THE IMPACT OF EU MARKET ENLARGEMENT.

THE CASE OF UKRAINE'S TRADE REORIENTATION POLICY.

by

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Abstract

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This study carries out an extensive empirical investigation of the effect of the previous EU enlargements on the import flows from the excluded developing countries and evaluates the impact of EU Eastern expansion on Ukrainian patterns of trade. The results indicate that for the period of 1958-2000 the total effect of the previous EU enlargements on average developing country's pattern of trade was positive. However, this effect was decreasing with time and for the period of 1990-2000 export was diverted away from the average developing country. To allow differential impact across sectors, it can be concluded that the EU expansion leads to benefits for the developing countries with the high share of unprotected products in their export structures, but entails looses if the share of sensitive products prevails. The results on the regional trade relations indicate that CIS and Ukrainian export shares to the EU are significantly lower than those of the acceding countries. The increase in exports from the AC to the EU occurred at the expense of the Ukrainian export. Ukraine has a great scope to increase its export further, but the EU trade discrimination prevents this increase. In order for benefits from the EU Eastern enlargement due to lower overall tariff protection, larger internal market and single market rules to prevail over the high level of trade defense measures, the EU trade policy towards Ukraine need to be reviewed.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

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GLOSSARY

AC	Acceding Countries
CIS	Commonwealth of Independent States
CEEC	Central and Eastern European Countries
CEFTA	Central European Free Trade Agreement
CET	Common External Tariff
CU	Customs Union
FEM	Fixed-Effects Model
GATT	Generalized Agreement on Tariffs and Trade
GSP	General System of Preferences
EEC	European Economic Community
EFTA	European Free Trade Association
EU	European Union
FTA	Free Trade Area
OLS	Ordinary Least Squares
REM	Random Effects Model
RTA	Regional Trade Area
SUR	Seemingly Unrelated Regression
WTO	World Trade Organization

Chapter 1

INTRODUCTION

After successfully growing to 15 members, the European Union (EU) has recently experienced the biggest enlargement ever in terms of scope and diversity. Ten countries, until that time known as "acceding countries", - Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia became EU full members on May 1, 2004.

Foreign trade is an essential part of economic activity and a factor of future growth for Ukraine. Now the European Union is the main Ukrainian trading partner, outside the Commonwealth of Independent States (CIS). Further, accession to the EU became the dominant strategic objective of Ukrainian trade policy. However, it should be emphasized that the future trade patterns of almost every EU trade partner are very unclear now, when the greatest enlargement is in process. Thus, at present time the most essential issue that needs to be elucidated concerns the implications and the clear consequences that the EU eastern expansion will have on Ukraine's trade relations with 25 members of the EU. Only after this effect is clear enough, can the analysis be extended to find compelling evidence with regard to the necessity for Ukraine to seek the EU market integration in future.

While analyzing the impact the EU enlargement will have on Ukrainian trade pattern, it is of necessity to make a distinction between the effects of trade creation and trade diversion arising from formation of regional trade union. The framework for the bilateral relations between the acceding countries (AC) and

the EU members was provided by the European Agreements, which came into force in the year 1999. The aim of the European Agreements was to establish free trade in industrial products over the gradual, transition period. As a result, almost all industrial products from the AC have had virtually free access to the EU (with exceptions in the field of agriculture). This implies that the possibility of trade creation and trade diversion effects will result from mostly from the establishment of the Common External Tariff (CET) between these two groups of countries, from the adoption of EU preferential trade agreements, and EU trade defense measures.

The impact of the enlargement on Ukraine's pattern of trade is ambiguous. On one hand, it is expected that a trade diversion effect with respect to Ukraine, i.e. decrease in trade between Ukraine and EU-25, may occur mostly because of the changes in acceding countries' non-tariff trade regime, which includes increased level of antidumping proceedings, technical and sanitary standards, and other special measures. The possibility of such a change is explained by the fact that the EU has higher non-tariff restrictions and tighter quality control than the candidate countries have. On the other hand, the negative implications of EU enlargement will be mitigated due to the decrease in tariff barriers of AC on Ukraine's exports. Such expectation is based on the fact that the average EU customs tariff is lower than the current average tariffs of AC. In addition, the general nature of EU-15 trade policy should not become more restrictive with respect to Ukraine, because of the differences in export structures of candidate countries and Ukraine to EU.

There are three goals of this study. First, the aim is to empirically investigate the effect of the previous EU enlargements on the world patterns of trade. It is essential to test to what extent trade was diverted away from the excluded countries. In order to differentiate the degree of trade discrimination, EU nonmembers were divided into industrial and developing countries.

Second, asymmetry in the regional trade liberalization across sectors will be analyzed. The question of interest is whether the EU enlargements had a differential impact for the developing nonmember countries between the following categories of sectors: unprotected manufacturing, clothing, footwear, agriculture, and other highly protected manufacturing.

Last, it is necessary to determine how strong the relations of Ukraine are with the EU, on one hand, and the relations of Ukraine with AC, on the other hand. These estimates will help us to evaluate the impact of EU expansion on Ukrainian trade performance, i.e. whether trade diversion or trade creation effect will appear between Ukraine and enlarged EU.

The thesis outline is as follows. Chapter 2 provides a review of the related literature. Chapter 3 presents the basic theory on free trade area (FTA) or customs union (CU) formation, trade diversion and trade creation effects. Chapter 4 focuses on the data description and the methodology of estimation. Chapter 5 describes the empirical results. Chapter 6 concludes with the discussion of the findings.

Chapter 2

LITERATURE REVIEW

This section presents a review on recent literature about the empirical estimation of gravity models of trade, analysis of the process of EU market enlargement and its impact on the excluded countries as well as some findings on the effect of EU Eastern enlargement on Ukraine.

The foundations of the gravity model approach were laid by Timbergen (1962) and Pöyhönen (1963), which were first to use a gravity equation to analyze international trade flows. Since then, the gravity model has become a popular general trade indicator that has been used widely for analyzing the impact of different trade policy issues.

According to the general gravity model of trade, the volume of trade between countries *i* and *j* in year *t* is related to the trade costs, proxied by distance between the two countries' capitals, their economic sizes, proxied by GDP and their population.

$$X_{ijt} = \alpha\ Y_{it}^{\beta_1}\ Y_{jt}^{\beta_2}\ N_{it}^{\beta_3}\ N_{jt}^{\beta_4}\ D_{ij}^{\beta_5}\ \varepsilon_{ijt}\ , \qquad t = 1,\ldots, T;$$

where X_{ijt} is exports from country *i* to country *j* in year *t*, Y_{it} (Y_{jt}) indicates the GDP of the exporter (importer) at time t, N_{it} (N_{jt}) are the GDP per capita of the exporter (importer) at time t and D_{ij} represents distance. The disturbance term ε_{ijt} is assumed to have the following properties: $\varepsilon_{ijt} \sim N(0, \sigma_t^2)$, $E(\varepsilon_{ijt}, \varepsilon_{ij't}) = 0$ and $E(\varepsilon_{ijt}, \varepsilon_{ijt-1}) = 0$. The error terms are also assumed to be pairwise uncorrelated.

In the estimation procedure the log-linear form, i.e. taking the natural logarithms of the variables, is often applied. In this case the specification will be the following:

$$\log X_{ijt} = \alpha + \beta_1 \log Y_{it} + \beta_2 \log Y_{jt} + \beta_3 \log N_{it} + \beta_4 \log N_{jt} + \beta_5 \log D_{ij} + \varepsilon_{ijt};$$

The paper by Cheng and Wall (1999) provides a good theoretical underpinning for this research. In their statistical overview it is noted that in the general specification of the gravity model the intercept α has three parts and can be written as $\alpha = \alpha_0 + \alpha_t + \alpha_{ij}$, where α_0 is the part common to all years and country pairs, α_t is common to all pairs, but specific to year *t*, α_{ij} is common to all years, but specific to the country pairs.

To estimate the bilateral trade flows the restricted versions of the general gravity model are applied. One of the standard estimation methods is a cross section model for a single year *t*, which impose the restriction that intercept is the same across country pairs, i.e. $\alpha_{ij} = 0$:

$$\log X_{ijt} = \alpha_0 + \alpha_t + \beta_t' \mathbf{Z}_{ijt} + \varepsilon_{ijt}, \qquad t = 1,\ldots, T;$$

where α_0 and α_t cannot be separated and $\mathbf{Z}_{ijt} = [Y_{it}\ Y_{jt}\ N_{it}\ N_{jt}\ D_{ij}]$ is $1 \times k$ row vector of the gravity baseline variables.

By imposing the restriction that the parameter vector is the same across all *t*, i.e. $\beta_1 = \beta_2 = \ldots = \beta_T = \beta$, one can estimate a pooled cross-section model using data for all the years from 1 to T:

$$\log X_{ijt} = \alpha_0 + \alpha_t + \beta' \mathbf{Z}_{ijt} + \varepsilon_{ijt};$$

where α_t denotes the year-specific effect. One of the year-specific effect, usually for $t = 1$, should be omitted to avoid collinearity.

Cheng and Wall (1999) demonstrated that both of the standard estimation methods, with the restriction of α_{ij}=0, produce biased estimates, i.e. trade between low-trade countries is overestimated and trade between high-trade countries is underestimated. The strong positive correlation between the residuals and the level of exports tend to produce this bias. They argue that the inability of the standard cross-section estimation to account for the pairwise heterogeneity of bilateral trade relations is the principal cause of the bias. Heterogeneity implies that the level of export from country *i* to country *j* and to country *k* may be different even if $GDP_j = GDP_k$ and $D_{ij} = D_{ik}$. These differences can be explained by political, historical, cultural factors that are correlated with levels of bilateral trade and with the baseline gravity variables. Omission or misspecification of these variables will lead to the heterogeneity bias. To eliminate this bias Cheng and Wall (1999) adopted a two-way fixed-effects model (FEM) which includes both the country-pair and year dummies. The specific country-pair effects between the trading partners (α_{ij}), such as distance, border, language, culture, etc., are cross-sectionally specific but remain constant over time. In this case the specification is the following:

$$\log X_{ijt} = \alpha_0 + \alpha_t + \alpha_{ij} + \beta' \mathbf{Z}_{ijt} + \varepsilon_{ijt};$$

Mátyás (1997), in turn, emphasized: "Unfortunately, none of the applications of this model bothered to take into account the local, target and time effects, which means that all practitioners were imposing the unnecessary restrictions … These are unlikely to be correct". In this way, Mátyás (1997) argues that the correct econometric specification of the gravity model should include $\{\alpha_i\}$- the importer (target) country effects, $\{\alpha_j\}$- the exporter (local) country effects, and $\{\alpha_t\}$- the time effects. In other words, gravity model should take the form of a triple-indexed model.

