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Turkey and the European Union: possible incidence of the EU accession on migration flows

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Abstract:
This paper analyzes possible incidences of Turkish EU accession on the emigration from Turkey to the European Union. Panel data estimators are applied on the emigration data from EU-18 into Germany in order to construct possible future scenarios of Turkish migration to the EU. Eventual migration flows from Turkey into the EU are forecasted based on the estimated results.
We find that seemingly unrelated regressor is the most efficient estimator that can be applied in Turkey-EU migration framework. Our results reveal that both the network effect and target country labour market conditions represent the strongest determinants for migration, whilst the effect of per capita income is actually relatively low. In particular, Turkish per capita income does not have nearly any effect on migration, because it enters the model in two variables that work against each other. Furthermore, a very low importance of opening the German labour market for Turkish migrants is found. Estimated coefficients are used to predict migrations to Germany and through appropriate extrapolations to the whole European Union (EU). Three scenarios of migration are created and the sensitivity of estimated coefficients on migration from Turkey into the Germany during next 25 years is further discussed in detail.

Keywords: Economy of migration, Turkey, EU Enlargement, panel data, seemingly unrelated regression

JEL: C33, F15, F22, J11, J61

Introduction

It should be rightfully acknowledged that the relationship of the European Union (EU) and Turkey nowadays is far more complicated than that of EU and any other European country seeking EU membership. Since the 12th of September 1963, when Turkey signed an Association Agreement (called "the Ankara Treaty") with the European Communities and became an associate member of the EC and with EC representatives proclaiming that Turkey was a "part of Europe", the European Union has been facing a tough decision trying to find an answer to everlasting question of: "What to do with Turkey?" (Miiftiiler-Bac, 1997).

There is no doubt that eventual Turkish EU accession would have had considerable economic, institutional and social implications both for Turkey itself and for the European Union. For quite some time, researchers analyzed EU-Turkish trade relations (see for example Völker, 1976; Marguiles, 1996; Sayek and Selover, 2002; Derviş, Gros, Öztrak, and Işık, 2004; Ulgen and Zahariadis, 2004) as well as possible consequences of Turkey joining the EC or/and the EU (see for example Lejour, de Mooij, and Capel, 2004; Flam, 2004; Quaisser and Wood, 2004; Lammers, 2006). Turkish EU membership clearly might generate benefits for Turkey from entering the EU Common Market as well as bring about narrowing income differences and improving economic and trade relations. However, the most fundamental question in the debate about Turkish EU membership is the issue of Turkish migrations to the European Union and the side effects of these migrations.

Turkey is a large country with the total population of over 70 million of people; that is why it can be compared with other large EU Members State such as Germany or United Kingdom. However, Turkish GDP per capita in market prices is more than six times lower that that of the EU15 and almost two times lower than in EU10 (Eurostat, 2007). Despite the fact that Turkish economy was very dynamic in the last five years, the economic importance of Turkey in Europe remains minor. Even if its rapid economic growth continues until 2015,

Turkey will remain a poor neighbour for the majority of the EU27 states. According to Lammers (2006), Turkey's income per capita at market prices in 2015 will be just 20 % from the EU27 average.

On that economic background migration Turkish migration potentials might look quite grim for the EU Member States. Martin, Midgley and Teitelbaum (2001) remark that there are about 3.5 million Turks living abroad nowadays and of those 3 million reside in the EU (with 70 % of EU-based Turks staying in Germany). This high proximity to migration amongst relatively young and dynamic Turkish population (the average age is 27.7 for men and 28.8 for women) often brings fears that Turkish EU membership would trigger of the wave of massive migration; estimates are that 20 to 30 % of Turkish youth would emigrate to seek higher wages in Europe if they could do so (Martin, Midgley and Teitelbaum, 2001).

These fears might never come true, however, as far as much-sought admission to the EU might bring EU assistance and FDI that, in turn, create jobs and push up the wages in Turkey that would make labour migrations irrelevant. Thence, it seems worth exploring the predictions of Turkish migration to the EU after the eventual accession.

The main purpose of this paper is to come up with an overview of factors determining Turkish migrations. Based on the Sjaastad (1962), Harris and Todaro (1970) and Hatton (1995) human capital migration approach econometric tools described in Boeri, Brücker (2000) and Alvarez-Plata, Brücker, Siliverstovs (2003) are applied with an intention to estimate and predict future migrations from Turkey to Germany and to the EU respectively. Stages of integration Turkey has to pass on its way to the EU membership and especially the timetable of Turkish accession are the main determinants of different migration scenarios presented here. Apart from that, this paper elaborates on the following research questions: Which are the most important economic variables influencing Turkish migrations to the EU? How important is the development of those variables for migration itself and for the EU and Turkey separately? And finally: Are there any other than economic determinants influencing Turkish-EU migration flows?

1. Methodology and literature review.

Turkish labour migration to Europe dates back to the early 1960s. The agreement between Turkey and West Germany that was signed in 1961 provided West Germany with low-skilled temporary workers (so-called "*Gastarbeiter"*) on mutually beneficial conditions. War-torn

Germany gained access to the vast pool of cheap labour force, while Turkey benefited by decreasing its unemployment rate. Back then, guest-worker agreements were temporary and envisaged the return of Turkish workers who would come back home equipped with new methods and representing high-skilled labour force. Migrations were fuelled by the information about the economic and social benefits of employment in Europe that trickled back to Turkey (Sayari, 1996).

Apart from Germany, Turkey also signed agreement with Austria, Belgium, Holland, Sweden and France; however most of the Turkish workers went to West Germany and Holland. Those guest workers settled down and brought their families with them. The other confusion was that instead of low-skilled labor high-skilled workers emigrated from Turkey (see for example Güngör and Tansel, 2006).

The recruitment of Turkish labor came to a halt after the 1973 oil crises. However, Turkish emigration to Europe continued in the 1980s and 1990s, particularly thanks to family reunifications. Another direction of Turkish emigration occurred in the 1970s. Economic boom in Middle East created an incentive for Turkish workers to migrate to countries such as Iraq, Libya, and Saudi Arabia (SORT, 2007; Eurostat 2007). Strong migration outflows played an important role in Turkish economy: since 1960s remittances sent by immigrant workers abroad constituted the major currency input for Turkey (Kirisci, 2003).

