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**„On the Impacts of Preferential Trade Agreements
on Turkey´s Foreign Trade: A Gravity Approach“**

Verfasser

Ahmet Cetindas

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Gürkan Öztürk

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Betreuerin / Betreuer: Neil Foster, BA MSc PhD

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
CCT	Common Customs Tariff
CEEC	Central and Eastern European Countries
CES	Constant Elasticity of Substitution
CET	Common External Tariff
CU	Customs Union
CGE	Computable General Equilibrium
DIST	Distance
EEC	European Economic Community
EFTA	European Free Trade Association
EU	European Union
EXP	Export
FEM	Fixed effect Model
FTA	Free Trade Agreement
GDP	Gross Domestic Product
IIT	Index of Intra-Industry Trade
IMP	Import
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Co-operation and Development
POP	Population
PTA	Preferential Trade Agreement
REM	Random Effect Model
ROO	Rules of Origin
R&D	Research and Development
TSLs	Two Stage Least Squares
VAT	Value Added Tax
WTO	World Trade Organization

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1. Introduction

Flows of goods and services across countries have increased drastically in the recent past. One reason for this increase has been the decline in trade costs that have taken place over the last decades. An important factor that played a role in shaping trade in the last century was the distance between countries. The reduction of man-made barriers to foreign trade due to containerisation, cheap air transport and so on has resulted in more trade between countries, but natural transportation costs remain and can inhibit trade creation. A further factor that has encouraged trade has been the reduction in man-made barriers to trade. A particular aspect here has been efforts to reduce tariffs and non-tariff barriers through successive rounds of the General Agreement on Tariffs and Trade (GATT) and subsequently the World Trade Organisation (WTO). In the recent past there has also been a proliferation of Preferential Trade Agreements that have led to greatly decreased trade barriers between subsets of countries.

An important research question that has developed is to understand the relative importance of these natural and man-made barriers to trade and how both impact upon trade flows between countries. Countries which are closer to each other will tend to have lower transport costs which can encourage trade between countries in close proximity. In this context, a model for the evaluation of foreign trade based on transportation costs has been sought. The result was the gravity model, which relates trade between two countries to their economic sizes and the geographic distance between them, along with other trade inhibiting or creating factors. According to the gravity model, trade between two countries increases through increases in GDP and decreases through increasing distance. The reason for the positive effect of GDP on countries trade flows is that an increase in GDP increases export and import capacity. If the GDP of the exporter country increases, production capacity increases and the variety of goods produced increases. An increase in the GDP of the importing country leads to an increase in import volumes. It is expected that the GDP of the importer and exporter affect bilateral trade flows positively. Other factors that affect foreign trade include common borders, common languages, common currencies, and colonial and historical ties. The gravity model in its initial form was based upon the law of gravity in physics. The gravity model has also been used to examine the impact of PTAs on trade after controlling for other gravity determinants. This is done by including a dummy variable taking the value one if two countries are in the same PTA. The resulting

coefficient provides an estimate of the impact of PTAs on bilateral trade flows. Since its development in the 1960s the gravity model has been used extensively to explain trade between countries and to examine the impact of distance, common currencies, preferential trade agreements and border effects on trade. There are several studies which apply this model to analyse Turkey's foreign trade. Jan Tinbergen (1962) was the first to apply the gravity model to international trade data, with many other studies following. Following these early studies, economists such as Anderson (1979), Bergstrand (1985, 1989), Krugman and Helpman (1985) and Deardorff (1998) developed a theoretical foundation for the model.

In this thesis we consider the importance of PTAs generally, and Currency Unions in particular, on both the exports and imports of Turkey with respect to a large number of trade partners over the period 1962-2011. Due to the potential advantages of CUs and PTAs, such as abolishing or reducing tariffs and trade restrictions, Turkey has concentrated on seeking new trade agreements with a number of countries, most notably European countries. Economic integration and the search for new markets are the dynamics of Turkey's trade expansion. With CU and PTAs, Turkey gains important trading partners and has created good trade relations. Using the gravity equation this thesis shows that while there has been no significant impact of PTA and CU membership on Turkey's exports, membership has had a positive impact on Turkey's imports.

2. International Trade

International trade involves the exchange of goods and services across nations. Such countries will usually have different languages, legal systems and business customs. In addition, there are usually a complex web of factors that are necessary to transact, fulfil, and deliver products or services that may involve tariffs , tax customs and duties, container freight, measurement systems, shipping insurance, which may entail lengthy delays during the transaction process.

Nowadays, international trade is the most distinctive element of the economic relations between countries. International trade refers to international economic relations with the transactions of goods and services in exchange for money.

International trade became an important activity again after the Second World War. While the war resulted in the loss of confidence between countries it also encouraged nations to build international institutions to promote development and peace. One aspect of this was the formation of the General Agreement on Tariffs and Trade (GATT) which sought to reduce trade barriers between members. Through successive rounds GATT and the World Trade Organisation (WTO) which followed, achieved substantial declines in trade barriers between countries. Combined with declines in natural trade barriers – and to transport costs in particular – these tariff reductions encouraged trade which increased rapidly from the 1970s onwards.

Globalization involves the growing cooperation of countries arising from the increasing integration of trade, finance, people, and ideas in the global market. Globalization which started after World War II has become more important since the mid-1980s, driven by two significant factors. First, globalization involves technological advances that reduce the transportation cost and provide communication and computation for a firm to locate different stages of production in different countries. The other factor is related to the increasing liberalization of trade and capital markets: increasingly governments refuse to protect their economies from foreign competition or influence it through import tariffs and nontariff barriers such as, export restraints, legal prohibitions and import quotas.¹

¹ http://www.worldbank.org/depweb/beyond/beyondco/beg_12.pdf

Developments in international trade have become more important due to the increased volume of international trade and the presence of global value chains and so, meaning that events in one country can be quickly transferred to other countries. The growth in preferential trade agreements, which reduce the transaction costs of parties, causes the growth in international trade. These agreements may include – in addition to tariff reductions – such features as monetary and financial cooperation, exchange rate arrangements, macroeconomic policy coordination, and regional mechanism for the provision of international liquidity which, in addition to being more easily attainable, may also lead to greater stability and guard against systemic instability and contagion (Sgro, 2009)

The discussion of international trade is often split into its constituent parts: exports and imports. Exports are simply defined as the shipping of the goods and services out of the port of a country. The exporter is the seller of goods and services and the buyer is referred to as the "importer". In International Trade, "exports" refers to selling goods and services produced in the home country to other markets (Joshi, 2005). Imports are defined as bringing goods or services into a country from another country. Countries which cannot produce a product due to the lack of availability of resources, labour skills, production cost etc. import (buying) products from other countries.

Serious scientific study of international can be traced back at least as far as Adam Smith (1776). According to Smith, international trade increases the efficiency of resources due to international specialization and division of labour. Thus, international trade increases the welfare and the production capacities of countries. Smith therefore refuted the zero-sum game idea of mercantilists. Smith argued that the reason for international trade is "absolute advantage" which expresses the ability of a country, individual, company or region to produce a good or service at a lower cost per unit than the cost at which any other entity produces that good or service.² The theory of absolute advantage is not sufficient to satisfy the requirements of today's trade however.

Even if a country specializes in producing a particular product, this product could be imported. Ricardo's "Comparative Advantage Theory" went some way to resolving this

² <http://www.investopedia.com/terms/a/absoluteadvantage.asp#ixzz26lnoRzyV>

deficiency of the Absolute Advantage argument. According to Ricardo (1817), a country has a comparative advantage in the production of a good if the ratio between its pre-trade marginal costs of that good, and its pre-trade marginal cost of producing another good is less than that of its trading partner.³ There are two main features of the Ricardian Model:

- only homogeneous labour are used as a primary input into production
- comparative advantage arises from differences across goods and countries in the technology for producing goods from that labour.

The above mentioned requirements separate the Ricardian Model from the other principal trade theories such as the Heckscher-Ohlin Model (Kenneth and Rajan, 2009).

The Heckscher-Ohlin model was founded by Eli Heckscher (1919) and Bertil Ohlin(1933). The insight of the model is that traded commodities are a mix of factors such as land, labour, and capital. The exchange of goods globally is therefore indirect factor arbitrage, transferring the services of otherwise immobile factors of production from locations where these factors are abundant locations where they are scarce. Under some circumstances, this indirect arbitrage can completely eliminate factor-price differences. Perhaps the most important implication of the Heckscher-Ohlin model is that the option to sell factor services externally (through the Exchange of commodities) transforms a local market for factor services into a global market. As a result, the derived demand for inputs becomes much more elastic and also more similar across countries (Leamer, 1995).

During the period after the Second World War, economists developed alternative international trade theories. Kravis (1956) explains international trade in term of the non-availability of goods, such that each country imports goods if they are not available on domestic markets. The reason for this unavailability may be due to the lack of natural resources or because domestic producers cannot produce the products or that they could only produce them at prohibitive costs (Gandolfo, 1998).