The gravity model is a conventional method used to estimate the effects of a variety of phenomena on international trade. Several studies have tried to find an empirical evidence of multilateral or regional trade agreements on international trade and, thus, contributed to the refinement of gravity model approach. Some of them are relevant to this research.

A recent study by Rose (2002a) provided a comprehensive econometric study to analyze the effect of the World Trade Organization (WTO), the Generalized Agreement on Tariffs and Trade (GATT), and the General System of Preferences (GSP). The augmented gravity model, with the value of real bilateral trade between trading countries as a dependant variable, for the period from 1948 to 1999 was estimated. Rose applied empirical strategy to control for as many "natural" causes of trade as possible. The augmented gravity model was estimated by Ordinary Least Squares (OLS) with standard errors that are robust to clustering by country pairs. The author concluded that membership in WTO/GATT does not imply an increase in trade intensities; the volume of bilateral trade between members and non-members is not significantly different. However, it should be noted that the coefficient, which was obtained after the country-specific fixed effects were added to the benchmark equation, did indicate that GATT/WTO membership is associated with may be not strong, but nevertheless positive effect on trade. The attention should be further paid to the fact that one of the perturbations in the sensitivity analysis, when the sample of countries was restricted to the industrial countries only, had important positive effect on the GATT/WTO coefficient. This estimate indicated a pair of industrial GATT/WTO members traded about 60% more that an otherwise identical pair of non-members.

The results of Rose (2000a) were strongly questioned by Subramanian and Wei (2003). The authors provided evidence that Rose's analysis is incomplete on both

the economic and econometric grounds. On one hand, the analysis needs to be further developed to take into account the three types of liberalization asymmetries of the WTO trade policy: between developed and developing countries; between developing countries that joined the WTO before and after the Uruguay Round; and between trade sectors. Once the econometric specification incorporates these types of unevenness in the patterns of trade liberalization, the impact of WTO on promoting world trade appears to be strong and positive, although uneven. On the other hand, the authors suggest that Rose's gravity model specification needs to be improved methodologically in the important respect. Namely, Anderson and van Wincoop (2003) showed that gravity equation always needs to include country fixed affects to capture the impact of "multilateral resistance" or "remoteness". This impact appears due to the fact that trade between two countries depends not only on the existing trade regime between them, but is also influenced by the barriers to trade between these two countries concerned and the rest of the world.

The economic implications of the regional trade area (RTA) formation for international trade were examined in many empirical papers. With respect to the EU membership it is usually found that it was associated with the increase in trade intensities within the area. The possible explanation is that increase in trade within the EU was a consequence of trade diversion. In this case, EU enlargement might not be a beneficial outcome for the non-member countries. Thus, additional point elucidated in the literature was related to the impact of the EU accession on the industrial countries or on the rest of the world in general.

A distinction between trade creation (increase in the intensity of trade between members of RTA) and trade diversion effect (decrease in trade with third countries) is made in Bayoumi and Eichegreen (1995). The authors apply the gravity model with addition of specific dummy variables for participation in various RTA. The positive coefficient on the dummy variable indicating a pair of

countries, both of which are the members of RTA, point out that they trade more with one another than is predicted by their incomes and distance, and, so, it is the evidence of trade creation effect. The negative coefficient on the dummy variable indicating a pair of countries, one of which is the member of RTA and the other is non-member, is an indication of trade diversion vis-à-vis the rest of the world. In order to identify differences over time in the trade creating and trade diverting effects of EU integration, successive cross sections were analyzed for a sample of 21 industrial countries and a period of 1953-1992. The authors found that European Free Trade Association (EFTA) resulted in trade creation, while the Eropean Economic Community (EEC) promoted trade within the region through the combination of trade creation and trade diversion. It is also noted that the accession of Spain and Portugal resulted in almost no trade diversion.

Fidmuc and Fidrmuc (2000) assessed the effects of integration and disintegration in Europe for the period from 1990 to 1998. The authors analyze the evolution of trade intensities among Eastern European countries that were disintegrated in early 1990s: Czechoslovakia, Yugoslavia and the CIS. After estimating the gravity equation for each of the nine years, they found that the collapse of the former Soviet Union was followed by a sharp decline in the trade intensity among the affected countries. However, trade relations still remain quite strong. The bilateral trade among Belarus, Russia and Ukraine around the time of disintegration exceeded the *normal* level about 40 times and by 1998, this level decreased to 30. In contrast, the effect of European integration on trade intensity appeared to be only moderately positive. According to their results, intra-EU trade exceeds the potential level 1.4 times, whereas Central European Free Trade Agreement (CEFTA) within trade was twice the normal level by 1998. The authors conclude: "These results need not be interpreted as evidence of failure of the European integration process. Rather, they reflect the ongoing process of global liberalization, which, in turn, reduces the relative advantage of regional

integration." It should be emphasized that trade between the EU and the AC has already reached its potential level due to the liberalization of trade.

Christie (2001) presents a classical approach to the problem of quantifying potential trade levels, with a specific emphasis on trade flows with and within southeast Europe. After applying the gravity model approach and using panel data from 1996 to 1999 the author found that EU members trade 122% more than non-member countries, however the cross-section estimation for 1999 year indicated that this effect decreased to 98%. The author notes: "Overall, regional variables appear as significant in the panel model, but on separate cross-sections regression their significance deteriorates with the years". Christie points that the CEFTA effect is much higher than the EU effect and EU Association agreements are also significant. Trade intensity among Russia, Ukraine and Belarus, as in other studies, appeared to be huge.

In the context of this research study paper by Chang and Winters (1999) is of interest. They have shown that regional integration on average does have significant adverse effect on non-member partners exporting to the integrated market. This will induce excluded exporters to decrease their prices to meet the competition from suppliers within the RTA. Even if regional integration aims only to provide the members with more liberal trade regime and not to increase external barriers to trade, the excluded countries may still be negatively influenced.

Literature on the impact of the EU Eastern Enlargement on Ukraine is not rich. There exist only some empirical investigations of the trade patterns for Ukraine in the ongoing process of enlargement.

Kalina (2001) used the gravity model estimates to predict the change in geographical distribution and commodity structure of Ukrainian export after Eastern enlargement. The results lead to a conclusion that trade flows of Ukraine

with Central and Eastern European countries (CEEC) will diminish after the enlargement takes place. However, the estimates and the conclusions of the thesis are not reliable, because of the particular countries included in the list of AC. While excluded from the list, Cyprus and Malta are going to accede in 2004. Bulgaria and Romania will become full members in 2007. On the contrary, the condition of Turkish membership is not clear now. With the available accurate information about the AC at hands, it is possible to obtain more precise measures of the enlargement's impact on Ukrainian trade performance.

The recent paper of Åslund, Warner (2003) presents the findings relative to this research. The authors analyzed the consequences of the EU enlargement for the CIS countries. They found that, in contrast to the acceding countries, CIS countries' exports to the EU are significantly low. Moreover, this fact is not eliminated by controls for the countries' reforms. The point is that the EU trade regime toward AC and CIS countries is different; CIS countries suffer from the EU discrimination.

In summary, a substantial literature has dealt with the impact of EU enlargement on members, nonmember industrial countries or the rest of the world in general. However, it appears that the consequences of the EU accession for the developing countries are not investigated enough. Thus, one of the goals of this research is to clear out to what extent trade is diverted away from the developing countries. It is necessary to differentiate the degree of trade discrimination across the industries as well. In addition, the literature does not provide us with the reliable projections of the impact of EU Eastern enlargement on Ukrainian future patterns of trade. Thus, in this research it is also essential to elucidate the implications of the EU Eastern expansion for Ukraine's trade relations with 25 members of the EU.

Chapter 3

THE THEORY OF FREE TRADE AREAS AND CUSTOMS UNIONS

Early attempts to investigate the effect of regional economic integration were undertaken in several studies (for example, Viner, 1950; Tinbergen, 1954 and Balassa, 1961), which laid the foundation of the analysis of various types of regional economic areas. The two most common types of economic integration are: FTA – all barriers to trade within the area are removed, and CU – members have free trade within the region plus a CET. The economic effects of these types of regional economic integration can be classified as either static or dynamic effects. Static effects arise from new resource allocation due to established free movement when factors of production, technology, and characteristics of competitive environment are constant. Effects from changing in the quality and quantity of factors of production, improvement of technology, and changes in competitive environment are, in turn, called dynamic.

From a point of view of static affects only, the establishment of the CU or FTA will not always lead to the improvement in overall welfare. Viner (1950) emphasized the possibility of increase in member countries' discrimination against non-members. The distinction is made with respect to two possible outcomes: a trade creation and a trade diversion effect. Trade creation will occur if formation of regional trade union results in transfer of production from a high-cost source in a home country to the low-cost source in a partner country, because tariffs have been moved from the trade between these countries. Trade diversion, in contrast, will occur if production is transferred from a low-cost source in a third country to the higher-cost source in a partner country, because tariffs are no longer imposed on the goods from the latter.

