computational problems, biases, treatment of missing and zero observations arise. These issues should be considered and proper estimation strategy should be adopted respectively. In the estimation, incorporating unilateral and bilateral variables in a single regression together may cause a bias. Fixed effects estimation is a consistent and robust method for estimating the panel gravity equation so it can overcome this bias (Feenstra 2002; Kandoğan 2007, 2008; Clark et al. 2007; Lewer and Van den Berg 2008; Ullah 2012). Missing or zero observations in bilateral migration flows and the treatment of these values in estimating gravity models is another issue. In gravity model literature, one of the approaches to the treatment of the missing and zero type observations in estimation is omitting those observations and running regression using the remaining observations. A second approach is applying ‘scaled’ ordinary least squares (OLS), in which prior to taking logarithms, one is added to the variable that suffers from zero or missing observations as in Eichengreen and Irwin (1995). Alternatively, the transformed specification is estimated using Tobit as in Rose (2004),

Table 3 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
$\ln(\text{Migration}_{ijt})$	217	6.419	3.974	0	14.821
$\ln(\text{GDP}_{jt}/\text{GDP}_{it})$	1261	1.352	0.746	-0.833	2.567
$\ln(\text{Population}_{it})$	1674	17.694	0.300	17.148	18.133
$\ln(\text{Population}_{jt})$	1674	15.672	1.480	12.076	18.229
Distance _{ij}	1674	7.549	0.460	6.280	8.392
Urbanization Rate _{jt}	1394	-0.379	0.201	-1.073	-0.022
$\ln(\text{Area}_j)$	1674	4.418	1.112	0.535	7.200
Contiguity _{ij}	1674	0.065	0.246	0	1
Community _j	1674	0.290	0.454	0	1
Landlocked _j	1674	0.194	0.395	0	1

This table displays the descriptive statistics for the major variables in this study

Table 4 Correlations matrix

Variable	ln(Migration) _{ijt}	ln(GDP _{ijt} /GDP _{it})	ln(Population) _{it}	ln(Population) _{ijt}	Distance _{ij}	Urbanization Rate _{it}	ln(Area _{ij})	Contiguity _{ij}	Community _{ij}	Landlocked _j
ln(Migration) _{ijt}	1.000									
ln(GDP _{ijt} /GDP _{it})	0.430	1.000								
ln(Population) _{it}	0.075	-0.109	1.000							
ln(Population) _{ijt}	0.616	-0.050	0.046	1.000						
Distance _{ij}	0.056	0.597	0.010	-0.011	1.000					
Urbanization Rate _{it}	0.370	0.547	0.066	-0.159	0.415	1.000				
ln(Area _{ij})	0.215	-0.074	0.094	0.288	-0.225	0.039	1.000			
Contiguity _{ij}	0.098	-0.321	-0.021	0.034	-0.465	0.016	-0.044	1.000		
Community _{ij}	0.734	0.470	0.015	0.418	0.256	0.387	0.324	-0.157	1.000	
Landlocked _j	0.013	0.063	0.021	-0.123	-0.100	-0.099	0.155	-0.122	0.007	1.000

Soloaga and Winters (2001). In order to take into account the abovementioned issues, we estimated the panel gravity model using four different methods namely ordinary least squares (OLS), scaled ordinary least squares (SOLS), Tobit model and fixed effects (FE), following Ullah (2012).

4 Empirical findings and discussion

The empirical results are presented in Table 5. The results indicate that emigration decision from Turkey to Europe is significantly affected by different push and pull factors.