The 1980s brought the new type of migration: asylum migrations. Asylum seekers from Turkey came to Europe due to increase of violence and political instability in Turkey (this was especially relevant with regard to the Kurdish minority). This trend lasted until second half of 1990s. The latest estimations showed that approximately 3.6 million Turkish nationals lived abroad, from which a significant part of 3.2 million resided in the EU (SORT, 2007).

1.1. Target countries for Turkish immigrants

The outward migration from Turkey is low at present. Although the official emigration figures are not reported by the Turkish authorities, a considerable decrease in the Turkish asylum seekers can be observed: in 2004 it was 16.000 people (1/3 less than in the 2000) (SIS, 2007). In 2004 the stock of Turks living abroad decreased by 2% and reached approximately 3.5 million. This trend might be attributed to both to naturalization and return migrations to Turkey.

Clearly the biggest community of Turks in today's EU can be found in Germany (more than 1.750 thousand people) which is about a half of all Turks living abroad. It is apparent that approximately 76% of Turks migrating to Europe are going to Germany (Table 1).

Recently, emigration from Turkey decreased. This can be shown on the decreasing importance of remittances in the Turkish economy that began around 1998. In 2004, remittances by the Turkish expatriate community ranged at $800 million or 0.2 % of GNP, the lowest level since 1975 ($1.3 billion or 2.8 % of GNP) and a strong decline over 2003 ($1.7 billion or 0.7 % of GNP) (OECD, 2006). Another factor that points at the decrease of outward migration is the cyclic character of migration and furthermore the favorable economic conditions in Turkey that are in contrast with economic stagnation in EU15.

Table 1: Stocks of Turks residing in selected EU and EEA countries.

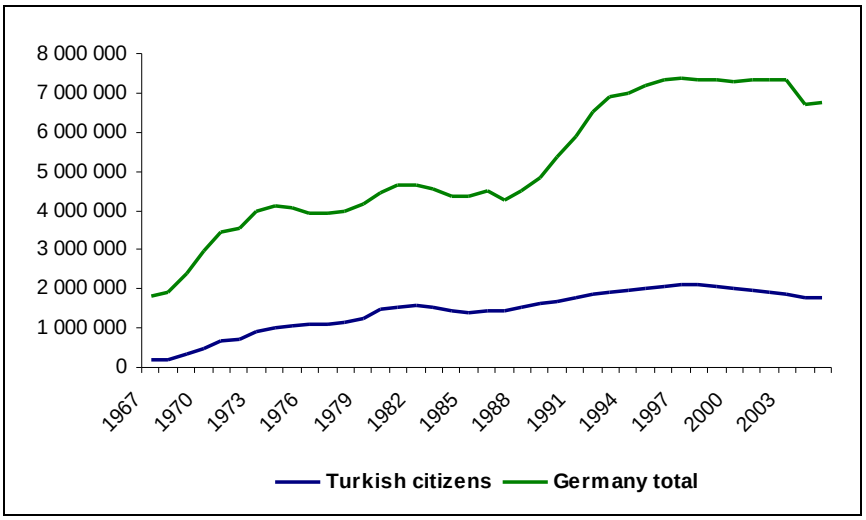
	2004	% of total	Rank **	Source
Austria	142	6	1	Labour Force Survey, Statistics Austria
Belgium	79	3	6	Population register, National Statistical Office.
Denmark	31	1	1	Statistics Denmark.
Finland	3	0	10	Central population register, Statistics Finland.
France	n.a.	n.a.	n.a.	Census, National Institute for Statistics and Economic Studies (INSEE).
Germany	1 764	76	1	Statistisches Bundesamt, Wiesbaden
Greece*	77	3	3	National Statistical Service of Greece.
Netherlands	196	8	1	Register of Population, Central Bureau of Statistics (CBS).
Norway	9	0	11	Central Population Register, Statistics Norway.
Sweden	35	1	10	Population register, Statistics Sweden.
Total	2 336	100		

* Data are from 2001; ** Ranking of minority size in each country

1.2. Germany as a major target EU country for Turkish migrations.

Federal Republic of Germany is currently the largest target EU country for incoming Turkish migrations. This is partly caused by the historical background and partly by the lack of workforce in Germany after the WWII. Moreover, Turks were not the only one ethnic that contributed to German economic growth: Italians, Spaniards and Portuguese also took part in boosting upheaval of West German economy that took place in the 1960s.

Figure 1: Foreign citizens in Germany (1967-2005)



Source: Statistisches Bundesamt, Wiesbaden, 2006

Figure 1 shows the numbers of Turkish citizens in comparison with all foreigners residing in Germany. There was a steady growth in absolute numbers with its peak around 2000 and slight decrease after 2001. Furthermore, it can be seen that in relative numbers the record has got its peak even earlier. In 1975 Turkish citizens constituted 26 % of all foreigners living in Germany (Statistisches Bundesamt, 2007) and by the 1987 they reached the position of the most numerous group of foreigners residing in Germany.

Between 1960s and 2000s Turkish migration underwent several stages. The latest statistics showed that it actually decreased since the beginning of the 21st century. This might be caused by either cyclic character of migration or by the economic situation in the EU and Turkey. Furthermore, the 2004 EU enlargement caused higher competition between immigrants within EU due to the increasing amounts of migrants from EU10 countries and the substitution effect caused by that.

Therefore, in spite of high migration inflows from Turkey to the EU in the past, possible Turkish accession to the Union should not necessarily lead to the massive influx of immigrants. Most economically developed EU countries seem to be already saturated by the Turkish labor migrants who have a long tradition of living and working there. Even though, future migrations from Turkey to the EU might be caused by other than economic factors, it seems interesting to explore the recent trends and to build scenarios of migrations after Turkish EU accession: realistic, optimistic and pessimistic. This can be achieved through

studying the data from recent Turkish migrations and extrapolating the data in accordance with relevant factors that might occur in the future.

