LUND UNIVERSITY

Department of Economics

Turkey Taking the CEEC Road

- Would There Be Gains From a Turkish Accession Into the EU?

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Bachelor Thesis 2009-01-11
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Abstract

This thesis investigates how Turkey´s trade flows would have been affected if they had taken the same road of integration, into the EU, as the CEEC. For this purpose we have used the gravity model and produced both cross section and panel data regressions. The method used is first an *in sample estimation* of the bilateral trade flows between the CEEC and EU. Secondly a trade potential for Turkey was calculated allowing for a comparison with the observed trade flows in an *out of sample estimation.* The data used are mainly collected from OECD and contains 1893 observations. The overall result tells us that Turkey outperforms the CEEC but it seems as additional trade could be created from further integration with the EU.

Keywords: Gravity model, integration, bilateral trade flows, Turkey, EU

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List of abbreviations

CAP – Common Agricultural Policy

CEEC – Central Eastern European Countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia)

CES – Constant Elasticity of Substitution

EA – European Agreement

EC – European Community

EEC – European Economic Community

EU – European Union

EU12 - Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovenia and Slovakia

EU15 – Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, the Netherlands, Portugal, Spain, Sweden, United Kingdom

FDI – Foreign Direct Investment

FTA – Free Trade Agreement

IIT – Intra Industry Trade

NTB – Non-Tariff Barriers

OLS – Ordinary Least Squares

RIA – Regional Integration Agreement

RHS – Right Hand Side

ROW – Rest Of the World

SEM – Single Market Programme

VIF - Variance Inflation Factor

1. Introduction

Since Turkey became an associated country of the EU following the signing of the Ankara Treaty in 1963, a Turkish accession into the EU has been a topic of great importance. The effects of a Turkish accession have been widely debated, often focusing on the areas of democracy, human rights and migration flows. *The purpose for this thesis is to make a contribution to this debate, concerning how a Turkish accession would affect the bilateral trade flows between the EU members and Turkey.*

In 2001 Turkey and the EU managed to establish a customs union, ensuring the free movement of goods between the two. Even though this was a first step in integrating Turkey economically with the EU there is still much to be done before becoming a full member. Twelve countries (the EU12) recently took the great step and became members of the EU. These countries have gone a long way in integrating with the EU starting with the signing of Europe Agreements in 1995.

Since EU12 have taken these steps of integration they will serve as a good example for what effects European integration has on the bilateral trade flows. In order to estimate how a Turkish accession into the EU will affect the bilateral trade flows, we will make an empirical estimation of the EU12 countries' integration process and apply this to Turkey. Hence, the main subject of this thesis is to investigate: *If Turkey had taken the same road of integration as the EU12, would there have been any difference in bilateral trade flows?* And from these results we will be able to discuss: *What can we expect from further Turkish integration with the EU?*

We are aware of that the EU12 and Turkey are not completely similar. In despite of this fact we regard this to be an interesting comparison since, as mentioned above the EU12 are the countries who most recently have become fully integrated with the EU. Furthermore, a plausible assumption is that the CEEC are the countries most similar to Turkey within the EU.

The empirical estimation consists of two steps. First we will make an *in sample estimation* using the gravity model to estimate the trade development during the integration process of the EU12 countries. In this step we will both present panel- and cross section data. The second step is an *out of sample estimation* where we apply the empirically derived relationships from step one to Turkey. The result will give us the trade potential of Turkey if they had taken the same road to EU membership as the CEEC. This will allow us to compare

our estimates e.g. the expected level of trade predicted from the gravity model, with the observed trade flows.

We will estimate the trade flows on an aggregate level and the sample covers the time period of 1995 – 2007. This time period has been chosen since the EU12 were integrating with the EU during this period and due to that the EU15 was enlarged with the accession of Austria, Finland and Sweden in 1995. The lack of data has made us exclude Malta and Cyprus. This ought not to affect our analysis by much since they are economically small countries compared to the other EU12 countries.

The thesis is organized as follows: In chapter two we present previous research followed by chapter three which is an overview of the integration process for the EU12 and Turkey with the EU respectively. This will be accompanied by the theory of economic integration. The theoretical framework of the gravity model will then be presented in chapter four followed by the results in chapter five and in chapter six one will find the concluding remarks.

2. Previous Research

This section will present an overview of previous research conducted considering how an accession into the EU would affect Turkey. Our focus will be the effects on bilateral trade flows.

Flam (2004) has made a prediction of the future development of the bilateral trade flows between the EU15 and Turkey using the gravity model. The data set covers the years of 1990 – 2000 and he concludes that there is a potential for higher trade flows in the future. Flam does not attribute the potential increase in trade flows to a deepened economic integration between Turkey and the EU (Flam 2004:199). He does, however, underline that if Turkey would accede to the EU the major effects on the trade patterns would be seen in the agricultural sector. This is due to that a customs union in industrial goods has existed between Turkey and the EU since 2001; this seems like a plausible assumption (Flam 2004:197).

Another contemporary study made by Lejour, Mooij and Capel (2004) forecasts that a Turkish accession would increase the trade flows with the EU by 34% compared to the level in 2001. They assign this increase to the reduction of administrative and technical barriers and increased political and macroeconomic stability (Lejour, Mooij and Capel 2004:30*ff*). They also stress the importance of EU membership working as a catalyst for institutional reforms in Turkey. If an accession would improve Turkish institutions to the level of Portugal[1] they find that aggregate trade would increase by 57 % (compared to 17 % in the previous case) (Lejour, Mooij and Capel 2004:33).

A third study made by Togan (2005) also indicates that an accession to the EU would be followed by an increase in trade flows between EU15 and Turkey. He forecasts the future trade flows under the assumption that the trade intensity between Turkey and the EU will reach the same level as for the countries within the EU as it was in 2005. By using the gravity model Togan predicts that if Turkey had been more integrated with the EU total trade flows would have increased to $25.75 billion which is 25.2 % higher than the observed trade flows. He further emphasizes another important aspect. If Turkey would have a share of EU trade to total trade equal to the four largest EU countries (58 %), total trade flows between Turkey and the EU would further rise to $44.4 billion (Togan in Hoekman & Togan 2005:328*f)*. This ought to be an important aspect when trying to predict the future trade flows between the EU and Turkey.

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[1] They use the IT Corruption Perceptions index and refers to 2003

Nowak – Lehmann, Herzer, Martínez-Zarzoso and Vollmer (2005:738*f*) have studied the impact of the creation of the customs union between Turkey and the EU. From their results they make a simulation of what effects an extended customs union, including fruits and vegetables would have on Turkish exports to the EU. They find that if tariffs were lowered on fruits and vegetables and included in the common agricultural policy (CAP) Turkish exports would increase by 21.0 % for vegetables and by 18.7 % for fruit. They do accentuate that a full integration of Turkish agriculture into the customs union would be costly for the union due to the CAP and structural fund rules that will have to be applied. However, they stress that an abolition of tariffs and tariff-like measures from the EU will be an effective way in further integrating Turkey with the EU.

Previous research indicates that a further integration of Turkey with the EU would increase the bilateral trade flows. We intend to make a contribution to this research by using a different method than previous researchers and actually comparing Turkey with the countries that most recently went through the process of becoming members in the EU, the EU12.

3. European Integration: Enlargement and Theory

In this chapter we will present an overview of the EU enlargement process for the Central Eastern European Countries (CEEC) and Turkey respectively. Our focus will be economic integration, and how it affects the bilateral trade flows between nations. To be able to fully analyze the possible trade effects of a Turkish accession into the EU, this chapter will also explain the economic theory of European integration.