Table 5 Panel regression estimates

ln(Migration _{ijt})	OLS	SOLS	TOBIT	FE
ln(GDP _{jt} /GDP _{it})	1.895*** (0.202)	2.090*** (0.240)	2.149*** (0.254)	2.000*** (0.249)
ln(Population _{it})	3.221*** (0.468)	3.175*** (0.616)	3.201*** (0.648)	6.242*** (1.334)
ln(Population _{jt})	1.029*** (0.113)	0.963*** (0.156)	0.985*** (0.168)	0.965*** (0.158)
Distance _{ij}	-1.498*** (0.374)	-1.985*** (0.452)	-2.064*** (0.463)	-1.958*** (0.446)
Urbanization Rate _{jt}	0.455 (0.772)	1.158 (1.271)	1.187 (1.339)	1.219 (1.256)
ln(Area _j)	-0.0445 (0.0903)	0.0313 (0.124)	0.0270 (0.134)	0.0304 (0.120)
Contiguity _{ij}	2.589*** (0.704)	2.826*** (0.751)	2.869*** (0.748)	2.784*** (0.785)
Community _j	2.612*** (0.328)	2.972*** (0.459)	2.992*** (0.473)	3.009*** (0.464)
Landlocked _j	0.317 (0.280)	0.617* (0.315)	0.659** (0.323)	0.683** (0.304)
Year 1970	-	-	-	-0.503 (0.667)
Year 1980	-	-	-	-0.795 (0.543)
Year 1990	-	-	-	-1.631*** (0.376)
Year 2000	-	-	-	-2.473*** (0.554)
Year 2010	-	-	-	-3.117*** (0.718)
Year 2013	-	-	-	-2.445*** (0.745)
Constant	-57.58*** (9.046)	-53.37*** (10.97)	-53.65*** (11.36)	-106.3*** (23.26)
Observations	154	165	165	165
R-squared	0.822	0.765	-	0.775

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The components of simple gravity equation, namely income, population and distance are significant and the sign of each variable is in line with the existent literature. The variables representing different aspects of migration display similar behavior under the different estimation methods. In general, the estimated outputs under the four alternative estimation techniques are compatible with each other. The insignificant landlocked variable under OLS technique becomes significant in the latter three estimation techniques. FE method, on the other hand, allows the incorporation of cyclical influences through time fixed effects which makes it the most relevant option.¹⁷

Results in Table 1 reveal that per capita differences in destination and origin countries affect migrant stock positively. In other words, emigration decision is positively affected by better economic opportunities. Population in origin and destination countries has positive and significant effects on immigrant stock. Furthermore, emigrants from Turkey to Europe are more likely to immigrate to destinations where the population of source country nationals is greater. Immigrant volume decreases with distance while it increases with contiguity. Though being landlocked affects migration stock positively to a certain degree, this outcome is largely irrelevant and it is not compatible with our expectations.

5 Conclusions

Unlike the Irish, Greeks or Spaniards, Turkish people had no history of large-scale labour migration before the 1960s. The legal basis of Turkish workers' migration to Europe was set up by the agreements signed between Turkish and Western European governments. Following these agreements, Turkish workers started to move to Europe in large numbers in the 1960s. Though migration from Turkey to different Western European countries started as labour migration, it now manifests characteristics of different types of migration. Turkish migrants became asylum-seekers, refugees or irregular migrants, while many others migrated via family reunification or as dependents. Many Turkish migrants and their families have become permanent elements of European societies and they have become the subject of debates concerning difficulties in integration, citizenship, acculturation, multiculturalism and more recently, radical Islam.

Turkey's troubled relationship with the European governments involved in the European integration added another complex dimension to the equation of migration from Turkey. Mobility and migration of Turkish people and transit migrants, who cross Turkey to reach Europe, have become contentious issues in Turkey-EU relations. European governments and citizens have long feared that new waves of migration from Turkey would follow full EU membership. The Turkish government, meanwhile, has feared that Turkey would turn into a buffer zone and a dumping ground for irregular migrants so, until very recently, it refused to sign the readmission agreement, which is one of the requirements for visa liberalization/facilitation. As a result, Turkish citizens cannot move freely to EU countries despite the country's deep economic, political and historical relationship with Europe.