While the above models help explain the presence and the volume of trade between countries they don't offer too much insight into recent trade patterns, and in particular the

³ http://are.berkeley.edu/courses/ARE201/fall2008/notes2009/chapter1_2009.pdf

large amount of intra-industry trade that takes place between countries. Models that can help explain such trade often rely on scale economies and increasing returns (see Krugman 1978a and b). The determinants of comparative advantage such as geography and factor proportions are not considered in the Ricardian model. Paul Krugman (1979), the founder of New Trade Theory, added the determinants of comparative advantage in the model. According to Krugman, comparative advantage is not enough to explain international trade because similar characteristics exist across countries, which are difficult to explain by comparative advantage. Krugman (1991) created a model which includes increasing returns with capital and labour migration and transport costs.⁴

2.1 Determinants of International Trade

Based on the above and other theories a large number of factors can be considered important for international trade. Here we describe a number of these factors:

- 1) *Product differences*: Products, which are produced in different countries and satisfy the same needs, could appeal to different consumer segments in different countries due to their shape, function, colour, odour and ergonomics.
- 2) *Supply-demand imbalances*: If some goods are produced more than needed, the surplus is exported to other countries. The lack of supply of manufactured products is the reason of import to fulfil the needs of society.
- 3) *Technology*: An innovating country produces new goods as a result of R&D and entrepreneurship and has absolute advantage until the other countries are also able to manufacture these goods. In the meantime they will import them. Thus, international trade is created for the time necessary to imitate the new goods (Gandolfo, 1998).
- 4) *Exchange rate*: The value of the exchange rate has a significant impact on export and import volumes. A depreciation of the exchange rate would curtail imports and stimulate exports, while an appreciation of the exchange rate would encourage imports and damage exports. The existence of the import content of exports and the dynamic effects of productivity developments are neglected in this prediction (Abeysinghe and Yeok, 1998).
- 5) *Export taxes*: GATT/WTO allows export taxes. In more than 100 countries an export tax is applied. Most of these countries are developing countries which evoke

⁴ <http://marginalrevolution.com/marginalrevolution/2008/10/what-is-new-tra.html>

environmental, developmental and fiscal goals and food security as reasons to impose export taxes (Solleder, 2012).

6) *Quality*: The quality of products is also an important determinant of international trade. A comparison between Chinese goods and German goods would be a good example. Also restrictions of quality standards affect international trade because it is not possible to export products which do not comply with the standards of the importer country.

7) *Political state*: Companies want to conduct business in a foreign country with a political environment they understand. A company which intend to operate outside of their own country must consider the government structure and the political systems of the target market (Zekiri and Angelova, 2011).

8) *Consumer tastes and preferences*: Consumer tastes and preferences are also sometimes a reason of international trade. The consumer utility of different countries should be similar and in addition, people's preferences, traditions and culture, beliefs are factors that determine the structure of foreign trade.

9) *Tariffs / non-tariff barriers*: Tariffs and non-tariff measures which are forms of trade policies are the most widely used trade restricting policy instrument. Trade liberalization which is negotiated under the auspices of the WTO or as a consequence of PTAs has reduced the average level of applied tariffs. The usage of non-tariff measures increases depending on the economic development of countries. This is especially true for non-tariff measures, which are increasingly used in high income countries to regulate trade (Hoekman and Nicita, 2011).

3. Preferential Trade Agreements

Krueger (1997) defined preferential trading arrangement as any trading arrangement which allows the import of goods from countries signatory to the agreement at lower rates of duty than are imposed on imports from third countries. Krueger also mentioned that preferential arrangement may be partial or total with respect to the amount of duty reduction and with respect to the commodity coverage of the arrangement.

After the 1950s when international trade started to be important, countries were thinking about economic integration which makes the trade between them easier. So the first PTA according to the WTO was signed between EFTA countries in 1959. According to the WTO database the number of PTAs was 25 in 1990, 91 in 2000, 194 in 2007 and 241 in October 2012.

3.1 Bilateral Free Trade Agreements

Bilateral trade agreements are a pact between countries to set up a free trade area where trade in commodities and services may be conducted across their common borders, without any tariffs and barriers, but the movement of capital and/or labour may be restricted. Member countries ordinarily impose common external tariffs on trade against third countries.⁵ When a country-pair signs an FTA, both countries have a gains in exports, consumer surplus and reductions in home profit and tariff revenue. The FTA has to increase the welfare for each country otherwise countries would not support it (Chen and Joshi, 2010).

3.1.1 Benefits of Free Trade Agreements

Free trade agreements have can potentially lead to great benefits for countries. Their main advantages are as follows:

3.1.1.1 Innovation and Competition

With an FTA it makes economic sense to buy a good from another country that specializes in such manufacture and can make it easier or for less cost. FTAs offer consumers the best choices and opportunities to improve their living standards which provide fair trade. It encourages competition, inciting companies to innovate and develop better goods and to bring more of their innovative products and services to market. Low prices and high

⁵ <http://www.businessdictionary.com/definition/free-trade-agreement.html>

quality are also obligations to retain or increase their market share. Free trade increases innovation because, through the exchange of goods and services, the flow of trade circulates new ideas. Since companies are in competition with their overseas competitors, firms can consider of all the successes and the failures that exist in the global marketplace (Froning, 2000).

3.1.1.2 Economic Growth

The aim of free trade for parties is to increase incomes and having better living standards in parallel with economic growth. Competitive advantage in industries provides increasing production capacity, efficiency and productivity which are the starting point for economic growth. If an industry branch is moved to a foreign country, it could result in increasing production on both the import and export sides. The increase in productivity in import and export sides of the economy may lead to an increase in wages.

That openness to trade more generally can lead to increased growth has been addressed extensively – both theoretically and empirically – in the literature. A large number of empirical studies have surveyed the relation between the growth rate of an individual country and the level of openness of that country. Dollar (1992), Sachs and Warner (1995), Edwards (1998), Frankel and Romer (1999), and Dollar and Kraay (2004) found a positive impact of openness on economic development, while Harrison (1996), Rodriguez and Rodrik (2000), Rodrik, Subramanian and Trebbi (2004), and Wacziarg and Welch (2008) found that effect of free trade on economic growth is negative or insignificant. To the extent that PTAs enhance trade and to the extent that openness impacts upon economic growth therefore we may expect that PTAs will have positive impacts upon economic growth (Hur and Park, 2012)

3.1.1.3 Consumers Benefits

As a result of free trade agreements, the diversity of products and services increases which offers more options to customers. When choosing goods or services they can also compare the prices, which decrease because of high competition. Consumer preferences force companies to offer innovative goods and services. Satisfaction of consumer needs with the innovative products may bring mutual utility between consumer and providers.

3.1.1.4 Employment

The movement of resources to more productive areas creates winners and losers as a result of trade liberalization. Due to the increase in employment in exporting industries, workers will be displaced from importing industries to exporting industries. Especially in manufacturing and service industries, with free trade many different jobs can be created, which can be the solution of unemployment problem.⁶

3.2 Preferential Trade Agreements of Turkey

In addition to the imposition of the Common Customs Tariff (CCT), Turkey has to align its preferential trade regime applied towards third countries in accordance with the rules and regulations of Turkey – EU Council Decision of 1995 (Sonmez, McDonald and Perraton, 2007). Turkey signed its first PTA with the European Free Trade Association (EFTA) countries but the most important PTA of Turkey was the Customs Union with the EU, signed in January 1996. By signing this agreement Turkey improved its trade relations and the agreement was one of the milestones of Turkey's economic development. Following the accession of 10 Central and Eastern European Countries (CEECs) to the European Union, Turkey cancelled PTAs with these countries and resumed its trade relations with these countries under customs union conditions.

The World Trade Organization (WTO) is the main source for information on Turkey's PTAs. The WTO Committee on Regional Trading Agreements reviews all PTAs, in a process which consists of written questions and answers. Within this context, application is available for third countries which consider they are biased by these agreements. The Committee follows the date of entry into force of PTAs and reviews operations of them. Turkey's PTAs has gone in line of the trade regime, while it involves different treatment between trading partners. The application of the CU with the EU has lead to substantial declines in protection on industrial goods from third countries.⁷

According to the WTO Turkey has 17 PTAs. Sixteen of these agreements are Free Trade Agreements (FTAs) and one of them is a Customs Union Primary Agreement with EU countries.

⁶ http://www.hsc.csu.edu.au/economics/global_economy/tut7/Tutorial7.html

⁷ <http://www.oecd.org/regreform/1840760.pdf>

The FTA between Turkey and the EFTA States was signed in 1991 in Geneva and entered into force in April 1992. This agreement was the first step on the way to the integration of the preferential regimes of the EU.⁸ EFTA is an organization which was set up for the promotion of free trade and economic integration to the benefit of its four Member States. EFTA was founded in 1960 to provide free trade in order to achieve economic growth and welfare amongst its member countries as well as increasing economic interdependence between the Western European countries. EFTA countries wished to contribute to the expansion of trade globally and were founded by seven countries: Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the United Kingdom. Finland joined in 1961, Iceland in 1970 and Liechtenstein in 1991. The United Kingdom and Denmark left EFTA in 1973 to join the European Economic Community (EEC). Portugal followed them in 1986 and Austria, Finland and Sweden in 1995. Today the EFTA Member countries are Iceland, Liechtenstein, Norway and Switzerland.⁹

EFTA countries nullified all customs duties on imports of industrial goods from Turkey after entry into force of the FTA in April 1992, except for those on textiles and apparel goods. Tariffs for textiles and apparel goods were eliminated on the 1st of January 1996.¹⁰

⁸ <http://www.allaboutturkey.com/economy.htm>

⁹ <http://www.efta.int/about-efta/the-european-free-trade-association.aspx>

¹⁰ <http://www.oecd.org/regreform/1840760.pdf>

The following diagram shows the exports and imports of EFTA States with Turkey between 2001 and 2011.

