Migration – trade nexus revisited: Empirical evidence from Turkish emigrants in OECD countries

Kadir KARAGÖZ
Celal Bayar University of Manisa, Turkey
kkaragoz3@hotmail.com

Abstract. *In recent decades, economists seek to find the answers of two very fundamental questions "why has global trade grown, and what are the consequences of that growth?". Two answers that come to mind immediately are trade liberalisation and falling transportation costs. Another possible explanation is that trade has grown because economies have converged in economic size. A fourth source may be increased outsourcing. And as another factor the international movement of people may play a significant role on international trade. The declining cost of travel and communications has lowered information barriers and encouraged migration across national borders.*
The current paper aims at testing the impact of migration on bilateral trade in an augmented panel gravity model framework. To this end the relationship between Turkish emigrant stock in the 13 OECD countries and bilateral trade volume (imports and exports) for the years 2000-2012 was analysed. Economic size and geographical distance between trading partners were controlled. Empirical results show that there is a significant impact of migration on bilateral trade both in terms of imports and exports. On the other hand, as expected, economic size and distance have positive and negative effect respectively on trade.

Keywords: Migration, trade, Turkey, OECD countries, panel gravity model.

JEL Classification: A13, B30, D01.

1. Introduction

Migration is a typical human activity; ever since developing into modern humans we have been on the move. Today about 3% of the world's population are migrants. This ratio has remained relatively stable over the past 50 years (Özden et al., 2011). According to UN report, in 2013, the number of international migrants worldwide reached 232 million, up from 175 million in 2000 and 154 million in 1990. Between 1990 and 2000, the international migrant stock grew by an average of 1.2 per cent per year whereas the annual growth rate accelerated over the following ten year, reaching 2.3 per cent (UN-DESA, 2013).

However, in parallel with the rapid globalization process and international trade expansion during the last decades, global migrant flows, either legal or illegal, gained more momentum as well. Over the period 1960 – 2010, for example, the share of total world exports over real-domestic product (GDP) has increased by 172%, whereas human migration more than doubled. This extraordinary growth in cross-country human migration and trade did not occur only intensively (i.e. over known migration corridors), but also extensively (i.e. over new migration corridors). Over the period of 1960-2000, the number of newly-created export channels between world countries exhibited a threefold increase, whereas number new migration corridors almost doubled (Fagiolo and Mastrorillo, 2014).

People leave their home country because of various reasons. Due to (ethnic or interstate) wars, environmental degradation and environmental disasters (flood, droughts) people are forced to migrate. Indeed, it can be described as a *push* and *pull* process. On the supply side, the main push factors include demographics and the lack of adequate employment opportunities at home. The pull factors include wage differences and associated labor productivity across markets, as well as perceived quality of life and a stream of income (UNCTAD, 2009).

International trade and international migration are two key facets of globalization, which are therefore likely interconnected. Since the pioneering work of Gould (1994) and Heid and Ries (1998), ample evidence have been found revealing that larger bilateral migration networks between countries are associated with larger trade flows. At the same time recent theories of international trade that provide the theoretical underpinnings to the analysis of trade flows in the context of a gravity equation, emphasize how factors affecting the variable and fixed costs of trade between two locations would affect the volume of trade (Peri and Requena, 2009). Migrant networks have the capacity to reduce the information, communication, transaction and contracting costs between locations, and hence to promote the international trade.

Emigration is an important issue for Turkey. Today, more than 5 million Turkish nationals live in tens of different countries all around the world most of whom are permanent migrants. OECD countries are the most favorite destinations for Turkish emigrants. Most of the OECD countries besides constitute foremost bilateral trade partners of Turkey. However, economic implications of the Turkish emigrants is not sufficiently studied and addressed in the related empirical literature. So, this paper is a

modest step towards to fill this gap by focusing on the Turkish emigrants in OECD countries.

The paper is organised as follows: In the next section theoretical background and implication of migrant-related international trade flows is given. The third section was devoted to historical information about Turkish migrant flows over five decades. As the international migrant flows gained considerable momentum in recent years the imlications of international migration has been subject to vast literature both theoretically and empirically. There is a growing body of empirical works on the relationship between migration and trade as well. Some of them were cited in the fourth section. The structures of employed models and data used are described in the section five. Estimation results are also given therein. The paper ends with the conclusions.