2. Data.

The most notorious problem with estimation of migrations is the lack of the appropriate data. Especially historical data about migration stocks and flows are missing for a number of countries. This makes comparisons of different national data very complicated due to the differences in methodology used by various states.

For the estimations used in this paper the data sample for inward migrations to Germany during the period of 1967 to 2005, time series from OECD database (complemented by AMECO database for the time periods not covered by OECD database) and data from Eurostat statistical office were used.

Migration data used here are compiled from German central register of foreign nationals and German Statistical Office. The sample is pooled for 18 European source countries (i.e. Austria, Belgium, Denmark, Finland, France, Greece, Holland, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Sweden, Switzerland, Spain, Turkey and UK). Former-USSR countries are excluded from the data sample due to the political and data incomparability reasons.

The sample period of dependent variable (that is the share of migrants from home country living in Germany as a % of source country population) starts in the 1967 when the foreign residence in Germany starts to be reported on annual basis. The data are not available for foreign-born population so they are based on the ethnicity principle.

According to the German Statistical Office, there are two breaks in migration stock data series. The first one happened in 1972 due to the change from paper-based to computer-base statistic. This transfer caused minor statistical break in some countries. In order to deal with that, the methodology used in Alvarez-Plata et al (2003) is adapted. It appears that after including of dummy variable to control this break, the dummy variable is insignificant.

The second break in the data occurred during the period from 1987 to 1989 because of the revision of the statistics for foreigners that had to follow the directive of the population census of 1987. This had a consequence of significant reduction in foreign citizens stocks for the period of three years. However, after this period the statistics were again based on the

former methodology. This break is solved by recalculating of foreign residence for affected three years[1].

Dependent variables are normalized with the home countries population representing the difference in migration stocks as a % of the original home population. Although this is not exactly the net migration rate, comparing these figures seems reasonable upon accepting certain assumptions. The difference could be in different population growth rates, i.e. of population in original home country and of appropriate population of foreign citizens in receiving country (in this case Germany) and also in the rate of naturalization. Equation 1 below shows the relation between net migration and difference in migration stocks.

$$\textbf{(1)} \qquad \Delta mst_{fht} = m_{fht} + \frac{g_f - g_h - d_f}{1 + g_h} mst_{fh,t-1}$$

where mst_{fh} denotes the ratio of the stock of foreign residence from country *f* in home country *h* (Germany) to the original home population, m_{fh} is the ration of actual net migration of foreigners from country *f* into home country *h* to the original home population, g_h is the natural growth of population in the original home country, g_f is the growth of migrant population in Germany, δ_f is the rate of naturalization of foreign population in Germany. The index *t* denotes the time period. From the equation above it is clear that net migration equals the migration stock if the numerator of the fraction is equal to zero. It is assumed that population growth rates are equal and the naturalization rates are zero.

3. Empirical model.

The first part of the theoretical model is consistent with those models based on human capital approach (see for example Sjaastad 1962, Harris and Todaro 1970, or Hatton 1995) and deals with investment in human capital and expected future income. The model applies the econometric methods used by Boeri and Brücker (2000) and Alvarez-Plata, Brücker and Siliverstovs (2003) in estimating migration from CEEC into the EU15.

[1] Dividing of the difference in the number of foreign residents between 1986 and 1989 by total net immigration in this time period, and multiplied this factor by annual net immigration in order to calculate the change in the number of foreign residents in each year. For more information on this methodology see Alvarez-Plata et al. (2003).

3.1. Introduction to the model.

In line with above-mentioned studies an assumption that people make expectations regarding the future income in the target (host) country and source (home) country is accepted. The differences in the past values of those incomes are creating individuals' expectations about the future possible income. GDP per capita of a country is thus taken as a proxy for individuals' incomes both in source and target countries. The average employment rate in both target and source country is taken as a proxy for the labor market conditions. More precisely, individual probability of finding a job is rising with higher employment and vise versa. The lagged migration stocks serves as a proxy for network effects. If migration flows are based on expectations about past variables that mean present values are influenced by past values (Hatton 1995) thus it should be first-order autoregressive process (AR (1)). Therefore a simple error-correction model can be constructed in the following way[2]:

$$(1)\quad \Delta m_{fh,t} = b_1 * \Delta \ln(\frac{w_{f,t}}{w_{h,t}}) + b_2 * \Delta \ln(w_{h,t-1}) + b_3 * \Delta \ln(e_{h,t}) + b_4 * \Delta \ln(e_{f,t}),$$
$$+ b_5 * \ln(\frac{w_{f,t-1}}{w_{h,t-1}}) + b_6 * \ln(w_{h,t-1}) + b_7 * \ln(e_{h,t-1}) + b_8 * \ln(e_{f,t-1}),$$
$$+ b_9 * (m_{fh,t-1}) + b_{10} * DummyF + e_t$$

where:

$m_{fh,t}$	the share of migrants from home country *h* living in country *f* (i.e. Germany) as a % of home population *h.*
$w_{f,t}/w_{h,t}$	foreign to home country income difference
$w_{h,t}$	home country income
$e_{f,t}$	German employment rate
$e_{h,t}$	country of origin employment rate
$m_{fh,t-1}$	lagged migrants stock of home country h in country f (Germany)
DummyF	dummy variable for the free movement of labor
t, t-1	denotes time periods

As it is obvious, variables enter the equation 1 both as steady levels and as variables' differences. Variables' differences show the short term reaction of migration to these fluctuations, on the other hand the levels of the variables determine the long-run relations

[2] An error-correction model is a dynamic model in which the movement of the variables in any periods is related to the previous period's gap from long-run equilibrium. For more details see Baltagi (2005).

