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MEDITERRANEAN UNION INTEGRATION:

AN AUGMENTED GRAVITY MODEL

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DEDICATION

This thesis is dedicated to my parents

for their love, endless support

and encouragement.

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I would like to express my sincere gratitude to my supervisor, Associate Professor Thierry Warin. *Your dedication to invaluable instructions and many thoughtful suggestions ever cannot be overstated.*

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To my parents, who has given me so much, thanks for your faith in me, and for teaching me that I should never surrender.

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RÉSUMÉ

Ces jours-ci, globalisation a formé l'environnement économique du monde d'un côté et de l'autre côté, conduit à surligner l'importance d'intégration économique. Donc, l'augmentation de la vitesse du développement des entreprises et des pays après l'intégration n'est pas un grand surpris.

Les études récentes ont montré la création des alliances ou réseaux économiques est une des méthodes des plus effectives pour faire face aux nouvelles opportunités et défis mondiale.

La question principale c'est que si l'union monétaire doit être suivie est adressée par OCA, qui est un point de départ utile pour quelconque discussion sur l'intégration régionale.

Le but de cette étude est l'analyse du niveau d'intégration entre les pays du Moyen-Orient et pays Afrique du nord en relation avec l'union européenne. En fait, le niveau d'intégration entre trois régions est étudié, l'Union Méditerranéenne, la région du MENA et huit pays choisis de la région MENA. L'étude présente sélectionne 12 pays de la région MENA et EU dans son ensemble. Tous les pays Méditerranéens ne sont pas inclus dans cette étude à cause de quelques barrières incluant indisponibilité des données. 12 pays la région du MENA sont Albanie, Algérie, Croatie, Égypte, Israël, Jordanie, Liban, Mauritanie,Maroc,Syrie,TunisieetTurquie. Un modèle de la gravité augmentée est utilisé. La variable dépendant de ce modèle est l'export de la chaque économie à ses partenaires. Les variables indépendantes sont : les variables de la gravité traditionnelle, les variables d'Hecksher Ohlin et variables de convergence. On utilise aussi analyse section transversale des séries chronologiques basant sur le commerce bilatéral. Les données couvrent la période du 1995 à 2010.
Notre analyse indique que la perspective pour plus d'intégration des trois régions est espérant et encouragent mais encore il reste plusieurs défis. Ces trois défis doivent être comme les relations politiques ou quelques bloquent économiques existants, qui fournissent un tremplin vers l'union monétaire plus grand.

ABSTRACT

Nowadays, the forces of globalization, on the one hand, have shaped the world's economic environment and on the other hand, led to the increased importance of economic integration. Hence, a faster growth of corporations and countries after they integrated is not a big surprise. Recent studies have shown that the creation of an economic alliance or network is one of the most effective methods to face new global economic opportunities and challenges. The central question of whether a monetary union should be pursued is addressed by the OCA, which is a useful starting point for any discussion on regional integration.

The goal of this study is to analyse the level of integration among the Middle Eastern and North African countries, in relationship with the European Union. In fact, the level of integration in three regions is examined: the Mediterranean Union, the MENA region and eight selected countries from the MENA region. The present study selects 12 countries within the MENA region and the EU as a whole. All countries of the Mediterranean region are not included in this study due to some barriers such as the unavailability of data. 12 countries from the MENA region are Albania, Algeria, Croatia, Egypt, Israel, Jordan, Lebanon, Mauritania, Morocco, Syria, Tunisia, and Turkey.

An augmented gravity model is used. The dependent variable in this model is exports from each economy to its partners. Independent variables are: traditional gravity variables, Hecksher Ohlin variables and convergence variables. We use a cross-section time-series analysis based on the bilateral trade. The data cover the period from 1995 to 2010.

Our analysis shows that the prospect for further integration of the three regions is promising and looks encouraging, but many challenges still persist. These challenges could be such as political relationships or some existing economic blocks, which provide a first stepping stone to a larger currency union.

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LIST OF ACRONYMS AND ABREVIATIONS

CES	Constant Elasticity of Substitution
CPI	Consumer Price Index
CEPII	Centre d'Etudes Prospectives et d'Information Internationales
EC	European Commission
EMP	Euro-Mediterranean Partnership
EMU	European Monetary Union
ENPI	European Neighbourhood Policy Instrument
EOCA	Endogeneity of Optimum Currency Area
EU	European Union
FEMIP	Euro-Mediterranean Investment and Partnership Facility
FTA	Free Trade Area
GDP	Gross Domestic Product
IMF	International Monetary Fund
LDC	Least Developed Countries
MENA	Middle East and North Africa
OCA	Optimum Currency Area
PAFTA	Pan-Arab Free Trade Area
RPLA	Resource-Poor, Labour-Abundant
RRLA	Resource-Rich, Labour-Abundant
RRLI	Resource-Rich, Labour-Importing
TLPC	Trend Line of Plot chart
UfM	Union for the Mediterranean

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CHAPITRE 1 INTRODUCTION

1.1 Importance of the Study

Nowadays, the forces of globalization (i.e. faster communication, more efficient transportation, increased flow of goods and services, labour mobility and more rapid financial flows) have two impacts. On the one hand, they have shaped the world's economic environment and on the other hand, led to the increased importance of economic integration. In addition, it is widely accepted that the world is getting smaller and interconnecting and economic integration has led to the interaction and cooperation of companies and countries. Hence, a faster growth of corporations and countries after they integrated is not a big surprise. Recent studies have shown that the creation of an economic alliance or network is one of the most effective methods to face the new global economic opportunities and challenges (Ghadar 2006).

When it comes to evaluating the conditions of integrating countries, the academic literature relies essentially on one approach: the Optimum Currency Area (OCA) theory. The central question of whether a monetary union should be pursued is addressed by the OCA theory, which is a useful starting point for any discussion on regional integration (Nnanna 2009).

Robert Mundell in 1961 formulated the OCA theory and defined it in terms of an optimal geographic area, which adopts a single currency, or several currencies, whose exchange rates are permanently pegged. The notion of optimality relies on multiple conditions. These conditions include factor mobility of production, price and wage flexibility, economic openness, consumption and production diversification, similarity in inflation rates, political integration and fiscal integration (Mundell 1961). To refine the Optimum Currency Area (OCA) theory, the Endogeneity of Optimum Currency Area (EOCA) theory was pioneered by Frankel and Rose in 1998. They showed that reciprocal trade is improved significantly by monetary integration. The main focus in the context of the endogeneity of OCA theory is that the OCA criteria likely will be achieved by sharing a single currency ex-post even if they do not ex-ante (Frankel and Rose 1998).

1.2 Areas of the Study and Their Importance

In this study, the level of integration in three regions is examined base on the time period from 1995 to 2010:

- The Mediterranean Union,
- The MENA region and,
- Eight countries from the MENA region

The Mediterranean Union contains 43 countries, 27 member states of the European Union (EU) and 16 countries from the Middle East and North Africa (MENA region). The Union is considered as a new phase of the Euro-Mediterranean Partnership (also known as the Barcelona Process). Geographical proximity and economic growth in the Mediterranean countries play an important role in promoting integration. Hence, renewed growth in the Mediterranean countries will promote greater regional integration, both with the European countries and within Southern Mediterranean (Ülgen 2011).

Openness of the Middle East and North Africa (MENA) region to the global economy has been improved today more than in the early 1990s and the participation of the region to the global economy has been increased significantly. In this regard, tariffs have been reduced under the Pan-Arab Free Trade Area (PAFTA), intra-regional tourism is growing, and transport connectivity is improving. Still, the MENA region, compared to the other regions, is less globally and regionally integrated in terms of trade, investment and capital flows – with the exception of oil – to obtain the benefits of the current wave of globalization. In the Southern Mediterranean, The lack of an integrated market as well as the complicated set of rules of origin cause a shift of foreign investments to the North. A European investor can easily serve all the MENA markets while a MENA investor have difficulties due to the holes in the set of bilateral trade agreements among the MENA countries. Under these conditions, a fundamental rethink of the economic integration between the North and South of the Mediterranean should be considered (WorldBank 2010; Ülgen 2011).

1.3 Goal and Research Questions

The goal of this research is to analyse the level of integration among:

- The Middle Eastern and Northern African countries, in relationship with the European Union.
- The Middle Eastern and Northern African countries (MENA region).
- A selection of countries from the MENA region.

In fact, this study aims at answering the following questions:

- What are the main criteria to determine the suitability of integration for the Mediterranean union?

The domain of the study for the Mediterranean union in this research is the European Union and 12 countries from the MENA region:

- What are the main criteria to determine the suitability of integration for the MENA region?

The domain of the study for the MENA region is the 12 mentioned countries in the first question.

- What are the main criteria to determine the suitability of integration for the eight selected countries from the MENA region?

Among the 12 countries from the MENA region in our sample, 8 countries are selected based on a procedure explained in chapter 5. The methodology adopted in this section has devoted a large part in the originality of this research, since it has been developed by the author. The methodology is developed based on classifying the tables investigated in the descriptive analysis in chapter 4. In section 5.5.1 the methodology is explained in detail.

1.4 Project Structure

This study is structured in six chapters, starting with the explanation of the interest of this study and its aims in Chapter 1. This is followed by identifying the importance of the investigated areas and research questions of the project. Chapter 2 presents a brief background on the two areas investigated in this study: the Mediterranean Union and the MENA region. Continuing with Chapter 3, the background of the study and its literature review, along with descriptions of the

gravity model (i.e. a model which supports investigation of the research questions stated in this study). Thereafter, the descriptive analysis of the data is discussed. Each country is considered as an exporter and its relationships with other economies in terms of dependent and independent variables are investigated in chapter 4. In chapter 5 the research strategy and methods, adopted in the empirical investigations, are discussed. The report is completed with the policy implications and a summary of the outcomes in Chapter 6.

CHAPITRE 2 BACKGROUND ON THE MEDITERRANEAN UNION AND THE MENA REGION

2.1 Background on the Mediterranean Union

The Union for the Mediterranean (UfM) is considered as a multi-lateral partnership, which contains 43 countries from Europe and the Mediterranean Basin (Wikipedia 2012):

- 27 member states of the union are from the European Union, namely:

Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.

- 16 member states of the union are from North Africa, the Middle East and the Balkans, namely:

Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Israel, Jordan, Lebanon, Mauritania, Monaco, Montenegro, Morocco, the Palestinian Authority, Syria, Tunisia, and Turkey.

2.1.1 History of the Mediterranean Union

The Union for the Mediterranean is seen as an extension of the EU's Euro-Mediterranean Partnership (EMP), which was launched in Barcelona (Spain) in 1995. According to the 1995 Barcelona Declaration, the aim of this initiative is "turning the Mediterranean basin into an area of dialogue, exchange and cooperation guaranteeing peace, stability and prosperity" (Xenakis and Chryssochoou 2001)

At the start of its formation, the Euro-Mediterranean Partnership included only 27 member countries, 15 of which from the European Union and 12 from the Mediterranean countries (i.e. Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, the Palestinian Authority, Syria, Tunisia, and Turkey). In consequence of the European Union enlargement in 2004 and 2007, the number of EU member countries increased to 27, and two countries from the Mediterranean (i.e. Cyprus and Malta) became part of the European Union. Thus, due to the EU enlargement, the configuration of the Barcelona Process changed from "15+12" to "27+10".

Ultimately, by joining Albania and Mauritania to the Barcelona Process in 2007, the number of participants raised to 39 (Montobbio 2009).

After the celebration of the 10th Anniversary of the Euro-Mediterranean Summit in Barcelona in 2005, criticisms against the Barcelona Process increased (VoltaireNetwork 2005). Two main reasons for these criticisms are: firstly, nonattendance of heads of state and government from the Southern Mediterranean countries[1] versus the attendance of the 27 European Union's heads of state and government. Secondly, the lack of an agreement on the definition of the term "terrorism" is considered as a barrier to approve the final declaration. The Palestinian Authority, Syria and Algeria disagreed with the definition of the term "terrorism" if "resistance movements against foreign occupation" is part of the definition (European Commission 2005).

After the criticisms against the Euro-Mediterranean Summit in Barcelona in 2005, the efficiency of the Barcelona Process for fulfilling its objectives of peace, stability and prosperity felt into the suspicion (Fernandez and Youngs 2005). For instance, the disappointment about the Euro-Mediterranean Partnership and its inability to deliver some results is expressed by a Spanish politician, namely Josep Borrell (Fontelles 2010). However, the validity of the Barcelona Process' framework has been defended by many European Union diplomats.

After the Barcelona Process, the idea of a 'Union of the Mediterranean' was developed originally by President Sarkozy during the French presidential election campaign in 2007. The idea was advanced during a speech in Tangier on 23 October 2007, according to which just the coastal states of the Mediterranean would aim at a "political, economic and cultural union … of which our children will be proud" (Emerson 2008). The idea was presented with strategic and historical importance. However, he had aimed to model the Mediterranean Union on the European Union with a shared judicial area and common institutions. In addition, Mr. Sarkozy was thinking about Turkish membership of the Mediterranean Union as an alternative to membership of the European Union (Holm 2007). A number of criticisms came across the proposal at the highest levels.

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[1] with the exception of the Palestinian and Turkish

Criticisms against the 'Union of the Mediterranean'

First, due to the considering Turkish membership in the Mediterranean Union instead of in the European Union, the idea was rejected immediately by Turkey. Second, the European Commission agreed with the plans of promoting regional cooperation if they would be built based on the existing structures, specifically based on the Barcelona process. Third, on 5 December 2007, Chancellor Merkel rejected the idea of having only the participation of countries bordering the Mediterranean, she stated (Emerson 2008):

"This would create a situation I would qualify as dangerous. A situation could be created where Germany would be drawn to Central and Eastern Europe and France to the Mediterranean. This would create tension that I would not like."

In addition, German chancellor Angela Merkel was worried about the risk of splitting and threatening the core of the EU by the creation of the Mediterranean Union based on Mr. Sarkozy's assumption.

Fourth, at the time of Slovenian presidency of the EU in 2008, Prime Minister Janez Jansa added to the criticisms and indicated (Keller 2012):

"We do not need a duplication of institutions, or institutions that would compete with EU, institutions that would cover part of the EU and part of the neighbourhood."

However, among the EU member countries, the idea of the Mediterranean Union was supported by Italy, Spain, and Greece (DeutscheWelle 2007); while among the non EU members, the proposal was supported by Egypt and Israel (EJP 2007).

Modified Proposal of 'Union of the Mediterranean'

Against the opposition from the EU member countries and the European Commission, Sarkozy modified his plan for the Mediterranean Union at the start of 2008. These modifications are (EuropeanUnion 2008; Vucheva 2008):

- At the end of February of 2008, France's minister for the European affairs, Jean-Pierre Jouyet, declared that "there is no Mediterranean Union" but rather a "Union for the

Mediterranean," which its only concern is "completing and enriching" the already existing EU policies.

- As a result of a meeting with German Chancellor Angela Merkel, all the EU member states were included in the project and the idea of having only the participation of countries bordering the Mediterranean was dropped.
- The Union of the Mediterranean would be built based on the Barcelona process.
- Turkish membership to the Union of the Mediterranean was no longer an alternative to its EU membership. This declaration was guaranteed from France, based on which Turkey accepted to participate to the project.
- The proposition of creating common institutions was dropped as well.

The Union for the Mediterranean Is Launched

After several negotiations during a summit in Paris, the Union for the Mediterranean was launched on the 13th of July 2008 with the participation of 43 heads of state and government from the Euro-Mediterranean region. The Union is built upon the Barcelona Declaration and its objectives of achieving peace, stability and security. Also, it is considered a multilateral partnership with a vision to increase the potential for the regional integration. Heads of states emphasized the importance of co-ownership by all participants. They believed that the Euro-Mediterranean region will meet common challenges due to the important role of this initiative. One of those common challenges is economic and social development, with a view to promote dialogues among cultures. The Paris summit was considered a diplomatic success for Nicolas Sarzoky. Besides, it was agreed to held biennial summits by heads of state and government. The results of the summits should be a political announcement and a short list of tangible regional projects to be set in the process. Progress in the implementation of the summit conclusions would be reviewed by the annual foreign affairs ministerial meetings. Also determining the next summit meetings and approving the new projects, in the case of necessity, are considered in the biennial summits. It was agreed that the summit meetings should take place in the EU and in the Mediterranean partner countries alternately. The host country is selected by consensus. All countries party to the initiative will be called to the summits, ministerials and other plenary meetings of the Barcelona Process: Union for the Mediterranean (Declaration 2008).

2.1.2 Institutional Framework of the Mediterranean Union

Any political union requires not only a financial and political support but also an institutional support. Several institutions were launched to support a better functioning of the UfM and for a better coordination among the states.

To improve the political dialogue at the highest level, a summit of heads of state and government was planned to be held every two years. According to the Paris Declaration[2] (Ilievska 2011):

"Heads of State and Government agree to hold biennial summits. The summits should result in a political declaration and a short list of concrete regional projects to be set in motion. The Conclusions should endorse a broad two-year work programme for the Barcelona Process: Union for the Mediterranean. Annual Foreign Affairs Ministerial meetings will review progress in the implementation of the summit conclusions and prepare the next summit meetings and, if necessary, approve new projects."

The foundation for the functioning of the UfM was built based on the biennial summit. In other words, the biennial summits seemed to be a place in which most of the problems are expected to be resolved.

The secretariat is another form of institutional support; two of its task is (Ilievska 2011):

- Identifying and monitoring the implementation of the concrete projects for the Euro-Mediterranean region;
- Searching for the partners to finance these projects[3].

2.1.3 Co-Presidency

In order to improve the stability and the joint ownership of the cooperation, heads of state and government set up a co-presidency; one from the EU while the other would be from the

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[2] Declaration, J. (2008). "Joint Declaration of the Paris Summit for the Mediterranean." URL: http://www. internationalepolitik. de/ip/archiv.

[3] Final Statement of the Marseille Meeting of the Euro-Mediterranean Ministers of Foreign Affairs

Mediterranean partner countries. The co-presidency is applied to the summits, all ministerial meetings, the senior officials meetings, the Joint permanent committee and, whenever possible, experts/ad hoc meetings within the initiative. The rules of a co-presidency for the EU and the Mediterranean partners are such as (Declaration 2008; Statement 2008):

- The co-presidency of the Partnership as a whole should be assumed by the co-presidents.
- From the EU side, co-president must be compatible with the external representation of the European Union in accordance with the Treaty provisions[4] in force;
- From the Mediterranean side, the co-president must be chosen by consensus for a non-renewable period of two years.
- Necessary consultations with all partners will be performed by the co-presidencies in order to adopt common conclusions of Summit, Ministerial, and other meetings.

2.1.4 Scope and Main Objectives

It was agreed by the heads of state and government that the challenge of the "Barcelona Process: Union for the Mediterranean" is (Declaration 2008):

- Enhancing multilateral relations;
- Increasing co-ownership of the process;
- Setting governance on the basis of equal footing and translate it into the concrete projects;
- Progressing and economic benefits of the creation of a deep Free Trade Area and strengthening of regional economic integration in the Euromed region by 2010 and beyond;
- Supporting the main lines of the Euromed Trade Roadmap till 2010 and beyond;
- Studying the establishment of a smooth, efficient and business-friendly trade facilitation mechanism which would bring further transparency and trade and investment opportunities;
- Implementing the projects in order to enhance the flow of exchanges among the people of the whole region and thus creating a future of peace and shared prosperity in the entire region. In this regard, the human and cultural dimension of the initiative was pointed out;

[4] The provisions of the Treaties are the primary source of EU law.

- Improving the political level of the EU's relationship with its Mediterranean partners;
- Providing more co-ownership to the multilateral relations; and
- Making these relations more tangible and visible through the additional regional and sub-regional projects.

The main fields, which the UfM had in mind are (Process 1996):

- *Political and security basket*: by defining a common area of peace and stability via reinforcement of political and security dialogue.
- *Economics and trade basket*: by creating a zone of shared prosperity via an economic and financial partnership and the gradual configuration of a free-trade area.
- *Socio-cultural basket*: by creating social, cultural and human partnership and rapprochement between peoples to encourage understandings among the cultures and exchanges among civil societies.

2.1.5 Six Concrete Projects of the UfM

As an addition to these chapters about cooperation, six concrete projects of the UfM were identified, which consider specific needs of the Euro-Mediterranean regions, such as (Declaration 2008; Ilievska 2011):

- *De-pollution of the Mediterranean*. This broad project includes many plans such as good environmental governance, access to drinkable water, water management, pollution reduction, and protection of the Mediterranean biodiversity.
- *Maritime and land highways*. Improving the circulation of commodities and people throughout the Euro-Mediterranean region is the intention of this project by improving ports, and building highways and railways.
- *Civil protection*. The ultimate goal of this project is to bring the Mediterranean Partner Countries progressively closer to the European civil protection mechanism.
- *Alternative energies: Mediterranean solar plan*. Promoting the production and use of renewable energies is the goal of this project
- *Higher education and research: Euro-Mediterranean University.* As confirmed by the 43 heads of state and government, the goal of this project is to promote higher

education and scientific research in the Mediterranean, also, to establish a "Euro-Mediterranean Higher Education, Science and Research Area".

- *The Mediterranean business development initiative*. The main goal of this initiative is to foster and promote small and medium-sized enterprises from the Mediterranean partner countries.

2.1.6 Funding

The Paris Declaration states that the capacity to attract funding from following resources will have to be developed by contributions for the Union for the Mediterranean. Resources are (Declaration 2008):

- The private sector participation;
- Contributions from the EU budget and all partners;
- Contributions from other countries;
- International financial institutions and regional entities;
- The Euro-Mediterranean Investment and Partnership Facility (FEMIP);
- The European Neighborhood Policy Instrument (ENPI).

Contributions from the European Commission to the Union for the Mediterranean are performed through the European Neighborhood Policy Instrument (ENPI). In July 2009, €72 million were allocated by the ENPI for the following Union for the Mediterranean projects during 2009–2010 (Lindh 2010):

- De-pollution of the Mediterranean (€22 million);
- Maritime and land highways (€7.5 million);
- Alternative energies: Mediterranean Solar Plan (€5 million);
- Euro-Mediterranean University of Slovenia (€1 million).

Contributions from the European Investment Bank to the Union for the Mediterranean are performed through its Euro-Mediterranean Investment and Partnership (FEMIP). Specifically, the Euro-Mediterranean Ministers of Finance on 2008 mandated the FEMIP to support three of the six concrete projects (Lindh 2010):

- de-pollution of the Mediterranean;
- alternative energies;
- Maritime and land highways.

$750 million have been allocated by the World Bank for the renewable energy project through the Clean Technology Fund.

2.2 Background on the MENA Region

The Middle East and North Africa (MENA) is an economically diverse region consisting of 20 countries ranging from the Least Developed Countries (LDCs) to the high-income countries. This region has a population of 355 million, with 85 percent living in the middle-income countries, 8 percent in the high-income countries and 7 percent in the low-income countries (Saade 2012).

2.2.1 Economic Performance of MENA Region

During the last few years, a strong economic performance has been shown by the MENA region. A large share of this performance is derived by high oil prices and reform policies, which are generally on a positive track. The region's growth performance was one of its best since the 1970s. In 2007 and 2008, GDP at market prices grew at 5.8%, up from an average of 3.7% in the years of 1999-2000. However, due to the high population growth rates, growth of per capita income remains lower. Although the recent global financial and economic crisis in the MENA region has been weathered relatively well, it still faces daunting medium-term challenges. One of these challenges is high unemployment especially among the young people. The labour markets across the region have not improved much over the same period. In 2005 the unemployment rate in the MENA amounted to 12% on average, but varies significantly between the countries. Estimates of unemployment are very high and labour migration within and outside the region is a very frequent phenomenon. Therefore, the job creation remains a priority in the MENA region. Other challenges for the MENA are vulnerability to the oil and food price shocks and water scarcity and inefficiencies of the public sectors. Indeed, the MENA region is highly dependent on the oil and oil products. Up to 80% of merchandise exports belong to this group of products

despite the fact that diversification of exports is an important task to achieve a long-term sustainable economic performance (GTZ 2009).

