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Topical Problems of European Integration Process

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Thesis

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MSc. Twana Salih

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Abstract

The European integration, has established complicated structures of exchanging goods and services, labor, and capital, and the size of these structures is increasing over the time. The main orientation of the study is finding the optimal size of each member has to be shared in this trade structure, and then represents this integration structure in matrices, to find in turn, whether or not these structures are optimal or not, or whether this matrix represent the Pareto-Optimal shares of the trade relationships for the European integration. The study is contributed by setting up a model with some new axioms to analyze the optimality conditions for this matrix, with an appropriate definition of the optimality position. The main aims of the study are evaluating the level of European integration optimality, or any other integration over the world, and examine the impacts of entry of the new member states to this integration, and whether this new entry makes the integration better off or vice versa. The dissertation work found that European Union was not obtaining the optimality position for their relation structure, even before entry of new member states. The study also found that last enlargement adds to the EU gap of not optimization more points.

Keywords

European Integration, Pareto-Optimality, European Enlargement, Intra-Trade Structure, Loser and Winner in EU Integration.

Abstrakt

Evropská integrace vytvořila komplikované struktury výměny zboží, služeb, práce a kapitálu, přičemž rozsah těchto struktur se postupem času zvyšuje. Disertační práce je především zaměřena na hledání optimální velikosti každého člena v této struktuře směny; v maticích je následně uvedená integrační struktura představována s cílem zjistit, zda jsou struktury optimální či nikoli a jestli tyto matice představují z pohledu evropské integrace Paretovo optimum. Přínos studie spočívá ve vytvoření modelu s některými novými axiomy umožňujícího analyzovat pro tuto matici podmínky optimality s přibližným definováním optimálního postavení. Hlavním cílem disertační práce je zhodnocení úrovně optimality evropské integrace, či jakékoli jiné ve světě existující integrace, s přihlédnutím k identifikaci dopadu vstupu nových členských států na tuto integraci; autor se snaží odpovědět na otázku, zda vstup nových států činí integraci efektivnější či naopak. Disertační práce dokládá skutečnost, že Evropská unie z pohledu její relační struktury nedosáhla optimálního postavení dokonce ještě ani před vstupem nových států. V disertační práci se rovněž dospívá k závěru, že poslední rozšíření nedodává rozdílům v Evropské unii vyššího optima.

Klíčová slova

Eropská integrace, Paretovo optimum, rozšíření Evropské Unie, vnitřní obchodní struktura, pořažený a vítěz v integraci Evropské Unii.

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List of Abbreviations

AKFTA: ASEAN-Korea Free Trade Area

CAP: Common Agriculture Policy

CEECs: Central and Eastern European Countries

CM: Common Market

CU: Customs Union

EEC: European Economic Community

EU: European Union

FDI: Foreign Direct Investment

FTA: Free Trade Area

GDP: Gross Domestic Product

GNP: Gross National Product

IIT: Intra Industrial Trade

NAFTA: North American Free Trade Area

PTA: Preferential Trade Areas

QR: Quantitative Restrictions

R1: Rank of the Row

R2 Rank of the Column

Introduction

The economic integration process was the most desirable process for opening economies during the second half of the last century. Although several significant integrations have been established, the most successful one was and is the European Integration. The first purpose of the EU establishing might be starting with political origins. But later on many economists found that this integration has more economical benefits side has to be considered.

In 1951 six countries (France, Germany, Belgium, Italy, Netherlands and Luxembourg) singed the treaty of coal and steal union (sectorial integration), which was consider as the first step of this integration, and followed in 1957 all six signed the Rome Treaty, and thereby created the EEC (European Economic Community). This Union was developed from an initial core of six countries, to which a further nine countries were added over the years, plus ten (and two) more coutnries in 2004 and 2007, respectively1.

Although the last enlargements makes many people from old EU15 countries think that competition in the enlarged single market has somehow become 'unfair'. They accuse the new member-states of engaging in 'social dumping' and harmful tax competition. They blame high unemployment rate in their own countries on an influx of Polish plumbers, Hungarian nurses or Latvian builders. Due to this, EU politicians, Brussels officials and the media must explain to Europeans that enlargement has been good for the EU economy as a whole.

While some other people are argue that trade links between the 'old' and the new member-states has been growing, and foreign direct investment from the west to the east has created thousands of jobs in Central and Eastern Europe while helping West European companies to stay competitive in the face of global competition. But still for most of the 15-EU member-states, trade and investment links with the new member countries are simply too small to have a direct, measurable impact on their economies. One of the assumptions in this thesis is, this enlargement brings benefits for some members and harmful effects for some others. But the question arise here is who gains more and who loses more and in which directions or aspects?

[1] Kristin Archick, Vince L. Morelli, European Union Enlargement, CRS Report for Congress, Received through the CRS Web, October 25, 2006

At the beginning economists discovered in economic integration a rapidly growing field for their theories and their empirical studies, but they were hardly trained to deal with distributional issues. Their attention was concentrated on economic efficiency and Pareto-Optimal situations assessment. Thus the question of winners and losers hardly appeared in earlier economic studies on the effects of regional integration. But over the time this issue began to rise more rapidly.

The main orientation of the work is concentrated on the same direction of loser and winner, but with some new aspects. The European integration, has established complicated structures of exchange of goods and services, labor, and capital. And this integration structure can be represented by matrices, the study want to find the optimal size of this trade structure, and then the question is whether or not these structures are uniformed or distorted, or whether this matrix represent the Pareto-Optimal size of relationships for this integration, and whether there is any optimal condition for this matrix, with an appropriate definition of optimality. There are many other significant questions such as; how this optimality reflects the realistic situations of the global economy? How entries of new members to the European integration affect their relationship structures and their optimality?

The Aims and Hypotheses of the Research;

The main problem of the study; the research has to challenge many questions in lack of significant answer, which the dissertation work will try to answer in this study. The main issue is how to evaluate the structure of trades among integrated countries. In other words, does the European Integration have an optimal trade structure or optimal share of economic relations for other regions to follow?

The aims of this research mainly are; first to find the optimal level of integration that trade links within this integration obtaining the equilibrium degree for share of member's trade structure. And then, to find a model which can evaluates through it, the level of European integration optimality, or any other integration over the world. Second examine the impacts of entry of the new member states to this integration, and whether this new entry makes the integration better off or vice versa. Third is evaluating and analyzing the main impacts of the last EU enlargement, through this model, as a main application for the model.

Hypotheses and Assumptions:

- The main hypotheses in this study; are the optimal integration can be obtained only when the rank of row are equal to the rank of column in the integration matrix for each member states. In other words, the optimal matrix is the equilibrium case when the summation of the differences between ranks of rows and columns is equal to zero.
- The member state is better off if only one or both of its ranks approach to zero.
- The main assumption for the study is the new member states are so small to have any impacts on the European integration optimality.

Methods used in the research are representing European trade structure links by a matrix, whose columns reflect the imports coming from countries in the rows, and rows reflect the exports to the members in the columns. In other words, the study is building the model similarly to Leontief model of (input – output), with some significant changes, such as modification of using (import – export, inflow - outflow) instead of (input – output). After the model of the matrix has been built, the next step is evaluating the integration optimality level.

Data and application periods; The study chooses data from the Eurostat intra and extra trade for EU25, during the period of time between 2000- 2008. Also data are covering some economic indicators as they are linked to the EU enlargement impacts and economic background. The reasons behind choosing data of year 2006 as standard year for comparing and analyzing the impacts of entrance of new members, is because the study considers the year 2006 a standard year as its come two years after the last enlargement, which is enough relatively for the new members to adopt economic impacts of the European integration. Also the year of 2006 is relatively before the period of the last global economic crisis to start its impacts on the European international trade.

Thereby the thesis is divided into two main parts. First part, concentrate on the theoretical framework, which in turn is containing three chapters. First chapter considers economic integration concepts and reviews the main classical literature theories, and presents considerations behind economic integration. Also, it is trying to explain some of the factors that make integration theoretically desirable. In addition, ending with brief explanation of the model has used in this thesis. Second chapter continuously, illustrates the model of thesis and setting up some of the necessary

axioms for the model and their explanation for using on the integration trade structure. Third chapter focuses on some indicators of old EU members, comparing with same indicator in the new member state as a review for economic background of European Union enlargement process, and it comes up with brief idea about loser and winner through some indicators from process of the EU enlargement toward Eastern Europe.

Second part, of the dissertation work is concentrated on the application framework of the model of Pareto-Optimal matrix of European integration process. This part contains two main chapters. Fourth chapter in turn applies the model of optimal integration on the EU15 trade structure, and it examines the Pareto-Optimality of EU 15 before and after entry of new member states. Fifth chapter of this part concentrates also on the application of the model of the optimality on the new member states entry.

The dissertation work ends up with a set of conclusions that the study figured out from the modeling and applications the new standards for evaluating EU enlargement process.

First Part: Theoretical Framework

This part of the thesis concentrates on the essence of economic integration and, explains of the theoretical considerations behind economic integration. Simultaneously the study tries to mention to some of the factors that make integration theoretically desirable. Also it reviews the European Integration enlargements and its economic effects on the old and new member states. The review of literature history of loser and winner in European Union in the last expansion toward the central and eastern countries, and finally, brief review of the approach is going to be used in this thesis.

1 Theoretical Framework and Literatures Review

This chapter considers economic integration concepts and reviews the theoretical considerations behind economic integration, and tries to mention to some of the factors that make integration theoretically desirable.

1.1 Definitions of Economic Integration

International economic integration is a process of a formal unification of previously separate economic areas: after canceling tariff and non-tariff barriers, it increases volume of trade among members of economic union, generates more economic activity and thus changes inner content of integrated economies towards better welfare.[2]

In other words, ***economic integration***: discriminatory removal of all trade impediments between at least two participating countries plus establishment of certain elements.

Balassa, (1961) defines the *Regional integration* as involves a process of increasing interaction and interdependence in the economic and political arena among a group of countries. The extensive body of literature on economic integration has its roots in work that coincided with the beginning of the European Community, and even pre-dated it of cooperation and coordination between them[3]. It is also possible to define ***the Regional economic integration*** as a process whereby various economies of region undergo a progressive removal of the barriers to free movement of good, services, capital and labor.[4]

To put in another way, ***economic integration*** refers to trade unification between different states by the partial or full abolishing of customs tariffs on trade taking place within the borders of each state. This is meant in turn to lead to lower prices for distributors and consumers (as no customs duties are paid within the integrated area) and the goal is to increase trade[5]. In general words, the study can define Economic Integration as the abolition of the various restraints of trade between countries.

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[2] Dalimov R.T. (2009)"Oscillation Theory of International Economic Integration", African Journal of Marketing Management, Vol. 1(2)pp 50-61.

[3] Balassa, B. (1973)" *The Theory of Economic Integration"*, London: fourth Edition, Allen & Unwin,.

[4] Donghyun Park, Is the Asean- Korea Free Trade (AKFTA) an Optimal Free Trade Area?, Working Paper Series on Regional Economic integration No.21, November 2008 http://faculty.washington.edu/karyiu/confer/seoul06/papers/park_dh.pdf (cite 21.july.2009)

[5] Ibid, Dalimov R.T. (2009) pp 50-61.

1.2 Types of Economic Integrations

Different types of integration can be identified depending on the width and depth of the resulting unification. Thus, the distinction can be made between sectorial integration, which includes only specific sectors of the economy, such us a particular industry, and general integration, which includes all sectors of the economy, moreover, integration may be of varying depth, as follow:

Table (1-1) Main Types of Economic Integration

Types of Integration	No Internal Visible Trade Restrict.	Common External Trade Restrict	No internal Invisible Trade Restrict	Free Mobility of Factors of Production	Common Currency	Common Economic Policy
Free Trade Area	X					
Customs Union	X	X				
Single Market for Products	X	X	X			
Common Market	X	X	X	X		
Monetary Union	X	X	X	X	X	
Economic Union	X	X	X	X	X	X

Table above is explaining and dividing the main types of integration, as they are including and adopting some of the macroeconomics policies in their agreements.
Hereby, an introduction to each type of the integration process will be addressed;

1.2.1 Free Trade Area (FTA)[6]

A free trade area occurs when a group of countries agree to eliminate tariffs between themselves, but it maintains their own external tariff on imports from the rest of the world. The North American Free Trade Area is an example of the FTA. When the NAFTA is fully implemented, tariffs of automobile imports between the US and Mexico will be zero. However, Mexico may continue to set a different tariff than the US on auto imports from non-NAFTA countries. Because of the different external tariffs, FTAs generally develop elaborate "rules of origin". These rules are designed to prevent goods from being imported into the FTA member country with the lowest tariff and then transshipped to the country with higher tariffs.

[6] Ronald J. Wonnacottm, (May, 1996) “Free-Trade Agreements: For Better or Worse?” The American Economic Review, Vol. 86, No. 2, , CA, January 5-7, pp. 62-66

1.2.2 Customs Union

A customs union occurs when a group of countries agree to eliminate tariffs between themselves and set a common external tariff on imports from the rest of the world. The European Union represents such an arrangement. A customs union avoids the problem of developing complicated rules of origin, but introduces the problem of policy coordination. With a customs union, all member countries must be able to agree on tariff rates across many different import industries[7].

1.2.3 Single Market for Products

A single market is differentiated as a more advanced form of common market. In comparison to a common market a single market envisions more efforts geared towards removing the physical (borders), technical (standards) and fiscal (taxes) barriers among the member states. These barriers obstruct the freedom of movement of the four factors of production, and they have to formulate common economic policies. In the European Union the Single Market became a reality in January 1993, establishing the principles of free movement of goods, people, services and capital.[8]

1.2.4 Common Market

Common Markets (CMs): these are arrangements that comprise all the characteristics that define a CU, but also allow for full mobility of factors of production. By the same token, member countries within a CM define common policies regulating factor flows with third countries. The need for domestic policy harmonization is more compelling in this case than in the CUs case. However, there is no formal obligation for member countries to move in this direction[9].

1.2.5 Monetary Union[10]

Monetary union establishes a common currency among a group of countries. This involves the formation of a central monetary authority which will determine monetary

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[7] Ricardo Argüello C, (2000)Economic Integration. An Overview of Basic Economic Theory and other Related Issues, University Del Rosario, (ISSN: 0124-4396) p5

8 European Union Committee, (2007–08) "the Single Market: Wallflower or Dancing Partner?" Inquiry into the European Commission's Review of the Single Market, 5th Report of Session . http://www.parliament.the-stationery-office.co.uk/pa/ld200708/ldselect/ldeucom/36/36.pdf

[9] Ibid, Ricardo Argüello (2000) p5

[10] Galand J., Fiévet R. (, 2006.) "Treatment of Currency Unions," SNA/M1.06/39 (Citi. 5, March , 2010) http://unstats.un.org/unsd/nationalaccount/AEG/papers/m4CurrencyUnions.pdf

policy for the entire group. The Maastricht treaty signed by EU members in 1991 proposed the implementation of a single European currency (the Euro) by 1999. Perhaps the best example of an economic and monetary union is the United States. Each USA state has its own government which sets policies and laws for its own residents. However, each state cedes control, to some extent, over foreign policy, agricultural policy, welfare policy, and monetary policy to the federal government. Goods, services, labor and capital can all move freely, without restrictions among the USA states and the Nations sets a common external trade policy.

1.2.6 Economic Union;

An economic union typically will maintain free trade in goods and services, set common external tariffs among members, allow the free mobility of capital and labor, and will also relegate some fiscal spending responsibilities to a supra-national agency. The European Union's Common Agriculture Policy (CAP) is an example of a type of fiscal coordination indicative of an economic union[11].

1.3 Theory of Economic Integration

The theory of economic integration studies how and at what cost countries can pass from situation of total protectionism, that is, a closure country's borders to the international flows of goods, services and factors of production to a situation of free trade[12].

1.3.1 Classical Literature;

The theory of economic integration is anchored in the theory of customs union. Jacob Viner (1950) was one of the first who tried to analyze systematically the economic consequences of forming a customs union. Viner showed that customs union affect international trade in two different ways; **trade creation**, which arises when tariff reductions allow high cost domestic production to be replaced by low cost production from a partner country in the union. And, **trade diversion** which arises when higher

[11] Ibid, Galand J. ,Fiévet R,
[12] Carlo Altomonte, Mario Nava, (2005) "Economics and Policies of an Enlarged Europe," Edward Elgar Publishing, Cheltenham , UK (ISBN 1843768321) P 31

tariffs against third party country causes their low cost production to be replaced by higher cost production from a partner country. [13]

Viner sets out to answer the question why many free traders and protectionists agreed on the desirability of preferential trade areas (PTA)? In the process, he developed the important distinction between trade creating and trade diverting unions. A union was trade creating if preferential liberalization by a member country allowed it to replace the higher-cost domestic supply by the lower-cost partner-country supply. Unions that were principally trade creating enhanced efficiency and were therefore beneficial to the member countries and the world. Unions were trade diverting if preferential liberalization by a member country led it to replace the lower-cost supply from non-member countries by the higher-cost supply by the partner country. Unions that were largely trade diverting reduced efficiency and lowered the welfare of the union members as well as the world. Viner concluded that free traders who supported PTAs probably had trade-creating customs unions in mind while protectionists who supported them expected them to be trade diverting[14].

The key feature of regional economic integration is that the component economies of a region or trading bloc agree to undertake a progressive removal of barriers to free movement of goods, services, capital, and labor. Reduction or removal of tariffs and non-tariff barriers will obviously lead to economic integration within the region by facilitating the flow of goods. For example, in the European Union (EU) the Maastricht Treaty of 1991 established, in principle, free movement of goods, services, capital, and labor in Western Europe. The EU probably represents the most advanced form of international integration in the world today.[15]

Lipsy (1957, 1960) has extended Viner's analysis by considering consumption effects, in so far as a customs union leads to consumer prices closer to world prices, the composition of consumption change and improves consumer welfare; where imports are diverted from cheaper to a more expensive producer, the loss of tariff revenue may outweighs the gain in the welfare.[16]

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[13] Christopher S.P. Magee , (2008) "New Measures of Trade Creation and Trade Diversion", Journal of International Economics 75 , pp 349–362

[14] Hansen, Jorgen Drud, and Nielsen J. Ulff-Moller, (1997) "An Economic Analysis of the EU," McGraw-Hill, London. Second Edition, (ISBN 0077092317) P 19

[15] Ibid. Donghyun Park, (2008) p7-8

[16] Ricardo Argüello C,(2000) " Economic Integration. An Overview of Basic Economic Theory and other Related Issues", University Del Rosario, (ISSN: 0124-4396) p 8

Johnson (1965) extended the analyses of Lipsy and Viner by looking at the welfare effects of a customs union on a member country with rising supply curve and falling demand curve for a particular good. He assumes, however, that the customs union does not affect on prices either within or outside the union, so supply curve is horizontal. His model is therefore relevant only for a small country whose membership of a customs union cannot affect the terms of trade with its partner countries[17].

Cooper and Massell (1965)[18], Johnson (1965) and Bhagwati (1968) independently developed an alternative approach to welfare-improving customs union in the context of developing countries wanting to achieve a certain level of industrialization. The essential idea was that if a group of developing countries wanted to achieve an exogenous level of industrialization, they could do so at a lower cost by specializing among themselves through a customs union[19].

Mundell (1964) and Petith (1977), demonstrate how customs unions formed by the analysis for the large-country and multi-country cases rapidly increases the complexity of the problem. The Meade-Ohyama-Kemp-Wan, Theorem Meade (1955) showed that if all barriers are "fixed and unchanging" quantitative restrictions, then a CU must increase the sum of the economic welfare of member nations. Formation of the CU will have no impact on external trade, or rest-of-world welfare, if the quantitative restrictions (QRs) remain binding. Removing internal QRs, however, allows a more efficient allocation of CU resources and transfers among CU partners can ensure a Pareto improvement[20].

Kemp and Wan (1976) proved that, when the external tariff is assumed to be variable or changeable, the customs union considered as a whole always has the possibility of a net welfare gain[21]. Kemp and Wan (1976) demonstrated also that if two or more countries form a customs union setting the common external tariff vector such that trade with outside countries remains precisely at its pre-customs-union level, the outcome is

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[17] El-Agraa, Ali M., (2007) " The European Union, Economics ans Policies", eighth Edition, Cambridge University press, Cambridge, UK, (ISBN 9780521874434) P 110

[18] Cooper C. and Massell B., (1965) "A New Look at Customs Union Theory, The Economic Journal, Vol. 75 , , pp742-7

[19] Krishna, Pravin.(2005) " Preferential Trade Agreements", Prepared for the conference organized at Columbia University on August, (citi 21.January.2010) http://www.columbia.edu/~ap2231/jbconference/Papers/Krishna_Bhagwati%20Conference.pdf

[20] Richard E. Baldwin, Anthony J. Venables, (2004) " Regional Economic Integration" , p5 http://www.graduateinstitute.ch/webdav/site/ctei/shared/CTEI/Baldwin/Publications/Chapters/Trade%20Theory/Baldwin_Venables_Handbook.pdf

[21] Kemp, Murray, and Henry Jr. Wan. (1976). "An Elementary Proposition Concerning the Formation of Customs Unions", J. of Int. Econ. 6:1, pp. 95-98.

necessarily weakly welfare superior to the initial equilibrium for the union as a whole and the world[22].

Most of the past literature concerning the economic integration was concentrated on economic efficiency and microeconomic side of the issues. Thus the question of winners and losers hardly appeared in the earlier economic studies on the effects of regional integration, but over the time a growing minority of economists began to raise the challenge[23].

It is thus possible to view a free trade area as a variant of the customs union or vice versa. Theoretically, a customs union entails both positive and negative welfare effects. The positive effect, referred to as trade creation, arises from the replacement of higher cost domestic products with lower cost imports from member countries. The change from an expensive to a cheaper source of supply is beneficial and increasing the social welfare, because it is a move toward freer trade. The negative effect, trade diversion, occurs when a member-country replaces low cost imports from non-members with higher cost imports from member nations. This diversion takes place because non-members face higher tariffs than members of the customs union. Trade diversion has a negative effect on welfare since it implies greater access to a more costly source of supply. In this sense, it is a move toward protectionism and away from free trade[24]. The net gain of customs union depends on which effect is larger. If trade creation outweighs trade diversion, then the net effect of the customs union on welfare will be positive. However, if trade diversion outweighs trade creation, customs union could do more harm than good.

As we have just seen, the question is whether a customs union is beneficial depends on whether the magnitude of trade creation is greater or less than trade diversion. In answering this critical question, it is important to consider both static and dynamic factors, in each member states which make advantages or disadvantages of integration more clear and sensible. Static factors are important considerations in evaluating the one-off change in welfare arising from the formation of a customs union. Among these factors are ;(a) the size of the free trade area (FTA), (b) geographical proximity of member-economies, (c) levels of economic development of member-economies, (d) and

[22] Panagariya, Arvind. (2000). "Preferential Trade Liberalization: The Traditional Theory and New Developments," *Journal of Economic Literature* 38, June, 287-331.

[23]Tsoukalis, Loukas . (2005) "What Kind of Europe", Oxford University Press, New York, , p 44 (ISBN 0-19926666-2)

[24] Ibid. Donghyun Park, (2008) p 9

complementarily of economic structures among member economies. In addition, factors related to external trade, including tariff structures of member economies prior to customs union, are important considerations. Finally, it is crucial to look at the substitutability between products of member states and products of non-member states in determining whether a customs union will be beneficial or not[25].

In contrast to static factors, dynamic factors do not pertain to one-off changes in welfare but gradually emerge over time. For example, we can expect firms and industries of a country more exposed to competition from its neighbors after the formation of a customs union to become more efficient. But those efficiency gains will not be realized overnight. The main dynamic benefits are improvements in efficiency due to greater competition and gains from greater specialization, economies of scale, and learning-by-doing. Other dynamic benefits include reduction in intra-regional transactions costs, some protection from adverse developments in world markets, and bargaining power vis-à-vis industrialized countries. Against these potential dynamic benefits, we must also consider the dynamic cost of polarization. Integration among countries with different levels of income and economic development could lead to an unequal distribution of gains. Any perception that the benefits or costs of integration are disproportionately falling upon a country or a subset of countries is likely to produce a backlash which will threaten the viability of the union over time[26].

1.3.2 Integration Theory in the Recent Literature:

New studies now are concerning with integration indicators, (Arribas, et al. 2006) try to measure the integration degree, to find some indicators for economic integration. Others attempt to define a standard of Perfect International Integration[27]. It seems that my approach which used in this thesis is slightly closer from the Perfect International Integration defined above. Although they are developed their ideas from others economist such as (Rodrik 1998, Salvatore 2004, Stiglitz 2002)[28]

For instance, Rodrik (1998) takes international integration as something leading to increased volatility of the terms of trade. To cope with this risk the public sector can be

[25] Ibid. Donghyun Park, (2008) p 9

[26] El-Agraa, Ali M., (2007) "The European Union, Economics ans Policies", eighth Edition, Cambridge University press, Cambridge, UK, (ISBN 9780521874434) P 115

[27] Jeffrey A. Frankel. (2000) "Globalization of the Economy", NBER Working Paper, No7858, P7 http://www.nber.org/papers/w7858.pdf/ (cite. 5 February ,2010)

[28] Arribas et al, (2006) "Measuring International Economic Integration: Theory and Evidence of Globalization," http://mpra.ub.uni-muenchen.de/16010/1/MPRA_paper_16010.pdf/

expanded so as to move resources away from sectors exposed to market risks. Rodrik also presents empirical evidence to the effect that more open economies tend to have a larger public sector which supports his conclusion that international integration calls for an expansion of public sector activities[29].

Arribas et al. (2006) argue that international integration process start with the openness of economies, but its effects and scope depend on the structure of current relations between these economies .Relevant aspects of this structure include the number of economies each one is in contact with; whether the relationship are direct or indirect, the number of flows between them and the proportionality of these flows the size of the economies. They set up some axiom for their approach such as; openness; more open an economy more integrated it will be. And higher level of integration will come with balancing the direct relationship with other economies in proportion to their size[30].

Finally, Arribas, et al. (2006) in their study they firstly make the conclusion that domestic bias is affecting trade, which in turn limits the degree of openness, and represents the highest limit to integration. And secondly they found that; the effect of bias on trade among economies towards certain areas (which limits the direct connection balance) is more limited than the effect of the degree of openness. Third ; the reduction in transport costs and ITC development may well represent a relevant factor in increasing the degree of total connection for many economies over the world and as a result, their degree of integration[31].