between migration stocks and appropriate variables. The equilibrium stock of migrants can be thence derive from equation 1 by setting all changes equal to nil and getting steady state for stock of migrants[3]:

$$\bar{m}_{fh} = (\frac{b_5}{-b_9}) * \ln(\frac{w_f}{w_h}) + (\frac{b_6}{-b_9}) * \ln(w_h) + (\frac{b_7}{-b_9}) * \ln(e_h) + (\frac{b_8}{-b_9}) * \ln(e_f) + \frac{b_{10}}{-b_9} * DummyF + e \quad (2)$$

where $\bar{m}_{fh}$ is the steady state equilibrium rate of the foreign migrants to the source population. β in brackets are therefore semi-elasticities in the long-run equilibrium and denote the relation between stocks of migrants and explanatory variables. The coefficient β_9 is expected to be negative; hence the signs of the original coefficients will be not changed. Negative sign of the coefficient is expected due to assumption that migration follows AR(1) process. Hence $m_t=\eta m_{t-1}$ where η must be smaller than 1. If this condition does not hold, the whole population of the source country will migrate. The part of equation 2 can be re-written in the following way:

$$\Delta m_t = m_t - m_{t-1} = b_9 * (m_{t-1}), \quad m_t = (1 + b_9) * (m_{t-1}). \quad (3)$$

Thus, it appears that β_9 should be negative to assure the sustainability of migration. If the β_9 were even slightly positive, the coefficient before lagged migration would have been larger than one and this would have led to unsustainable migration explosion.

In order to formulate the error correction model shown in equation 1, it has to be proved that all variables have to be cointegrated in order to form a dynamic long-term equilibrium (see Johnson, 2001). To achieve that a two-stage cointegration test was performed and it was proved that the available data constitute cointegrated set. This makes it possible to continue with testing the main model without any restrictions.

3.2. Model estimations.

Econometric model applied here for estimating stocks of immigrants in Germany included date on the 18 source countries, i.e. Austria, Belgium, Denmark, Finland, France, Greece, Holland, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Sweden, Switzerland, Spain, Turkey and UK. As noted above, Germany was chosen as a target country because of the size of migration community and the relative accessibility of data. These panel data are

[3] Variable *t* was left out from the equation in order to indicate the long-term equilibrium.

characterized by smaller cross-section dimension (18 cross-sections) and relatively larger time dimension (39 annual observations).

Variables were tested for the cointegration (in order to see whether the long-term equilibrium between migration stocks and explanatory variables existed) that showed that they formed the cointegration set (e.g. they passed the two-stage process). Thence, estimation of the long-term equilibrium parameters from the equation 1 was legitimate. The changes of variables for steady stage were set at zero, which allowed estimating equation 2.

A part of cointegration, the cross-section pooling of data, can involve further restrictions that may cause problems to the regression results. In the research literature a whole variety of estimators for estimating such panel data is used. From the assumptions presented here (and based on similar studies - see for example Alvarez-Plata, Brücker, and Siliverstovs, 2003) it appeared that the most efficient estimator in this framework was the Seemingly Unrelated Regression (SUR). However, it also appeared relevant to estimate the model using classical panel data Least Squares (PLS) and General method of moments (GMM).

Furthermore, variable denoting the employment rate in country of origin (domestic income) had to be eliminated from equation 2 due to the fact that it proved to be insignificant in all estimations (it appeared to be redundant due because the null hypothesis of insignificancy of beta was not rejected). The final model can be then presented in the following way:

$$m_{fht} = a_h + b_1 \ln(w_{ft} / w_{ht}) + b_2 \ln(w_{ht}) + b_3 \ln(e_{ft}) + b_4(m_{fh,t-1}) + \\ + b_5(m_{fh,t-2}) + b_6 * DummyF + Z_{fh}g + e_t \quad (4)$$

where

m_{fht} - the dependent variable representing the share of migrants from source country h living in target country f as a % of source country population h.

w_{ht} – country of origin income level

w_{ft}/w_{ht} – foreign to home country income difference

e_{ft} – German employment rate

$m_{fh,t-1}$ – lagged migrants stock of home country h in country f (Germany)

$m_{fh,t-2}$ – lagged migrants stock of home country h in country f (Germany)

Z_{fh} – vector of time-invariant variables which affect the migration between two countries such as geographical proximity and language.

dummy – Free mobility of labour.

3.2.1. Results and stability tests.

The results of the estimations are shown in table 2. Estimators reject the null hypothesis of insignificancy of all variables at the 1 % level, with the exception of income differential in PLS that is significant on the 5 % level and is insignificant in GMM estimator. The results confirm that SUR estimation is the most powerful one here due to the Hausman test that could not reject the null hypothesis. The issue that could distort the estimation results is heteroscedasticity. This could be caused by heterogeneity of countries, so that variances of the explanatory variables do not have to be distributed evenly across the sample. This might lead to the inefficient results and to the preference of SUR estimator.

Table 2: Panel data estimation results

	PLS	GMM	SUR
C	-4.5302 **		-4.2034 **
w_{ht}	0.0419 **	0.0331 **	0.0444 **
w_{ft}/w_{ht}	0.0533 *	0.0935	0.0422 **
e_{ft}	0.761 **	0.698 **	0.7398 **
$m_{fh,t-1}$	1.5006 **	1.1233 **	1.3536 **
$m_{fh,t-2}$	-0.5083 **	-0.3558 **	-0.4929 **
Dummy	0.0113 **	0.0095 **	0.0152 **

**,* coefficients are significant at 1 and 5% level, respectively

Cross section fixed effect (Turkey)	0.2875

Source: Own computations (using eViews 6®).

The correlation of error terms across countries that could be caused by common shocks were tested by Wald test that rejected the null hypothesis about the errors being serially uncorrelated against the alternative one that they were correlated. Hence, the common shocks were present in the data. This finding was in line with the expectation that the variables used in the model fit into the global economic framework and therefore were not independent.
Table 3 specifies the model and shows different data adjustments that had to be made due to the assumptions applied on estimators.

Table 3: Models' specifications

	PLS	GMM	SUR
Sample (adjusted)	1969 2005	1970 2005	1969 2005
Cross sections	18	18	18
Total panel observations (balanced)	666	648	666

Source: Own computations (using eViews 6®).