3.1 Enlargement of the European Union; 15 Becomes 27

During the cold war the involvement of the EC in the Soviet satellite states was almost nonexistent. In 1985 the reformist Mikhail Gorbachev came to power in the Soviet Union, this set spark to what came to be a deep and wide cooperation between EC and the CEEC. Following the election of Gorbachev the first bilateral trade agreement with the EC was signed by Hungary in 1988. In the years to come additional "first-generation agreements" between the EC and CEEC were signed but as the iron curtain fell new opportunities for co-operation were created (Van Oudenaren in Tiersky 1999:401*ff*).

3.1.1 Europe Agreements

After the fall of the Berlin wall the unification of Germany was the primary object for the EC. In addition to this challenging mission the member states expanded trade to and aided the CEEC in their costly economic transition towards market economy. The community sought closer bonds to a stabilized Central and Eastern Europe (Van Oudenaren in Tiersky 1999:405).

Between 1991 and 1996 the EU[2] signed "second-generation Europe Agreements" with Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. These agreements provided a legal instrument for co-operation between the EU and the CEEC member states. This responded to the CEEC's wish of gaining access to the European market and in the extension an accession into the EU. Besides providing a legal framework and political dialogue the Europe Agreements included trade related issues. The Europe Agreements stated that a *free trade area* was to be established between the EU and the CEEC within ten years. Since the Europe Agreements required approval from all member states involved (including EU institutions) the implementation of the agreements was postponed. In response to this, interim agreements concerning trade and

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[2] On November the 1st 1993 the EC transformed into the EU following the signing of the Maastricht treaty (Van Oudenaren in Tiersky 1999:*405*).

commerce were put into force by the European commission (Van Oudenaren in Tiersky 1999:405)(Senior Nello 2009:469*f*).

Country	Interim Agreement	Europe Agreement	EU membership
Bulgaria	May 1993	February 1995	January 2007
Czech Republic	March 1992	February 1995	May 2004
Estonia	January 1995	February 1998	May 2004
Hungary	March 1992	February 1994	May 2004
Lithuania	January 1995	February 1998	May 2004
Latvia	January 1995	February 1998	May 2004
Poland	March 1992	February 1994	May 2004
Romania	December 1993	February 1995	January 2007
Slovakia	March 1992	February 1995	May 2004
Slovenia	July 1997	February 1999	May 2004

Table 3.1) Dates of entry into force of the Interim and the Europe Agreements (Spiesa & Marques, 2009:32).

When the Interim Agreements were implemented the CEEC could gain access to the European market and the benefits of trading with the EU. An aspect worth highlighting is that when implementing the free trade area the tariffs on EU products were lowered on a broader scale and to a lower level compared to the CEEC (Van Oudenaren in Tiersky 1999:407). As can be seen in table 3.2 different sectors were liberalized at different times, this reflects the integration process of becoming a EU member. Moreover, some goods considered more sensitive by the EU were not liberalized right away. The most protected group, agricultural products were not liberalized until the accession in 2004 (Wilhelmsson 2004:4).

Destination/origin Commodities	EU/ Poland	Poland/EU	EU/Latvia	Latvia/EU	EU/Slovenia	Slovenia/EU
Industrial goods	1992	1992 (mainly raw materials), 1999	1995	1995	1997	1997
Minerals and chemicals prod.	1993					
Non ferrous metals	1994					
Other *sensitive* industrial goods	1995	2001 (Petroleum prod.),		1997[1] 1999[2]	2000	2000,2001

	2002 (vehicles)				
Textile	1997[3]		1998		1998	1997-2000,2001
Steel/Goods	1996[4]	1999(Steel, some steel 1992)			1997	1997,2000[5]

Table 3.2) Timetable for liberalizing EU-CEEC industrial trade – The time for liberalization of goods is more or less the same for countries signing the EA: s at the same time (Willhelmsson 2006:5).

[1] Some goods including footwear and trunks, [2] Including some footwear, tools and wooden furniture [3] Quantitative restriction eliminated in 1998, [4] 1993 for most coal products, [5] Some specified goods

A recent study was conducted by Spiesa & Marques (2009) showing that the free trade area increased EU imports from the CEEC by on average 72 %, indicating a trade creating effect. At the same time they found the trade diverting effect to be quite limited. Imports decreased from the ROW by 14% for Czech Republic, Slovakia and Slovenia. Spiesa & Marques compares their study with previous studies concerning the trade creating effects of the FTA between the EU and the CEEC. The studies show that there has been an overall trade creating effect. The most positive study was conducted by Laaser & Schrader (2002) presenting a trade creating effect of 286% (Spiesa & Marques, 2009:26*ff*).

3.1.2 White Paper

The Europe Agreement was a first step in preparing the CEEC for the accession into the EU. To fully ensure that an accession would be implemented smoothly the EU published the White paper in May 1995. While the Europe Agreements focused on the legal relationships concerning trade issues between the states the White paper focused on the implementation of EU law on national basis. The White paper was designed to prepare the CEEC for the internal market and the free mobility of capital, goods, persons and services. The most important aspects for the stimulation of trade which the white paper concerned were the removal of customs duties, taxes on exchanges between countries and discriminatory measures on grounds of nationality. Furthermore the White paper stated that capital movements were to be liberalized to ensure a stable macroeconomic environment and that the EC directive of public procurement was to be implemented. This directive ensured that public procurement, in the sectors of telecommunications, water, energy and transport would be contracted to the cheapest firm within the economic area (Coleman 1995:34*ff)*. All these measures further

deepened the economic co-operation and increased the opportunities for trade relations between the members of the EU and the CEEC countries.

3.1.3 Accession

On 1 May 2004 the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Cyprus and Malta acceded into the EU. Following their example Bulgaria and Romania became members of the EU on 1 January 2007 (Schadler in Artis & Nixson, 2007:375). Accession into the EU meant that the new member states implemented the Single Market Programme (SEM) with free mobility for capital, goods, persons and services and became a part of the European customs union(Senior Nello 2009:470). Since trade had already been liberalized in the accession process prior to 2004 studies conducted by Breuss and Egger (1999) and Piazolo (2001) suggests that most gains from economic integration have already been exploited (Fuchs & Wochlrabe 2005:2). However, Fuchs and Wohlrabe (2005) argue that there still exist informal barriers to trade due to the great difference in institutions between the EU15 and EU12. To estimate differences in institutions, an index of economic freedom[3] produced by the Heritage Foundation was used. They conclude that in the medium- and long run, convergence of institutions will increase the bilateral trade flows between the EU15 and EU12. Fighting corruption and the informal market in the EU12 will be the largest contributors to an increase in EU15 imports (Fuchs & Wohlrabe 2005:14). These positive effects of accession will not be captured in our analysis. However, it is important to bear this in mind when discussing the expected future gains from a Turkish accession into the EU.

3.2 Turkey and the European Union

The European Economic Community (EEC) had recently been established, following the signing of the Treaty of Rome, when Turkey sought closer bonds to the EC. As early as in 1963 Turkey became an associated country of the EC following the signing of the Ankara treaty. The treaty stated that a customs union between the two was to be formed by 1995 at latest. As the free trade area for the CEEC, the customs union was thought of as a primary step towards accession of Turkey into the EU. During this period, as for the CEEC, the EC granted Turkey preferential tariffs and financial aid to ease its preparation for closer economic bonds. During the 1970s and 80s political and economic conditions in Turkey put the full implementation of the customs union with mutually decreased tariffs on hold. In 1987 Turkey

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[3] Amongst other things government intervention, restrictions on foreign business and the embodiment of property rights are factors used in calculating the index (Fuchs & Wohlrabe 2005:3).

applied for full membership but since the EU was more concerned with the situation in Eastern Europe at the time (described above), Turkey's accession was postponed.

During the time period of 1996 – 2001 the EU and Turkey managed to establish a customs union for industrial goods by removing tariffs and quantitative restrictions. Even though this is a good start for an economic integration between the EU and Turkey, much of the SEM was not implemented. Restrictions and tariffs still apply to the movement of capital and services and since Turkey is not a part of the Schengen area, free movement of labor is restricted as well (Flam 2004:172). Except for the creation of a customs union much of the EU's regulatory framework has been implemented in Turkey. The most important aspect for our analysis is the harmonization of customs duties and of technical barriers to trade i.e. lowering the *non-tariff barriers* (NTB) between the EU and Turkey (Adam & Moutos 2008:690).