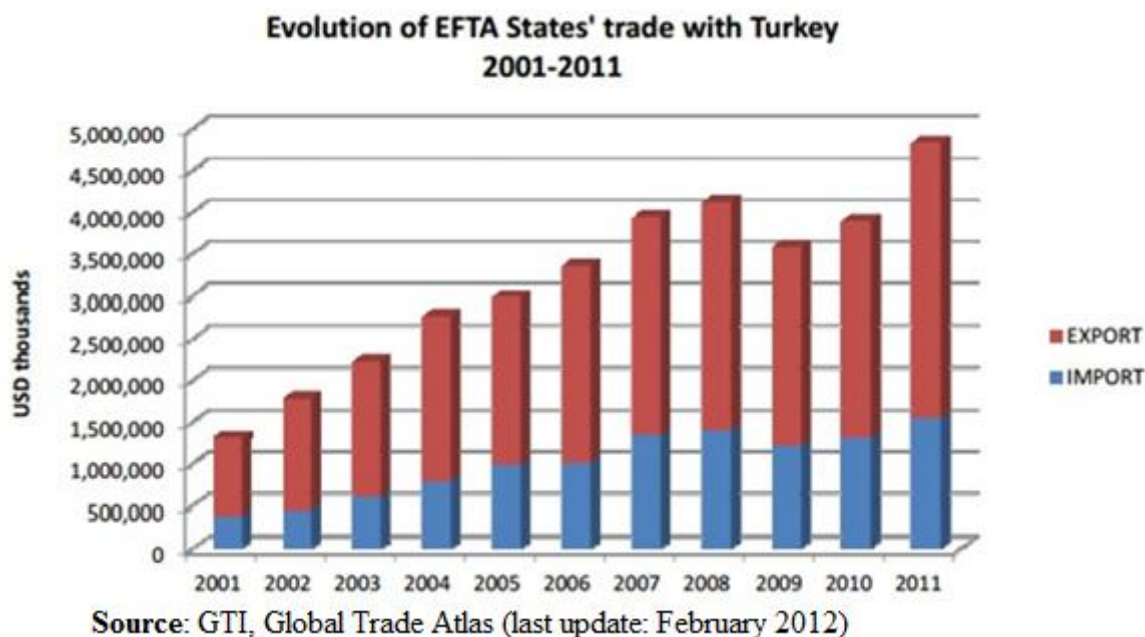


Figure 1: Evolution of EFTA States' trade with Turkey 2001-2011

Figure 1 shows that the trade volume between EFTA and Turkey has increased every year, except for 2009 due to the financial crisis in 2008. It also seems that imports of Turkey have increased more rapidly than exports and if we consider trade only between Turkey and EFTA it causes a trade balance deficit.

The FTAs between Turkey and CEECs (Lithuania, Hungary, Estonia, Czech Republic, Slovakia, Poland, Slovenia and Latvia, Bulgaria and Romania)¹¹ were cancelled after they became members of the EU. Romania and Bulgaria became members of the EU in January 2007, while the other CEECs became members in May 2004.

In parallel with the economic development of Balkan nations, the Balkans is an important trade area for Turkey. As proof of this is the free trade agreement between Turkey and Macedonia which entered into force in 2000. To realize a trade volume expansion in the Balkans Turkey also signed FTAs with Bosnia and Croatia in 2003. The Barcelona process

¹¹ Date of entry into force of PTAs between Turkey and CEECs: Lithuania 1992, Hungary 1992, Estonia 1997, Czech Republic 1976, Slovakia 1997, Poland 1980, Slovenia 1996, Latvia 1997, Bulgaria 1994 and Romania 1986.)

has also accelerated Turkey's trade expansion towards the Mediterranean basin. The FTA between Turkey and Israel which came into force in 1997 was signed in March 1996. Turkey has also signed FTAs with Tunisia, Palestine, Jordan, Egypt and Syria. Common historical background, religion, distances and so on all played an active role in the formation of these agreements. Table 1 lists the preferential trade agreements of Turkey that are currently in force.

Nr.	Country	Date of Notification	Date of Entry into Force
1	EFTA countries	10.12.1991	01.04.1992
2	EU customs union	22.12.1995	01.06.1996
3	Israel	14.03.1996	01.05.1997
4	Macedonia	07.09.1999	01.09.2000
5	Croatia	13.03.2002	01.07.2003
6	Bosnia and Herzegovina	03.07.2002	01.07.2003
7	Palestine	20.07.2004	01.06.2005
8	Tunisia	25.11.2004	01.07.2005
9	Morocco	07.04.2004	01.01.2006
10	Syria	22.12.2004	01.01.2007
11	Egypt	27.12.2005	01.03.2007
12	Albania	22.12.2006	01.05.2008
13	Georgia	21.11.2007	01.11.2008
14	Montenegro	26.11.2008	01.03.2010
15	Serbia	01.06.2009	01.09.2010
16	Chile	25.02.2011	01.03.2011
17	Jordan	02.12.2009	01.03.2011

Table 1: PTAs of Turkey

3.3 Customs Union

According to the European Commission, the Customs Union (CU) is the foundation of the European Union and an essential element in the functioning of the single market. The single market can only function properly when there is a common application of common rules at its external borders.¹²

With the customs union agreement, parties legalize common customs tariffs against third countries. After payment of custom duties, goods which are imported from third countries obtain freedom of movement. The member countries of a customs union nullify any restrictions that would prevent the free movement of goods and do not apply any other duties as custom duties against third countries.

In addition, the application of "common commercial policy" and "common customs tariff" of the customs union member states against third countries is the main difference between customs union and free trade agreements. However, free trade zone member states are free to determine the tariffs applied to third countries. So, free trade agreements provide a free trade area by removing custom duties and non-tariff barriers which restricts and prevents the trade between parties. But, this agreement is not a common tariff application with liability to third countries. The Customs Union applies the principle of freedom of movement, while free trade agreements apply rules of origin.

Viner (1950) examined the impact of regionalism and regional trade agreements on countries. In the framework of this analysis, Viner (1950) focused on the impacts of trade creation and trade diversion effects which are viewed as a subset of the production effects of customs union. The main reason for putting emphasis on these effects is the idea that the agreements, which liberalize regional trade, affect the third countries negative.

3.3.1 The economic impact of the Customs Union

World trade liberalization efforts, which are the main objectives of economic integration, show a limited effect of customs unions which is a type of economic integration. The customs union is a form of an agreement which liberalizes the trade of the parties of customs union while continuing protectionism with respect to third countries.

¹² http://ec.europa.eu/taxation_customs/customs/policy_issues/customs_strategy/index_en.htm

The economic effects of the customs union are divided into two parts as static and dynamic. Viner (1950) focused more on the static effects of the customs union theory. Static effects of customs union on national income are short-term effects. Dynamic effects show themselves on the growth rate of national income.

3.3.1.1 Static effects

The application of the customs union represents a reducing of protectionism between member countries but discriminatory policies of customs union members against third countries remain in force. Although a reduction in protectionism may seem like a progress towards more liberalization of trade and an increase in welfare, the discrimination against third countries may seem like a potential loss of world trade and welfare. So, it depends on the static effects of customs union whether customs union represents progress towards liberalization of trade and an increase of welfare or not.

Static effects are, under the assumption that factor endowments, demand structure and technological level remains constant, the redistribution of resources within the union. These effects are short term effects. The static effects of customs union are examined in three groups:

1. Production effect
2. Consumption effect
3. Terms of Trade effect

3.3.1.1.1 Production effect

There are likely to be differences in the production capacity of countries after becoming a member of a customs union. After the foundation of a customs union, some industries purchase some inputs cheaper through the nullification of custom tariffs. This increases the production volume. Viner (1950) production decrease and production increase as "trade creation" and "trade diversion".

The trade creation effect is defined as the replacement of the expensive domestic production by cheap imports from a union country. This effect is also known as the positive production effect. In other words, a country which joins the customs union, due to increase of custom tariffs, prefers to import a product from a country in the union which produce it at lower price rate instead of producing itself. Thus, cash flow is transmitted to

less expensive resources instead of expensive resources which lead to a more efficient allocation of resources.

The trade diversion effect is defined as the replacement of cheap imports from third countries by more expensive imports from customs union members. The common custom tariffs applied by customs union countries against third countries cause a diversion of trade. The trade diversion effect of customs unions is also known as the negative production effect. After the foundation of a customs union, the most efficient manufacturers could remain out of union. It causes trade diversion by ending imports from non-customs union countries, since a tariff is applied to the products of non-customs union countries. Thus, before being a member of customs union, countries import the products from the manufacturer which produces them at the lowest price rate. With membership of a customs union, member countries have a favourable position against third countries due to custom tariffs. Thus, cash is transmitted to expensive resources instead of less expensive resources which lead to an inefficient allocation of resources.

3.3.1.1.2 Consumption effect

In addition to a customs union production effect, there is also a consumption effect. Viner (1950) focused more on the production effect of customs union and didn't consider demand. Economists such as Meade (1955), Gehlers (1956) and Lipsey (1960) note that this is lacking in Viner's analysis and considered the demand side, paying attention to the consumption effect. These economists assert that with the nullification of custom tariffs, which obstruct the efficiency of resources, the relative price between countries will change and the changes of the prices will alter consumer preferences.

Due to reduced custom tariffs, products which are imported cheaper from member countries are more in demand and in this way the consumption effect of customs union arises. If the demand elasticity of goods with decreased prices is greater than zero, the demand for cheaper goods will increase and the consumption effect of customs union will occur. Declining prices will lead to increased consumption of goods from custom union members instead of domestic goods or from third countries. As a result, import volumes between member countries will increase and there will be a change in the consumption structure within the union.

3.3.1.1.3 Terms of Trade effect

Terms of trade effect is another static effect of customs unions. The terms of trade measures the ratio of export prices to import prices. Due to the nullification of custom tariffs, the union cancels the restrictions on international trade and changes the direction and volume of trade. If demand conditions don't change the response of exports of a country is dependent on the supply elasticity. The cost increase of a country is inversely correlated with the supply elasticity of exported goods from the same country. So, if the supply elasticity is high, then the cost increase will be lower (Ludema and Mayda, 2011).

3.3.1.2 Dynamic effects

Dynamic effects are related to changes in the supply of resources, production management and technology. These changes occur in an integrated common market. While static effects are one-off costs and benefits, dynamic effects are sustainable and mostly accelerate development.

As far as most recent writers are concerned, the dynamic factors affect non-participating countries only indirectly and in a favourable way through the foreign trade multiplier (Kreinin, 1964).