2. Theoretical background

The economic implications of migration can appear in various channels for the host and home countries. The most prominent one is the effect on financial flows between host and home country in the form of remittances. Other phenomena are the foreign direct investment undertaken by migrants in their home countries either as part of their investment or through arrangements such as technological licensing and joint ventures (Wei and Balasubramanyam, 2006). Another possible effect is the migrants-related international trade flows.

Theoretical approaches to trade – migration nexus handle the subject either from the transaction costs or factor substitution point of view. In his seminal paper, Gould (1994) argued that trade between any two countries may be enhanced by stock of immigrants present in either countries and coming from the other one. Such a result is theoretically plausible because of both macro and micro considerations.

At the macro level, it can be argued that immigration-induced population growth increases aggregate demand and output, which – in turn – increases the demand for imports. Exports may increase as well if the presence of immigrants in export industries lowers unit production costs or if immigration enhances the international competitiveness of the host country more broadly (e.g. through greater labor mobility and lower prices). At the micro level, immigrants may be expected to have ongoing links with the home country that can help businesses in the host country to develop networks that can facilitate exporting to, or importing from, the migrant home country – *trade facilitation effect* (Genç et al., 2011). Immigrants also may well know the institutional and legal structure of their home country and their native language may help to easing communication in trading relationship. On the other hand, migrants often prefer their native goods (especially food items) from the homeland – *home preference effect*. Furthermore, they may play a significant role in marketing native goods in the host country. The gross impact of migrants on bilateral trade balance depends on the sum these two effects. Since the trade facilitation effect can affect both imports and exports, while the home preference effect only affects imports, under the assumption of *symmetric* trade facilitation effect, migrants would be more effective on imports in the host country.

Recent theoretical and empirical contributions to the trade literature have emphasized the existence of important fixed costs inherent to the process of exporting. Besides an ongoing debate on the components of those costs, negotiation costs, contracting costs or costs related to information barriers are likely to be an element (Jansen and Piermartini, 2009). Migrants may play a significant role in reducing such transactions costs due to their privileged position to provide necessary information on the host and their home country.

Another stream of theoretical approaches considers the factor mobility and tries to determine whether migration and trade are complements or substitutes. In a standard two goods, two factors trade model without trade costs, factor prices will equalize through goods trade. Hence, goods trade has the same effect as if factors could wander freely between countries. Immigration has the same impact on factor prices as trade. Hence, factor price differences between countries will trigger both trade and immigration flows, implying that trade and immigration are not statistically independent and therefore correlated (Heid, 2014). Mundell (1957) asserts that, in the Heckscher-Ohlin framework, any impediment to trade allows for factor movements across the borders and hence trade and migration are substitutes. This argument has support in the development literature where it is argued that under these circumstances sustained and equitable growth in migrant sending countries is the only effective strategy to cope with the migration pressure (Akkoyunlu and Siliverstovs, 2006).

Markusen (1983) shows that removing the original assumptions of the Heckscher-Ohlin model, trade and factor movements can be complements that is increase in the trade volume is accompanied by corresponding increase in labor mobility (Bettin and Lo Turco, 2009; Abdalla et al., 2007). In addition, there are also theoretical models which show that the relationship between migration and trade is ambiguous (Akkoyunlu and Siliverstovs, 2006). As Canavire-Bacarreza and Ehrlich (2006) pointed out, migration flows can also effect the composition of trade flows by introducing new product flows or amplifying product flows with historically low importance.

On the other hand, destination countries face a number of economic and social costs due to large migrant flows. Potential costs include; unemployment, lower wages, threats to national security, increasing cultural differences and challenges to the social peace. However, an economic analysis of migration suggests that rich countries overall benefit from immigration, including an increase and diversification of the work force. Incomes of indigenous population increase by 0.4% on average as a result (World Bank, 2006).

3. Turkish emigrant movements over recent decades

Traditionally, Turkey has been known as a country of emigration. There has been, indeed, a Turkish migrant worker phenomenon long before World War II, but it was depended on individual decisions. If development of Turkish migrant labor flow is examined, depending on global economic dynamics, three separate but partially overlapped time periods can be distinguished, namely labor migration to Western Europe (from early-

1960s to late 1970s), to Arabian countries (from mid-1970s to early 1990s), and to Russia and other former Soviet republics (from early-1990s by now).

The beginning of the Turkish labor movements dates from the bilateral agreement concluded between the Federal Republic of Germany and Turkey in 1961 with main objective of assisting the reconstruction of post-war Germany with temporary unskilled labor, "guest workers". It was expected that these workers would return to turkey with new skills and help reorient the Turkish economy from rural agriculture to industry (Kirişçi, 2003). Destination countries have been multiplied in the course of time and over 2 million Turkish workers have migrated for employment to 30 countries. Today, Germany is still by far the most important host country for Turkish emigrants with some 2 million Turks, or just under two-third of the whole Turkish community abroad and is followed by France (Köksal, 2006).