2.2.2 Three Groups of Countries within the MENA Region

In order to adequately demonstrate the different economic characteristics of the MENA region, three groups of countries are distinguished by the World Bank (Abdo and Ayman 2010):

- Resource-Poor, Labour-Abundant (RPLA: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, and Palestinian Territories),
- Resource-Rich, Labour-Abundant (RRLA: Algeria, Iran, Iraq, Syria, and Yemen); and
- Resource-Rich, Labour-Importing (RRLI: Bahrain, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and United Arab Emirates).

Many of the labour-abundant countries rely on the export of labour. For countries such as Egypt, Jordan, Syria and Yemen, one of the most important sources of the foreign exchange is labour remittances. The region's integration in terms of labour mobility is quite high in contrast to trade in goods and investment. Regarding export markets for merchandise trade, the EU is a key destination for several North African countries, especially Tunisia, Morocco, and Algeria. In contrast, for the Middle Eastern countries, the other MENA economies are major export markets.

Table 2.1 shows two main partners (in terms of share of total export) of selected countries from the MENA region.

Table 2.1 Major trade partners of selected MENA countries (share of total exports in %) Data source: IMF DOTS 2006-retrieved from (GTZ 2009)

	Algeria	**Egypt**	**Jordan**	**Morocco**	**Syria**	**Tunisia**
EU 27	53,9	38,2	3,6	71,9	32,2	78,1
MENA	2,1	20,1	46,2	3,7	59,0	9,2

CHAPITRE 3 LITERATURE REVIEW

3.1 A History of the Optimum Currency Area Theory

An optimum currency area (OCA) is defined in terms of an optimal geographic area, which adopts a single or several currencies whose exchange rates are permanently pegged (IJssennagger and Ligthart). The notion of optimality relies on several conditions. These conditions include factor mobility of production (labour and capital), price and wage flexibility, economic openness, consumption and production diversification, similarity in inflation rates, political integration, and fiscal integration. Results of sharing the above conditions might be internally and externally balanced while reducing the impact of some types of shocks. Therefore, the usefulness of the nominal exchange rate as a mechanism of adjustments is reduced (Mongelli and Europeo 2002).

In the context of the OCA theory, the terms “optimal” and “optimum” are interpreted in different ways. McKinnon (1963) refers the term of optimum to a currency area where three objectives are satisfied; two objectives of the internal equilibrium, which are full employment and a stable price level, and an objective of the external equilibrium, which is a balanced external account.

In the sense of Grubel (1970) “optimal” is used to describe “the union between a number of regions or countries, which improves welfare of the population within these territories above the level enjoyed when each was a separate currency area.” Kenen, Dornbusch et al. (1980) believe that “optimal” in the OCA theory comes into the view when the costs of the balance-of-payments adjustment are minimized.

The theory of optimum currency area determines the required conditions to be satisfied by countries in order to make a monetary union attractive. In fact, the conditions ensure that the benefits of the monetary union exceed its costs (Kenny 2003).

Mundell (1961), McKinnon (1963) and Kenen (1969) are the main contributors to the OCA theory who have concentrated on the cost side of the cost-benefit analysis of a monetary union. Each argumentation by these three economists is discussed in details.

3.1.1 Mundell Argumentation

Robert Mundell was the first one to formulate the theory of Optimum Currency Areas (OCA). According to him, optimum currency areas are identified by economic regions, i.e. regions with

internal mobility on factors of production, labour and capital, and external immobility of factors. he expressed (Mundell 1961):

"I have argued that the stabilization argument for flexible exchange rate is valid only if it is based on regional currency areas. If the world can be divided into regions within each of which there is factor mobility and between which there is factor immobility, then each of these regions should have a separate currency which fluctuates relative to all currencies."

Based on Mundell's definition, an OCA is a currency area in which the benefits of adopting a single currency or a fixed exchange rate regime are greater than the costs of abandoning the exchange rate as an internal mechanism of adjustment (i.e. within the area). Countries with highly integrated relationships in terms of trade and other economic relations are more likely to form an optimum currency area (Frankel 1999).

The main focus is on the costs of a monetary union. These costs refer the loss of a country's ability to use the exchange rate as an instrument to deal with shocks in demand and supply. In fact, in a monetary union, there is a central bank which monitors and controls partner countries in the union and makes a central decision about a certain condition for all partners (Horvath and Komárek 2002).

Mundell (1961) believes in the ability of factor mobility, especially labour mobility, to remove or at least reduce these costs. He also highlights the significant role of the price and wage flexibility as the instruments to deal with idiosyncratic demand shocks. Hence, there is no more need for changes in the exchange rate in an economy (region) with labour mobility or price and wage flexibility.

Shift in Demand and Ability of Labour Mobility and Wage Flexibility

Mundell (1961) developed the case of a demand shift in his famous article on the optimum currency areas. Imagine there is a shift away in aggregate demand from A-made to B-made products, e.g. due to a change in the preferences of consumers. As illustrated in Figure 3.1, this situation is presented by an upward movement in demand curve in B and a downward movement in A. In fact, as aggregate demand in A reduces, both output and price decreases in A. Also, by rising aggregate demand in B both output and price increases. Effects of these asymmetric shocks are unemployment in A and inflation in B. However, there are some mechanisms pushing back to

the initial equilibrium. Wage flexibility and mobility of labour are two adjustment instruments when countries A and B are trading from a monetary union. Following is the explanation for each mechanism (Kenny 2003).

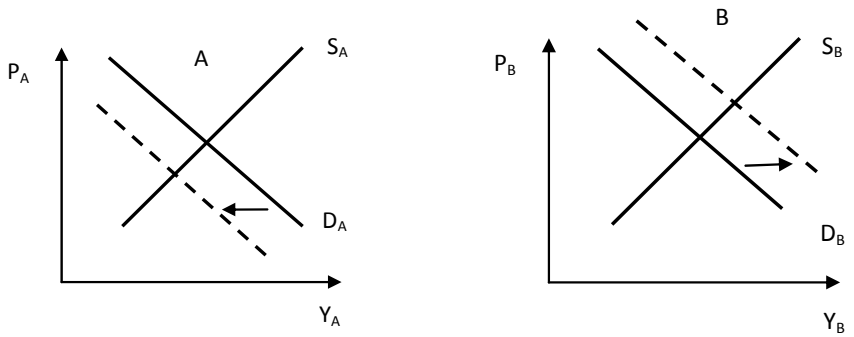

Figure 3.1 Shift in aggregate demand in A and B-retrieved from (Kenny 2003) .

a. Wage flexibility. With wage flexibility in A and B, the following results are observed. Once unemployment occurred in A, workers decrease their wage claims. As a result, the supply curve moves downward in A. In addition, the wage rate is pushed up in B because of the excess demand for labour and consequently moving upward the supply curve in B. As illustrated in Figure 3.2, the equilibrium will be brought back by these shifts. In fact, products of country A are going to be more competitive because their price fall and so there will be a boost in demand for them. For B, the opposite would occur. Figure 3.2 shows this adjustment.

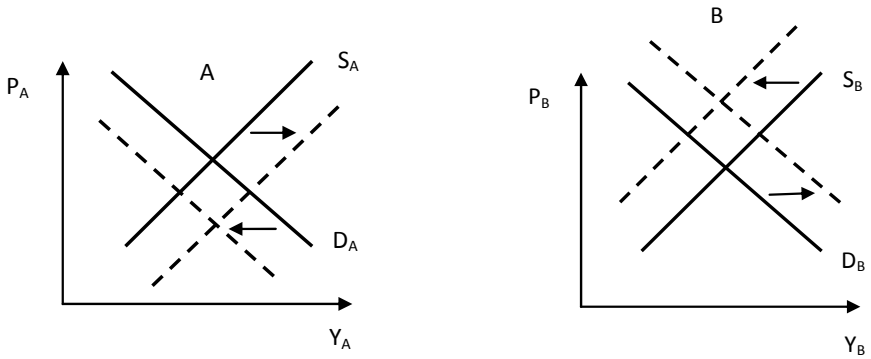

Figure 3.2 Adjustment mechanism by wage flexibility retrieved from (De Grauwe 2007)

b. Mobility of labour. With the possibility of labour mobility, excess demand for labour in B will be vanished by moving A's unemployed labour to country B. This movement

prevents the declining of wage in A and increasing of wage in B. As a result, there is no more unemployment in A and inflationary wage pressures in B.

Debates on Mundell Argumentation

Mundell's definition of an optimum area is the main focus of contention. Factor mobility, which Mundell had in mind, was about the geographic factor mobility. McKinnon (1963) indicates factor mobility in two separate senses: factor mobility among the regions and factor mobility among the industries. He argues that if the demand for A-made products falls, there is no great need for movements of factor from A to B if country A could make B-type products. However, if country A cannot develop B-type products, movements of factor from A to B prevent a fall of income in country A as a mechanism of adjustment. Nevertheless, McKinnon like Mundell believes that regions in which there is factor mobility should form a common currency area.

However, some authors such as Kenen (1969), Grubel (1970) and (Giersch 1973) have some criticisms to Mundell's argumentation. For instance, Kenen (1969) expresses that there should be perfect homogeneity of labours to have perfect interregional labour mobility. Grubel (1970) states that there is no certain declaration of levels of labour mobility in the context of regions in Mundell's definition of region. Giersch (1973) believes that mobility is high in the long run and is a function of time; therefore the world should be an optimum currency area in the long run (Horvath 2003).

3.1.2 McKinnon Argumentations

McKinnon (1963) is the second who contributed to the theory of optimum currency area. In McKinnon's view, the degree of openness is the main criterion to constitute an OCA; and defines it as the ratio of tradable to non-tradable goods. A fixed exchange rate is more advantageous for an open economy and there are more arguments for having a flexible exchange rate when economy is rather closed (Broz 2005). The following explanation shows that flexible exchange rates cannot be served as a mechanism of adjustment in an open economy.

Assume a small economy[5] with a high ratio of tradable to non-tradable goods. Tradable include exportable, X_1, and importable, X_2, and non-tradable are defined as X_3. Price of exportable, P_1, and importable, P_2, in domestic currency varies under a flexible exchange rate regime. So the fluctuations in exchange rate prevent a stable price level. McKinnon (1963) writes:

"...if we move across the spectrum from closed to open economies, flexible exchange rates become both less effective as a control device for external balance and more damaging to internal price level stability."

However, a large economy will be less affected by the fluctuations in the exchange rate. The logic is that only a small part of GDP in a large economy is engaged in the foreign trade (McKinnon 1963).

Giersch (1973) and Ishiyama (1975) criticized the McKinnon's view. Ishiyama (1975) believes that McKinnon's argumentation comes true if outside world price level is stable. However, stability of the outside world price level does not prevail in the real world. He says McKinnon's argumentation could be reversed because domestic economy in which there is fixed exchange rate regime would be directly affected by the external instability.

Giersch (1973) expresses that flexible exchange rate is more advantageous for open economies since it may be more affected by cyclical disturbances from outside world.

3.1.3 Kenen Argumentations

Kenen (1969) is the third important contributor to the OCA theory. Product diversification is introduced as an important criterion in forming an optimum currency area by Kenen.

Kenen (1969) explains the application of diversification by an example. Assume a negative demand shock is exposed to a country, which is not diversified and only produces one product. The exports revenue of the single product of this country will fall since it is affected by the negative demand shock. React to this shock is different under the type of exchange rate regime. If

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[5] The likelihood of openness in a small economy is higher than in a large economy. For a small economy it is more efficient to produces only those goods in which it has competitive advantage. Also it is more efficient to engage in foreign trade to export produced goods and import other goods which it does not produce.

such a country is under a flexible exchange rate regime then the solution to this shock is depreciation of the exchange rate[6]. However, if the country in question has a fixed exchange rate regime, the equilibrium should be brought back through a reduction in wage or a raise in unemployment. Therefore, fixed exchange rate is not appropriate for an undiversified economy. Imagining a well-diversified economy in which, consequently, exporter sector is also diversified. Each kind of industry might be exposed to some kind of shock. A positive shock in one industry can be offset by a negative shock in another industry in a diversified economy[7]. Therefore, giving up a flexible exchange rate as a mechanism of adjustment has a little cost for a well-diversified economy, on the one hand, and on the other hand, benefits from a single currency exceeds this cost.

Kenen (1969) introduces another important criterion in forming an optimum currency area, which is fiscal integration. The impact of asymmetric shocks between the two regions can be smoothed through the fiscal transfers from a low-unemployment region to a high-unemployment region.

3.2 The Costs of a Common Currency

The main cost of a monetary union is related to losing the power of national monetary policy. When a country joins a common currency, firstly, it has to stop using its national currency and secondly, its national central bank has no real power to conduct a national monetary policy. The later means that once a country enters a monetary union, it has no authority anymore to change its short term interest rate or price of its currency.[8] The advantage is the usefulness and effectiveness of these independent national policies, which are vanished by joining a monetary union. In fact, there are many situations in which these policies are the only choice to bring back the equilibrium which has been gone by some negative shocks. For instance, the helpfulness of the flexible exchange rate as an independent national policy, derive from the fact that countries are different

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[6] By depreciation of the exchange rate, now exporter gets more domestic currency for every unit of foreign currency and consequently export revenues improves.

[7] However, there should be occupational mobility between industries within region.

[8] When the country is not able to change the price of its currency, it is meant here that the country cannot devalue or revalue its currency.

in some significant senses in which this policy can do the best (Horvath and Komárek 2002). The three subsequent sections describe some of these differences in details in which applying the flexible exchange rate is necessary.

3.2.1 Shifts in Demand

There are two scenarios that have to be considered. The first one is about trade between two countries named A and B from a monetary union so using a common currency. And the second one is about trade between these two countries with their national currency.

Firstly, in the example of countries A and B once they are facing with demand and supply shock, labour mobility and wage flexibility are two mechanisms of adjustment. Therefore, the adjustment problem will vanish if these two mechanisms prevail between countries A and B in a monetary union. But what will happen if labour mobility and wage flexibility are not sufficiently high between countries A and B, which are two members of a monetary union? In this situation, in order to adjust to the disequilibrium, inflationary pressure is exposed to country B, which is in fact, the cost of joining a monetary union. On the one hand, there is no reduction of wages in A and also unemployment workers do not move from country A to country B. On the other hand, there is excessive demand for labour in B, which pushes the supply curve upward. This is because workers demand an increase in their wage rate. Thus, in B, prices increase and it in turn makes A's product more competitive. By that, demand for A's product increases and consequently aggregate demand curve in A shifts upward. As a result of labour immobility and wages inflexibility, adjustment to the disequilibrium took the form of inflation in B.

Secondly, there are some other adjustment mechanisms to deal with asymmetric shocks when two countries are not joining a common currency. This scenario explains the effectiveness of the national monetary policy. Considering the example of country A and B in which each country has its own national currency, the problem of asymmetric shocks will be solved by two mechanisms of adjustment derived from the national monetary policy. The first is related to the flexible exchange rate by which countries can manipulate their domestic interest rate. In this example, country A can lower its interest rate and so encouraging aggregate demand and country B can do the inverse. These mechanisms, which are applied by countries A and B, probably lead to depreciation of country A's currency and appreciation of country B's currency. By this method, A-made products will be sold in country B cheaper.

The second is that countries A and B peg their exchange rate to another currency. In this situation, asymmetric shocks will be vanished if country A devaluates its currency against the currency of country B; hence the same effect on aggregate demand would be attained. Figure 3.3 shows the effect of independent monetary policy on aggregate demand.

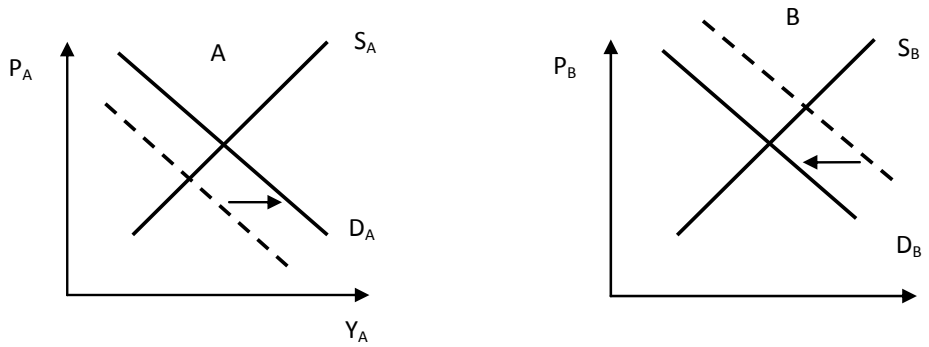

Figure 3.3 Effects of a devaluation of country A's currency, retrieved from (De Grauwe 2007).

Therefore, if there is not sufficient level of wage flexibility and labour mobility between countries in a monetary union, coming back to the equilibrium will be more costly than when the countries use their national monetary policy (De Grauwe 2007).

3.2.2 Different Preferences of Countries about Inflation and Unemployment

Countries in a monetary union are sensitive to inflation by different levels. This might make the common currency costly. Considering different preferences of two countries about inflation and unemployment in a monetary union, two countries may choose two different points on their Phillips curve. Hence, inflation will be different in the two countries and as a result, a fixed exchange rate will not be sustainable. The cost of a monetary union increases here, which derives from the fact that these two countries have to choose another point on their Phillips curve if they want to keep exchange rate fixed. In other words, they have to choose a less preferred point on their Phillips curve to keep inflation rate in an equal level. In this procedure, one country has to accept more inflation and less unemployment and the other country has to accept less inflation and more unemployment. None of these conditions are in their interest while they have to accept them and also accept costs derived from them so as to keep their exchange rate fixed (Ruprah and Luengas 2011).

3.2.3 Differences in Labour Market Institution

The degree of centralization of labour market institutions in different countries is not similar. In some countries, there is a high degree of centralization and others are less centralized. Under these differences, Wage and price reactions will be affected. It in turn may lead to a costly monetary union. If wage bargaining is strongly centralized, there is no incentive for unions to increase the wage of their members when they face supply shock. In countries in which labour unions are less centralized the approach is quite different. In these countries, each union has a tendency to increase the wage of its members since the union knows that all other unions do so even if it does not so. Thus, if individual union does not claim for wage increasing, the real wage of its members would decline. As a result, there will be different inflation rates when a monetary union is composed of countries with different degrees of centralization of labour market institution. This leads to have a costly monetary union (Grabner 2003).

3.2.4 Differences in Growth Rate

Some countries experience higher growth rate than other countries. Different growth rate in countries from a monetary union leads to a costly problem. It is explained by the example of country A and country B. Suppose that the GDP growth rate for country A is 5% and is 3% for country B. Also, assume country A imports from country B at income elasticity equal one and income elasticity of country B's import from A is one. In this situation, country A, which grows faster in terms of GDP, will have a balanced problem. This problem is resulted from the fact that country A's import grows faster than its export. To deal with this deficit, county A will have to reduce the price of its goods which is exported to B to make them more competitive and thus to able to sell them to country B. Hence, a monetary union can be costly for the fast growing countries (De Grauwe 2007).

3.2.5 The Cost of Monetary Union and the Degree of Openness

The effect of the degree of openness on the cost of a monetary union is analysed via the effectiveness of the exchange rate when asymmetric shocks appear. This analysis is performed by comparing two independent economies, one relatively open and the other one relatively closed. The relatively open economy is affected stronger than the relatively closed economy by the same depreciation since the exports of the open economy is higher than the exports of the closed

economy. In fact, by the same depreciation the aggregate demand is raised more in the former than in the latter. At the same time, the imports of the relatively open economy are more than the imports of the relatively closed economy. So, the CPI[9] is increased more in the open economy by the same depreciation. This in turn makes workers to request additional wage and shifts upward supply curve more in the open economy than in the relatively closed economy. It can be concluded that the aggregate price level in an open economy is affected more strongly than in a relatively closed economy by the same depreciation.

Therefore, the national monetary policy is likely to be more costly in an open economy than in a (relatively) closed economy (Benigno and Benigno 2003; Grabner 2003).

Figure 3.4 Relation between the cost of a monetary union and the openness of a country – retrieved from (De Grauwe 2007)

When the degree of openness of a country increases, the cost of a monetary union decreases. This relation is shown in Figure 3.4.

3.3 The Benefits of a Common Currency

Economic efficiency can be a result of joining a common currency since the national currencies are removed. Indeed, a multitude of national currencies are merged into a single one. Therefore, due to the reduction in transaction costs, efficiency gains will be improved (Grabner 2003).

[9] An index of the cost of all goods and services to a typical consumer

3.3.1 Direct and Indirect Gains from the Elimination of Transactional Cost

One of the most obvious and direct gains from joining a common currency is the elimination of transaction costs. Two different forms of transaction costs are such as fixed commission or spread between the buying and the selling prices of any given currencies. Elimination of transaction cost has also an indirect gain: price transparency. On the one hand, a simple platform for price comparison is created by price transparency and on the other hand, price transparency causes an increase in competition, so that the consumer will benefit from the same lower prices (Monnet).

3.3.2 Welfare Gains from Less Uncertainty

Uncertainty about future revenues of the firms in a fixed exchange rate regime is less than in a flexible exchange rate regime. In other words, one of the main reasons of uncertainty about future revenues of a firm is uncertainty about exchange rate. In addition, the world population is composed of risk-averse individual who prefer a certain level of future revenue. Put another way, just, if they are promised that the more risky return will be higher than the less risky return, then they accept that (De Grauwe 2007).

3.3.3 Benefits of an International Currency

Using a common currency in a monetary union has three sources of benefits. The first source of benefits deals with the additional benefits of an international currency. In fact, the issuer of a currency obtains additional benefits when the currency in question is used internationally. The second source of benefits derives from the fact that foreign central banks hold an international currency as an international reserve. However this kind of reserve is held as treasury securities and not in the form of cash. By the third benefit, it is concluded that activities by domestic financial markets are improved when they work under an international currency. This is because of interests of foreign residents to invest in asset and issue debt in that international currency. Therefore, bond and equity markets and also businesses are attracted by domestic banks and consequently some new jobs are performed (Grabner 2003).

3.3.4 Benefits of a Monetary Union and the Openness of Countries

There is a relationship between benefits of a monetary union and the openness of a country. The higher the degree of openness of an economy in a monetary union, the higher welfare gains of this monetary union. The elimination of transaction cost is more important in countries where a large proportion of goods and services are traded. The likelihood of making an inappropriate decision in these countries is high. The reason is that firms and consumers in these countries are facing different markets and hence different currencies. So in the process of transaction domestic currency to foreign currencies they will lose a proportion of their benefits of their trade. Eliminating these risks in small and open countries causes a larger welfare gains in compare to the large and relatively closed countries. The relationship between the benefits of a monetary union and the openness of the countries is represented in Figure 3.5. By this relationship, welfare gains from a monetary union increases when openness toward the other partners in the union increases (De Grauwe 2007).

Figure 3.5 Relation between degree of openness (trade) and benefits of a monetary union – retrieved from (De Grauwe 2007)

3.4 Comparison of Costs and Benefits of a Monetary Union

Benefits and costs related to the openness of a country were analysed separately in previous sections. The combination of these relations is analysed in Figure 3.6.

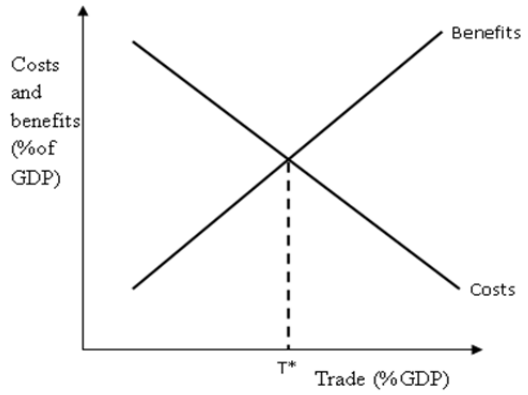

Figure 3.6 Costs and benefits analysis of a monetary union – retrieved from (De Grauwe 2007)

Figure 3.6 illustrates that the critical level of openness is determined by the intersection point of the benefit and cost lines. In fact, this point guides countries whether join a monetary union or not. To the left of this point the costs of a monetary union are more than the benefits of a monetary union. Hence, in this side, it is better to use the national monetary policy. To the right of this point the benefits of a monetary union are more than the costs of a monetary union. Therefore, in this area, joining a monetary union could be a better choice than keeping the national monetary policy like exchange rate policies. Figure 3.6 shows a general form of a cost-benefit analysis of a monetary union (De Grauwe 2007).