Ülgen & Zahariadis (2004) have conducted a study confirming the customs union as a technical success. They stress the fact that the customs union has not had a major impact on Turkish – EU trade flows. This is due to the fact that most tariffs on industrial goods (except textiles) were lowered before the creation of the customs union and had thereby already made the EU Turkey's most important trading partner. Ülgen and Zahariadis find three main areas were the customs union needs improvement. Technical barriers to trade need to be eliminated by Turkey at the same time as the trade in the service industry has to be liberalized and agricultural products need to be incorporated in the customs union. Accomplishing these goals will be crucial in the further integration of Turkey and for the creation of more welfare from the existing customs union (Ülgen & Zahariadis 2004:20*f*).

Antonucci & Manzocchi (2006) have studied whether the long period of EU preferential treatment towards Turkey has generated a special trade relationship. They conduct a comprehensive study applying the gravity model on Turkish trade flows for the years 1967 – 2001. By doing this they can compare the trade flows predicted from the gravity model with the observed trade flows between the EU and Turkey. They find no evidence of Turkish trade flows being larger than predicted from the model; hence, there does not seem to be any positive effect from the preferential treatment. However, they do point out that since the customs union was formed in 2001 this special relationship might have developed in the years subsequent to the study (Antonucci & Manzocchi 2006:167). But reconnecting this with the findings of Ülgen & Zahariadis this does not seem likely to be the case.

3.3 The Economic Theory of European Integration

The first major contribution to the economic theory of integration was made by Viner in 1953. Viner considered the *static effects* of integration, at the time known as customs union theory. As theory evolved Viner's thoughts were complemented with the *dynamic effects* of integration. Important dynamic effects are economies of scale*,* increased competition and technology transfer. Studies have been made evaluating the dynamic effects of the Single Market Programme (which will be discussed in detail below) arguing that the dynamic effects could be five to six times as large as the static effects of integration (Senior Nello 2009:119*f).* In our analysis we will not make an attempt of isolating the impact of dynamic effects on the bilateral trade flows. However, some dynamic effects, i.e. economies of scale will be captured in our estimates and hence increase the positive effects of the integration process.

3.3.1 Trade Effects

When Viner analyzed the static effects of integration he considered the effects on the production side, assuming that goods were consumed in the same proportion. In his analysis of forming a free trade area or a customs union he made the very useful distinction between *trade creation* and *trade diversion*. Trade creation refers to when the removal of trade barriers gives rise to an increase in cheaper imports from the partner country replacing domestic production. This sort of trade was nonexistent before the *regional integration agreement* (RIA) and is associated with an improvement of the international resource allocation. Trade diversion occurs when the removal of trade barriers due to a RIA replaces low cost imports from the *rest of the world* (ROW) with more expensive imports from the partner country (Senior Nello 2009:111). Hence, trade diversion indicates worsened international resource allocation. In 1957 Lipsey showed that forming a customs union also affects the consumption side of the economy (Spiesa & Marques 2009:13). To fully evaluate the static effects of integration we will now consider two different scenarios of regional integration, the forming of a free trade area and of a customs union.

Free Trade Area

The forming of a free trade area is a more elementary version of a customs union and for countries joining the EU it is normally the first step in the integration process. When forming a free trade area the countries remove the tariffs between themselves while withholding the freedom of choosing barriers to trade towards third country. Since third country could be able to export to one of the countries (the country with the lowest tariff towards third country) in order to reach its partner country's market without paying tariffs, *rules of origin* are required.

Rules of origin require documentation along with the good stating the country of origin. If the good is to be further exported to the partner country the good often requires a level of refinement (Senior Nello 2009:6). Restrictive rules of origin might increase the trade diverting effects when forming a free trade area. In the beginning of the implementation of the EA: s rules of origin were rather restrictive which hence might have decreased the positive effects of the EA: s (Wilhelmsson 2004:5).

Customs Union

A customs union is a form of integration suited for deeper integration between countries e.g. the forming of the EU. A customs union, as a free trade area removes the tariffs between the involved nations. The difference is that the trade barriers towards third a country are leveled as an average of the external tariffs of the countries forming the union (Senior Nello 2009:6). In the case of the EU this is called the Common Commercial Policy.

There are ambiguous results for countries joining a customs union. There are a number of country specific factors that generally determines whether there will be positive or negative effects. The most interesting factors for our analysis which are believed to increase the positive effects of forming a customs union are: *Geography*, if countries are situated close to each other this is assumed to increase the positive effects since transport costs will be lower. Greater *trade flows* between the countries before forming the customs union is positive since trade barriers are removed and there will be a lower risk for trade diversion. If the industries of the two countries are *competitive,* firms can become more specialized and the costs of adaption decrease compared to if the industries would complement each other. Finally the *larger the customs union* is the higher is the probability that the lowest-cost producer will be part of the union and thereby eliminating the risk of trade diversion (Senior Nello 2009:118*f*).

Krueger (1997) argues that a free trade agreement cannot yield more welfare gains than a customs union; hence a customs union is the pareto-superior choice. This is due to that a free trade agreement cannot increase trade creation more than a customs union at the same time as a free trade area requires rules of origin which leads to more trade diversion (Krueger 1997:180). We thereby expect the customs union between the EU and Turkey to yield more positive effects than the EA: s initially did for the CEEC. However, since the customs union only applies for industrial goods, the EA: s will probably generate more positive effects in the end. The reason for this is that the CEEC gradually adopted the Single Market Programme

during the integration process, i.e. the freedom of movement for capital, goods, persons and services.

3.3.2 Single Market Programme

A very important aspect when assessing the positive effects of European integration is the implementation of the Single Market Programme (SEM). After the oil shocks of the 1970s the European economy went into a deep recession. At the same time it seemed as the EC lost competitiveness compared to the US and Japan. The community was shattered and the terms "Europessimism" and "Eurosclerosis" were coined describing the situation (Van Oudenaren in Tiersky 1999:255).

In 1991 Krugman conducted a study comparing the four largest countries in the EC with the four regions of the US (North-East, west and south). His main result was that the European market was far more fragmented than the US market despite larger distances in the US. He addressed this problem to the existence of NTB's (Senior Nello 2009:133).

The bilateral trade flows between the EC countries were limited due to the lack of unity within the community. National standards and technical regulations on goods differed between the countries making the import process more lengthy than necessary. Border controls limited the flows of goods and persons between the member states due to paper work and the fact that the trucks had to wait in line to enter the country of destination. Furthermore restriction on capital flows induced by the states assured that the capital stayed within the nation's border. The service industries were largely national making the providing of a service in another EC country very difficult. This was particularly the case for the two essential financial and transport industries (Van Oudenaren in Tiersky 1999:256*f*). Additionally the member states restricted the competition for public procurement. This meant that the state would rather contract a national company than a cheaper company within the union. The fact that public procurement account for about 16 % of EU GDP and that prior to the implementation of the SEM, only in one case out of 50 was a firm from another country contracted, shows the importance of this matter. The overspending from public procurement was calculated to be about 25 % (Senior Nello 2009:147).

The SEM was a natural development of The Treaty of Rome which stated that an internal market was to be established within the EC with free movement for capital, goods, persons and services (Van Oudenaren in Tiersky 1999:256). A very important step in ensuring free movement of persons was the implementation of the Schengen Agreement. Implementing the

agreement led to the removal of all frontier controls on persons. According to theory removal of barriers to migration leads to increased efficiency and improved allocation of resources. This is due to that high and low skilled workers can move to the country where there is a shortage of labor and thereby use their skills in the best possible way (Senior Nello 2009:139, 183).