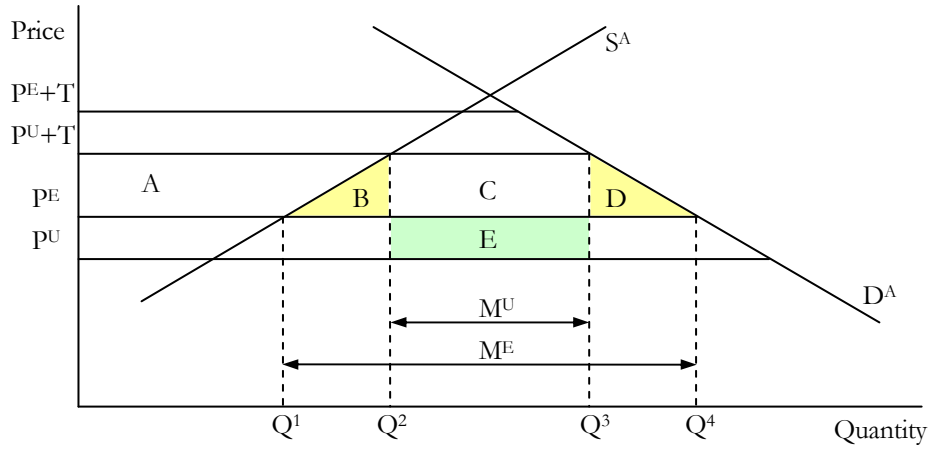

Figure 1 Trade creation and trade diversion

Trade creation and diversion effects can arise from any regional economic integration that results in geographically discriminatory barriers reduction, i.e. trade barriers reduction that is not extended to non-member countries. The effects of the establishment of such a regional trade area will now be analyzed with reference to Figure 3.1.

Consider the case when the acceding country (home country), with its domestic supply and demands curves denoted by S^A and D^A respectively, has two potential sources of imports, Ukraine and the EU. Since free trade price for a certain good in Ukraine (P^U) is less than free trade price in EU (P^E), Ukraine is said to be lower-cost producer of that good than the EU is. Assume further that AC is small enough to face a flat import supply curves from all countries. Initially the home country maintains a tariff barriers that increase the price of each country's imports above the free trade price by \$T. In this case acceding country will buy all imports M at the price P^U +T from the lower-cost producer Ukraine. Next, assume the AC forms a RTA with the EU only. The resulted discriminatory liberalization will change the relative competitiveness of goods from Ukraine and the EU, and, thus, distorts the price signals. Since P^E is less than P^U +T, the import demand will be diverted from Ukraine towards the EU. In other words,

importers will switch from lower-cost to higher-cost foreign supplier. A diversion in the purchase of imports from non-member Ukraine to the partner EU equals Q^2Q^3. The competition from imports will increase and, consequently, the prices of locally made goods will fall with a resulted loss in producers' surplus of (A). High-cost home production of Q^1Q^2 is now replaced by lower-cost imports. There is a gain in consumers' surplus of (A+B+C+D) and a loss in tariff revenue of (C+E). The overall welfare effect is (B+D-E), which can be either positive or negative. B+D are trade creation gains, i.e. reduced producer and consumer distortions. Now, with the lower domestic price, home country's resources and expenditures are allocated more efficiently. E can be considered as the cost of trade diversion. It constitutes a loss from the national standpoint, because the discriminatory tariff resulted in transferring purchases from a low-cost nonmember country to a high-cost member of regional trade agreement.

CU or FTA is considered to be beneficial if trade creation effect outweighs trade diversion. Trade creation effect will be greater the higher is the initial level of tariff (or protection in general). Cost of trade diversion will be lower, the smaller are the differences in costs of production between the member countries and the excluded countries. In this respect Moore (1989) distinguished between complementary economies, i.e. economies that produce a different range of products, and competitive economies, i.e. those that produce the same range of products. A union between the competitive economies provides a scope for trade creation, because it is likely that low-cost producers will oust the higher-cost producers when barriers to trade are removed. It is also important to consider how strong trade relations are with the partner countries. If the import from the intended partner is already high, then discriminatory tariff cut will provide the least scope for trade diversion.

Chapter 4

DATA DESCRIPTION AND METHODOLOGY

Data description

With a goal to find the solutions to the each of the questions, which were put forth in the introduction, three data sets are applied in this research.

The first data set is a version of Rose's (2002a) data set, which is borrowed from his web-site: http://papers.nber.org/papers/W9273. This data set is a panel with data for 178 IMF trading entries and years 1948-1999 (with gaps). A list of countries is included in the Appendix A. The descriptive statistics of the variables that are relevant for this research is presented in Appendix B.

The dependant variable, i.e. the *value of average real bilateral trade* between countries *i* and *j*, is calculated as the average of the four measures: exports from i to j, imports into j from i, exports from j to i, imports into i from j. The data for this regressand was taken from the International Monetary Fund's *Direction of Trade Statistics CD-ROM*. Bilateral trade on FOB exports and CIF imports is recorded in millions of US dollars. It was deflated by the U.S. consumer price index (CPI).

Data for *Population* and real *Gross Domestic Product* were obtained from the World Bank's *World Development Indicators* (2000 CD-ROM and 2002 CD-ROM for the period of 1998-99), the IMF's *International Financial Statistics*, and the Penn World Table Mark 5.6. National currency GDP figures were converted into U.S. dollars at the current dollar exchange rate.

Country-specific variables, such as land area, landlocked and island status, language, contiguity, colonizers, distance, were taken from the CIA's *World Factbook*. The basic source for currency union data is the IMF's *Schedule of Par*

Values and issues of the IMF's *Annual Report on Exchange Rate Arrangements and Exchange Restrictions.*

The second dataset, aggregated data set, was taken from Subramanian and Wei (2003). This is a modified and updated version of Rose's (2002a) data set. All the Rose's variables in this panel data set were updated for the year 2000 and the observations for every 5 years beginning in 1960 were taken. Thus, our second panel data set covers 172 IMF trading countries during the five-year periods from 1950 to 2000. The value of bilateral imports rather than the value of average real bilateral trade was used as a regressand. It was obtained from the IMF's *Direction of Trade Statistics.* Imports were reported by the importing country, measured in U.S. dollars and deflated by the U.S. CPI. The list of countries in the aggregate estimations is presented in Appendix C. Descriptive statistics for the basic data of this data set is presented in Appendix D.

The third data set, disaggregated data set, which covers 147 countries and years 1990, 1995, and 2000, was also taken from Subramanian and Wei (2003). In addition to the same variables as those used in the aggregate estimations, i.e. using previous dataset, this disaggregated data set contains bilateral import data for each of the protected and unprotected industry within five categories: unprotected manufacturing, clothing, footwear, agriculture, and other highly protected manufacturing.

The import data and the data on tariff and non-tariff barriers, which were used by Subramanian and Wei (2003) for the disaggregated estimations, were obtained respectively from COMTRADE databases of the United Nations and the Trade Analysis Information Systems (TRAINS). The authors determined the list of industries subject to high and zero protection both in the US and EU for 1989 and 2001. A given industry was treated as protected if its average ad valorem tariff rate both in the US and the EU exceeded 10%. All industries with zero tariff rates are aggregated into unprotected manufacturing. For a given year and

country pair, the value of bilateral imports of all products were summarizes within the relevant category. The list of sectors used in the disaggregate estimations, which contains 33 protected industries (sorted in the four categories: food, clothing, footwear, and manufacturing) and 41 unprotected industries, is presented in Appendix D.

Both the first and the second data sets, extended to include regional dummy variables, are used to empirically investigate the effect of the previous EU enlargements on developing EU nonmember countries and the impact of the EU Eastern enlargement on Ukraine's foreign trade. The application of both of these two data sets should provide us with more reliable basic conclusions. The major difference between them is that they are designed for different specifications of the gravity model.

The distinctive feature of the data set 1 is that the dependent variable is the average value of real bilateral trade and the basic independent variables are used in a product form, i.e. log of product of importer and exporter real GDP values, log of product of their real GDP per capita. Thus, with this data at hand it is not possible to differentiate importer and exporter characteristics and their effects on trade. However, this data set has advantage of more years included in the sample.

Data set 2, in turn, uses imports from exporter *j* to importer *i* at time *t* as a regressand together with independent variables as separate regressors for importer and exporter countries, i.e. log of importer's and log of exporter's real GDP values, log of importer's and log of exporter's real GDP per capita level.

Data set 3 is of great importance for this research because it provides us with the possibility to test whether EU membership has any differential impact for the developing nonmember countries across the following categories of sectors: unprotected manufacturing, clothing, footwear, agriculture, and other highly protected manufacturing.

Gravity model specification and methodology of estimation

In my research I intend to estimate the gravity model of trade. The first goal of this study is to empirically investigate the effect of the previous EU enlargements on the world patterns of trade. It should be noted that this effect may differ across industrial and developing countries, because these two groups of countries may have different relationship between trade and economic characteristics, such as transaction costs, income elasticity of trade, etc. In order to differentiate the degree of trade discrimination, EU nonmember countries will be divided into two groups: nonmember industrial countries and nonmember developing countries. The aim of this research is to test to what extent trade was diverted away from the excluded developing countries.

Thus, with the first goal in mind, for the data set 1 we estimate the following gravity specification in panel and cross-section framework for the aggregate period of 1948-1999:

$$\ln X_{ijt} = \{\alpha_t\} + \beta_1 \ln D_{ij} + \beta_2 \ln(Y_i Y_j)_t + \beta_3 \ln(Y_i Y_j / P_i P_j)_t +$$

$$+ \sum \beta_k S_{ijt} + \delta_1 \text{bothEU}_{ijt} + \delta_2 \text{oneEU\_ind}_{ijt} + \delta_3 \text{oneEU\_dev}_{ijt} + \varepsilon_{ijt} \qquad (1)$$

where X_{ijt} is the average value of real bilateral trade between trading countries *i* and *j* at time *t*; D_{ij} is the distance between the countries; $(Y_i Y_j)_t$ is a product of importer and exporter real GDP values; $(Y_i Y_j / P_i P_j)_t$ is a product of importer and exporter real GDP per capita values where P stands for population. All variables are in logs.

bothEU$_{ijt}$ is a binary variable, which is unity if both *i* and *j* are EU-15 members at time *t*.[1]

oneEU_ind$_{ijt}$ is a dummy, which is unity if one country (either *i* or *j*) is a member of the EU-15 and the other is industrial nonmember country at time *t*.

oneEU_dev$_{ijt}$ is a dummy, which is unity if one country is an EU-15 member and the other is a developing nonmember country at time *t*.