On the other hand, studies by Hanson (1996, 1998) and Krugman and Hanson (1993) suggest that trade liberalization might strongly affect the economy of border regions. Those studies show that tariff reductions and resulting trade intensification among the United States and Mexico attracted numerous firms from Mexico City towards regions close to the border with the United States. Krugman and Hanson (1993) argue that, since Mexico is a comparatively small economy, free trade with the large US market effectively turned the Mexican economy inside out in the sense that firms shifted their focus from domestic markets towards export markets in a literal geographic sense.

[29] Andersen, Torben M., (2002) " International Integration, Risk and the Welfare State," Discussion paper series, IZA DP No. 456, ftp://repec.iza.org/RePEc/Discussionpaper/dp456.pdf/

[30] Ibid, Arribas et al, 2006

[31] Ibid, Arribas et al, 2006

Altogether, the economic upswing of Mexico's border regions results from the fact that the NAFTA gave Mexico access to the large US market[32].

Andersen, (2002) focuses on the fact that international integration enhances the possibilities for mutually advantageous trades while it at the same time enlarges the exposure to risk (foreign shocks) as well as creates possibilities for risk diversification (domestic shocks). Risk diversification may go through many routes in financial, labor and product markets[33].

[32] Annekatrin Niebuhr, Silvia Stiller, , (2002) "Integration Effects in Border Regions – A Survey of Economic Theory and Empirical Studies", 42nd Congress of the European Regional Science Association "From Industry to Advanced Services - Perspectives of European Metropolitan Regions" August 27th – 31st, 2002, Dortmund http://www-sre.wu-wien.ac.at/ersa/ersaconfs/ersa02/cd-rom/papers/066.pdf

[33] Ibid, Andersen, Torben M 2002

1.4 The Model Used in This Thesis

After this brief review of the theories that are studied the regional economic integration, and its consequences on the member countries has been involved with it, that should be necessary to mention briefly the main idea of the approach uses in this study, to the best of my knowledge, this model with its techniques, is the first time to be used in this area, and especially with European integration enlargement.

A general description to the model gives a chance to analyze the elements and details of the model that will present in the coming chapters.

Let's consider a set of countries of the world W and a special chosen subset $U \subset W$, and some moveable aspects among countries as consumption of goods and services, labor, capital etc.

Denote

- d_{ij} amount of chosen aspect which is moved from $i \hat{I} U$ to $j \hat{I} U$ $i \neq j$,
- d_{ii} amount of chosen aspect which is from country $i \hat{I} U$ and is used in country i,
- D matrix of elements d_{ij} ,
- e column vector with coordinates 1,
- Symbol ´ operation of transposition.
We define vectors d_c, d_r and value d by formulae

$$d_c = De, \qquad d_r' = e'D, \qquad d = e'De.$$

Coordinates of the vector d_r represent exports from countries (outputs), and coordinates of the vector d_c represent imports to countries (inputs).

Coordinates of vectors d_c, and d_r' correspond one to one to countries from

$$U=\{1, 2\ldots n\}.$$

Vector d_c does not depend on ordering of columns of matrix D, but if ordering of columns of matrix D is changed to the new one, we have to reorder coordinates of d_r' according to new ordering. The new ordering is described by permutation of numbers 1, 2,… n. We denote it π_r

Vector d_r does not depend on ordering of rows of matrix D, but if ordering of rows of matrix D is changed to the new one, we have to reorder coordinates of d_c

according to new ordering. The new ordering is described by permutation of numbers 1, 2, …, n. We denote it π_c

We reorder the rows and columns of the matrix D according to values of coordinates of vectors d_c, and d_r from the highest to the lowest. So we receive two permutations π_c , π_r.

For any country $k \in U$ we find a positions $\pi_c(k)$, $\pi_r(k)$ of k in permutation π_c , π_r , respectively. These positions are given by numbers from the set {1, 2, …, n}.

I define values

$$\Delta_k = \left| \pi_c(k) - \pi_r(k) \right| .$$

The set U is consider as optimal, if

$$\sum_k \Delta_k = 0 .$$

Or in other words, we can use the formula as used in this thesis;

$$\sum \left| Rr\text{-}Rc \right| = 0$$

- Rr is the rank of the rows.
- Rc is the rank of the columns.

With this formula the ***Pareto-Optimality***[34] will be satisfy, because we can not make any members of U *better off* without make other members *worse off* .

Now, it is possible to consider new set of countries $U \cup \{k\}$, where $k \in (W-U)$ and they are analyzing influences of this change.

In the contrary case when; $\sum \left| Rr\text{-}Rc \right| \neq 0$

or let is say $\sum \left| Rr\text{-}Rc \right| = \beta$

then it refers to the subset $U \subset W$ are not obtaining the Pareto-Optimality and they are far from this optimazation by some degree = β

[34] The most widely-used concept in theoretical welfare economics is "Pareto optimality" (also known as "Pareto efficiency"). An allocation is Pareto-optimal if it is impossible to make at least one member better off without making any other members worse off; a Pareto improvement is a change in an allocation which makes someone better off without making anyone else worse off.

With using the model above, the study is evaluating Pareto-Optimality in EU15 and also EU-25, and the size of changes in (β) has happened with entrance of each new member states.

2 Theoretical and Mythology Analysis of the Model

This chapter illustrates the model of thesis and setting up some of the necessary axioms for the model and their explanation for using on the integration trade structure. And also is explaining how to use this model for evaluating the optimality of the integration matrix.

2.1 The Specification of the Model

The study will consider and build a new model for analyzing European Integration by using matrices form. The main orientation of the dissertation work will be analyzing the effect of new member states entrance to the EU. This analyzing will evaluate whether the process of enlargement was on benefit to European Union integration, or the impacts were negative on the European integration improvement.

For most of the EU15 member-states, trade and investment links with the new member countries are simply too small to have a direct, measurable impact on their economies. The exceptions are Germany, Austria, and Belgium whose trade a lot with the region and, alongside France and the Netherlands, account for the bulk of foreign investment there. On the other hand, the benefit of EU enlargement will be increasing of the size of the European Internal Market and leads to increased trade. More trade, specialization, and access to a larger market will raise welfare by leading to a more efficient allocation of expenditure and resources (known as allocation effects) or put another way, production is more efficient, and more competition potentially means lower prices for consumers. The larger market means that firms can expand production, potentially making larger profits, and take advantage of economies of scale. Consumers will also have a greater variety of choice[35].

The effects of the EU enlargement on current and new member countries and on world commodity markets require careful consideration, as the EU is a major player in world's markets. The entry of new members has effect on all EU15 members but in deferent aspects and deferent levels, some of them benefit from it and some other loses. To find which country loses more and who benefits from these new member entries and which new members were affected more the integration, and how? The study will design a

[35] UK Department of Trade and Industry,(April 2004) "Trade and Investment Implications of EU Enlargement", Europe and World Trade Directorate, p 9.(cite , 4 March,2010) http://www.berr.gov.uk/files/file19584.pdf/

model to analyze the range of the effects of the for each new member. The study is using with this model a new technique of the matrix to figure out the Pareto-Optimal level of this integration and examine the condition of their optimality.

The chapter will discuss some hypothetical models to explain the theoretical concepts behind setting up this model, and how to use it in any similar integration over the world. As it mentioned that the Ranks of the matrices have been used to find and analyze the optimality of the EU integration, these matrices in turn, provide us with some new standard to deal with this model.

The origin idea for this model, it comes from the (Leontief Input-Output Model)[36]; In order to understand and be able to manipulate the economy theory formulation of our model, it needs to come up with a certain model based on the various sectors (Input-Output) of this economy. The Leontief model is an attempt in this direction. Based on the assumption that each industry in the economy has two types of demands: external demand (from outside the system) and internal demand (demand placed on one industry by another in the same system), the Leontief model represents the economy as a system of linear equations.

To understand the Leontief model in more details[37]; Consider an economy consisting of n interdependent industries (or sectors) S1,…,Sn. That means that each industry consumes some of the goods produced by the other industries, including itself (for example, a power-generating plant uses some of its own power for production). We say that such an economy is closed if it satisfies its own needs; that is, no goods leave or enter the system. Let mij be the number of units produced by industry Si and necessary to produce one unit of industry Sj. If pk is the production level of industry Sk, then mij pj represents the number of units produced by industry Si and consumed by industry Sj . Then the total number of units produced by industry Si is given by:

$$p1mi1+p2mi2+\ldots+pnmin.$$

In order to have a balanced economy, the total production of each industry must be equal to its total consumption. This gives the linear system:

[36] W.W. Leontief, (1966.) "Input Output Economics", Oxford University Press, New York,

[37] **See for more details**; Iris Jensen. (2001) "The Leontief Open Production Model or Input-Output Analysis", http://online.redwoods.cc.ca.us/instruct/darnold/laproj/Fall2001/Iris/lapaper.pdf

$$
\begin{array}{ccccccccc}
m_{11}p_1 & + & m_{12}p_2 & + & \mathbf{L} & + & m_{1n}p_n & = & p_1 \\
m_{21}p_1 & + & m_{22}p_2 & + & \mathbf{L} & + & m_{2n}p_n & = & p_2 \\
\mathbb{M} & & \mathbb{M} & & \mathbb{M} & & \mathbb{M} & & \mathbb{M} \\
m_{n1}p_1 & + & m_{n2}p_2 & + & \mathbf{L} & + & m_{nn}p_n & = & p_n
\end{array}
$$

If

$$
A = \begin{bmatrix}
m_{11} & m_{12} & \mathbf{L} & m_{1n} \\
m_{21} & m_{22} & \mathbf{L} & m_{2n} \\
\mathbb{M} & \mathbb{M} & \mathbb{M} & \mathbb{M} \\
m_{n1} & m_{n2} & \mathbf{L} & m_{nn}
\end{bmatrix}
$$

Then the above system can be written as AP=P, where

$$
P = \begin{bmatrix}
p_1 \\
p_2 \\
\mathbb{M} \\
p_n
\end{bmatrix}.
$$

A is called the input-output matrix.

We are then looking for a vector P satisfying AP=P and with nonnegative components, at least one of which is positive.

With this brief explanation for Leontief (Input-Output) model mentioned above, the study formalizes its model with the same techniques of matrix Leontief used it, but with relatively deferent purposes and aspects. We are using the model with (Export-Import model) for an integration structure.

Thereby, the dissertation work has build new model with respect to three important aspects, such as exchange of goods and services, movement of labor and capital, *even in this study we will examine only the first aspect (export-import) as an application on the EU integration.* The next section will explain the main ideas through some compared data. (The research is using small number for easy calculation).

2.2 Application of Import – Export Model

In order to analyze the Pareto-Optimal matrix for any integration we need to first consider and verified some important axioms used by this study such as:

∨ ***First Axiom****: Optimal Matrix is:* $\sum \left| \text{Rank of the Rows} - \text{Rank of the columns} \right| = 0$

This definition means that all members are represented in the optimal matrix should have the same ranks from the both rows and columns.
The absolute value used in this formula means that the study does not prefer imports ranks on exports ranks or vice versa, so any member has better ranks from imports (columns) its in the same preference like has better ranks in the exports (rows).

∨ ***Second Axiom****; Better Off position is; Rank of row →0, rank of column→ 0*

The definition is explaining the position in which the member will be ***better-off***, if its ranks of row or column approaching to the zero. Also we can use this definition with phenomena ***worse-off*** is the opposite of the Better-off position, and it will be when the ranks of the rows or columns are getting far from the zero.
In other words; *an economy that balances its direct relationships with other members in the union, in proportion to their size will have a higher or better off position in the integration.*

∨ ***Third Axiom;*** *Criterion of Pareto-Optimality is ; the distribution that No one can be made better off without making someone else worse off.*

The criterion is explaining; an alternative is Pareto-Optimal if there dose not exist another alternative that is at least acceptable to all society members and definitly preferred by some , the Pareto-Optimality criterion specifies that in any social decision problem a Pareto-Optimality alternative should be selected[38].
A typical definition of Pareto efficiency would be: "A given economic arrangement is efficient if there can be no arrangement which will leave someone better off without worsening the position of others." Thus any exchange or reallocation of resources is only Pareto-Optimal if the exchange or reallocation will not harm somebody[39].

[38] Craig W. Kirkwood. Pareto Optimality and Equity in Social Decision analysis, Technical Report 17-5, 1977(http://ioe.engin.umich.edu/techrprt/pdf/TR77-05.pdf)
[39] Barry P. Brownstein, (winter 1980) Pareto Optimality, External Benefits and Public Goods: A Subjectivist Approach, the Journal of Libertarian Studies, Vol. IV , No 1

Pareto optimality in general word is an economics term for describing a solution for multiple objectives. Which is no part of a Pareto optimal solution can be improved without making some other part worse.

As an introduction to the model the research will use some examples data only for analyzing and understanding the definition s has set up by the model explained above.

To start the model we can consider an example about the set of countries (A, B, C, D, E, F, G, H, I, J) as it shown in the Matrix (1) which represents the relationships between these countries.

Matrix (1)

	A	B	C	D	E	F	G	H	I	J	∑
A	12	4	5	8	4	7	2	1	3	7	53
B	6	11	3	4	5	9	7	3	4	5	57
C	3	7	9	6	2	4	7	1	2	5	46
D	5	2	7	15	6	4	2	7	5	9	62
E	4	3	2	5	8	5	3	7	2	3	42
F	4	6	3	7	6	15	5	5	7	2	60
G	3	4	2	5	4	7	11	6	5	4	51
H	7	5	4	1	2	3	4	13	4	4	47
I	2	1	3	5	6	7	2	4	10	2	42
J	5	2	4	9	5	1	7	2	4	11	50
∑	51	45	42	65	48	62	50	49	46	52	

In the matrix there are some random numbers for all 10 countries in the rows and columns, the rows denote the exports of each country to the countries in the columns and the columns represent the imports coming from countries in the rows. After summing all columns and rows as it is presented in matrix (1) we got different sums for each column and row which are rearrange in a descending order, as it presented in matrix (2)

Matrix (2)

	R2	1	2	3	4	5	6	7	8	9	10	
R1		D	F	J	A	G	H	E	I	B	C	∑
1	D	15	4	9	5	2	7	6	5	2	7	62
2	F	7	15	2	4	5	5	6	7	6	3	60
3	B	4	9	5	6	7	3	5	4	11	3	57
4	A	8	7	7	12	2	1	4	3	4	5	53
5	G	5	7	4	3	11	6	4	5	4	2	51
6	J	9	1	11	5	7	2	5	4	2	4	50
7	H	1	3	4	7	4	13	2	4	5	4	47
8	C	6	4	5	3	7	1	2	2	7	9	46
9	E	5	5	3	4	3	7	8	2	3	3	43
10	I	5	7	2	2	2	4	6	10	1	3	42
	∑	65	62	52	51	50	49	48	46	45	43	

Considering the matrix (2) which rows and columns have ranks from {1, 2…10}. Country (D) has the first rank from both columns (imports) and rows (exports), which means country (D) has sufficient participation in the integration. Same case for countries (F, A, G, H) with different degree of sufficiency the other countries have insufficient participation (because the rows and columns do not have same ranks which affects the optimality of the matrix. For example, country (B) has surplus trade, but its participation is still insufficient, because ($\left|\text{R1-R2}\right| \neq 0$). On the other hand, the rest of counties (E, I, J) have deficit with insufficient participation. Thereby, the matrix is far away from optimality. Further, to examine by how many points this matrix is different from optimality, we have to find the differences between each countries ranks,(per rows and columns), and sum them to find the total of differences:

The ranks of the countries (D, F, A, G, H) are equal (per rows and columns) but the differences for the other countries are :

B **è** | 9 – 3 | = 6

J **è** b | 3 – 6 | = 3

C **è** |10 – 8| = 2

I **è** | 8 – 10| = 2

E **è** | 7 – 9 | = 2

$\sum$ | R1r-R2c | = 15

The result shows that matrix (2) differs from optimality by 15 points. As it mentioned from the first definition; the optimal matrix is a matrix whose absolute summation of the differences of ranks equals to zero ($\sum$ | Rr-Rc | = 0)

The formula of ($\sum$ | Rr-Rc | = 0) used in integration matrix; means that we are applying the *Pareto Optimaliy Criterion* ***(Third Axiom)***; *that No one can be made better off without making someone else worse off.*

We can aware weather our model work well or not, and which countries improved or kept its position in the group and which members have a significant role or dependency in this integration over the time. Ruther, it is possible also to find out the crucial economic policies which may have play a role in improving the integration and make the matrix closer from optimality.

However, the example will offer the more interested part of the model or would make sense with real data (as it will be in the next chapters). Let´s now; assume that there are some other countries thinking to join to the integration as a new member, and then we may ask how these new members affect the optimality of their matrix (positively or negatively) and weather make the sum of differences of ranks increase or decrease. After this, we can go back again to our last example when country, say (X) decides to join this integration, and how it affects the structure of the matrix of the relationship for the integration, shown in matrix (3).

Matrix (3)

	R	1	2	3	4	5	6	7	8	9	10			
R		D	F	J	A	G	H	E	I	B	C	∑		X
1	D	15	4	9	5	2	7	6	5	2	7	62		4
2	F	7	15	2	4	5	5	6	7	6	3	60		8
3	B	4	9	5	6	7	3	5	4	11	3	57		5
4	A	8	7	7	12	2	1	4	3	4	5	53		4
5	G	5	7	4	3	11	6	4	5	4	2	51		5
6	J	9	1	11	5	7	2	5	4	2	4	50		2
7	H	1	3	4	7	4	13	2	4	5	4	47		8
8	C	6	4	5	3	7	1	2	2	7	9	46		4
9	E	5	5	3	4	3	7	8	2	3	3	43		3
10	I	5	7	2	2	2	4	6	10	1	3	42		7
	∑	65	62	52	51	50	49	48	46	45	43	511		51
	X	3	7	5	5	4	4	7	6	3	4	48		

With the entrance of the new member, all positions of old members in the integration have been varied some of them got batter off and others worse off (second definition). Thereby, some countries will possibly asking about; how they can change their exports or imports toward and from this new member. Suppose that new member (X) just entered and let us consider its effects explained in matrix (4).

Matrix (4)

	R	1	2	3	4	5	6	7	8	9	10	11	
R		F	D	X	J	A	E	G	H	I	B	C	∑
1	F	15	7	8	2	4	6	5	5	7	6	3	68
2	D	4	15	4	9	5	6	2	7	5	2	7	66
3	B	9	4	5	5	6	5	7	3	4	11	3	62
4	X	7	3	12	7	5	7	4	4	6	2	4	61
5	A	7	8	4	7	12	4	2	1	3	4	5	57
6	G	7	5	5	4	3	4	11	6	5	4	2	56
7	H	3	1	8	4	7	2	4	13	4	5	4	55
8	J	1	9	2	11	5	5	7	2	4	2	4	52
9	C	4	6	4	5	3	2	7	1	2	7	9	50
10	I	7	5	7	2	2	6	2	4	10	1	3	49
11	E	5	5	3	3	4	8	3	7	2	3	3	46
	∑	69	68	62	59	56	55	54	53	52	47	47	
	|R1-R2|	0	0	1	4	0	5	1	1	1	7	2	22

As we saw from matrices (3), (4) that new member (X) got fourth rank from the rows and third rank from the columns, however it has some trade deficit, but still relatively consider a good position for new members, and relatively sufficient participation in this relationship. On the other hand, its entry makes some country like (F) better off, which got first rank from both columns and rows, while makes others such as (D) and (A) worse off in second and fifth ranks respectively, however they are keeping their balanced position in the matrix. Although the rest of the countries they are loss their balanced position like (G), or varied the difference between their rows and columns ranks. In general, the structure of matrix of the relationship became more far away from optimality, we can measure this as follow:

$$X \rightarrow |4-3| = 1$$
$$J \rightarrow |8-4| = 4$$
$$B \rightarrow |3-10| = 7$$
$$G \rightarrow |6-7| = 1$$
$$C \rightarrow |9-11| = 2$$
$$E \rightarrow |10-9| = 1$$
$$H \rightarrow |7-8| = 1$$
$$\sum |R1-R2| = 17$$

That's mean the matrix (4) far away now from optimality by (17) points. This increase in the differences of ranks results from entry of new member, and in general should be the integrated countries lose some of its economic stability, the rate of economic growth might decrease or increase, it may depend on some other factors such as labor and capital exchange structures. Therefore, the dissertation work can determine the effects of a new member joining the integration by using a similar approach.

2.3 Application of (Inflow – Outflow Model) of Labor Movements

However, the labor exchange structure is different from goods and services structure, and the study will use the trade links for optimality application only, but still the study can use the same approach and analysis, with the same definitions to determine the optimality of (inflow – outflow) of labor. Let us first determine the necessary condition to get optimality in this model;

We use the ratio of skilled labor to unskilled labor, which they are exchanged, as inflow of labor to the country and outflow of the labor from the county.

Hence satisfy this condition is necessary for building an optimal structure for the model of labor inflow. After this we can apply the same approach that used up and we can consider the same example such as matrix (5).

Matrix (5)

	A	B	C	D	E	F	G	H	I	J	∑
A	0.5	0.1	0.2	0.2	0.3	0.4	0.8	0.4	0.2	0.1	3.2
B	0.1	0.4	0.4	0.5	0.7	0.1	0.2	0.4	0.3	0.2	3.3
C	0.3	0.2	0.5	0.4	0.2	0.8	0.1	0.2	0.4	0.5	3.6
D	0.4	0.1	0.2	0.5	0.2	0.2	0.1	0.4	0.4	0.3	2.8
E	0.4	0.2	0.3	0.7	0.3	0.3	0.2	0.1	0.2	0.3	3
F	0.5	0.2	0.2	0.4	0.4	0.5	0.5	0.2	0.4	0.2	3.5
G	0.2	0.2	0.2	0.4	0.4	0.2	0.2	0.1	0.4	0.4	2.7
H	0.4	0.2	0.2	0.4	0.2	0.5	0.2	0.3	0.2	0.3	2.9
I	0.4	0.1	0.2	0.3	0.3	0.3	0.4	0.2	0.2	0.2	2.6
J	0.2	0.2	0.4	0.4	0.3	0.5	0.5	0.4	0.4	0.4	3.7
∑	3.4	1.9	2.8	4.2	3.3	3.8	3.2	2.7	3.1	2.9	

From the matrix above we show the structure of labor flow to and from all members. After rearranging this matrix in descending order we can get matrix (6) below which represents the new arrangement of all these participant countries. The country (D) has the first rank of inflow countries which means it has a biggest ratio of skilled to unskilled labor for other members, and country (F) has the second rank, the (A) has third and so on. While from the row or outflow side country (J) has the first and the (c) has the second and so on, as its shown in the matrix (6).

Matrix (6)

	R2	1	2	3	4	5	6	7	8	9	10	
R1		D	F	A	E	G	I	J	C	H	B	∑
1	J	0.4	0.5	0.2	0.3	0.5	0.4	0.4	0.4	0.4	0.2	3.7
2	C	0.4	0.8	0.3	0.2	0.1	0.4	0.5	0.5	0.2	0.2	3.6
3	F	0.4	0.5	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.2	3.5
4	B	0.5	0.1	0.1	0.7	0.2	0.3	0.2	0.4	0.4	0.4	3.3
5	A	0.2	0.4	0.5	0.3	0.8	0.2	0.1	0.2	0.4	0.1	3.2
6	E	0.7	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.2	3
7	H	0.4	0.5	0.4	0.2	0.2	0.2	0.3	0.2	0.3	0.2	2.9
8	D	0.5	0.2	0.4	0.2	0.1	0.4	0.3	0.2	0.4	0.1	2.8
9	G	0.4	0.2	0.2	0.4	0.2	0.4	0.4	0.2	0.1	0.2	2.7
10	I	0.3	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.1	2.6
	∑	4.2	3.8	3.4	3.3	3.2	3.1	2.9	2.8	2.7	1.9	

Now, let us explain whether or not, this labor-flow structure is optimal. We can find the absolute value of the differences between the ranks of the rows and columns such as follow:

J **è** $|1 - 7| = 6$

C **è** $|2 - 8| = 6$

F **è** $|3 - 2| = 1$

B **è** $|4 - 10| = 6$

A **è** $|5 - 3| = 2$

E **è** $|6 - 4| = 2$

H **è** $|7 - 9| = 2$

D **è** $|8 - 1| = 7$

G **è** $|9 - 5| = 4$

I **è** $|10 - 6| = 4$

$\sum |R1\text{-}R2| = 40$

The matrix differs from the optimality by (40) points, which is mean the structure is not uniform and not optimal. In other words these countries have to rethink about their positions in the matrix looking for ***better-off*** positions.

Now let's examine the effects of new entry member say (X) .as it mentioned that the entrance of any new entry member affects the optimality structure positively or negatively. Consider matrices (7) and (8).