Dynamic factors change the monopoly power present in the pre-integration period to a more competitive economic environment. Access to integrated markets, through external and internal economies of scale, results in an increase in productivity in the expanded export sector. The economic environment which is growing and becoming more profitable provides more investment from internal and external sources. Analysis of dynamic effects has to take the effects of production, consumption, investment, foreign trade and so on in to account. The impacts of dynamic effects in the long term can be explained through the analysis of economic development, economies of scale and welfare. Dynamic effects, (i.e. economies of scale, intensification of competition, decreasing of uncertainty and risks, external economies and technological developments) are long term effects which influence the relationship between growth rate and market size.

3.3.1.2.1 Effect on Competition

Before the foundation of a customs union, countries protected their industries with customs barriers and other protective measures. This highly protective environment allows for the emergence of monopolies. But after the foundation of a customs union, high barriers are abolished and the countries have to adapt themselves to a new competitive environment which they have never faced. After the foundation of a customs union the power of monopolists are reduced due to the competition effect. The outcome of market expansion can shift consumers towards the cheapest and most appropriate products for themselves and manufacturers consider consumer behaviour to improve production techniques and product quality.

3.3.1.2.2 Economies of Scale effect

Economies of scale involve an increase in the efficiency of production as the number of goods being produced increases. Typically, a company that achieves economies of scale lowers the average cost per unit through increased production since fixed costs are shared over an increased number of goods.¹³ An increase in production as firms operate in larger effective markets following the formation of a CU may lead to benefits through economies of scale. Through large scale production, the costs reducing effects are divided into internal and external economies of scale.

Internal economies of scale occur within the firm itself. With the realization of cooperation and the labour division, along with resources redistribution, R&D investments for labour division and risk and uncertainty reduction fostering long term investment may lead to internal economies of scale. Furthermore, depending on the expanded market, using less inputs and producing more output causes declining costs.

External economies of scale are external savings by the growth of the operating industries. Generally, external economies are defined as bilateral gains or losses between producers. External economies include developed technology and management skills, economic specialization, better use of R&D's and intra-industry transition of innovations (Kreinin, 1964).

¹³ <http://www.investopedia.com/terms/e/economiesofscale.asp#axzz27oA3Z1RU>

3.3.1.2.3 Investment Encouragement Effect

It is expected that the CU has an investment increasing effect. There are different reasons why investment may increase in integrated economies. The first of these is related to the increase in national income based on resource allocation. Thus, the growth of national income results in increased savings and investment. Another expectation is that the nullification of tariffs and barriers in the union, in parallel with abolishing risk and uncertainties, increase the profitability of investment. Custom tariffs against third countries may also shift investment into the union. The expansion of market share in parallel with the expansion of union borders leads to more opportunities for internal and external investors and increases the gravity effect of foreign capital.

3.3.1.2.4 Technological Development Effect

Internal and external economies of scale and the increase in competition which can emerge in a customs union lead to the use of advanced technology and the development of available technology. R&D may also be encouraged to accelerate technological development. Thus, a customs union increases the speed of technological development in member countries. Larger firms operate in the wider market after the foundation of a CU, and these could create more funds for R&D and could easily allow for advanced techniques to flow from abroad.

3.3.2 Turkish Participation in the Customs Union

After the Second World War, countries were separated basically in two blocks. These blocks created with similar anxieties their own economic entities. The economic entity of the Eastern block was COMECON, while the economic entities of the West were OECD, EFTA and EEC. Developing countries, such as Turkey strive to join these kinds of organisations and unions due to potential political and economic benefits. During the integration period the EEC was the first community which Turkey tried to join due to the high volume of foreign trade with Western Europe countries.

There were other reasons for Turkey to join in EEC. Firstly, Turkey did not want to be outside of a political union which could be founded in Western Europe. Secondly, was the potential co-operation offered by EEC. This situation was a good opportunity for Turkey which had economic hardships in the years after the war. In 1959 Turkey made its first application to the EEC. The primary requirement then was that the political regime of any

candidate country was a democracy. This was not the case in Turkey where the democratic regime had been suspended in 1960, as a result of military intervention.

After Turkey's regime changed to democracy in 1963 the application to the EEC was accepted. After coming into force the customs union started to abolish one sided custom duties and quantity restrictions on Turkish industrial products, a process which was finalized in January 1996. Since uniting with the EU is one of the main goals of Turkey, the customs union was the greatest economic and commercial integration which Turkey had ever made.

When Turkey applied for common membership of the EEC, the community proposed a trade agreement while Turkey aspired to a Customs Union formation. As a result the Ankara Agreement was signed and in this framework a Customs Union was decided to be formed in a three stage process (Cayhan, 2003).

The preparation period has begun with the signing of the Ankara agreement. This period also was proposed as the necessary time to improve Turkey's economic performance. The Supplementary Protocol that was signed on the 1st January 1973 started the second period which is known as the Transition period. The transition period continued for 22 years because of tumultuous economic and political developments in Turkey. The customs union agreement which was signed on the 6th March 1995 and entered into force on the 1st January 1996 was the end of the transition period and the beginning of the Last period which involves a movement towards full membership. Turkey's situation is, due to being first not full member in the EU, an exception.

With the rejection of the full membership application, Turkey put full effort into accomplishing a Customs Union. On the other hand Turkey's efforts were criticized since a customs union without the full membership would result in insufficient financial support from the Community and that the deprivation from the decision mechanism would result in the worsening of the relations with third parties due to the community's one-sided decisions.

Turkey's customs union process concerns the free movement of industrial products and processed agricultural products between the EU and Turkey. In the CU process Turkey is

responsible for adapting its legislation to the EU's customs and trade policies and the competition and intellectual and industrial property rights policies. The customs union is an intensive integration process and has brought many institutional and structural changes in Turkey.

It should be kept in mind that the Customs Union was only one stage of the Association Agreement whose ultimate goal was Turkey's full membership. With the emergence of the Customs Union and the completion of the harmonization process, Turkey gained a transparent economic legislation base, industrial structure that copes with international standards and qualities, a market that operates relatively effectively and an economy that is open to external markets compared to the past years (Kaleagasi, 2003).

3.3.2.1 Progress of Foreign Trade of Turkey during 1996 to 2011

Table 2 presents the trade relations between Turkey and the EU since 1996, after signing the custom union agreement. According to this data we can say that turkey's exports to the EU increased every year except of 2008 due to the financial crisis. The crisis between 2000 and 2001 didn't affect the increase in Turkey's exports to EU but for imports this cannot be said. The decrease from 28 billion USD to 19 billion USD in Turkey's imports from the EU shows how the crisis affected Turkey.

Years	Total Export (000\$)	Export to EU (000\$)	Total Import (000\$)	Import from EU (000\$)	Share of EU (%)	
					Export	Import
1996	23 224 465	12 563 345	43 626 642	24 320 639	54.10%	55.75%
1997	26 261 072	13 434 739	48 558 721	26 118 947	51.16%	53.79%
1998	26 973 952	14 809 293	45 921 392	25 282 204	54.90%	55.06%
1999	26 587 225	15 424 238	40 671 272	22 529 938	58.01%	55.40%
2000	27 774 906	15 664 421	54 502 821	28 526 902	56.40%	52.34%
2001	31 334 216	17 545 567	41 399 083	19 823 457	55.99%	47.88%
2002	36 059 089	20 415 034	51 553 797	25 688 833	56.62%	49.83%
2003	47 252 836	27 393 762	69 339 692	35 140 139	57.97%	50.68%
2004	63 167 153	36 580 859	97 539 766	48 095 671	57.91%	49.31%
2005	73 476 408	41 364 962	116 774 151	52 695 793	56.30%	45.13%
2006	85 534 676	47 934 746	139 576 174	59 387 030	56.04%	42.55%
2007	107 271 750	60 398 502	170 062 715	68 394 869	56.30%	40.22%
2008	132 027 196	63 390 419	201 963 574	74 407 779	48.01%	36.84%
2009	102 142 613	47 013 415	140 928 421	56 508 918	46.03%	40.10%
2010	113 883 219	52 685 304	185 544 332	72 179 705	46.26%	38.90%
2011	134 906 869	62 347 441	240 841 676	91 128 441	46.22%	37.84%

Table 2: The trade relations between Turkey and EU

3.4 Differences between FTAs and Customs Unions

These two economic integration forms have a deterministic characteristic that has essential implications. For an FTA, there are different external tariffs for each country which are called the rules of origin (ROO) and are the distinctive characteristic of a FTA. For a CU the common external tariff (CET) is the distinctive feature which is applied to third countries (Mirus and Rylska, 2008).

An FTA allows for every country to maintain its individual trade barriers but to abolish the barriers and tariffs against member countries. The goal of ROO is to inhibit trade reflection, in other words goods and services that can enter the FTA member countries from third countries with the lower tariffs. ROOs increase trade diversion by inducing producers to buy inputs at higher cost from member countries, thus satisfying the origin requirements. Firms and service providers seek protection against foreign competitors and require more restricted ROOs that give advantages to suppliers from member countries compared to competitors from third countries. Due to different tariff barriers, different member countries have different input prices. This leads producers to have different input costs which cause distorting production. Because of the complexity of ROO, its applications lead to extra costs and red tape monitoring.

ueger (1995) has suggested that the CU settles an average common external tariff (CET) by taking the higher and lower tariff countries into account. This shows that an FTA does not lead to more net trade creation than a CU. The CET could be set below the level of the high cost country. So, we cannot say that a FTA will enhance the welfare more than a CU for the same members. In that situation, when the high cost country cuts production in the wake of tariff cuts we can say that trade is created, while an FTA would hinder the tariff and provide less trade. This implies with the trade-diversion effect of ROO more trade creation for a CU. So, we can say that the potential welfare effects of a CU are higher than an FTA. Under an FTA borders and separate customs procedures continue but a CU resembles a larger single market. In negotiations with third countries this lessens the power of interest groups compared to an FTA and makes for more pronounced scale economies and pro-competitive effects. Non-members of a PTA will behave in a more conciliatory fashion vis à vis an emerging CU than an emerging FTA, as the risks of confrontation with a larger economic unit (market) with a common external tariff act as a strong deterrent.