David Gould argues that this approach omits important aspects which are relevant in the discussion of the impacts of migration flows on bilateral trade flows between countries. According to Gould immigrant links with the home country has positive effects on bilateral trade flows and he defines two reasons to why that is so. First, when moving to a foreign country immigrants bring a demand for their home country products. Secondly, immigrants lower the transaction costs of trade by bringing information of the foreign market, spreading their native language and providing useful contacts to firms (Gould 1994: 302*f*). When investigating the US and 47 of its trading partners Gould finds a positive relationship between immigrant links and bilateral trade flows. He also finds that the positive effect is greater for consumer goods and exporting industries (Gould 1994:314). Applying these results to the EU15 trade and migration flows with the CEEC and Turkey we could expect even more positive effects from immigrant links. This is due to that the distances between the countries within the EU and between Turkey and the EU are much shorter than the average distance between the US and its trading partners, making it physically easier to move.

Furthermore since the decision to migrate amongst other things depends on ethnic and family networks (Senior Nello 2009: 185) there ought to be positive effects from including Turkey in the Schengen Agreement since a lot of Turks migrated to Europe in the 1960s (Senior Nello 2009: 195). Implementing the Schengen Agreement meant that border controls and customs formalities on goods were removed as well. The benefit of this removal was calculated to save a total of €9 billion a year which obviously increases the incentives to trade (Senior Nello 2009: 141).

In ensuring the freedom of movement of capital, liberalizing the financial sector was crucial. Freeing capital movements is assumed to increase efficiency since capital-abundant countries (EU15) will invest in capital-strapped economies (EU12 and Turkey) due to the law of diminishing returns i.e. higher marginal returns (Buch & Piazolo 2001:185). This in turn increases the supply of capital which enables entrepreneurs to borrow and invest more money in firms and projects in the developing countries (Senior Nello 2009:151). Buch and Piazolo

made an *ex ante* study intending to predict the change in capital and trade flows after the CEEC's accession to the EU. Their most important result for our analysis is that capital and trade flows have common determinants. Countries joining the EU are more likely to receive more capital from other members and to import more of their goods (Buch & Piazolo 2001:210*f*). They highlight another important aspect, since an accession into the EU requires adoption of common technical standards and institutions, information costs for foreign investors will be lowered (Buch & Piazolo 2001:185*f*). This in turn ought to increase the capital flows and establish deeper economic bonds between the member states.

Additionally there seems to be a positive correlation between foreign direct investment (FDI) and intra industry trade (IIT) for the EU15 with the EU12 (Aturupane, Djankov & Hoekman 1997:20). In 2006 the share of IIT of total trade for the EU12 was at the same level as for the EU15. The same year FDI from EU15 to EU12 reached €46 billion which was an increase from 6 % (in 2005) to 11 % of intra EU25 investment flows (Senior Nello 2009:471).

Turkey has not been able to attract as much FDI as the CEEC. Macroeconomic and political instability are regarded to be the most contributing factors to this problem, making investments in Turkey more risky compared to in the CEEC. Furthermore, corruption, high bureaucratic costs and domestic monopolies further decrease the incentives to invest in Turkey (Hughes 2004:13). An adoption of EU institutions and liberalized capital flows could hence be assumed to increase the FDI in Turkey.

It seems safe to assume that if Turkey was to implement the remainder of the SEM when acceding into the EU we can expect positive effects on the bilateral trade flows according to the discussion above. Turks would probably move to countries where relatives are settled and where opportunities for jobs exist. This would increase the resource allocation and immigrant links with their home countries would increase the bilateral trade flows. By liberalizing capital movements, FDI (from the EU15) will increase in Turkey and hence increase investments in Turkish industries and agriculture, allowing for more trade. Larger bilateral trade flows are also expected from the adoption of common technical and institutional standards since NTB: s will be decreased.

4. The Gravity Model

This chapter will be organized as follows: first we present a historical background of the gravity model, which originates from Jan Tinbergen´s work. The second part focuses on the theoretical framework of the model which connects to part three were we will discuss barriers to trade and multilateral resistance.

4.1 Historical Background

The foundation of the gravity model is based on Isaac Newton's "Law of Universal Gravitation". The Law of Universal Gravitation states that the attraction between two objects is affected by the mass of the objects and the distance between them. In other words the attracting force will be greater the larger the objects are and the closer the objects are to each other. In 1962 Jan Tinbergen applied Isaac Newton´s idea to international business flows. He made the plausible assumption that larger countries close to each other trade more than smaller countries which are separated by a great distance (Head 2003:2).

The gravity model is one of the most empirical successful models in economics. In spite of this the model for a long time lacked a formal explanation based on trade theory. Since the pioneering work of Anderson (1979) a number of papers, Bergstrand (1985, 1989), Helpman and Krugman (1985), Deardorff (1998), Anderson and van Wincoop (2003), have been written to provide theoretical foundation (Greenaway and Milner 2002:579).

4.2 Theoretical Framework

When Tinbergen started to model bilateral trade flows he presented this relatively simple model:

Eq. 4. 1
$$F_{ij} = G \frac{M_i M_j}{D_{ij}^{\theta}}$$

Where F_{ij} represent trade flows between country i and j. M is the economic mass, often measured as GDP and D_{ij} is the distance between the countries. If country i is the exporting country, M_i is to be seen as the amount which i is willing to supply to all customers. M_j, on the other hand, is the quantity demanded by country j. This boils down to a classic supply and demand equilibrium where the distance, D_{ij}, represents a trade cost which could be seen as a tax. Hence, the distance reduces trade since the market no longer will be in equilibrium.

To fully understand the gravity model one must understand what drives imports. There are some different ways to approach this but the most common theoretical justified model was

derived by Anderson and van Wincoop in 2003. The two building blocks in their gravity equation are the assumptions of (1) preferences are homothetic and (2) all goods are differentiated by place of origin (Anderson and van Wincoop 2003:174). Homothetic preferences imply that given a certain price consumers will demand the good in equal proportions even though their level of income differs. To estimate these preferences Anderson and van Wincoop uses the *constant elasticity of substitution* (CES) subutility function, developed by Dixit and Stiglitz in 1977. The key assumption behind the CES is the *love of variety approach, videlicet* consumer utility will increase, not with the quantity consumed but with the quantity of each variety consumed. The CES subutility function captures this in a neat way:

Eq. 4. 2
$$U_\omega = \left(\sum_i X_{i\omega}^\beta \right)^{1/\beta_i}$$

Eq. 4. 3
$$\beta_i = (1 - 1/\sigma_i)$$

Where $X_{i\omega}$ is the quantity of varieties consumed and σ_i is elasticity of substitution. The CES subutility function captures consumer's preference for variety since the assumption is made that all pair of varieties are substitutable for each other and does not differ in price. Hence, consumers will consume an equal amount of each variety. The conclusion is that for a given level of consumption and equal prices utility will increase with more variety of products ($X_{i\omega}^\beta$) (Helpman & Krugman 1985:117*f*).

On the production side Dixit and Siglitz (1957) incorporated monopolistic competition, differentiated goods and increasing returns to scale into the model. Increasing returns are assumed to be internal to the firm, this implies that average cost decreases with the quantity produced. To fully exploit the internal increasing returns to scale, firms will limit production to one location. Since consumers love variety firms will specialize in producing only one variety. This is due to the fact that if a firm would produce a variety already supplied by another firm they would have to split the market and thereby lose profits. This leads us to a situation where firms will only produce one unique variety and they will produce it at one location (country). One firm per variety, one variety per firm and one country per variety (Helpman & Krugman 1985:132)(Dingel 2009:4).