The basic gravity equation is augmented with a number of extra conditioning variables that affect trade, in order to account for as many extraneous factors as possible. Factors that determine specific trade effects, S_{ijt}, include a number of dummy variables, such as sharing a common land border, speaking a common language, being ever colonized, using the same currency at time *t*, etc. The full description of these variables is presented in Appendix 2. The empirical strategy to control for as many "natural" causes of trade as possible is applied. The term $\{\alpha_t\}$ represents a set of time dummies for each year in a period. It is included to capture the year-specific fixed effects, which could account for such factors as the global business cycle or the extent of the "globalization", that is "the common trend toward greater real trading volumes, independent of the sizes of the economies". They will catch all the omitted factors that affect bilateral trade, are constant across trading pairs and vary over time.

The version of the gravity model for the data set 2 is different that of for the data set 1 in that it uses imports (M_{ijt}) by country *j* from country *i* at time *t* as a regressand together with basic independent variables as separate regressors for importer and exporter countries.

[1]EU-15 members and their accession dates are the following: Austria (1995), Belgium (1958), Denmark (1973), Finland (1995), France (1958), Germany (1958), Greece (1981), Ireland (1973), Italy (1958), Luxembourg (1958), Netherlands (1958), Portugal (1986), Spain (1986), Sweden (1995), United Kingdom (1973).

$$\ln M_{ijt} = \{\alpha_t\} + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln(Y/P)_{it} + \beta_4 \ln(Y/P)_{jt} +$$
$$+ \beta_5 \ln D_{ijt} + \sum \beta_k S_{ijt} + \delta_1 \text{bothEU}_{ijt} +$$
$$+ \delta_2 \text{EU\_indnm}_{ijt} + \delta_3 \text{oneEU\_devnm}_{ijt} + \delta_4 \text{nm\_EU}_{ijt} + \varepsilon_{ijt} \qquad (2)$$

where

bothEU$_{ijt}$ is a dummy variable, which is unity if both importer i & exporter j are EU-15 members at t;

EU_indnm $_{ijt}$ is a dummy, which is unity if importer is EU-15 member but exporter is industrial country & EU-15 nonmember at t;

EU_devnm $_{ijt}$ is a dummy, which is unity if importer is EU-15 member but exporter is developing country & EU-15 nonmember at t;

nm_EU$_{ijt}$ is a dummy, which is unity if importer is EU nonmember country but exporter is in EU-15 at t.

The specification (2) is estimated in a panel and cross-section framework for the aggregate period of 1950-2000. The coefficients of GDP in both importer i and exporter j, β_1 and β_2, are expected to be positive. In the importing country, the higher level of income should imply higher imports. In the exporting country, the higher level of income will give rise to the general level of production and this, in turn, will increase the availability of goods for export. The signs of the estimated coefficients for GDP per capita of both importer and exporter countries, β_3 and β_4, are ambiguous. Income per capita, instead of population, is used here as an additional measure of country size. Coefficient β_4 will be positive if higher level of exporter's income per capita is associated with higher exports. Alternatively, positive β_4 implies negative relationship between country's population and its level of exports, i.e. so called absorption effect, when a big country exports less than a small one. On the contrary, economies of scale effect, when a big country exports more, will result in a negative β_4. The coefficient of

distance is expected to be negative, because D_{ij} is used as a proxy for the trade costs.

To evaluate the impact of EU eastern enlargement on Ukrainian export and import flows and, in particular, to determine how strong are the relations of Ukraine with the EU, on one hand, and the relations of Ukraine with acceding countries, on the other hand, specification (2) was expanded to include the regional dummy variables of interest. The aggregate period for the estimation is 1993-2000.

$$\ln M_{ijt} = \{\alpha_t\} + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln(Y/P)_{it} + \beta_4 \ln(Y/P)_{jt} +$$
$$+ \beta_5 \ln D_{ijt} + \sum \beta_k S_{ijt} + \lambda_1 EU\_acced_{ijt} + \lambda_2 acced\_EU_{ijt} + \lambda_3 EU\_CIS_{ijt} +$$
$$+ \lambda_4 CIS\_EU_{ijt} + \lambda_5 EU\_UKR_{ijt} + \lambda_6 UKR\_EU_{ijt} + \varepsilon_{ijt} \qquad (3)$$

The variables are defined as follows:

EU_acced$_{ijt}$ - importer is an EU-15 member and exporter is an acceding country at t; Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia became EU full members on May 1, 2004. Bulgaria and Romania are going to become members in 2007. These 12 countries are defined as AC in this research. This dummy variable is constructed by taking the dates when the Europe Agreements (EU Association Agreements) between the EU and this group of countries came into force.[2]

acced_EU$_{ijt}$ - importer is an AC and exporter is an EU-15 member at t;

EU_CIS$_{ijt}$ - importer is an EU-15 member & exporter is in CIS[3] at t;

CIS_EU$_{ijt}$ - importer is in CIS & exporter is an EU-15 member at t;

EU_UKR$_{ijt}$ - importer is an EU-15 member & exporter is Ukraine at t;

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[2] Cyprus (1973), Czech Republic (1995), Estonia (1998), Hungary (1994), Latvia (1998), Lithuania (1998), Malta (1971), Poland (1994), Slovak Republic (1995), Slovenia (1999), Bulgaria (1995), Romania (1995).

[3] Data set 1 does not contain data on Azerbaijan and Kyrgyz Republic. While data set 2 contains data on all CIS countries (with gaps).

UKR_EU$_{ijt}$ - importer is Ukraine & exporter an EU-15 member is at t.

One important thing to remember when using this set of regional dummy variables ($\sum_{\eta=1} \lambda_{\eta} \ln R_{ijt}$) is to avoid cases of near- or perfect multicollinearity. Because the inclusion of all these dummies in a single equation may result in excessive combined or single overlap between the defined categories (e.g. dummy for CIS states and dummy for Ukraine), this specification will be divided into two equations.

The positive coefficient on the dummy variable indicating a pair of countries, both of which are the members of RTA, points out that they trade more with one another than is predicted by their economic sizes, incomes and distance, and, so, it is the evidence of trade creation effect. It means this trade agreement has actually promoted trade. The negative coefficient on the dummy variable indicating a pair of countries, one of which is the member of RTA and the other is non-member, is an indication of trade diversion vis-à-vis the rest of the world.

The results obtained using the approach discussed above can be questioned on several grounds. First, coefficients on dummy variables for regional trade agreements will catch all the effects of the omitted factors. These will be the factors in which those countries differ in their trade performance and that are not included in the gravity regression.

In addition, while specifying variables for gravity model estimation, some problems on how to measure specific concepts arise. One of the problem concerns measuring economic distance, which is used as a proxy for the trade costs (transport and transaction costs). It is usually measured as a distance between the capital cities of the two countries. However, geographical distance does not take sufficient account of different trade impediments, such as infrastructure quality, border waiting times, etc. It also matters whether goods are transported by sea or by road. In this respect Bayoumi (1993) notes: "Insofar as

economic distance is mismeasured, its effects may be loaded into the dummy variables intended to capture the effects of regionalism".

Further, baseline gravity model approach makes an assumption that the level of bilateral trade depends only on economic measures of a given pair of countries. However, it may also depend on competitiveness relative to the other markets. Thus, because the "third-country effects" will be neglected, the baseline approach will suffer from the omitted-variables bias or so called heterogeneity bias, which was discussed in the literature review.

Thus, in order to estimate the effects of regional integration on the bilateral trade flows by applying the gravity model approach, it is important to account for country-pair heterogeneity. In this way, Mátyás (1997) argues that the correct econometric specification of the gravity model should include $\{\alpha_i\}$ - the importer (target) country effects, $\{\alpha_j\}$ - the exporter (local) country effects, and $\{\alpha_t\}$ - the time effects. In other words, gravity model should take the form of a triple-indexed model. Cheng and Wall (1999), in turn, argued that this gravity triple-indexed model imposes arbitrary restrictions on the country-pair effects $\{\alpha_{ij}\}$ and, thus, can be regarded as a special case of the two-way FEM, which includes specific country-pair effects between the trading partners and time effects.

In this research we are going to adopt both of the discussed above approaches. First, two-way FEM, with a set of dummies for each year $\{\alpha_t\}$ and a set of specific effects for each country-pair $\{\alpha_{ij}\}$, will be estimated. Second, triple-indexed model, with a set of dummies for each importer $\{\alpha_i\}$, for each exporter $\{\alpha_j\}$ and for each year $\{\alpha_t\}$, will be estimated by OLS. If these alternative models are nested, likelihood-ratio test provides a way to compare them.

Additional goal of the research will be to determine whether EU membership has a differential impact for the developing nonmember countries between the following categories of sectors: unprotected manufacturing, clothing, footwear, agriculture, and other highly protected manufacturing. In this case we will specify a system of five equations, one for each sector, and estimate this system using the Seemingly Unrelated Regression (SUR) technique. Because the error terms in this system are correlated across equations, SUR is more general than OLS. The specification of the gravity model will include M_{ijSt}, the level of imports from country j to country i for each particular sector $S = 1,\ldots,5$, as a dependant variable.

Chapter 5

RESULTS

Descriptive statistics on the variables for the data sets 1 and 2 are available in Appendix B and in Appendix D respectively. It can be seen that the key EU variables are not highly correlated with the most of the gravity variables. The only exception is the dummy for GSP, which is positively correlated with the dummy for one country being the EU member and its partner being the nonmember developing country (Appendix B; 40%) and is also positively correlated with the dummy for the importer being the EU member and the exporter being the nonmember developing country (Appendix D; 49%). This is not an unexpected result given that the intent of GSP is to grant special trade preferences to developing countries. However, this implies that it will be difficult to distinguish the effect of the two correlated variables on the trade flows. To avoid multicollinearity, GSP variable will be excluded from the analysis. But we should not forget about the degree of correlation while interpreting the effect that average country's accession to the EU will have on the excluded developing countries.

The first goal of this study is to empirically investigate the effect of the previous EU enlargements on the world patterns of trade. It is essential to test to what extent trade was diverted away from the excluded developing countries. With these questions in mind, specifications (1) and (2) - for the data sets 1 and 2 respectively- are estimated.

Estimation results of the specification (1), with average of real bilateral trade as a regressand.

The estimates of the five different specifications of the equation (1) are summarized in the Table 1. To obtain the estimated coefficients, country-pair FEM was applied for the period of 1948-1999. The results of the likelihood-ratio test show that the model (IV), with the division of EU nonmembers on the industrial and developing countries and with the inclusion the WTO dummies, is to be preferred.