After the mid-1970s, the economic downturn in Western Europe due to oil crisis of 1973 ended the recruitment of labor from Turkey. However, Europe's recession coincided with an economic boom in the Middle East, allowing Turkish workers migrate to countries such as Libya, Saudi Arabia and Iraq. This emigration rarely involved entire families. The Turkish presence in Iraq (and to a lesser extent, other Arab countries) was reduced by the 1991 Gulf War. In the early 1990, meanwhile, after the collapse of the Soviet Union a new destination was arose for Turkish migrant workers.

The economic and political context in Turkey during the period of 1960-1980 is closely related with the trends in Turkish workers migration abroad. Although the first two of the Five Year Development Plans were reasonably successful to achieving their growth targets, they were less successful in bringing about basic structural transformation in the economy, or in distribution the gains from development to those most in need. Also, price stability was not achieved and employment generation was not sufficient (Aydaş et al., 2004). Because of these failures and in view of the inflow of savings and remittances, "export of surplus labor power" became an increasingly attractive policy to the government. The outflow of migrant workers was primarily determined by host country demand and so was subject to large fluctuations. Bilateral agreements shaped the initial stages of migratory flows. After then, migratory movements have gained their own dynamics and mechanisms quite independently.

İçduygu et al. (2001), by analyzing empirical data from Turkey, assert that a threshold of socio-economic development may lead to a higher level of migration. They also assert much has changed in Turkey since the early 1960s in both volume and type of migration, the heavy involvement of middle-level developed districts in migration continues to be significant.

In a final aspect of emigration, the last few years have witnessed an increase in the number of highly qualified professionals and university graduates moving to Europe or the CIS countries. Today, it is estimated that more than 5 million Turkish nationals living abroad, of whom about 4.5 million are in European countries, a substantial increase from 600 thousands in 1972 (Kirişçi, 2003).

4. Review of the empirical literature

There is a growing empirical literature on the relationship between migration and trade which prompted by the rapid growth in the foreign-born population in many OECD countries in recent decades. Most of the studies have been devoted to investigate the trade implication of migration from less developed or developing countries to one or a number of developed countries[1]. The studies which aim to examine the impact of emigration on trade are rather rare. The concern and content of the studies can be classified in various aspects. Some studies cover differentiated products only or all products while others discuss immigration heterogeneity or business networks. Another distinction may be made in terms of the contents of the trade variable. Some studies devoted to exploring the impact of migration on cross-border trade while others restricting to the intra-industry flows.

The studies on migration impact on trade use the methodology of gravity that has been a popular approach for estimating trade flows in general. In previous studies, several specific explanatory factors have been added in addition to the standard gravity variables, namely GDP, per capita GDP, population and distance (Canavire-Bacarreza and Ehrlich, 2006).

Ghatak and Piperakis (2007) examined the impact of immigration from Eastern European countries on the volume of UK's bilateral trade flows. By using an augmented gravity model with immigration variables, they confirm the results of the previous studies about the positive link between immigration and trade, but only for imports. It appears that preference of immigrants for home country products is strong enough to influence aggregate imports. This confirms the pro-trade effect of immigration found in Gould (1994), Head and Ries (1998), and Dunlevy and Hutchinson (1999). On the other hand they failed to establish any export-enhancing effect from Eastern European countries.

Faustino and Leitao (2008a, 2008b) test the relation between immigration and Portuguese bilateral trade using static and dynamic panel gravity models. The results show that, the stock of immigrants has a positive effect on Portuguese exports, imports and bilateral intra-industry trade. The underlying assumption is that immigration contributes to decrease the costs of transactions, which in turn promotes trade flows. Their findings do not confirm the hypothesis of a negative effect of immigration on Portuguese exports. The results also suggest that when immigrants to Portugal come from a Latin partner-country, the effects on trade are stronger than in the case of immigrants from non-Latin countries.

The findings of Blanes (2005) also confirm that the stock of immigrants in a country has appositive effect on the share of its bilateral intra-industry trade (IIT). The paper links the literature about immigration and trade about IIT determinants. The key notion here is that immigration contributes to trade transaction costs reduction and this would benefit the trade in differentiated products, i.e. IIT, more than the trade in homogenous products, i.e. inter-industry trade. He tests this hypothesis using Spanish data and departing from the models developed by E. Helpman. His results are robust to different IIT measures, estimation methods and specifications.