Anderson and van Wincoop´s elegant gravity model derives the *import demand* (x_{ij}) and is stated as follows:

Eq. 4. 4
$$x_{ij} = \frac{y_i y_j}{y^w} \left(\frac{t_{ij}}{P_i P_j} \right)^{1-\sigma}$$

Eq. 4. 5
$$y_i = \sum (p_{ij} c_{ij})$$

Eq. 4. 6
$$y_j = \sum (p_{ij} c_{ij})$$

Where country i exports the amount c_{ij} to j, for the price p_{ij}, y_i is therefore the income of country i. The opposite is the case for country j, which is the importer, and y_j denotes their budget constraint. Consequently y_i and y_j are the economic masses of each country. The world income, y_w, is defined as: $y_w \equiv \sum_j y_j$. The first fraction in Eq.4.4 on the right hand side puts the economic masses in relation to the world income.

The second fraction is somewhat more interesting because it explains what impedes trade. The term t_{ij} is the bilateral resistance and $P_i P_j$ is called multilateral resistance. Both the nominator and denominator will be discussed in two separate chapters.

4.3 Bilateral Barriers to Trade, t_{ij}

Bilateral barriers to trade should be considered as every variable that affects trade between two partners. These variables are country specific; hence bilateral barriers to trade are not dependent on any other country besides the trading partners (see next section for multilateral resistance). $\boldsymbol{t_{ij}}$ is therefore a vector containing all these variables.

Three common variables in $\boldsymbol{t_{ij}}$ are distance, landlocked and adjacency. Adjacency is a dummy which measures the trade effects if the partner countries share a common border. A country is landlocked if it has no access to the sea. The intuition behind this is that the transport and transaction costs would increase. But since we will use country specific dummies they will capture this effect and we will hence not use landlocked in our model.

Free Trade Agreements is obviously something that will affect bilateral trade. These agreements represent, among other things, both tariff cuts and decreasing nontariff barriers. In this thesis we are interested in two agreements, the European Agreement and full membership in the European Union. To measure the effect of these two we have introduced two dummies; FTA_{EA} and FTA_{EU}. Both dummies will be able to capture a trade creating effect and FTA_{EU} will also capture the extra trade effect a country experiences from becoming a full member.

As stated in section 3.2 immigrant links can have positive effect on trade due to e.g. import demand for home country goods, these links could also be called cultural bounds. There are a few ways to measure these cultural bounds. The most common way is to use dummy variables for common language and colonial links. A more straight forward way, when investigating the significance of immigrant links, would be to introduce a dummy that would measure minorities. This dummy would be equal to 1 if there is a minority of more than (for example) 1% of the total population in the partner country consisting of people from the other country (N.B this dummy is our own idea of an interesting measurement). Despite good reasons to include a measure of cultural bounds in the analysis we choose not to. This is the logical choice because when studying the data we find that there are only a few of the EU10 countries that have any cultural bounds (defined as above) with EU15 countries[4].

Our vector of bilateral barriers to trade:

Eq. 4. 7 $$t_{ij} = \beta_1 DIST_{ij} + e^{\beta_2 ADJ_{ij} + \beta_3 FTA_{EA} + \beta_4 FTA_{EU}}$$

4.4 Multilateral Resistance, $P_i P_j$

In 2003 Anderson and van Wincoop concluded that trade flows between two countries are affected by *relative* trade barriers. To concretize this they introduced a variable called *multilateral resistance.* Consider that country *j* wants to import from country *i*. If tariffs between country *j* and ROW would increase (and bilateral tariff between *i* and *j* remains the same) the multilateral resistance would increase as well. Hence, country *i*´s goods would become cheaper compared to the ROW and country *j* would import more from country *i.* As Anderson and van Wincoop states: "Trade between two regions depends on the bilateral barrier between them relative to average trade barriers that both regions face with all their trading partners" (Anderson and van Wincoop 2003:176).

Multilateral resistance is at the time considered to be the most accurate way to measure barriers to trade. However the multilateral resistance has a minor disadvantage, it is quite complex to use (Anderson and van Wincoop 2003:179) and therefore it is popular to approximate multilateral resistance with *remoteness*.

Eq. 4. 8 $$REM_i = \left[\sum_{k=1, k \neq i}^{N} Y_k (D_{ik})^{1-\sigma} \right]^{1/1-\sigma}$$ (Carrère 2006:227)

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[4] We have not studied minorities.

Where Y is the GDP of land *k* and D is the distance between land *k* and *i, σ* is the constant elasticity of substitution. The intuition behind remoteness is that countries which are surrounded by many neighboring countries will have a low value of remoteness and therefore trade less with each country. An example of the opposite is a country, like Australia, which has fewer countries located closely will have a higher value of remoteness and trade more with each, of the few, neighbors (Head 2003:8).

As stated multilateral resistance could be complex to use, this is mainly because one estimates with nonlinear least squares. However, there is another estimation that could be used; namely to replace the multilateral resistance with country specific dummies (Anderson and van Wincoop 2003:180). There are two major advantages with this method; (1) ordinary least squares can be used and (2) there is no need to calculate internal distances, which is required in both remoteness and multilateral resistance. The disadvantage: this estimator is not as effective as nonlinear least squares. With this in mind we intend to use this last method to estimate multilateral resistance

5. Data and Empirical Approach

Chapter 5 will focus on presenting the data and discuss the problems and solutions to zero trade flows. It will also describe variables included in the estimated gravity model, expected signs of the coefficients and lastly it will present the estimation of our gravity model following Anderson and van Wincoop (2003).

5.1 Data

The data consist of 1893 observations of imports to EU15 from CEEC under years 1995-2007. There are also 150 observations of imports to EU15 from Turkey. These observations have been collected from OECD. The statistics for population and nominal GDP come from IMF. Data of nominal GDP is expressed in $US and in current prices. Geographical variables are gathered from CEPII.

The time span has been chosen for three main reasons. To begin with, in earlier years some of the countries in the study simply did not exist (Czech Republic and Slovakia). Secondly, in 1995 EU was enlarged by Sweden, Finland and Austria joining the union. Lastly the European Agreements started to be implemented around 1995.

Of our 1893 import observations there are some observations of zero trade. In the sample of EU15 and EU10 there are 3.01% zeroes, when using the log-linear OLS model this will become a problem. The reason is that the natural logarithm of zero is undefined. There are several ways to overcome this problem and which way to choose depends on the amount of zeros in the sample. If there is a severe problem a Tobit or Heckit model can be used. In the Tobit model, also known as the censored regression model, it is assumed that values below a certain threshold are censored and therefore takes the value of zero. Following the argumentation of Linders & Groot (2006) the Tobit model will not be a suitable solution because it is not likely that our data has been censored. The other model, Heckit, is more advance and models the decisions whether or not to trade (Linders & Groot 2006:8). The Heckit model is more intuitively correct because zero trade flows probably depends on a choice not to trade rather than censored observations. There are also two more simple models, one can either discard the zeros or add a small constant to the dependent variable e.g. (*y +1),* the logarithm will then defined. Linders & Groot (2006) criticize these two methods. Discarding the zeros may lead to underestimation of some explanatory variables and when adding a constant it can lead to inconsistent estimates but one will not lose any observations.

One can use the method of discarding the zeros if they are randomly distributed (Westerlund & Willhelmsson 2006:2). In our data the zeros are not randomly distributed but they are quite few. Hence, we will use the model of adding a small constant to every observation with zero trade. We believe that the results will not be severely biased.

5.2 Variable Definition

This section will present an overview of the variables used in our gravity model and their expected signs.

Economic Mass (MASS)

Eq. 5. 1
$$MASS = GDP_i * GDP_j$$

Economic mass is one of the key variables in the gravity equation and refers all the way back to Newton. When working with the gravity equation one wants to stay as close as theory as possible and therefore we use nominal GDP.

Countries with large GDP will trade more with each other compared to countries with a smaller GDP, the reason is that larger countries will trade with more varieties (Baier & Bergstrand 2002:18). As stated above consumers prefer varieties, hence the GDP will reflect the import demand and export supply.