Table 1: Panel FEM Estimates of Core Regressions, 1948-1999 (data set 1).

Variable	(I)	(II)	(III)	**(IV)**	(V)
Both countries are EU members	1.100	1.122	1.125	**1.126**	.922
One country - EU member, the other -industrial nonmember	.380	.386	.386	**.390***	
One country - EU member, the other - developing nonmember	.082	.084	.086	**.081**	
Only one country is EU member					.131
Both countries are WTO members		.074	.119		
Both industrial countries are WTO members				**.040**	.030*
Both developing countries are WTO members				**.104**	.105
Only one country is WTO member			.047	**.050**	.049
Log product of real GDP	.468	.474	.466	**.473**	.448
Log product of real GDP per capita	.207	.200	.206	**.198**	.225
Number of observations	234597	234597	234597	**234597**	234597
R-square overall	.517	.518	.517	**.518**	.517
F test that all u_i=0	26	26	26	**26**	26

Note: regressand is log of average real bilateral trade; in real $. Country-pair FEM together with year effects. All displayed coefficients are significant at 1% level, those with * are insignificant at 10% level.

To make sure that the coefficients are reliable a variety of robustness checks were applied. The results are presented in the Table 2. First, model (IV) was estimated with pooled OLS, computing standard errors that are robust to clustering by country-pairs, with the inclusion of a set of the year-specific fixed effects $\{\alpha_t\}$ (i.e. set of dummies for each year) and with the restrictive assumption of a single intercept for each trading country-pair ($\alpha_{ij} = \alpha$). Second, country-pair specific FEM with and without $\{\alpha_t\}$ was applied. Last, country-pair Random Effects Model (REM) with $\{\alpha_t\}$ was estimated.

Table 2: Robustness Checks for the period of 1948-1999 (data set 1).

Specification	Both countries are EU members	One country - EU member, the other - industrial nonmember	One country - EU member, the other - developing nonmember
Pooled OLS with year effects	-.210	-.354	.466
Country-pair FEM	1.024	.296	.085
Country- pair FEM with year dummies	**1.126**	**.390**	**.081**
Country- pair REM with year dummies	1.312	.421	.192

Note: pooled OLS with year effects uses robust standard errors (clustering by country-pairs). All displayed coefficients are significant at 5% level, those with * are significant at 10% level, those with ** are insignificant at the traditional level of significance.

To check for the significance of the group effects an F-test is performed. Under the null hypothesis of equality of country-pair effects ($\alpha_{ij} = \alpha$), the efficient estimator is pooled least squares. The result of test shows that the null hypothesis is rejected. This implies that the OLS results are biased and the FEM is to be preferred. Next step is to discriminate between FEM and REM using Hausman test. REM is more efficient under the null hypothesis of no correlation between

α_{ij} and the explanatory variables. The rejection of the null hypothesis indicates that only FEM is consistent. To check for the significance of year effects, likelihood-ratio test was conducted. The result shows that the effect of dummies for each year is significant at the .001% level. So, it can be concluded that the FEM estimation together with year effects is to be selected.

The benchmark model (IV) in Table 1 give quite good explanation of trade patterns as evidenced by the value of the overall R^2 (0.52). Traditional gravity effects are plausible in magnitude and highly statistically significant. Since GDP term is the product of two countries levels of GDP, this implies that a 1% rise in a country's GDP should be associated with a 0.95% (=0.473*2) rise in its level of bilateral trade, all else constant. In the same manner, an elasticity of trade with respect to changes in GDP per capita is 0.4%. Distance variable was dropped while estimating with FE, because it does not have variation over time.

Given that the regressand is in natural logarithm, to interpret the dummies one needs to transform the coefficients from logs to levels by taking antilog and subtracting one. The transformed value of *bothEUijt* dummy suggest that intra-EU trade is about 208% (=exp (1.126) -1) higher than expected level from the gravity model. Thus, the results suggest that from the beginning of the history of the EU till the year of 2000 joining the EU was associated with a total increase in the bilateral trade between member countries.

Further, if one country becomes an EU member, the level of its trade with developing nonmember country will increase by a total of 8%. In other words, the results imply that the volume of average trade with the nonmember partners during the whole period of 1957-1999 has increased for developing countries. However, the results say nothing about how the import and export flows was affected. To make the state of affairs clear, we will return to this question while interpreting the coefficients of the similar specification for the data set 2.

Estimation results of the specification (2), with level of imports as a regressand.

Table 3 presents the estimates of the specification (2) of the gravity model, which uses imports from country *j* to country *i* at time *t* as a regressand together with basic independent variables as separate regressors for each partner country. At this stage of the estimation process five core specifications were estimated for the whole period of 1950-2000 by applying OLS with a set of importer, exporter and time fixed effects and with robust standard errors (clustered by country-pairs).

The results of the BIC' statistic imply that, on one hand, model (II) is to be preferred when considering model (I) and model (II) and, on the other hand, BIC' provides very strong support for the model (V) from the set of models (III)-(V). Because specifications (II) & (V) have different number of observations, it is not possible to prefer one model over the other on the basis of BIC statistics. However, the result of the Wald test with F (5, 11796) = 21.24 indicates that the hypothesis of valid restrictions can be rejected at the 0.001 level. This implies that a model (V) is to be chosen.

Robustness checks for the model (V) are summarized in Table 4. First, to compare country-pair FEM with country-pair REM, both with year-specific fixed effects, Hausman test was applied. The result shows that FE is more efficient and RE estimates are inconsistent because of the correlation of the explanatory variables and the individual effects. Next, two-way FEM, with a set of dummies for each year $\{\alpha_t\}$ and a set of specific effects for each country-pair $\{\alpha_{ij}\}$, is identical to the pooled least squares with set of dummies for each year and for each country-pair. We need to compare this model with triple-indexed model pooled OLS, with a set of dummies for each importer $\{\alpha_i\}$, for each exporter $\{\alpha_j\}$ and for each year $\{\alpha_t\}$. Likelihood-ratio test indicates that these

alternative models are nested and the restricted triple-indexed model is to be chosen (LR $\chi^2 = 0.01$, $\rho = 0.91$).

Table 3: Pooled OLS estimates of core regressions, 1950-2000 (data set 2).

Variable	(I)	(II)	(III)	(IV)	**(V)**
Both importer & exporter are EU members	.314	.456	.566	.577	**.617**
Importer is in EU but exporter is an industrial nonmember	.035**	.059**	-.045**	-.110*	**-.195**
Importer is in EU but exporter is a developing nonmember	.062*	.068	.125	.114	**.128**
Importer is nonmember & exporter is EU member		.179	.167	.168	**.172**
Log of Distance	-.974	-.975	-.972	-0.966	**-.959**
Log real GDP of importer	.472	.473	.466	0.465	**.466**
Log real GDP of exporter	.117	.202	.238	0.209	**.197**
Log real GDP per capita of exporter	.377	.290	.259	0.283	**.296**
Developing country importer WTO member			.010**		
Industrial country importer WTO member			.181		
Industrial country importer and partner WTO members				.280	
Industrial country importer in WTO, partner industrial country and WTO member					**.405**
Industrial country importer in WTO, partner developing country and WTO member					**.195**
Developing country importer and partner WTO members				-.017**	**-.034****
Industrial country importer WTO member, but not partner				.013**	**.011****
Developing country importer WTO member, but not partner				.057**	**.042****
Number of observations	56439	56439	55831	55831	**55831**
R-square	0.711	0.711	0.712	0.713	**0.713**
BIC'	-66074	-66096	-65558	-65650	**-65673**

Note: regressand is log real imports. Pooled OLS with importer & exporter fixed effects and with time effects and robust standard errors (clustered by country-pairs). All displayed coefficients are significant at 5% level, those with * are significant at 10%.

Table 4: Robustness Checks for the period of 1950-2000 (data set 2).

Specification	Importer & exporter are EU members	Importer-EU member, exporter-industrial nonmember	Importer-EU member, exporter-developing nonmember	Importer-nonmember, exporter-EU member
Pooled OLS with importer, exporter, and time fixed effects	**.617**	**-.195**	**.128**	**.172**
Country - pair fixed effects with year effects	1.075	.168	-.095	.087
Country - pair random effects with year effects	1.262	.086*	.086	.148
Weighted least squares (weight-log import)	.522	-.231	.142	.167
Weighted least squares (weight-log real GDP of exporter)	.582	-.212	.142	.168
Weighted least squares (weight-log real GDP per capita of exporter)	.574	-.206	.141	.173

Note: all coefficients are significant at 5% level, those with * are significant at 10% level, those with *** are insignificant at the traditional levels of significance.

This is opposite to robustness checks for the specification (1), where the statistics of the likelihood-ratio test shows that two-way pooled OLS, with a set of dummies for each year $\{\alpha_t\}$ and a set of specific effects for each country-pair $\{\alpha_{ij}\}$ is to be preferred (LR $\chi^2 = 20.62$, $\rho = 0.0001$). This can be explained by a fact that in the specification (2) country-pair fixed effects differ according to the direction of trade, $\alpha_{ij} \neq \alpha_{ji}$, i.e. import from country j to country i is not the same as import from country i to j. On the contrary, in the specification (1) average bilateral trade between countries i and j is the same as average bilateral

trade between countries j and i. Thus, the set of country-pair dummies is different across the specifications.

The model (V) in Table 3 gives good explanation of trade patterns. The value of R^2 equals to 0.71, which is even higher than the alternative value from Table 1 (0.52). With the exception of real importer's GDP per capita variable, all the other baseline variables – GDP of importer, GDP of exporter, GDP per capita of exporter, and distance - are highly significant and have the expected signs. Twice as distant, i.e. 100% increase in distance, as another otherwise identical country will export 96% less due to the negative influence of trade costs on the trade movements. 1% rise in a country's GDP is associated with a 0.47% rise in its import and a 0.20% rise in its export, all else constant. Thus, the elasticity of export with respect to changes in GDP is lower than the elasticity of imports, because the effect of higher level of income on the export increase is not direct, but is also influenced by the changes in the general level of production. An elasticity of exports with respect to changes in GDP per capita is 0.3%.