Matrix (7)

		1	2	3	4	5	6	7	8	9	10			
		D	F	A	E	G	I	J	C	H	B	∑		X
1	J	0.4	0.5	0.2	0.3	0.5	0.4	0.4	0.4	0.4	0.2	3.7		0.4
2	C	0.4	0.8	0.3	0.2	0.1	0.4	0.5	0.5	0.2	0.2	3.6	←	0.2
3	F	0.4	0.5	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.2	3.5		0.4
4	B	0.5	0.1	0.1	0.7	0.2	0.3	0.2	0.4	0.4	0.4	3.3		0.8
5	A	0.2	0.4	0.5	0.3	0.8	0.2	0.1	0.2	0.4	0.1	3.2		0.6
6	E	0.7	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.2	3	←	0.1
7	H	0.4	0.5	0.4	0.2	0.2	0.2	0.3	0.2	0.3	0.2	2.9		0.2
8	D	0.5	0.2	0.4	0.2	0.1	0.4	0.3	0.2	0.4	0.1	2.8		0.1
9	G	0.4	0.2	0.2	0.4	0.2	0.4	0.4	0.2	0.1	0.2	2.7		0.3
10	I	0.3	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.1	2.6		0.6
	∑	4.2	3.8	3.4	3.3	3.2	3.1	2.9	2.8	2.7	1.9	.		3.7
			↑				↑							
	X	0.2	0.5	0.3	0.4	0.1	0.1	0.4	0.3	0.3	0.6	3.2		

Matrix (8)

	R2	1	2	3	4	5	6	7	8	9	10	11	
R1		D	F	X	E	A	G	J	I	C	H	B	∑
1	J	0.4	0.5	0.4	0.3	0.2	0.5	0.4	0.4	0.4	0.4	0.2	4.1
2	B	0.5	0.1	0.8	0.7	0.1	0.2	0.2	0.3	0.4	0.4	0.4	4.1
3	F	0.4	0.5	0.4	0.4	0.5	0.5	0.2	0.4	0.2	0.2	0.2	3.9
4	C	0.4	0.8	0.2	0.2	0.3	0.1	0.5	0.4	0.5	0.2	0.2	3.8
5	A	0.2	0.4	0.5	0.3	0.5	0.8	0.1	0.2	0.2	0.4	0.1	3.7
6	X	0.2	0.5	0.2	0.4	0.1	0.2	0.4	0.1	0.3	0.3	0.6	3.2
7	I	0.3	0.3	0.6	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.1	3.2
8	E	0.7	0.3	0.1	0.3	0.4	0.2	0.3	0.2	0.3	0.1	0.2	3.1
9	H	0.4	0.5	0.2	0.2	0.4	0.2	0.3	0.2	0.2	0.3	0.2	3.1
10	G	0.4	0.2	0.3	0.4	0.2	0.2	0.4	0.4	0.2	0.1	0.2	3
11	D	0.5	0.2	0.1	0.2	0.4	0.1	0.3	0.4	0.2	0.4	0.1	2.9
	∑	4.4	4.3	3.7	3.7	3.5	3.4	3.3	3.2	3.1	3	2.5	

As we saw from matrices above that entry of country (X) affects the structure of relationships and rearrange matrices which make the optimality differ by (41)points:

J **è** $|1 - 7| = 6$

C **è** $|4 - 9| = 5$

F **è** $|3 - 2| = 1$

B **è** $|2 - 11| = 9$

A **è** $|5 - 5| = 0$

E **è** $|8 - 4| = 4$

H **è** $|9 - 10| = 1$

D **è** $|11 - 1| = 10$

G **è** $|10 - 6| = 4$

I **è** $|7 - 8| = 1$

$\sum |R1\text{-}R2| = 41$

That's mean the effects of entry country (X) make the differences of matrix increase by one more points. The other possible use for this model is with (inflow-outflow) of

capital. With using a similar approach and technique, will find some similar results (maybe with some differences would appear) also with some different data or ratio.

Now the dissertation work might go more deeply and find the main reason which makes these matrices far from Pareto-Optimality. Here the work will use econometrics approach (regression) to find the correlation between dependent variable which is the sequence of variances of the matrices over study period and take the other variable as independent variables such as (exchange rate unemployment, interest rate….etc) of course, with respect to the type of matrices we are considering. Also we can use any possible statistics tests to find any other relation between these variables.

On the other hand we can try also to find the effects of this non-optimality of these matrices and other certain variable such as growth rate, investment…etc.)

3 European Enlargement Process

This chapter considers some indicators of old EU members, comparing with same indicators in the new member state as a review for economic background of European Union enlargement process, and it comes up with brief idea about loser and winner through some indicators from process of the EU enlargement toward Eastern Europe.

3.1 Historical Review of European Enlargement Process

Many people think that the EU is just about money, a club for the rich countries to have a convenient trading zone. But if we think about first purpose of the EU, we will see that it started with political origins. In 1946 the former British Prime Minister, Winston Churchill, suggested some kind of cooperation among the European countries. The biggest challenge was political cooperation. If Europe would be controlled by a single organization, all countries would have to give away a part of their sovereignty. European countries were not ready for that in 1940's. So Churchill's idea of a "federation of European states" was put aside[40].

In 1951; Six countries signed the treaty of the coal and steal union: Italy, France, Germany, Belgium, The Netherlands and Luxembourg: The idea of the union came to the world through the political work of two politicians, *Robert Schumann and Jean Monet*[41]. In May 1950 they suggested that Germany and France should pool their coal and steel resources. The brilliant idea of Monet and Schumann was that if Germany and France could control each others access and use of coal and steel neither of the two countries would ever be able to produce weapons and get ready for a new war. Of course avoiding another war was on the top of the political agenda in postwar Europe, so the initial purpose of the EU can be traced to a truly political wish: *peace*[42].

In 1957 the six member states of the Coal and Steel Union started to regulate cooperation in agriculture, industry and trade. They were prepared to give away a limited amount of sovereignty in these areas in order to get shared power of decisions. All six signed the Rome treaty and thereby created the EEC (European Economic Community) in 1958. The duty on agricultural and industrial articles was removed

[40] Sima, Isabela .et al. (2010) " European Union on the international stage," mpra.ub.uni-muenchen.de/20852/ MPRA http://mpra.ub.uni-muenchen.de/20852/1/MPRA_paper_20852.pdf

[41] Altomonte, C. Nava, M. (2005) "Economics and Policies of an Enlarged Europe, Edward Elgar publisher, Cheltenham, (ISBN 1-84376832-1) p2

[42] Kristin Archick, Vince L. Morelli, (2006) "European Union Enlargement", CRS Report for Congress, Received through the CRS Web, October 25, (2006)

among the member countries and they had a common duty on goods from countries outside the EEC. In 1962 the countries of the EEC introduced a common policy on agriculture because they hoped to be self-sufficient with agricultural commodities. Slowly the economic integration leads to a political integration as well[43].

The EEC first added new members in 1973, with the entry of the United Kingdom, Ireland, and Denmark. Of course British people were unhappy with deal they had been forced to accept as the price for joining,. They began asking awkward question about who gains and who loses from the community budget. In 1981 – Greece has joined to the European integration and five years later in 1986 - Spain and Portugal also joined too. After ten years when the process of enlargement has to be continued and the union was widen with three more country - Austria, Finland and Sweden, but before this enlargement in 1991. Began with Maastricht treaty, EEC has changed its name to the European Union[44].

The last enlargement with countries from central and Eastern Europe has become an important political and economic issue in the European Union. The first round of accession negotiation started after the Luxembourg European council in December 1997. At this meeting the 15-EU old members states decided to open formal negotiation with all applicant countries. At the same time the enlargement negotiations were only started with the first group of six countries (Czech Republic, Estonia, Poland, Hungary, Slovenia, and Cyprus). The remaining countries were offered annual screening of the progress made in view of the well-known Copenhagen criteria, which set out the general conditions for EU membership. Two years later at the Helsinki European council in December 1999, the Union followed up its decision made in Luxembourg. It decided to start negotiations with the second group of countries as well (Lithuania, Malta, Latvia, and Slovakia)[45]. And the last enlargement was joining of Bulgaria and Romania in January 2007.

In the European Union 2002: The EURO became the new currency of the cooperating EU countries: after two years in 2004 - Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovakia and Slovenia, joined to the EU. The table down sumarmize the enlargements process of European Union.

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[43] Ketels, Christian; Porter, Michael E, , (April 2009) "European Integration Meeting the Competitiveness Challenge," Harvard Business School Publishing, Rev, 9-708-421p5

[44] Gungor, Gaye, (June 2007) ,"Ever Expanding Union? A Closer Look at the European Union's Enlargement Agenda." EUMA, Vol. 4 No. 15

[45] Alain Monnier and Godfrey I. Rogers. (2004), "The European Union at the Time of Enlargement", Population (English Edition, 2002-), Vol. 59, No. 2, pp. 315-336

Table 3.1: The Ever Wider Union

Original Member States (1958)	Enlargements					
	First (1973)	Second (1981)	Third (1986)	Fourth (1995)	Fifth (2004)	Sixth (2007)
Belgium France W. Germany Italy Luxembourg Netherlands	Britain Denmark Ireland	Greece	Spain Portugal	Austria Finland Sweden	Czech Republic Cyprus Hungary Estonia Latvia Lithuania Malta Poland Slovak Republic Slovenia	Bulgaria Romania

3.2 EU Expand Toward Eastern Europe

The accession of ten new member states in the European Union was of historical significance because it went a long way toward reuniting the continent. More than previous enlargements, however, it brings to the fore the question of how its membership is decided, and ultimately, what its final form may be. Why did the European Union (EU) decide to expand to Central and Eastern Europe? why did the EU open the accession process with the ten associated Central and Eastern European countries in March 1998 and start concrete accession negotiations with (only) five of them (the Czech Republic, Estonia, Hungary, Poland, and Slovenia)[46]

The question of why enlargement has worked as a successful democracy-promotion program, compelling EU leaders to expand its scope to the Western Balkans. Two reasons stand out: First, the high level of integration among EU members produces the sweeping requirements that aspiring members have to satisfy. Second, the benefits of inclusion (and the costs of exclusion) create powerful incentives for states to seek membership and therefore to satisfy all of these requirements[47].

On the other hand, the decision to expand the EU to the East had two principal dimensions on which member state preferences diverged significantly. The first Issue was whether (and when) the EU should commit itself to Eastern enlargement in general.

[46] Frank Schimmelfennig , (Winter, 2001)," The Community Trap: Liberal Norms, Rhetorical Action, and the Eastern Enlargement of the European Union" .International Organization, Vol. 55, No. 1, pp. 47-80

[47] Milada Anna Vachudova, (September 2005) , "Historical Institutionalism and the EU's Eastward Enlargement" , Memo prepared for the State of the European Union Conference Princeton,

Simply stated, one group of member governments (the "drivers") advocated an early and firm commitment to Eastern enlargement, whereas other member governments (the "brakemen") were reticent and tried to put off the decision. The second issue concerned the selection of Central and Eastern European countries for accession negotiations. Here, one group of countries pushed for a limited (first) round of enlargement focusing on the Central European states; others favored an inclusive approach of "equal treatment" for all associated Central and Eastern European countries[48].

Each wave of expansion of the European Union has led to political tensions and conflict. Existing members fear their membership privileges will diminish and candidates are loath to concede the expected benefits of membership. Despite these conflicts, enlargement has always succeeded - so why does the EU continue to admit new states even though current members might lose from their accession? Combining political economy logic with statistical and case study analyses, (Christina J. Schneider 2009) argues that the dominant theories of EU enlargement ignore how EU members and applicant states negotiate the distribution of enlargement benefits and costs. She explains that EU enlargement happens despite distributional conflicts if the overall gains of enlargement are redistributed from the relative winners among existing members and applicants to the relative losers. If the overall gains from enlargement are sufficiently great, a redistribution of these gains will compensate losers, making enlargement attractive for all states[49].

The member states' geographical position vis-a-vis Central and Eastern Europe can be understood as a proxy variable for, according to Moravcsik, "the imperatives induced by interdependence and, in particular, the exogenous increase in opportunities for cross-border trade and capital movements" that should determine national preferences. First, it is reasonable to assume that, all else being equal, international interdependence increases with geographical proximity. Member states on the eastern border of the EU are more sensitive to developments in Central and Eastern Europe than the more remote member states. Crises and wars and economic and ecological deterioration in the region affect them more immediately and more strongly[50]. Thereby, enlargement can be seen as an instrument to stabilize Central and Eastern Europe, to control the negative externalities of political and economic transformation in the East, and to expand the

[48] Ibid. Frank Schimmelfennig , (Winter, 2001) ", pp. 47-80

[49] Schneider ,Christina J. Conflict, (2009) "Negotiation and European Union Enlargement", Cambridge University Press, (ISBN 0521514819, 9780521514811)

[50] Ibid, Frank Schimmelfennig,

borders of the EU zone of peace and prosperity. Therefore, Border States have a strong interest in enlargement. Second, geographical proximity creates opportunities for economic gains from trade and investment, for instance, by reducing the costs of transport and communication. Member states close to Central and Eastern Europe therefore stand to gain more from economic exchange with the East than more distant states. This is roughly reflected in the member states' shares of EU trade with Central and Eastern Europe as compared to their shares of EU economic output. All member states with a disproportionately high share in exports (Austria, Germany, and Finland) are Border States; all member states with a disproportionately low share (Britain, Ireland, France, Portugal, and Spain) are not. We can further assume that those countries that are closest to, and most highly involved in, the Central and Eastern European economies will also gain most from the membership of these countries (for example, through the further opening of markets and the better protection of their economic assets in the region)[51].

Finally, in light of this argument, member states should be most interested in the membership of those countries with which they share a border or are in close proximity. It is also small wonder that France, Greece, and Italy, all southern states, gave their special support to Bulgaria and Romania, southeastern candidates; whereas Denmark and Sweden, northern states, most strongly advocated the cause of the Baltic States, the northernmost of the Central and Eastern European applicants[52].

3.3 EU Enlargement Effects on Labor Productivity and Labor Movements

The large differences in income and the high unemployment rates in the Accession States, along with free movement of workers, imply that immigration will flow from new to old Member States. However, income disparities are not sufficient to induce migration. The level of unemployment and the number of job vacancies in the host country are important pull factors and the relative labor market situation is also important in determining whether migrant workers from the Accession States choose to go to which of the old members. Other factors influencing a migrant's choice of destination are geographic proximity and language. Studies have shown that countries

[51] Richard E. Baldwin, (1995) the Eastern Enlargement of the European Union, *European Economic Review 39* pp 474-481

[52] Ibid, Frank Schimmelfennig(2001) p60

with English as the main language are preferred by migrants with high levels of education[53].

Insofar as large wage and income gaps between the CEECs- 10 and the EU are likely to persist for decades, strong economic incentives to migration are bound to be present well beyond the date of accession. This holds true particularly for the richest regions of the EU which are bordering the CEECs-10, such as the Bavarian border with the Czech Republic and the Austrian borders with Slovakia, Hungary and the Czech Republic. However, international migration is hindered by high transaction costs and by the limited absorption capacity of labour markets in the countries of destination[54]. For instance the deferent wage or salary earning by employees might be one of significant factors for immigrants to choose the destination country, see the table (3-2).

The table shows that the minimum wages earn in one month some of the old and new members are significantly deferent. The employees in the most of the new members are getting very low wages in comparison with other old members. These differences between wages might be the most significant factor for employee from the new members immigrates to other old members that have higher wages per month. However, the table also shows that wages in the new members are increasing rapidly after their entrance to the EU integration, but that is still not enough for reducing the gap between the wages.

[53] Nicola Doyle, et al, (2006) Freedom of Movement for Workers from Central and Eastern Europe, Swedish Institute for European Policy Studies (ISBN 91-85129-38-0) p9

[54] *Boeri ,Tito* and *Herbert Brucker,* (2001) "Eastern Enlargement and EU-Labour Markets:Perceptions, Challenges and Opportunities," World Economics, Vol. 2, No. 1

Table 3.2: Minimum Wage (EUR/Month, as of 1 January)

Countries	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	1,096	1,118	1,163	1,163	1,186	1,210	1,234	1,259	1,310
Czech Republic	111	144	175	199	207	235	261	288	304
Estonia	:	:	118	138	159	172	192	230	278
Ireland	945	945	1,009	1,073	1,073	1,183	1,293	1,403	1,462
Greece	526	544	552	605	631	668	668	658	681
Spain	425	433	516	526	537	599	631	666	700
France	1,049	1,083	1,126	1,154	1,173	1,197	1,218	1,254	1,280
Latvia	84	89	107	116	121	116	129	172	229
Lithuania	106	120	120	125	125	145	159	174	232
Luxembourg	1,191	1,259	1,290	1,369	1,403	1,467	1,503	1,570	1,570
Hungary	100	151	202	212	189	232	247	258	273
Malta	500	532	552	534	542	557	580	585	612
Netherlands	1,092	1,154	1,207	1,249	1,265	1,265	1,273	1,301	1,335
Poland	159	196	212	201	177	205	234	246	313
Portugal	371	390	406	416	426	437	450	470	497
Slovenia	359	387	419	451	471	490	512	522	539
Slovakia	:	:	114	133	148	167	183	217	243
United Kingdom	970	1,130	1,118	1,106	1,083	1,197	1,269	1,361	1,223

Source: Eurostat, Economic indicators EU27, 2009

In general, the study argues that, immigration increases labor supply, which in turn implies a decline in wages. However, an increased supply of labor may also induce new investments which may counteract a wage decline. Furthermore, labor is not a homogeneous factor of production: the immigrant work force may be a complement to, rather than a substitute for, the native work force. This would imply an increase in the wages of native workers. Hence it is not possible to determine the sign and size of the wage effect without empirical studies. Most such studies indicate only small effects55.

On the other hand, Consider table (3-3) for labor productivity in the EU25 , the study found that labor productivity in most of the new member states are increasing more rapidly, After entrance of 10 new members in 2004 while in most of the old members, the labor productivity are decreasing relatively. This indicates that the impacts of migration of new member states are negative for old members while it's positive for new member states. Of course, the impacts of immigration will differ from profession to profession. Age and qualification are not the only determinants of the competition of immigrants with domestic labor. Although some prospective immigrants have a good education, most of them are bound to work in low-paid jobs below their qualification

[55] Ibid, Nicola Doyle, et al, (2006) p10

levels. Apart from the structure of the labor market, the number of expected immigrants is a key to the adjustment process. As indicated above, the number of immigrants will differ sharply from Member State to member state.

There are a number of factors besides labor market access that would influence the decision of a citizen from the Accession States to migrate. These factors include income and unemployment differentials as important influences on the magnitude and direction of migration. The direction of the flow is expected to be from countries with low GDP per capita and high unemployment rates to countries with high incomes and low unemployment rates.

Table 3.3: Labor Productivity per Person Employed

COUNTRIES	2002	2003	2004	2005	2006	2007
EU-27	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Euro area	**NA**	**NA**	**110.3**	**110.6**	**110.2**	**110.2**
Belgium	136.6	134.8	132.2	132.0	131.3	130.2
Czech Republic	63.1	66.7	68.1	68.9	70.4	*73.6*
Denmark	108.6	106.4	108.8	109.2	108.3	106.0
Germany	106.5	108.8	108.3	107.4	106.9	105.7
Estonia	49.3	53.0	55.3	59.0	61.7	64.7
Ireland	133.5	135.5	134.8	133.8	134.7	*135.7*
Greece	100.5	100.3	101.8	103.5	103.8	105.0
Spain	105.0	104.0	102.2	102.0	102.9	105.1
France	125.7	121.8	120.8	123.7	124.0	124.3
Italy	117.8	115.7	112.3	111.1	108.9	108.0
Cyprus	84.6	82.7	82.9	84.2	85.0	86.1
Latvia	43.1	44.3	46.0	49.2	50.9	53.6
Lithuania	48.0	52.0	53.3	54.6	57.1	60.7
Luxembourg	163.5	166.8	169.8	175.6	183.9	180.3
Hungary	71.0	71.9	72.2	73.4	74.5	73.9
Malta	92.1	90.4	90.4	90.7	90.6	90.1
Netherlands	113.4	111.0	112.4	115.3	114.4	*114.3*
Austria	118.0	118.8	119.0	119.9	119.8	119.9
Poland	54.1	62.6	65.0	65.3	66.2	67.4
Portugal	68.0	68.5	67.2	68.6	68.5	69.9
Slovenia	76.7	78.1	80.9	82.7	83.9	84.3
Slovakia	62.6	63.4	65.6	68.8	71.7	76.8
Finland	111.6	109.6	112.8	110.8	112.3	111.9
Sweden	107.8	110.2	113.5	112.9	113.8	115.3
United Kingdom	110.3	110.6	112.3	109.7	109.5	108.8

Source: Eurostat, Economic indicators EU27, 2009

The magnitude of the differentials in incomes and unemployment rates impact on the size of the migratory flow. As incomes in the sending and receiving countries converge the propensity of the sending country's citizens to migrate decreases. Therefore, if incomes in the Accession States come closer to those of the Member States, by way of high growth rates, the incentives for EU10 nationals to migrate will be reduced[56].

3.4 EU Enlargement Effects on Capital Movements

Barriers to Foreign Direct Investment (FDI) and, more broadly, capital movements have been to a large extent dismantled, there is still poor regulation and supervision of capital

[56] Ibid, Nicola Doyle, et al (2006)p10

markets and of the banking systems in the new member states of the present EU members, capital flows to the CEECs-10 are, in any event, "too small to matter": yearly capital flows currently account for barely 0.2 percent of the EU's GDP and 0.8 percent of gross fixed investment in the EU. Even a significant increase in capital flows from such low levels, can hardly have any impact on interest rates and factor incomes in the EU. FDIs originating in the EU are, however, large for the CEECs-10 (in 1998 they accounted for 7 percent of their GDP and more than 25 percent of their gross fixed investment) and hence an increase in FDIs may significantly contribute to capital formation, growth, interest rates and wages in the countries candidate to accession[57].

Understanding whether reprising of systematic risk took place in the EU accession countries is important for at least three reasons. First, it allows us to evaluate the benefits of EU integration. Integrated capital markets should deliver a lower cost of capital leading to higher investment and growth. The lower cost of capital should come from the reduction in the risk free interest rate as well as the reduction in systematic risk. The reduction in systematic risk will benefit firms only if this risk is correctly priced by the market. If it is, then the benefits of EU integration extend beyond access to larger markets. Second, finding out whether changes in systematic risk are priced by the market is important beyond the context of the EU enlargement. Greater risk sharing is one of the frequently emphasized benefits of open capital markets. Third, it is worthwhile to investigate whether risk sharing is actually priced by the market. In a similar vain, capital market integrations also provide a unique opportunity to test the asset pricing models in differences rather than in levels[58].

Similarly, FDI flows from west to east have been hugely important for the recipient countries, but much less so for the countries where they originate. Even for Germany – traditionally the biggest foreign investor in the EU-8 – investment in the new members has typically amounted to 1-2 percent of total corporate investment in recent years. In 2004, the old EU-15 invested eleven times more in each other's economies than in the new member-states. Taking these asymmetries into account, it is safe to assume that the

[57] Ibid, Tito Boeri (2001*)*

[58] Dvorak, Tomas and Podpiera, Richard. (2005) "European Union Enlargement and Equity Markets in Accession Countries", Working Paper Series NO, 552 / November, p 7

impact of enlargement on the new members is roughly 20 times larger than on the old ones[59].

Around half of EU investment in the new members has gone into services, such as banks, supermarkets and hotels. A much smaller share has been invested in factories that produce for exports in sectors such as cars, clothing and chemicals. This share, however, is growing. First, much of the service sector FDI came through the privatization of banks and telecoms, which is now drawing to a close. Second, EU accession means that the East European economies are now looking more like those in the old EU. They now have the same trade policies, competition rules and product standards. As business environments have become more alike, differences in wage costs have become a more important factor in companies' decisions on where to produce. Wages are much lower in the Czech Republic, Hungary and Poland than in France or Germany[60].

3.5 EU Enlargement Effects on Economic Growth

There are remarkable differences between the EU and the ten new members in GDP per capita at purchasing power: according to the most recent data available, income levels of the CEE countries range between one-third (World Bank estimates) and 40 % (Eurostat) of those in the EU. Differences in GDP per capita at current exchange rates – capturing labor productivity gaps – are even larger (of the order of 85 percent). The new members are far from being a monolith, as the variance of income levels in the region is sizeable: per capita GNP levels at current exchange rates range between 6 percent of the EU levels in Bulgaria and 42 percent in Slovenia or, at purchasing power, between 20 and 60 percent. Moreover, in the regions of ten new members bordering the EU, wage levels can be from 20 to 60 percent of those prevailing on the other side of the border[61].

Many West Europeans misunderstand the way in which enlargement has impacted on their country. The impact of enlargement cannot be measured directly, since too many others, non-enlargement factors influence trade flows, investment decisions, inflation rates and job-market developments. Instead, economists have used complex models to calculate the theoretical impact of accession. Such studies should therefore not be taken

[59] Barysch, K. (2006) "Enlargement two years on: Economic Success or Political Failure?" Briefing paper for the Confederation of Danish Industries and the Central Organization of Industrial Employees in Denmark. (cit. 6,June,2008)

[60] Barysch, K.(2004) "EU Enlargement: How to Reap the Benefits" , Economic Trends, 2/ (citi 7, March ,2010) http://www.cer.org.uk/pdf/barysch_economictrends_june%2004.pdf

[61] Ibid, Tito Boeri (2001) p 3

as an estimate or forecast of the real impact of enlargement. They are, however, useful for illustrating broad trends in the enlarged EU. Economists usually assume that there are four channels through which enlargement can have an impact on the economies of the EU-15[62]:

- Trade: the removal of the remaining tariffs and border controls lowers the cost of east-west trade flows;
- The single market: integrating the new members into the single market increases competition, which is result in higher productivity and lower prices.
- The movement of factors of production: capital moves from west to east and workers move from east to west;
- Financial costs: transfer payments to the new members through the EU budget.

Numerous surveys come to the conclusion that in the long run, EU eastward enlargement will have positive effects on the economic growth of the EU-15. Most of the models capture a ten-year horizon. The results vary between 0.0 and 0.8 percentage point; the European Commission forecasts cumulative additional GDP growth to run to 0.5 to 0.7 percentage point[63].

The direct impact of eastward enlargement on the old EU has been marginal, simply because the new member-states are so small. Taken together, their GDPs amount to only 5 percent of the EU-15 GDP, or 10 percent if measured at purchasing power. In economic terms, therefore, enlargement was the equivalent of adding an economy the size of the Netherlands to a single market with 380 million consumers and a GDP worth 10 trillion Euro. While the EU-15 is the destination of 70 percent or more of East European exports, the new members account for only around 4 percent of EU-15 trade.[64].

After considering table (3-4) the study found the significant GDP growth for EU25 during last decade, especially for new member states in the eastern Europe, the GDP increased during (1999-2007) roughly to three folds, while the GDP growth were relatively small in Malta and Cyprus. For the old members in the EU15 the growth of GDP was not so big, except, for Belgium, Ireland, Greece and Luxembourg, the rate of growth were relatively faster.