Distance (DIST)

There are many reasons why distance is a good measure of trade barriers. First and foremost when considering shipping, distance represents a large share of trade costs. Secondly a vast distance between two countries normally suggests greater cultural differences which plausibly will decrease trade due to e.g. misunderstandings. Finally greater distance means that searching for business opportunities becomes more expensive to carry out, *videlicet* greater distance means greater transaction costs (Head 2002:6*ff*).

Population (POP)

Eq. 5. 2
$$POP = POP_i * POP_j$$

According to Anderson and van Wincoop (2003) total GDP consist of tradable and non-tradable, where the fraction of GDP spent on tradables is a function of GDP and population. Tradable $= \emptyset GDP$, where $\emptyset = \frac{GDP}{POP}$. $\emptyset$ could also be seen as the productivity of the tradable sector. *Ceteris paribus* a country with a small population will have a high productivity of tradable and therefore the relative price of non-tradable will rise, explicit increasing the

fraction spent on tradable. Following this argumentation population will capture non-homogeneity in preferences between tradable and non-tradable goods.

Additional Dummy Variables

In section 4.3 we discussed t_{ij} and all the dummies included in this vector. In the model bilateral trade costs will be accompanied by country specific dummies to measure multilateral resistance. That is, the specification is completed with country specific dummies for exporters as well as for importers. Connecting to theory; the denominator in the second fraction on the RHS of Eq.4.4 represents the multilateral resistance value. Since country i is the home country P_i will always be equal to 1 (because a country cannot have any resistance towards itself) multilateral resistance will therefore be represented by P_j. We will also include time dummies in our estimation, these dummies will capture the development of trade over the observed years. The time dummies will help us to evaluate the trade effects during the integration process.

Coefficient	Variable	Expected sign	Reason
β_1	CONSTANT		
β_2	$MASS$	+	Larger economic mass implies a larger import demand and export supply.
β_3	$DIST_{ij}$	-	Larger distance implies larger transport costs.
β_4	POP_{ij}	+/-	Captures non-homogeneity in tradable and non-tradable goods.
β_6	ADJ_{ij}	+	Sharing a common border will reduce trade costs.
β_7	FTA_{EA}	+	CEEC becomes more integrated with EU.
β_7	FTA_{EU}	+(?)	Accession into the EU, more a political than trade liberalizing effect?
$\beta_{9-}\beta_{35}$	Country specific dummies	+/-	Multilateral resistance is a relative barrier to trade and can therefore both take negative and positive values.
$\beta_{36-}\beta_{50}$	Time dummies	+	Over time the CEEC will become more integrated with the EU.

Table 5.1) Expected signs and explanations

5.3 Empirical Approach

Our estimated gravity model originates from Anderson and van Wincoop's theoretical derived gravity equation (Eq. 4.4). The equation is, as usual, in log-linear form which enables us to use OLS:

Eq. 5. 2
$$ln\ N_{ij} = \beta_1 + \beta X_{ij} + \beta D_{ij} + \varepsilon_{ij}$$

Where $\boldsymbol{X}_{ij}$ is a vector containing all explanatory variables, which are written in log-form. $\boldsymbol{D}_{ij}$ is also a vector containing all the dummy variables, including dummies from $\boldsymbol{t}_{ij}$. With this estimation we will be able to analyze how imports have developed during the EU integration process.

According to Carrère (2006:230) it is likely that trade flows will increase a couple of years before the agreements are implemented due to an *anticipation effect*. This might be the case but will not be observable in our estimation since, when implementing (e.g. a Europe Agreement) the effect on trade will not be instantaneous but rather occur gradually. Hence, the observed increase in trade will not be an anticipation effect but an effect of the last implemented agreement.

5.4 Tests

The regressions above have all been made in STATA SE10 using a robust variance-covariance estimations technique to correct for heteroscedasticity. Further, the two main tests will be for multicollinearity and specification.

Ramsey's RESET test is testing the hypotheses that there are omitted variables (Gujarati 2006:353*f*). In our panel data and cross section of 1996 the null hypotheses are rejected with a p-value of 0.000. In the cross section of 2004 the null hypotheses could not be rejected because of a p-value of 0.1372. In 2007 we again reject the null hypotheses but at the 90% level. Overall there does not seem to be a severe problem with omitted variables.

Multicollinearity is a phenomenon occurring in multiple regressions; high multicollinearity means that different variables in the regression are correlated with each other. VIF, or Variance Inflation Factor, helps the researcher to detect this. VIF is actually an index which explains how much the variance of the coefficients is increased or inflated by multicollinearity (Gujarati 2006:375). We have presented the mean VIF value in table 6.1 and since all our VIF values are low (< 10) there are no problems with multicollinearity.

6. Results

This chapter will focus on the econometric results. The first section presents expected results, the results from both panel and cross section data and also a discussion of some econometrical tests. The second section deals with the out of sample results i.e. how the model explains Turkey's trade if they had taken the same road to EU membership as the CEEC.

6.1 In Sample Results

Our data measures, among other things, the imports of EU15 from EU10 for the period of 1995 – 2007. During this time period the EU integration process has proceeded and evolved resulting in deeper and wider economic integration. We thereby have two main expectations considering our dummies.

Firstly, as the integration and cooperation becomes more profound throughout the time period we expect a steady growth in trade from year to year. Hence, as stated in table 5.1 we expect the time dummies to be positive and also increasing over time. The second expected result would be to have positive FTA-dummies. These dummies represent the time for implementing a Europe Agreement or acceding into the EU. According to theory trade should increase when countries have reached a deeper level of integration.

Results

In the table below the coefficients and their level of significance from four regressions are presented, *N.B.* the time and country dummies are presented in table A1 in the appendix. The panel data gives us an overall picture of how EU15 imports are explained by the model over time. The cross section regressions are more consistent with theory and are picked to be able to study important years when considering the EU integration process. 1995 is the first year in our cross section analysis due to the start of the European Agreement implementation process. 2004 and 2007 is of course two interesting years due to the EU enlargements.

Import EU 15 from EU 10	Panel data 1995-2007	Cross section 1995	Cross section 2004	Cross section 2007
No. observations	1893	150	148	150
R^2	$R^2 = 0.9296$	$R^2 = 0.9257$	$R^2 = 0.9336$	$R^2 = 0.9340$
Mean VIF	4.24	2.92	3.18	2.84
Constant	24.632***	22.736***	23.468***	23.005***
Mass	0.047***	0.373***	0.293***	0.313***
Distance	-1.369***	-1.542***	-1.342***	-1.231***
Adjacency	0.186**	0.139	0.141	0.180
Population	-0.007	-0.041	0.038*	-0.005
FTAea	0.094	0.941***	(dropped)	(dropped)
FTAeu	-0.194**	(dropped)	0.613**	(dropped)

Table 6.1) Resluts of the regressions

Panel-Data Results

The panel data estimation contains 1893 observations of imports to EU15 from EU10 and with an R^2-value of 0.9293 the estimation is to be considered to have a great explanatory significance.

The first term that could be economically interpreted is *mass*. As defined in Eq. 5.1 mass is the product of the two trading partner countries' GDP. Since mass is one of the cornerstones in the gravity model one could expect a higher value of the coefficient than 0.047. The explanation of this notably low value is to be found in the way we have measured. Since we have only measured inside Europe the economic masses are quite alike and therefore have not affected the imports by much. With a P-value = 0.000 mass is nevertheless highly significant and has, as expected, a positive sign.

If the first corner stone was economic mass, *distance* is the second. With this in mind the high coefficient value of distance is not surprising but rather expected. As well as that it has a

negative sign and is significant. Distance is apparently very useful when explaining imports from EU10 into EU15, and we can conclude that trade will decrease with distance.

Adjacency is a dummy equal to one if the trading partners share a common border. This is not the typical case in our data and thereby we did not expect it to affect the bilateral trade flows by much. We also expected a positive sign and these expectations proved to be correct. Even though the case of a common border is rare in our sample, the dummy turned out to be significant. The conclusion would be that when sharing a common border trade will increase, this being in line with the intuition of the gravity model.