Though both parties continue to try to cooperate, the earlier fears and other political issues pose further obstacles. Public opinion across EU countries is negative. In this context, in order to make a humble contribution to these discussions, this study analysed the past trends of Turkish migration to 31 European countries with an enlarged gravity model by employing four different methods of estimation: OLS, SOLS, Tobit Model and FE. The gravity model is enlarged with the integration of eight additional variables and tests ten hypotheses in order to ascertain the significance of these variables as determinants of the

migration flows from Turkey to these European countries. As the analysis firstly suggests, per capita differences in destination and origin countries affect volume of migrants positively, meaning that better economic conditions and opportunities in destination countries affect Turkish migrants' decision of emigration positively. Turks have chosen to migrate to those European countries which offer better economic conditions than Turkey. Secondly, populations in origin and destination countries have a positive effect on migration stocks. Thirdly, it is understood that Turks have migrated to those European countries where the population of Turkish migrants are already significant. In other words, they have chosen to migrate to the European countries which already harbor large Turkish communities. Fourthly, the analysis of the panel data on Turkish migration to Europe reveals that volume of immigration decreases with distance and conversely increases with contiguity. In other words, Turks are less likely to migrate to the EU countries farthest from Turkey. And by mistakenly taking account of the Turks in Bulgaria—autochthonous people of the region since the early thirteenth century, the analysis puts forth that Turks have chosen to migrate to those European countries with which Turkey shares a border or are in close proximity to. Although the analysis via four different methods of estimation is consistent and valid, the existence of ethnic Turks in Bulgaria obstructs the analysis and induces an incorrect proposition. As a concluding remark, we can note that, despite all the barriers to their movement, Turkish people have continued to move—indicating that they will continue to move if the economic conditions and opportunities in Turkey continue to be worse than the EU countries. If these economic conditions persist, they will move to the countries offering better prospects, where Turkish migrants already live and which are not far from their ancestral home. Though political stability has not been examined as a variable, we truly think that it also plays an important role in the migration decisions of Turks. Therefore, we may conclude by saying that unless the economic and political conditions in Turkey improve, whether in the form of asylum, labour, family or brain migration, Turks will continue to flow to the European countries.

Endnotes

¹In many cases, these students and highly skilled workers do not have any plans for return (Güngör and Tansel 2008).

²Council of the European Union, Regulation 539/2001 of 15 March 2001.

³Military ultimatum in 1971, Turkey's intervention to Cyprus in 1974, Prime Minister Bülent Ecevit's 1978 proposal to suspend Turkey's customs union obligations unilaterally for 5 years, 1980 coup affected the course of relations negatively. By 1980, Turkey was far from fulfilling its obligations for establishing a customs union with the EEC.

⁴Differently from Martin (1991), Aydın-Düzgit and Tocci (2015) note that Turkey insisted on visa liberalization on the grounds of the Ankara Agreement and 1973 Additional Protocol. The authors also refer to the 2009 Soysal Judgement of the European Court of Justice (C-228/06) and add that the ruling of the Court in this case strengthened the arguments of Turkey. Soysal Judgement was about two Turkish lorry drivers (Mehmet Soysal and Ibrahim Savatlı) who had been subject to visa restriction when entering Germany to transport goods. The Court ruled that visa obligations and/or restrictions constituted a barrier in providing services, impeded trade between Turkey and EU countries and contradicted the 1963 Ankara Association Agreement and its Additional Protocol on these grounds (European Court of Justice 2009).

⁵EU-Ukraine and EU-Moldova Visa Facilitation Agreements and Readmission Agreements entered into force in 2007; EU-Georgia in 2011 and EU-Armenia in 2014. EU-Ukraine Agreements were amended in 2013 after the conflict in the country (European Commission 2016a).

⁶The document included 72 requirements under five categories: document security, migration management, public order and security, fundamental rights and readmission of irregular migrants (European Commission 2013).

⁷The Joint Action Plan aimed to step up cooperation in managing refugee flow to the EU. In other words, Turkey would curb irregular migration flows to the EU (including that of Syrian refugees) and the EU would support Turkey's efforts with new funds and create resettlement schemes (European Commission 2015).

⁸In the period between 20 March and 9 May, Turkey readmitted 386 irregular migrants, according to the terms of the readmission agreement, 125 Syrian refugees were settled in Germany, Netherlands, Finland, Sweden and Lithuania. (Ministry of Foreign Affairs, Turkey 2016b).

⁹It noted that Turkey has been able to meet 65 of the 72 requirements (European Commission 2014, 2016c, 2016d, 2016e, Migration Watch UK 2016).