Using a new dataset on stock of foreign-born individuals by skill class, Felbermayr and Toubal (2008) separately quantify two channels in which international migrants contribute to bilateral trade creation. They assume that improved information affects host countries' imports and exports symmetrically, while the preference channel matters for imports only. Their findings reveal that, in line with expectations, the trade cost channel (and hence the efficiency effect) is largest with differentiated goods and for high-skilled migrants.

In a trade model which extended in differentiated goods, Iranzo and Peri (2007) analyze the joint phenomena of migration and trade in a world where countries use different skill-specific technologies and workers have different skill levels (education). In this framework they match the features of the Western European countries (EU-15) and the new eastern European members of the EU. Then they simulate the effects of freer trade and higher labor mobility between the two regions. Their findings point out even in a freer trade regime the removal of the restrictions on labor movements would benefit Europe as a whole by increasing the GNP of Eastern and Western Europe.

The existing literature gives a certain importance to the role of time and integration within the host country ethnic network. Temporary migrants can be expected to be less integrated in the host country than permanent migrants. On the other hand, their knowledge of the home country can, in generally, be expected to be more up to date. Gould (1994) conducted one of the pioneering studies on trade and immigration relationship with a special emphasis on duration. He found that imports increase with immigrant volume at a decreasing rate over time, whereas for exports it takes several years to increase. Herander and Saavedra (2005) also found that the average length of stay of a migrant in the host country positively affects the exports. In a recent paper, Jansen and Piermartini (2009) investigated whether temporary migrants, like permanent migrants, have an impact on bilateral trade flows. Their empirical results show that temporary migrants have a role complementary to that of permanent migrants in promoting trade. They found that a 10 per cent increase in the number of temporary migrants from a country increases US exports to that country by 1 to 2.3 per cent and US imports from that country by 1 to 3.5 per cent. They also found that temporary migrants have a stronger impact than permanent migrants on both exports and imports and their results fall in the upper range of previous estimates on the impact of (permanent) migration on trade. Additionally, their findings confirm that temporary migrants have a more important role in reducing transaction costs for differentiated than for homogeneous goods.

The works in which migration – trade nexus has been handled for the case of Turkey are quite scarce. Karagöz (2010) studied this relationship for Turkish emigrants in a set of 24 countries for the period 2000 – 2005. Results of his analysis suggest that size of the host countries which denoted by GDP, population and per capita GDP separately, has an extending effect on bilateral trade volume whatever the trade indicator, *i.e.* exports, imports and total trade. Only exception is the effect of per capita GDP on total trade. Number of Turkish emigrants in sampled countries seems to have a positive impact on bilateral trade. In each model the coefficients are positive and statistically significant.

European countries are the main trade partners of Turkey and main migration destinations as well. In another study, İnsel and Çakmak (2010) investigated the relation between emigration and bilateral trade, focusing on Turkey as a sending country and her main trading partners in Western Europe. Using fixed effects panel data model, they conclude that migration to the European countries increases the exports from and imports to Turkey, the results which indicate the validation of both the preferences and network channel hypotheses.

On the other hand, Parsons (2012) casts a suspicion on the strong trade enhancing effect of migration by focusing on unobserved factors which may be driving this relationship. He re-examines the trade-migration nexus using a panel spanning several decades, which comprises the majority of world trade and migration in every decade. First the findings common to the literature are reproduced. Then he uses country-pair fixed effects to account for unobserved bilateral factors, the implementation of which removes all of the positive impact of migration on trade. So, unobserved factors, a leading candidate for which it is argued is international bilateral ties, are on average strongly and positively correlated with migrant networks. At the end of the analysis, he concludes that the results demonstrate the large biases inherent in cross-sectional studies investigating the trade-migration nexus and highlight the extent to which previous results have been overstated.

5. Empirical analysis

5.1. Variables, data and method

To test the said relationship gravity model framework has been adopted which is considered to be one of the most successful models explaining trade flows between countries, as evidenced by its extensive using in the literature. It derives its success from the facts that it is well-founded on theoretical foundations, it is applicable to a wide range of specifications, it is robust over time, and since it can be derived from almost all plausible trade models, it can be used to illustrate the empirical patterns of bilateral trade (Abdalla et al., 2007).