The transformed estimated value of the dummy variable if both importer and exporter are EU members suggests that joining the EU does increase imports between member countries by a total of 85% (=exp (0.617) -1). Thus, the results again suggest that from the beginning of the history of the EU till the year of 2001, the EU did have a strong effect in average. Further, the level of export from new EU member to the nonmember countries will increase by 19%.

Additional results suggest that if an importer becomes an EU member, the level of its import from industrial nonmembers will decrease by a total of 18%. In other words, with the previous EU enlargements export was, on average, diverted away from industrial nonmember countries. However, the state of affairs is not the same for the developing exporters, which were excluded from EU membership. The estimated coefficient implies that if an importer becomes an EU member, the level of its import from developing nonmembers will, on the

contrary, increase by 14%. Thus, there is no evidence that during the period of 1958-2000 the average degree of EU trade discrimination between its members and the excluded developing countries was high enough to result in trade diversion. But there existed discrimination in trade effects between industrial and developing nonmembers.

To provide the justification for these findings we can refer back to the earlier remarks on the descriptive statistics. It was noted that there is 49% of correlation between the variable for import flows to the EU from the developing nonmember countries and the GSP dummy. The positive effect that historic EU enlargements had on the export from developing countries may be due to GSP, according to which industrial countries are authorized to grant individual trade preferences to all developing countries. Thus, under the legal framework of the GSP discrimination in favor of developing countries was permitted. The EEC implemented the system in 1971.

Cross-section estimation results of the specification (1), with average of real bilateral trade as a regressand (data set 1).

The main advantage of running separate regressions for a certain number of periods is that this approach provides us with a possibility to look at the evolution of the effect of the EU on trade patterns. In addition, cross-section estimation will not imply the possible loss of efficiency, because the sample size is large enough.

Initially the data was divided into two periods. The first period of 1950-1980 is the period of EEC and EFTA formation; EU first enlargement, when the United Kingdom, Ireland and Denmark joined the EU in 1973; and the period when remaining EFTA countries concluded trade agreements with the Community. The second period of 1980-1999 is the period of the other EU enlargements, when the Community was enlarged to include Greece (1981), Spain and Portugal

(1986), Austria, Finland and Sweden (1995). The first two columns in the Table 5 display the transformed estimated coefficients for these two periods.

For the first half period of the EU history the coefficient for a pair of countries one of which is an EU member and the other is a developing nonmember is positive and highly significant. So, this does not provide us with the evidence of the trade diversion effect with respect to the developing nonmembers. However, the magnitude of this coefficient becomes smaller and negative for the second half period. If to look at the years of 1990-1999 - this period is of high interest for our research, because it incorporates data on transition countries – the size of the coefficient turns out to be even more negative. It implies that if a country becomes a member of the EU, its average trade with a developing excluded partner will decrease by 22%. In other words, trade will be noticeably diverted away from the developing countries, which are excluded from membership

Table 5: Cross-section results (data set 1).

Variables	Estimated coefficients			Transformed° coefficients		
	1950-1980	1980-1999	1990-1999	1950-1980	1980-1999	1990-1999
Both countries are EU members	**.970** (.000)	**.188** (.132)	**-.408** (.026)	**1.64** (.000)	**.21** (.132)	**-.34** (.026)
One country - EU member, the other-industrial nonmember	**.214** (.000)	**.157** (.103)	**.036** (.806)	**.24** (.000)	**.17** (.103)	**.04** (.806)
One country - EU member, the other-developing nonmember	**.107** (.000)	**-.147** (.000)	**-.249** (.000)	**.11** (.000)	**-.14** (.000)	**-.22** (.000)

Note: regressand is log of average real bilateral trade; in real $. Country-pair Fixed Effects together with year effects. P value is in parentheses.
°Transformation implies taking antilog and subtracting one.

Cross-section estimation results of the specification (2), with level of imports as a regressand (data set 2).

The cross-section estimates, when the dependant variable is the level of imports, are depicted in the Table 6. Similar to the previous findings for the specification (1), it can be concluded that the positive effect of the EU enlargements on the level of exports from the developing excluded countries is decreasing with time. The result for the period of 1990-2000 points out to fact that exporter from a developing nonmember country will decrease by 20% when a partner-importer becomes an EU member. Thus, the conclusion about the export diversion from the developing excluded countries coincides with those from the specification (1).

Table 6: Cross-section results (data set 2).

Variables	Estimated coefficients			Transformed° coefficients		
	1950-1980	1980-2000	1990-2000	1950-1980	1980-2000	1990-2000
Both importer & exporter are EU members	**.515** (.000)	**.205** (.008)	**-.030** (.750)	**.67** (.000)	**.23** (.008)	**-.03** (.750)
Importer is EU member but exporter is industrial nonmember	**-.226** (.005)	**-.242** (.001)	**-.277** (.001)	**-.20** (.005)	**-.21** (.001)	**-.24** (.001)
Importer is EU member but exporter is developing nonmember	**.254** (.000)	**.010** (.842)	**-.219** (.001)	**.29** (.000)	**.01** (.842)	**-.20** (.001)
Importer is nonmember & exporter is EU member	**.296** (.000)	**.039** (.290)	**.002** (.971)	**.34** (.000)	**.04** (.290)	**.00** (.971)

Note: regressand is log real imports. Robust standard errors (clustered by country-pairs) with importer & exporter fixed effects and with time effects. P value is in parentheses.
°Transformation implies taking antilog and subtracting one.

The negative trend in trade diversion from the developing countries can to a certain extent be attributed to the changes in GSP scheme. The EEC established a GSP in 1971, under which it was importing manufactures from developing countries tariff-free up to a certain limit. Since 1995 tariff quotas were replaced by a degree of tariff preference which varies according to the sensitivity of products on the EU market and according to the exporting countries' level of development. Data for the period of 1990-2000 includes economies in transition, which emerged following the break-up of the former Soviet Union. To those of them which did not conclude a trade agreement with the EU the GSP was extended. However, transition countries are most competitive in the very sensitive (textiles, agricultural products, ferro-alloys) and sensitive (many agricultural products, clothing, footwear, rubber, chemicals, leather, wood) products, imports of which are not duty-free. Duties on imports of very sensitive and sensitive products are only 15% and 30% respectively lower that the MFN duties are.

In summary, it can be argued that EU "public good benefits" for the developing counties were decreasing with time and as a result turned out to be negative. Table 5 predicts that for the period of 1990-2000 the EU trade with developing countries was 22% below the potential level, i.e. the level that is predicted by basic gravity variables and other natural factors. At the same time from Table 6 it can be inferred that for this period the EU underimported from the developing countries by 20%. These findings enable us to conclude that, all else things being equal, the EU eastern enlargement will, on average, result in export diverting away from the developing countries. Of course, the degree of trade diversion effect will differ across the countries and across sectors. Thus, the second goal of our research is to differentiate the impact of the EU enlargement across the industries.

The impact of the EU market enlargement on the developing countries across the industries.

The estimation results of the two different methods of estimation are presented in Table 7. First, the system of five equations, one for each sector, was specified and estimated with SUR technique. Because the error terms in this system are correlated across equations, SUR is more general than OLS. However, given the fact that the maximum number of variables that can be included in any of Stata's estimation commands equals to 800, it appears to be impossible to estimate the system of five equations, each of which includes, together with the baseline variables, 147 importer specific effects, 147 exporter specific effects and 3 year dummies. Thus, to be able to make SUR estimation, the importer and exporter dummies were restricted to the EU members, AC and CIS countries. Second, OLS estimation for each of the sectors separately was applied. OLS incorporates the full set of dummies, but it does not capture the relations across the sectors.

Table 7: Disaggregated import to the EU from developing nonmember countries; 1990, 1995, 2000 years.

Real import of:	**SUR**		**OLS**	
	Estimated coefficients	Transformed coefficients	Estimated coefficients	Transformed coefficients
Unprotected industries	.317 (.011)	**0.37**	.617 (.000)	**0.85**
Highly protected industries	-1.307 (.000)	**-0.73**	-.776 (.000)	**-0.54**
Clothing industry	-.135 (.443)	**-0.13**	.051 (.703)	**0.05**
Footwear	-1.687 (.000)	**-0.81**	-.948 (.000)	**-0.61**
Food industry	-1.085 (.000)	**-0.66**	-.593 (.002)	**-0.45**

Note: seemingly unrelated regression includes time effects and importer & exporter specific effects only for EU-25 and CIS countries. OLS includes time effects together with importer & exporter fixed effects for all countries in the data set. P value is in parentheses.

On the basis of the results in Table 7, it can be concluded that the impact of EU enlargement on the developing countries' trade is not even across the sectors. EU enlargement will have a positive impact on the developing country with the high share of unprotected products in its export structure. For such a country, export to the EU market may increase. However, there will be a negative effect for the developing countries with a prevailing share of sensitive products in their exports structure. It should be emphasized that the previous results indicate that for the average country the negative effect will be dominant.

EU trade relations with acceding countries, CIS states and Ukraine.

The third goal of the research is to understand the nature of EU-Ukraine trade relations and to determine how the EU enlargement will affect Ukrainian trade performance. The estimation results of the specification (3) in the Table 8 provide us with the description of the trade relations between the EU, AC, CIS and Ukraine for the years of 1995 and 2000.

Table 8: EU trade relations with acceding countries, CIS states and Ukraine.

Importer	Exporter	Estimated coefficients		Transformed° coefficients	
		1995	**2000**	**1995**	**2000**
Specification 1					
EU	**Acceding country**	**−.163** (.140)	**.142** (.135)	**−.15**	**.15**
Acceding country	**EU**	**.085** (.466)	**.373** (.001)	**.09**	**.45**
EU	**CIS°°**	**−.987** (.000)	**−.108** (.563)	**−.63**	**−.10**
CIS	**EU**	**−.142** (.488)	**.002** (.989)	**−.13**	**.00**
Specification 2					
EU	**Ukraine**	**−1.023** (.015)	**−1.498** (.000)	**−.64**	**−.78**
Ukraine	**EU**	**.343** (.234)	**.101** (.690)	**.41**	**.11**

Note: regressand is log real imports. Robust standard errors (clustered by country-pairs) with importer & exporter fixed effects and with time effects. P value is in parentheses.