¹⁰At the time of writing (23 May 2016), the deal between Turkey for visa-free travel to Schengen Area in return for curbing irregular migration to the EU is on the brink of collapse, as President Erdoğan insisted that Turkey would not change anti-terrorism laws – one of 5 remaining requirements in the Roadmap (See The Guardian. 06/05/2016. EU-Turkey visa deal on brink as Erdoğan refuses to change terror laws. <http://www.theguardian.com/world/2016/may/06/erdogan-turkey-not-alter-anti-terror-laws-visa-free-travel-eu> (accessed 23/05/2016)).

¹¹See The Guardian, *ibid.*; The Independent, 6/5/2016. Erdogan tells EU 'we'll go our way, you go yours' over anti-terror laws. <http://www.independent.co.uk/news/world/europe/erdogan-tells-eu-well-go-our-way-you-go-yours-over-anti-terror-laws-a7017906.html> (accessed 23/5/2016) and Aktar (2016).

¹²We estimated the panel gravity model using four different methods namely ordinary least squares (OLS), scaled ordinary least squares (SOLS), Tobit model, and fixed effect (FE), following Ullah (2012).

¹³In our analysis we used migration stock data rather than flow data of migration. Studies such as Ortega and Peri (2009), Brücker and Siliverstovs (2006), Grogger and Hanson (2011), Ramos and Suriñach (2013) among others data have used stock data. Brücker and Siliverstovs (2006) argues that the analysis of stocks can be interpreted as a representation of a long-term equilibrium analysis. They argue that stock data are probably of higher quality than flow data because stocks data are based on national censuses, thus free from unambiguous net permanent moves and the undercounting of undocumented immigrants.

¹⁴Rather than including gross domestic products of source and destination country separately we add the relative differences in GDP per capita between the destination and the source country

¹⁵We expect that being landlocked has a negligible effect for Turkish migrants due to good international transportation opportunities to Europe.

¹⁶See Appendix 1 for list of countries.

¹⁷We base our results to fixed effects estimation.

Appendix 1

Table 6 List of countries

Country name	ID	Country name	ID
Austria	1	Latvia	17
Belgium	2	Lithuania	18
Bulgaria	3	Luxembourg	19
Croatia	4	Malta	20
Cyprus	5	Netherlands	21
Czech Republic	6	Norway	22
Denmark	7	Poland	23
Estonia	8	Portugal	24
Finland	9	Romania	25
France	10	Slovakia	26
Germany	11	Slovenia	27
Greece	12	Spain	28
Hungary	13	Sweden	29
Iceland	14	Switzerland	30
Ireland	15	United Kingdom	31
Italy	16		

Table 7 Variable definitions, data definitions and sources

Variable	Definition	Source
Migration _{jt}	Migration stock	World Bank
GDP _{jt}	Destination country's GDP, PPP (constant 2011 international \$)	World Bank
GDP _{it}	Origin country's GDP, PPP (constant 2011 international \$)	World Bank
Population _{it}	Origin country's total population	World Bank
Population _{jt}	Destination country's total population	World Bank
Distance _{ij}	Simple distance between capitals (capitals, km)	CEPII
Urbanization Rate _{jt}	Urbanization rate of the destination country	World Bank
Area _j	Land area of the destination country	CEPII
Contiguity _{ij}	A dummy variable indicating whether the source and the destination country are contiguous.	CEPII
Landlocked _j	A dummy variable indicating whether the destination country is landlocked or not	CEPII
Community _j	A dummy variable indicating the existence of the Turkish community in the destination country	TÜBİTAK

Table 8 Variance inflating factors

Variable	VIF	1/VIF
ln(GDP _{jt} /GDP _{it})	3.740	0.267
ln(Population _{it})	1.440	0.692
ln(Population _{jt})	1.830	0.546
Distance _{ij}	2.690	0.372
Urbanization Rate _{jt}	2.220	0.450
ln(Area _j)	3.450	0.290
Contiguity _{ij}	1.780	0.562
Community _j	2.760	0.362
Landlocked _j	1.170	0.858
Mean VIF	2.390	

To check for multicollinearity among some independent variables, we calculated variance inflation factors (VIFs) for all the independent variables in the model. The mean VIF for all variables in the model was 2.39 with a maximum of 3.74 for ln(GDP_{jt}/GDP_{it}) and a minimum of 1.17 for Landlocked

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