3.5 The Endogenous Optimum Currency Areas Theory

The theory of endogeneity of Optimum Currency Areas was pioneered by Frankel and Rose (1998). They showed that reciprocal trade is improved significantly by monetary integration. Between the members of a potential OCA, four inter relationships are studied by much of literatures in the subject of optimum currency area theory (Frankel and Rose 1998):

1) The degree of trade;

2) Synchronisation of shocks and cycles;
3) The degree of mobility of labour; and
4) The system of risk sharing[10] .

A common currency will be more attractive and suitable if any of these four linkages will be greater between the potential members. For instance, these four criteria were examined by researchers so as to determine the suitability of the entrance of a country into the European Monetary Union (EMU). But in the sense of Frankel & Rose this procedure is untenable since the OCA criteria are endogenous. Frankel and Rose (1998) argue on the first two criteria although they do not deny the importance of the third and fourth criteria.

The nature of national business cycles might be affected by tighter international trade ties. Warin, Wunnava et al. (2008) stated that 'waiting for two economies to be in phase before adopting the same currency is only one part of the path towards an OCA since using a common currency will also force the economies to become an OCA'. Frankel and Rose (1998) mentioned that 'a naive examination of historical data gives a misleading picture of a country's suitability for entry to a currency union, since the OCA criteria are endogenous'. In fact, a monetary union itself may contribute to an additional enhance to trade integration and consequently business cycle synchronisation.

There are two different interpretations about the effect of closer international trade on correlations of national business cycles. The first interpretation, known as 'pro-synchronisation' hypothesis, claims that the deeper the monetary integration process, the more co-movement (correlation) in the national business cycles. This co-movement of national business cycles is strengthened especially in the case of intra-industry trade. According to the second interpretation, co-movement between the outputs of countries in a monetary union decrease with monetary integration. This interpretation is called 'anti synchronisation'. This hypothesis suggests that specialization can be expected to happen when inter-industry trade prevail. By 'pro-synchronisation' hypothesis, it is concluded that a positive correlation between members' output is fostered by integration. This in turn leads to more synchronisation of business cycles. The

[10] Often, risk sharing is done by fiscal transfers.

reasons for this claim are based on the four microeconomic conditions which are necessary to form an OCA (Akiba and Iida 2009):

1) Decline of transaction cost

   Chaplygin, Hallett et al. (2006) state that "a necessary and sufficient condition for low costs is both a high positive correlation between the shocks..., and shocks of similar size."
2) Allocation of scarce resources will be more efficient
3) Creating more opportunities in financial market integration and hence a boost in capital mobility.
4) Real exchange rate volatility is decreased in the result of more flexibility in wage and prices.

All of these four argumentations can be expected to contribute to improve trade and more integration and symmetry of outputs. Pursuant to 'pro-synchronisation' hypothesis, member countries may satisfy the OCA properties ex post, even though they may fail to satisfy them ex ante. This hypothesis is called 'endogeneity of OCA hypotheses' by Mongelli and Europeo (2002).

The latter hypothesis, 'anti synchronisation', was discussed by Krugman (1993). He claims that reciprocal volume of trade between countries increases as a result of more integration. Therefore, a necessary condition, openness, for forming an OCA is satisfied. Exporting countries will be specialised in production for which they have a comparative advantage due to the raise in openness. Specialization, in turn undermines 'diversification', the necessary condition for the OCA. Hence, in Krugman's words, countries in a monetary union will be more exposed to asymmetric shocks for the reason that the correlation coefficient of output has a tendency to fall. Mongelli and Europeo (2002) called this hypothesis the 'Krugman specialization hypothesis'.

The high correlation coefficients between outputs of countries are important since within a monetary union, independent monetary policy, which is applied to deal with asymmetric shocks, must be removed. The cost, which is resulted from abandoning independent monetary policy, is lowered if output co-move among the member countries. By co-movement of output it is meant here that the correlation coefficient is high (Akiba and Iida 2009).

Frankel and Rose (1998) believe the 'pro-synchronisation' hypothesis to be the more realistic one. They wrote: 'only countries whose business cycles are imperfectly synchronised with

others' could benefit from the potential stabilisation afforded by a national monetary policy'. As mentioned so far, the relation between the extent of trade among members of a potential common currency and the correlation of incomes is discussed by endogeneity of OCA theory by Frankel and Rose (1998). This argumentation also is discussed by De Grauwe, Mongelli et al. (2005)

Figure 3.7 gives a better understanding of endogeneity of OCA theory. Vertical axis shows correlation of business cycles across countries, i.e. income correlation. Income correlation means that the shocks exposed to the economies are symmetric. Horizontal axis shows the extent of international trade.

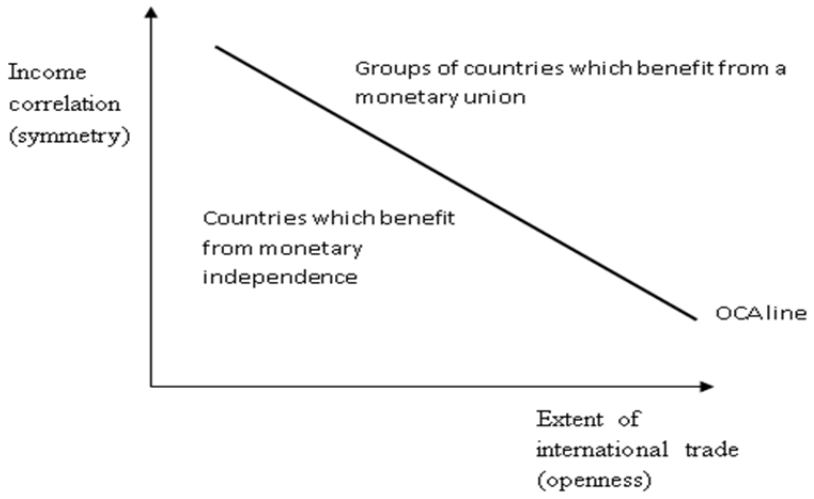

Figure 3.7 Income correlation, integration and OCA line-retrieved from (Frankel and Rose 1998)

The OCA line indicates that sharing a single currency is beneficial for countries which share a high level of either openness or income correlation among them (Frankel and Rose 1998).

The OCA line in this representation is downward-sloping. De Grauwe, Mongelli et al. (2005) mentioned the reason for the shape of OCA line. On the one hand, the costs of a monetary union are increased if symmetry is decreased. This is because losing of national monetary policy instrument is more costly while the degree of asymmetry increases. On the other hand, as the degree of integration increases member countries benefit more from the monetary union, i.e. benefits from efficiency gains. Therefore, integration can be considered as a source of benefits of a monetary union. As a result, the costs originated from more asymmetry can be compensated by the benefits generated from more integration. Frankel and Rose (1998) explained the reason for

the shape of OCA line as: ‘the advantages of adopting a common currency depend positively on both trade integration and the degree to which business cycles are correlated internationally’.

Each point on the OCA line represents a combination of certain level of symmetry and a certain level of integration. Costs and benefits of a monetary union balance for all points on the OCA line. Points high up and to the right of the OCA line indicate groups of countries which have found it beneficial to join a monetary union. In other words, benefits of a monetary union outweigh its cost for groups of countries to the right of the OCA line. To the left of the OCA line the benefits from independent national monetary policy overcome the efficiency gains from the monetary union. There is a disagreement regarding the direction in which income correlation moves along the OCA line when openness increases. This debate is represented by Figure 3.8. In one case, income correlation increases as openness increases. Therefore, the union moves along the upward arrow (shown by arrows number one). In another case, income correlation decreases as openness increases and consequently the union moves along the downwards sloping arrow (shown by arrow number two)[11] (De Grauwe, Mongelli et al. 2005).

[11] These two views have been mentioned previously. The former is in fact European commission view and the latter is Krugman’s view.

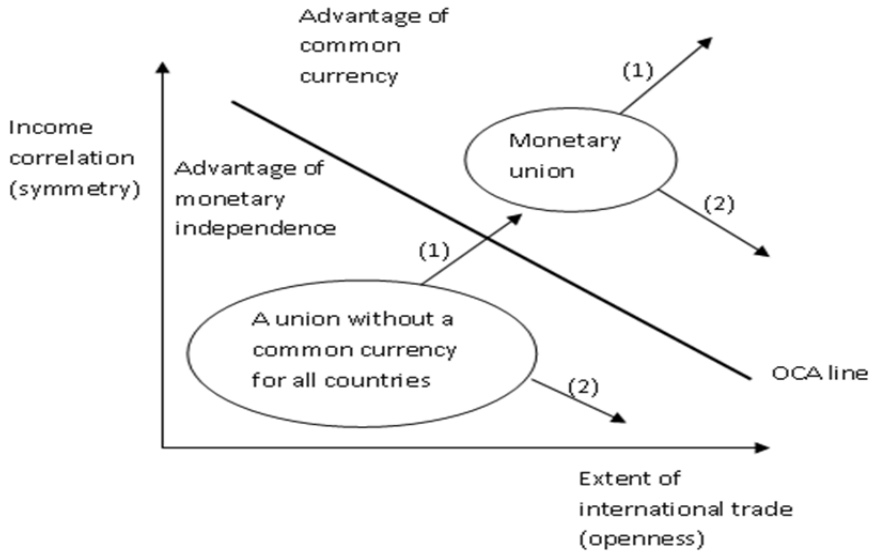

Figure 3.8 Direction of movement of a union related to relation between income correlation and openness-retrieved from (De Grauwe, Mongelli et al. 2005)

In the latter case, which is also called specialisation, increased openness has the opposite effect on income correlation. Therefore, in the sense of De Grauwe, Mongelli et al. (2005), another significant dimension, flexibility, should be taken into account so as to judge the merit of monetary union. They showed the trade-off between income correlation and flexibility by the downward sloping OCA line. Figure 3.9 shows this relationship for a given level of integration.

The argumentation for the relation between income correlation and flexibility is similar to the argumentation about the relation between income correlation and openness. Each point on the OCA line represents a combination of certain level of symmetry and a certain level of flexibility. For all points on the OCA line, costs and benefits of a monetary union are balanced. The OCA line in this representation is downward sloping. While the degree of symmetry decreases, the cost of the monetary union increases. Thus, there should be an increase in flexibility (as a source of benefits of a monetary union), so as to compensate the cost originated from less symmetry.

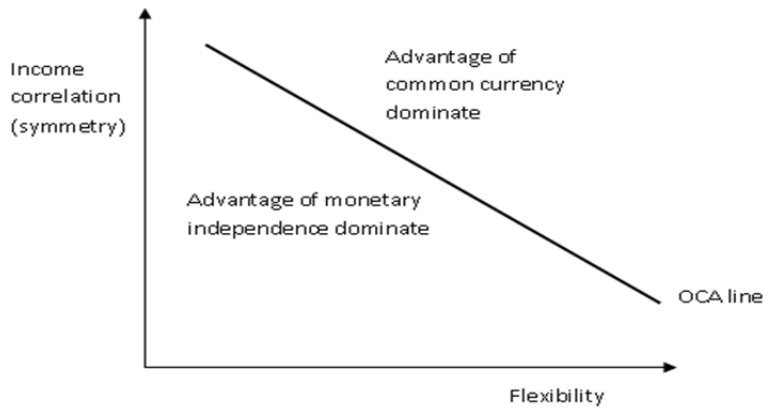

Figure 3.9 Income correlation, flexibility and OCA line-retrieved from (De Grauwe, Mongelli et al. 2005)

Considering the relationship between income correlation, degree of openness (integration) and flexibility, in Figure 3.10, the OCA line is drawn for a given level of integration. In Figure 3.10, the relationship between income correlation and flexibility is investigated by different levels of integration. The OCA line (composed of points which are combination of certain level of income correlation and flexibility) shifts downward as a result of a boost in integration. In fact, benefits of a union rise as a consequence of increased integration, so that the need for flexibility and symmetry in order to making a monetary union beneficial is decreased. Figure 3.10 shows that for a higher level of integration ($I_2>I_1$), the OCA line shifts downward. Consequently, for a certain level of symmetry (S) we need less flexibility (F_2) to make a monetary union beneficial. Similarly, for a certain level of flexibility (F) we need less symmetry (S_2) to make a monetary union beneficial. De Grauwe, Mongelli et al. (2005) formulate these relations by a linear mathematical. In their sense, the net benefits of a monetary union are a positive function of:

1. The degree of flexibility
2. The degree of symmetry
3. The degree of integration

The linear equation can be considered as below:

B=f+I+s

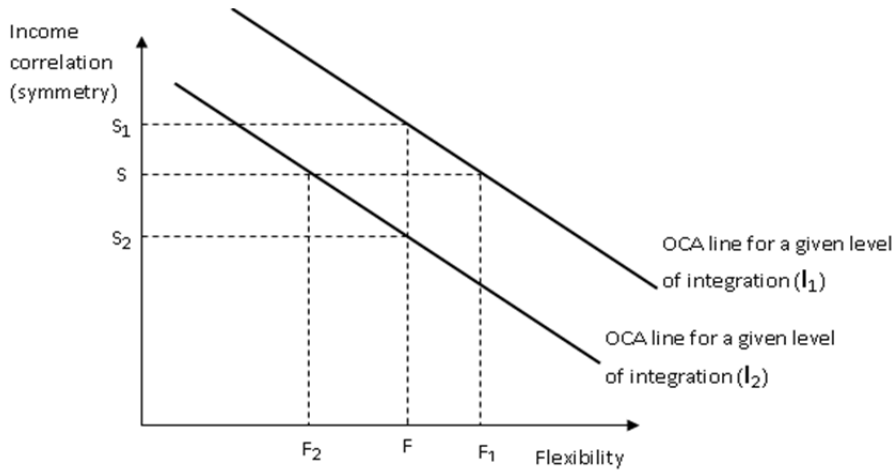

Figure 3.10 OCA line as a combination of income correlation and flexibility relative to different levels of integration -retrieved from (De Grauwe, Mongelli et al. 2005)

3.6 Gravity Model of Trade

The law of gravity in the 17th century was formulated by Newton stating that the attraction between two bodies is affected positively by the product of masses of two bodies and negatively by the distance between these two bodies (Djabir 2009).

Law of universal gravitation formulated by Newton (Head 2003):

$$M_{ij} = G * \frac{Y_i * Y_j}{D_{ij}^2} \qquad (1)$$

Where:

- M_{ij} is the attractive force.
- *Yi* and *Yj* are the masses.
- D_{ij} is the distance between the two objects.
- *G* is a gravitational constant depending on the units of measurement for mass and force.

In economics, Tinbergen (1962) and Pöyhönen (1963) introduced the gravity model to study the bilateral trade flows. Since then, the gravity model is known as a popular instrument in the empirical international trade analysis.

Indeed, flows of international trade are explained widely by using this model. In the context of international trade, physical bodies refer to exporting and importing countries (bilateral trade partners) and the size of economies of these partners are masses. The gravity model of international trade claims that trade flows between two economies depend positively on the size of these economies (their national income) and negatively on the distance between two economies. Distance serves as a proxy for the degree of resistance between two countries, which increases transportation costs (Djabir 2009). In other words, one of the most stable relationships in economics is described by the gravity model. Brakman and Bergeijk (2010) state: "interactions between large economic clusters are stronger than between smaller ones, and nearby clusters attract each other more than far-off ones."

The same functional form to the law of Newton applicable to the international trade flows was proposed by Tinbergen (1962):

$$X_{ij} = G * \frac{Y_i^{\alpha} * Y_j^{\beta}}{D_{ij}^{\theta}} \qquad (2)$$

Where:

- X_{ij} is considered as the "flow" from home country *i* to the destination country *j*
- Y_i and Y_j are the relevant economic sizes of the two locations. These variables could be gross domestic product (GDP) of each location If *X* is measured as a monetary flow (e.g. exports values).
- D_{ij} is the distance between the locations (usually measured centre to centre). By returning to Newton's law if $\alpha = \beta = 1$ then $\theta = 2$.

3.6.1 Economic Explanations for Gravity

The gravity model could be considered as a sort of short-hand representation of supply and demand forces. Consider country *i* as the home country and then Y_i represents the amount it is willing to supply. Meantime, suppose Y_j be the amount of income country *j* spends on all goods from any source *i*. In addition, Distance is considered as a kind of tax which increases trade costs.

Finally, suppose s_{ij} be the share of Y_j that gets spent on goods from country i. By all of these parameters, an equation will be obtained as below:

$$X_{ij} = s_{ij} * Y_j \quad (3)$$

On the one hand, S_{ij} depends positively on a wide variety (n_i) and high quality (μ_i) in products of country i. On the other hand, trade barriers such as distance decreases S_{ij}. However this variable is between 0 and 1 (Head 2003). S_{ij} is derived from the following relation:

$$S_{ij} = \frac{g\left(\mu_i, n_i, D_{ij}\right)}{\sum_l g\left(\mu_l, n_l, D_{lj}\right)} \quad (4)$$

There are different approaches about the specific form of *g(.)*. One approach by Bergstrand (1985) assumes $\mu_i = 1$ and makes n_i proportional to Y_i. There is a second approach by Anderson (1979) who assumes each country produces a single good ($n_i=1$), but lets the preference parameter μ_i vary in such a way as to also be proportional to Y_i. However, both approaches assume that trade costs is a power function of the distance. Thus, equation 5 specifies the form of s_{ij}:

$$S_{ij} = Y_i * D_{ij}^{-\theta} * Rj \quad (5)$$

Such that:

$$Rj = 1 \Big/ \sum_l g\left(\mu_l, n_l, D_{lj}\right) \quad (6)$$

Now by substituting equation (5) into the equation (3), equation (7) is obtained which is very close to application of gravity model in trade, (i.e. equation (2) proposed by Tinbergen (1962)) (Head 2003).

$$X_{ij} = R_i * \frac{Y_i * Y_j}{D_{ij}^{\theta}} \quad (7)$$

3.6.2 Mathematical and Economic form of the Gravity Model

The mathematical form of the gravity model in its most basic interpretation (also another form of the equation (2)) is expressed as(Zarzoso ; Djabir 2009):

$$X_{ij} = \beta_0 * Y_i^{\beta 1} * Y_j^{\beta 2} * N_i^{\beta 3} * N_j^{\beta 4} * D_{ij}^{\beta 5} * \varepsilon_{ij} \qquad (8)$$

Where:

- X_{ij} is the value of bilateral trade between countries *i* and *j*.
- Y_i and Y_j are the national income of country *i* and country *j* respectively.
- N_i and N_j are the population of countries *i* and country *j* respectively.
- *Dij* represents the geographic distance between two countries *i* and *j*.
- ε_{ij} represent any other factors (which are not included in the model) facilitating or preventing trade between two countries *i* and *j*.

β_1, β_2, β_3, β_4, and β_5 are exponents indicating that the relations between the explanatory variables and the trade flows may not be necessarily linear or directly proportional.

In most of the literature, the variable population is replaced by GDP per capita. However, equation (8) should be estimated economically. Hence, it has to be expressed in log-linear form:

$$\ln X_{ij} = \beta_0 + \beta_1 * \ln Y_i + \beta_2 * \ln Y_j + \beta_3 * \ln N_i + \beta_4 * \ln N_j + \beta_5 * \ln D_{ij} + \sum_h \delta_h P_{ijh} + \varepsilon_{ij} \qquad (9)$$

Ln in this model indicates variables in natural logs. P_{ijh} is a dummy variable that takes one for value, if a certain condition is satisfied, and zero otherwise. In fact, dummy variables reflect the effect of particular conditions on the bilateral trade. Bilateral trade is increased when the coefficient of a dummy variable is positive and significant comparing to a situation in which these conditions do not exist. Dummy variables could be such as sharing a common border or common language between two trading partners as well as membership in a Free Trade Agreement (FTA) or customs union. Different literatures have used different dummy variables.

Dummy variables in our work are common border, common language and common colonizer at any time between two partners.

We expect a positive sign for $\beta_1$and β_2. On the one hand, a result of high level of income in the exporting country is a high level of production. In addition, it in turn indicates the availability of goods for exports. On the other hand, higher imports are a result of a high level of income in the importing country. The expected sign for the coefficient of the population in exporting and importing countries are ambiguous. It depends on whether the country exports less when it is big or whether a big country exports more than a small country (Zarzoso).

Equation (9) is considered as a very basic gravity model. Variables in this equation are coming from the works of Kalirajan (1999), Endoh (1999), Breuss and Egger (1999), Nitsch (2000), Buch and Piazolo (2001), Porojan (2001), Sapir (2001), Soloaga and Alan Wintersb (2001), Glick and Rose (2002), Kurihara (2003), Gopinath and Echeverria (2004), Roberts (2004), Sohn (2005), Peridy (2005), Tang (2005), Carrere (2006), Fratianni and Kang (2006), Elliott (2007), Kalirajan (2007), Bun and Klaassen (2007), Tzouvelekas (2007), Melitz (2007) There are many other independent variables promoting or hampering trade among economies. Some of these variables were categorized by Brülhart and Kelly (1999):

- Variables that describe the potential supply of the exporting country include income and income per capita and population of the exporting country;
- Variables that describe the potential demand of the importing country include income and income per capita and population of the importing country;
- Variables that describe the resistance to trade include geographical distance, policy and cultural barrier to trade, etc.

A number of these variables are entered into the gravity model by different studies.

Kandogan (2008) has added foreign currency reserves, similarity in economic size and relative factor endowment (Hecksher Ohlin variables). Also, relative factor endowment has been added by Antonucci and Manzocchi (2006). One of the most complete forms of gravity model was presented by Warin, Wunnava et al. (2009) in investigating the Southern African Economic Integration. They added monetary and fiscal variables including inflation, public deficit, public expenditure, and public debt to the gravity model of trade. This study aims to apply a gravity model with a complete set of explanatory variables that are used in different other studies. Except

empirical justification for gravity model, theoretical foundations of this model also were justified by several studies, which are presented in the next section.

3.6.3 Theoretical Foundations of the Gravity Equation

In fact, the gravity equation started by is considered as a purely empirical contribution to explaining bilateral trade flows (Tinbergen 1962; Pöyhönen 1963). By purely empirical, it is meant that at that time there was no theoretical foundation to explain the gravity model in international trade. More variables were added to the equation by Linnemann (1966) such that he went further toward a theoretical justification. Since the late 1970s, the gravity equation obtained more legitimacy by a series of theoretical articles. In fact, these theoretical articles indicated the consistency of the gravity equation with various models of trade flows. Leamer and Stern (1970) by following work of Savage and Deutsch (1960) derived the gravity equation in the form of a probability model of transactions. Anderson (1979) followed the contributions to derive the gravity equation with the assumption of product differentiation first by assuming Cobb-Douglas preferences and then, constant-elasticity-of-substitution (CES)[12] preferences. Also, Bergstrand (1985) used CES preferences to derive a reduced form equation for bilateral trade involving price indexes.

Helpman (1987) based on his work with Krugman and Helpman (1985), presents a model in the form of the gravity equation in which, intra industry trade is addressed directly. In his model he indicates that trade volume within a group increases when countries in that group are more symmetric in their income. Deardorff (1998) derived the gravity equation from the perspective of the Hechsher-Ohlin theory of comparative advantage[13]. In this theory, the comparative advantage of a country is specified by relative resources of the country. Also, in support of the gravity equation from the perspective of theoretical foundations, Deardorff (1998) derived two gravity equations based on incomplete specialization (Fratianni 2007). van Wincoop and Anderson

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[12] In economics, Constant elasticity of substitution (CES) is a property of some production functions and utility functions.

[13] Theory of comparative advantage indicates that capital-rich countries have a tendency to exports capital-intensive products; while labor-rich countries will exports products that require a relative intensive use of the labor.

(2003) and Baldwin and Taglioni (2006) have extended the work of Anderson (1979). Behind the history of the gravity equation, works by Anderson (1979), van Wincoop and Anderson (2003) and Baldwin and Taglioni (2006) are the main references for subsequent works on the gravity equation, which is explained in the next section. Thus, despite the lack of theoretical foundations for the gravity equation in the sixties and before, this model was legitimated by a series of theoretical articles in the seventies.