°Transformation implies taking antilog and subtracting one.

°°CIS dummy in specification 1 include Ukraine.

From the estimated coefficients it can be inferred that from the 1995 to 2000 the trade relations between the EU and the AC have improved. In 1995 exports of the AC to the EU was 15% below the potential level, but in 2000 it increased by 30% and stayed 15% above the level that is predicted by the baseline gravity model. The coefficients are not highly significant, but the results are surely not surprising, given the fact that it was the period when most all of the Europe Agreements came into force. These agreements provide for bilateral free trade and EU phased out all tariffs on industrial goods from the AC. Given the deterioration of the EU trade relations with Ukraine during the same period, which is discussed below, it is possible to conclude that increase in exports from the AC to the EU occurred at the expense of the Ukrainian export.

In contrast to the exports from AC, the EU was not so generous for CIS countries. Exports from the CIS countries were 63% below the potential level in 1995. This is an evidence of poor degree of integration between the EU and CIS regions. Because the coefficient for the year 2000 is highly insignificant, it is difficult to say how liberalization of the EU trade with the AC has affected the trade relations between the EU and CIS.

For Ukraine, in both years the coefficients are highly significant, but the results are not very hopeful. In 1995 Ukraine underexported to the EU by 64% and in 2000 the intensity of Ukrainian trade relations with the EU deteriorated and Ukrainian export stayed 78% below the level predicted by the gravity variables, i.e. if free trade and markets prevailed.

Thus, after controlling for distance, importer's and exporter's level of income, size of their economies, and other natural factors, we found out that import shares of the EU from AC and from the CIS, or Ukraine in particular, differ a lot. Moreover, for the period of 1995-2000 the gap between the Ukraine and the AC

was not closing. In 1995 Ukraine exported to the EU 49 percentage points lower that those of the AC, while in 2000 it exported 93 percentage points lower.

Aslund and Warner (2003), it should be stressed, also found that the fact that CIS export share to the EU are significantly lower than that of the AC is not eliminated by controls for the countries' reforms. The point is that the EU trade regime toward AC and CIS countries is different; CIS countries and Ukraine suffer from the EU discrimination. Ukraine's Relations with the EU are to a large extent based on the Partnership and Cooperation Agreement, which was concluded in 1994 and entered into force only in 1998. In general, it contains little of substance for Ukraine. In this respect, Aslund and Werner (2003) note that this agreement was "little but a codification of WTO principles for WTO nonmembers". Ukraine remains subject to a high level of trade discrimination from the EU. The only trade policy concessions of the EU for Ukraine are the conclusion of agreements to regulate trade in textiles and in steel products that eliminated its import quota system in 2003. In addition, GSP is not very beneficial for Ukraine, because sensitive products, i.e. goods that are particularly exposed to protectionist measures by EU, comprises above 70 percent of its export.

Because of the data limitations, it is not possible to estimate the intensity of trade relations between the Ukraine and AC[4]. However, it is sure that Ukraine is an important partner of the acceding countries. Several studies, e.g. Dean, Eremenko, and Mankovska (2003), found that the level of Ukrainian exports to the CEEC is significantly higher than predicted gravity level. The European Commission (EC) anticipates that trade between the enlarged EU and Ukraine will increase after enlargement. One of the arguments is that current average tariff in the AC (9%) is higher than the average tariff in the EU (4%), so the overall

[4] Data includes the import flows only for Cyprus-Ukraine or Malta-Ukraine.

degree of tariff protection against the Ukrainian exports will decrease after the enlargement. Poland, the country with the highest level of protection among the AC, is the main Ukraine's trade partner within the group. Another positive effect stems from the unification of the European market. On the contrary, it can be disputed, the EU has high level of quantitative restrictions and trade defense measures. For the goods that Ukraine has a comparative advantage and might be expected to export, overall level of the EU protection is high. As a result, the estimated coefficients point to the negative relations between the EU and Ukraine for the period of 1995-2000. Is it possible to argue that in the last four years the intensity of trade relations has improved? In some sense, it may be the case. In 2001 the bilateral agreement between the EU and Ukraine came into force, under which the EC lifted all quantitative import restrictions on textiles and clothing. In 2003 EC renegotiated steel quotas. The EU has already started its internal reflection on the impact of EU enlargement on Ukraine and in March 2003 the EC released Communication on Wider Europe initiative. It is noted by the EC that "in return for effective implementation of political, economic and institutional reforms, Ukraine and other neighboring countries should be offered the prospect of a stake in the EU's internal market, accompanied by further integration and liberalization". The EC further argues that given that the majority of the AC are traditional trade partners for Ukraine, 'Ukraine should anticipate that specific policy priorities of acceding countries will influence the EU's general policies … No reason why we will not see similar developments in future arising from the current enlargement'.

Chapter 6

CONCLUSIONS

The goals of this study are to carry out an extensive empirical investigation of the effect of the previous EU enlargements on the import flows from the excluded developing countries and to evaluate the impact of EU Eastern expansion on Ukrainian pattern of trade.

The results, which were obtained by applying different techniques of estimation for the two various data sets, provide us with the same conclusions. During the period of 1958-2000 the total effect of the previous EU enlargements on average developing country's pattern of trade was positive. In other words, there is no evidence that during that period the average degree of EU trade discrimination between its members and the excluded countries was high enough to result in trade diversion from the nonmember developing countries. However, it can be argued that EU "public good benefits" for these counties were decreasing with time and as a result turned out to be negative. For the period of 1990-2000 the EU trade with developing countries was 22% below the potential level and the EU underimported from the developing countries by 20%. These findings enable us to conclude that, all else things being equal, the EU eastern enlargement will result in export diverting away from the average developing country. However, the degree of trade diversion effect differs across the industries. The enlargement will have a high negative effect of trade diversion for the sensitive industries, but for the unprotected industries the impact will be positive. Thus, it can be concluded that the EU expansion will lead to the increase in exports to the EU market from the developing countries with the high share of unprotected products in their export structures. However, the EU imports from the

developing countries with a prevailing share of sensitive products in their exports structure will decrease. In this respect, it should be noted that 70% of Ukrainian exports to the EU consists of sensitive products.

The results on the regional trade relations indicate that CIS and Ukrainian export shares to the EU are significantly lower than those of the acceding countries. From the 1995 to 2000 the trade relations between the EU and the AC have improved and in 2000 the AC exported 15% above the potential level in 2000. In contrast, the trade relations between the EU and Ukraine have deteriorated and Ukrainian exports stayed 78% below the level predicted by the gravity variables. The increase in exports from the AC to the EU occurred at the expense of the Ukrainian export. In this respect, Aslund and Warner (2003) note that this difference in the intensity of trade relations is not eliminated by controls for the countries' reforms. The point is that the EU trade regime toward AC and Ukraine is different; Ukraine suffers from the EU discrimination.

The results of the estimation indicate that Ukraine has a great scope to increase its export further, but the European trade barriers prevent this increase. How the EU enlargement will affect EU-Ukraine trade relations? This effect to a large extent depends on future EU trade policy towards Ukraine. In order for benefits due to lower overall tariff protection, larger internal market and single market rules to prevail over the high level of trade defense measures, the latter need to be reviewed. As Aslund and Werner (2003) noted, "The EU has been surprisingly successful in accommodating the CEE countries' trade interests, but it has done very little for the CIS countries' trade interests. Fortunately, there many reasons to believe that this situation cannot continue forever".

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APPENDIX A

TRADING ENTRIES IN DATA SET 1.

Albania
Algeria
Angola
Antigua and Barbuda
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bermuda
Bhutan
Bolivia
Botswana
Brazil
Bulgaria
Burkina Faso
Burma(Myanmar)
Burundi
Cambodia
Cameroon
Canada
Cape Verde
Central African Rep.
Chad
Chile
China
Colombia
Comoros
Congo, Dem. Rep. of (Zaire)
Congo, Rep.
Costa Rica
Cote D'Ivoire (Ivory Coast)
Croatia
Cyprus
Czech Republic
Denmark
Djibouti
Dominica
Dominican Rep.
Ecuador
Egypt
El Salvador
Equatorial Guinea
Estonia
Ethiopia
Fiji
Finland
France
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Grenada
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hong Kong
Hungary
Iceland
India
Indonesia
Iran
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kiribati
Korea, South (R)
Kuwait
Kyrgyz Republic
Lao People's Dem. Rep.
Latvia
Lebanon
Lesotho
Liberia
Libya
Lithuania
Luxembourg
Macedonia
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Mauritania
Mauritius
Mexico
Moldova
Mongolia
Morocco
Mozambique
Namibia
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Panama
Papua N. Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Reunion
Romania
Russia
Rwanda
Samoa
Sao Tome & Principe
Saudi Arabia
Senegal
Seychelles
Sierra Leone
Singapore
Slovak Republic
Slovenia
Solomon Islands
Somalia
South Africa
Spain
Sri Lanka
St. Kitts & Nevis
St. Lucia
St. Vincent & Gren
Sudan
Suriname
Swaziland
Sweden
Switzerland
Syria
Tajikistan
Tanzania
Thailand
Togo
Tonga
Trinidad & Tobago
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
Uzbekistan
Vanuatu
Venezuela
Vietnam
Yemen, Republic of
Yugoslavia, Socialist Fed. R.
Zambia
Zimbabwe

APPENDIX B

DESCRIPTIVE STATISTICS OF DATA SET 1.