As mentioned in the second section, since the impact of emigration on trade may differ in terms of import and export, it would be more convenient to investigate the relationship with regard to import and export separately. Therefore, following this way, we examined the impact of emigration on exports, imports and total foreign trade volume separately. To this end, the model has been augmented by adding the emigrant stock variable, besides the core variables of a gravity model like economic size and distance.

In order to represent the countries' economic size, abiding by the general application, GDP and population volume have been used. As an alternative measure per capita GDP, which is frequently used in gravity models, has been employed in a different model specification instead of GDP and population. The assumption behind this choice is that wealthy countries are more open to international trade and per capita income is better indicator for this purpose.

In the related literature, migration-trade nexus has been implemented in terms of both the emigrants (Min, 1990; Canavire-Bacarreza and Ehrlich, 2006; Karayil, 2007) and the immigrants (Ghatak ve Piperakis, 2007; Blanes, 2005; Lung, 2008; Girma ve Yu, 2002; Head ve Ries, 1998; Bruder, 2004; Tai, 2009). In this paper, the amount of the citizens of the Republic of Turkey which are abroad for various purposes is used to indicate the stock of emigrants.

Accordingly, the alternative models which are subject to estimation can be expressed as follows:

$$LEXP_{it} = \alpha_{10} + \alpha_{11}LGDP_{it} + \alpha_{12}LGDPTr_{it} + \alpha_{13}LPOP_{it} + \alpha_{14}LPOPTr_{it} + \alpha_{15}LDIST_{it} + \alpha_{16}LMS_{it} + \epsilon_{1it} \tag{1}$$

$$LEXP_{it} = \alpha_{20} + \alpha_{21}LPCGDP_{it} + \alpha_{21}LPCGDPTr_{it} + \alpha_{22}LDIST_{it} + \alpha_{23}LMS_{it} + \epsilon_{2it} \tag{2}$$

$$LIMP_{it} = \beta_{10} + \beta_{11}LGDP_{it} + \beta_{12}LGDPTr_{it} + \beta_{13}LPOP_{it} + \beta_{14}LPOPTr_{it} + \beta_{15}LDIST_{it} + \beta_{16}LMS_{it} + \epsilon_{3it} \tag{3}$$

$$LIMP_{it} = \beta_{20} + \beta_{21}LPCGDP_{it} + \beta_{22}LPCGDPTr_{it} + \beta_{23}LDIST_{it} + \beta_{24}LMS_{it} + \epsilon_{4it} \tag{4}$$

$$LTBT_{it} = \gamma_{10} + \gamma_{11}LGDP_{it} + \gamma_{12}LGDPTr_{it} + \gamma_{13}LPOP_{it} + \gamma_{14}LPOPTr_{it} + \gamma_{15}LDIST_{it} + \gamma_{16}LMS_{it} + \epsilon_{5it} \tag{5}$$

$$LTBT_{it} = \gamma_{20} + \gamma_{21}LPCGDP_{it} + \gamma_{22}LPCGDPTr_{it} + \gamma_{23}LDIST_{it} + \gamma_{24}LMS_{it} + \epsilon_{6it} \tag{6}$$

where, EXP_{it} denotes the volume of exports from Turkey to country *i* in year *t* (million USD),
IMP_{it} denotes the volume of imports from country *i* to Turkey in year *t* (million USD),
TBT_{it} denotes the volume of total bilateral trade ($EXP_{it} + IMP_{it}$) between Turkey and country *i* in year *t* (million USD),
GDP_{it} denotes the GDP of country *i* in year *t* (million USD),
$GDPTr_{it}$ denotes the GDP of Turkey across country *i* in year *t* (million USD),
$PCGDP_{it}$ denotes the per capita GDP of country *i* in year *t* (USD),
$PCGDPTr_{it}$ denotes the per capita GDP of Turkey across country *i* in year *t* (USD)
POP_{it} denotes the population of country *i* in year *t* (thousand person),
$POPTr_{it}$ denotes the population of Turkey across country *i* in year *t* (thousand person)
$DIST_{it}$ denotes the population weighted distance between the capital of country *i* and the Turkey's capital Ankara (km)
MS_{it} denotes the volume of Turkish migrant stock in country *i* in year *t* (thousand person)
L denotes the logarithmic transformation

For the sake of convenience, we will call each of the models 1, 3 and 5 as long model (LM), whereas each of the models 2, 4 and 6 are called as short model (SM).