Moreover, a large enough CU will have an influence on the prices of internationally traded goods, forcing outside countries to accept the prices prevailing inside the CU. Thus the outside countries will export to the CU at prices that include the CET and transport costs, bestowing an element of monopsony power to the CU. This effect is much less clear for an FTA of similar composition. Therefore, on balance, the economic benefits of a CU outweigh those of an FTA (Mirus and Rylska, 2008). Krueger also focused in her study on the differences between FTAs and CU with the overlapping issue. Overlapping of FTAs can exist while overlapping of CU is not possible.

4. Term of Gravity Model

The starting point of the “Gravity Model of International Trade” is the Newton’s law of gravity from Physics. According to Newton's Law of Gravity, gravitational force is in direct proportion to the masses of objects and inversely related with the distance between both objects. Based on this observation, the gravity model of international trade posits in its simplest form that trade between two countries or regions is proportional to the economic mass of the two countries (as measured by their GDPs) and inversely related to the geographical distance between them. Studies using the simple gravity equation which uses gross domestic product (GDP) and distances between pairs of countries yield highly successful results, with the model able to explain a large proportion of the variation in bilateral trade flows. Results also suggest a strong and significant role for geography, and the impact of distance in particular, on bilateral trade.

The simple gravity model has been modified to include additional variables that help predict trade. Examples include dummy variables for common language, common border, common currency, membership of an economic bloc, colonial information, etc. as well as population and per capita GDP. While the use of and specification of the gravity appears ad-hoc and was implemented initially without a theoretical foundation, a number of subsequent studies have presented theoretical foundations for the gravity model based on a number of theories of international trade (examples including Anderson (1979), (1985, 1989), Krugman and Helpman (1985) and Deardorff (1998)). In addition to considering the level of trade between countries, the model has also been used to consider intra-industry trade flows and the variety of traded products between countries.

4.1 Literature Review of Gravity Model

According to Antonucci and Manzocchi (2006), the gravity model is the one of the most successful econometric approaches that has been adopted to estimate spatial transactions among different variables. They express that the general idea behind the gravity model and also the name comes from the gravity theory in physics. Tinbergen (1962) applied such models to international trade, which take the geographical dimension into account and accept countries as entities having a physical location. The success of the gravity model is proved with many academic studies and became very employable for empirical purposes in social sciences. By the adaptation of the gravity approach to international trade, the exporting and importing countries are the "physical entities" and the "masses" are the sizes of their economies. The larger is the economies of the involved countries, the larger is the trade exchanges among them. However, due to transport costs and time of deliveries the distance has a negative effect on trade flows. There are also some other trade hampering factors which are representing indirect or artificial trade costs such as import tariffs, border controls and quantitative restrictions (Antonucci and Manzocchi, 2006).

The first use of the gravity approach to model international trade flows date back to Tinbergen (1962), Poyhonen (1963) and Linnemann (1966). Poyhonen (1963) argued that trade volume depends on the national income of the countries considered and that distance between countries has a negative effect on trade volume. Linnemann included new variables into his model and justified the model in terms of a Walrasian general equilibrium system and denoted that there are three main factors by considering the theoretical aspects of a gravity model for trade (Paas, 2002):

- 1) the total potential supply (or exports) of a country to the world market;
- 2) the total potential demand (or imports) of a country to the world market;
- 3) those factors that create resistance to trade and thus affect the degree of trade intensity. These factors include generally tariff barriers and transportation costs.

Anderson (1979) was the first to do so, first assuming Cobb-Douglas preferences and then, in an appendix, constant-elasticity-of-substitution (CES) preferences. In both cases he made what today would be called the Armington assumption, that products were differentiated by country of origin. His framework was in fact very similar to what Deardorff (1998) examined with impeded trade, although he motivated the differentiation

among products, by the HO model's case of non factor price equalization (non-FPE) and specialization rather than by the Armington assumption. Anderson modelled preferences over only traded goods, while Deardorff assumed for simplicity that they hold over all goods. Anderson's primary concern was to examine the econometric properties of the resulting equations, rather than to extract easily interpretable theoretical implications.

Bergstrand (1985), in his study, described the micro-economic principles of the gravity equation. He discussed the gravity equation based on a general equilibrium model. In this context, according to Bergstrand, the consistent empirical success of the gravity equation in many different areas (such as migration, tourism shipping, etc) can be considered.

Deardorff (1998) improved the gravity equation by using two cases of the Heckscher-Ohlin model. The first case causes free trade in homogenous goods with the manufacturers and consumers indifferent between choosing among the different trading partners. The second case, including countries producing different goods and Cobb-Douglas or CES preferences, again causes a version of the gravity equation. Deardorff concludes that the gravity model is suitable with a large variety of standard trade models (Smarzynska, 2001).

Anderson and van Wincoop (2003) developed a multi-country general equilibrium model for international trade. Each country has a single good which causes differences from those produced by other countries. This product is also the most important income source. Individual consumers enjoy consuming a large combination of domestic and foreign goods. Consumer preferences are supposed to be equivalent across countries and are captured by constant elasticity of substitution utility. Anderson and van Wincoop allege with their model that the determinants of trade flows between countries are not only bilateral trade barriers. Multilateral trade barriers determine also trade flows between two countries. This they term the multilateral resistance term. Failing to take account of this term can bias estimates when using the gravity model, with most recent studies looking to control for this term (Novy, 2012).

Many academic papers have also been written about the relationship between PTAs and trade. Some authors such as Aitken (1973), Abrams (1980), and Brada and Mendez (1985) found an economically and statistically significant effect of the European Community (EC) on trade flows among members, while Bergstrand (1985) and Frankel, Stein and Wei

(1995) found insignificant effects. Magee (2003) is one of the first writers who adjusts for FTAs endogeneity using instrumental variables. According to Magee (2003) the relationship between FTA and trade is a simultaneous-equations system. Magee found by estimating the effect of FTAs on trade flows similarly a range of large positive to large negative effects of FTAs on trade flows. Magee (2003) suggests “we should be cautious in using gravity equation estimates to draw strong conclusions about the effect of PTA formation on trade.” (Baier and Bergstrand, 2007)

There are also some studies which examine the trade relations between Turkey and CU, often using Computable General Equilibrium (CGE) analysis. Harrison, Rutherford and Tarr (1996) examine the impact of the CU for Turkey's welfare using CGE analysis. They estimated that a CU between Turkey and the EU would result in a 1-1.5 percent increase in Turkey's annual GDP depending on supplementary policies. In alternative specifications they also estimate a 1.4% decline in Turkey's GDP however and suggest that to compensate the losers the Turkish government would have to increase VAT to 16.2%. Mercenier and Yeldan (1997) also used CGE analysis in their study of the effects of the CU on welfare in Turkey and concluded that the CU is not enough to increase welfare.

Antonucci and Manzocchi (2004) assess empirically whether trade relations between Turkey and the EU, which is its most developed economic neighbour and its politico-economic “attractor”, are already so “special”. In order to do this, they analysed Turkey's merchandise trade over (1967–2001) with the gravity model in a panel-data framework. Provided that the gravity benchmark fits, they wanted to assess whether Turkey already has a special trade relation with the EU, namely whether actual trade volumes have been significantly larger than predicted ones. The main findings of their study are, that the gravity model provides a good fit of Turkey's trade patterns, and despite the 1963 Association agreement and the customs union launched in 1996, there is no evidence of additional trade between Turkey and the EU.

Nowak-Lehmann et al. (2005) in their paper examine the trade effects of Turkey's trade integration into the EU. To this end sectoral trade flows to the EU based on panel data from the period 1988 to 2002 were examined concentrating on Turkey's sixteen most important export sectors. Emphasis is placed on the role of price competition, EU

protection, and transport costs on exports between Turkey and the EU. The empirical model used is an extended version of the gravity model. Nowak-Lehmann et al. concluded that regulations in Turkey's price competitiveness cause an improvement in exports in most of the sectors. They further found that transport cost significantly influence Turkey's exports in most sectors. Transport costs have no effect on cotton, iron and steel, machinery sectors only. If the restrictions of the CU on agricultural sector of Turkey were removed, the export volume of Turkey could increase remarkably.

Neyapti, Taskin and Ungor (2003), in their study analyzed Turkey's foreign trade between 1980 and 2001 with EU and reached the conclusion that the CU impacted positively upon both exports and imports. In their study they estimated import and export equations separately using panel data. When they take crisis periods into account, the results which they obtained are also positive significant.

4.2 Formulation of the Gravity Model

The gravity model allows for the inclusion of spatial elements into the bilateral trade flow analysis. As mentioned above, Tinbergen (1962) and Pöyhönen (1963) were the first economists who applied the gravity model in economics. Linnemann (1966) improved the model by using other explanatory variables and the gravity model was given a solid theoretical foundation by Anderson (1979) and Bergstrand (1985). The gravity model despite some of its constraints has been one of the most successful models in economics, consistently explaining a large proportion of the variation in international trade flows.