[62] Ibid, Barysch, K (2008) p12
[63] Ibid. Jarko Fidrmuc, Gabriel Moser,2002)
[64] Ibid, Barysch, K (2008) p13

Table 3.4: GDP at Current Market Prices (EUR 1 000 Million)

	1999	2000	2001	2002	2003	2004	2005	2006	2007
EU-27	8,558	9,173	9,549	9,911	10,077	10,577	11,035	11,641	12,304
Euro area	6,422	6,757	7,051	7,299	7,514	7,819	8,109	8,499	8,919
Belgium	238	252	259	268	275	290	302	317	331
Czech Republic	56	61	69	80	81	88	100	113	*127*
Denmark	163	174	179	185	189	197	208	220	228
Germany	2,012	2,063	2,113	2,143	2,164	2,211	2,243	2,322	2,423
Estonia	5	6	7	8	9	10	11	13	15
Ireland	91	105	117	130	139	149	161	175	*186*
Greece	132	138	146	158	171	185	199	214	229
Spain	580	630	681	729	783	841	909	982	1,051
France	1,368	1,441	1,497	1,549	1,595	1,660	1,726	1,807	1,892
Italy	1,127	1,191	1,249	1,295	1,335	1,392	1,428	1,480	1,536
Cyprus	9	10	11	11	12	13	14	15	16
Latvia	7	8	9	10	10	11	13	16	20
Lithuania	10	12	14	15	16	18	21	24	28
Luxembourg	20	22	23	24	26	27	30	34	36
Hungary	45	52	60	71	75	82	89	90	101
Malta	4	4	4	4	4	5	5	5	5
Netherlands	386	418	448	465	477	491	513	540	567
Austria	198	208	212	219	223	233	244	257	271
Poland	157	186	212	210	192	204	244	272	309
Portugal	114	122	129	135	139	144	149	155	163
Slovenia	20	21	22	24	25	27	28	30	34
Slovakia	19	22	24	26	29	34	38	45	55
Finland	123	132	140	144	146	152	157	167	180
Sweden	241	266	251	264	276	288	295	313	332
United Kingdom	1,384	1,573	1,613	1,679	1,616	1,745	1,805	1,913	2,019

Source: Eurostat, Economic indicators EU27, 2009

We can argue from the table above, that the enlargement toward central and Eastern Europe is benefited new member states more than old members. The reason might be the size of the new members' market small to have significant impacts on the old member's economic growth.

(Crespo-Cuaresma, et al 2002)[65], show that formal EU accession has positive effects on the growth of all EU Member States. The growth effects, however, are not linear: On the one hand, the positive impact of EU membership augments with the duration of the integration period, and countries with a lower per capita income benefit relatively more from integration than wealthier member countries. The Eastern enlargement of the EU will trigger the following economic effects;[66]

[65]Crespo-Cuaresma, J., et al. Growth Effects of European Integration: Implications for EU Enlargement. In: *Focus on Transition*, 2002(1), pp. 87-100.

[66]Ibid, Jarko Fidrmuc, Gabriel Moser, (2002)

- The traditional trade effects may be positive (trade creation) or negative (trade diversion). The countries bordering on CEE (above all, Austria, Germany, Sweden and Finland) benefit more than the remaining EU member states.
- Factor migration has different effects on source and on target countries: Immigration boosts growth in the EU whereas production outsourcing (direct investment in CEE) reduces it.
- The dynamic effects (capital accumulation, improved access to new technologies, increased competition and gains due to increased returns to scale) possibly constitute the majority of the long-term effects of economic integration The dynamic effects of integration are asymmetric, with a relatively low impact on today's EU members and a possibly large impact on acceding countries.
- Eastern enlargement of the EU is generally not expected to have significant macroeconomic impacts on the EU-15. However, financial transfers to the new members could severely burden the EU budget by raising contributions for net payers and/or by diminishing transfers from the EU budget to net recipients. Moreover, the short-term adjustment costs caused by migration in addition to foreign trade might be quite substantial in some sectors.

Second Part: The Application Work

Second part, of the dissertation work is concentrated on the application framework of the model of Pareto-Optimal matrix of European integration process. Also briefly deal with application for the model of optimal integration on the EU15 trade structure, and it examines the Pareto-Optimality of EU 15 before and after entry of new member states. Fifth chapter of this part is concentrate also on the application of the model of the optimality on the new member states entry.

4 Optimality Analysis of EU-15 (Application Model)

This chapter concentrates on application for the model of optimal integration matrix on the EU15 trade structure, and it examines the Pareto-Optimality of EU 15 before and after entry of new member states.

4.1 Basic Indicator of EU15 Trade

An essential feature of the integration process is an increase in economic relations and, more specifically, in trade flows between the countries in question, since this integration is essentially brought about by the removal of barriers to trade. Right from the outset, studies of the EEC integration process, initially, (Balassa, 1966) and (Grubel and Lloyd, 1975) and subsequently, many others[67], have shown that the reduction or elimination of trade barriers leads to an increase in Intra Industrial Trade (IIT) as a proportion of total trade. More recent studies have shown that the pace of growth of IIT in the first half of the eighties was lower than during the previous decade .[68]

As a major player in international trade, EU-15 is the source of about a quarter of all international trade flows. As the world's leading exporter, it is ahead of the United States, the Dynamic Asian Economies , Japan and China. As the world's second biggest importer, it ranks behind the United States but is well ahead of the Dynamic Asian Economies, Japan and China[69].

Table 4.1: EU-15 Intra- and Extra-Community Trade EUR Billion (1995-2002)

	Export					*Import*				
	1995	*1999*	2000	2001	2002	1995	*1999*	*2000*	2001	2002
Intra-EU 15 Trade	1 000.3	1 339.2	1 565.5	1 581.7	1 596.5	954.5	1 273.0	1 489.8	1 489.6	1 493.8
Extra-EU15 Trade	573.3	760.2	942.0	985.8	993.7	545.3	779.8	1 033.4	1 028.2	987.4
Ratio Intra/Extra	174%	176%	166%	160%	161%	175%	163%	144%	145%	151%

Sources : David Cristallo, Trade in a 25-member European Union, Statistics in focus, THEME 6 – 4/2003

As its obvious from table above that EU15 intra-trade was more than extra trade during (1995-2002), especially from the intra export view of point, which show almost (75%-

[67] Bernatonyte, Dalia, (2009) "Intra-Industry Trade and Export Specialization: Lithuanian Case," Economics & Management, NO. 14,

[68] Greenaway, D., Hine, R.C. (1991), "Intra-Industry Specialization, Trade Expansion and Adjustment in The European Economic Space", Journal of Common Market Studies, Vol. 24 pp.603-22.

[69] David Cristallo, Trade in a 25-member European Union, Statistics in focus, THEME 6 – 4/2003

60%) more than extra EU15 trade. As a first impression from the table (4-1) one can realize that EU15 was a successful integration during the last decades, that can consider as an indicator proves that EU15 was able to depend on intra-trade instead of extra trade, even the cost of this intra trade was more according with some studies70, which shows that trade diversion was more. In other words, EU15 was increasing the ability for integration of their free trade area (FTA), in order to remove the market competitiveness on their goods and services after the Maastricht treaty (1991).

This assessment it needs to mention in further details in this study, but before to so far, let's first consider the data of intra-trade in the EU 15 from the table below:

In table (4-2), the use of real data from EU15 intra-trade in year 2000 in million Euros, as application of the model going to use in this study. After analyzing the table, and consider that the countries from the rows exporting to the same countries from the columns, which mean that the data is also, represent imports of the countries in the columns from countries of the rows. After this rearrangement the rows and columns as descending order according to the summation of the rows and columns.

As it can be realize form the ranks of the members shown in the table below. The first country in the row is Germany because of the biggest size of exports to the countries in columns with (337,380) million Euros, and follow by France as a second exporter country to the EU15, with (162,947) million Euros. The third exporter country in the row is Netherlands with (131,869) million Euros, but the thesis found that Netherlands is in the fifth rank in the columns, even its imports are bigger than exports; but there are two other countries (UK and Italy, respectively) are importing more than it. In the next section the study will analyze this table in more detail for each country separately. In the end of the list shown in the table (4-2) the Greece with the small amount of imports (4,275) million Euros, which reflects that Greece is slightly not integrated with EU in the good rank, in other words, the countries of the EU15 was exporting to Greece more than importing from it.

4.2 Optimal Model of the EU15

The model started with building a matrix which shows that Export from each of 15 members in the rows to the same members in the columns. As it mentioned in the

[70] Dieppe Alistair, and Warmedinger, (2007) Thomas Modeling Intra-and Extra-Area Trade Substitution and Exchange Rate Pass- Through in the Euro Area, Working Paper Seires, NO 760 / June http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp760.pdf

section above, then set for each rows and columns a rank (R1, R2, respectively) which represent the ordinarily ranks of the country in the matrix.

The next step is to find the absolute value of the deference between R1 and R2 for each country.

As the hypothesis of the model indicate that the *Pareto-optimal point* is; the summation of the /R1-R2 / is equal to zero, in other words, the matrix is achieving the Pareto-Optimality if only the case when:

$$\sum \left| \mathbf{R1 - R2} \right| = 0 \text{ ..... (1)}$$

This formula indicates that any integration will be in the Pareto-Optimal position, when no member can be better off without make any other members worse off, so it should be acceptable position by all members in the integration, because there are not any other distribution better than this arrangement. On the other hand when this formula dose not equal to zero, that means the integration not optimizing in its structure, and needs to be rearranged in other way to be approaching or equal to the zero.

The application of this formula on the EU15 in year 2000, indicates that EU15 not optimizing and it's far from Pareto- optimality by 18 points, as the results shows from the followed applications;

Table 4.2: Exports an Imports EU15 year 2000 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
R1		DE	FR	UK	IT	NL	BE	ES	AT	SE	PT	IE	DK	FI	EL	LU	∑
1	DE		67,418	49,377	45,011	38,994	30,105	26,732	32,436	13,525	6,255	3,628	9,605	7,005	4,665	2,624	337,380
2	FR	55,232		33,730	30,822	15,008	23,838	31,955	3,399	5,115	5,956	3,099	2,742	1,723	2,607	2,953	162,947
3	NL	66,638	27,123	27,296	14,796		31,278	8,295	3,778	5,936	2,216	1,960	3,713	2,623	2,136	719	131,869
4	UK	36,712	29,692		13,635	24,010	15,714	13,310	1,832	6,801	2,669	20,841	3,773	2,334	2,004	364	136,979
5	BE	34,541	35,844	20,239	11,286	25,758		7,343	2,096	3,195	1,660	1,619	1,657	1,121	1,310	4,143	117,271
6	IT	39,558	33,196	18,036		6,965	7,208	16,355	5,804	2,631	3,612	1,890	2,048	1,167	5,414	379	104,705
7	ES	15,325	24,127	10,199	10,855	4,563	3,379		1,164	1,251	11,855	883	887	516	1,315	149	71,143
8	SE	10,064	4,831	8,660	3,566	4,588	3,916	2,678	921		522	591	5,087	4,796	656	30	40,842
9	IE	9,393	6,341	17,066	3,317	4,684	4,105	2,122	464	1,335	257		620	405	294	39	41,049
10	AT	24,413	3,281	3,148	6,464	1,760	1,099	1,972		826	378	219	525	390	345	128	20,535
11	DK	10,657	2,984	5,523	1,893	2,821	918	1,347	509	7,037	306	738		1,839	451	140	26,506
12	FI	6,246	2,577	4,548	2,173	1,973	1,105	1,286	648	4,643	315	283	1,257		441	34	21,283
13	PT	4,761	3,342	2,868	1,046	1,117	1,566	5,086	218	437		139	320	135	105	27	16,406
14	LU	2,262	1,880	708	489	457	1,085	261	128	119	61	50	66	43	26		5,373
15	EL	1,736	491	861	1,363	347	214	412	115	160	86	42	96	82		6	4,275
	∑	317,538	243,127	202,259	146,716	133,045	125,530	119,154	53,512	53,011	36,148	35,982	32,396	24,179	21,769	11,735	1,238,563
	|R1-R2|	0	0	1	2	2	1	0	2	1	3	2	1	1	1	1	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

$$
\begin{aligned}
|R1DE - R2DE| &= 0 \\
|R1Fr - R2Fr| &= 0 \\
|R1UK - R2UK| &= 1 \\
|R1It - R2It| &= 2 \\
|R1NL - R2NL| &= 2 \\
|R1Be - R2Be| &= 1 \\
|R1Es - R2Es| &= 0 \\
|R1At - R2At| &= 2 \\
|R1SE - R2SE| &= 1 \\
|R1PT - R2PT| &= 3 \\
|R1IE - R2IE| &= 2 \\
|R1\ DK - R2DK| &= 1 \\
|R1FI - R2FI| &= 1 \\
|R1EL - R2EL| &= 1 \\
\underline{|R1LU - R2LU| = 1} & \\
\sum |R1 - R2| &= 18
\end{aligned}
$$

For explaining the idea more specificly consider the figure (4-1) which shows the size and the shape of the gap from the Pareto –optimality of EU15 in year 2000.

The figure (4-1) shows the size of the gap between Pareto-optimal positions; which is represented by horizontal line and degree of farness from the Pareto-Optimality; represented by the red area in the figure (vertical line). At the same time the red area shows all the members which are responsible of not optimization the EU15 integration. Next section will analyze each of these countries separately and explaining the reasons behind not achieving the optimal position in year 2006.

Let's now consider the matrices of trade structures in EU15 during years (2002) and (2006), and analyze the improvements in the gaps of the farness from the optimality.

Figure 4.1: The Gap of the Pareto- Optimality of EU15 in 2000

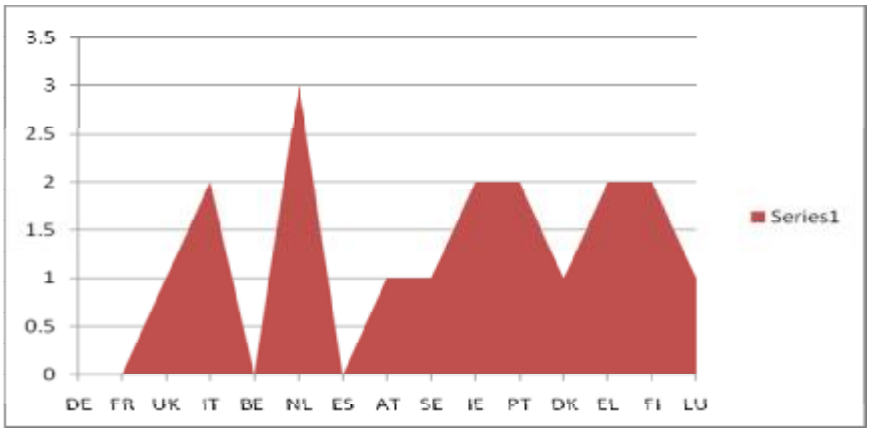


Figure 4.2: The Gap of the Pareto- Optimality of EU15 in 2002

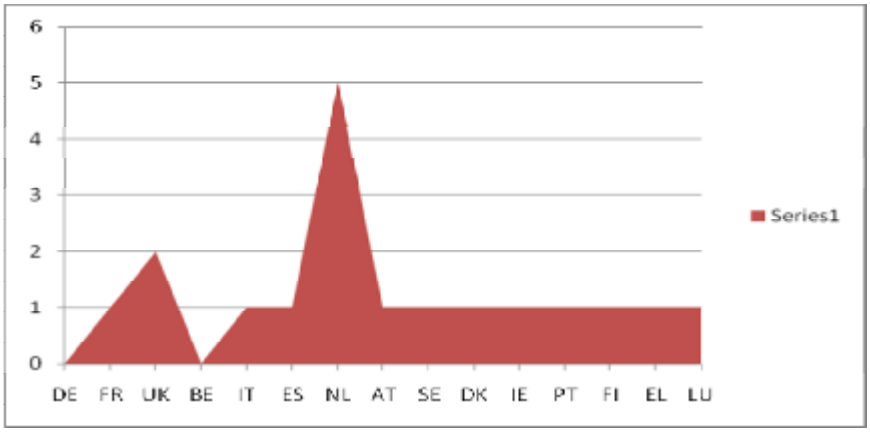


Figure 4.3: The Gap of the Pareto- Optimality of EU15 in 2006

Source : The figures come from the tables 4.2, 4.3, 4.4

Table 4.3: Exports an Imports EU15 year 2002 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
R1		DE	FR	UK	IT	BE	NL	ES	AT	SE	IE	PT	DK	EL	FI	LU	∑
1	DE		68,720	53,760	47,334	31,095	40,462	29,435	33,862	13,495	3,958	6,764	11,286	5,002	6,618	3,010	354,801
2	FR	52,673		34,565	31,484	24,091	13,534	31,563	3,471	4,745	3,047	5,946	2,825	2,664	1,646	2,086	214,340
3	NL	64420	26738	27,931	15725	32231		9368	3,800	4,928	2571	2,233	3662	2214	2,687	777	199,285
4	UK	34,409	29,476		13,420	15,833	21,923	13,319	2,002	6,121	25,155	2,417	4,352	1,910	2,276	564	173,177
5	BE	42,606	37,321	21,975	12,398		26,678	8,282	2,395	3,139	1,783	1,513	1,723	1,417	1,182	4,119	166,531
6	IT	37,256	33,069	18,780		8,293	6,960	17,354	6,004	2,600	1,464	3,384	2,090	5,721	1,424	417	144,816
7	ES	15,317	25,349	12,862	12,551	3,523	4,310		1,216	1,215	850	13,560	982	1,566	484	149	93,934
8	IE	6,732	4,687	22,488	3,598	13,548	3,489	2,241	335	1,202		362	545	330	303	77	59,937
9	AT	26,246	3,922	4,086	7,701	1,324	2,087	2,360		959	257	378	601	498	508	143	51,070
10	SE	8551	4340	6,922	3021	3977	4,475	2080	854	4,707	424	438	5044	387		35	45,255
11	DK	11,924	3,089	5,970	2,021	1,008	2,813	1,805	552	7,087	888	369		475	1,897	169	40,067
12	FI	5,674	2,196	4,592	1,624	1,295	2,202	1,223	480	4,180	365	289	1,156	401		38	25,715
13	PT	4,844	3,706	2,846	1,249	1,180	1,053	5,738	170	407	149		274	100	121	26	21,863
14	LU	2,581	2,176	946	663	1,138	472	482	138	159	52	84	80	47	114		9,132
15	EL	1,142	391	681	929	116	259	275	79	99	27	67	72		37	2	4,176
	∑	314,375	245,180	218,404	153,718	138,652	130,717	125,525	55,358	55,043	40,990	37,804	34,692	22,732	19,297	11,612	
	|R1-R2|	0	0	1	2	0	3	0	**1**	1	2	2	1	2	2	1	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.4: Exports an Imports EU15 year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	∑	Ex-EU15
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	469440	355,049
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	273104	93,197
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	237965	143,096
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	213734	150,804
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	209389	143,614
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	169784	138,673
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	112648	51,824
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102	0	8,068	664	577	7,025	603	76	62029	53,305
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	1,108	789	359	446	570	608	194	61583	49,941
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595	0	422	454	369	153	53532	51,604
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407	0	997	565	2,215	582	42	48170	23,056
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200	0	319	41	30007	27,833
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171	0	232	123	35	25076	11,983
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78	0	15292	6,858
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98	0	4	7381	18,622
	∑	394,838	306,715	230,253	185,395	183,472	170,014	165,335	76,517	67,551	45,258	44,771	41,827	32,698	27,758	16,732		
	EX-EU15	355,151	151,384	218,367	87,142	173,360	108,907	177,826	35,897	38,014	23,210	19,526	14,268	23,392	24,322	6,599		
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	18	

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

According to the thesis model used here, the study has found that EU 15 was not achieving the Pareto-Optimality during last decades. And the gaps were still big, maybe more than 18 points which's considered as a big gap and far from optimal case we were looking for. The reason for these gaps it's not due to the entry of new member states, maybe some of them attempting to participate strongly and achieving close position to the Pareto-Optimality, if isn't achieving optimality itself.

4.3 Analyzing Pareto-Optimality in the EU15

Considering the table (4-4) of 2006, it indicates that the first and the biggest country trade in the EU15 is Germany followed by France in the second rank, and ending with Greece and Luxemburg respectively.

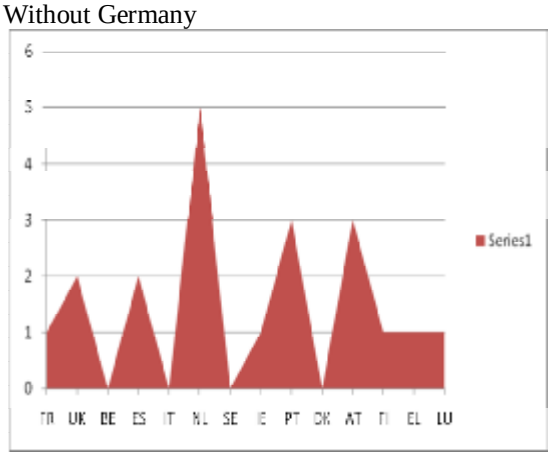
4.3.1 Germany (DE)

In the EU15 Germany is not only one of the biggest countries in the Union, but also has the biggest participation from trade (export-import) with intra-EU15. Germany is leading EU15 for the last decades as it has first rank from the export and the import as well. And with this position, its achieving the best rank and Pareto-Optimality, (R1-R2=0).

That's mean Germany is Exporting to the EU15 at the same rate of its import from the EU15. So its give to the EU15 as strongly as it takes from them, which can not obtain better position than one it has. So Germany is perfectly integrated with the first rank and in the Pareto-Optimal position.

To examine the ranks of its importance in the EU15, let us suppose that Germany was not joining the EU, and then it is possible to ask how would be the impacts of joining Germany on the optimality of EU15. In the table (4-5) after it removes Germany from export and import side, the study found that EU14 without Germany losing a lot of balance and they get more far from the Pareto-Optimality by 2 more points. Which's indicating that Germany is one of the most important members to the EU15?

Without Germany



EU15

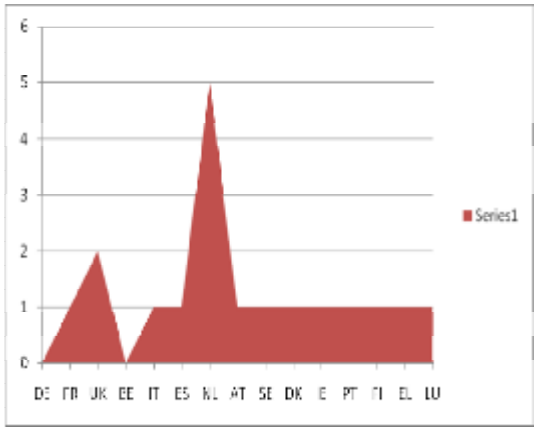


Figure 4.4: The Gaps Comparison between EU15 and without Germany in 2006

Source: The figures come from the tables 4.5, 4.4

After considering the figures above, the one in the right is showing the gap of EU15 in 2006, and the left one is showing the gap of EU14 without Germany. The study made the comparison between the red areas in both figures, and found that the red area without Germany is increasing by two more points.

Now let's consider table (4-5) which represent the matrix of intra- trade of EU14 without Germany, we will find that France is in the first rank as the biggest importer, while in the export side Netherlands taking place of Germany, in the first rank, however, both of the members couldn't obtain the Pareto-Optimality in the matrix. On the other hands, most of the other members keeping relatively their position with same rank and significant reduce in the size of their exports and imports, except Austria is getting far from the importer ranks, because of its big trade size. In general these strong impacts of Germany on the EU15 integration prove the importance position of Germany in the EU15 trade structure, as the biggest importer and exporter.

Table 4.5: Exports and Imports EU14 without Germany in year 2006 Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		FR	UK	BE	ES	IT	NL	SE	IE	PT	DK	AT	FI	EL	LU	∑
1	NL	31,645	33,017	51,524	13,336	18,882	0	6,723	3,336	2,731	4,699	5,180	3,939	2,678	1,390	179,080
2	FR	0	32,751	28,621	37,974	35,095	15,879	5,029	2,710	4,887	2,910	3,689	1,910	3,294	1,825	176,574
3	BE	42,451	0	19,180	18,254	13,869	24,318	7,576	25,238	3,406	5,636	2,462	2,668	2,152	2,385	169,595
4	UK	49,359	23,073	0	10,737	15,101	34,981	4,262	2,372	1,747	2,311	2,977	1,877	1,868	5,489	156,154
5	IT	38,211	19,758	9,415	23,631	0	7,800	3,495	1,687	3,601	2,574	7,996	1,588	6,507	557	126,820
6	ES	31,892	13,578	4,979	0	14,528	5,634	1,638	1,047	15,173	1,362	1,407	731	1,908	180	94,057
7	SE	5,764	8,332	5,322	3,595	3,918	5,529	0	664	577	8,068	1,102	7,025	603	76	50,575
8	AT	5,047	15,495	12,496	3,241	3,616	3,395	1,088	0	422	595	420	454	369	153	46,791
9	IE	3,613	6,446	1,148	2,254	2,559	3,993	10,407	997	565	0	576	2,215	582	42	35,397
10	DK	4,096	4,142	1,726	3,030	9,796	1,969	1,108	359	446	789	0	570	608	194	28,833
11	FI	2,043	4,001	1,408	1,528	1,946	3,153	6,432	229	200	1,305	468	0	319	41	23,073
12	PT	4,143	2,305	1,074	9,139	1,353	1,255	381	171	0	235	177	232	123	35	20,623
13	LU	2,815	1,721	1,599	957	1,741	807	485	59	596	311	438	175	78	0	11,782
14	EL	732	987	214	666	1,860	358	160	68	94	127	134	98	0	4	5,502
	∑	221,811	165,606	138,706	128,342	124,264	109,071	48,784	38,937	34,445	30,922	27,026	23,482	21,089	12,371	
	|R1-R2|	1	2	0	2	0	5	0	1	3	0	3	1	1	1	20

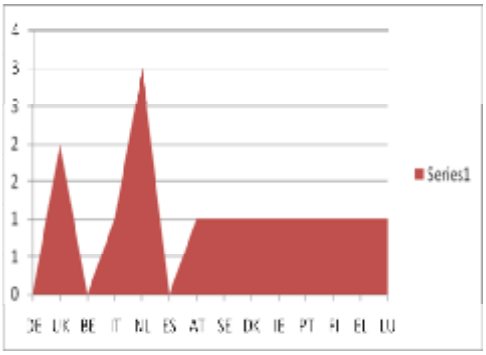
Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.2 France (FR)

France as a second rank and as one of the biggest member state in EU15 has also remarkable effects on the Pareto-Optimality in the EU15. Its exports to the intra-EU15 were worth (176,574 Mio Euro) in 2006. Its imports from the zone of EU 15 were even higher (221,811 Mio Euro) than its exports in the same year. France is the second biggest importer from EU 15 after Germany, but it's the third as exporter on the other hand. Bear in mind this; it seems that removing this country from EU 15 intra-trade matrix, this will make EU15 be closer to Pareto-Optimality by four points. In other words, France is making EU15 far from optimality with his joining to the EU integration and increasing the red area of farness from optimality.

To analyze the reason why these negative effects appear, the study found that France's trade makes Netherlands to move far from Pareto-Optimality by more 2 points and other countries such as Spain move from Pareto-optimal position to non-optimal and getting far by one more point. If we compare the figure below, we will find that red space getting smaller without France.