***The Gravity Equation by Anderson* (1979)**

The simplest possible gravity equation was developed by Anderson (1979). To develop his micro foundations for the gravity equation, he used a Cobb Douglas expenditure equation with some assumptions such as:

- Complete specialization assumption for each country, means that each country only produces one good and is specialized in its own good;
- There is no tariff or transportation cost;
- Zero balance of trade is assumed in each period;
- The fraction of income spent on the country *i*'s product is the same in all countries;
- Prices are assumed constant at equilibrium values and units are picked so that they are all assumed unity;

With these assumptions, trade flow from country *i* to *j* in each time period *t* is expressed as:

$$X_{ij}^{*} = \theta_i * Y_j \quad \text{Or} \quad \theta_i = X_{ij}^{*} / Y_j \qquad (10)$$

Where:

θ_i: The fraction of income spent on the country *i*'s product,

Y_j: Real GDP in country *j* (importing country).

Assumption of equality of income and sales implies that production in country *i* should be equal to the sum of domestic consumption and external consumption (exports). Thus GDP of country *i* can be modeled as:

$$Y_i = \sum_{j=1}^{N} X_{ij}^{*} = \sum_{j=1}^{N} \theta_i * Y_j = \theta_i * \left(\sum_{j=1}^{N} Y_j \right)$$

Or

$$\theta_i = Y_i \Big/ \left(\sum_{j=1}^{N} Y_j \right) = Y_i / Y_W \qquad (11)$$

Where $Y_W = \sum_{j=1}^{N} Y_j$ represents the real GDP of the world that is constant for each country pair.

By inserting equation (11) into equation (10), we obtain:

$$X_{ij}^{*} = Y_i Y_j \Big/ \left(\sum_{j=1}^{N} Y_j \right) = Y_i Y_j / Y_W \qquad (12)$$

Equation (12) is one of the simplest forms of the gravity model by Anderson (1979). The basic structure of the gravity model is achieved by taking a natural logarithm of both side of this equation:

$$\ln X_{ij}^{*} = \alpha + \beta \ln Y_i + \gamma \ln Y_j + \phi Z_{ij} \qquad (13)$$

Where $\alpha = (-\ln Y_W)$, and Z_{ij} indicates a vector of variables, which are constant across time (e.g. distance or border effect). A more complete form of the gravity equation (rather than equation 13) is seen in the work of van Wincoop and Anderson (2003) and Baldwin and Taglioni (2006).

Gravity Equation by Baldwin and Taglioni (2006) and Anderson and van Wincoop (2003)

Baldwin and Taglioni (2006) represent a simplified derivation of the gravity model in six steps.

Step 1: The first step is based on the equality of supply and demand, which indicates that the value of trade follows from country *i* to country *j* should equal the share of country *i* in expenditure of country *j*:

$$p_{ij} * x_{ij} = s_{ij} * E_j \qquad (14)$$

Where:

p_{ij} indicates the price of import from country *i* to country *j*

s_{ij} indicates the share of country i has in expenditure of country j

E_j is expenditure of country j

Step 2: Next, S_{ij} is derived by following a CES demand structure. Assume all goods are traded, the share of country i in country j's expenditure depends on the bilateral prices, p_{ij}, relative to a price index, P_j.

$$sij = \left(pij / Pj\right)^{1-\sigma} \quad (15) \qquad \text{Such that} \quad Pj = \left(\sum_{i=1 \ldots N} ni * \left(pij\right)^{1-\sigma} \right)^{1/1-\sigma}$$

Where notations are defined as follows:

σ: elasticity of substitution among varieties ($\sigma > 1$)

N: number of nations,

n_i: number of varieties which is supplied by nation i,

Step 3: trade costs are added in this step. One of the most important factors in all gravity models is the cost of trade. Suppose that t_{ij} indicates the costs of bilateral trade between country i and country j. Hence, the price in market j is:

$$p_{ij} = p_i * t_{ij} \qquad (16)$$

In this equation p_i represents the mill price of a variety in country i. p_{ij} is the price in market j after transportation. Note that varieties are assumed symmetric and there is no index for them.

Step 4: total trade between two economies is described by gravity equation which this implies aggregation across varieties:

$$T_{ij} = n_i * s_{ij} * E_j = n_i * \left(p_i * t_{ij}\right)^{1-\sigma} * E_j / P_j^{1-\sigma} \qquad (17)$$

The third part of equation (17) ($n_i * \left(p_i * t_{ij}\right)^{1-\sigma} * E_j / P_j^{1-\sigma}$) is obtained by inserting equation (16) into equation (15) and then inserting the result of this combination into the second part of the equation (17) ($n_i * s_{ij} * E_j$).

Step 5: in this step the budget constraint is taken into account. Since all goods are traded, total income of country *i*, Y_i, equals total sales to all destination countries *j*. Country *i* itself is considered as a destination country since it is also a consumer of *i*'s products.

$$Y_i = \sum_j T_{ij} = n_i * p_i^{1-\sigma} * \sum_j \left(t_{ij}^{1-\sigma} * E_j / P_j^{1-\sigma} \right) \quad (18)$$

Second equality in equation (18) is obtained by inserting the right side of equation (17) into the second part of equation (18) ($\sum_j T_{ij}$).

Equation (18) can be written as:

$$n_i * p_i^{1-\sigma} = Yi / \Pi_i^{1-\sigma} \quad (19)$$

Where

$$\Pi_i = \left(\sum_j \left(t_{ij}^{1-\sigma} * E_j / P_j^{1-\sigma} \right) \right)$$

Step 6: gravity equation is derived by inserting equation (19) into equation (17):

$$T_{ij} = Y_i * E_j * \left(t_{ij} / \Pi_i * p_j \right)^{1-\sigma} \quad (7)$$

Equation (20) is a gravity equation, which was derived by Baldwin and Taglioni (2006). This equation is similar to the equation derived by van Wincoop and Anderson (2003). The only difference is that van Wincoop and Anderson (2003) used income share instead of expenditure. The gravity equation by van Wincoop and Anderson (2003) has the following form:

$$X_{ij} = Y_i * Y_j / Y_W * \left(t_{ij} / \Pi_i * p_j \right)^{1-\sigma} \quad (21)$$

Where:

$$\Pi_i = \left(\sum_j \left(t_{ij} / P_j \right)^{1-\sigma} * \theta_j \right)^{1/1-\sigma}$$

Where notations are defined as:

Y_i, Y_j are real GDP in the exporter and importer countries respectively,

Y_W is the real GDP of the world,

t_{ij} is the costs of bilateral trade between country *i* and country *j*,

P_j is the consumer price index of *j*.

The main difference between equation (21) and the one that was derived by Tinbergen (1962) is the price index *P* and *Π*, which are called multilateral resistance terms. These terms indicate that bilateral trade between two economies except for depending on bilateral variables related to these two economies also depends on their position relative to the world economy.

The gravity equation in this study is based on general form of gravity model in international trade in equation (2) in section 3.6 (gravity model of trade). This equation was extended in this research and additional explanatory variables were put in the basic model, such as convergence variables, market size, income similarity and relative factor endowment. From the literature review, different explanatory variables were put in different regression lines based on different gravity equation used in previous researches.

3.6.4 Two of the Most Important Variables in the Gravity Model

The key point in the gravity model is that the volume of bilateral trade can be explained by two important variables: economic size of two trading partners and distance between them (Feyrer 2009).

- **Economic size (income)**

High levels of income in the exporting and importing countries indicate respectively:

  - High level of production which in turn indicates the availability of goods for exports in exporter country;
  - Higher imports as a result of a high level of income in the importing country.

- **Distance**

Although, some studies have discussed the “death of distance” many studies using the gravity equation of bilateral trade confirm that the impact of geographic distance is still substantial. In fact, the main significant characteristic of the gravity model is the concept of bilateral distance since volume of trade between countries is affected substantially by distance between them. Put differentially, tastes and cultural characteristics may diverge if distance increases between countries and consequently, trade decreases between them.

In natural science, such as physics, the concept of distance is well defined and measurement of that is unambiguous and explicit. In the context of economics, however, distance is a multifaceted variable and its interpretation and measurement is not as clear as in natural science. The main reason of entering distance into the gravity model is that it can be considered as a proxy for transportation costs and transport time. Also, it can be counted as a proxy for measuring the “mental” distance of exporter and importer. Different studies have used different proxies for measuring distance costs in the gravity models. Some researchers rely on the dummy variables to measuring the costs of distance such as common borders, language similarities, cultural differences, colonial ties, etc. The effect of these variables is explained in the next section. Actual data on shipping costs are used by most of other studies to measure the costs of trade in the gravity model (Brakman and Bergeijk 2010).

In this study, the dummy variables were used as well as the distance between two economies in kilometre.

3.6.5 Intangible Barriers to the International Trade

The effects of intangible trade barriers are another important characteristic, which are explained in the gravity model. In this context, the main concern of most of the gravity model studies is only the geographical distance. However, there are important additional costs involved in trade beside the transportation costs. Deardorff (2004) states that the current amount of global trade would be much higher than what it is now, if transportation costs were the only cost involved in trade.

Cultural distances could be considered as the other dimension of distance. Tariffs, search costs and information costs about the product and the reliability of trading partners are several kinds of

transaction costs, which are stated by Den Butter and Mosch (2003) and Anderson and Van Wincoop (2004). In addition, the costs of negotiation increase when two trading partners do not have a common language.

Cultural differences as trade barriers are entered into the gravity equation in the form of dummy variables stating whether the trading partners have a common language, common border and/or colonial past. A significant positive effect of these variables on the amount of international trade was found by most of studies. These variables capture cultural familiarity, meaning that if trading partners satisfy the presence of these variables among them, they communicate and share information easier since they have more knowledge about the cultures of each other (Brakman and Bergeijk 2010).

CHAPITRE 4 DESCRIPTIVE ANALYSIS

In this section a descriptive analysis is presented to provide a clear picture of our dataset. Dependent and independent variables are investigated for each economy relative to the other economies through the years. By this investigation, behaviour of exports (i.e. dependent variable), and all explanatory variables of each economy as an exporter are investigated by taking a trend line of their plot charts. Years are shown in the plot charts by X axis. Each variable is shown on the Y axis. For instance, exports for the pair Albania-Algeria is displayed by a plot chart in which X axis shows year 1995 to 2010 and Y axis shows exports from Albania to Algeria in thousands of US dollars. By taking a trend line of this chart, we can see exports from Albania to Algeria through the years. This procedure is done for all pairs relative to the dependent variable, exports, and some of the independent variables mentioned in Table 4.1 firstly to give a big picture of our dataset, and secondly to find smaller groups of economies that might be good candidates for integration. A table will be presented after a brief description for each economy as an exporter in which direction of trend line for the investigated variables in Table 4.1 relative to all partners of each economy is summarized. In these tables, the variables will be presented by numbers. Variables are defined in the Table 4.1 based on these numbers.

Table 4.1 Definition of variables based on numbers

1	Common border
2	Common language
3	Common colony
4	Absolute value of difference of GDP growth
5	Absolute value of difference of interest rate
6	Absolute value of difference of inflation
7	Absolute value of difference of budget deficit
8	Absolute value of difference of government debt
9	Absolute value of difference of government expenditure
10	Absolute value of difference of reserves position
11	Market size
12	Income similarity
13	Absolute value of relative difference of factor endowments

Variables starting with ‘Absolute value of difference of…’ (i.e. variable number 4, 5, 6, 7, 8, 9, 10 and 13), In Table 4.1, are explained in more details. For instance, consider the variable ‘Absolute value of difference of GDP growth’ for pair Albania-Algeria. Firstly, it is tried to

calculate difference of GDP growth of these two economies for years from 1995 to 2010. Secondly, the absolute value of this difference for the given pair is calculated through the years. This procedure is performed for all variables relative to all pairs through the mentioned years.

Pairs that have a descending trend line for explanatory variables include “absolute value of difference of GDP growth”, “absolute value of difference of deposit interest rate”, “absolute value of difference of budget deficit”, “absolute value of difference of inflation”, “absolute value of difference of government debt”, “absolute value of difference of government expenditure”, “absolute value of difference of reserve position”, and “absolute value of difference of factor endowment” might be good candidates for integration. Descending trend line for these variables in a pair of countries shows the convergence and homogeneity of this pair in terms of GDP growth, deposit interest rate, budget deficit, inflation, government debt, government expenditure, reserve position, and factor endowment. In a pair of countries, ascending trend line for two variables “market size” and “income similarity” make them suitable for integration. Moreover, historical and cultural ties between economies might make a more stable and durable integration between economies. Proxies for historical and cultural ties could be common border, common language and common colony at any time period.

A plot chart also is drawn for dependent variable, export from each economy to its partners. In this regard, pairs that have an ascending trend line of exports in their plot charts might be a good candidate for integration.

In the next section, the analysis of the dataset is discussed investigating trend lines of plot charts (TLPC) of all variables for each economy as an exporter. In investigating each economy, a table will be presented in which the amount of maximum, minimum, and average as well as the sum of exports from each economy (exporter) to its partners are highlighted. In addition, figures for the amount of exports as well as for the trend line of exports from each economy to the EU will be demonstrated as an example. Figures for all other pairs in terms of exports and explanatory variables will be presented in appendix section.

4.1 Economy, Geography and History of Albania Relative to its Partners

TLPC of exports from Albania to Egypt, Israel, Jordan, Syria, and Turkey and EU is ascending. However, this line is descending for pairs Albania-Algeria and Albania-Croatia. Data on exports are not available for partners of Albania such as Lebanon, Mauritania, Morocco and Tunisia. For instance, Figure 4.1 (a) shows the amount of exports from Albania to the EU in thousands of US dollar, which minimum and maximum exports are 122935.59 and 1058729.70 in year 1997 and 2010 respectively. Moreover, Figure 4.1 (b) represents the linear trend line of exports from Albania to the EU, which is ascending through the years. Figures of all other partners of Albania in terms of exports can be seen in appendix XI.

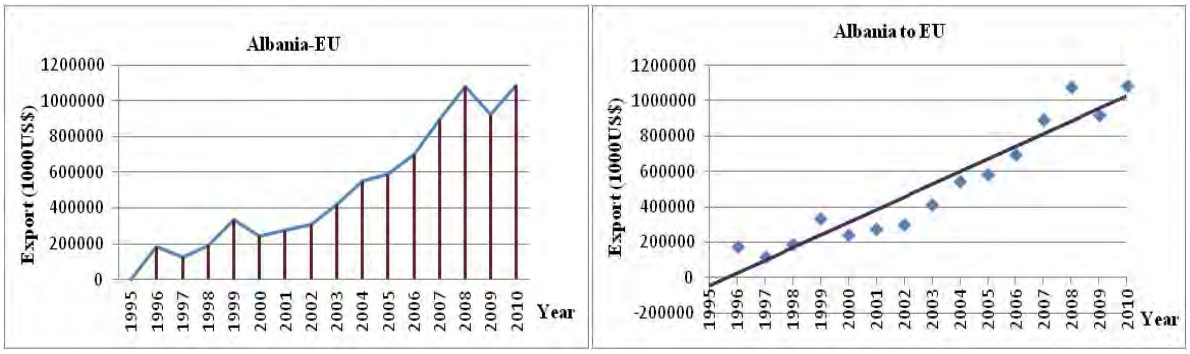

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Figure 4.1 (a) Exports from Albania to EU; (b) trend line of exports from Albania to EU

Table 4.2 represents a brief summary of this information for all pairs originated from Albania. From this table and based on average and sum of exports, the main partners of Albania are the European Union, and Turkey as well as Croatia. However, relation of Albania and Algeria in terms of exports is the weakest partnership in this group.

About the variable distance, Croatia (585 km) is the closest country to Albania while Mauritania is the farthest (4264 km). Among all partners, Albania has a common border with EU and a common colony with Turkey. Albania has a common language with none of its partners. Table 4.3 shows the relationship between Albania and all of its partners in terms of explanatory variables.

Table 4.2 Exports from Albania to its partners

Exports from Albania to	***Max/Year***	***Min/Year***	***Average***	***Sum***
Algeria	62.08/2004	5.47/2007	29.34	117.35
Croatia	5780.02/1997	49.72/2001	1365.90	19122.67
Egypt	5324.99/2010	2.23/2003	845.61	7610.51
Israel	868.32/2006	2.542008	215.87	2158.71
Jordan	765.65/2009	17.87/2008	259.37	1296.87
Lebanon	No data available	No data available	No data available	No data available
Mauritania	No data available	No data available	No data available	No data available
Morocco	No data available	No data available	No data available	No data available
Syria	153.83/2007	12.38/2004	78.23	547.61
Tunisia	No data available	No data available	No data available	No data available
Turkey	92656.313/2010	1098.59/1999	13588.53	203828.01
EU	1058729.70/2010	122935.59/1997	526784.67	7901770.09

The TLPC of the variable “absolute value of difference of GDP growth” is descending for most partners of Albania. However, this line is ascending for Mauritania. By descending it is meant here that GDP growth of two economies become converge through the years and ascending means that this variable for two economies through the years become diverge. The TLPC of the variable “absolute value of difference of GDP growth” for all pairs is demonstrated in appendix I.

The TLPC of the variable “absolute value of difference of interest rate” is descending for all partners of Albania except for pair Albania-Tunisia which data on this pair is not available. The TLPC of the variable “absolute value of difference of interest rate” for all pairs is demonstrated in appendix II

Concerning the variable “absolute value of difference of inflation”, the TLPC of this variable is ascending for Mauritania and descending for the other partners of Albania while the data are not available on this variable for the pair Albania-Syria. The Descending trend line of this variable for most partners of Albania means that in the sense of inflation, Albania becomes similar to the

other economies through the years. The TLPC of the variable “absolute value of difference of inflation” for all pairs is demonstrated in appendix III.

The data on variable “absolute value of difference of budget deficit” are not available for partners of Albania such as Algeria, Mauritania, Syria, and Turkey. For all the other partners, the TLPC of this variable is descending. The TLPC of the variable “absolute value of difference of budget deficit” for all pairs is demonstrated in appendix IV.

The TLPC of the variable “Absolute value of difference of government debt” is descending for most partners of Albania except for Algeria, Israel, and Tunisia. Hence, this similarity of Albania to most of its partners helps to satisfy the condition of the Treaty of Maastricht. The TLPC of the variable “Absolute value of difference of government debt” for all pairs is demonstrated in appendix V.

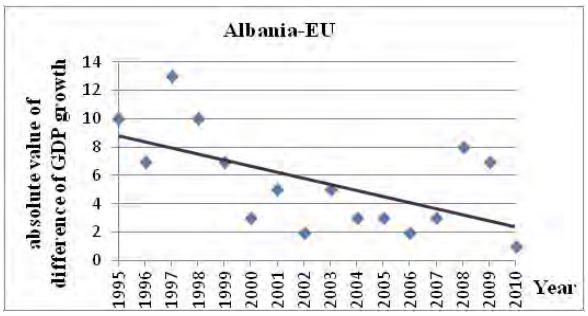
The absolute value of difference of government expenditure decreases for majority partners of Albania through the years. However, the trend line of this variable is ascending for partners of Albania such as Algeria, Jordan, Mauritania, and the EU. The TLPC of the variable “Absolute value of difference of government expenditure” for all pairs is demonstrated in appendix VI.

Regarding the reserve position, Albania becomes similar to economies such as Croatia, Egypt, and Tunisia through the years. However, the absolute value of difference of reserves position between Albania and its other partners increases through the years. the TLPC of the variable “Absolute value of difference of reserve position” for all pairs is demonstrated in appendix VII.

Among the Hecksher-Ohlin variables, the TLPC of market size for all pairs originated from Albania is ascending. In addition, income similarity increases through the years for all partners of Albania except for Mauritania. The TLPC for relative difference between pairs originated from Albania in terms of relative factor endowments is descending for majority partners of Albania. However, this line is ascending for Egypt, Mauritania, and Syria. The TLPC of the variables “Market size”, “Income similarity” and “Absolute value of difference of factor endowments” for all pairs are demonstrated in appendix VIII, IX and IXX respectively.

As an example, the TLPC of all explanatory variables for the pair Albania-EU are shown in Figure 4.2, including (a) absolute value of difference GDP growth, (b) absolute value of difference of interest rate, (c) absolute value of difference of inflation, (d) absolute value of difference of budget deficit, (e) absolute value of difference of government debt, (f) absolute

value of difference government expenditure, (g) absolute value of difference of reserves position, (h) market size, (j) income similarity and (j) absolute value of difference of factor endowment.



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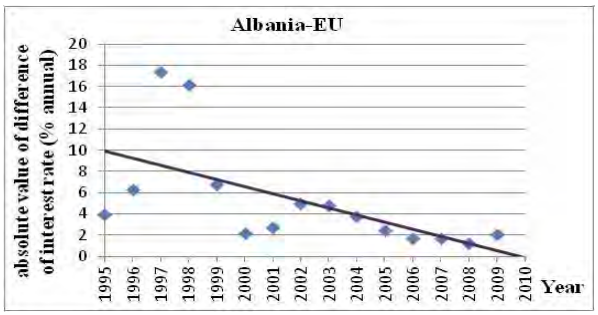

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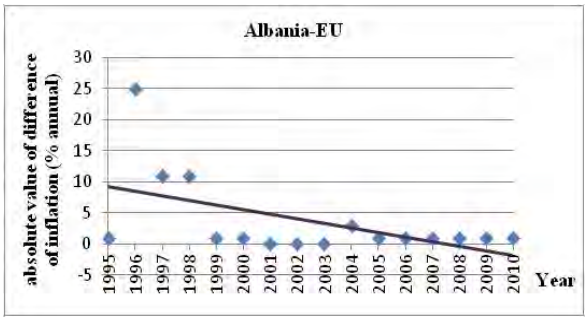

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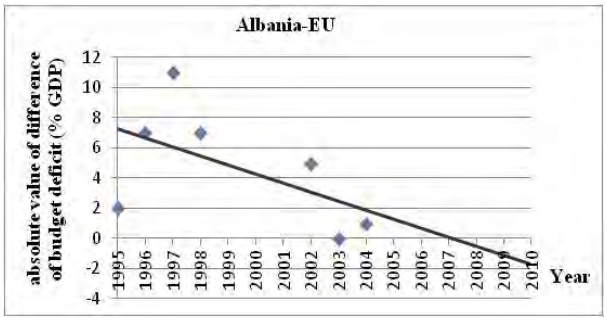

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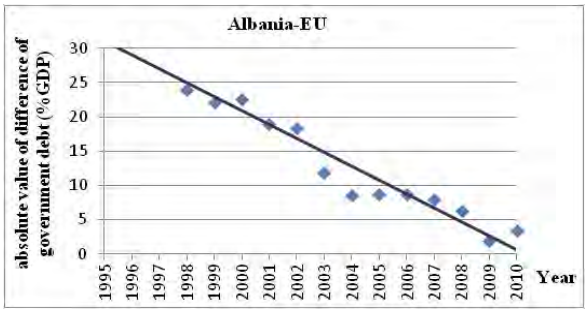

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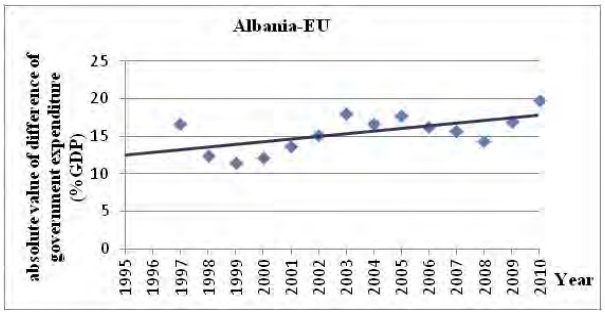

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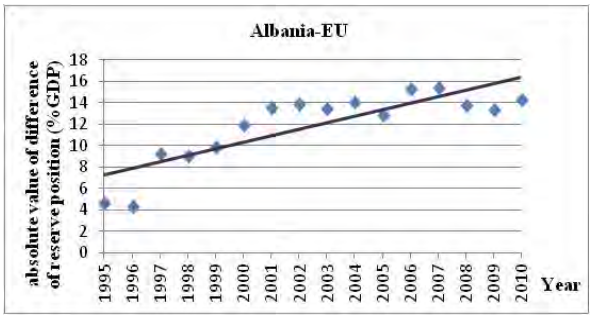

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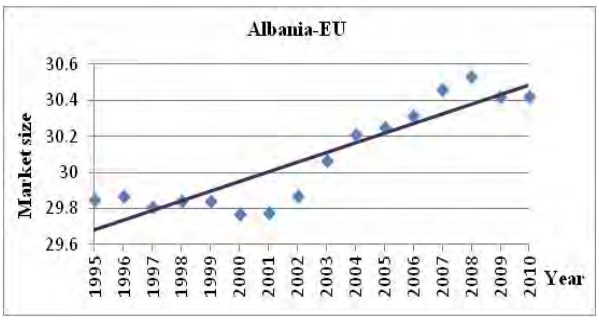

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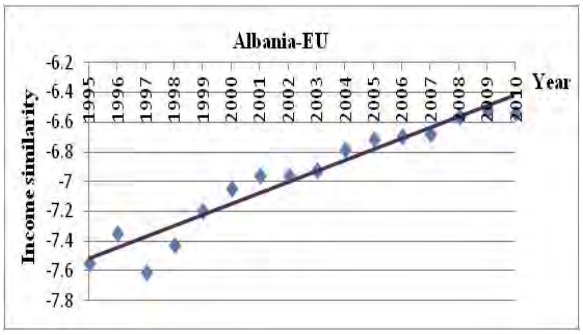

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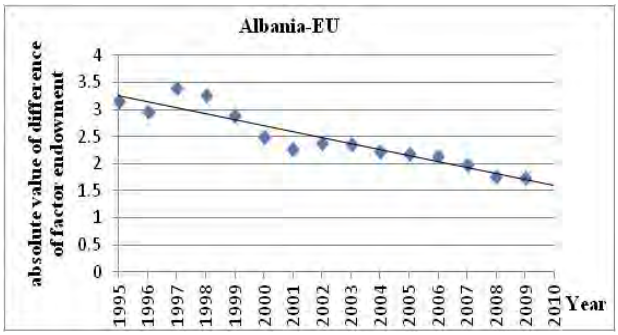

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Figure 4.2 TPLC of all explanatory variables for the pair Albania-EU

Table 4.3 demonstrates a summary for all partners of Albania in our sample with regard to all explanatory variables. Cells in green colour indicate suitability of integration between Albania and the other partners in terms of certain variables. Letter A, D and S indicate that trend line is ascending, descending and straight respectively. Cells shown by ND indicate unavailability of data.