The estimated model is based on SUR regression due to the results of Hausman test with fixed cross section effects and it can be presented in the final form:

$$m_{fht} = -4.2034 + 0.0422 * \ln(w_{ft} / w_{ht}) + 0.0444 * \ln(w_{ht}) + \\ +0.7398 * \ln(e_{ft}) + 1.3536 * (m_{fh,t-1}) - 0.4929 * (m_{fh,t-2}) \\ +0.0152 * DummyF + Z_{fh}g. \quad (5)$$

where Z_{fh} for Turkey is equal to 0.2875. The redundancy of fixed effects and presence of random cross section effects were tested for. The Likelihood ratio that uses sum-of-squares (F-statistic) was applied and the statistic value and an appropriate ρ-statistics strictly rejected the null hypothesis of redundancy of fixed effects. Stability of coefficients was also made by using a classical F-test with X^2 distribution. The main results of the model specified by equation 5 can be summarized as follows:

- In accordance with preliminary expectations income differential has positive and significant impact on migration. 1 % increase in the income differentials leads to the 0.04 % increase in migration. Furthermore, the income in the source countries is also significant and has a positive impact on migration. The effect of 1 % increase in the source countries income will have a 0.04 % impact on migration.
- Employment rate in Germany (used as an indicator of the labor market conditions) also has the expected sign. The impact of employment rate is significant and positive. % increase in the employment rate in Germany leads to the 0.74 % increase in migration.
- Lagged variables of migration have significant and positive impact on migration. That represents the crucial network effect that makes 0.86 % of former migration..
- The dummy variable has a positive sign and it is significant, however its impact is rather small. It might be that migrants with the biggest incentives to move have already done so before introduction of free movement of labor. Hence, migration flows appear not to be much influenced by the free movement of labor.

A short notion should be made on the use of estimators. There is a large scale of different estimators to be used for dynamic panel data estimations that can be found in the research literature. The panel data used for the estimation of migration into Germany in this paper is two dimensional, i.e. differences both between time periods and between countries might be observed. Thus, for the purpose of this research SUR estimator with the best forecasting performance was applied. This is in accord with the similar studies (see for example Alvarez-Plata, Brücker and Silverstovs, 2003).

3.3. Simulation of migration: 2006-2030.

In this sub-section migration from Turkey into Germany is simulated based on the results obtained from the main model. The projection has three scenarios that are described below. The estimated results as well as the exogenous variables might not exactly reflect the reality, thence they should be taken with care. Nevertheless, with the given level of available data they present the best possible simulations of migration from Turkey.

A short explanation of the cross-section variable, in other words of the country-specific effect, is needed before presenting the results of simulations. The country-specific effect captures the characteristics specific for each country that might effect migration. The most important examples of this variable are: distance, culture, language or education. Due to a short time horizon of each cross section these country-specific effects are not split into further segments. The most important issue is that Turkey is also incorporated in the sample countries, which means that the country-specific effect for Turkey was accounted for 0.2875. This effect is therefore used as a country-specific constant during the whole simulated period.

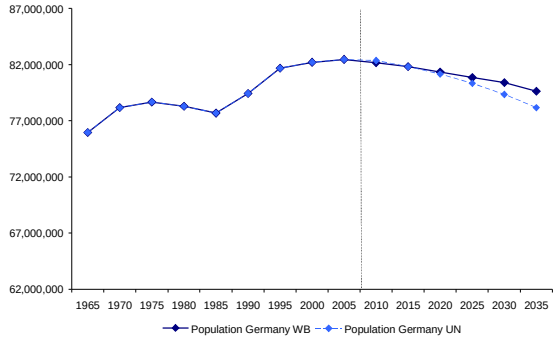
3.3.1. Assumptions about exogenous variables.

In this sub-section exogenous variables and their expected development in the forecasted period form 2006 till 2030 are shortly described. Assumptions about exogenous variables are crucial for the migration forecasts and therefore special attention is paid on their possible development whilst they are applied for steering the migration scenarios. There are three exogenous variables that enter the model: population, GDP per capita and unemployment.

Population

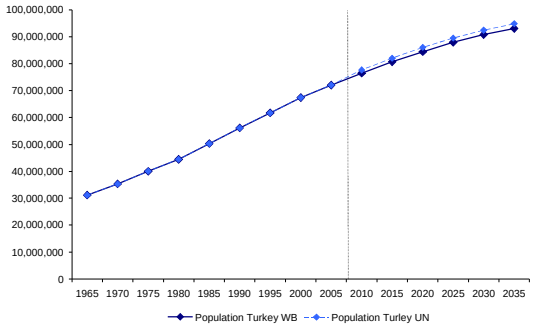
German and Turkish populations do not enter projections directly. However, they are substantial for them. The data about population was taken from Eurostat and the predicted values were based on World Bank population projections. As a secondary source United Nation (UN) projections were adapted.

Figure 2: Projections of German population from 1965 until 2035



Source: Eurostat, World Bank, United Nations, 2007

Figure 3: The Turkish population figures from 1965 till 2035



Source: Eurostat, World Bank, United Nations, 2007

Turkish population seems to represent a more important but more unstable variable. It enters the model as a numerator of the actual migration stocks (Figure 3).