Tinbergen (1962) and Pöyhönen (1963)'s approach is an adaptation of Newton's universal law of gravity in bilateral trade relations. According to Newton's gravitational law, the force of gravity is in direct proportion to the masses of two objects and inversely proportional to the distance between them. In this framework trade flows between two countries can be supposed as in direct proportion to their GDPs and inversely proportional to their distance. Accordingly, a simple gravity model can be expressed as follows;

$$Trade_{ij} = \alpha * \frac{(GDP_i * GDP_j)}{Distance_{ij}} \quad (1)$$

$Trade_{ij}$ expresses the volume of bilateral trade between country i and j where GDP_i and GDP_j are the variables which represents the national incomes of country i and j respectively. $Distance_{ij}$ is the geographical distance between the trade partners and α is a

constant of proportionality. The logarithms of the gravity model as in (1) will give us the linear form of the equation as follows (Batra, 2004):

$$\text{Log}(\text{Trade}_{ij}) = \alpha + \beta_1 \log(\text{GDP}_i * \text{GDP}_j) + \beta_2 \log(\text{Distance}_{ij}) + u_{ij} \quad (2)$$

where α , β_1 and β_2 are coefficients, which show whether the variables affect trade between countries positively or negatively. The error term (u_{ij}) captures any other shocks and chance events that may affect bilateral trade between the two countries. Equation (2) is the main gravity model equation where bilateral trade is predicted to be a positive function of income and negative function of distance (Batra, 2004).

A gravity equation can also include binary or dummy variables such as those if countries share a common border, common language, common currency, or are both members of an economic bloc, etc. The inclusion of these variables depends upon the aim of the analysis as well as the format of the data (i.e. whether panel data is used or not). An example of a general gravity model is presented below where the variable GDP is split in exporter (i) and importer (j) countries separately and the dummy variables common language, common border, preferential trade agreement, custom union and common currency and independent variable population are introduced. In the fifth section, the particular version of the gravity equation used for our analysis is discussed.

$$\text{Trade}_{ij} = \beta_0 + \beta_1 \text{GDP}_i + \beta_2 \text{GDP}_j + \beta_3 \text{POP}_i + \beta_4 \text{POP}_j + \beta_5 \text{DIST}_{ij} + \beta_6 \text{LANG}_{ij} + \beta_7 \text{ADJ}_{ij} + \beta_8 \text{LOCK}_{ij} + \beta_9 \text{PTA}_{ij} + \beta_{10} \text{CU}_{ij} + \beta_{11} \text{CUR}_{ij} + u_{ij}$$

Where Trade_{ij} = Export, import or total trade

LANG_{ij} = Common language

ADJ_{ij} = Common border

LOCK_{ij} = Landlocked

PTA_{ij} = Preferential trade agreement

CU_{ij} = Custom Union

CUR_{ij} = Common Currency

POP_i and POP_j = Population of country i and j.

5. Implementation of Gravity Model on Turkey's Export and Import

5.1 Model

In this study we examine the impact on Turkey's exports and imports of PTA and CU membership over the period 1962-2011. The Gravity Model is used to analyze these changes. The main reason for choosing Gravity model is that it allows to control for variables like population, GDP and distance, and has been found to be a particularly useful model for identifying the impacts of PTAs and CUs. This model also enables to observe the impacts of each variable.

The dependent variable of the gravity equation which is applied in this study is either Turkey's total exports or its total imports with trade partners. The two models – for exports and for imports – can therefore be written as follows:

$$EXP_{ij} = \beta_0 + \beta_1 GDP_i + \beta_2 GDP_j + \beta_3 POP_i + \beta_4 POP_j + \beta_5 DIST_{ij} + \beta_6 PTA_{ij} + \beta_7 CU_{ij} + u_{ij}$$

$$IMP_{ij} = \beta_0 + \beta_1 GDP_i + \beta_2 GDP_j + \beta_3 POP_i + \beta_4 POP_j + \beta_5 DIST_{ij} + \beta_6 PTA_{ij} + \beta_7 CU_{ij} + u_{ij}$$

Where EXP_{ij} and IMP_{ij} refer to logged total exports from Turkey (i) to country j and logged total imports to Turkey (i) from country j respectively. As explanatory variables we include the great circle distance between capital cities, along with the population and GDP of the trade partner countries. All of these variables are included in logs. The population and GDP of Turkey are excluded from the model because in various specifications time dummies are included and it would not be possible to include the population and GDP of Turkey and these dummies. Finally, we also include dummy variables for PTAs and CUs, which take on the value one if the partner was in either a PTA or a CU in a particular year.

In terms of the coefficients, we expect that a greater distance between Turkey and its trade partners will reduce trade and so a negative coefficient is expected on distance. In the literature this coefficient tends to be around -1.0. GDP represents the production capacity of an economy as well as the purchasing power of an economy, so we would expect a positive coefficient when considering both exports and imports. In the literature a coefficient of around 1.0 is often found. A large population indicates a large domestic market, a higher degree of self-sufficiency and less need to trade. A large population also promotes division of labour and implies the presence of economies of scale in production and therefore opportunities and desire to trade with a greater variety of goods. Given this,

the coefficient on population is ambiguous, though in the literature small, negative and insignificant coefficients are often found. Finally, the coefficients on the dummy variables for PTAs and CUs of the augmented gravity model are expected to be positive. The reason of that is that trade agreements between countries will nullify or reduce tariffs and are therefore expected to increase the trade volume. Existing studies tend to find positive effects of trade agreements in general, though the results for specific trade agreements are more mixed (with positive, negative and insignificant effects found).

In our analysis we do not include variables capturing common language, common borders and common currencies. In the case of the common currency the reasoning is straightforward as there are no countries that share a common currency. According to WTO data, there are only two countries (Bulgaria and Cyprus) which have a common language with Turkey. Since these countries have a small share in Turkey's export and import we did not include the language effect. In some specifications of the regression model these effects will also be captured by the inclusion of country-specific fixed effects.

5.2 Data

Data on bilateral trade (i.e. imports and exports) are taken from the UN's COMTRADE database and are expressed in (current) US dollars. Data on the population and GDP of Turkey's trade partners are from the World Bank's World Development Indicators database. Data on GDP is expressed in constant US dollars. Information on the distance between capital cities are taken from the CEPII website (<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>), while data on PTAs and CUs are taken from the WTO website (<http://rtais.wto.org/UI/PublicAllRTAList.aspx>).

In terms of the PTA and CU variables, which are discussed above, changes need to be made as countries switched from one agreement to another. The PTA between Turkey and CEECs for examples (Lithuania, Hungary, Estonia, Czech Republic, Slovakia, Poland, Slovenia, Latvia, Bulgaria and Romania) was abolished after their participation in the EU. This means that these countries were included in the list of PTA countries prior to their accession to the EU and then in the list of CU countries after their accession. The same situation applies to Austria, Denmark, Portugal, Sweden, UK and Finland which left the EFTA and participated in the EU. These countries are included in the analysis as PTA

countries until they participated in the EU and after that they are considered as CU countries.

5.3 Regression Analysis

The data types, which are used in econometric studies, are cross-sectional data and time series data. Time series data includes different values of variables in a certain time period. The cross-section data is the values of different variables at a single time. So, panel data combines these two data types.

Panel data is a data set which is a combination of more than one time series of cross-section. Panel data sets are referred as balanced panel data if the sets contain equal length time series for each section otherwise it is unbalanced panel data.

There are three main reasons which make panel data sets important. The first of them is that the use of panel data may offer a solution to the problem of bias caused by unobserved heterogeneity, a common problem when fitting models with cross-sectional data sets. A second reason is that it could be possible to utilize panel data sets to disclose dynamics which are challenging to detect with cross-sectional data. A third reason is that the number of observations is often very large. If there are n units of observation and if the analysis is undertaken in T time periods, there are nT observations in the dataset (Dougherty, 2006).

There are two types of panel models, namely random effects or fixed effects. Ott and Longnecker defined fixed effects model and random effect model as follows:

“In a fixed effects model for an experiment, all the factors in the experiment have a predetermined set of levels and the only inferences are for the levels of the factors actually used in the experiment. In a random effects model for an experiment, the levels of factors used in the experiment are randomly selected from a population of possible levels. The inferences from the data in the experiment are for all levels of the factors in the population from which the levels were selected and not only the levels used in the experiment”.

The cross-section data are often used to estimate trade models by standard gravity equations in a particular year or on averaged data. However, panel-data might offer additional advantages, capturing the relationships over time and preventing the risk of choosing an unusual year. Furthermore, panels permit monitoring unobservable individual effects (β_i) between partners: this characteristic is relevant because an appropriate

econometric property of the gravity equation may be to control for heterogeneous business relationships. As estimation methods, fixed effects model (FEM) and random effects model (REM) can be applied. By estimating trade flows between randomly drawn samples of trading partners from a larger population, the REM would be more suitable (Antonucci and Manzonchi, 2004). Some researchers such as Baier and Bergstrand (2007), Baldwin and Taglioni (2006), Subramanian and Wei (2007) argue that the introduction of time, country-pair, importer and exporter effects in panel gravity models only eliminate part of the bias. According to these papers the ideal properties for empirical analysis should include time-varying country and time invariant country-pair fixed effects. In the existing empirical literature, this important aspect has not always been given consideration, a shortcoming that Baldwin and Taglioni (2006) labelled as the gold medal mistake. There are also two other mistakes which they label as silver and bronze medals mistake. The bronze mistake is the inappropriate deflation of nominal trade values by the US aggregate price index. The silver mistake is the use of the log of the average rather than the average of the logs. (Kong and Kneller, 2012).

In their study Baier and Bergstrand (2004) preferred to apply fixed effects instead of random effects. Because they believe the source of endogeneity bias in the gravity equation is unobserved time-invariant heterogeneity. In economic terms, they believe that the presence of an FTA and the volume of trade are simultaneously influenced by unobserved time-invariant bilateral variables. They expressed the relation of unobserved time-invariant bilateral variables with FTA dummy (FTA_{ij}) as follows:

" ... because these variables are likely correlated with FTA_{ij} , they are best controlled for using bilateral fixed effects, as this approach allows for arbitrary correlations of unobserved time-invariant bilateral variables with FTA_{ij} . By contrast, under "random effects" one assumes zero correlation between unobservable time-invariant bilateral variables with FTA_{ij} , which seems less plausible"

5.4 Results

Our discussion of the results is split in to two sub-sections. In the first we discuss the results when considering the impact of PTAs and CUs on exports, and in the second we discuss the results when considering the impact of PTAs and CUs on imports.