Without France



EU15

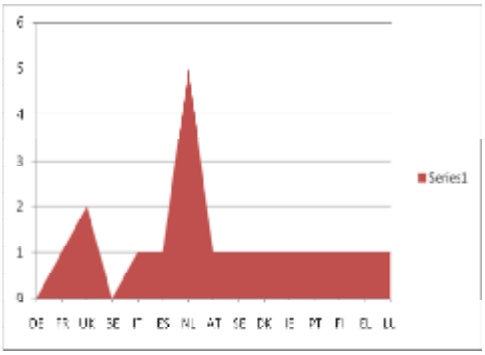


Figure 4.5: The Gaps Comparison between EU15 and without France in 2006

Source : The figures come from the tables 4.5, 4.4

However, France is also one of the important members in the EU15, even the structure of its trade isn't uniform, that's because of its imports from most of the EU15 members is bigger than its exports, such as; DE,BE,IT,NL,DK,AT,FI,IE, and LU. While it have vice versa, with the rest of the members, that we can see it clearly from the table (4-6).

Table 4.6: Exports and Imports EU14 without France year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		**DE**	**UK**	**BE**	**IT**	**NL**	**ES**	**AT**	**SE**	**DK**	**IE**	**PT**	**FI**	**EL**	**LU**	∑
1	***DE***	**0**	**64,647**	**46,689**	**59,208**	**56,264**	**41,672**	**49,491**	**18,767**	**14,336**	**5,834**	**7,382**	**9,216**	**6,669**	**4,361**	**384,536**
2	***NL***	**94,024**	**33,017**	**51,524**	**18,882**	**0**	**13,336**	**5,180**	**6,723**	**4,699**	**3,336**	**2,731**	**3,939**	**2,678**	**1,390**	**241,459**
3	***BE***	**57,580**	**23,073**	**0**	**15,101**	**34,981**	**10,737**	**2,977**	**4,262**	**2,311**	**2,372**	**1,747**	**1,877**	**1,868**	**5,489**	**164,375**
4	***UK***	**39,794**	**0**	**19,180**	**13,869**	**24,318**	**18,254**	**2,462**	**7,576**	**5,636**	**25,238**	**3,406**	**2,668**	**2,152**	**2,385**	**166,938**
5	***IT***	**42,964**	**19,758**	**9,415**	**0**	**7,800**	**23,631**	**7,996**	**3,495**	**2,574**	**1,687**	**3,601**	**1,588**	**6,507**	**557**	**131,573**
6	**ES**	**18,591**	**13,578**	**4,979**	**14,528**	**5,634**	**0**	**1,407**	**1,638**	**1,362**	**1,047**	**15,173**	**731**	**1,908**	**180**	**80,756**
7	**SE**	**11,454**	**8,332**	**5,322**	**3,918**	**5,529**	**3,595**	**1,102**	**0**	**8,068**	**664**	**577**	**7,025**	**603**	**76**	**56,265**
8	**AT**	**32,750**	**4,142**	**1,726**	**9,796**	**1,969**	**3,030**	**0**	**1,108**	**789**	**359**	**446**	**570**	**608**	**194**	**57,487**
9	**IE**	**6,741**	**15,495**	**12,496**	**3,616**	**3,395**	**3,241**	**420**	**1,088**	**595**	**0**	**422**	**454**	**369**	**153**	**48,485**
10	**DK**	**12,773**	**6,446**	**1,148**	**2,559**	**3,993**	**2,254**	**576**	**10,407**	**0**	**997**	**565**	**2,215**	**582**	**42**	**44,557**
11	**FI**	**6,934**	**4,001**	**1,408**	**1,946**	**3,153**	**1,528**	**468**	**6,432**	**1,305**	**229**	**200**	**0**	**319**	**41**	**27,964**
12	**PT**	**4,453**	**2,305**	**1,074**	**1,353**	**1,255**	**9,139**	**177**	**381**	**235**	**171**	**0**	**232**	**123**	**35**	**20,933**
13	**LU**	**3,510**	**1,721**	**1,599**	**1,741**	**807**	**957**	**438**	**485**	**311**	**59**	**596**	**175**	**78**	**0**	**12,477**
14	**EL**	**1,879**	**987**	**214**	**1,860**	**358**	**666**	**134**	**160**	**127**	**68**	**94**	**98**	**0**	**4**	**6,649**
	∑	**333,447**	**197,502**	**156,774**	**148,377**	**149,456**	**132,040**	**72,828**	**62,522**	**42,348**	**42,061**	**36,940**	**30,788**	**24,464**	**14,907**	
	|R1-R2|	**0**	**2**	**0**	**1**	**3**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**14**

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.3 United Kingdom (UK)

UK is also one of the big country member in the EU15, and one of the big exporter to the intra-EU15 with (209,389 Mio Euro) and importing even more in the same year (230,253 Mio Euro) the biggest third importer after Germany and France, with this unbalanced trade UK has made EU15 closer from Pareto-Optimality by 2 points. For analyzing UK position in the EU15 integration we should remove UK from the matrix and then find its effect on the Pareto-Optimality, the study found that removing of UK from the EU15 trade matrix makes the integration far from the Pareto-Optimality by 2 points, but in the same time makes some of the members better off to the optimality by one point such as; Sweden, Finland, Denmark and Austria. The only advantage member state from the entrance of the UK was Ireland, because of the big size of the imports coming from the UK to it, without UK Ireland position is far from Pareto-Optimality by 5 points, also in the rank of 13th. The same situation is repeating with the Portugal, which is getting better off with 3 points, when we add UK to the matrix of EU integration.

The study found that market competitive is behind UK's unbalanced trade; in other words, because of UK still keep staying out of the Euro area which makes it facing a big market competitive of its exports into Euro area.

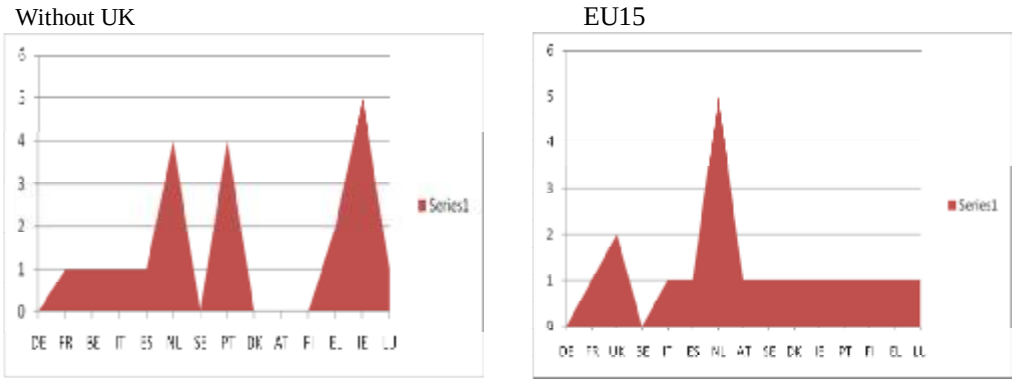


Figure 4.6: The Gaps Comparison between EU15 and without UK in 2006

Source: The figures come from the tables 4.7, 4.4

Compare the red gap in the figures above, it shows that removing UK from the matrix of EU trade, it causes a big change in the shape and the structure of the gap relatively. This change makes some members move very far from the optimality, while some

other, closing or even obtaining the Pareto-Optimality, like DK, AT and FI. That is obviously can be seen from the table (4-7).

4.3.4 Belgium (BE)

Belgium is one of the critical member states in the EU15. Its exports to the EU15 (213,734 Mio Euro) where it was more than its imports (185,395 Mio Euro), while its still keeping in the position of Pareto-Optimality in the fourth rank. On the other hand, if we remove Belgium from the matrix of the EU15 integration, the study found that EU14 without Belgium will be better off. In other word, without Belgium EU14 will be closer from optimality by 6 points, and four members such as Austria, Sweden, Denmark and Ireland will be optimal. Furthermore, Netherlands will be far from optimality with 4 points instead of 5 points. Clearly you can see from the comparison of figures (4-7) which shows the gap of farness from Pareto-Optimality is reducing significantly.

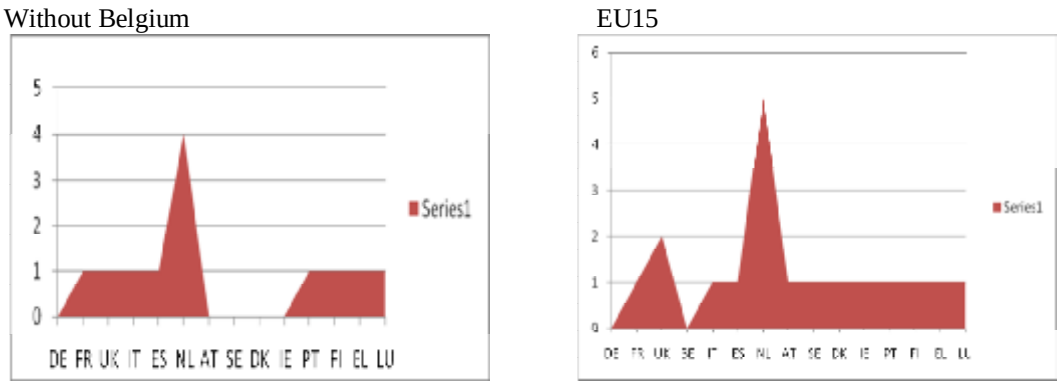


Figure (4-7) the Gaps Comparison between EU15 and without Belgium in 2006

Source : The figures come from the tables 4.8, 4.4

The deference's possibly are more obvious showing from the table (4-8). In general the model argues that entrance of Belgium has positive impacts for Belgium itself, while it has significant negative impacts on the structure of the EU15 integration.

Table 4.7: Exports and Imports EU14 without UK year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	BE	IT	ES	NL	SE	PT	DK	AT	FI	EL	IE	LU	∑
1	DE	0	84,904	46,689	59,208	41,672	56,264	18,767	7,382	14,336	49,491	9,216	6,669	5,834	4,361	404,793
2	NL	94,024	31,645	51,524	18,882	13,336	0	6,723	2,731	4,699	5,180	3,939	2,678	3,336	1,390	146,063
3	FR	61,391	0	28,621	35,095	37,974	15,879	5,029	4,887	2,910	3,689	1,910	3,294	2,710	1,825	143,823
4	BE	57,580	49,359	0	15,101	10,737	34,981	4,262	1,747	2,311	2,977	1,877	1,868	2,372	5,489	133,081
5	IT	42,964	38,211	9,415	0	23,631	7,800	3,495	3,601	2,574	7,996	1,588	6,507	1,687	557	107,062
6	ES	18,591	31,892	4,979	14,528	0	5,634	1,638	15,173	1,362	1,407	731	1,908	1,047	180	80,479
7	SE	11,454	5,764	5,322	3,918	3,595	5,529	0	577	8,068	1,102	7,025	603	664	76	42,243
8	IE	6,741	5,047	12,496	3,616	3,241	3,395	1,088	422	595	420	454	369	0	153	31,296
9	DK	12,773	3,613	1,148	2,559	2,254	3,993	10,407	565	0	576	2,215	582	997	42	28,951
10	AT	32,750	4,096	1,726	9,796	3,030	1,969	1,108	446	789	0	570	608	359	194	24,691
11	FI	6,934	2,043	1,408	1,946	1,528	3,153	6,432	200	1,305	468	0	319	229	41	19,072
12	PT	4,453	4,143	1,074	1,353	9,139	1,255	381	0	235	177	232	123	171	35	18,318
13	LU	3,510	2,815	1,599	1,741	957	807	485	596	311	438	175	78	59	0	10,061
14	EL	1,879	732	214	1,860	666	358	160	94	127	134	98	0	68	4	4,515
	∑	355044	179360	119526	110395	110088	84753	41208	31039	25286	24564	20814	18937	13699	9986	
	|R1-R2|	0	1	1	1	1	4	0	4	0	0	0	2	5	1	20

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.8: Exports and Imports EU14 without Belgium year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	422751
2	NL	94,024	31,645	33,017	18,882	13,336	0	5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	221580
3	FR	61,391	0	32,751	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	209344
4	UK	39,794	42,451	0	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	190209
5	IT	42,964	38,211	19,758	0	23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	160369
6	ES	18,591	31,892	13,578	14,528	0	5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	107669
7	AT	32,750	4,096	4,142	9,796	3,030	1,969	0	1,108	789	359	446	570	608	194	59857
8	SE	11,454	5,764	8,332	3,918	3,595	5,529	1,102	0	8,068	664	577	7,025	603	76	56707
9	DK	12,773	3,613	6,446	2,559	2,254	3,993	576	10,407	0	997	565	2,215	582	42	47022
10	IE	6,741	5,047	15,495	3,616	3,241	3,395	420	1,088	595	0	422	454	369	153	41036
11	FI	6,934	2,043	4,001	1,946	1,528	3,153	468	6,432	1,305	229	200	0	319	41	28599
12	PT	4,453	4,143	2,305	1,353	9,139	1,255	177	381	235	171	0	232	123	35	24002
13	LU	3,510	2,815	1,721	1,741	957	807	438	485	311	59	596	175	78	0	13693
14	EL	1,879	732	987	1,860	666	358	134	160	127	68	94	98	0	4	7167
	∑	337258	257356	207180	168371	159277	130354	73540	63289	42947	42399	40080	30821	25890	11243	
	|R1-R2|	0	1	1	1	1	4	0	0	0	0	1	1	1	1	12

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.5 Italy (IT)

Italy has similar an impact as Belgium with a bit different on member states. Italy is at the rank 5, and exporting (169784 Mio Euro) less than its imports (183474 Mio Euro) from the EU15. In the figure below when remove Italy from the EU15, it is appeared that the area of gap getting smaller by 6 points, which is mean that the entrance of Italy cause three country such as Ireland, Denmark and Spain move from far optimality by one point. On the other hand, Netherlands moves far from the optimality by two more points.

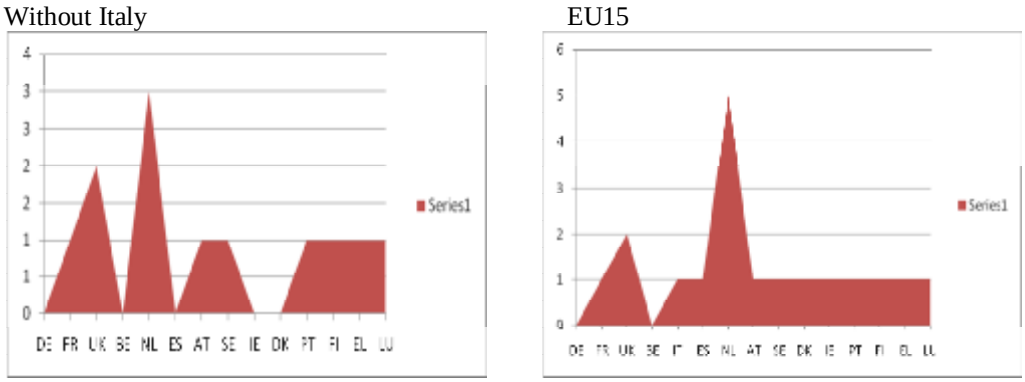


Figure 4.8: The Gaps Comparison between EU15 and without Italy in 2006

Source : The figures come from the tables 4.9, 4.4

The comparison of figures above shows that the structure of the matrix is better off without Italy, which possibly comes from the big but powerful industry other members in the EU have it, that changes the direction of its exports and imports to the out side of the EU15, instead of facing the market competitive in the intra- EU15 markets. Also that opens an opportunity in front of Italy's products to exports and imports from the extra-EU markets relatively the closer amounts of its trade with intra-EU15. See table (4-4) and (4-9).

Table 4.9: Exports and Imports EU14 without Italy year 2006 in Mio Euro

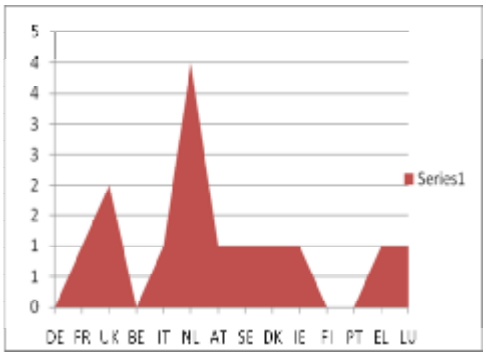
	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	NL	ES	AT	SE	IE	DK	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	46,689	56,264	41,672	49,491	18,767	5,834	14,336	7,382	9,216	6,669	4,361	410232
2	NL	94,024	31,645	33,017	51,524	0	13,336	5,180	6,723	3,336	4,699	2,731	3,939	2,678	1,390	254222
3	FR	61,391	0	32,751	28,621	15,879	37,974	3,689	5,029	2,710	2,910	4,887	1,910	3,294	1,825	202870
4	BE	57,580	49,359	23,073	0	34,981	10,737	2,977	4,262	2,372	2,311	1,747	1,877	1,868	5,489	198633
5	UK	39,794	42,451	0	19,180	24,318	18,254	2,462	7,576	25,238	5,636	3,406	2,668	2,152	2,385	195520
6	ES	18,591	31,892	13,578	4,979	5,634	0	1,407	1,638	1,047	1,362	15,173	731	1,908	180	98120
7	SE	11,454	5,764	8,332	5,322	5,529	3,595	1,102	0	664	8,068	577	7,025	603	76	58111
8	AT	32,750	4,096	4,142	1,726	1,969	3,030	0	1,108	359	789	446	570	608	194	51787
9	IE	6,741	5,047	15,495	12,496	3,395	3,241	420	1,088	0	595	422	454	369	153	49916
10	DK	12,773	3,613	6,446	1,148	3,993	2,254	576	10,407	997	0	565	2,215	582	42	45611
11	FI	6,934	2,043	4,001	1,408	3,153	1,528	468	6,432	229	1,305	200	0	319	41	28061
12	PT	4,453	4,143	2,305	1,074	1,255	9,139	177	381	171	235	0	232	123	35	23723
13	LU	3,510	2,815	1,721	1,599	807	957	438	485	59	311	596	175	78	0	13551
14	EL	1,879	732	987	214	358	666	134	160	68	127	94	98	0	4	5521
	∑	351874	268504	210495	175980	157535	146383	68521	64056	43084	42684	38226	31110	21251	16175	
	|R1-R2|	**0**	**1**	**2**	**0**	**3**	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**1**	**12**

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.6 Spain (ES)

Spain is also has relatively significant impact on the EU15 especially with its neighbor the Portugal as a border country. Entrance of Spain is causing a negative effect on the Portugal's position to be far from Pareto-Optimality with one point. On the other hand, Spain has caused the EU15 to be in far position from the optimality by more 4 points. And consequently the gap is getting bigger with its entrance.

Without Spain



EU15

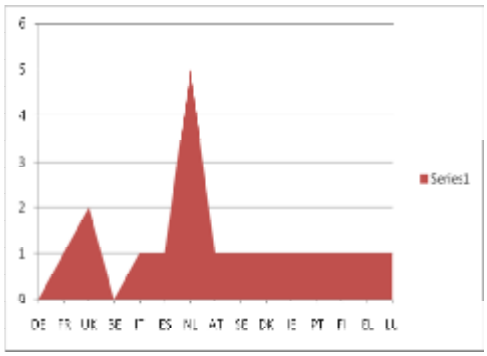


Figure 4.9: The Gaps Comparison between EU15 and without Spain in 2006

Source : The figures come from the tables 4.10, 4.4

Consider the figures (4-9) above, we will find the red gap relatively reduce from the size without Spain, especially the area near FI and PT, while other members keeping same gap and position. The reason behind these negative impacts of Spain, it comes possibly from the big deference between Spain's exports (112,648 Mio Euro) to its imports (170,014 Mio Euro). In fact, this deference causes the bigger change in the import ranks (R2) more than export Ranks (R1). That's clearer from the table (4-10).

Table 4.10: Exports and Imports EU14 without Spain year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	NL	AT	SE	DK	IE	FI	PT	EL	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	56,264	49,491	18,767	14,336	5,834	9,216	7,382	6,669	4,361	427768
2	NL	94,024	31,645	33,017	51,524	18,882	0	5,180	6,723	4,699	3,336	3,939	2,731	2,678	1,390	259768
3	FR	61,391	0	32,751	28,621	35,095	15,879	3,689	5,029	2,910	2,710	1,910	4,887	3,294	1,825	199991
4	BE	57,580	49,359	23,073	0	15,101	34,981	2,977	4,262	2,311	2,372	1,877	1,747	1,868	5,489	202997
5	UK	42,964	38,211	19,758	9,415	0	7,800	7,996	3,495	2,574	1,687	1,588	3,601	6,507	557	146153
6	IT	39,794	42,451	0	19,180	13,869	24,318	2,462	7,576	5,636	25,238	2,668	3,406	2,152	2,385	191135
7	SE	32,750	4,096	4,142	1,726	9,796	1,969	0	1,108	789	359	570	446	608	194	58553
8	AT	12,773	3,613	6,446	1,148	2,559	3,993	576	10,407	0	997	2,215	565	582	42	45916
9	IE	11,454	5,764	8,332	5,322	3,918	5,529	1,102	0	8,068	664	7,025	577	603	76	58434
10	DK	6,934	2,043	4,001	1,408	1,946	3,153	468	6,432	1,305	229	0	200	319	41	28479
11	FI	6,741	5,047	15,495	12,496	3,616	3,395	420	1,088	595	0	454	422	369	153	50291
12	PT	4,453	4,143	2,305	1,074	1,353	1,255	177	381	235	171	232	0	123	35	15937
13	LU	3,510	2,815	1,721	1,599	1,741	807	438	485	311	59	175	596	78	0	14335
14	EL	1,879	732	987	214	1,860	358	134	160	127	68	98	94	0	4	6715
	∑	376247	274823	216675	180416	168944	159701	75110	65913	43896	43724	31967	26654	25850	16552	
	|R1-R2|	0	1	2	0	1	4	1	1	1	1	0	0	1	1	14

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.7 Netherlands (NL)

Netherlands is the most critical member state in the EU15, however Netherlands has the second biggest exporter after Germany with (273,104 Mio Euro) while it has seventh rank from importer countries (165,335 Mio Euro), which is meaning that this country's exports is higher than its imports to the EU15. With this surplus trade balance to the EU15, causing a big odd impact that increases EU15 gap with optimality from 8 points without Netherlands to the 18 points far from optimality. Furthermore, entrance of Netherlands removes six member states from the Pareto-Optimality, such as; France, UK, Austria, Sweden, Ireland, and Denmark. As a result, entrance of Netherlands is increasing the gap with horizontal line of Pareto-Optimality, as we can see from the differences between the red areas of below figure.

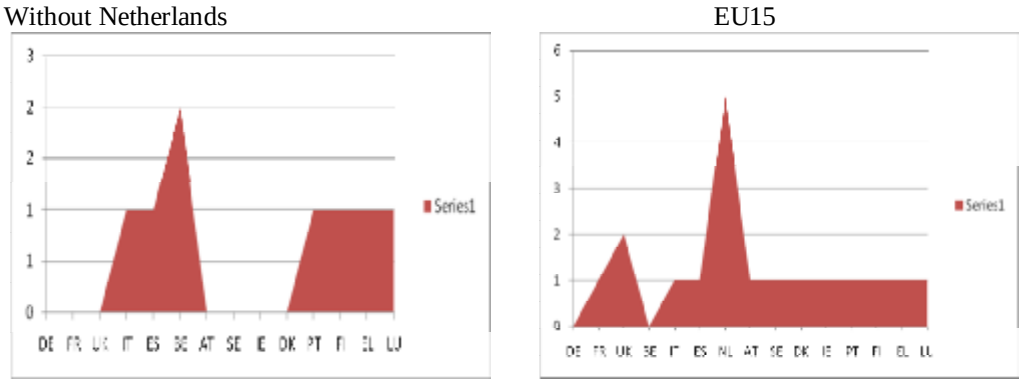


Figure 4.10: The Gaps Comparison between EU15 and without Netherlands in 2006

Source : The figures come from the tables 4.11, 4.4

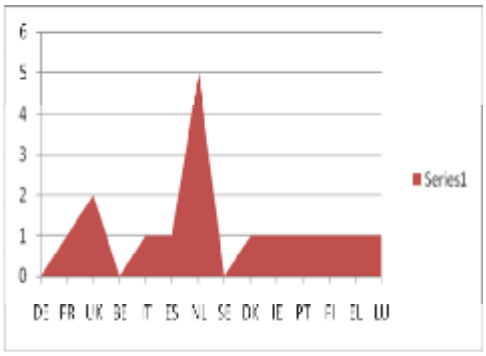
Let's consider the gaps in both figures above, without Netherlands the gap is reducing significantly, where the higher degree with horizontal line is only two points, and most of the members obtaining the Pareto-Optimality. These significant negative impacts of Netherlands' trade links with EU15, comes possibly from local market competitiveness for the imports come from intra-EU15 members. If you consider the extra-EU15 imports to the Netherlands in the table (4-4) you will find that its imports from the rest of the world twice than its exports to the outside of the EU15. This refers that Netherlands compensate needs of its markets by importing from the outside EU integration market, and it's destroying the structure of the matrices trade in the EU integration. The negative impacts of the Netherlands is effecting both of EU15

optimality and Netherlands also. But if we consider the table (4-10), which is show the structure of the EU14 trade, we will find that EU14 without Netherlands is reducing the size of most of the member's imports, and changing the rank of most of the members.

4.3.8 Austria (AT)

Entrance of Austria has no big effect as other member states have in the EU15 structure of the trade. Austria is moving EU15 far from optimality only by two more points, and makes Sweden not optimal by one point. That is maybe the only impact Austria has indirectly with the Sweden. Austria is exporting (61,583 Mio Euro) to the EU15 market relatively small size in comparison with other members mentioned above. While importing slightly more (76,517 Mio Euro), that's possibly the reason of small impact of Austria on the EU15 optimality.