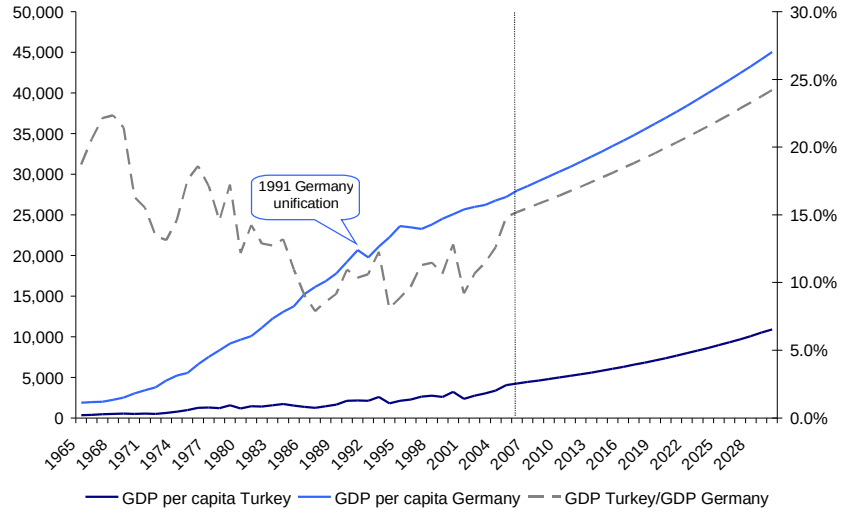
In another words, changes of total population might heavily influence the migration stocks in target country. Sources of population projections in Turkey are the same as for Germany. Table 3 shows that the Turkish population will increase in the future but the increment will be decreasing. Population figures show the well-known trend that the population in the West is ageing and there might be a need for migrants to fill the gaps in the productive population in the future (Buchanan, 2004).

GDP

The GDP per capita enters the migration forecast in two ways: first, the stand-alone GDP per capita of Turkey as a proxy of economic situation in Turkey; and second, as the ratio of Turkish GDP p.p. to German GDP p.p. The GDP data were obtained from Eurostat and the projections were made using the following assumption: in the realistic scenario it was assumed that Turkish GDP p.p. would grow 4 % p.a. from 2007 on and that German GDP p.p. would increase by 2 % p.a.[4]. Figure 4 shows GDP p.p. development as well as the change of the GDP per capita ratio (in the Y axes).

[4] The growth rates were taken from Eurostat, World Bank and OECD and capture the assumption of strong growth rate in developing countries due to a next wave of globalization.

Figure 4: GDP per capita development and ratio



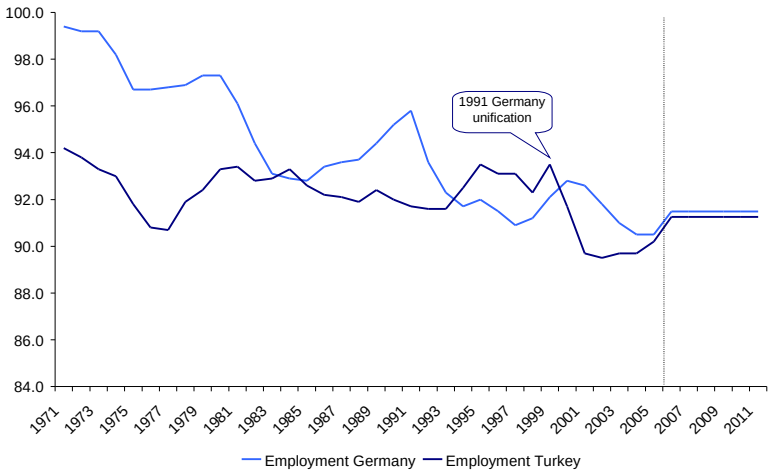
Source: Eurostat, 2007; own computations.

German unification in 1991 decreased the GDP p.p. in Germany; however the drop was smooth and the growth of GDP decelerated in the following years. It should be noted that the income difference is stable in absolute terms, hence the ratio is increasing (i.e. the income difference in %s is shrinking).

Unemployment

Originally both German and Turkish employment was of an interest in the mainframe of this research. However, due to the fact that the null hypothesis of insignificants of the source country employment variable was not rejected, the Turkish employment was not included in any of the simulations. On the other hand, German employment as a proxy of labor market conditions in Germany represents a strong migration driver. The significant drop in employment level in 1991 is caused by German unification. The actual figures are completed by projections that were made as an average of last 10 years and assumed to be constant on a given level (Figure 5).

Figure 5: Employment development



Source: Eurostat, 2007; own computations

The methodology of variables projection corresponds with the migration literature (see for example Erzan et al., 2004; Alvarez-Plata et al., 2003; Boeri, Brücker, 2001).

3.3.2. Scenarios and results.

In this sub-section three different scenarios of what might happen to Turkish migration to Germany after EU accession are presented: realistic scenario, optimistic scenario and pessimistic scenario. The optimistic and pessimistic scenarios do not concern the number of migrants but are rather based on Turkish economic development and integration point of view.

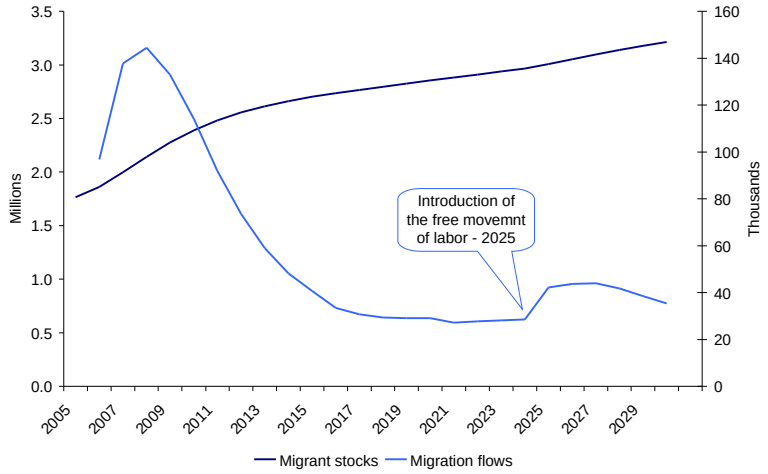
Realistic scenario

In the realistic scenario employment rate remains unchanged and GDP in Germany and Turkey grows at rate 2 % and 4 % p.a. respectively. Moreover, dummy variable for free movement of labor from the year 2025 is employed because of the possible Turkey EU accession or similar agreements that would have the effect on free movement of labor. The results are reported in figure 6 below.