5.4.1 Export

		Std. Error	p> t		
GDP	0.715***	(0.021)	0.000	Time effects	No
Population	0.055**	(0.025)	0.029	Country-time effect	No
Distance	-1.429***	(0.039)	0.000	Observation	5127
PTA	1.093***	(0.103)	0.000	F-test	1958.71***
CU	1.786***	(0.078)	0.000	R-squared	0.537
Constant	9.791***	(0.502)	0.000	Within R-squared	-

Table 3: Pooled regression 1- Export

Table 3 reports results from the pooled regression, where neither time nor country fixed effects are included. Considering the results we find a coefficient on distance that is negative and significant as expected, though the coefficient is somewhat larger than that found in other studies. A 1% increase in distance between Turkey and the importer country decreases exports by around 1.43%. The coefficient on GDP of the trade partner is positive and significant, though somewhat smaller than the value of 1.0 that is often found. A 1% increase in GDP of the trade partner leads to an increase of around 0.72% in Turkey's export. The coefficient on population is small, positive and significant, indicating that more populous countries import to a greater extent from Turkey. Turning to the coefficients on the PTA and CU dummies we find that both coefficients are large, positive and significant. The coefficients indicate that being in a PTA or CU with Turkey increases exports from Turkey to the trade partner by more than 100 percent. The coefficient on CU dummy is found to be larger than that on the PTA dummy indicating that the effect of CUs on exports is larger than that of PTAs.

		Std. Error	p> t
GDP	0.929***	(0.015)	0.000
Population	0.011	(0.018)	0.558
Distance	-1.791***	(0.028)	0.000
PTA	-0.808***	(0.069)	0.000
CU	-0.682***	(0.068)	0.000
Constant	5.031***	(0.489)	0.000

Time effects	Yes
Country-time effect	No
Observation	5127
F-test	386.76***
R-squared	0.7824
Within R-squared	-

Table 4: Pooled Regression 2 - Export

Table 4 introduces time fixed effects into the model. This increases the R-squared significantly with the model now explaining around 78 percent of the variation in exports compared with the 54 percent explained by the model above. Coefficients on our variables of interest also change considerably. The coefficient on distance remains negative and significant, but increases in size, while that on GDP continues to be positive and significant and is now close to the value of 1.0 found elsewhere in the literature. The coefficient on population continues to be small and positive, but is now not significant. Turning to the coefficients on the PTA and CU dummies we find that when controlling for time-specific heterogeneity the coefficients on the PTA and CU dummies become negative and significant. In particular, exports are found to be around 80 and 68 percent lower for exports to countries with which Turkey shares a PTA and CU respectively.

	(3)	Std. Error	p> t
GDP	1.821***	(0.066)	0.000
Population	4.848***	(0.132)	0.000
Distance	-	-	-
PTA	0.627***	(0.112)	0.000
CU	1.619***	(0.093)	0.000
Constant	-104.381***	(1.315)	0.000

Time effects	No
Country-time effect	Yes
Observation	5127
F-test	2739.90***
R-squared	-
Within R-squared	0.689

Table 5: Fixed effect 1 - Export

Table 5 reports results from a fixed effect panel model, where partner country fixed effects are included. Due to the inclusion of these partners fixed effects it is not possible to include other partner-specific, time-invariant variables in the model, which means that the distance variable is dropped. When accounting for cross-country heterogeneity we observe that the coefficients on GDP and population both increase, with both coefficients being large, positive and significant. The coefficients on the PTA and CU dummies are also once again positive and significant, with that on the PTA dummy suggesting that PTA countries import around 63 percent more than non-PTA countries (holding all else constant), and CU countries importing around 162 percent more from Turkey than non-CU countries.

	(4)	Std. Error	p> t
GDP	0,415***	(0.075)	0.000
Population	1.946***	(0.150)	0.000
Distance	-	-	-
PTA	-0.146	(0.105)	0.166
CU	-0.122	(0.099)	0.222
Constant	-28.235***	(2.618)	0.000

Time effects	Yes
Country-time effect	Yes
Observation	5127
F-test	276.46***
R-squared	-
Within R-squared	0.749

Table 6: Fixed effect 2- Export

Finally, in table 6 we report results from a fixed effects panel model that also includes time fixed effects. Once again, this implies that distance has to be dropped. The coefficients on GDP and population remain positive and significant, but are much smaller than the corresponding coefficients reported in Table 5. The coefficient on GDP indicates that a 1 percent increase in GDP is associated with a 0.42 increase in exports from Turkey to the partner country. The coefficients on the CU and PTA dummies remain negative, but are no longer significant. When accounting for both unmodelled time and country heterogeneity therefore we find that PTAs and CUs have no significant impact on exports from Turkey.

5.4.2 Import

	(1)	Std. Error	p> t
GDP	1.038***	(0.022)	0.000
Population	0.085***	(0.028)	0.002
Distance	-1.172***	(0.041)	0.000
PTA	1.213***	(0.107)	0.000
CU	1.721***	(0.078)	0.000
Constant	-0.656	(0.513)	0.201

Time effects	No
Country-time effect	No
Observation	4898
F-test	2194.67***
R-squared	0.59
Within R-squared	-

Table 7: Pooled regression 1 – import

In this subsection we report the results from estimating the gravity model on imports rather than exports. The approach we adopt is the same however; we begin by reporting results without any fixed effects, then results when including time fixed effects only, then when including country fixed effects only, and finally when including both time and country fixed effects. Table 7 reports results when no fixed effects are included. Results on the main gravity variables are as expected. The coefficient on GDP is large, positive and significant, with a coefficient of around 1.0. The coefficient on distance is large, negative and significant, with a coefficient not too different from -1.0. The coefficient on population is small, positive and significant. We further find coefficients on the PTA and CU dummies that are large positive and significant. The coefficients indicate that countries in PTAs export around 121 percent more to Turkey than non-PTA countries, while CU countries export around 172 percent more to Turkey than non CU-members. The results again suggest therefore that the impact of CUs on imports is stronger than that from PTAs.

	(2)	Std. Error	p> t
GDP	1.179***	(0.020)	0.000
Population	0.066***	(0.025)	0.000
Distance	-1.394***	(0.035)	0.000
PTA	0.012	(0.095)	0.899
CU	0.112	(0.081)	0.163
Constant	-4.68***	(0.522)	0.000

Time effects	Yes
Country-time effect	No
Observation	4898
F-test	290.2***
R-squared	0.70
Within R-squared	-

Table 8: Pooled Regression 2 - import

Table 8 reports results when time fixed effects are included. The coefficients on GDP, distance and population are consistent with those reported in the above table, with coefficients that are similar in terms of size. The coefficients on the PTA and CU dummies however are much different. In particular, the coefficients remain positive but are now small and insignificant, suggesting that there is no impact of PTAs and CUs on imports into Turkey.

	(3)	Std. Error	p> t
GDP	2.572***	(0.083)	0.000
Population	2.322***	(0.170)	0.000
Distance	-	-	-
PTA	0.339**	(0.142)	0.017
CU	1.378***	(0.117)	0.000
Constant	-82.652***	(1.693)	0.000

Time effects	No
Country-time effect	Yes
Observation	4898
F-test	1403.11***
R-squared	-
Within R-squared	0.54

Table 9: Fixed effect 1 - import

Table 9 reports results when including country fixed effects, which again necessitates the dropping of distance from the regression model. As with the case of exports, when including country fixed effects, the coefficients on GDP and population increase in absolute magnitude. In particular, we observe that a one percent increase in GDP in the partner country is associated with an increased in imports of 2.6 percent and a one percent increase in population in the partner country increases imports by around 2.3 percent. The coefficients on the PTA and CU dummies are once again significant, with the coefficients

suggesting that PTA members export around 34 percent more than non-PTA members and CU members around 138 percent more than non-CU members.

	(4)	Std. Error	p> t
GDP	1.598***	(0.100)	0.000
Population	0.275	(0.204)	0.178
Distance	-	-	-
PTA	-0.107	(0.141)	0.448
CU	0.238*	(0.134)	0.076
Constant	-29.603***	(3.524)	0.000

Time effects	Yes
Country-time effect	Yes
Observation	4898
F-test	126.39***
R-squared	-
Within R-squared	0.59

Table 10: Fixed effect 2 - import

Finally, in table 10 we include both time and country fixed effects. When doing this we obtain a positive and significant coefficient on the GDP of the trade partner and a positive but insignificant coefficient on the population variable. The coefficient on the PTA dummy is found to be negative, but insignificant, while that on the CU dummy is positive and significant. The results thus suggest that CUs have a positive impact on imports into Turkey, with imports being around 24 percent higher for CU members relative to non-CU members, while there is no significant impact of PTAs on imports into Turkey.

6. Conclusion

Except some studies, PTAs and CU membership have positive effect on bilateral trade flows. International economic integration aims to create a common market which unites countries to found trade block. This block nullifies the barriers and aims to remove discrimination between partners and provides the free movement of production factors.

Nowadays almost 81% of economic integrations are constituted by free trade areas. 11% of these economic integrations are constituted by customs unions and the most developed custom union is EU.

Gravity model is a very important model to explain the development of bilateral trade flows. Wide application area of model, easy accessibility to data and reliability of model are the reasons to use Gravity model. A further reason to use gravity model is the acceptance of empirical success of model. Gravity model is criticized because of its

undeveloped theoretical infrastructure. However recent studies aim to develop theoretical infrastructure of the model.