The *population* variable is insignificant and has a very low value. Hence, population does not contribute much to our estimation.

The first dummy variable is *FTAea* which has the expected sign but is not significant. One would expect a higher value of the FTAea coefficient since it is supposed to capture the extra trade that would result from implementing a Europe Agreement. The reason for the low value is due to that almost all the countries implement the Europe Agreements at the same time. Hence, there will be difficult to capture any time differences in the FTA dummies.

FTAeu has surprisingly a negative value. One would rather expect a positive contribution to trade when becoming a full member of the EU. We can explain this partly by the same reasoning as above and due to the fact that time dummies has capture the positive trade effects. However, since most of the trade liberalization and harmonization between the CEEC and EU occurred before full membership FTAea is assumed to contribute more to increased trade flows than FTAeu.

The country dummies are divided into two groups, importers and exporters. This will be of importance when dealing with the out of sample estimation. For now we treat them as the same and they are all a measure of multilateral resistance derived by Anderson and Wincoop. As multilateral resistance captures the barriers between an individual country and its trading partner relative to the barriers towards ROW (see section 4.4) the country dummies can take both positive and negative values. These dummies also capture other country specific factors such as whether the countries are landlocked or not. Most of the coefficients are significant at a high level.

The *time dummies* capture the development of trade over time. Almost all dummies are significant at a 99% level and they are increasing over time. As known from section 3.1 the

implementation of the Europe Agreement started around 1995 and prepared the CEEC for membership, which became the case in 2004 and 2007. The over time increasing values of the time coefficients illustrate this process (see diagram 6.1 below). These dummies have captured all of the positive trade effects of joining both EA and EU, we observe an estimated value almost ten times as high in 2007 compared to in 1996. The integration process via the European Agreement to EU membership has had a very positive effect on exports from the CEEC.
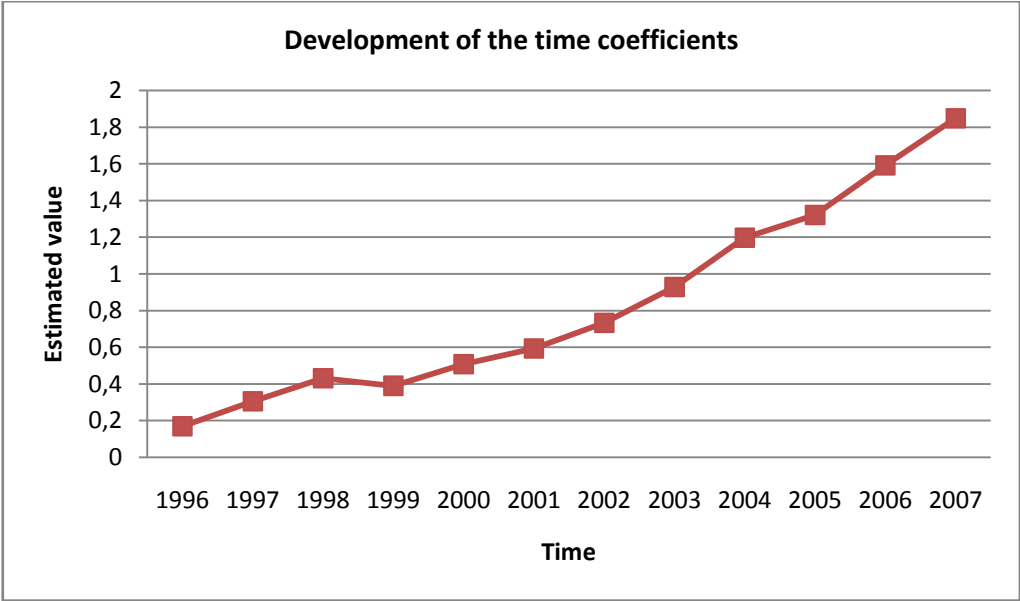
Development of the time coefficients

Diagram 6.1)

Cross Section

The cross section part focuses on the years 1995, 2004 and 2007. All three regressions contain of around 150 observations each and there R^2-values are in the interval of $0,9257 - 0,9376$.

When using the cross section approach, the mass coefficient has a higher value compared to the panel data. The higher value is more consistent with expectations due to the fact that mass is one of the key ingredients in the gravity model. The higher value is probably due to the obvious lack of time dummies. In the panel data regression the time dummies capture some of the effect form mass because mass varies over time. In the cross section regression, the effect of mass is instead transferred to the mass coefficient.

Distance is significant in all cross section regressions and as in the panel data the coefficients take a high value. Notable is that the variable decreases from 1995 and onward, this is interesting when noting that distance could be seen as a proxy for transport cost and can therefore capture some non-tariff barriers such as border controls. A decrease in the distance

coefficient would therefore mean a decrease in non-tariff barriers. As known from section 3.3.1 the EU had difficulties with a fragmented market because of the existence of non-tariff barriers. The solution to this problem was the Single Market Programme and the observable decrease in the negative impact of distance could be a result of the CEEC becoming more integrated with the European market. If this holds to be true then we could expect a similar effect to Turkey if they were to become more integrated with the EU.

As well as in the panel-data population does not contribute much and is insignificant except for the year 2004.

Of the FTAea-dummies only the dummy for 1995 was significant and FTAeu was dropped or insignificant in all regressions. In 1995 none of the CEEC countries were EU members and in 2007 it was dropped due to co-linearity.

Most of the country dummies are significant but a few are not and some are dropped. Even in this case the dummies take both positive and negative values but worth noticing is the development of the coefficients over time, multilateral resistance is not constant. This ought not to be a surprise because multilateral resistance is the relative barrier to trade towards ROW. Projects like SEM have integrated the countries and lowered barriers to trade on a broad scale and therefore lower each country´s multilateral resistance. This would be the opposite to the example in section 4.4.

6.2 Out of Sample Results

As known from the introduction, the aim of this thesis is to investigate if there would have been any difference in Turkey's bilateral trade flows if they had taken the same road of integration as EU12 and further to make a forecast of Turkey's future trade. The method used to reach this aim was to create an export potential for Turkey. By doing this we can compare the potential and the actual trade. The potential is created by using all the coefficients, except the exporter dummies, from the panel data regression in table 6.1 and apply them to Turkey´s and the partner country´s values such as mass and distance. To model the multilateral resistance term of Turkey we make a key assumption; the average of the nine export dummies is equal to Turkey´s resistance term. This assumption is undoubtedly strong since Turkey is not very similar to any of the CEEC countries. Despite this fact we consider it to be a fair assumption in our study since we want to measure the trade effect if Turkey had taken the same road to integration as these ten CEEC.

The potential trade is calculated for all years and with all trading partners. This will boil down to thirteen comparisons, one for each trading partner. In the diagram below all of the EU15 countries are above the 45 degree line which implies that the actual trade is higher than the estimated. In other words, Turkey exports more to all EU15 members than expected from the gravity model. This results clearly tells us that Turkey has an over exporting behavior.
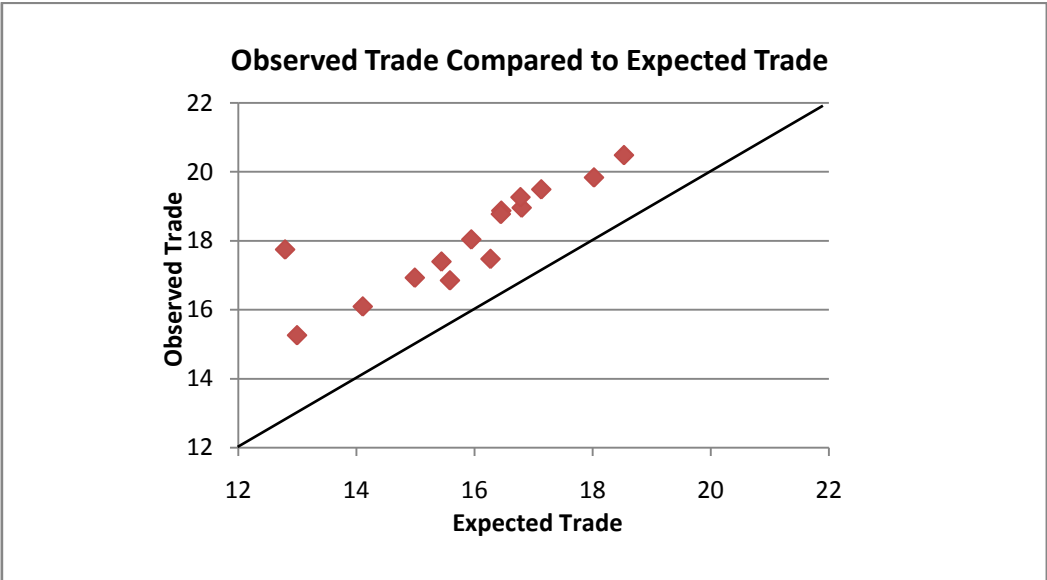