In the realistic scenario the migration flow reaches its top in the 2009 and than decreases. A slight increase can be observed after simulated EU accession. The migration flows are marginal after 2030 onwards. This is mainly caused by ageing of Turkish population. The number of Turks living in Germany is stabilized at the 3.2 millions and the initial peak of

migration flows in 2009 is caused by the gap that appears in the beginning of 21st century in a migration flows from Turkey. Thence, the model is trying to compensate it and get the migration to the standard level.

Figure 6: Realistic scenario – Turkish immigrants: migration stocks and migration flows



Source: Own computations.

It should be noted that migration flows are average migrations over time intervals and that they are expected to change in the course of business cycles. Migration stocks remain stable from 2015 onwards, hence the forecasted migration stocks of Turks in Germany is approximately 3.2 million people. However, the % of Turkish migrants to the total Turkish population slightly decreases from 2015, perhaps due to the Turkish population projections. On the other hand, the % of Turkish migrants to the total German population increases.

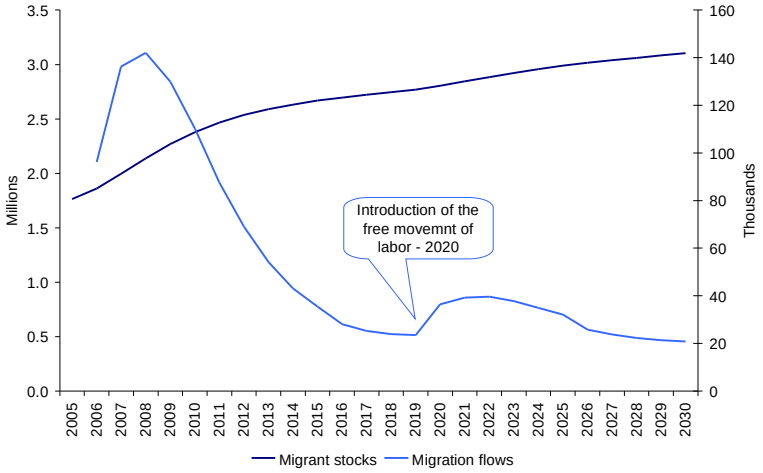
Optimistic scenario

In the optimistic scenario faster convergence of Turkish economy to the German level is assumed. Moreover, the integration process of Turkey into the EU also happens earlier. GDP per capita of Turkey converges to the German GDP per capita in a rate of 4 % p.a. and free movement of labor is introduced in 2020. The employment rates remain constant as in the realistic scenario. The results of the simulation are reported in figure 7.

It can be seen that in the optimistic scenario the development of migration is similar to the realistic: migration decreases from 2009 and than raises slightly after the introduction of free movement of labor. However, the whole convergence process to the steady state is faster and

the total amount of migrants residing in Germany in 2030 is approximately 3.1 million, i.e. 0.1 million lower.

Figure 7: Optimistic scenario – Turkish immigrants: migration stocks and migration flows

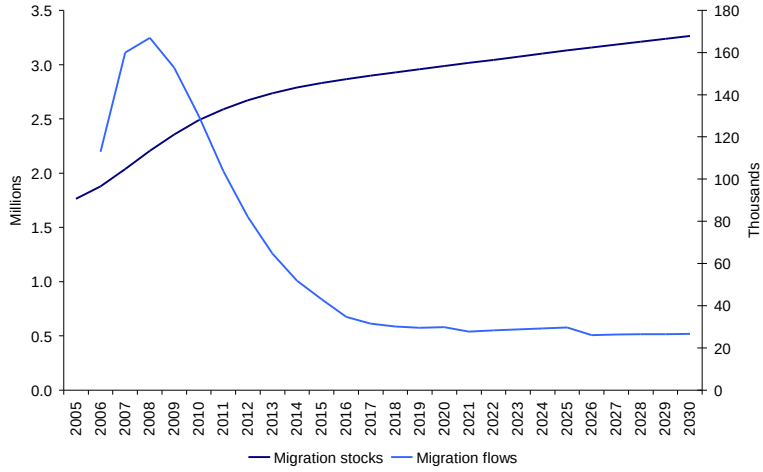


Source: Own computations.

Pessimistic scenario

In the pessimistic scenario the GDP convergence does not exist at all. In other words, the German GDP per capita grows as fast as the Turkish GDP per capita for the whole simulated period. Furthermore, it is assumed that the free movement of labor between Turkey and Germany is not introduced at all. The employment rate in Germany is set about 2 % higher compared to the base case and then remains stable.

Figure 8: Pessimistic scenario – Migration stocks, Migration flows



Source: Own computations.

In the pessimistic scenario, the faster increase of migrations from Turkey to Germany is observed (Figure 8). However, the increase after introduction of free movement of labor is missing, thus the final stock of migrants is not that pessimistic as one could have expected. The total amount of Turkish migrants in Germany in 2030 is about 3.3 million. That is 100 thousand more migrants compared to the realistic scenario.

Sensitivity

Sensitivity of estimated results should be accounted for. The impact of GDP per capita both in Turkey and Germany on the stocks of Turkish residents living in Germany is rather small in the long run. Thus, there exists relatively low elasticity between the migrant stock and GDP per capita in Turkey, as well as between the income differential.

Table 4: GDP growth sensitivity analysis

	GDP per capita Growth		Stocks of residents (Thousands)	
	Germany	Turkey	2020	2030
No growth	**0%**	**0%**	2,786	3,078
	0%	**4%**	2,793	3,091
	0%	**8%**	2,799	3,103
	2%	**0%**	2,849	3,200
Base case	**2%**	**4%**	2,855	3,213
	2%	**8%**	2,862	3,225
	4%	**0%**	2,910	3,320
	4%	**4%**	2,917	3,332
High growth	**4%**	**8%**	2,923	3,344

Source: Own computations.

It becomes clear that German GDP represents the strongest migration incentive. Turkish GDP growth is, on the other hand, irrelevant mostly because of the coefficients of the variables where the Turkish GDP is employed (Turkish GDP is presented also as a denominator of income difference variable). The other exogenous variables were taken from the realistic scenario (see Table 4).