Variable	**Mean**	**Standard Deviation**	**Correlation with both countries in EU**	**Correlation with one EU member, the other industrial nonmember**	**Correlation with one EU member, the other developing nonmember**
Log of average real bilateral trade; in real $	10.06	3.34	.14	.20	.27
Both countries are EU members	.01	.07	1.00	−.01	−.03
One country is EU member, the other is industrial nonmember	.02	.13	−.01	1.00	.28
One country is EU member, the other is developing nonmember	.18	.38	−.03	.28	1.00
Both countries in GATT/WTO	.49	.50	.08	.12	.13
One country in GATT/WTO	.42	.49	−.06	−.10	−.05
GSP	.23	.42	−.02	−.05	**.40**
Currency Union	.01	.12	−.01	−.02	−.05
Log Distance	8.16	.81	−.15	−.09	−.02
Log Product of Real GDPs	47.88	2.68	.12	.18	.24
Log Product of Real GDPs per capita	16.03	1.50	.14	.21	.30
Common Language	.22	.42	−.03	−.03	−.09
Land Border	.03	.17	.07	.03	−.06
Number Islands 0/1/2	.34	.54	−.05	−.00	−.11
Number Landlocked countries 0/1/2	.25	.47	−.03	−.02	−.05
Common Colonizer	.10	.30	−.03	−.04	−.15
Pairs ever in Colonial Relationship	.02	.14	.01	.03	.16
Pairs currently in Colonial Relationship	.00	.04	−.00	−.01	.02
Common country	.00	.02	−.00	−.00	.03
Log of Product of Land Areas	24.21	3.28	−.01	.03	−.07

234,597 observations

APPENDIX C

TRADING ENTRIES IN DATA SET 2

Industrial Countries:

AUSTRALIA
BELGIUM
DENMARK
FRANCE
GREECE
IRELAND
JAPAN
NETHERLANDS
NORWAY
SPAIN
SWITZERLAND
UNITED STATES
AUSTRIA
CANADA
FINLAND
GERMANY
ICELAND
ITALY
LUXEMBOURG
NEW ZEALAND
PORTUGAL
SWEDEN
UNITED KINGDOM

Developing Countries:

ALBANIA
FIJI
NEPAL
URUGUAY
ALGERIA
GABON
NICARAGUA
UZBEKISTAN
ANGOLA
GAMBIA
NIGER
VANUATU
ANTIGUA AND BARBUDA
GEORGIA
NIGERIA
VENEZUELA
GHANA
OMAN
VIETNAM
ARGENTINA
GRENADA
PAKISTAN
YEMEN, REPUBLIC OF
ARMENIA
GUATEMALA
PANAMA
YUGOSLAVIA
AZERBAIJAN
GUINEA
PAPUA N.GUINEA
ZAMBIA
BAHAMAS
GUINEA-BISSAU
PARAGUAY
ZIMBABWE
BAHRAIN
GUYANA
PERU
BANGLADESH
HAITI
PHILIPPINES
BARBAROS
HONDURAS
POLAND
BELARUS
HONG KONG
REUNION
BELIZE
HUNGARY
ROMANIA
BENIN
INDIA
RUSSIA
BERMUDA
INDONESIA
RWANDA
BHUTAN
IRAN
QATAR
BOLIVIA
IRAQ
SAMOA
BOTSWANA
ISRAEL
SAO TOME & PRINCIPE
BRAZIL
JAMAICA
SAUDI ARABIA
BULGARIA
JORDAN
SENEGAL
BURKINA FASO
KAZAKHSTAN
SEYCHELLES
BURUNDI
KENYA
SIERRA LEONE
BURMA(Myanmar GHANA)
KIRIBATI
SINGAPORE
CAMBODIA
KOREA
SLOVAK REPUBLIC
CAMEROON
KUWAIT
SLOVENIA
CAPE VERDE
KYRQYZ REPUBLIC
SOLOMON ISLANDS
CENTRAL AFRICAN REP.
LAO PEOPLE'S DEM. REP.
SOMALIA
CHAD
LATVIA
SOUTH(R)
CHILE
LESOTHO
SOUTH AFRICA
CHINA
LIBERIA
SRI LANKA
COLOMBIA
LIBYAN ARAB
ST. KITTS&NEVIS
COMOROS
JAMAHIRIYA
ST.LUCIA
CONGO, DEM. REP. OF (ZAIRE)
LITHUANIA
ST.VINCENT&GRE
MACEDONIA
SUDAN
CONGO, REP. OF
MADAGASCAR
SURINAME
COSTA RICA
MALAWI
SWAZILAND
COTE D'IVORIE
MALAYSIA
SYRIA
CROATIA
MALDIVES
TAJIKISTAN
CYPRUS
MALI
TANZANIA
CZECH REPUBLIC
MALTA
THAILAND
DOMINICAN REP
MAURITANIA
TOGO
DJIBOUTI
MAURITIUS
TONGA
DOMINICA
MYANMAR
TRINIDAD&TOBAGO
ECUADOR
MEXICO
TUNISIA
EGYPT
MOLDVA
TURKEY
EL SALVADOR
MONGOLIA
TURKMENISTAN
ESTONIA
MOROCCO
UGANDA
EQUATORIAL GUINEA
MOZAMBIQUE
UKRAINE
ETHIOPIA
NAMIBIA
UNITED ARAB IMIRATES

APPENDIX D

DESCRIPTIVE STATISTICS OF DATA SET 2

.

Variable	Mean	Standard Deviation	Correlation with both importer & exporter in EU	Correlation with importer EU member, exporter is industrial nonmember	Correlation with importer EU member, exporter developing nonmember	Correlation with importer is nonmember & exporter is EU member
Log real import	11.97	2.18	.17	.15	.15	.16
Both importer & exporter are EU members	.01	.08	1.00	−.01	−.03	−.03
Importer is EU member but exporter is industrial nonmember	.01	.09	−.01	1.00	.29	−.04
Importer is EU member but exporter is developing nonmember	.09	.29	−.03	0.29	1.00	−.12
Importer is nonmember & exporter is EU member	.02	.14	−.03	−.04	−.12	1.00
Industrial country importer granting GSP	.11	.31	−.03	−.02	**.49**	−.12
Importer WTO member	.51	.50	−.08	.09	−.07	−.18
Industrial country importer and partner WTO members	.08	.28	−.02	.28	.18	−.01
Industrial country importer but not partner	.06	.23	−.02	−.01	.13	−.09
Developing country importer and partner WTO members	.26	.44	−.05	−.06	−.20	−.08
Developing country importer and partner WTO members	.11	.31	−.03	−.03	−.11	−.11
Log of Distance	8.09	.84	−.18	−.07	−.01	.01
Log real GDP of importer	24.37	2.10	.09	.10	.36	−.14
Log real GDP of exporter	24.61	1.96	.08	.06	−.18	.33
Log real GDP per capita of exporter	8.15	1.19	.11	.11	.39	−.14
Log real GDP per capita of importer	8.19	1.15	.11	.11	−.14	.38
1 for Common Language	.22	.42	−.03	−.02	−.08	−.07
Common Border	.04	.20	.07	.02	−.05	−.05
Common Colonizer	.07	.26	−.03	−.03	−.12	−.11
Pairs currently in colonial relationship	.00	.05	−.00	−.00	.01	.00
Pairs ever in Colonial relationship	.03	.18	.01	.02	.11	.10
Same Nation/Perennial Colonies	.00	.02	−.00	−.00	.02	.01
Strict Currency Union	.01	.12	−.01	−.01	−.04	−.04

76,094 observations

APPENDIX E.

LIST OF SECTORS BY CLASSIFICATION. DISAGGREGATED DATA SET.

A. Sectors with high tariff barriers in 1989

FOOD
Cabbages, cauliflowers, kohlrabi, kale...etc,
Vegetables, frozen
Margarine; edible preparations of animal or veg
Malt extract; food preparations of flour, etc.
Tomatoes prepared or preserved
Other manufactured tobacco and substitutes

CLOTHING
Woven fabrics of carded wool or of carded fine
Woven fabrics of combed wool or of combed fine
Men's or boys' overcoats... and similar article
Women's or girls' overcoats and similar article
Men's or boys' suits, ensembles, etc, knitted
Women's or girls' suits, ensembles, etc, knitted
Men's or boys' shirts, knitted or crocheted
Women's or girls' blouses, etc, knitted or crochetered
T-shirts, singlets and other vests, knitted or crochetered
Jerseys, pullovers, cardigans and similar articles
Babies' garments and clothing accessories, knitted
Track-suits, ski-suits and swimwear, knitted or crochetered
Other garments, knitted or crocheted, nes
Panty hose, tights, etc, and footwear, knitted
Men's or boys' suits, ensembles, jackets, blazers
Women's or girls' suits, ensembles, jackets, blazers
Women's or girls' blouses, shirts and shirt-blouses
Bables' garments and clothing accessories
Track suits, ski suits and swimwear
Curtains (incl. drapes) and interior blinds
Sets of woven fabric and yarn

FOOTWEAR
Waterproof footwear
Other footwear with outer soles and uppers of rubber
Footwear with rubber, plastic, leather soles

HIGHLY PROTECTED MANUFACTURING
Tableware, kitchenware, other household, toilet articles
Glass articles used for indoor decoration
Motor vehicles for the transport of goods

B. Sectors with zero tariff barriers in 2001

UNPROTECTED MANUFACTURING
Photographic plates, film, paper
Cinematographic film, exposed and developed
Printed books, brochures, leaflets and similar
Newspapers, journals and periodicals
Music, printed or in manuscript
Maps, etc (incl. atlases, wall maps...), printed
New stamps; stamp-impressed paper; banknotes
Other printed matter, including printed picture
Compression-ignition, combustion piston engines
Accessory parts suitable for engines of heading
Turbo-jets, turbo-propellers and other gas turbines
Pumps for liquids, with or without measuring devices
Air or vacuum pumps, exhausting and compression
Machinery, plant or lab equipment for all purposes
Mechanical appliances for projecting
Automatic data processing, magnetic, optical
Transmission shafts, cranks, clutches
Electric motors and generators
Electric instantaneous, domestic appliances
Records, tapes for sound
Electric filament, discharge lamps, ultra-violet
Other aircraft, spacecraft, and spacecrafts launch
Parts of goods of heading No. 88.01, 88.02
Aircraft launching gear, deck-arrestor
Cruise ships, excursion/ferry-boats
Fishing vessels; factory ships
Yachts, other vessels for pleasure, sports, rowing
Tugs and pusher craft
Navigation vessels, floating or submersible drills
Other vessels including warships, lifeboats
Vessels and other floating structures
Direction finding compasses; other navigational devices
Other breathing appliances, gas masks
Revolution counters, mileomoters, pedometers
Parts, accessories of articles of heading
Articles, equipments for general physical exercise
Worked ivory, bone, tortoise-shell, coral
Hand made decorative materials
Original engravings, prints, lithographs
Original sculptures and statuary, in any material
Postage, revenue stamps, postal stationery

Source: United Nations' TRAINS database