Table 4.3 Status of all pairs originated from Albania relative to explanatory variables

Variable / Partner	1	2	3	4	5	6	7	8	9	10	11	12	13
Algeria	NO	NO	NO	D	D	D	ND	A	A	A	A	A	D
Croatia	NO	NO	NO	D	D	D	D	D	D	D	A	A	D
Egypt	NO	NO	NO	D	D	D	D	D	D	D	A	A	A
Israel	NO	NO	NO	D	D	D	D	A	D	A	A	A	D
Jordan	NO	NO	NO	D	D	D	D	D	A	A	A	A	D
Lebanon	NO	NO	NO	D	D	D	D	D	D	A	A	A	D
Mauritania	NO	NO	NO	A	D	A	ND	D	A	A	A	D	A
Morocco	NO	NO	NO	D	D	D	D	D	D	A	A	A	D
Syria	NO	NO	NO	D	D	ND	ND	D	D	A	A	A	A
Tunisia	NO	NO	NO	D	ND	D	D	A	D	D	A	A	D
Turkey	NO	NO	YES	D	D	D	ND	D	D	A	A	A	D
EU	YES	NO	NO	D	D	D	D	D	A	A	A	A	D

4.2 Economy, Geography and History of Algeria Relative to its Partners

The TLPC of exports from Algeria to most of its partners is ascending. However, this line is descending for Croatia and Mauritania. In addition, data on exports for the pair Algeria-Israel are not available. For instance, Figure 4.3 (a) shows amount of exports from Algeria to EU in thousands of US dollar which minimum and maximum exports are 5853041.54 and 41407429.21 in the years 1995 and 2008 respectively. Figure 4.3 (b) represents linear trend line of exports from Algeria to EU which is ascending through the years. Figures of all the other partners of Algeria in terms of exports can be seen in appendix XII.

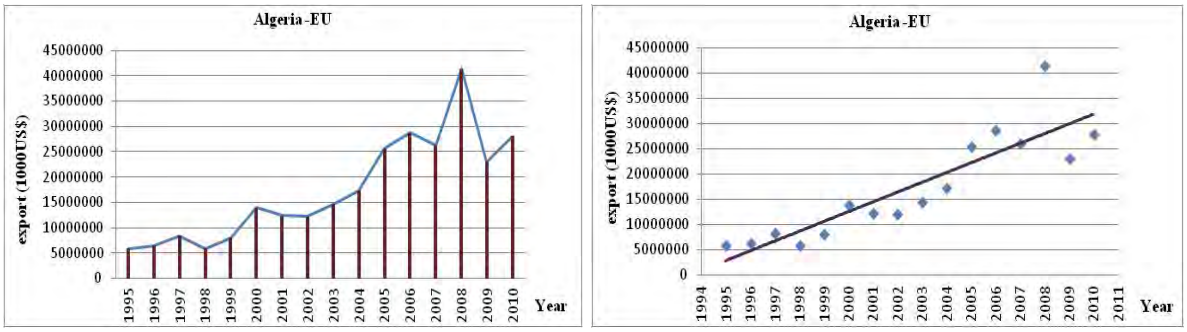

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Figure 4.3 (a) Exports from Algeria to EU; (b) trend line of exports from Algeria to EU

Table 4.4 represents a brief summary of this information for all pairs originated from Algeria. Noticing the sum and average exports, the main partners of Algeria are European Union, Turkey as well as Tunisia and Morocco. In addition, the relationship of Algeria and Albania in terms of exports can be seen as the weakest partnership in this group. However, data on exports from Algeria to Israel are not available.

Table 4.4 Exports from Algeria to its partners

Exports from Algeria to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	2150.60/2007	15.40/1998	696.28	666.49
Croatia	24276.32/2002	0.74/2004	4714.99	75439.87
Egypt	606899.35/2008	1715.08/1999	249244.03	3987904.51
Israel	No data available	No data available	No data available	No data available
Jordan	24695.83/2010	168.49/2000	8754.41	140070.51
Lebanon	28337.66/2010	155.80/2004	9026.94	144430.97
Mauritania	52035.44/1997	149.22/2005	15055.80	240892.88
Morocco	713200.68/2010	59620.72/1998	275891.63	4414266.01
Syria	74336.53/2010	3.25/1998	15551.57	233273.56
Tunisia	859068.28/2008	32883.68/1998	186974.18	2991586.84
Turkey	2919721.1/2008	314394.11/1995	1362868.88	21805902.01
EU	41407429.21/2008	5853041.54/1995	17375619.95	278009919.2

In the sense of distance, Tunisia and Jordan are the closest (642 km) and farthest (3057 km) countries to Algeria respectively. Among all partners Algeria has a common border with Mauritania, Morocco, and Tunisia as well as a common language with Egypt, Israel, Jordan, Lebanon, Mauritania, Morocco, Syria, and Tunisia.

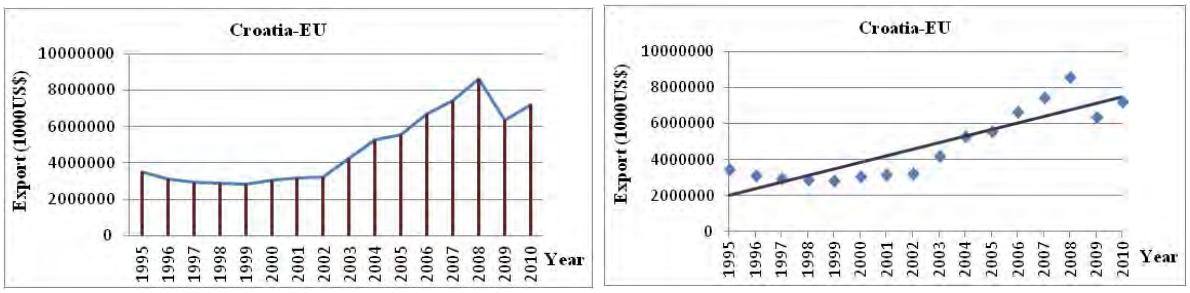
Table 4.5 demonstrates a brief summary for all partners of Algeria in this research sample with regard to all the explanatory variables. Cells in green colour indicate suitability of integration between Algeria and other partners in terms of certain variables.

Table 4.5 Status of all pairs originated from Algeria relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	ND	A	A	A	A	A	D
Croatia	NO	NO	NO	A	D	S	A	A	D	A	A	D	A
Egypt	NO	YES	NO	A	A	D	A	A	A	A	A	A	A
Israel	NO	YES	NO	D	D	A	D	A	D	A	A	A	D
Jordan	NO	YES	NO	A	D	D	A	A	A	A	A	D	A
Lebanon	NO	YES	NO	A	A	D	D	A	S	D	A	D	D
Mauritania	YES	YES	NO	A	A	D	ND	D	A	A	A	D	S
Morocco	YES	YES	NO	D	D	D	D	A	A	A	A	D	D
Syria	NO	YES	NO	A	D	D	ND	A	D	A	A	A	A
Tunisia	YES	YES	NO	D	ND	D	A	A	A	A	A	D	D
Turkey	NO	NO	NO	D	D	D	D	A	D	A	A	S	D
EU	NO	YES	NO	A	D	D	A	A	D	A	A	A	D

4.3 Economy, Geography and History of Croatia Relative to its Partners

The TLPC of exports from Croatia to all of the other economies is ascending. Figure 4.4 (a) shows the amount of exports from Croatia to the EU in thousands of dollar which minimum and maximum exports are 2859139.89 and 8595184.73 in year 1999 and 2008 respectively.



a b

Figure 4.4 (a) Exports from Croatia to EU; (b) trend line of exports from Croatia to EU

Figure 4.4 (b) represents the linear trend line of exports from Croatia to the EU, which is ascending through the years. Figures of all the other partners of Croatia in terms of exports are demonstrated in appendix XIII.

Table 4.6 represents a brief summary of information on exports for all pairs originated from Croatia. With a view to average and sum of exports from Croatia to its partners in Table 4.6, it can be seen that, the main partners of Croatia are European Union, and Turkey as well as Egypt and Albania. However, the relationship between Croatia and Mauritania in terms of exports is the weakest partnership in this group.

Table 4.6 Exports from Croatia to its partners

Exports from Croatia to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	78976.29/2010	2496.62/1995	23105.19	369683.06
Algeria	19781.86/2009	681.93/2000	8257.23	132115.67
Egypt	97325.10/2009	10107.27/2002	32461.44	519383.05
Israel	11427.05/2009	1636.26/1998	6448.37	103174
Jordan	16836.63/2009	401.60/1996	3558.50	56935.95
Lebanon	71560.63/2006	323.58/2003	17915.65	286650.34
Mauritania	2469.76/2010	1017.50/2006	1814.80	9074
Morocco	19133.42/2004	953.01/1999	5601.17	89618.73
Syria	37440.89/2009	138.77/1995	8089.54	129432.57
Tunisia	17920.66/2006	537.75/2004	5097.64	81562.21
Turkey	140538.08/2009	4623.36/1995	46778.13	748450.10
EU	8595184.73/2008	2859139.89/1999	4755113.11	76081809.71

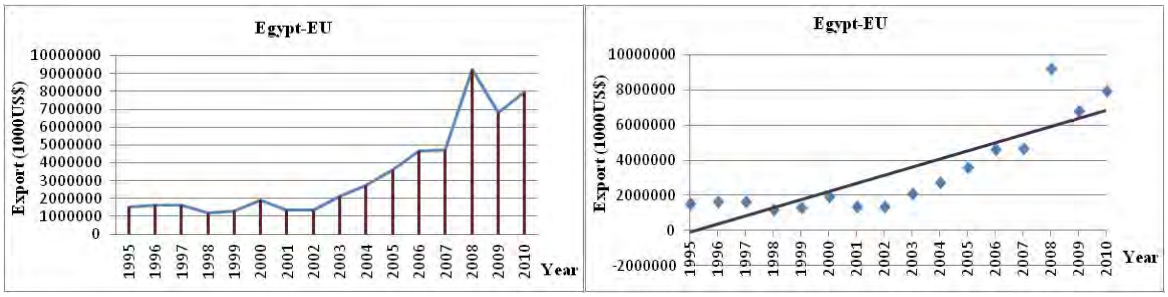
Concerning the distance variable, Albania (585 km) is the closest country to Croatia while Mauritania is the farthest (4264 km). Among all partners, Croatia has a common border with the EU. However, Croatia has no common language or a common colony history with its partners. Table 4.7 shows relations among Croatia and all of its partners in terms of the explanatory variables.

Table 4.7 Status of all pairs originated from Croatia relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	D	D	D	A	A	D
Algeria	NO	NO	NO	A	D	S	A	A	D	A	A	D	A
Egypt	NO	NO	NO	A	D	A	A	D	D	D	A	A	A
Israel	NO	NO	NO	A	D	D	D	D	D	A	A	A	D
Jordan	NO	NO	NO	A	D	D	A	D	A	A	A	A	A
Lebanon	NO	NO	NO	A	D	D	D	D	A	A	A	D	A
Mauritania	NO	NO	NO	A	A	A	ND	D	A	A	A	A	D
Morocco	NO	NO	NO	D	D	D	A	D	D	A	A	A	A
Syria	NO	NO	NO	A	A	D	ND	D	A	A	A	A	S
Tunisia	NO	NO	NO	A	ND	D	D	D	D	D	A	D	A
Turkey	NO	NO	NO	A	D	D	D	D	A	A	A	D	A
EU	YES	NO	NO	D	D	D	D	A	A	A	A	A	D

4.4 Economy, Geography and History of Egypt Relative to its Partners

The TLPC of exports from Egypt to all of its partners is ascending except for Israel. As an example, Figure 4.5 (a) shows the amount of exports from Egypt to the EU in thousands of US dollar, where the minimum and maximum exports are 1196377.75 and 9211350.53 in years 1998 and 2008 respectively. Figure 4.5 (b) represents the linear trend line of exports from Egypt to the EU which is ascending through the years. Figures of all the other partners of Egypt in terms of exports are demonstrated in appendix XIV.



a b

Figure 4.5 (a) Exports from Egypt to EU; (b) trend line of exports from Egypt to EU

Table 4.8 represents a brief summary of information about exports for all partners of Egypt. Sum and average of exports in this table show that, the main partners of Egypt are European Union, and Turkey as well as Jordan, Syria and Lebanon. In addition, the relationship between Egypt and Croatia in terms of exports is the weakest partnership in this group.

Table 4.8 Exports from Egypt to its partners

Exports from Egypt to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	16699.23/2008	903.27/1997	6707.86	107325.80
Algeria	380992.88/2009	6944.87/1997	75716.80	121468.72
Croatia	14341.71/2009	1699.37/1999	6191.87	99069.86
Israel	351802.56/1996	10630.47/2004	121506.34	1944101.36
Jordan	930910.62/2009	18940.62/2000	227878.49	3646055.87
Lebanon	523882.77/2010	23111.26/1999	171350.99	2741615.89
Mauritania	46564.23/2010	1.50/1995	6509.33	104149.22
Morocco	402138.01/2010	8076.06/1996	106964.22	1711427.50
Syria	843430.84/2009	34571.10/1997	220688.47	3531015.56
Tunisia	254868.42/2009	14510.99/2000	67544.28	1080708.53
Turkey	985259.79/2010	76527.41/2001	295158.78	4722540.44
EU	9211350.53/2008	1196377.75/1998	3364806.61	53836905.71

In regards to the distance, Israel and Mauritania are the closest (404 km) and farthest (4939 km) countries to Egypt respectively. Egypt has a common language with most of its partners such as Algeria, Israel, Jordan, Lebanon, Mauritania, Morocco, Syria, Tunisia, and the EU. Moreover, there is a common border between Egypt and Israel. Among all the partners, Egypt has a common colony history with Turkey. Table 4.9 shows the relationship between Egypt and all of its partners in terms of explanatory variables.

Table 4.9 Status of all pairs originated from Egypt relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	D	D	D	A	A	A
Algeria	NO	YES	NO	A	A	D	A	A	A	A	A	A	A
Croatia	NO	NO	NO	A	D	A	A	D	D	D	A	A	A
Israel	YES	YES	NO	S	A	A	A	A	D	D	A	A	D
Jordan	NO	YES	NO	A	A	D	A	D	D	A	A	A	S
Lebanon	NO	YES	NO	S	D	A	D	D	A	A	A	S	D
Mauritania	NO	YES	NO	A	A	A	ND	D	D	D	A	A	D
Morocco	NO	YES	NO	D	D	A	A	D	D	D	A	A	A
Syria	NO	YES	NO	D	D	S	ND	A	D	D	A	A	A
Tunisia	NO	YES	NO	S	ND	A	A	A	D	D	A	S	A
Turkey	NO	NO	YES	A	D	D	D	A	D	D	A	D	A
EU	NO	YES	NO	A	A	A	D	D	A	D	A	A	A

4.5 Economy, Geography and History of Israel Relative to its Partners

The TLPC of exports from Israel to most of its partners is ascending excluding Algeria, Lebanon, Mauritania, and Tunisia. Figure 4.6 (a) shows the amount of exports from Israel to the EU in thousands of US dollar which minimum and maximum exports are 5528323.088 and 17800785 in year 1995 and 2008 respectively. Figure 4.6 (b) represents the linear trend line of exports from Israel to EU which is ascending through the years. Figures of all the other partners of Israel in terms of exports are shown in appendix XV.

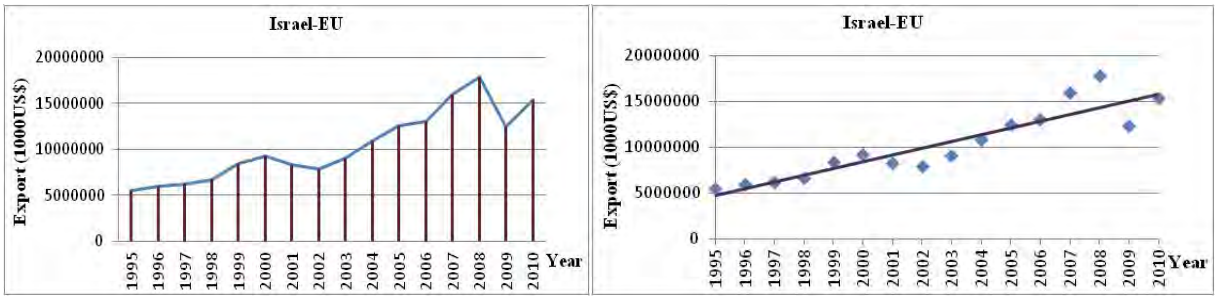


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Figure 4.6 (a) Exports from Israel to EU; (b) trend line of exports from Israel to EU

Table 4.10 represents a brief summary of information on exports for all the pairs originated from Israel. By considering average and sum of exports from Israel to its partners in Table 4.10, it can be seen that, the main partners of Israel are the European Union, and Turkey as well as Jordan and Egypt. However, the relationship between Israel and Algeria in terms of exports is the weakest partnership in this group.

Table 4.10 Exports from Israel to its partners

Exports from Israel to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	35423/2010	63/1996	5995.5	95928
Algeria	520/2003	4/2006	197.57	1383
Croatia	27917/2007	8018/2002	14120.5	225928
Egypt	153623/2007	26286/2002	77193.5	1235096
Jordan	288318/2008	543/1995	104027.19	1664435
Lebanon	773/2003	3/2010	192.2	1922
Mauritania	4899/2004	55/2001	648.1	6481
Morocco	20680/2008	5008/1997	10544.69	168715
Syria	8312/2010	469/2008	5516.33	16549
Tunisia	3279/1996	100/2010	1194.81	19117
Turkey	1609994/2008	184024.99/1995	663029.56	10608473
EU	17800785/2008	5528323.088/1995	10321305	165140879.96

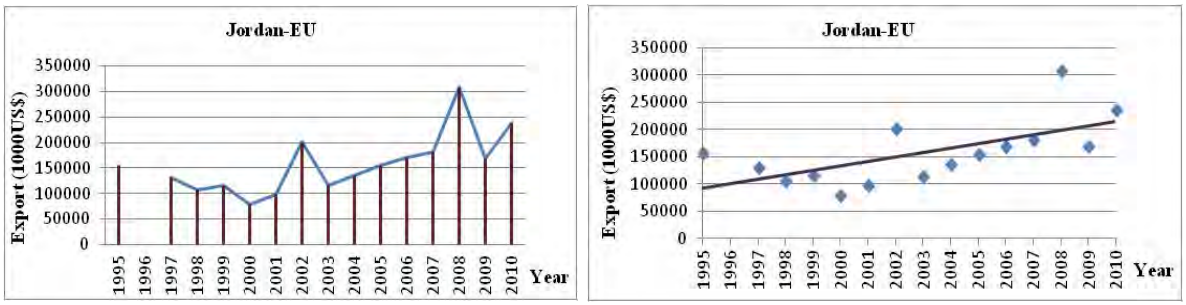
Concerning the distance variable, Jordan (111 km) is the closest country to Israel while Mauritania is the farthest (5291 km). Among all the partners, Israel has a common border with Egypt, Jordan, Lebanon, and Syria. Also, Israel has common language with Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia. However, there is no common colony history between Israel and its partners. Table 4.11 shows the relationship between Israel and all of its partners in terms of explanatory variables.

Table 4.11 Status of all pairs originated from Israel relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	A	D	A	A	A	D
Algeria	NO	YES	NO	D	D	A	D	A	D	A	A	A	D
Croatia	NO	NO	NO	A	D	D	D	D	D	A	A	A	D
Egypt	YES	YES	NO	S	A	A	A	A	D	D	A	A	D
Jordan	YES	YES	NO	A	D	D	A	D	D	A	A	A	D
Lebanon	YES	YES	NO	A	A	D	D	D	A	A	A	A	D
Mauritania	NO	NO	NO	A	A	A	ND	D	A	A	A	A	D
Morocco	NO	YES	NO	D	D	D	A	A	D	A	A	A	D
Syria	YES	YES	NO	D	D	A	ND	A	D	A	A	A	D
Tunisia	NO	YES	NO	D	ND	D	D	A	D	S	A	A	D
Turkey	NO	NO	NO	D	D	D	D	A	D	A	A	D	D
EU	NO	NO	NO	A	D	D	D	D	D	A	A	D	A

4.6 Economy, Geography and History of Jordan Relative to its Partners

The TLPC of exports from Jordan to all of its partners is ascending except for Croatia. Figure 4.7 (a) shows the amount of exports from Jordan to the EU in thousands of dollar, where the minimum and maximum exports are 79386.046 and 307894.964 in year 2000 and 2008 respectively. Figure 4.7 (b) represents the linear trend line of exports from Jordan to the EU which is ascending through the years. Figures of exports of all the other partners of Jordan can be seen in appendix XVI.



a b

Figure 4.7 (a) Exports from Jordan to EU; (b) trend line of exports from Jordan to EU

Table 4.12 represents a brief summary of information about exports for all the pairs originated from Jordan. Average and sum of the exports in Table 4.12 show that the main partners of Jordan are the European Union, Syria, Israel, and Lebanon. However, the weakest partner of Jordan in terms of exports is Mauritania.