German employment rate (see Table 5) seems to have greater impact on migration stock. The % change in employment rate in Germany (used as a proxy for the German labour market conditions) affects the migration stock of Turks living in Germany stronger than a % change in German or Turkish GDP per capita. The other variables are taken from the base case.

No doubt, the real migration figures may highly deviate from the obtained results and projections. Some factors might influence migration stocks stronger than the variables used

in this model. Those might be country specific conditions, such as the issue of Northern Cyprus, Kurdish minority issues or unpredictable radicalization of Turkish political representation. All these issues, if triggered, might potentially lead to international isolation of Turkey which will, in its turn, cause higher migrations due to political refugees or asylum-seekers.

Table 5: Employment rate sensitivity analysis

	Employment rate (%)	Stocks of residents (Thousands)	
		2020	2030
Low Emp.	89	2,729	3,077
	90	2,779	3,131
	91	2,829	3,185
Base case	91.5	2,855	3,213
	92	2,878	3,237
	93	2,927	3,289
High Emp.	94	2,976	3,341

Source: Own computations.

On the contrary, there might occur a significant decrease of migration due to stronger migration barriers or nationality. Secondly, per capita income in Turkey is much lower than in most EU countries, thus the income gap is extreme and could also change abruptly. Third, the negotiation and agreements with the EU will be also crucial and Turkish cooperation with the EU might also have significant impacts on migration.

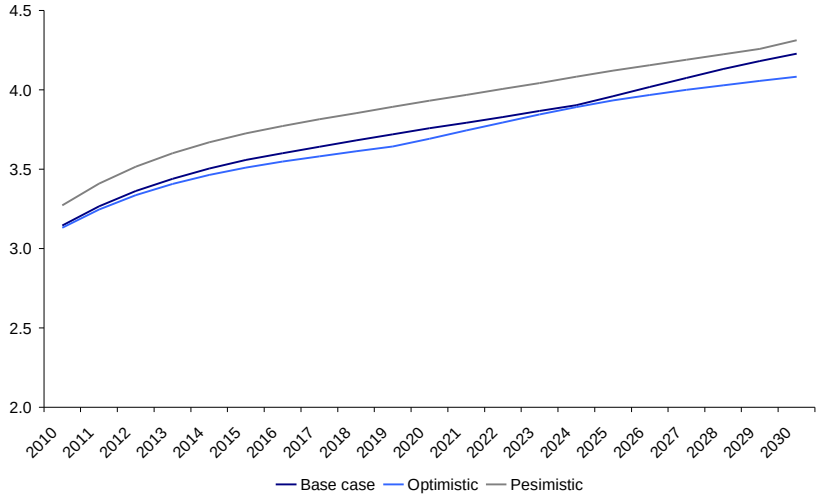
3.4. Extrapolation to EU 15

The next step is the extrapolation of the results for the whole EU15. Taking into account that about 76 % of all Turkish immigrants in today's EU live in Germany, results from the scenarios above can be extrapolated for the EU15. In all scenarios a stock of some 3 million residents from Turkey is expected to live in EU15 in 2010. As the time count reaches the 2020 the scenarios start to vary more significantly and by the 2030 there is expected to be from 4.0 to 4.4 million Turks living in EU15.

Nevertheless, it has to be noted that the extrapolation shown in Figure 9 is subjected to one important restrictive assumption. This is that the distribution of Turkish migrants in 2004 across the EU15 countries might remain constant over the whole period included into the simulation (2010-2030). Indeed, current migration stocks and flows depend on underlying

economic variables that can change over time, moreover institutional restrictions may also disappear.

Figure 9: Extrapolation results for Turkish migration to the EU15 until 2030 (millions)



Source: Own computations.

However, country specific reasons for migration seem to be relatively stable in the past. Therefore, the extrapolation of Turkish migration into Germany to the EU15 gives a reasonable picture of the possible development until the 2030.

4. Conclusions.

The major outcome of this paper is the following: in the case of Turkish EU accession the envisaged stocks of Turkish migrants in the EU15 should not increase dramatically. The results stemming from the estimations in this paper show that post-accession annual migration flows from Turkey to the EU15 might be as high as 40 thousand people in the long run. The experience with former EU enlargements supports these findings.

It should be acknowledged that the EU can not afford to have a "zero migration" policy under current institutional framework. Furthermore, a successful accession period with high growth and implementation of the reforms is actually leading to elimination of the migration pressures. There is no "*a priori"* reason why Turkey should go via different path. More precisely, the Turks with the strongest incentives to migrate had already settled in the EU (mostly Germany).

The results of this paper also suggest that Turkish convergence to the EU might be important for narrowing the income differences and improving of other economic and trade relations. However, the impact of economic convergence or introduction of free movement of labour on migration is not very significant (the network effects seem to prevail). On the other hand, factors such a minority rights or Kurdish question, can significantly change the character of migration and thus also the migrants flows.

There are also other implications arising from this paper. First of all, it should be reminded that the results presented here should be taken with great care. The uncertainty about migrations from Turkey after its possible EU accession still prevails. The simulation of possible Turkish migration presented in this paper is based on an empirical model that shows dependence of migration to Germany on income differential, employment rate and an institutional factor of free movement of labour across the EU. However, some issues that could have distorted the results (i.e. institutional reform in the EU and its migration policy, political crises in Turkey, a halt in Turkish economic convergence to the EU, major crisis involving Kurdish minority, women rights, Cyprus conflict or abortion of Turkey EU accession process) were left out from the model.

Second, the cross-section character of the regressions used in the paper did not allow for period adjustment which could play a key role in migrations flows. It also seems complicated to compare the data on Turkey and other emigration countries. On average, the income gap is significantly larger between Germany and Turkey than between Germany and most of the other source countries. With this in mind, it seems quite complicated to make predictions.

Third, results presented in this study might be biased due to a recent trend in Turkish migration stocks: the decrease in migration in recent years might not be fully captured in the model and the forecasted values might be overestimated. Nevertheless, if this is controlled for, migration inflows to the EU15 are stabilized at between 32 to 50 thousands Turkish emigrants annually, depending on the presented scenario.

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