Diagram 6.2)

When studying the same observations as used in diagram 6.2, but over time one can observe a slightly downward trend in exports. Turkey´s over exporting behavior seems to decline over the period, with the greatest shift occurring in 2001. This is not surprising because 2001 was the year when Turkey experienced a severe financial crisis (Özatay & Sak 2002:1).
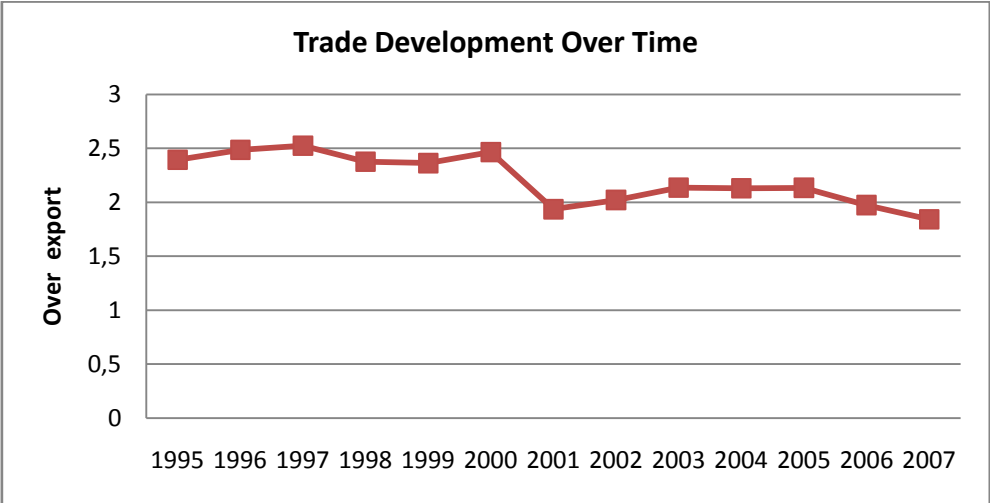

Diagram 6.3)

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In order to present an understandable overview of the trade development over time we have calculated "over export". Over export is equal to the logarithm of the observed exports minus the logarithm of the expected exports. A plausible explanation to the downward trend could be that CEEC are performing better over time, compared to Turkey, and actually taking export shares from Turkey. This in turn could be explained by a more economically integrated EU where the CEEC are great benefiters. If this is the case we could expect the same development for Turkey if they were to accede to the European Union.

7. Conclusion

In this thesis we have investigated how Turkey´s trade flows would have been affected if Turkey had undergone a similar integration process with the EU as the CEEC. By using the gravity model we have obtained the following main findings:

- A comparison between observed and expected trade reveals that Turkey outperforms the CEEC when considering exports to EU15.

- Over time it appears as if Turkey's "over exports" are decreasing. This could in fact originate from the CEEC becoming more integrating with the EU followed by an increasing in exports as a result. This seems to hold true for the "membership years" 2004-2007.

- Overall our model produced highly significant results. Most of the variables behaved according to the expectations. The exceptions were: Mass, which had a lower value than expected. Population caused multicollinearity which forced us to drop the variable and finally the FTAeu-dummy turned out to have a negative value in the panel data regression.

Considering the over exporting behavior of Turkey we could draw the conclusion that a Turkish membership with the EU would not increase trade flows by much. However, three facts contradict this assumption. Firstly, the customs union between Turkey and EU only includes industrial goods. A full membership would expand the customs union to include all goods and in particular agricultural goods which plausibly will increase the trade flows, this being in line with previous research. Secondly the decreasing value of the distance variable indicates that the SEM has been successful, the non-tariff barriers has diminished. If Turkey would join the EU and consequently take part in the SEM, this could induce trade creation.

From our results we can draw conclusions which allow for us to answer our main questions. If Turkey would have taken the same road as the CEEC they undoubtedly would not have exported more than they do today. However, in table 6.3 we can see a downward sloping trend from 2004. If this indicates that more integration between the CEEC and the EU give rise to more trade, then we could expect a further increase in bilateral trade flows if Turkey would become a member of the EU, this would be the third contradiction. In other words, if

Turkey does not become a member of the EU they would probably lose export shares to the CEEC and other countries. This development will be of importance when evaluating the gains from integrating Turkey with the EU looking at a disaggregated level to identify competing industries. The authors of this thesis would find further research in this area to be of great interest and importance.

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Appendix

Table A1

Below all of the country specific and time dummies from our regressions are presented. This is a continuation from table 6.1.

Import EU 15 from EU 10	Panel data 1995-2007	Cross section 1995	Cross section 2004	Cross section 2007
Belgium IM-dummy	1,023***	1,163***	0,790***	0,913***
Denmark IM-dummy	0,058	0,407	-0,188	-0,147
Finland IM-dummy	0,009	0,561	-0,265	-0,211
France IM-dummy	1,363***	-1,391***	-1,132***	-1,242***
Germany IM-dummy	2,612***	(dropped)	(dropped)	(dropped)
Greece IM-dummy	-0,990***	-0,403	-1,343***	-1,098***
Ireland IM-dummy	0,003	0,681*	-0,292	-0,275
Italy IM-dummy	1,585***	-0,900***	-0,919***	-0,962***
Luxemburg IM-dummy	-2,473***	-2,235***	-1,515***	-1,753***
Portugal IM-dummy	-0,746***	-0,649	-0,711***	-0,712**
Spain IM-dummy	1,202***	0,967***	-1,217***	-1,317***

Sweden IM-dummy	0,509***	0,755***	0,234	0,141
United IM-Kingdom dummy	1,152***	-1,224***	-1,512***	-1,751***
The Netherlands IM-dummy	1,370***	1,336***	1,014***	1,084***
Czech Rep. EX-dummy	0,621***	-0,112	-0,511***	0,242
Estonia EX-dummy	-0,921***	-0,349	-1,185***	-0,590
Hungary EX-dummy	0,941***	0,227	-0,153	0,401
Latvia EX-dummy	-0,945***	-0,377	-1,402***	-0,807**
Lithuania EX-dummy	-0,501***	(dropped)	-1,114***	-0,450
Polen EX-dummy	1,534***	0,517**	(dropped)	0,892***
Romania EX-dummy	0,563***	-0,012	0,303	0,470
Slovakia EX-dummy	-0,529***	-1,046***	-1,241***	-0,554
Slovenia EX-dummy	-0,374***	0,197	-1,073***	-0,570
1996 dummy	0,170**			
1997 dummy	0,307***			
1998 dummy	0,432***			
1999 dummy	0,391***			
2000 dummy	0,508***			
2001 dummy	0,594***			

2002 dummy	0,734***
2003 dummy	0,929***
2004 dummy	1,198***
2005 dummy	1,323***
2006 dummy	1,592***
2007 dummy	1,849***