The set of explanatory variables included in the models is similar to the variables included in the previous literature using the gravity type trade model. Some augmenting covariates however have been excluded which control for shared colonial history, common language, religious similarity, cultural proximity so forth. This is because Turkey has no colonial history, and has no socio-cultural similarity with the sampled

countries which renders these variables irrelevant. So the only augmenting variable is Turkish emigrant stock.

As a result of linearization, all variables are used in their logarithmic form. For the 15 OECD countries in which the Turkish emigrants are settled down regardless of whether temporarily or permanently, data have been used for the years 2000-2012, *i.e.* 195 observations totally[2]. In the choice of the sampled countries data availability played a restrictive role. Migrant data cover the workers those settled down abroad permanently or temporarily as well as the Turkish citizens who are being abroad for other purposes (trade, education, official mission etc.). Necessary data have been derived from various databases. Trade statistics has been gathered from the Turkish Statistical Institution, GDP, per capita GDP and population data from the World Bank's WDI, and the migrant's data from OECD's online database. Weighted distances have been gathered from the CEPII[3].

CEPII calculated two distance variables following the great circle formula, which use latitudes and longitudes of the most important cities (*dist*) and capitals cities (*distcap*). Furthermore, two other weighted measures of distance are also proposed to assess the geographic distribution of population (in 2004) inside each nation. The idea is to calculate distance between two countries based on bilateral distances between the biggest cities of those two countries, those inter-city distances being weighted by the share of the city in the overall country's population.

$$d_{ij} = \left(\sum_{k \in i} (pop_k/pop_i) \sum_{l \in j} (pop_l/pop_j) \, d_{kl}^{\theta} \right)^{1/\theta}$$

where, pop_k denotes the population of city k belonging to country i. The parameter θ measures the sensitivity of trade flows to bilateral distance d_{kl} (Mayer and Zingano, 2006). For the weighted distance measure which used in this paper θ is set to 1.

Due to theoretical considerations all coefficients are expected to have positive sign except the coefficients of *DIST* variable which are expected to be negative.

The relationship under consideration has been investigated in a panel data model framework. As Baltagi (2005) and Hsiao (1986) pointed out, when the number of cross-section units (countries) is greater than the length of time period (here the number of years), the sample does not cover the whole population, and a time-invariant variable like distance is used, the random effect model (REM) specification would be more convenient than fixed effect model (FEM). Since the above mentioned cases are valid here we employed the REM specification. However, the FEM estimations are also given for the purpose of comparison.

5.2. Empirical findings

In order to avoid any possible spurious regression relationship it is necessary to investigate the stationarity features of the variables used. Although we have a short panel, which reduce the possibility of the variables being nonstationary, we employed three

alternative unit-root tests to investigate whether the variables are stationary or not. In the related literature, panel unit-root tests are classified as Generation I and Generation II tests, with respect to independence of cross-sectional units. Since the countries in the sample does not depend each other, Generation I type tests are available in the unit-root search. The test results are given in Table 1 below. As seen from the table, all variables are stationary in their level, as indicated by at least two test methods. In this regard, population variables *LPOP* and *LPOPTr* have unit-root and hence are nonstationary[4]. These findings make it more plausible to regard the estimation of SM type equations.

Table 1. *Results of panel unit-root tests.*

Variable	ADF – Fisher χ^2	PP – Fisher χ^2	IPS - W
LEXP	**52.824 (0.0062)**	**91.843 (0.0000)**	**-2.845 (0.0022)**
LIMP	**55.648 (0.0030)**	34.782 (0.2507)	**-2.820 (0.0024)**
LTBT	**63.889 (0.0003)**	**50.243 (0.0117)**	**-3.861 (0.0001)**
LGDP	**54.166 (0.0044)**	**63.421 (0.0003)**	**-3.033 (0.0012)**
LGDPTR	**66.591 (0.0001)**	5.410 (1.0000)	**-4.174 (0.0000)**
LPCGDP	**56.686 (0.0023)**	**82.439 (0.0000)**	**-3.263 (0.0006)**
LPCGDPTR	**67.249 (0.0001)**	5.845 (1.0000)	**-4.225 (0.0000)**
LPOP	18.704 (0.9460)	9.240 (0.9999)	3.915 (1.0000)
LPOPTR	0.009 (1.0000)	**155.915 (0.0000)**	13.859 (1.0000)
LMS	**41.329 (0.0816)**	**92.435 (0.0000)**	-0.965 (0.1672)

Notes: i) Figures in ( ) are p-values. ii) Bold faced figures point to statistical significance at 10% level or below.