Without Austria



EU15

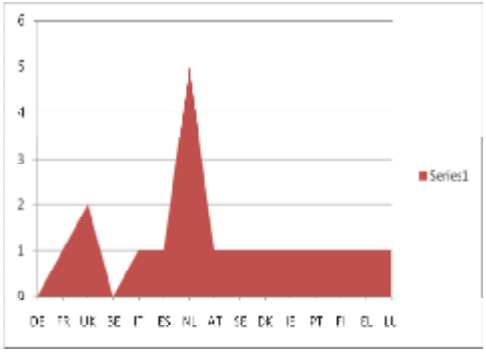


Figure 4.11: The Gaps Comparison between EU15 and without Austria in 2006

Source : The figures come from the tables 4.12, 4.4

Table 4.11: Exports and Imports EU14 without Netherland year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R!		DE	FR	UK	IT	ES	BE	AT	SE	IE	DK	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	59,208	41,672	46,689	49,491	18,767	5,834	14,336	7,382	9,216	6,669	4,361	413176
2	FR	61,391	0	32,751	35,095	37,974	28,621	3,689	5,029	2,710	2,910	4,887	1,910	3,294	1,825	222086
3	UK	39,794	42,451	0	13,869	18,254	19,180	2,462	7,576	25,238	5,636	3,406	2,668	2,152	2,385	185071
4	BE	57,580	49,359	23,073	15,101	10,737	0	2,977	4,262	2,372	2,311	1,747	1,877	1,868	5,489	178753
5	IT	42,964	38,211	19,758	0	23,631	9,415	7,996	3,495	1,687	2,574	3,601	1,588	6,507	557	161984
6	ES	18,591	31,892	13,578	14,528	0	4,979	1,407	1,638	1,047	1,362	15,173	731	1,908	180	107014
7	AT	32,750	4,096	4,142	9,796	3,030	1,726	0	1,108	359	789	446	570	608	194	59614
8	SE	11,454	5,764	8,332	3,918	3,595	5,322	1,102	0	664	8,068	577	7,025	603	76	56500
9	IE	6,741	5,047	15,495	3,616	3,241	12,496	420	1,088	0	595	422	454	369	153	50137
10	DK	12,773	3,613	6,446	2,559	2,254	1,148	576	10,407	997	0	565	2,215	582	42	44177
11	FI	6,934	2,043	4,001	1,946	1,528	1,408	468	6,432	229	1,305	200	0	319	41	26854
12	PT	4,453	4,143	2,305	1,353	9,139	1,074	177	381	171	235	0	232	123	35	23821
13	LU	3,510	2,815	1,721	1,741	957	1,599	438	485	59	311	596	175	78	0	14485
14	EL	1,879	732	987	1,860	666	214	134	160	68	127	94	98	0	4	7023
	∑	300814	275070	197236	164590	156678	133871	71337	60828	41435	40559	39096	28759	25080	15342	
	|R1-R2|	0	0	0	1	1	2	0	0	0	0	1	1	1	1	8

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.12: Exports and Imports EU14 without Austria year 2006 in Mio Euro

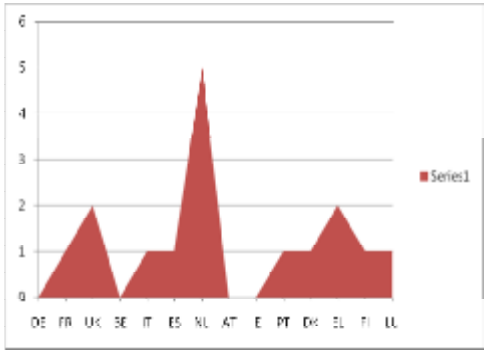
	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	SE	DK	IE	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	18,767	14,336	5,834	7,382	9,216	6,669	4,361	419949
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	6,723	4,699	3,336	2,731	3,939	2,678	1,390	267924
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	5,029	2,910	2,710	4,887	1,910	3,294	1,825	234276
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	4,262	2,311	2,372	1,747	1,877	1,868	5,489	210757
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	7,576	5,636	25,238	3,406	2,668	2,152	2,385	206927
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	3,495	2,574	1,687	3,601	1,588	6,507	557	161788
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,638	1,362	1,047	15,173	731	1,908	180	111241
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	0	8,068	664	577	7,025	603	76	60927
9	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	1,088	595	0	422	454	369	153	53112
10	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	10,407	0	997	565	2,215	582	42	47594
11	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	6,432	1,305	229	200	0	319	41	29539
12	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	381	235	171	0	232	123	35	24899
13	LU	3,510	2,815	1,721	1,599	1,741	957	807	485	311	59	596	175	78	0	14854
14	EL	1,879	732	987	214	1,860	666	358	160	127	68	94	98	0	4	7247
	∑	362088	302619	226111	183669	173676	166984	163366	66443	44469	44412	41381	32128	27150	16538	
	| R1-R2 |	0	1	2	0	1	1	5	0	1	1	1	1	1	1	16

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.9 Sweden (SE)

Sweden has similar effect as Austria, as they have relatively similar size of trade with EU15 (see table 4-4), with small effect on the EU15 only removing EU15 from optimality far by two more points, but at the same time has a big effect on the Finland as a border member and making it better off in the position in comparing with Greece, which will be better off as well as with one point closer from the optimality. As we can see from the figure below the red area is not changing with removing Sweden from the EU15.

Without Sweden



EU15

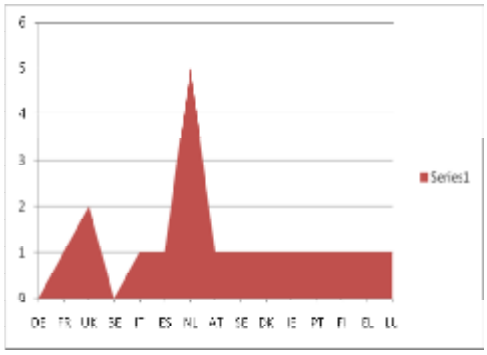


Figure 4.12: The Gaps Comparison between EU15 and without Sweden in 2006

Source : The figures come from the tables 4.13, 4.4

From the figures above we can realize that, Sweden has indirect impacts on the Greece through its impacts on position of Finland in the imports ranks getting more far, which indicate that most of the Finlands imports come from Sweden as the second biggest importer for Finland after Germany.

Table 4.13: Exports and Imports EU14 without Sweden year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	AT	IE	PT	DK	EL	FI	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	5,834	7,382	14,336	6,669	9,216	4,361	450673
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	3,336	2,731	4,699	2,678	3,939	1,390	266381
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	2,710	4,887	2,910	3,294	1,910	1,825	232936
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	2,372	1,747	2,311	1,868	1,877	5,489	209472
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	25,238	3,406	5,636	2,152	2,668	2,385	201813
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	1,687	3,601	2,574	6,507	1,588	557	166289
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,047	15,173	1,362	1,908	731	180	111010
8	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	359	446	789	608	570	194	60475
9	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	0	422	595	369	454	153	52444
10	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	997	565	0	582	2,215	42	37763
11	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	171	0	235	123	232	35	24695
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	229	200	1,305	319	0	41	23575
13	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	59	596	311	78	175	0	14807
14	EL	1,879	732	987	214	1,860	666	358	134	68	94	127	0	98	4	7221
	∑	383384	300951	221921	180073	179554	166419	159806	75415	44107	41250	37190	27155	25673	16656	
	|R1-R2|	0	1	2	0	1	1	5	0	0	1	1	2	1	1	16

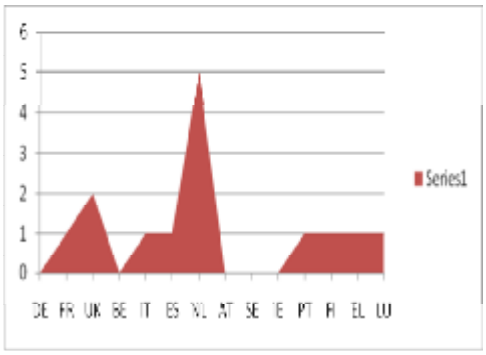
Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.10 Denmark (DM)

Denmark is not a big exporter to the EU15 with only (48,170 Mio Euro), also has relatively smaller imports (45,258 Mio Euro) from the EU15. That's why it is in the 10th from the importer ranks of the EU15 integration.

On the other hand, the impacts of the Denmark is not small on the Pareto-Optimality of the EU15, that is, when we remove Denmark from the structure of the EU15 trade, the red gap with the horizontal line in general will be closer to the optimality by four points, and three member states will be on the optimal position such as; Austria, Sweden, and Ireland. That is clearer from the figure (4-13).

Without Denmark



EU15

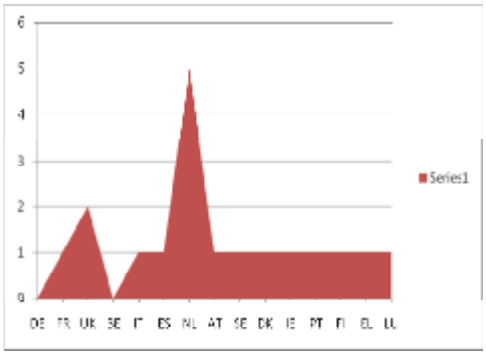


Figure 4.13: The Gaps Comparison between EU15 and without Denmark in 2006

Source : The figures come from the tables 4.14, 4.4

Table 4.14: Exports and Imports EU14 without Denmark year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	IE	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	5,834	7,382	9,216	6,669	4,361	455104
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	6,723	3,336	2,731	3,939	2,678	1,390	268405
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,710	4,887	1,910	3,294	1,825	235055
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	4,262	2,372	1,747	1,877	1,868	5,489	211423
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	7,576	25,238	3,406	2,668	2,152	2,385	203753
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	3,495	1,687	3,601	1,588	6,507	557	167210
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,638	1,047	15,173	731	1,908	180	111286
8	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	1,108	359	446	570	608	194	60794
9	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102	0	664	577	7,025	603	76	53961
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	0	422	454	369	153	52937
11	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	229	200	0	319	41	28702
12	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	171	0	232	123	35	24841
13	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	59	596	175	78	0	14981
14	EL	1,879	732	987	214	1,860	666	358	134	160	68	94	98	0	4	7254
	∑	382065	303102	223807	184247	180913	167760	161342	75941	57144	43774	41262	30483	27176	16690	
	| R1-R2 |	0	1	2	0	1	1	5	0	0	0	1	1	1	1	14

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.11 Ireland (IE)

Ireland has a very small effect on the EU15; even in 2006 its exports to the EU15 was (53,532 Mio Euro) and Import from the EU15 was equal to (44,771 Mio Euro), but in fact it has no effect on the optimality of the EU15, only small change like moving Denmark from the Pareto-Optimality position with its entrance, and making Italy far from optimality by one more point. While in the general EU15 without Ireland will not change any thing from its Pareto-Optimality as it stay at the same gap with 18 points.

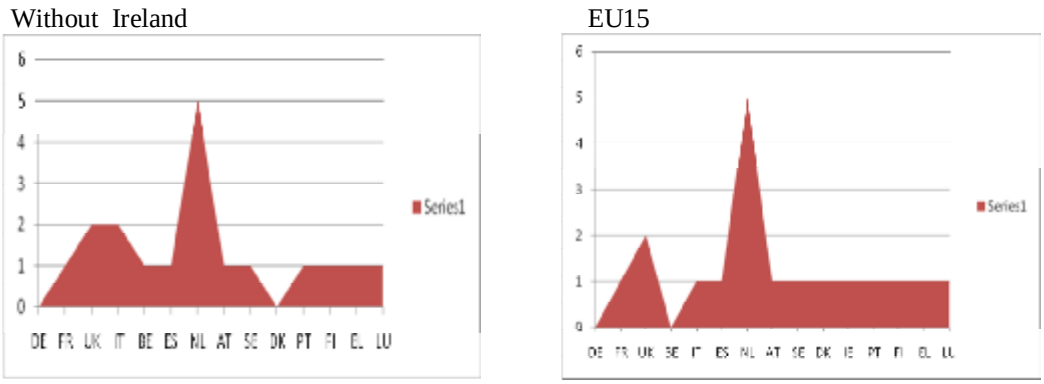


Figure 4.14: The Gaps Comparison between EU15 and without Ireland in 2006

Source : The figures come from the tables 4.15, 4.4

Table 4.15: Exports and Imports EU14 without Ireland year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	IT	BE	ES	NL	AT	SE	DK	PT	FI	EL	LU	∑
1	DE	0	84,904	64,647	59,208	46,689	41,672	56,264	49,491	18,767	14,336	7,382	9,216	6,669	4,361	463606
2	NL	94,024	31,645	33,017	18,882	51,524	13,336	0	5,180	6,723	4,699	2,731	3,939	2,678	1,390	269768
3	FR	61,391	0	32,751	35,095	28,621	37,974	15,879	3,689	5,029	2,910	4,887	1,910	3,294	1,825	235255
4	BE	57,580	49,359	23,073	15,101	0	10,737	34,981	2,977	4,262	2,311	1,747	1,877	1,868	5,489	211362
5	UK	39,794	42,451	0	13,869	19,180	18,254	24,318	2,462	7,576	5,636	3,406	2,668	2,152	2,385	184151
6	IT	42,964	38,211	19,758	0	9,415	23,631	7,800	7,996	3,495	2,574	3,601	1,588	6,507	557	168097
7	ES	18,591	31,892	13,578	14,528	4,979	0	5,634	1,407	1,638	1,362	15,173	731	1,908	180	111601
8	SE	11,454	5,764	8,332	3,918	5,322	3,595	5,529	1,102	0	8,068	577	7,025	603	76	61365
9	AT	32,750	4,096	4,142	9,796	1,726	3,030	1,969	0	1,108	789	446	570	608	194	61224
10	DK	12,773	3,613	6,446	2,559	1,148	2,254	3,993	576	10,407	0	565	2,215	582	42	47173
11	FI	6,934	2,043	4,001	1,946	1,408	1,528	3,153	468	6,432	1,305	200	0	319	41	29778
12	PT	4,453	4,143	2,305	1,353	1,074	9,139	1,255	177	381	235	0	232	123	35	24905
13	LU	3,510	2,815	1,721	1,741	1,599	957	807	438	485	311	596	175	78	0	15233
14	EL	1,879	732	987	1,860	214	666	358	134	160	127	94	98	0	4	7313
	∑	388097	301668	214758	179856	172899	166773	161940	76097	66463	44663	41405	32244	27389	16579	
	|R1-R2|	0	1	2	2	1	1	5	1	1	0	1	1	1	1	18

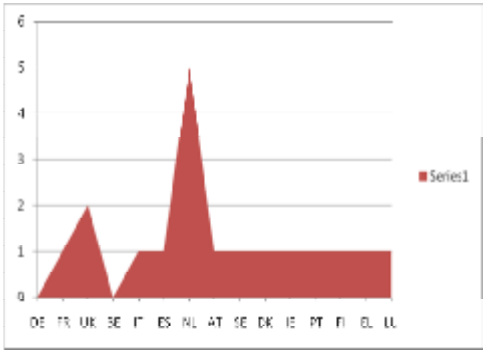
Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

4.3.12 Last Four Members (FI) (PT) (EL) (LU)

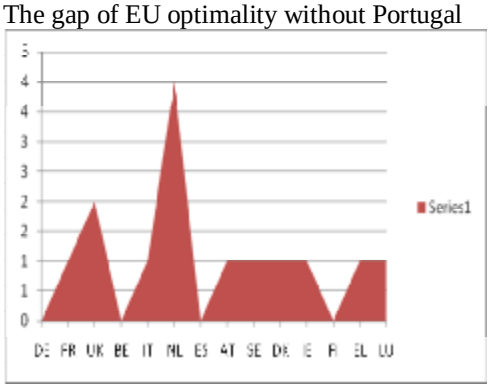
The last four Members have nearly similar impacts on the EU15. Portugal and Finland have the shape of the gap is very similar only replace each other. Maybe the other deference the study found is that without Portugal Spain will be in the position of Pareto-Optimality, and then the EU15 will be closer from the optimality by 14 points instead of 18 points. While the case with other two members Luxembourg and Greece is completely similar, only replacing each other from the EU15. And the four members are far from the optimality by one point for each of them.

For analyzing the case with Luxembourg is not hard to understand why it is in the end of the EU15, because they are small country has very small trade balance. But Greece is the bigger country in comparison with Luxembourg and should have better position the EU15. The only reason for analyzing the position of Greece is; that Greece has very big trade relationship with outside of EU15 bigger than intra trade as we can see this from the table (4-4). That's why all four members have very small effect on the optimality of EU15. As it can be realize from the figures and tables below.

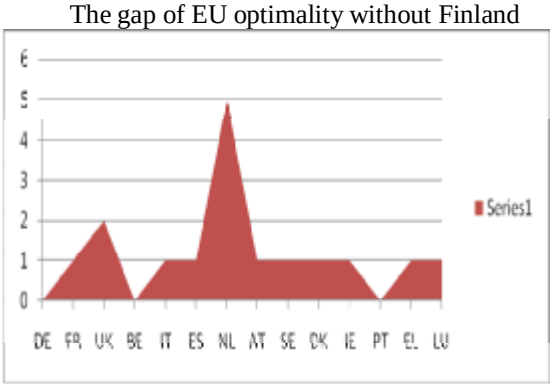
EU15



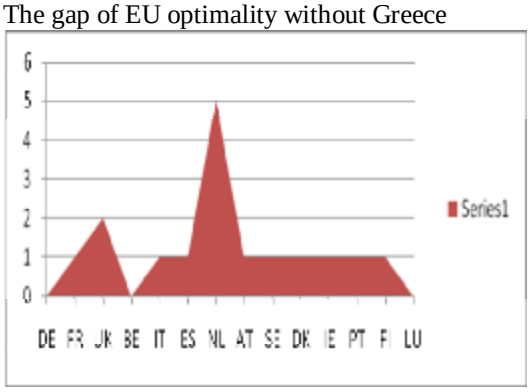
The gap of EU optimality without Portugal



The gap of EU optimality without Finland



The gap of EU optimality without Greece



The gap of EU optimality without Luxembourg

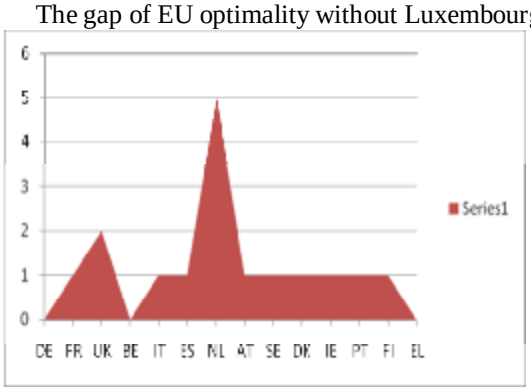


Figure 4.15: The Gaps Comparison between EU15 and without each of PT, FI, EL, and LU

Source : The figures come from the tables in Apendex (B), Talble 1, 2, 3, 4 and 4.4

4.4 Over All Analyses

The Model has used here shows that EU-15 was not obtaining the optimality over the last decade, as it's shown from the table (4-16), that most of the member states were not optimizing during (2000-2006), the only exception was Germany which has kept the

Pareto-Optimal positions over the time, and leading EU- trade in first rank as exporter and also as the biggest importer, this indicates that Germany is integrated optimally and exporting to the markets of the EU15 more than its extra -exports to the rest of the world and also importing from the other partners more than its imports from the outside of the EU15. This result is indicating that Germany is important for the EU integration as the producer power and also as a big market for other members to export to it.

While Netherlands with its big gaps of the Pareto-Optimality over the years, even it has the second rank of the exporter to the EU15 markets. These gaps indicate that NL was not integrated as well as other partners did in the EU15. Netherlands as an economy in the EU15 has not balances its direct relationships with other members in the union, in proportion to it size. That's why can not obtain a higher or better off position in the integration (Second Axiom). Netherlands was exporting to the EU15 markets more than importing from them, on the other hand, Netherlands were importing from outside EU15 twice than its imports from the EU15.

France and Belgium, show that they are integrated well even they couldn't get better ranks, but their trade with EU15 more than with extra-EU15, and consuming of locally produced is low, as we can see in the table (4-16), France was in the optimal rank at the beginning of the decade, only in the 2006 not optimizing by one point, possibly this not optimization comes indirectly from negative effect of Netherlands in this year. The case is similar with Belgium but it was not optimizing in year 2000 only, might be the reason behind this was unbalanced trade of Italy in this year.

The other members, such as; UK, Italy, Spain, Austria, Sweden, and Denmark, they kept the normal positions and the indicators of Pareto-Optimality are normal relatively. UK and Sweden suffering from market competitive because they are out of Euro area, their exports facing hard competitive from this area, while their markets are integrated well and open for all other members' exports. The tables (4-2,3,4) shows respectively that UK and Sweden had deficit trade balance with EU every years due to this market competitiveness. Spain has gotten optimal ranks until 2006 and they have normal position in the EU15,

The rest five members in the end of the list they have exactly the same situations with respect of the ranks, they were not showing any improvements during (2000-2006), and exceptionally Portugal is closing year by year from the Pareto-Optimality relatively every year. Greece was not integrated into EU15 integration as it should be, and it was importing from the other countries outside EU15 more than its imports from the EU15,

that effects its position stay at the end of the list, also its importance or dependency is low for the EU15. See the figure (4-16) for more details.

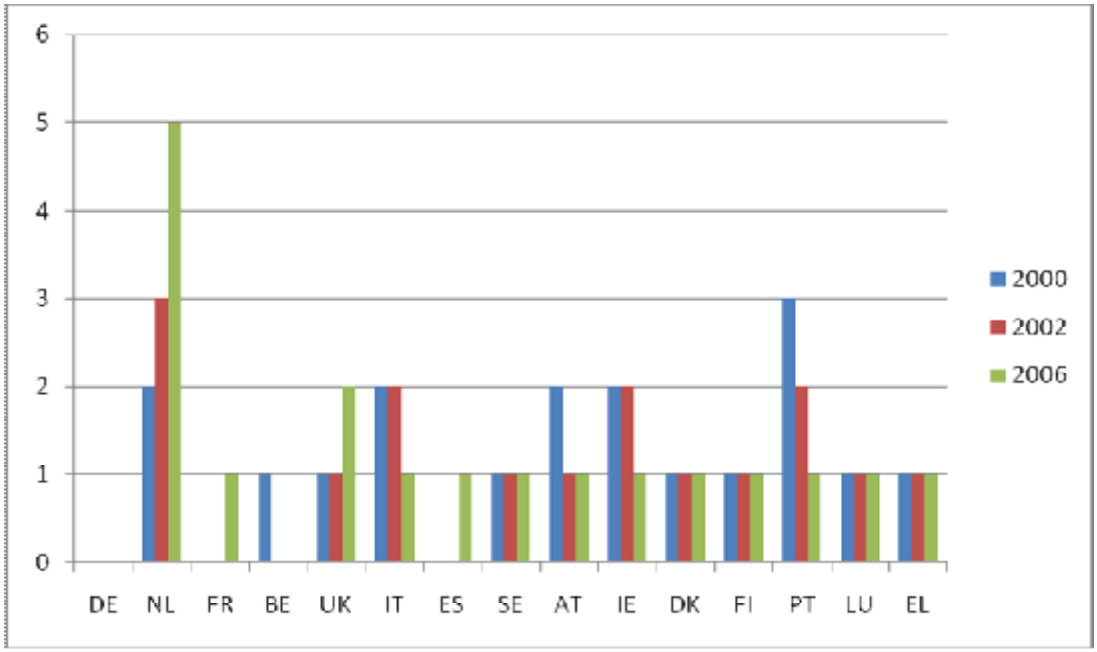


Figure 4.16: The Gaps of the Pareto- Optimality of EU15 in (2000-2006)

Source : The figure comes from the tables 4.20

Table 4.16: Overview of the Model EU15 (2000-2006)

	trade EU15 in 2006 in million Euro				Rank in EU15								
					2000			2002			2006		
Members	**Export Intra-EU15**	**Export Extra-EU15**	**Import Intra- EU15**	**Import Extra- EU15**	**R1**	**R2**	**|R1-R2|**	**R1**	**R2**	**|R1-R2|**	**R1**	**R2**	**|R1-R2|**
DE	469,440	355,049	394,838	355,151	1	1	**0**	1	1	**0**	1	1	**0**
NL	273,104	93,197	165,335	177,826	3	5	**2**	3	6	**3**	2	7	**5**
FR	237,965	143,096	306,715	151,384	2	2	**0**	2	2	**0**	3	2	**1**
BE	213,734	150,804	185,395	87,142	5	6	**1**	5	5	**0**	4	4	**0**
UK	209,389	143,614	230,253	218,367	4	3	**1**	4	3	**1**	5	3	**2**
IT	169,784	138,673	183,472	173,360	6	4	**2**	6	4	**2**	6	5	**1**
ES	112,648	51,824	170,014	108,907	7	7	**0**	7	7	**0**	7	6	**1**
SE	62,029	53,305	67,551	38,014	8	9	**1**	10	9	**1**	8	9	**1**
AT	61,583	49,941	76,517	35,897	10	8	**2**	9	8	**1**	9	8	**1**
IE	53,532	51,604	44,771	19,526	9	11	**2**	8	10	**2**	10	11	**1**
DK	48,170	23,056	45,258	23,210	11	12	**1**	11	12	**1**	11	10	**1**
FI	30,007	27,833	32,698	23,392	12	13	**1**	12	13	**1**	12	13	**1**
PT	25,076	11,983	41,827	14,268	13	10	**3**	13	11	**2**	13	12	**1**
LU	15,292	6,858	16,732	6,599	14	15	**1**	14	15	**1**	14	15	**1**
EL	7,381	18,622	27,758	24,322	15	14	**1**	15	14	**1**	15	14	**1**

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.17: Exports, Imports, GDP and Consuming Locally Produced in EU25. 2006 Billion Euros

Countries	Total Exports	Total Imports	GDP	Consuming of locally produce
EU-27	1,159	1,352	11,641	
Euro area	1,384	1,392	8,499	5,723
Belgium	292.2	280.3	317	-256
Czech Republic	75.6	74.2	113	-36
Denmark	73.7	68.1	220	78
Germany	882.5	722.1	2,322	717
Estonia	7.7	10.7	13	-5
Ireland	86.6	58.2	175	30
Greece	16.5	50.7	214	147
Spain	170.2	261.8	982	550
France	394.9	431.6	1,807	981
Italy	332.0	352.5	1,480	796
Cyprus	1.1	5.5	15	8
Latvia	4.9	9.2	16	2
Lithuania	11.3	15.4	24	-3
Luxembourg	18.2	21.2	34	-6
Hungary	59.9	62.3	90	-32
Malta	2.1	3.2	5	0
Netherlands	369.3	332.0	540	-161
Austria	108.9	109.3	257	39
Poland	88.2	101.1	272	83
Portugal	34.5	53.1	155	68
Slovenia	18.5	19.2	30	-7
Slovakia	33.3	35.7	45	-24
Finland	61.5	55.3	167	50
Sweden	117.7	101.6	313	94
United Kingdom	357.3	479.0	1,913	1,076

Source: Eurostat, Economic indicators EU27, 2009

5 Entrance of New Member States

This chapter of the application part is concentrate also on the application of the model of the optimality on the new member states entry. Through some sections illustrate the two type of members one have impacts on the EU optimality, while the second group are without impacts. And in the final section is evaluating the impacts of all ten new members together.