Table 4.12 Exports from Jordan to its partners

Exports from Jordan to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	874.49/2001	4.18/1997	294.41	4416.17
Algeria	133100.2/2008	2778.47/1997	58778.07	881671
Croatia	2792.17/2002	2.07/2003	305.23	4273.24
Egypt	153835.61/2008	16993.02/1995	54460.87	816913.04
Israel	166313.17/2008	22694.93/1997	107781.35	1508938.87
Lebanon	231259.18/2010	23697.77/1998	83166.58	1247498.67
Mauritania	347.49/2006	15.51/1997	162.82	1302.54
Morocco	13380.97/2010	1673.24	5256.86	78852.84
Syria	307572.82/2007	23621.08/1999	137514.75	2062721.21
Tunisia	35443.50/2009	4104.78/1997	12592.45	188886.72
Turkey	60795.84/2010	9785/1998	24813.95	372209.19
EU	307894.96/2008	79386.05/2000	157431.26	2361468.96

Regarding the distance, Israel (111 km) is the closest country to Jordan and Mauritania is the farthest (5400 km). Among all the partners, Jordan has a common border with Israel, Syria, and

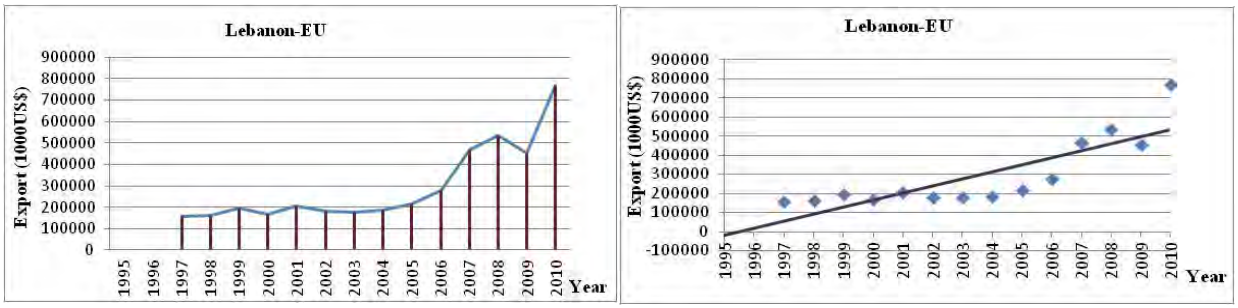
the EU. Moreover, there is a common language between Jordan and its partners such as Algeria, Egypt, Israel, Lebanon, Mauritania, Morocco, Syria, and Tunisia. Jordan has a common colony history with none of its partners. Table 4.13 shows the relationship between Jordan and all of its partners in terms of the explanatory variables.

Table 4.13 Status of all pairs originated from Jordan relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	D	A	A	A	A	D
Algeria	NO	YES	NO	A	D	D	A	A	A	A	A	D	A
Croatia	NO	NO	NO	A	D	D	A	D	A	A	A	A	A
Egypt	NO	YES	NO	A	A	D	A	D	D	A	A	A	S
Israel	YES	YES	NO	A	D	D	A	D	D	A	A	A	D
Lebanon	NO	YES	NO	A	D	D	D	A	D	A	A	A	D
Mauritania	NO	YES	NO	A	A	A	ND	D	D	A	A	D	D
Morocco	NO	YES	NO	D	D	A	A	D	D	D	A	A	D
Syria	YES	YES	NO	A	D	D	ND	A	A	D	A	D	D
Tunisia	NO	YES	NO	D	ND	A	A	D	D	A	A	A	D
Turkey	NO	NO	NO	A	D	D	D	D	D	A	A	D	A
EU	YES	NO	NO	A	D	A	D	D	S	A	A	A	A

4.7 Economy, Geography and History of Lebanon Relative to its Partners

The TLPC of exports from Lebanon to most of its partners is ascending, excluding Croatia. However, the data on exports for the pair Lebanon-Israel are not available. Figure 4.8 (a) shows the amount of exports from Lebanon to the EU in thousands of US dollar, where the minimum and maximum exports are 156254.70 and 767923.38 in year 1997 and 2010 respectively. Figure 4.8 (b) represents the linear trend line of exports from Lebanon to the EU which is ascending through the years. Figures of all the other partners of Lebanon in terms of exports can be seen in appendix XVII.



a b

Figure 4.8 (a) Exports from Lebanon to EU; (b) trend line of exports from Lebanon to EU

Table 4.14 represents a summary of information on the exports for all the pairs originated from Lebanon. By considering average and sum of exports from Lebanon to its partners in Table 4.14, it can be seen that, the main partners of Lebanon are the European Union, Turkey, and Syria. However, the relationship of Lebanon and Croatia in terms of exports is the weakest partnership in this group.

Table 4.14 Exports from Lebanon to its partners

Exports from Lebanon to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	6430.73/2003	47.08/2006	1535.59	21468.23
Algeria	29528.73/2008	1587.13/1999	14706.7	205893.77
Croatia	496.58/1997	0.75/2003	98.24	982.37
Egypt	201079.99/2010	15246.46/1999	57754.53	808563.43
Israel	No data available	No data available	No data available	No data available
Jordan	119109.36/2008	24825/1997	62357.80	873009.25
Mauritania	2466.88/2007	193.77/2001	1097.98	15371.66
Morocco	21323.95/2010	2111.47/2002	7908.31	110716.36
Syria	225443.46/2009	25755.98/2000	124308.40	1740317.58
Tunisia	15922.81/2010	894.08/1998	5583.23	78165.27
Turkey	230657.99/2010	14397.04/1999	86259.49	1207632.83
EU	767923.38/2010	156254.70/1997	295827.85	4141589.92

Regarding the distance, Syria (85 km) is the closest country to Lebanon while Mauritania is the farthest (5376 km). Among all the partners, Lebanon has a common border with Israel and Syria. Moreover, there is a common language between Lebanon and its partners such as Algeria, Egypt, Israel, Jordan, Mauritania, Morocco, Syria, and Tunisia. There is no common colony history between Lebanon and its partners.

Table 4.15 shows the relationship between Lebanon and all of its partners in terms of explanatory variables.

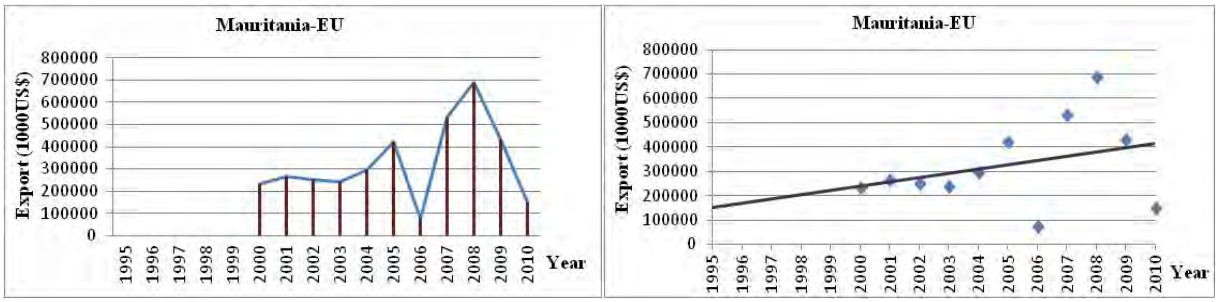
Table 4.15 Status of all pairs originated from Lebanon relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	D	D	A	A	A	D
Algeria	NO	YES	NO	A	A	D	D	A	S	D	A	D	D
Croatia	NO	NO	NO	A	D	D	D	D	A	A	A	D	A
Egypt	NO	YES	NO	S	D	A	D	D	A	A	A	S	D
Israel	YES	YES	NO	A	A	D	D	D	A	A	A	A	D
Jordan	NO	YES	NO	A	D	D	D	A	D	A	A	A	D
Mauritania	NO	YES	NO	A	D	A	ND	D	D	A	A	A	D
Morocco	NO	YES	NO	D	D	D	A	A	D	A	A	D	D
Syria	YES	YES	NO	A	D	D	ND	A	D	A	A	D	D
Tunisia	NO	YES	NO	D	ND	D	D	A	D	A	A	A	D
Turkey	NO	NO	NO	A	D	D	D	A	D	A	A	D	D
EU	NO	YES	NO	A	D	D	D	D	A	A	A	A	A

4.8 Economy, Geography and History of Mauritania Relative to its Partners

The TLPC of exports from Mauritania to most of its partners is ascending. However, the data on the exports are not available for partners of Mauritania such as Albania, Croatia, Israel, and Jordan. As an example, Figure 4.9 (a) shows the amount of exports from Mauritania to the EU in thousands of US dollar which minimum and maximum exports are 73783.44 and 689328.34 in

years 2006 and 2008 respectively. Figure 4.9 (b) represents the linear trend line of exports from Mauritania to EU which is ascending through the years. Figures of all the other partners of Mauritania in terms of exports are shown in appendix XVIII.



a b

Figure 4.9 (a) Exports from Mauritania to EU; (b) trend line of exports from Mauritania to EU

Table 4.16 represents a brief summary of information on the exports for all pairs originated from Mauritania. This table shows that the main partners of Mauritania are the European Union, Algeria, and Egypt. However, the relationship of Mauritania and Syria is the weakest partnership in this group.

Table 4.16 Exports from Mauritania to its partners

Exports from Mauritania to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	No available data	No available data	No available data	No available data
Algeria	15264.52/2004	33.83/2010	5842.32	46738.55
Croatia	No available data	No available data	No available data	No available data
Egypt	2616.12/2010	22.86/2001	752.63	6773.65
Israel	No available data	No available data	No available data	No available data
Jordan	No available data	No available data	No available data	No available data
Lebanon	482.97/2005	34.21/2007	227.13	2271.34
Morocco	482.97/2005	34.21/2007	227.13	2271.34
Syria	460.78/2008	22.58/2002	213	1064.99
Tunisia	747.35/2009	21.51/2005	387.7	3876.96
Turkey	557.76/2010	2.56/2002	157.1	1256.78
EU	689328.34/2008	73783.44/2006	326045.42	3586499.59

On the subject of distance, Morocco (1986 km) is the closest country to Mauritania while Syria is the farthest (5448 km). Among all the partners, Mauritania has a common border with Algeria. Moreover, there is a common language between Mauritania and its partners such as Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia. There is no common colony history between Mauritania and its partners. Table 4.17 shows the relationship between Mauritania and all of its partners in terms of the explanatory variables.

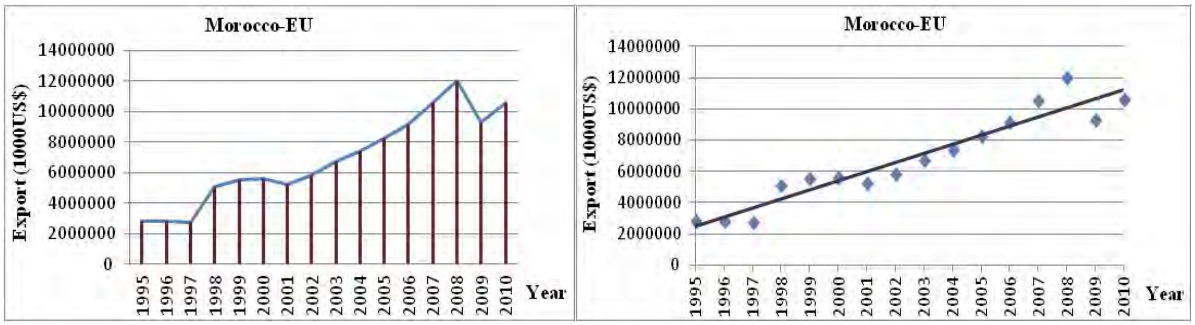
Table 4.17 Status of all pairs originated from Mauritania relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	A	D	A	ND	D	A	A	A	D	A
Algeria	YES	YES	NO	A	A	D	ND	D	A	A	A	D	S
Croatia	NO	NO	NO	A	A	A	ND	D	A	A	A	A	D
Egypt	NO	YES	NO	A	A	A	ND	D	D	D	A	A	D
Israel	NO	NO	NO	A	A	A	ND	D	A	A	A	A	D
Jordan	NO	YES	NO	A	A	A	ND	D	D	A	A	D	D
Lebanon	NO	YES	NO	A	D	A	ND	D	D	A	A	A	D
Morocco	NO	YES	NO	D	D	A	ND	D	D	A	A	S	S
Syria	NO	YES	NO	A	D	S	ND	D	A	A	A	D	D
Tunisia	NO	YES	NO	A	ND	A	ND	D	A	A	A	A	D
Turkey	NO	NO	NO	A	D	D	ND	D	A	A	A	D	D
EU	NO	NO	NO	A	A	A	ND	D	A	D	A	A	D

4.9 Economy, Geography and History of Morocco Relative to its Partners

The TLPC of exports from Morocco to all of the other economies is ascending. However, the data on the exports are not available for the pair Morocco-Israel. Figure 4.10 (a) shows the amount of exports from Morocco to the EU in thousands of US dollar, where the minimum and maximum exports are 2756880.75 and 12032683.51 in year 1997 and 2008 respectively. Figure

4.10 (b) represents the linear trend line of exports from Morocco to the EU which is ascending through the years. Figures of all other partners of Morocco can be seen in appendix XIX.



a b

Figure 4.10 (a) Exports from Morocco to EU; (b) trend line of exports from Morocco to EU

Table 4.18 represents a brief summary of information on the exports for all pairs originated from Morocco. Based on the sum and average of exports in this table, it is determined that the main partners of Morocco are the European Union, Turkey, Tunisia, as well as Algeria and Syria. However, the relationship between Morocco and Albania is the weakest partnership in this group.

Table 4.18 Exports from Morocco to its partners

Exports from Morocco to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	1092.10/2008	7.99/2003	493.06	5423.65
Algeria	138130.66/2010	3359.73/1997	48764.59	780233.48
Croatia	57380.31/2008	8587.88/2003	18572.88	297166.02
Egypt	106479.20/2009	3823.89/1996	32340.92	517454.71
Israel	No data available	No data available	No data available	No data available
Jordan	46950.03/2010	4885.39/1999	17905.61	286489.82
Lebanon	35230.81/2009	3995.51/2000	15775.46	252407.34
Mauritania	74919.61/2010	7710.26/1995	26212.95	419407.16
Syria	61667.89/2010	7166.56/1997	26943.24	431091.84
Tunisia	143512.53/2010	39111.84/1999	65292.25	1044676.08
Turkey	342271.20/2010	34737.38/2001	103103.21	1649651.30
EU	12032683.51/2008	2756880.75/1997	6861051.91	109776830.51

Algeria (945 km) is the closest country to Morocco while Jordan is the farthest (3971 km). Among all partners, Morocco has a common border with Algeria and the EU. In addition, Morocco has a common language with most of its partners such as Algeria, Egypt, Israel, Jordan, Lebanon, Mauritania, Syria, Tunisia, and the EU. However, there is no common colony history between Morocco and its partners. Table 4.19 shows the relationship between Morocco and all of its partners in terms of the explanatory variables.

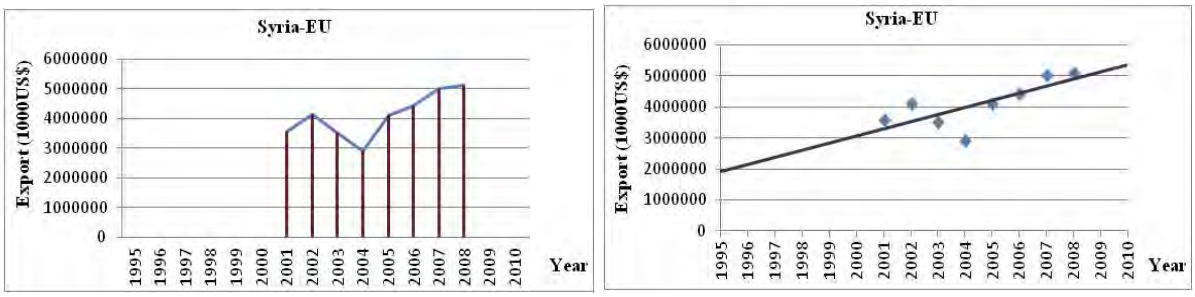
Table 4.19 Status of all pairs originated from Morocco relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	D	D	D	D	A	A	A	D
Algeria	YES	YES	NO	D	D	D	D	A	A	A	A	D	D
Croatia	NO	NO	NO	D	D	D	A	D	D	A	A	A	A
Egypt	NO	YES	NO	D	D	A	A	D	D	D	A	A	A
Israel	NO	YES	NO	D	D	D	A	A	D	A	A	A	D
Jordan	NO	YES	NO	D	D	A	A	D	D	D	A	A	D
Lebanon	NO	YES	NO	D	D	D	A	A	D	A	A	D	D
Mauritania	NO	YES	NO	D	D	A	ND	D	D	A	A	S	S
Syria	NO	YES	NO	D	A	D	ND	D	D	A	A	A	A
Tunisia	NO	YES	NO	D	ND	S	A	D	D	A	A	D	D
Turkey	NO	NO	NO	D	D	D	A	D	D	A	A	D	D
EU	YES	YES	NO	D	D	D	A	D	D	A	A	A	D

4.10 Economy, Geography and History of Syria Relative to its Partners

The TLPC of exports from Syria to most of its partners is ascending except for Croatia. However, the data on the exports are not available for the pair Syria-Israel. Figure 4.11 (a) shows the amount of exports from Syria to the EU in thousands of US dollar, where the minimum and maximum exports are 2913798.97 and 5114321.41 in years 2004 and 2008 respectively. Figure 4.11 (b) represents the linear trend line of exports from Syria to the EU which is ascending

through the years. Figures of all the other partners of Syria in terms of export are illustrated in appendix XX.



a b

Figure 4.11 (a) Exports from Syria to EU; (b) trend line of exports from Syria to EU

Table 4.20 represents a summary of information on the exports for all pairs originated from Syria. Based on sum and average of the exports in this table, main partners of Syria are the European Union, Lebanon, Jordan as well as Egypt and Algeria. However, the relationship between Syria and Albania is the weakest partnership in this group.

Table 4.20 Exports from Syria to its partners

Exports from Syria to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	1280.54/2007	2.87/2003	493.53	2467.64
Algeria	498555.46/2008	30006.68/2001	166097.22	1328777.78
Croatia	191413.34/2002	211.48/2008	51346.77	359427.38
Egypt	730350.33/2008	49941.33/2002	256597.79	2052782.33
Israel	No data available	No data available	No data available	No data available
Jordan	532472.09/2007	35934.15	169400.20	2371602.74
Lebanon	1335653.99/2008	136891.41/1999	324652.35	4545132.88
Mauritania	7434.32/2007	32.12/1995	2773.22	22185.74
Morocco	218192.51/2007	6742.95/1999	35639.38	498951.36
Tunisia	92910.55/2007	3249.20/1999	23601.34	330418.80
Turkey	635431.05/2008	230001.71/1995	401452.21	5620330.97
EU	5114321.41/2008	2913798.97/2004	4101575.42	32812603.36

Regarding the distance variable, Lebanon (85 km) is the closest country to Syria while Mauritania is the farthest (5448 km). Among all the partners, Syria has a common border with Israel, Jordan, Lebanon, and turkey. In addition, Syria has a common language with most of its partners such as Algeria, Egypt, Israel, Jordan, Lebanon, Mauritania, Morocco, and Tunisia. Also, there has been a common colony history between Syria and Turkey. Table 4.21 shows the relationship between Syria and all of its partners in terms of the explanatory variables.

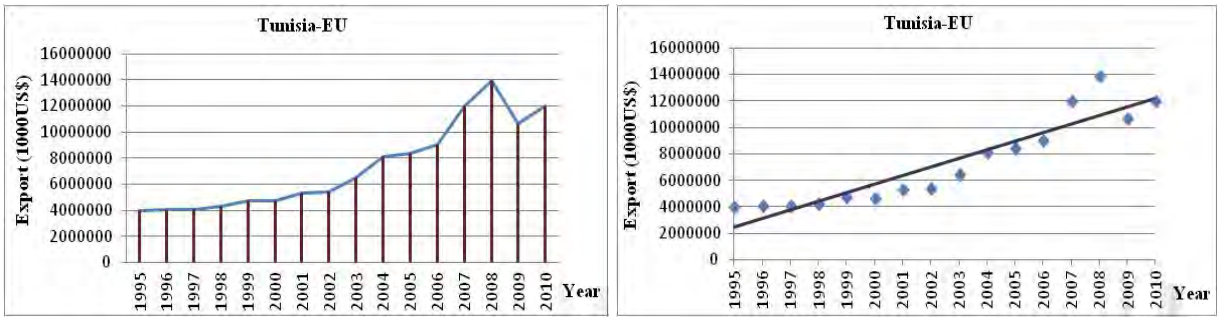
Table 4.21 Status of all pairs originated from Syria relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	D	ND	ND	D	D	A	A	A	A
Algeria	NO	YES	NO	A	D	D	ND	A	D	A	A	A	A
Croatia	NO	NO	NO	A	A	D	ND	D	A	A	A	A	---
Egypt	NO	YES	NO	D	D	---	ND	A	D	D	A	A	A
Israel	YES	YES	NO	D	D	A	ND	A	D	A	A	A	D
Jordan	YES	YES	NO	A	D	D	ND	A	A	D	A	D	D
Lebanon	YES	YES	NO	A	D	D	ND	A	D	A	A	D	D
Mauritania	NO	YES	NO	A	D	---	ND	D	A	A	A	D	D
Morocco	NO	YES	NO	D	A	D	ND	D	D	A	A	A	A
Tunisia	NO	YES	NO	D	ND	A	ND	D	D	A	A	A	D
Turkey	YES	NO	YES	D	D	D	ND	D	D	A	A	A	A
EU	NO	NO	NO	A	D	A	ND	D	A	A	A	A	D

4.11 Economy, Geography and History of Tunisia Relative to its Partners

The TLPC of exports from Tunisia to all of its partners is ascending except for Israel which data of exports for this economy are not available. Figure 4.12 (a) shows the amount of exports from Tunisia to the EU in thousands of US dollar, where the minimum and maximum exports are 3999856.20 and 13920178.65 in the years 1995 and 2008 respectively. Figure 4.12 (b) represents

the linear trend line of exports from Tunisia to the EU, which is ascending through the years. Figures of exports of all the other partners of Tunisia can be seen in appendix XXI.



a b

Figure 4.12 (a) Exports from Tunisia to EU; (b) trend line of exports from Tunisia to EU

Table 4.22 represents a summary of information on exports for all the pairs originated from Tunisia. In this table, the sum and average of the exports show that the main partners of Tunisia are the European Union, Algeria, Turkey, and Morocco. However, the relationship between Tunisia and Croatia is the weakest partnership in this group.

Table 4.22 Exports from Tunisia to its partners

Exports from Tunisia to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	5834.12/2006	43.89/1996	2126.21	31893.22
Algeria	474719.93/2010	27010.67/1998	176185.98	2818975.61
Croatia	8478283/2010	172.92/1999	1990.08	23880.98
Egypt	128861.65/2008	23757.47/1999	47853.82	765661.07
Israel	No data available	No data available	No data available	No data available
Jordan	17339.97/2009	1335.26/1996	7505.14	120082.26
Lebanon	15250.35/2010	3549.79/2003	7666.09	122657.45
Mauritania	24497.53/2010	526.98/1996	7277.17	116434.68
Morocco	234151.43/2010	25412.56/2000	92854.89	1485678.23
Syria	32349.24/2010	2454.59/1999	9752.81	156044.99
Turkey	309382.71/2008	33657.65/1995	106212.22	1699395.52
EU	13920178.65/2008	3999856.20/1995	7322185.22	117154963.58

Albania (642 km) is the closest country to Tunisia while Mauritania is the farthest (3297 km). Among all the partners, Tunisia has a common border with Algeria. In addition, Tunisia has a common language with most of its partners such as Algeria, Egypt, Israel, Jordan, Lebanon, Mauritania, Morocco, Syria, and the EU. Also, there has been a common colony history between Tunisia and Turkey. Table 4.23 shows the relationship between Tunisia and all of its partners in terms of explanatory variables.