Since all variables (except population) are stationary in their level, needless to check the long-run relationship among them via a cointegration method. A level panel regression equation would be meaningful. Estimations of the panel data models those reflect the relationship between trade indicators (namely imports, exports and total foreign trade) and gravitational factors (size variables, migrant stocks, and distance) in line with the REM and FEM are given in Table 2 and 3 below respectively.

Table 2. *Estimation of the models 1 – 6 based on cross-section random effect model.*

	Dependent Variable					
	LEXP	LEXP	LIMP	LIMP	LTBT	LTBT
Constant	16.596 (14.009) [0.238]	**10.616 (5.296) [0.046]**	– 7.243 (13.821) [0.601]	**13.127 (5.708) [0.023]**	5.647 (8.528) [0.509]	**13.589 (5.222) [0.010]**
LGDP	**1.206 (0.175) [0.000]**	–	0.140 (0.198) [0.479]	–	**0.721 (0.122) [0.000]**	–
LGDPTr	**0.457 (0.176) [0.010]**	–	**0.833 (0.180) [0.000]**	–	**0.605 (0.111) [0.000]**	–
LPOP	– 0.033 (0.163) [0.842]	–	**0.942 (0.211) [0.000]**	–	**0.382 (0.130) [0.004]**	–
LPOPTr	—— – 1.518 —— (1.408) —— [0.282]	–	0.146 (1.364) [0.915]	–	—— – 0.638 —— (0.241) —— [0.449]	–
LPCGDP	–	**0.432 (0.136) [0.002]**	–	0.038 (0.118) [0.747]	–	**0.184 (0.077) [0.018]**

	Dependent Variable					
	LEXP	*LEXP*	*LIMP*	*LIMP*	*LTBT*	*LTBT*
LPCGDPTr	–	**0.854** (0.098) [0.000]	–	**1.046** (0.085) [0.000]	–	**0.974** (0.055) [0.000]
LDIST	**– 0.962** (0.229) [0.000]	**– 1.419** (0.681) [0.039]	– 0.316 (0.389) [0.417]	**– 1.263** (0.736) [0.088]	**– 0.669** (0.241) [0.006]	**– 1.354** (0.675) [0.046]
LMS	0.012 (0.038) [0.743]	**0.196** (0.060) [0.001]	0.061 (0.050) [0.219]	**0.103** (0.056) [0.067]	0.044 (0.031) [0.156]	**0.091** (0.039) [0.019]
R^2	0.822	0.655	0.745	0.682	0.891	0.839
F – statistic	144.657	90.114	91.783	101.749	254.996	247.503
p – value	0.000	0.000	0.000	0.000	0.000	0.000
Hausman χ^2	16.270	13.053	10.992	18.287	5.805	18.214
p – value	0.006	0.005	0.052	0.000	0.326	0.000

Notes: i) Figures in ( ) denotes the standard errors while in [ ] are p-values. ii) Bold faced figures point to statistical significance at 10% level or below.

According to the REM estimations, size of the host countries which denoted by GDP and per capita GDP separately, has an extending impact on the bilateral trade volume when *EXP* and *TBT* are used as the trade indicator. Host country's GDP in LM and per capita GDP in SM seem to have no significant impact on import volume of Turkey from sampled countries. Population of the host country seems to have significant impact on import and total foreign trade of Turkey. On the other hand, population of Turkey does not have any significant impact on bilateral trade whatever the trade indicator. In terms of per capita GDP, the income elasticity of bilateral trade volume is higher for Turkey in compared with the host countries. Interestingly, Turkish migrant stocks in the host countries seem to have no meaningful impact on the bilateral trade volume in the LM specifications. But when the SM specification has been adopted its impact becomes statistically significant. This result may arise due to high correlation between the migrant stock and GDP and population variables. As it is known high degree of multicollinearity may cause to insignificant coefficients in regression equation.

Number of Turkish emigrants in sampled countries seems to have a positive impact on bilateral trade. In each model the coefficients, which can be called as *migration elasticity of trade*, are positive and statistically significant below 10% significance level. This result is in accordance with the case studies for other countries. According to the estimations, a 10% increase in Turkish migrant stock causes to 19.6% increase in exports, 10.3% increase in imports of Turkey and 9.1% increase in total bilateral trade volume. The significant (despite slightly asymmetric) effect of migration on imports and exports can be interpreted as that information extension about markets is effective as much as preferences in migration – trade interaction. The greater impact on exports, however, would imply that network affect prevails against preference affect, the case posited also by Gould (1994) and Girma and Yu (2002).