5.1 EU-10 Basic Indicators

The accession of ten new countries on 1 May 2004 constitutes a crucial stage in the construction of the European Union. This enlargement is the biggest ever in absolute terms -adding 74 million inhabitants to the population of the Union, which now totals 455 million-and involves countries whose demographic regime differs markedly from that of the fifteen existing member countries. In eight of the ten new member countries-those of central and eastern Europe-population growth is negative or very low, and their fundamental demographic characteristics are reminder that these countries belong to a region of the continent which was long regarded as "different". In some respects this is a novel situation. Hitherto, the countries that joined the European Economic Community (EEC) and the European Union (EU) had, even before their accession, reduced the difference relative to the existing member countries. The immediate effect of this enlargement of the Union will be to rejuvenate the community population but also to slow down its growth[71].

71 Alain Monnier and Godfrey I. Rogers. (2004) " The European Union at the Time of Enlargement," (Population English Edition, 2002-), Vol. 59, No. 2, pp. 315-336

Table 5.1: Basic Indicator for the New Member-States, 2005

Countries	population M	GDP, € Billion	GDP growth, Percent	Inflation, Percent	GDP per head, Percent of EU Average at PPP
Poland	**38.1**	**240.5**	**3.2**	**2.2**	**46.2**
Czech R	**10.2**	**98.4**	**4.9**	**1.9**	**65.6**
Hungary	**10.0**	**87.8**	**4.2**	**3.6**	**59.2**
Slovakia	**5.4**	**37.3**	**5.5**	**2.7**	**56.9**
Lithuania	**3.4**	**20.0**	**6.7**	**2.7**	**51.5**
Latvia	**2.3**	**12.8**	**9.8**	**6.7**	**46.3**
Slovenia	**2.0**	**27.4**	**3.9**	**2.5**	**82.8**
Estonia	**1.3**	**10.3**	**9.1**	**4.1**	**58.5**
Cyprus	**0.8**	**13.4**	**3.7**	**2.6**	**77.2**
Malta	**0.4**	**4.5**	**1.0**	**3.0**	**67.8**
EU 25	**459.0**	**10,793.8**	**1.5**	**2.1**	**100.0**

Source: Barysch, K "Enlargement two years on: Economic Success or Political Failure?"

5.2 Entrance of New Member States

For analyzing the influence size made by 10- new member states on the EU optimality, as it was expecting at the beginning, the effects are very small or some of the member has no impacts at all on trade structure of the EU15 member states, the reason is; they have relatively small trade size with the EU15 or even with EU25. Although some of the members have better influence on the EU trade optimality, and they made relatively changes on the EU25 optimality. Thereby, the thesis can divide 10- new member states into two main groups, according to their size of effects they made with their entrance to the EU integration:

5.2.1 Members Have Relatively Impacts

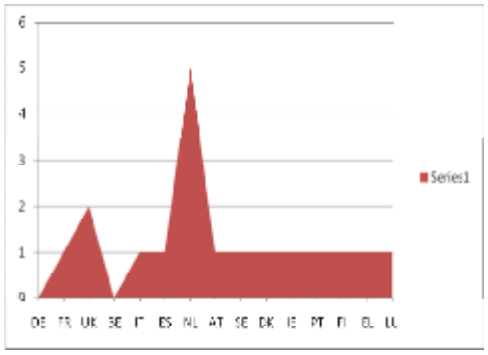
There are five of the new member states have relatively effects on the EU15 trade optimality. They are; Czech Republic, Poland, Hungary, Slovakia, and Slovenia. Of course they have deferent level of impacts and in the deferent directions, but as we found that all five countries have made deferent changes in the shape of the Pareto-optimality gap.

Czech Republic is one of the new member has a significant effect on the EU optimality gap. The shape of the gap has changed definitely, as we can see from the difference which appears between gap with Czech entrance and EU15 the figures of (5-1). The

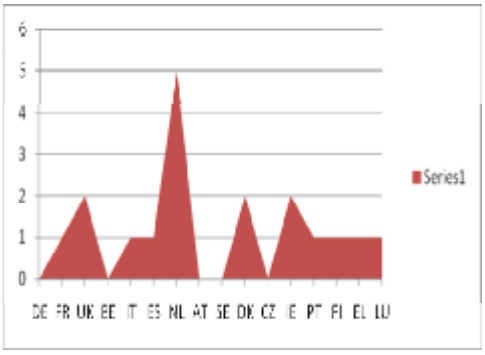
reason of the big change is due to the big size of Czech trade with EU15. In 2006 Czech Republic has exported to the EU15 (49,618 Mio Euro), that is bigger than the export values of the five old members, such as Ireland, Portugal, Finland, Greece, and Luxembourg. Czech has the position of 11th out of 16. At the same time has imports from the EU15 (45,392 Mio Euro), also at the same position of eleventh. In other words Czech Republic is in the position of Pareto-optimal, without to change the optimality of the EU15 as a general at the 18 points.

The entrance of Czech Republic in 2004 has also effected the position of some of the old members, due to its significant trade relation, such as Austria and Sweden, has gotten an optimal position in the EU15.

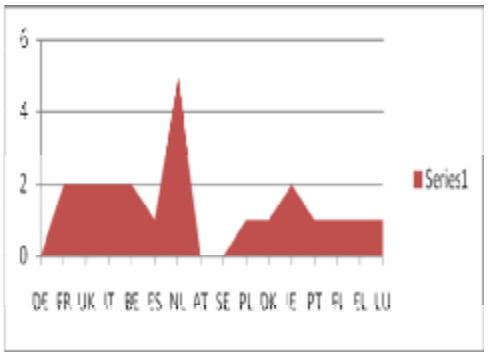
EU15 Gap before entrance new member



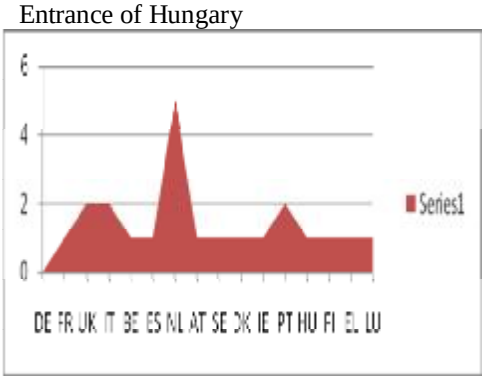
Entrance of Czech



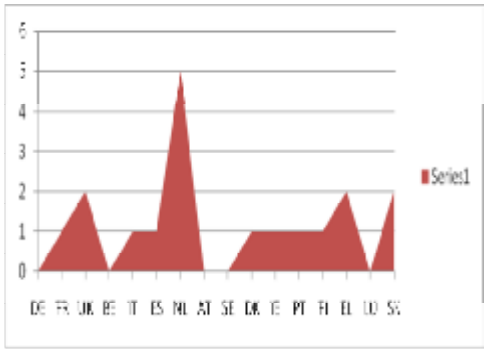
Entrance of Poland



Entrance of Hungary



Entrance of Slovakia



Entrance of Slovenia

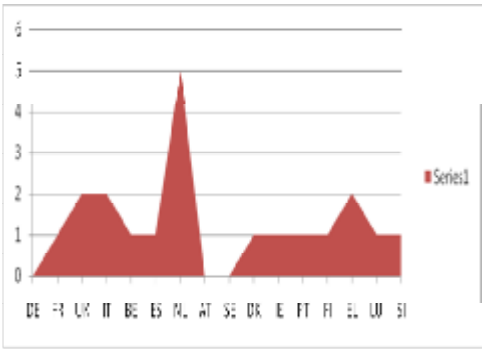


Figure 5.1 The Gaps Comparison between EU15 and with Entrance of each CZ, PL, HU, SK, and SL

Source : The figures come from the tables 4.4, 5.2, 5.3, 5.4, 5.5, 5.6

Poland is the biggest country as area and population from the new member states, and it has also a significant effect on the EU integration. With its entrance; the shape of the optimality gap has changed. We can see this effect clearly from the differences between two figures of gaps (5-1). The exports from Poland to the EU15 in 2006 was (56,164 Mio Euro) which is bigger than exports from each of Ireland, Portugal, Finland, Greece, and Luxembourg. Poland got the eleventh position in the EU15, but without achieving the Pareto-Optimality, because its imports (66,785 Mio Euro) from the EU15 in the

same year were bigger than its exports, and it was in the better position 10th from the EU15 importer.

Hungary has effects also on the EU15 integration, but of course, not at the same level of Czech and Poland. Entrance of Hungary has changed the shape of the Pareto-Optimality gap in slight deferent way. If we make a comparison between gap with entrance of Hungary and EU15 in figure (5-1) we find that there are no big change in the shape only makes Italy and Portugal be far from optimality by one more points for each, also Belgium remove from optimality by one point too. While Hungary got 13th rank as a position in the EU15 in the imports and far from optimality by one points due to differences between its exports and imports. Nearly half of the Hungarian exports go to the Germany, while half of its imports come from Belgium, that's why the changes happen in the position of Belgium and Italy. The most significant effect of the Hungry was adding to the not optimality of the EU15 by more 4 points.

The other two new members in this group, are Republic of Slovakia and Slovenia, they have very small effects on the EU15 integration. Although if we consider the two figures of gaps of each country entrance Slovakia and Slovenia respectively, and compare them with the figure of gap of EU15, we will find no big changes has happened after entrance of this two countries. Slovakia exporting to the EU15 relatively small value (19,154 Mio Euro), while importing even less than this amount (15,092 Mio Euro), that is why it takes the last position of the EU15 importers ranks. While Slovenia as a smaller member from this group is exporting (10395 Mio Euro) to the EU15, and importing relatively more (12,143Mio Euro), see table (5-1).

As a general entrance of Slovakia didn't make any change to the EU15 optimality but, the country itself far from the Pareto-Optimality by two points, while makes other two members (Austria and Sweden) in the better position of the Pareto- optimality.

Slovenia even it is smaller than Slovakia, has relatively a big effects on the EU15 optimality but in other direction of Slovakia. Which entrance of Slovenia is moving the EU15 far from Pareto-Optimality by two more points, in the same time makes two other members (Austria and Sweden) better off in the position of the Pareto-Optimality, and makes three other members (Italy, Belgium, and Greece) worse off in the position far of optimality by one more points. That's shown clearly from the Figure (5-1).

The increasing of the red gap with horizontal lines in figures (5-1), comes from indirect impacts Slovenia has on the EU15 trade structure. Slovenia's trade links with old members in the EU15 is very small to have directly these big impacts. But entrance of

Slovenia makes some of the small members in the EU15 change their position and indirectly makes all this impacts on the Pareto-Optimality. That's exactly what the Axiom three in this study was set up for, *No one can be better off without to make some other worse off.* For instance Italy has very small trade links with Slovenia, its exporting to this new member only (24 Mio Euro) and importing from Slovenia (2,289 Mio Euro), which makes Italy move one ranks better off in the importer ranks while Belgium because of small amount of imports from Slovenia (205 Mio Euro) only, get far from importer ranks to be in the 5th rank instead of 4th. This interchange between Italy and Belgium is behind all this change in the structure of EU15 Optimality.

Table 5.2: Entrance of Czech R. to the EU and its Impacts on the EU15 Trade Optimality

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	CZ	IE	PT	FI	EL	LU	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	4,985	5,834	7,382	9,216	6,669	4,361	474425
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,449	3,336	2,731	3,939	2,678	1,390	276553
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	719	2,710	4,887	1,910	3,294	1,825	238684
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	22,496	2,372	1,747	1,877	1,868	5,489	236230
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	2,130	25,238	3,406	2,668	2,152	2,385	211519
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	354	1,687	3,601	1,588	6,507	557	170138
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	83	1,047	15,173	731	1,908	180	112731
8	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	3,142	359	446	570	608	194	64725
9	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	1,193	664	577	7,025	603	76	63222
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595	3,226		422	454	369	153	56758
11	CZ	24,134	4,146	3,618	2,173	3,500	2,034	2,709	3,870	1,240	724		321	290	437	327	95	49618
12	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		163	997	565	2,215	582	42	48333
13	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	127	229	200		319	41	30134
14	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	323	171		232	123	35	25399
15	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	699	59	596	175	78		15991
16	EL	1,879	732	987	214	1,860	666	358	134	160	127	2,303	68	94	98		4	9684
	∑	418,972	310,861	233,871	187,568	186,972	172,048	168,044	80,387	68,791	45,982	45,392	45,092	42,117	33,135	28,085	16,827	
	|R1-R2|	0	1	2	0	1	1	5	0	0	2	0	2	1	1	1	1	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 5.3: Entrance of Hungary to the EU and its Impacts on the EU15 Trade Optimality

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	IT	BE	ES	NL	AT	SE	DK	IE	PT	HU	FI	EL	LU	∑
1	DE		84,904	64,647	59,208	46,689	41,672	56,264	49,491	18,767	14,336	5,834	7,382	2,766	9,216	6,669	4,361	472,206
2	NL	94,024	31,645	33,017	18,882	51,524	13,336		5,180	6,723	4,699	3,336	2,731	3,707	3,939	2,678	1,390	276,811
3	FR	61,391		32,751	35,095	28,621	37,974	15,879	3,689	5,029	2,910	2,710	4,887	387	1,910	3,294	1,825	238,352
4	BE	57,580	49,359	23,073	15,101		10,737	34,981	2,977	4,262	2,311	2,372	1,747	16,032	1,877	1,868	5,489	229,766
5	UK	39,794	42,451		13,869	19,180	18,254	24,318	2,462	7,576	5,636	25,238	3,406	1,391	2,668	2,152	2,385	210,780
6	IT	42,964	38,211	19,758		9,415	23,631	7,800	7,996	3,495	2,574	1,687	3,601	235	1,588	6,507	557	170,019
7	ES	18,591	31,892	13,578	14,528	4,979		5,634	1,407	1,638	1,362	1,047	15,173	67	731	1,908	180	112,715
8	SE	32,750	4,096	4,142	9,796	1,726	3,030	1,969		1,108	789	359	446	2,699	570	608	194	64,282
9	AT	11,454	5,764	8,332	3,918	5,322	3,595	5,529	1,102		8,068	664	577	844	7,025	603	76	62,873
10	IE	6,741	5,047	15,495	3,616	12,496	3,241	3,395	420	1,088	595		422	3,227	454	369	153	56,759
11	DK	12,773	3,613	6,446	2,559	1,148	2,254	3,993	576	10,407		997	565	69	2,215	582	42	48,239
12	HU	17,517	2,963	2,649	3,348	1,162	2,014	1,825	2,954	655	368	274	346		338	318	25	36,756
13	FI	6,934	2,043	4,001	1,946	1,408	1,528	3,153	468	6,432	1,305	229	200	140		319	41	30,147
14	PT	4,453	4,143	2,305	1,353	1,074	9,139	1,255	177	381	235	171		413	232	123	35	25,489
15	LU	3,510	2,815	1,721	1,741	1,599	957	807	438	485	311	59	596	492	175	78		15,784
16	EL	1,879	732	987	1,860	214	666	358	134	160	127	68	94	1,228	98		4	8,609
	∑	412,355	309,678	232,902	186,820	186,557	172,028	167,160	79,471	68,206	45,626	45,045	42,173	33,697	33,036	28,076	16,757	
	|R1-R2|	0	1	2	2	1	1	5	1	1	1	1	2	1	1	1	1	22

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 5.4: Entrance of Poland to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	IT	BE	ES	NL	AT	SE	PL	DK	IE	PT	FI	EL	LU	∑
1	DE		84,904	64,647	59,208	46,689	41,672	56,264	49,491	18,767	5,554	14,336	5,834	7,382	9,216	6,669	4,361	474994
2	NL	94,024	31,645	33,017	18,882	51,524	13,336		5,180	6,723	2,491	4,699	3,336	2,731	3,939	2,678	1,390	275595
3	BE	57,580	49,359	23,073	15,101		10,737	34,981	2,977	4,262	29,015	2,311	2,372	1,747	1,877	1,868	5,489	242749
4	FR	61,391		32,751	35,095	28,621	37,974	15,879	3,689	5,029	1,506	2,910	2,710	4,887	1,910	3,294	1,825	239471
5	UK	39,794	42,451		13,869	19,180	18,254	24,318	2,462	7,576	3,704	5,636	25,238	3,406	2,668	2,152	2,385	213093
6	IT	42,964	38,211	19,758		9,415	23,631	7,800	7,996	3,495	409	2,574	1,687	3,601	1,588	6,507	557	170193
7	ES	18,591	31,892	13,578	14,528	4,979		5,634	1,407	1,638	187	1,362	1,047	15,173	731	1,908	180	112835
8	AT	32,750	4,096	4,142	9,796	1,726	3,030	1,969		1,108	6,981	789	359	446	570	608	194	68564
9	SE	11,454	5,764	8,332	3,918	5,322	3,595	5,529	1,102		1,843	8,068	664	577	7,025	603	76	63872
10	IE	6,741	5,047	15,495	3,616	12,496	3,241	3,395	420	1,088	6,859	595		422	454	369	153	60391
11	PL	23,957	5,502	5,040	5,765	2,440	2,193	3,393	1,619	2,831		1,740	290	422	597	310	65	56164
12	DK	12,773	3,613	6,446	2,559	1,148	2,254	3,993	576	10,407	299		997	565	2,215	582	42	48469
13	FI	6,934	2,043	4,001	1,946	1,408	1,528	3,153	468	6,432	224	1,305	229	200		319	41	30231
14	PT	4,453	4,143	2,305	1,353	1,074	9,139	1,255	177	381	1,251	235	171		232	123	35	26327
15	LU	3,510	2,815	1,721	1,741	1,599	957	807	438	485	2,380	311	59	596	175	78		17672
16	EL	1,879	732	987	1,860	214	666	358	134	160	4,082	127	68	94	98		4	11463
	∑	418,795	312,217	235,293	189,237	187,835	172,207	168,728	78,136	70,382	66,785	46,998	45,061	42,249	33,295	28,068	16,797	
	|R1-R2|	0	2	2	2	2	1	5	0	0	1	1	2	1	1	1	1	22

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 5.5: Entrance of Slovakia to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	SK	Σ
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	787	470227
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	1,850	274954
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	153	238118
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	7,630	221364
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	666	210055
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	45	169829
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	29	112677
8	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	1,107	62690
9	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	450	62479
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	1,548	55080
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	53	48223
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	47	30054
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	107	25183
14	SK	7,806	1,436	1,290	618	2,170	944	1,413	2,016	457	289	76	62	362	182	33		19154
15	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		217	15509
16	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	403	7784
	Σ	402,644	308,151	231,543	186,013	185,642	170,958	166,748	78,533	68,008	45,547	44,847	41,889	33,060	27,940	16,765	15,092	
	|R1-R2|	0	1	2	0	1	1	5	0	0	1	1	1	1	2	0	2	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 5.6: Entrance of Slovenia to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	IT	BE	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	SI	∑
1	DE		84,904	64,647	59,208	46,689	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	654	470094
2	NL	94,024	31,645	33,017	18,882	51,524	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	2,009	275113
3	FR	61,391		32,751	35,095	28,621	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	88	238053
4	BE	57,580	49,359	23,073	15,101		10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	3,490	217224
5	UK	39,794	42,451		13,869	19,180	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	412	209801
6	IT	42,964	38,211	19,758		9,415	23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	24	169808
7	ES	18,591	31,892	13,578	14,528	4,979		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	201	112849
8	AT	32,750	4,096	4,142	9,796	1,726	3,030	1,969		1,108	789	359	446	570	608	194	1,297	62880
9	SE	11,454	5,764	8,332	3,918	5,322	3,595	5,529	1,102		8,068	664	577	7,025	603	76	442	62471
10	IE	6,741	5,047	15,495	3,616	12,496	3,241	3,395	420	1,088	595		422	454	369	153	2,916	56448
11	DK	12,773	3,613	6,446	2,559	1,148	2,254	3,993	576	10,407		997	565	2,215	582	42	46	48216
12	FI	6,934	2,043	4,001	1,946	1,408	1,528	3,153	468	6,432	1,305	229	200		319	41	28	30035
13	PT	4,453	4,143	2,305	1,353	1,074	9,139	1,255	177	381	235	171		232	123	35	111	25187
14	LU	3,510	2,815	1,721	1,741	1,599	957	807	438	485	311	59	596	175	78		140	15432
15	SI	3,538	1,156	472	2,289	205	331	243	1,559	168	178	26	60	53	61	56		10395
16	EL	1,879	732	987	1,860	214	666	358	134	160	127	68	94	98		4	285	7666
	∑	398,376	307,871	230,725	185,761	185,600	170,345	165,578	78,076	67,719	45,436	44,797	41,887	32,751	27,819	16,788	12,143	
	|R1-R2|	0	1	2	2	1	1	5	0	0	1	1	1	1	2	1	1	20

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

5.2.2 Members Have No Impacts

The second group of countries does not have any effects on the EU15, and they don't make any changes in the optimality of the EU integration or even in the order of the countries. These new members are; Estonia, Malta, Lithuania, Latvia and Cyprus. Due to their economies size they have relatively small trade links (export- import) with the old members of EU15. With their entrance they have similar shape of the optimality gaps; the only thing they add is one optimal member to the end of the gap.

These five countries also has common deficit trade balance with EU15, all five members have bigger imports than exports. This gap indicates that this group of new members has relatively small industry power, their products facing kind of market competitive, which can not find significant space in the EU markets. On the other hand, their markets have small capacity to increase the imports from the EU15.

That is possibly needs a long period of time to free up from this competitive. Also these members are in luck of a significant economic skill to improve the quality of the products, with keeping costs in the low level in the markets. As we can see from the table below;

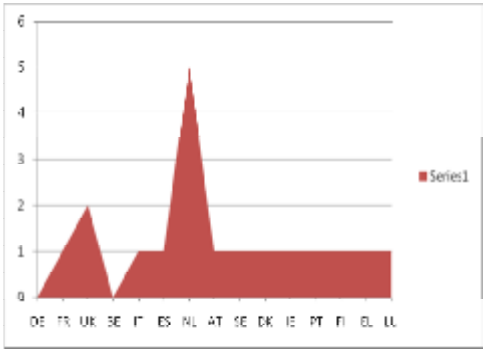
Table 5.7: Intra and Extra- Export and Import of Five New Members 2006 in Mio Euro

Countries	Intra-Exports to the EU15	Intra-Imports to the EU15	Extra EU25	
			Exports	Imports
Estonia	3691	6,615	2,746	2,664
Malta	1000	2,793	1,025	1,057
Lithuania	4283	5,818	5,775	4,142
Latvia	2044	4,643	2,169	1,358
Cyprus	550	5,472	1,818	334

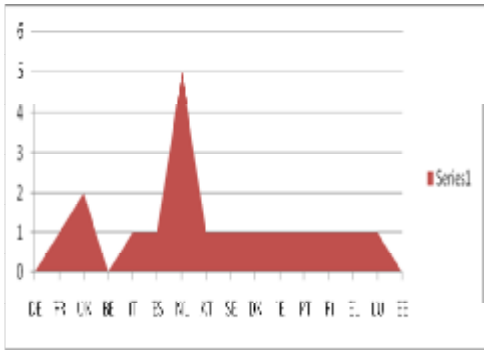
Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

From the table above can also clearly see that for most of the EU member-states, trade links with the new member countries are simply too small to have a direct, measurable impact on their economies. The member's links with EU15 is smaller than the smallest member of the EU 15, although these five members have also small external trade with the rest of the world outside the EU25. The other reason might be also, the ability of their markets to change their imports coming from outside EU15 to intra-imports in the EU integration.

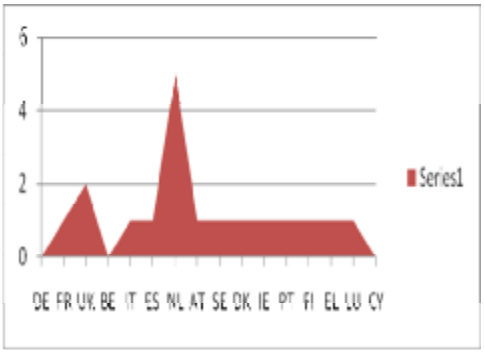
EU15 Gap before entrance new members



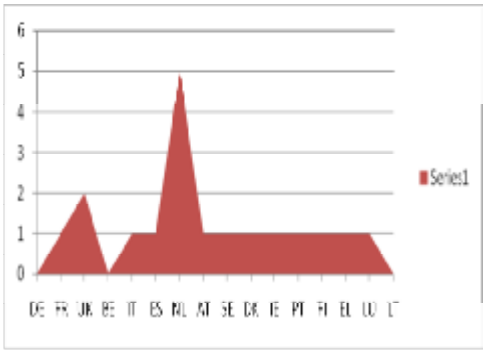
Entrance of Estonia



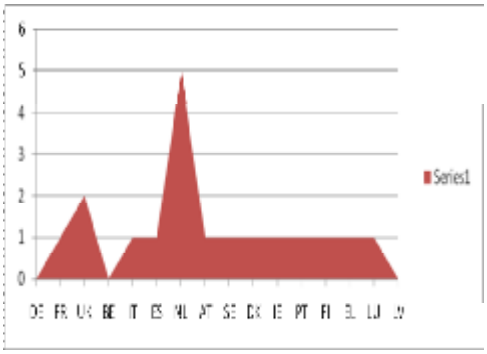
Entrance of Cyprus



Entrance of Lithuania



Entrance of Latvia



Entrance of Malta

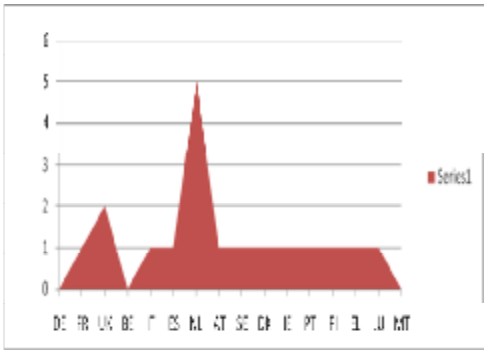


Figure 5.2: The Gaps Comparison between EU15 and with Entrance of each EE, CY, LT, LV, and MT

Source : The figures come from the tables in Apendex (C), talble 1, 2, 3, 4, 5 and 4.4

5.3 EU25 Optimal Analyses

The study argue that, entry of ten new members are destroyed the structure of the EU integration. They made the gap for not optimality getting bigger, after their entrance

EU25 is far from Pareto-Optimality by 32 points. The changes happened due to their entrance can be shown clearly from the figure (5-3).