In results section, effects of PTAs and CU on Turkey's export and import evaluated in 4 cases. To interpret the effect of CU and PTAs table 6 and Table 10, which use country and time dummies for estimation, are considered. Fixed effects model does not take into account the variable distance because of that Table 3 and 4 are used while interpreting of distance effect.

Thus, the estimation results of the applied model are summarized as follows.

GDP : According to estimation results, the variable GDP, which represents the national incomes of Turkey's bilateral trade partners, is positive and significant. It is expected that in parallel with growth of economies of importer countries, import demand also increases. According to the estimation results PTAs and CU have positive effect on Turkey's trade. Increase of national income increases the purchasing power of the countries so they import more from Turkey. Turkey has an increase in imports, as shown in the results. As mentioned increase of exporter countries' GDP provides product diversification and in parallel with technological developments, GDP increases production capacity and it results an increase in Turkey's import.

Population: According to estimation results increase in importer countries' population has positive effect on turkey's export. Growth in the target market depending on increase of population increases the demand and has positive effect on Turkey's export. When it comes to Turkey's import, insignificant regression results explain that increase in exporter countries' population has no effect on turkey's import.

Distance: Coefficient of the variable representing the distance from partner countries to Turkey is negative and significant while estimating turkey's export and import. Transportation costs are expressed as distance variable in the gravity model. Longer distances cause higher transport costs. We found as expected that the distance has a negative effect on Turkey's foreign trade and is significant.

PTA: It was expected that the variable PTA affects Turkey's export positive, but it is found insignificant.

CU: As expected the Variable *CU* has a positive effect on Turkey's import but unexpectedly it is insignificant on Turkey's export.

According to the results of regression analysis it can be said that Turkey has not gained the expected benefit from PTAs and *CU*. According to the results, the only comment, which could be made, is that after the participation in *CU* Turkey's import increased. Compared to export, import increases more, which leads to trade imbalances and a negative effect on the economy.

The entry of import goods in the country forced the domestic producers to adapt to competition. Producers which cannot adapt to the competition have to stop or restrict their production. In this case the total production in the country and thereby the GDP will decrease. This will lead to a decrease of welfare too.

According to Lejour et al (2004), if Turkey becomes full member of the EU, both Turkey and EU will profit. The reason of that is, now Turkey has restricted entry rights into internal market. After full membership Turkey attains larger market opportunities for its export goods which lead to a real impact on Turkey's export. Antonucci and Manzocchi (2006), suggest also the full membership of Turkey to the EU. By reasoning of that, they point out that there is no special business relationships between Turkey and the EU except of *CU*, but when it comes to full membership such a relationship may occur. It is known that the effect of agreements such as PTAs and *CU* may be seen in the long term. Correspondingly, it can be said that the effect of these agreements may change in the future and these agreements may affect Turkey's trade positive as expected.

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Abstract English

A large number of factors such as consumer preferences, technology and labour characteristics encourage international trade between countries.

The global economic developments, which emerged at the beginning of the 20th century and accelerated towards the middle of the same era and integration between countries, have increased the volume of trade between countries. In parallel with the increasing volume of trade new economic theories and models have emerged to explain the causes and consequences of international trade. The Gravity Model is one such model that has been important in explaining the structure and direction of international trade.

The gravity model estimates the extent of trade flows between countries as a function of country's economic size, their distance to trade partners as well as other cultural and economic links between pairs of countries (such as affiliated organizations, common borders, visa exemptions, etc).

In this study, the effects of Customs Union (CU) membership on Turkey's foreign trade are examined using the Gravity Model. The Gravity Model is estimated using annual data on a large sample of Turkey's trade partners, with the focus of the study being on the effects of a CU with the European Union (EU) and other Preferential Trade Agreements (PTAs) on Turkey's exports and imports. The effects of CUs and PTAs on Turkey's foreign trade are then compared.

The study consists of six main chapters. The first chapter introduces the topic. The second chapter discusses foreign trade and the factors affecting international trade in a theoretical way. Chapter three discusses PTAs and CUs and briefly describes the benefits of FTAs. A discussion of the historical development of Turkey's CU accession process, the concept of the CU and the impacts of CU on economies of member countries is also provided in this chapter. The fourth chapter describes the Gravity Model. The contributions of other researchers and a literature review on Gravity Model are presented here. Furthermore, the variables used in the gravity model and the definitions of these variables are stated here. Finally, this chapter presents a review of literature using the gravity model to explain Turkey's foreign trade. The fifth chapter presents an application of the gravity model on Turkey's foreign trade. After explaining the basics about regression analysis, the impacts of

CUs and PTAs on Turkey's foreign trade are analyzed. The results of this analysis are then discussed in detail. The final chapter – Chapter Six – concludes.

Keywords: Preferential Trade Agreements, Gravity Model, Import, Export, International Trade, Customs Union, Panel Data, Regression Analysis, Turkey

Abstract German

Eine große Anzahl von Faktoren wie Verbraucherpräferenzen, Technologie und Beschäftigungsmerkmalen fördert den Außenhandel zwischen den Ländern.

Die globalen wirtschaftlichen Entwicklungen, die zu Beginn des 20. Jahrhunderts entstanden und sich Mitte der gleichen Epoche beschleunigten, sowie die Vernetzung zwischen den Ländern erhöhten das Handelsvolumen zwischen den Ländern. Parallel zu dem steigenden Handelsvolumen wurden neue ökonomische Theorien und Modelle entwickelt, um die Ursachen und Folgen des internationalen Handels zu erklären.

Eines dieser bedeutenden Modelle ist das Gravitationsmodell, welches das Ausmaß des Handels zwischen Ländern als eine Funktion der wirtschaftlichen Größe eines Landes, dessen Entfernung zu Partnerländern sowie anderen kulturellen und wirtschaftlichen Beziehungen (z.B. angeschlossene Organisationen, gemeinsame Grenzen, Visumfreiheit, etc.) berechnet.

In dieser Studie werden mithilfe des Gravitationsmodells Auswirkungen der Mitgliedschaft der Türkei in der Zollunion auf deren Außenhandel untersucht. Für die Berechnung mit dem Gravitationsmodell zieht die vorliegende Studie jährlich erhobene Daten von Handelspartnern der Türkei heran, da die Studie ihren Fokus auf die Auswirkungen des türkischen Beitritts in die Zollunion (CU) der Europäischen Union (EU) und anderer präferenzielle Handelsabkommen (PTA) auf den türkischen Ex- und Import legt. Die Auswirkungen der Zollunion und präferenziellen Handelsabkommen auf den Außenhandel der Türkei werden verglichen.

Die Studie besteht aus sechs Kapiteln. Das erste Kapitel stellt das Thema vor. Das zweite Kapitel beschreibt den Außenhandel und die Faktoren, welche den internationalen Handel beeinflussen. Kapitel drei diskutiert präferenzielle Handelsabkommen und Zollunionen und beschreibt kurz die Vorteile von Freihandelsabkommen. Die historische Entwicklung des Beitrittsprozess der Türkei in die Zollunion, das Konzept der Zollunion und die Auswirkungen von Zollunionen auf die Volkswirtschaften der Mitgliedsländer werden in diesem Kapitel ebenso genauer beleuchtet. Das vierte Kapitel beschreibt das Gravitationsmodell. Die Beiträge anderer Forscher und eine Literaturübersicht über das Gravitationsmodell werden hier vorgestellt. Darüber hinaus sind in diesem Kapitel die Variablen, die das Gravitationsmodell verwendet, und die Definitionen dieser Variablen angegeben. Schließlich stellt dieses Kapitel eine Überprüfung der Literatur über das

Gravitationsmodell an, welches den türkischen Außenhandel erklärt. Das fünfte Kapitel befasst sich mit der Anwendung des Gravitationsmodells auf den Außenhandel der Türkei. Nach Erläuterung der Grundlagen der Regressionsanalyse werden die Auswirkungen von Zollunionen und präferenziellen Handelsabkommen auf den Außenhandel der Türkei analysiert. Die Ergebnisse dieser Analyse werden anschließend im Detail diskutiert. Das abschließende Kapitel - Kapitel Sechs – ist die Schlussfolgerung dieser Studie.

Schlagwörter: Präferenzielle Handelsabkommen, Gravitationsmodell, Import, Export, Außenhandel, Zollunion, Paneldaten, Regressionsanalyse, Türkei

Curriculum Vitae

Personal Information

Name: Ahmet Cetindas
Adress: Linzerstrasse 94/19, 1140 Vienna
Telephone: +43 664 169 14 76
E-Mail: ahmet_cetindas@yahoo.de
Date of birth: 5th September 1985
Geburtsort: Gaziantep/ Türkei
Nationality: German

Education

1992- 1996 Grundschule Katzenfurt (Primary school, Germany)
1996- 1998 Johanneum Gymnasium Herborn (middle school, Germany),
2000- 2003 Hasan Süzer Lisesi (high school, Gaziantep/Turkey)
2003- 2008 Marmara University (Bachelor's level) – Faculty of Economic and
Administrative Sciences, Business Administration
2010-2012 University of Vienna (Master degree) – International Business
Administration

Work Experience

2006- 2008 **SBS-MOTIF** decoration products (Turkey-Istanbul)
Position: Foreign Trade Authority
2008- 2009 **Rem Market** (Turkey-Istanbul)
Position: Importer
2009- 2010 **Razor** (England-Dorset)
Position: Export and Marketing Authority
2010-2011 **ICSL** (Austria-Vienna)
Position: Marketing Turkey

2011- 2012 **Deksis AG** (Austria-Vienna)
Position: East Europe Market Authority

2012- **ICSL** (Austria-Vienna)
Position: Marketing Austria

Personal Skills and Competences

Language skills: Turkish (native)
 German (native)
 English (Advanced)

EDV-Skills: Word, Excel, Power point
Interests: Digital photography, Music, philosophy