Table 3. *Estimations of the models 1 – 6 based on cross-section fixed effect model.*

	Dependent Variable					
	LEXP	LEXP	LIMP	LIMP	LTBT	LTBT
Constant	3.659 (15.272) [0.811]	0.547 (1.089) [0.616]	4.339 (14.787) [0.770]	**4.443** **(0.944)** **[0.000]**	7.251 (9.121) [0.428]	**3.655** **(0.612)** **[0.000]**
LGDP	**1.778** **(0.226)** **[0.000]**	–	– 0.058 (0.219) [0.790]	–	**0.706** **(0.135)** **[0.000]**	–
LGDPTr	0.131 (0.194) [0.502]	–	**0.948** **(0.188)** **[0.000]**	–	**0.614** **(0.116)** **[0.000]**	–
LPOP	0.707 (1.342) [0.599]	–	– 1.944 (1.299) [0.136]	–	– 1.064 (0.801) [0.186]	–
LPOPTr	– 1.926 (1.512) [0.204]	–	1.470 (1.464) [0.317]	–	0.002 (0.903) [0.999]	–
LPCGDP	–	**0.465** **(0.138)** **[0.001]**	–	0.044 (0.119) [0.716]	–	**0.188** **(0.077)** **[0.016]**
LPCGDPTr	–	**0.849** **(0.099)** **[0.000]**	–	**1.056** **(0.086)** **[0.000]**	–	**0.979** **(0.056)** **[0.000]**
LMS	0.018 (0.067) [0.785]	0.073 (0.074) [0.323]	– 0.022 (0.064) [0.738]	– 0.024 (0.064) [0.710]	0.010 (0.040) [0.800]	0.031 (0.042) [0.452]
R^2	0.969	0.961	0.973	0.973	0.989	0.987
F - statistic	289.966	254.646	337.966	373.574	813.277	812.809
p – value	0.000	0.000	0.000	0.000	0.000	0.000

Note: i) Figures in ( ) denotes the standard errors while in [ ] are p-values. ii) Bold faced figures point to statistical significance at 10% level or below.

In parallel with theoretical expectations and previous studies, the distance variable has negative impact on bilateral trade flows, indicating that transportation and transaction costs are significant trade barriers. Its deterring effect is greater in export specifications in compare with import models which may be interpreted as importing motivation is stronger than exporting in Turkey or an indication of import-dependency of domestic production.

6. Conclusion

Two prominent features of globalization in recent decades are the remarkable increase in international trade and in migratory flows between developing and developed countries. Thus, the migration-trade nexus has received substantial interest in recent years from both theoretical and empirical researchers. Empirical findings reveal that in most cases amount of emigrants/immigrants has a positive impact on bilateral trade volume.

Emigration is an important issue for Turkey as well. Today, more than 5 million Turkish nationals live in tens of different countries all around the world most of whom are permanent migrants. OECD countries are the most favorite destinations for Turkish emigrants. Most of the OECD countries besides constitute foremost bilateral trade partners of Turkey. However, economic implications of the Turkish emigrants is not

sufficiently studied and addressed. So, this paper is a modest step towards to fill this gap by focusing on the Turkish emigrants in OECD countries. To this end we employed a battery of panel gravity models which are augmented by Turkish emigrant stock in 15 OECD countries. Results of the random effects panel data analysis are in accordance with the theoretical expectations and suggest that size of the host countries which denoted by GDP and population, and alternatively by per capita GDP, have an extending effect on bilateral trade volume in terms of Turkey's exports. As expected, distance has negative impact on bilateral trade flows, indicating that transportation and transaction costs are significant trade barriers. The stock of Turkish emigrants in sampled countries seems to have a positive impact on Turkey's exports, imports and overall bilateral trade. In each equation its coefficient, which can be regarded as migration elasticity of trade, is positive and statistically significant. The significant effect of migration on imports and exports (symmetric impact) can be interpreted as that information extension about markets is effective as much as preferences in migration – trade interaction.

Notes

[1] A compilation and meta analysis of 48 empirical studies could be found in Genç et al. (2011).
[2] The sample includes those countries: Germany, United Kingdom, Netherlands, Italy, Denmark, Spain, Norway, Sweden, Finland, Austria, Switzerland, Belgium, Hungary, Greece and Iceland.
[3] Instead of the distance between the capitals, it is possible to use the distance between the countries' trade centers and Istanbul, but in the global scale it makes no significant difference.
[4] Since the geographical distance is a time invariant measure, the variable LDIST was not tested.

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