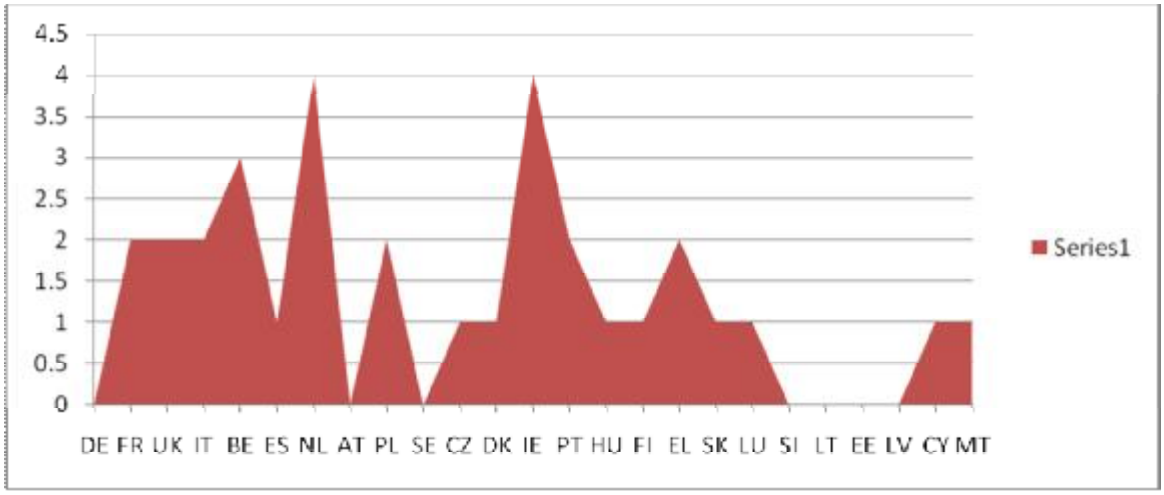


Figure 5.3: The gap of the Pareto- Optimality of the EU25 in 2006

Source : The figures come from the tables 5.13

Considering the figure above, the study found that the impacts area is concentrated on the old member states than new member. So that, most of the old members are getting far from Pareto-Optimality by some points. France and Italy are increasing their gaps by one point, and Belgium is removing from the optimality by three points. The reason behind Belgium's gap is due to a big size of exports to some of the new members such as; Poland (29015 Mio Euro), Czech, (22496 Mio Euro), Hungary (16032 Mio Euro). While its imports from these countries are relatively small, that makes Belgium move to the second ranks from the exporter while it is in the fifth rank from the importer.

Some of the new members are obtaining relatively a remarkable position in the EU25, such as; Poland and Czech, 9th and 11th, respectively. This position refers that these two new members have an important impacts on the EU25, and their entrance were reasonable for EU15. The relatively powerful industry sectors and big capacity of their market ensure this remarkable position for these members and also for Hungry, and Slovakia, respectively.

While most of the other new members falls in the end of the ranks, they ensure that their economies small enough to do not obtain any remarkable position, and their importance very small, they are not able to make any change in the structure of the EU integration trade.

Also some of the small old members are losing their position after of entry new members. Greece and Luxembourg are now in the rank of 17th and 19th, respectively, because of small trade links they already have with EU25. The importance of these two members reduces after some of the new member's entry.

Thereby the study can select some of the loser and winners from the new members' entry. In addition of Greece and Luxembourg, also Portugal and Finland, from the old member states in EU15, affected negatively by this new enlargement, and they lose some of their position for the new member states. While members like Belgium, Germany, Ireland, and Austria they were from the biggest beneficial members from this enlargement, because of opening some of the big markets in front of their products, without facing any significant market competitiveness. .

From the new members only three members (Poland, Czech and Hungary) are benefit from the EU enlargement, while most of the other new members are only benefit from the subsidies comes from the EU cohesion programs, but from the trade links they are not having any significant impacts, not in their markets aspects or in their production aspects.

The rest of the old members have relatively small impacts with EU enlargement. They are not losing much economically, while they might be politically beneficial from these new members entrance.

Table 5.8: Entrance of Ten New Members to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
R1		DE	FR	UK	IT	BE	ES	NL	AT	PL	SE	CZ	DK	IE	PT	HU	FI	EL	SK	LU	SI	LT	EE	LV	CY	MT	∑
1	DE		84,904	64,647	59,208	46,689	41,672	56,264	49,491	5,554	18,767	4,985	14,336	5,834	7,382	2,766	9,216	6,669	787	4,361	654	2,052	537	1,356	291	155	488577
2	BE	57,580	49,359	23,073	15,101		10,737	34,981	2,977	29,015	4,262	22,496	2,311	2,372	1,747	16,032	1,877	1,868	7,630	5,489	3,490	346	1,321	165	734	341	295304
3	NL	94,024	31,645	33,017	18,882	51,524	13,336		5,180	2,491	6,723	3,449	4,699	3,336	2,731	3,707	3,939	2,678	1,850	1,390	2,009	496	101	339	53	215	287814
4	FR	61,391		32,751	35,095	28,621	37,974	15,879	3,689	1,506	5,029	719	2,910	2,710	4,887	387	1,910	3,294	153	1,825	88	429	248	228	134	34	241891
5	UK	39,794	42,451		13,869	19,180	18,254	24,318	2,462	3,704	7,576	2,130	5,636	25,238	3,406	1,391	2,668	2,152	666	2,385	412	348	207	853	175	77	219352
6	IT	42,964	38,211	19,758		9,415	23,631	7,800	7,996	409	3,495	354	2,574	1,687	3,601	235	1,588	6,507	45	557	24	557	25	315	29	14	171791
7	ES	18,591	31,892	13,578	14,528	4,979		5,634	1,407	187	1,638	83	1,362	1,047	15,173	67	731	1,908	29	180	201	179	8	84	889	24	114399
8	AT	32,750	4,096	4,142	9,796	1,726	3,030	1,969		6,981	1,108	3,142	789	359	446	844	570	608	1,107	194	1,297	149	311	161	395	578	76548
9	IE	6,741	5,047	15,495	3,616	12,496	3,241	3,395	420	6,859	1,088	3,226	595		422	3,227	454	369	1,548	153	2,916	18	325	5	734	744	73134
10	SE	11,454	5,764	8,332	3,918	5,322	3,595	5,529	1,102	1,843		1,193	8,068	664	577	2,699	7,025	603	450	76	442	425	114	366	194	91	69846
11	PL	23,957	5,502	5,040	5,765	2,440	2,193	3,393	1,619		2,831	4,888	1,740	290	422	2,682	597	310	1,845	65	286	1,310	452	632	37	12	68308
12	CZ	24,134	4,146	3,618	3,500	2,173	2,034	2,709	3,870	4,301	1,240		724	321	290	2,267	437	327	6,379	95	386	254	116	168	27	11	63527
13	DK	12,773	3,613	6,446	2,559	1,148	2,254	3,993	576	299	10,407	163		997	565	69	2,215	582	53	42	46	403	11	253	191	13	49671
14	HU	17,517	2,963	2,649	3,348	1,162	2,014	1,825	2,954	2,420	655	2,033	368	274	346		338	318	2,320	25	621	160	94	85	47	5	44541
15	FI	6,934	2,043	4,001	1,946	1,408	1,528	3,153	468	224	6,432	127	1,305	229	200	140		319	47	41	28	370	10	469	19	8	31449
16	PT	4,453	4,143	2,305	1,353	1,074	9,139	1,255	177	1,251	381	323	235	171		413	232	123	107	35	111	10	1,791	26	51	14	29173
17	SK	7,806	1,436	1,290	2,170	618	944	1,413	2,016	2,075	457	4,579	289	76	62	2,035	362	182		33	289	89	30	69	32	1	28353
18	LU	3,510	2,815	1,721	1,741	1,599	957	807	438	2,380	485	699	311	59	596	492	175	78	217		140	19	923	11	55	19	20247
19	EL	1,879	732	987	1,860	214	666	358	134	4,082	160	2,303	127	68	94	1,228	98		403	4	285	17	683	12	1,528	466	18388
20	SI	3,538	1,156	472	2,289	205	331	243	1,559	570	168	439	178	26	60	525	53	61	305	56		44	17	19	4	3	12321
21	LT	969	471	496	238	140	214	546	31	684	507	91	473	43	36	44	97	17	17	5	5		729	1,246	19	2	7120
22	EE	390	100	198	58	80	47	176	37	92	945	29	199	30	6	139	1,411	14	9	0	2	371		701	3	1	5038
23	LV	477	82	369	97	67	55	111	21	114	306	31	237	69	9	20	138	5	12	1	3	694	602		14	9	3543
24	MT	266	323	201	74	22	15	19	8	8	7	17	10	2	6	22	44	3	1	0	0	0	0	0	3		1051
25	CY	52	84	160	37	15	7	16	5	1	7	5	3	12	1	2	2	149	4	0	1	2	1	1		4	571
	∑	473,944	322,978	244,746	201,048	192,317	177,868	175,786	88,637	77,050	74,674	57,504	49,479	45,914	43,065	41,433	36,177	29,144	25,984	17,012	13,736	8,742	8,656	7,564	5,658	2,841	
	|R1-R2|	0	2	2	2	3	1	4	0	2	0	1	1	4	2	1	1	2	1	1	0	0	0	0	1	1	32

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

6 Conclusion

The EU has achieved a remarkable degree of integration relatively among its member states in the post war period. It has extended its membership to include the largest economies in Europe and it has become one of the most important economic integration in the world. After the EU is expanded to include some of the countries of Central and Eastern Europe, it possibly plays a major part in global economic arrangements, and it may increase its role in economic and political frameworks. Nevertheless, the EU is likely to encounter considerable difficulties in last eastward enlargement, which effects it's economic and trade structure. That was the main aim of the thesis to analyze and evaluate these difficulties faced after the last enlargement.

Thereby the thesis can point out some important results have obtained from doing the study :

- One of the crucial results of the study is finding and using a new approach and concept for evaluating structures of any regional integration over the world. Also defining new phenomena and concept for optimal matrix using the Pareto-Optimality concept, which it means in this thesis; that the optimal matrix of the integration is the case in which can not make any member of the integration better off without making other members worse off. (This is similar in definition to the Pareto-Optimality).
- The other important point has founded in the thesis is a new indicator for dependency country. Some of the member stats in the integration getting a privilege ranks as the first or the second, some other members getting very far rank, which indicates to the level of dependency of the member state. The members with the first or the second ranks are considering as leaders of the integration, such as the case with Germany and Netherlands in the European integration, they are considering as the biggest power for producing and exporting to the internal EU markets. On the other hand, some other countries such as Greece, Luxembourg, and Portugal are in the end of the list of exporter ranks. As they have very small participation of exporting to the intra-EU markets. This is indicate that members with good ranks are more important dependable for the integration member states than other members with low ranks of the dependency.

- The reason behind establishing and enlarging European Union at the beginning was with political aspects, but later on most of the ecumenists are trying to find significant economical reason for establishing and enlarging it, also are trying to find some economic benefits for this enlargement process. This research found that European integration enlargements are still working on the political aspects more than economic benefits, most of the new members are adding nothing to the EU economically, in other words, they are small economically to have any impacts on the European economic aspects, these new members are; Estonia, Malta, Lithuania, Latvia and Cyprus . While there is some other candidate countries may have more impacts on the EU integration economically, but possibly because of some political reason they should still waiting on the list of the candidate countries.
- The thesis found that EU-15 was not achieving optimal structure even before entering of new member states. Most of the member states were having slight deference between the level of their exports and imports. The only country has keeping good position with optimal ranks was Germany; it was leading the EU-15 before entrance of new members and also after their joining. Netherlands is the second member from the exporting ranks, but it has a big gap of not optimality , because of it's level of imports lower than its exports and was rapidly growing through the years covered by the study (2000- 2006). Netherlands is one of the odd members in the EU integration because of this big gap of not optimization, the reason behind this was the big amount of Netherlands imports from the extra- EU, this is refers that Netherlands is not integrated into the EU integration as an optimal level. The other members such as; France and United Kingdom, were taking third and fourth ranks from the exporter and second and third respectively from the importer ranks. They were considering in a good position even not obtaining the optimality in the last decade. The position can be understandable for UK because of market competitive in the Euro area, since UK is keeping still out of this area. Most of the other members keeping in between ranks without obtaining the optimality most of the time, only two members (Greece and Luxembourg) they were in the end of the list without achieving optimality over the last decade, the case is clear for a small economy like Luxembourg, but for the Greece is odd, as it is a

big economy relatively, but because it has a big imports and exports with the rest of the world bigger than its intra-trade with the EU.

- Ø The study found that entrance of new member has benefit for new members more than to the old 15 members, especially from the trade side. Only five of this 10-new members, have small effects on the trade but none of them reach to the position to be in the beginning of the ranks or have a significant change in the gap of not optimization for the EU25. The other five members they even didn't have any impact of the trade structure, they only keep the end of the rank without any considering effects.
- Ø The study can select some of the loser and winners from the new members' entry. Some of the small old members are losing their position after of entry new members. Greece and Luxembourg are in the rank of 17th and 19th, respectively, because of small trade links they already have with EU25. The importance of these two members reduces after some of the new member's entry. In addition of Greece and Luxembourg, also Portugal and Finland, from the old member states in EU15, affected negatively by this new enlargement, and they lose some of their position for the new member states. While members like Belgium, Germany, Ireland, and Austria they were from the biggest beneficial members from this enlargement, because of opening some of the big markets in front of their products, without facing any significant market competitiveness.
- Ø From the new members only three members (Poland, Czech and Hungary) are benefit from this EU enlargement, while most of the other new members are only benefit from the Subsidies comes from the EU cohesion programs, but from the trade links they are not having any significant impacts, not in their markets aspects or in their production aspects.

7 Benefit of Application Model

1. The model can be used for evaluating any integration over the world, to find same optimality level for shares of its member states.

2. The model can also evaluate the importance of any country in world exchange trade. It can uses for specify the country position into the any global organization. In other word this model can examine up which level world exchange structures can depends on any country into their trade or labor movement over the world.

3. The model might help EU integration for making decision on any new member's negotiation for joining the EU integration in future. And specify in which level or degree this new member can make impacts on EU trade structure, or any other structures, such as; inflow –outflow of capital to and from this new member, also labor movements with EU integration.

4. The model might be used for other fields, such like, reorganizing the intra-market in the EU integration, and find the size of each member can be shared in the EU exports-imports structure, in order to obtain the Pareto-Optimality.

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Appendix

List of Appendix

Appendix (A)

Table 1.A: Exchange Rates against the Euro (1 Euro= … National Currency)

Countries	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bulgaria	1.9558	1.9522	1.9482	1.9492	1.9490	1.9533	1.9558	1.9558	1.9558
Czech Republic	36.884	35.599	34.068	30.804	31.846	31.891	29.782	28.342	27.766
Denmark	7.4355	7.4538	7.4521	7.4305	7.4307	7.4399	7.4518	7.4591	7.4506
Estonia	15.647	15.647	15.647	15.647	15.647	15.647	15.647	15.647	15.647
Latvia	0.6256	0.5592	0.5601	0.5810	0.6407	0.6652	0.6962	0.6962	0.7001
Lithuania	4.2641	3.6952	3.5823	3.4594	3.4527	3.4529	3.4528	3.4528	3.4528
Hungary	252.77	260.04	256.59	242.96	253.62	251.66	248.05	264.26	251.35
Poland	4.2274	4.0082	3.6721	3.8574	4.3996	4.5268	4.0230	3.8959	3.7837
Romania	1.6345	1.9922	2.6004	3.1270	3.7551	4.0510	3.6209	3.5258	3.3328
Slovakia	44.123	42.602	43.300	42.694	41.489	40.022	38.599	37.234	33.775
Sweden	8.8075	8.4452	9.2551	9.1611	9.1242	9.1243	9.2822	9.2544	9.2501
United Kingdom	0.65874	0.60948	0.62187	0.62883	0.69199	0.6787	0.68380	0.68173	0.68434

Source: Eurostat, Economic indicators EU27, 2009

Appendix (B)

Table 1.B: Exports and Imports EU14 without Portugal year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	NL	ES	AT	SE	DK	IE	FI	EL	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	56,264	41,672	49,491	18,767	14,336	5,834	9,216	6,669	4,361	462058
2	NL	94,024	31,645	33,017	51,524	18,882	0	13,336	5,180	6,723	4,699	3,336	3,939	2,678	1,390	270373
3	FR	61,391	0	32,751	28,621	35,095	15,879	37,974	3,689	5,029	2,910	2,710	1,910	3,294	1,825	233078
4	BE	57,580	49,359	23,073	0	15,101	34,981	10,737	2,977	4,262	2,311	2,372	1,877	1,868	5,489	211987
5	UK	39,794	42,451	0	19,180	13,869	24,318	18,254	2,462	7,576	5,636	25,238	2,668	2,152	2,385	205983
6	IT	42,964	38,211	19,758	9,415	0	7,800	23,631	7,996	3,495	2,574	1,687	1,588	6,507	557	166183
7	ES	18,591	31,892	13,578	4,979	14,528	5,634	0	1,407	1,638	1,362	1,047	731	1,908	180	97475
8	SE	11,454	5,764	8,332	5,322	3,918	5,529	3,595	1,102	0	8,068	664	7,025	603	76	61452
9	AT	32,750	4,096	4,142	1,726	9,796	1,969	3,030	0	1,108	789	359	570	608	194	61137
10	IE	6,741	5,047	15,495	12,496	3,616	3,395	3,241	420	1,088	595	0	454	369	153	53110
11	DK	12,773	3,613	6,446	1,148	2,559	3,993	2,254	576	10,407	0	997	2,215	582	42	47605
12	FI	6,934	2,043	4,001	1,408	1,946	3,153	1,528	468	6,432	1,305	229	0	319	41	29807
13	LU	3,510	2,815	1,721	1,599	1,741	807	957	438	485	311	59	175	78	0	14696
14	EL	1,879	732	987	214	1,860	358	666	134	160	127	68	98	0	4	7287
	∑	390385	302572	227948	184321	182119	164080	160875	76340	67170	45023	44600	32466	27635	16697	
	|R1-R2|	0	1	2	0	1	4	0	1	1	1	1	0	1	1	14

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 2.B: Exports and Imports EU14 without Finland year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	EL	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	6,669	4,361	460224
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	6,723	4,699	3,336	2,731	2,678	1,390	269165
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	3,294	1,825	236055
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,868	5,489	211857
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,152	2,385	206721
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	3,495	2,574	1,687	3,601	6,507	557	168196
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,638	1,362	1,047	15,173	1,908	180	111917
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102	0	8,068	664	577	603	76	55004
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	1,108	789	359	446	608	194	61013
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595	0	422	369	153	53078
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407	0	997	565	582	42	45955
12	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171	0	123	35	24844
13	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	78	0	15117
14	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	0	4	7283
	∑	387904	304672	226252	183987	181526	168486	162182	76049	61119	43953	44542	41627	27439	16691	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	0	1	1	16

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 3.B: Exports and Imports EU14 without Greece year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	LU	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	4,361	462771
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	6,723	4,699	3,336	2,731	3,939	1,390	270426
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	1,825	234671
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	5,489	211866
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,385	207237
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	557	163277
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,638	1,362	1,047	15,173	731	180	110740
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102	0	8,068	664	577	7,025	76	61426
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	1,108	789	359	446	570	194	60975
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595	0	422	454	153	53163
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407	0	997	565	2,215	42	47588
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200	0	41	29688
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171	0	232	35	24953
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	0	15214
	∑	392,959	305,983	229,266	185,181	181,612	169,348	164,977	76,383	67,391	45,131	44,703	41,733	32,600	16,728	1953995
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	0	16

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.B: Exports and Imports EU14 without Luxembourg year 2006 in Mio Euro

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	∑
1	DE	0	84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	465,079
2	NL	94,024	31,645	33,017	51,524	18,882	13,336	0	5,180	6,723	4,699	3,336	2,731	3,939	2,678	271,714
3	FR	61,391	0	32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	236,140
4	BE	57,580	49,359	23,073	0	15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	208,245
5	UK	39,794	42,451	0	19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	207,004
6	IT	42,964	38,211	19,758	9,415	0	23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	169,227
7	ES	18,591	31,892	13,578	4,979	14,528	0	5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	112,468
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102	0	8,068	664	577	7,025	603	61,953
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969	0	1,108	789	359	446	570	608	61,389
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595	0	422	454	369	53,379
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407	0	997	565	2,215	582	48,128
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200	0	319	29,966
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171	0	232	123	25,041
14	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98	0	7,377
	∑	391328	303900	228532	183796	181731	169057	164528	76079	67066	44947	44712	41231	32523	27680	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	0	16

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Appendix C

Table 1.C: Entrance of Estonia to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	EE	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	537	469977
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	101	273205
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	248	238213
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	1,321	215055
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	207	209596
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	25	169809
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	8	112656
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	114	62143
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	311	61894
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	325	53857
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	11	48181
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	10	30017
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	1,791	26867
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		923	16215
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	683	8064
16	EE	390	100	198	80	58	47	176	37	945	199	30	6	1,411	14	0		3691
	∑	395,228	306,815	230,451	185,475	183,530	170,061	165,511	76,554	68,496	45,457	44,801	41,833	34,109	27,772	16,732	6,615	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	0	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 2.C: Entrance of Cyprus to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	CY	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	291	469731
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	53	273157
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	134	238099
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	734	214468
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	175	209564
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	29	169813
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	889	113537
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	194	62223
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	395	61978
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	734	54266
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	191	48361
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	19	30026
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	51	25127
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		55	15347
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	1,528	8909
16	CY	52	84	160	15	37	7	16	5	7	3	12	1	2	149	0		550
	∑	394,890	306,799	230,413	185,410	183,509	170,021	165,351	76,522	67,558	45,261	44,783	41,828	32,700	27,907	16,732	5,472	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	0	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 3.C: Entrance of Lithuania to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	LT	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	2,052	471492
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	496	273600
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	429	238394
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	346	214080
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	348	209737
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	557	170341
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	179	112827
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	425	62454
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	149	61732
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	18	53550
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	403	48573
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	370	30377
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	10	25086
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		19	15311
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	17	7398
16	LT	969	471	496	140	238	214	546	31	507	473	43	36	97	17	5		4283
	∑	395,807	307,186	230,749	185,535	183,710	170,228	165,881	76,548	68,058	45,731	44,814	41,863	32,795	27,775	16,737	5,818	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	0	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 4.C: Entrance of Latvia to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	LV	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	1,356	470796
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	339	273443
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	228	238193
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	165	213899
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	853	210242
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	315	170099
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	84	112732
8	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	366	62395
9	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	161	61744
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	5	53537
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	253	48423
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	469	30476
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	26	25102
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		11	15303
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	12	7393
16	LV	477	82	369	67	97	55	111	21	306	237	69	9	138	5	1		2044
	∑	395,315	306,797	230,622	185,462	183,569	170,069	165,446	76,538	67,857	45,495	44,840	41,836	32,836	27,763	16,733	4,643	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	0	18

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006

Table 5.C: Entrance of Malta to the EU and its Impacts on the EU15 Trade Optimality 2006

	R2	1	2	**3**	4	5	6	7	8	9	10	11	12	13	14	15	16	
R1		DE	FR	UK	BE	IT	ES	NL	AT	SE	DK	IE	PT	FI	EL	LU	MT	∑
1	DE		84,904	64,647	46,689	59,208	41,672	56,264	49,491	18,767	14,336	5,834	7,382	9,216	6,669	4,361	155	469595
2	NL	94,024	31,645	33,017	51,524	18,882	13,336		5,180	6,723	4,699	3,336	2,731	3,939	2,678	1,390	215	273319
3	FR	61,391		32,751	28,621	35,095	37,974	15,879	3,689	5,029	2,910	2,710	4,887	1,910	3,294	1,825	34	237999
4	BE	57,580	49,359	23,073		15,101	10,737	34,981	2,977	4,262	2,311	2,372	1,747	1,877	1,868	5,489	341	214075
5	UK	39,794	42,451		19,180	13,869	18,254	24,318	2,462	7,576	5,636	25,238	3,406	2,668	2,152	2,385	77	209466
6	IT	42,964	38,211	19,758	9,415		23,631	7,800	7,996	3,495	2,574	1,687	3,601	1,588	6,507	557	14	169798
7	ES	18,591	31,892	13,578	4,979	14,528		5,634	1,407	1,638	1,362	1,047	15,173	731	1,908	180	24	112672
8	AT	32,750	4,096	4,142	1,726	9,796	3,030	1,969		1,108	789	359	446	570	608	194	578	62161
9	SE	11,454	5,764	8,332	5,322	3,918	3,595	5,529	1,102		8,068	664	577	7,025	603	76	91	62120
10	IE	6,741	5,047	15,495	12,496	3,616	3,241	3,395	420	1,088	595		422	454	369	153	744	54276
11	DK	12,773	3,613	6,446	1,148	2,559	2,254	3,993	576	10,407		997	565	2,215	582	42	13	48183
12	FI	6,934	2,043	4,001	1,408	1,946	1,528	3,153	468	6,432	1,305	229	200		319	41	8	30015
13	PT	4,453	4,143	2,305	1,074	1,353	9,139	1,255	177	381	235	171		232	123	35	14	25090
14	LU	3,510	2,815	1,721	1,599	1,741	957	807	438	485	311	59	596	175	78		19	15311
15	EL	1,879	732	987	214	1,860	666	358	134	160	127	68	94	98		4	466	7847
16	MT	266	323	201	22	74	15	19	8	7	10	2	6	44	3	0		1000
	∑	395,104	307,038	230,454	185,417	183,546	170,029	165,354	76,525	67,558	45,268	44,773	41,833	32,742	27,761	16,732	2,793	
	|R1-R2|	0	1	2	0	1	1	5	1	1	1	1	1	1	1	1	0	

Source: Eurostat, External and Intra-European Union Trade, Statistical yearbook — Data 1958-2006