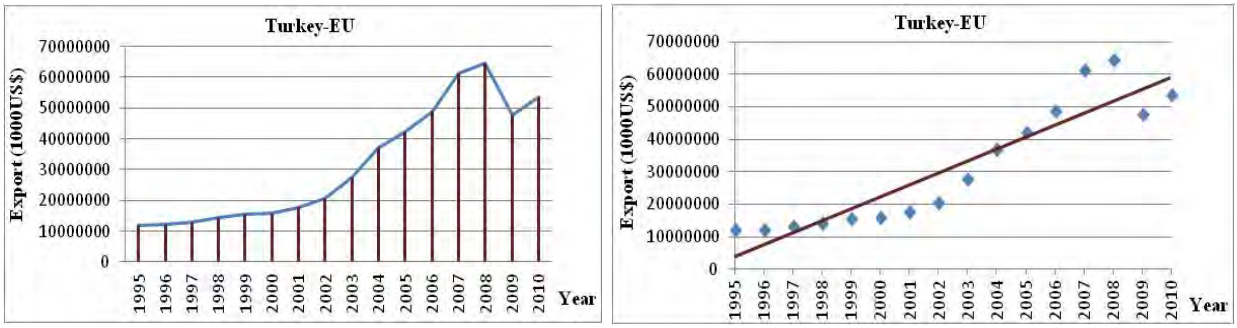
Table 4.23 Status of all pairs originated from Tunisia relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	NO	D	ND	D	D	A	D	D	A	A	D
Algeria	YES	YES	NO	D	ND	D	A	A	A	A	A	D	D
Croatia	NO	NO	NO	A	ND	D	D	D	D	D	A	D	A
Egypt	NO	YES	NO	S	ND	A	A	A	D	D	A	S	A
Israel	NO	YES	NO	D	ND	D	D	A	D	S	A	A	D
Jordan	NO	YES	NO	D	ND	A	A	D	D	A	A	A	D
Lebanon	NO	YES	NO	D	ND	D	D	A	D	A	A	A	D
Mauritania	NO	YES	NO	A	ND	A	ND	D	A	A	A	A	D
Morocco	NO	YES	NO	D	ND	S	A	D	D	A	A	D	D
Syria	NO	YES	NO	D	ND	A	ND	D	D	A	A	A	D
Turkey	NO	NO	YES	S	ND	D	D	D	D	A	A	D	A
EU	NO	YES	NO	A	ND	A	D	D	D	A	A	A	A

4.12 Economy, Geography and History of Turkey Relative to its Partners

The TLPC of exports from Turkey to all of its partners is ascending. Figure 4.13 (a) shows the amount of exports from Turkey to the EU in thousands of US dollar, where the minimum and maximum exports are 11950063.24 and 64450862.09 in year 1995 and 2008 respectively. Figure 4.13 (b) represents the linear trend line of exports from Turkey to the EU, which is ascending

through the years. Figures of all the other partners of Turkey in terms of exports are demonstrated in appendix XXII.



a b

Figure 4.13 (a) Exports from Turkey to EU; (b) trend line of exports from Turkey to EU

Table 4.24 represents a summary of information on the exports for all pairs originated from Turkey. Based on the sum and average of the exports in this table, main partners of Turkey are the European Union, Israel, Egypt, and Algeria. However, the relationship between Turkey and Mauritania is the weakest partnership in this group.

Table 4.24 Exports from Turkey to its partners

Exports from Turkey to	***Max/year***	***Min/Year***	***Average***	***Sum***
Albania	305782.84/2008	41042.28/1997	141897.59	2270361.43
Algeria	1782012.62/2009	268934.66/1995	775137.50	12402199.98
Croatia	355520.25/2007	23379.53/2000	123403.52	1982456.30
Egypt	2618572.11/2009	245172.74/1995	771609.05	12345744.76
Israel	2082969.56/2010	239529.30/1995	1051697.70	16827163.27
Jordan	572215.15/2010	88111.78/1999	240864.29	3853828.61
Lebanon	686514.08/2009	127400.42/2000	283695.23	4539123.65
Mauritania	37436.15/2010	247.04/1995	8592.41	137478.60
Morocco	957781.72/2008	51883.81/1997	312614.99	5001834.81
Syria	1848783.92/2010	18274.48/2000	579272.52	9268360.26
Tunisia	778113.91/2008	79259.87/1995	316825.51	5069208.19
EU	64450862.09/2008	11950063.24/1995	31514435.51	504230968.20

Regarding the distance variable, Albania (765 km) is the closest country to Turkey while Mauritania is the farthest (4963 km). Among all the partners, Turkey has a common border with Syria and the EU. However, there is no common language between turkey and its partners. In addition, there is a common colony history between Turkey and its partners such as Albania, Egypt, Syria, and Tunisia. Table 4.25 shows the relationship between Turkey and all of its partners in terms of the explanatory variable.

Table 4.25 Status of all pairs originated from Turkey relative to explanatory variables

Variables / Partners	1	2	3	4	5	6	7	8	9	10	11	12	13
Albania	NO	NO	YES	D	D	D	ND	D	D	A	A	A	D
Algeria	NO	NO	NO	D	D	D	D	A	D	A	A	S	D
Croatia	NO	NO	NO	A	D	D	D	D	A	A	A	D	A
Egypt	NO	NO	YES	A	D	D	D	A	D	D	A	D	A
Israel	NO	NO	NO	D	D	D	D	A	D	A	A	D	D
Jordan	NO	NO	NO	A	D	D	D	D	D	A	A	D	A
Lebanon	NO	NO	NO	A	D	D	D	A	D	A	A	D	D
Mauritania	NO	NO	NO	A	D	D	ND	D	A	A	A	D	D
Morocco	NO	NO	NO	D	D	D	A	D	D	A	A	D	D
Syria	YES	NO	YES	D	D	D	ND	D	D	A	A	A	A
Tunisia	NO	NO	YES	S	ND	D	D	D	D	A	A	D	A
EU	YES	NO	NO	D	D	D	D	A	A	A	A	A	D

Table 4.26 shows the trend line of plot chart (TLPC) of the dependent variable, exports. The first column shows the exporting countries and the first row shows the importing countries.

Table 4.26 TLPC of the dependent variable, exports, of each country as an exporter relative to its partners

Importer / Exporter	**Albania**	**Algeria**	**Croatia**	**Egypt**	**Israel**	**Jordan**	**Lebanon**	**Mauritania**	**Morocco**	**Syria**	**Tunisia**	**Turkey**	**EU**
Albania		D	D	A	A	A	ND	ND	ND	A	ND	A	A
Algeria	A		D	A	ND	A	A	D	A	A	A	A	A
Croatia	A	A		A	A	A	A	A	A	A	A	A	A
Egypt	A	A	A		D	A	A	A	A	A	A	A	A
Israel	D	A	A	A		A	D	D	A	A	D	A	A
Jordan	A	A	D	A	A		A	A	A	A	A	A	A
Lebanon	A	A	D	A	ND	A		A	A	A	A	A	A
Mauritania	ND	A	ND	A	ND	ND	A		A	A	A	A	A
Morocco	A	A	A	A	ND	A	A	A		A	A	A	A
Syria	A	A	D	A	ND	A	A	A	A		A	A	A
Tunisia	A	A	A	A	ND	A	A	A	A	A		A	A
Turkey	A	A	A	A	A	A	A	A	A	A	A		A

CHAPITRE 5 RESEARCH STRATEGY AND METHODS

5.1 Methodology

The empirical analysis is based on a variant of the gravity model, commonly used to analysing international trade. The dataset is composed of aggregate annual bilateral flows of volume of exports of Mediterranean Union countries. The data cover the period from 1995 to 2010. As mentioned before, the Mediterranean Union is composed of countries from the Middle East and Northern Africa (MENA region) and the European Union (EU). However, some countries from the Mediterranean Union are not included in this empirical analysis due to the lack of data. The countries investigated in this study are 12 members from the MENA region (Albania, Algeria, Croatia, Egypt, Israel, Jordan, Lebanon, Mauritania, Morocco, Syria, Tunisia and Turkey) and the EU as a whole. We will investigate three regions to see if they can be appropriate candidates for integration or adopting a common currency:

1. The Mediterranean Union (composed of 12 countries from the MENA region and EU),
2. The MENA region (12 countries in our data set) and
3. Eight selected countries from the MENA region (Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey)

Each region will be examined by six gravity models based on Rose (2000), Sapir (2001), Egger (2002), Peridy (2005), Warin, Wunnava et al. (2008), and Warin, Wunnava et al. (2009). We will use two kinds of estimations, which are used frequently for panel data: random effects estimation and fixed effects estimation. In addition, all estimations use volume of exports as the dependent variable, which is defined as following:

$$Ln(Export_{ij,t}) = LnX_{ij,t}$$

Where $X_{ij,t}$ are exports from country i to country j at time t.

For the first region (Mediterranean Union), there are N = (12* 11) + (12*1) = 144 bilateral relationships per time period[14]. The data cover the period from 1995 to 2010, yielding a total sample of n = 144 *16 =2304 bilateral observations. Since the dataset includes a few missing observations, the actual dataset is slightly smaller and unbalanced.

For the second region (MENA region), there are N = (12* 11) = 132 bilateral relationships per time period. The data cover the period from 1995 to 2010, yielding a total sample of n = 132 *16 = 2112 bilateral observations. Since the dataset includes a few missing observations, the actual dataset is slightly smaller and unbalanced.

For the third region (8 countries from the MENA region), there are N = (8* 7) = 56 bilateral relationships per time period. The data cover the period from 1995 to 2010, yielding a total sample of n = 56 *16 = 896 bilateral observations per time period. Since the dataset includes a few missing observations, the actual dataset is slightly smaller and unbalanced.

5.1.1 Six Different Gravity Models

Following equations show the six gravity models used in this research study:

Gravity Model as in (Rose 2000)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnECOSIZE_{ij,t} + \beta_2 LnDIS_{ij,t} + \beta_3 COMBOR_{ij,t} + \beta_4 COMLANG_{ij,t} + \beta_5 COMCOL_{ij,t} + \beta_6 LnGDPCAP_{ij,t} + \varepsilon_{ij,t}$$

Gravity Model as in (Sapir 2001)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnECOSIZE_{ij,t} + \beta_2 LnDIS_{ij,t} + \beta_3 COMLANG_{ij,t} + \varepsilon_{ij,t}$$

[14] The first parentheses refer to exports between countries from the MENA region and the second parentheses refer to exports from 12 countries in the MENA to the EU.

Gravity Model as in (Egger 2002)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnECOSIZE_{ij,t} + \beta_2 LnDIS_{ij,t} + \beta_3 COMBOR_{ij,t}$$
$$+ \beta_4 COMLANG_{ij,t} + \beta_5 LnGDPCAP_{ij,t} + \beta_6 S_{ij,t} + \varepsilon_{ij,t}$$

Gravity Model as in (Peridy 2005)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnECOSIZE_{ij,t} + \beta_2 LnDIS_{ij,t} + \beta_3 COMBOR_{ij,t}$$
$$+ \beta_4 COMLANG_{ij,t} + \varepsilon_{ij,t}$$

Gravity Model as in (Warin, Wunnava et al. 2008)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnDIS_{ij,t} + \beta_2 LnINT_{ij,t} + \beta_3 LnBUDG_{ij,t} +$$
$$\beta_4 LnDEBT_{ij,t} + \beta_5 G_{ij,t} + \beta_6 S_{ij,t} + \beta_7 R_{ij,t} + \varepsilon_{ij,t}$$

Gravity Model as in (Warin, Wunnava et al. 2009)

$$Ln(Export_{ij,t}) = \beta_0 + \beta_1 LnECOSIZE_{ij,t} + \beta_2 LnDIS_{ij,t} + \beta_3 COMBOR_{ij,t}$$
$$+ \beta_4 COMLANG_{ij,t} + \beta_5 COMCOL_{ij,t} + \beta_6 LnBUDG_{ij,t} + \beta_7 LnINF_{ij,t}$$
$$+ \beta_8 LnDEBT_{ij,t} + \beta_9 LnEXP_{ij,t} + \beta_{10} LnRES_{ij,t} + \beta_{11} LnGDPCAP_{ij,t} + \varepsilon_{ij,t}$$

Table 5.1 shows different models based on their own independent variables. Expected sign is written beside each variable.

Table 5.1 Different gravity models by different variables

	Rose (2000)	Sapir (2001)	Egger (2002)	Peridy (2005)	Warin, Wunnava et al (2008)	Warin Wunnava et al (2009)
Economic size (+)						
Distance (-)						
Common border (+)						
Common language (+)						
Common colony (+)/(-)						
Interest rate (-)						
Budget deficit (-)						
Inflation (-)						
Debt (-)						
Expenditure (-)						
Reserve position (-)						
Market size (+)						
Income similarity (+)						
Factor endowment (-)						
GDP per capita (-)						

5.1.2 Definition of Variables

Ln dis indicates the log of the distance between the capitals of two countries. Distance serves as a proxy for trade and transportation costs, which has a negative impact on volume of exports between two countries. Communication and coordination costs are also associated with the costs of distance.

Dummy Variables

COMBOR is a dummy variable that controls for a common border between two trading partners. This variable takes a value of one if two trading partners in a pair share a common border (land border or see border) and a value of zero otherwise.

COMLANG refers to a dummy variable that takes a value of one if two trading partners in a pair share a common language and a value of zero otherwise.

COMCOL is a dummy variable that takes a value of one if two trading partners in a pair have had the same colonizer at any time period and a value of zero otherwise.

Convergence Variables

Ln INT indicates the log of the absolute value of the difference in "interest rates" between two countries. A negative coefficient is expected for this variable due to the fact that interest rate measures the long-term cost of borrowing. Convergence of interest rate of two trading partners would increase the confidence of two partners.

Ln BUDG indicates the log of the absolute value of the difference in "budget surplus or deficit" as a percentage of GDP between two countries. This variable captures the effect of government fiscal responsibility. Hence, a convergence in the balance of the budget surplus is expected to increase volume of exports and trade between countries.

Ln INF indicates the log of the absolute value of the difference in "inflation" as the annual percentage between two countries. (Fleming 1971) notes that when inflation rate between countries is low and similar over time, the terms of trade will also remain fairly stable. Therefore, a negative coefficient is expected for this variable.

Ln DEBT indicates the log of the absolute value of difference of "government debt" as a percentage of GDP between two countries. A reduction in the debt differential between countries is likely to lead to an increase in trade flows. Therefore, a negative coefficient is expected for this variable.

Ln EXP indicates the log of the absolute value of difference of "government expenditure" as a percentage of GDP between the two countries. Existence of convergence in public expenditure could be used as an indicator of the rational distribution of welfare between two countries. The coefficient of this variable is expected to be negative.

Ln RES indicates the log of the absolute value of difference of "reserve position" as a percentage of GDP between the two countries. The coefficient of this variable is expected to be negative.

Ln GDPCAP indicates the log of the absolute value of difference of "GDP per capita" between two countries. This variable measures differences in the standard of living. The coefficient of this variable is also expected to be negative.

Hecksher Ohlin Variables

G measures the market size or overall economic space of two countries. This variable is expected to have a positive impact on volume of exports.

S is the measure of relative size of two economies. The index of income similarity takes the values between -∞ (i.e. the log of a number near zero) in case of perfect dissimilarity and -0.69 (the log of 0.5) for perfect similarity. Similarity in size should have a positive effect on volume of exports and volume of trade as (Krugman and Helpman 1985) predict that countries similar in size will trade more.

R is the measure of relative difference between two countries in terms of relative "factor endowment". R in this study is measured by the ratio of gross fixed capital formation and country population. In the case of equality in relative factor endowment, the factor endowment takes a minimum value of zero. This variable takes a maximum value that approaches one representing the largest possible difference in relative factor endowment. The coefficient of this variable is expected to be negative.

Variables are defined as following equations:

$$Ln\ ECOSIZE_{ij,t} = \ln\left(GDP_{i,t} \times GDP_{j,t}\right)$$

$$LnDIS_{ij,t} = Ln\left(Distance_{i,j,t}\right)$$

$$LnINT_{ij,t} = Ln\left|interest_{i,t} - interest_{j,t}\right|$$

$$LnBUDG_{ij,t} = Ln\left|budget_{i,t} - budget_{j,t}\right|$$

$$LnINF_{ij,t} = Ln\left|inflation_{i,t} - inflation_{j,t}\right|$$

$$LnDEBT_{ij,t} = Ln\left|debt_{i,t} - debt_{j,t}\right|$$

$$LnEXP_{ij,t} = Ln\left|expenditure_{i,t} - expenditure_{j,t}\right|$$

$$LnRES_{ij,t} = Ln\left|reserve\ position_{i,t} - reserve\ position_{j,t}\right|$$

$$LnGDPCAP_{ij,t} = Ln\left|GDP\ per\ capita_{i,t} - GDP\ per\ capita_{j,t}\right|$$

$$G_{ij,t} = Ln\left(GDP_{i,t} + GDP_{j,t}\right)$$

$$S_{ij,t} = Ln\left(1 - \left(\frac{GDP_{i,t}}{GDP_{i,t} + GDP_{j,t}}\right)^2 - \left(\frac{GDP_{j,t}}{GDP_{i,t} + GDP_{j,t}}\right)^2\right)$$

$$R_{ij,t} = \left| Ln\left(\frac{gcf_{i,t}}{N_{i,t}}\right) - Ln\left(\frac{gcf_{j,t}}{N_{j,t}}\right) \right|$$

5.2 Sources of Data

The data on GDP, GDP per capita, GDP growth, interest rate, inflation and foreign reserve position are taken from World Bank's World Development Indicators. In addition, data on government debt, government expenditure and budget deficit are taken from International Monetary Fund (IMF). The GDP values and GDP per capita values are expressed in current US dollar. Government debt, government expenditure, budget deficit and foreign reserve position are expressed as a percentage of GDP and GDP growth is the annual percentage growth rate of GDP. The interest rate values are expressed as the annual percentage. Inflation is measured by the consumer price index. Data on bilateral distances, colonial history, country adjacency and common official language are taken from a database maintained by the Centre d'Etudes Prospectives et d'Information Internationales (CEPII). The bilateral distances, measured in kilometres are distances between the countries' capitals. Data on exports between countries are collected from The United Nations Commodity Trade Statistics Database (UN Comtrade) and expressed in current US dollar. Table 5.2 shows a brief description about dependent and all independent variables

Table 5.2 Data sources and descriptions

Variables	*Unit*	*Definition*	*Data Sources*
Dependent variable			
Ln EXPORT$_{ijt}$	Log (%GDP)	Exports from country i to country j	UN Comtrade
Dummy variables			
COMBOR	0 or 1	Common border	CEPII
COMLANG	0 or 1	Common language	CEPII
COMCOL	0 or 1	Common colony	CEPII
Convergence variables			
Ln INT	Log (annual %)	Absolute value of difference of interest rate	World Bank's World Development Indicators
Ln BUDG	Log (% GDP)	Absolute value of difference of budget deficit	International Monetary Fund
Ln INF	Log (annual %)	Absolute value of difference of inflation	World Bank's World Development Indicators
Ln DEBT	Log (% GDP)	Absolute value of difference of government debt	International Monetary Fund
Ln EXP	Log (% GDP)	Absolute value of difference of government expenditure	International Monetary Fund
Ln RES	Log (% GDP)	Absolute value of difference of reserves position	World Bank's World Development Indicators
Ln GDPCAP	Log (US $)	Absolute value of difference of GDP per capita	World Bank's World Development Indicators
Hecksher Ohlin variables			Three Hecksher Ohlin variables are formulated based on GDP and gcf (gross capital formation). Data on GDP and gcf are taken from World Bank's World Development Indicators.
G		Market size	
S		Income similarity	
R		Absolute value of relative difference of factor endowments	
Ln DIS	Log(distance)	distance between the capitals of two countries	CEPII
Ln ECOSIZE	Log (GDP)	Economic size of two countries	World Bank's World Development Indicators

5.3 Analysing Integration of the Mediterranean Union Based on Six Gravity Models

In this section, the Mediterranean Union is examined to investigate whether this area is an appropriate candidate for integration or not. the Examination is done based on six mentioned gravity models. tthe Conclusion on this debate comes out from the combination of the results of these six gravity models.

5.3.1 Gravity Model of Trade Integration of the Mediterranean Union based on Rose (2000)'s Specifications

The first column in Table 5.3 shows the results following the random effects estimation. This estimation confirms that economic size has a highly significant impact on the volume of exports between countries in the Mediterranean Union. The magnitude of the coefficient suggests that a one percent increase in economic size raises volume of exports by about .36 percent. Based on random effects estimation, variables such as distance, common border and absolute value of difference of GDP per capita are known insignificant determinant of volume of exports between two countries in a given pair in the Mediterranean Union. Speaking the same language and having a common colony significantly increases exports between the two countries at significant level of 1% and 10% respectively.

In order to make sure that coefficient estimated by the random effects estimator are the same as the coefficients estimated by the fixed effects, the Hausman test takes into account. However, the magnitude of p-value, 7.57556e, is lower than 0.05. Hence, the fixed effects estimation is better than the random effects estimation due to inconsistence coefficients by random effects estimator. Fixed effects estimation confirms that the higher the economic size of each pair of countries, the higher the volume of exports between those countries. In addition, Lower distance increases volume of exports between countries. However, results derived from this estimator show that exports volume between countries in the Mediterranean Union is not significantly related to common border, common language, common colony and convergence in GDP per capita.

Table 5.3 Results of gravity model by Rose (2000), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Rose (2000)**, Mediterranean Union*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	Std. Error	p-value
CONSTANT	-18.906***	2.739	<0.00001	-18.02***	2.70472	<0.00001
ln ECOSIZE	0.356 ***	0.036	<0.00001	0.374 ***	0.036	<0.00001
ln DIS	-0.450	0.291	0.121	-0.591 **	0.277	0.033
COMBOR	0.917	0.760	0.228	1.069	0.689	0.121
COMLANG	1.293 ***	0.468	0.006	0.674	0.498	0.176
COMCOL	1.887 *	0.971	0.052	1.366	0.891	0.125
ln GDPCAP	0.026	0.052	0.615	0.028	0.053	0.595
Albania				-2.726***	0.928	0.0002
Algeria				-1.097	1.004	0.631
Croatia				-1.670	0.938	0.877
Egypt				-1.471	0.968	0.663
Israel				-2.596***	0.969	0.002
Jordan				-1.324	0.973	0.476
Lebanon				-1.926	1.001	0.981
Mauritania				-0.835	1.041	0.833
Morocco				-0.932	1.009	0.715
Syria				-0.987	0.972	0.233
Tunisia				-1.576	0.972	0.831
P-value of Hausman test			7.57556e-007			

5.3.2 Gravity Model of Trade Integration of the Mediterranean Union based on Sapir (2001)'s Specifications

Table 5.4 shows the results of the gravity model for our dataset on the Mediterranean Union based on Sapir (2001)'s specifications. By random effects estimation, all variables have the expected sign and are statistically significant.

Table 5.4 Results of gravity model by Sapir (2001), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Sapir (2001)**, Mediterranean Union*

Estimation Methods	**RE**	***Std. Error***	***p-value***	**FE**	***Std. Error***	***p-value***
CONSTANT	-17.088***	2.399	<0.00001	-15.698***	2.347	<0.00001
ln ECOSIZE	0.369***	0.030	<0.00001	0.388 ***	0.030	<0.00001
ln DIS	-0.711 ***	0.241	0.00326	-0.894 ***	0.224	0.00007
COMLANG	1.180 ***	0.439	0.00740	0.670	0.477	0.160
Albania				-3.768 ***	0.906	0.00003
Algeria				-0.683	0.978	0.485
Croatia				-0.246	0.893	0.782
Egypt				-0.784	0.959	0.413
Israel				-3.270 ***	0.933	0.0005
Jordan				0.254	0.947	0.789
Lebanon				-0.493	0.975	0.613
Mauritania				0.130	1.013	0.898
Morocco				0.162	0.987	0.869
Syria				0.988	0.963	0.305
Tunisia				-0.504	0.965	0.601
P-value of Hausman test			2.82671e-007			

However, the Hausman test confirms that coefficients estimated by the random effects estimation are not the same as ones estimated by the fixed effects estimation. Therefore, fixed effects estimation takes into account and confirms that economic size has a highly significant impact on the volume of exports between countries in the Mediterranean Union. The magnitude of the coefficient suggests that a one percent increase in economic size raises volume of exports by about .39 percent. The distance term is strongly negative, implying that a one percent increase in distance between two countries decreases the volume of exports by about .89 percent. However, common language is a statistically insignificant determinant of volume of exports between countries in the Mediterranean Union.

5.3.3 Gravity Model of Trade Integration of the Mediterranean Union based on Egger (2002)'s Specifications

Table 5.5 shows the results of the gravity model for our dataset on the Mediterranean Union based on Egger (2002)'s specifications. Based on the random effects estimation, variables such as economic size, distance and common language have the expected sign and are statistically significant. Moreover, common border and convergence in GDP per capita are known statistically insignificant. The volume of exports between the countries in the Mediterranean Union is negatively related to income similarity based on the random effects estimation. However, the magnitude of p-value based on the Hausman test confirms that coefficients estimated by the random effects estimation are not the same as ones estimated by the fixed effects estimation. Therefore, going through fixed effects estimation following results is achieved. The Coefficient of the variable ‘economic size’ confirms that exports volumes between the countries are positively and significantly related to this variable. A one percent increase in the economic size raises the volume of exports by about .39 percent.

If distance between two countries decrease by one percent, volume of exports increases by about .91 percent. Common border and convergence in GDP per capita are found to be insignificant determinant of the volume of exports based on Egger (2002)'s specifications. Common language is lowly significant determinant of the volume of exports between the countries in the Mediterranean Union with a positive impact. Volume of Exports between two countries which share a common language is .90 percent higher than for two countries that do not share a common language based on the fixed effects estimation and Egger (2002)'s specification. Like random effects estimation, fixed effects estimation also shows that volume of exports between countries is negatively related to the income similarity. If incomes of two countries become similar by one percent, the volume of exports decreases by about .58 percent.

Table 5.5 Results of gravity model by Egger (2002), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Egger (2002)**, Mediterranean Union*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	*Std. Error*	*p-value*
CONSTANT	-18.031***	2.653	<0.00001	-16.813 ***	2.613	<0.00001
ln ECOSIZE	0.379 ***	0.036	<0.00001	0.387 ***	0.036	<0.00001
ln DIS	-0.776 ***	0.286	0.007	-0.907 ***	0.272	0.00086
COMBOR	0.411	0.738	0.578	0.452	0.672	0.501
COMLANG	1.336 ***	0.435	0.002	0.901 *	0.472	0.056
S	-0.500 ***	0.053	0.814	-0.582 ***	0.113	<0.00001
ln GDPCAP	-0.012	0.120	0.00003	-0.009	0.053	0.866
Albania				-3.725 ***	0.866	0.00002
Algeria				-0.592	0.939	0.529
Croatia				0.191	0.860	0.824
Egypt				-0.620	0.918	0.499
Israel				-3.199 ***	0.898	0.0003
Jordan				0.318	0.906	0.726
Lebanon				-0.295	0.937	0.753
Mauritania				-0.619	0.984	0.530
Morocco				0.348	0.947	0.714
Syria				1.157	0.921	0.209
Tunisia				-0.261	0.923	0.778
P-value of Hausman test			1.40192e-006			

5.3.4 Gravity Model of Trade Integration of the Mediterranean Union based on Peridy (2005)'s Specifications

Peridy (2005) introduced a gravity model based on explanatory variables such as economic size, distance, common border and common language. Based on Peridy's specifications and Table 5.6, all variables included in this specification are correctly signed.

Table 5.6 Results of gravity model by Peridy (2005), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
Based on model ***Peridy (2005)****, Mediterranean Union*

Estimation Methods	**RE**	***Std. Error***	***p-value***	**FE**	***Std. Error***	***p-value***
CONSTANT	-18.770 ***	2.695	<0.00001	-11.014 ***	2.631	<0.00001
ln ECOSIZE	0.367 ***	0.030	<0.00001	0.793***	0.030	<0.00001
ln DIS	-0.483 *	0.293	0.099	-1.075 ***	0.278	0.029
COMBOR	1.052	0.765	0.169	-0.342	0.688	0.081
COMLANG	1.029 **	0.454	0.024	1.280 ***	0.488	0.312
Albania				-17.762 ***	0.907	0.00003
Algeria				0.385	0.983	0.391
Croatia				-0.606	0.894	0.757
Egypt				1.202	0.963	0.507
Israel				0.493 ***	0.936	0.0003
Jordan				-3.768	0.950	0.713
Lebanon				-0.843	0.980	0.739
Mauritania				-0.276	1.020	0.948
Morocco				-0.639	0.991	0.979
Syria				-3.373	0.964	0.343
Tunisia				0.350	0.967	0.672
P-value of Hausman test			5.69169e-007			

Economic size and distance are respectively highly and lowly significant determinants of the trade flow based on the random effects estimation. Speaking the same language is significant at 5% level and common border is insignificant determinant of the volume of exports between countries in the Mediterranean Union based on the random effects estimation.

However, the Hausman test confirms inconsistency of these coefficients with the ones estimated by the fixed effects estimation. Hence, the fixed effects estimator gives us a better estimation with more efficient coefficients. Based on the fixed effects estimation, economic size, distance and speaking the same language are statistically significant with the expected sign. If economic size of two countries (in a given pair) increases by one percent, volume of exports increases by

about .79 percent. In addition, the coefficient of distance is also strongly negative, implying that one percent increase in distance between two countries decreases volume of exports by about 1.08 percent. Moreover, the fixed effects estimation shows that volume of Exports between two countries which share a common language is 1.28 percent higher than for two countries that do not share a common language based on Peridy (2005)'s specification.

5.3.5 Gravity Model of Trade Integration of the Mediterranean Union based on Warin; Wunnava et al (2008)'s Specifications

Table 5.7 Results of gravity model by Warin, Wunnava et al (2008), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
Based on model ***Warin*; Wunnava et al *(2008)***, *Mediterranean Union*

Estimation Methods	RE	*Std. Error*	*p-value*
CONSTANT	-20.928 ***	4.675	0.00001
ln DIS	-0.829 **	0.390	0.034
ln INT	-0.106	0.121	0.384
ln BUDG	0.009	0.089	0.917
ln DEBT	0.027	0.075	0.718
G	0.896 ***	0.158	<0.00001
S	-0.337	0.246	0.171
R	-0.198	0.198	0.318
P-value of Hausman test	0.058		

Among gravity variables introduced by Warin, Wunnava et al (2008) in Table 5.7 only distance and market size are statistically significant determinants of the volume of exports between the countries in the Mediterranean Union based on the random effects estimation.

The null hypothesis of the random effects estimation is not rejected again by the Hausman test and it is safe to use the random effects estimation. The coefficient of distance in the random effects estimation is strongly negative implying that a one percent increase in distance between two countries decreases the volume of exports by about .83 percent. Moreover, if the variable

market size of two countries increases by one percent, the volume of exports increases by about .90%.

Explanatory variables such as convergence in interest rate, convergence in budget deficit, convergence in government debt, relative difference of countries in terms of factor endowment and also income similarity are found to be statistically insignificant determinants of the volume of exports based on the fixed effects estimation.

5.3.6 Gravity Model of Trade Integration of the Mediterranean Union based on Warin, Wunnava et al (2009)'s Specifications

Based on Warin, Wunnava et al (2009)'s specifications and Table 5.8, economic size and common language are known statistically significant among all variables included in this specification based on the random effects estimation. However, the Hausman test confirms the rejection of null hypothesis of the random effects estimation. Therefore, the following results are achieved based on the fixed effects estimation. Among all variables, economic size is a highly significant determinant of the volume of exports between two countries in a given pair in the Mediterranean Union. A one percent increase in economic size of two countries increases the volume of exports by about .66 percent. In addition, common language and convergence in reserve position are both lowly significant determinants of the volume of exports with the expected sign. Volume of Exports between two countries which share a common language is 1.11 percent higher than for two countries that do not share a common language based on Warin, Wunnava et al (2009)'s specification. Also, if absolute values of difference of reserve position of two countries decrease by one percent the volume of trade increases by about .13 percent based on the fixed effects estimator. Following variables are found to be insignificant based on Warin, Wunnava et al (2008)'s specification by the fixed effects estimator: distance, common border, and common colony, convergence in budget, inflation, debt, expenditure and GDP per capita.

Table 5.8 Results of gravity model by Warin, Wunnava et al (2009), Mediterranean Union

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
Based on model ***Warin*****; Wunnava et al** ***(2009)****, Mediterranean Union*

Estimation Methods	**RE**	***Std. Error***	***p-value***	**FE**	***Std. Error***	***p-value***
CONSTANT	-28.975 ***	4.330	<0.00001	-31.204***	4.454	<0.00001
ln ECOSIZE	0.625 ***	0.082	<0.00001	0.656 ***	0.083	<0.00001
ln DIS	-0.645	0.401	0.108	-0.589 ***	0.400	0.142
COMBOR	-0.074	0.926	0.936	0.773	0.931	0.407
COMLANG	1.402 **	0.554	0.011	1.110 *	0.618	0.073
COMCOL	1.025	1.253	0.414	0.339	1.210	0.779
ln BUDG	-0.021	0.104	0.843	-0.041	0.104	0.696
ln INF	-0.020	0.090	0.823	-0.030	0.090	0.739
ln DEBT	-0.014	0.092	0.880	-0.007	0.093	0.940
ln EXP	0.031	0.089	0.728	0.069	0.089	0.440
ln RES	-0.103	0.071	0.148	-0.131*	0.071	0.068
ln GDPCAP	-0.135	0.124	0.276	-0.043	0.125	0.731
Albania				-3.710**	1.548	0.017
Algeria				-0.418	1.170	0.721
Croatia				0.051	1.112	0.963
Egypt				-0.438	1.076	0.684
Israel				-3.065 ***	1.104	0.005
Jordan				0.818	1.097	0.456
Lebanon				0.187	1.136	0.869
Morocco				-0.221	1.170	0.850
Tunisia				1.152	1.160	0.321
P-value of Hausman test			0.000128604			

5.3.7 Country Fixed Effects in the Mediterranean Union

To separate country fixed effects, symmetric country dummy variables are generated. These dummies are proxies for countries' participation as either source of exports or origin of imports. There are small exports volumes interactions between the countries investigated in this study from the Mediterranean Union. Smaller economies such as Albania and Israel show minimum trade interactions with the other countries.

5.4 Analysing Integration of the MENA Region Based on Six Gravity Models

In this section, the MENA region is examined to investigate whether this area is an appropriate candidate for integration or not. Examination is done based on six mentioned gravity models. Conclusion on this debate comes out from the combination of results of these six gravity models.

5.4.1 Gravity Model of Trade Integration of the MENA Region based on Rose (2000)'s Specifications

Table 5.9 shows the results of the gravity model for our dataset on the MENA region based on Rose (2000)'s specifications. By the random effects estimation, variables such as economic size, distance, common language and common colony have the expected sign and are statistically significant. However, common border and convergence in GDP per capita are known statistically insignificant determinant of exports flow between the countries in the MENA region.

However, the Hausman test confirms that coefficients estimated by the random effects estimation are not the same as ones estimated by the fixed effects estimation (with p-value of 0.0146595 < 0.05). Therefore, the fixed effects estimation takes into account and confirms that economic size has a highly significant impact on the volume of exports between countries in the MENA region. The magnitude of the coefficient suggests that a one percent increase in economic size raises the volume of exports by about .34%. The distance term is strongly negative, implying that a one percent increase in distance between two countries decreases the volume of exports by about 1.04%.

Table 5.9 Results of gravity model by Rose (2000), MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Rose (2000)**, MENA region*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	*Std. Error*	*p-value*
CONSTANT	-15.623***	2.858	<0.00001	-13.521 ***	2.878	<0.00001
ln ECOSIZE	0.338 ***	0.039	<0.00001	0.340 ***	0.039	<0.00001
ln DIS	-0.843 ***	0.289	0.003	-1.030 ***	0.279	0.0002
COMBOR	-0.271	0.817	0.740	-0.255	0.751	0.734
COMLANG	1.856 ***	0.480	0.0001	1.322 ***	0.501	0.008
COMCOL	2.6426 ***	0.936	0.004	2.185 **	0.863	0.011
ln GDPCAP	0.020	0.055	0.719	0.0308	0.055	0.580
Albania				-3.812 ***	0.927	0.00004
Algeria				-0.449	1.004	0.654
Croatia				0.353	0.935	0.705
Egypt				-0.690	0.959	0.471
Israel				-3.316 ***	0.977	0.0007
Jordan				0.469	0.979	0.631
Lebanon				-0.264	0.997	0.791
Mauritania				0.045	1.051	0.966
Morocco				0.458	0.999	0.647
Syria				0.932	0.978	0.340
Tunisia				-0.593	0.963	0.538
P-value of Hausman test			0.0146595			

Among dummy variables, common border is known statistically insignificant determinant of the volume of exports between countries in the MENA region. In addition, volume of exports between two countries which share a common language is 1.32% higher than for the two countries that do not share a common language based on the fixed effects estimation and Rose (2000)'s specification. Also, based on the fixed effects estimation volume of exports between two countries which share a common colony history is 2.18% higher than for two countries that do not share a common colony history. Moreover, the fixed effects estimation confirms that

convergence in GDP per is found to be statistically insignificant determinant of volume of exports between countries in the MENA region.

5.4.2 Gravity Model of Trade Integration of the MENA Region based on Sapir (2001)'s Specifications

Sapir (2001) introduced a gravity model based on the explanatory variables such as economic size, distance and common language. Based on Sapir (2001)'s specifications and Table 5.10, all variables included in this specification are correctly signed and statistically significant determinant of trade flow between countries in the MENA region based on the random effects estimation. Moreover, the Hausman test confirms consistency of the coefficients estimated by the random effects estimation due to the fact that the magnitude of p-value, 0.111882, is larger than 0.05. Hence, by this specification it is safe to use the random effects estimation. From Table 5.10 it is concluded that if economic size of two countries (in a given pair) increases by one percent exports flow between those countries increases by about .35%. In addition, the coefficient of distance is also strongly negative, implying that a one percent increase in distance between two countries decreases volume of exports by about .87%.

Table 5.10 Results of gravity model by Sapir (2001), MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Sapir (2001)**, MENA region*

Estimation Methods	**RE**	***Std. Error***	***p-value***
CONSTANT	-15.553 ***	2.515	<0.00001
ln ECOSIZE	0.350 ***	0.033	<0.00001
ln DIS	-0.866 ***	0.240	0.0003
COMLANG	1.437 ***	0.451	0.001
P-value of Hausman test		0.111882	

Moreover, the random effects estimation shows that the volume of trade between two countries which share a common language is 1.44% higher than for two countries that do not share a common language based on Sapir (2001)'s specification.

5.4.3 Gravity Model of Trade Integration of the MENA Region based on Egger (2002)'s Specifications

Table 5.11 shows the results of the gravity model for our dataset on the MENA region based on Egger (2002)'s specifications. Based on the random effects estimation, variables such as economic size, distance and common language have the expected sign and are statistically significant. Moreover, common border, income similarity and convergence in GDP per capita are known statistically insignificant determinants of the exports flow.

However, the Hausman test confirms that coefficients estimated by the random effects estimation are not the same as ones estimated by the fixed effects estimation. Therefore, by going through the fixed effects estimation following results is achieved. Coefficient of variable ‘economic size’ confirms that the exports volumes between the countries are positively and significantly related to this variable. A one percent increase in economic size raises volume of exports by about .34 percent.

If distance between two countries decreases by one percent volume of trade increases by about 1.02 percent. Common border is found to be insignificant determinant of volume of exports. Common language is significant determinant of volume of exports between the countries in the MENA region with a positive impact. Volume of trade between the two countries which share a common language is 1.02 percent higher than for two countries that do not share a common language based on the fixed effects estimation and Egger (2002)'s specification. However, the fixed effects estimation shows the insignificant role of income similarity and convergence in GDP per capita as determinants of volume of exports between the countries in the MENA region.

Table 5.11 Results of gravity model by Egger (2002), MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Egger (2002)**, MENA region*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	*Std. Error*	*p-value*
CONSTANT	-15.449 ***	2.901	<0.00001	-12.964***	2.931	0.00001
ln ECOSIZE	0.344 ***	0.040	<0.00001	0.344 ***	0.040	<0.00001
ln DIS	-0.847 ***	0.299	0.005	-1.027 ***	0.285	0.0003
COMBOR	0.050	0.830	0.952	0.026	0.757	0.972
COMLANG	1.425 ***	0.471	0.003	1.020 **	0.498	0.040
S	0.037	0.167	0.824	-0.002	0.166	0.992
ln GDPCAP	0.016	0.056	0.775	0.030	0.057	0.600
Albania				-4.361 ***	0.919	<0.00001
Algeria				-1.087	0.993	0.274
Croatia				-0.406	0.919	0.658
Egypt				-1.062	0.966	0.271
Israel				-3.989 ***	0.959	0.00003
Jordan				-0.118	0.971	0.903
Lebanon				-0.837	0.995	0.400
Mauritania				-0.529	1.045	0.613
Morocco				-0.123	0.997	0.902
Syria				0.521	0.990	0.598
Tunisia				-0.964	0.977	0.324
P-value of Hausman test			0.00736666			

5.4.4 Gravity Model of Trade Integration of the MENA Region based on Peridy (2005)'s Specifications

Table 5.12 shows the results derived from a gravity model inspired from Peridy (2005). Based on the random effects estimation, all variables have the expected sign and are statistically significant (except common border) determinant of exports flow between the countries in the MENA region. In addition, the null hypothesis of the random effects estimation is not rejected by the Hausman

test. Hence, by this specification it is safe to use the random effects estimation. From Table 5.12, it is concluded that if economic size of two countries (in a given pair) increases by one percent exports flow between those countries increases by about .35 percent. In addition, the coefficient for distance is also strongly negative, implying that a one percent increase in distance between two countries decreases the volume of exports by about .86 percent. Moreover, the random effects estimation shows that the volume of exports between two countries which share a common language is 1.43 percent higher than for two countries that do not share a common language based on Peridy (2005)'s specification.

Table 5.12 Results of gravity model by Peridy (2005), MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Peridy (2005)**, MENA region*

Estimation Methods	RE	*Std. Error*	*p-value*
CONSTANT	-15.6122 ***	2.870	<0.00001
ln ECOSIZE	0.350 ***	0.033	<0.00001
ln DIS	-0.857 ***	0.301	0.004
COMBOR	0.040	0.843	0.961
COMLANG	1.430 ***	0.475	0.002
P-value of Hausman test	0.113		

5.4.5 Gravity Model of Trade Integration of the MENA Region based on Warin, Wunnava et al (2008)'s Specifications

Among gravity variables introduced by Warin, Wunnava et al (2008) in Table 5.13, only distance and market size are known statistically significant determinant of volume of exports between countries in the MENA region based on the random effects estimation.

Table 5.13 Results of gravity model by Warin, Wunnava et al (2008), MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
Based on model ***Warin,*** **Wunnava et al** ***(2008)****, MENA region*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	*Std. Error*	*p-value*
CONSTANT	-18.527 ***	5.799	0.002	-15.481 **	6.401	0.016
ln DIS	-0.932 **	0.413	0.025	-1.227 ***	0.394	0.002
ln INT	-0.247	0.193	0.202	-0.304	0.196	0.123
ln BUDG	0.014	0.109	0.895	-0.026	0.109	0.813
ln DEBT	-0.037	0.095	0.699	-0.038	0.094	0.687
G	0.881 ***	0.197	0.00001	0.854 ***	0.206	0.00005
S	0.302	0.514	0.557	-0.019	0.503	0.970
R	-0.281	0.240	0.244	-0.108	0.240	0.652
Albania				-7.560 ***	2.095	0.0003
Algeria				0.848	1.483	0.568
Croatia				0.010	1.391	0.994
Egypt				-0.015	1.375	0.991
Israel				-3.401 **	1.341	0.011
Jordan				-0.022	1.410	0.987
Lebanon				0.062	1.415	0.965
Morocco				-0.021	1.453	0.988
P-value of Hausman test		0.00155505				

However, the null hypothesis of the random effects estimation is rejected again by Hausman test. Hence, the fixed effects estimation can be seen as a more efficient alternative to the random effects estimation.

The coefficient of distance in the fixed effects estimation is strongly negative implying that a one percent increase in distance between two countries decreases the volume of exports by about 1.23 percent. Moreover, if variable market size of two countries increases by one percent, the volume of exports increases by about .85 percent.

Other explanatory variables such as convergence in interest rate, convergence in budget deficit, convergence in government debt, income similarity and also relative difference of countries in

terms of factor endowment are found to be statistically insignificant determinant of volume of exports based on the fixed effects estimation.

5.4.6 Gravity Model of Trade Integration of the MENA Region based on Warin, Wunnava et al (2009)'s Specifications

Based on Warin, Wunnava et al (2009)'s specifications and Table 5.14, economic size, distance, common border and common language are known statistically significant among all variables included in this specification based on the random effects estimation. However, the Hausman test confirms the rejection of null hypothesis of the random effects estimation. Therefore, the following results are achieved based on the fixed effects estimation. Among all variables, economic size is highly significant determinant of the volume of exports between two countries in a given pair in the MENA region. A one percent increase in economic size of two countries increases the volume of exports by about .59 percent. In addition, the coefficient of distance is strongly negative, implying that a one percent increase in distance between two countries in the MENA region decreases the volume of exports by about 1.23 percent. Among dummy variables, only common language is highly significant determinant of the volume of exports with the expected sign. Volume of Exports between two countries which share a common language is 1.68 percent higher than for two countries that do not share a common language based on Warin, Wunnava et al (2009)'s specification. The following variables are found to be insignificant based on Warin, Wunnava et al (2009)'s specification by the fixed effects estimator: common border, and common colony, convergence in budget, inflation, debt, expenditure, reserve position and GDP per capita.

Table 5.14 Results of gravity model by Warin, Wunnava et al (2009), MENA region

Random effects and fixed effects Estimations 1995-2010 [Double Log Specification], Dependent Variable: Ln (Exports) Based on model ***Warin,*** **Wunnava et al** ***(2009)****, MENA region*						
Estimation Methods	**RE**	***Std. Error***	***p-value***	**FE**	***Std. Error***	***p-value***
CONSTANT	-21.599 ***	5.096	0.00003	-22.935 ***	5.144	0.00001
ln ECOSIZE	0.552 ***	0.095	<0.00001	0.589 ***	0.094	<0.00001
ln DIS	-1.137 ***	0.416	0.007	-1.229 ***	0.373	0.001
COMBOR	-1.832 *	1.088	0.093	-1.369	0.961	0.155
COMLANG	1.862 ***	0.596	0.001	1.683 ***	0.565	0.003
COMCOL	1.545	1.225	0.208	0.665	1.060	0.531
ln BUDG	-0.050	0.116	0.664	-0.099	0.114	0.389
ln INF	-0.016	0.098	0.866	-0.039	0.096	0.686
ln DEBT	-0.082	0.106	0.439	-0.080	0.104	0.441
ln EXP	-0.007	0.096	0.943	0.051	0.094	0.588
ln RES	-0.070	0.0757	0.353	-0.115	0.074	0.123
ln GDPCAP	-0.171	0.131	0.191	-0.048	0.130	0.711
Albania				-7.480 ***	1.564	<0.00001
Algeria				-0.222	1.075	0.836
Croatia				0.144	1.017	0.887
Egypt				-0.711	0.972	0.465
Israel				-3.477 ***	1.039	0.0009
Jordan				0.258	1.024	0.801
Lebanon				-0.181	1.045	0.862
Morocco				-0.043	1.051	0.967
Tunisia				0.847	1.066	0.427
P-value of Hausman test			0.00261295			

5.4.7 Country Fixed Effects in the MENA Region

The results on country fixed effects in the MENA region is also the same as results in the Mediterranean Union. The reason is clear. Countries investigated in the Mediterranean Union are

the same countries investigated in the MENA region plus the EU as a whole. However, the EU in our dataset is not considered as an exporter. Hence, dummy magnitude of this economy in the Mediterranean Union is zero. Therefore, for both regions, the Mediterranean Union and the MENA region, results on the country fixed effects are the same.

5.5 Analysing Integration of the Potential Group of Countries in the MENA Region Based on Six Gravity Models

In this section, first it is tried to find a potential group of countries in the MENA region which are predicted to be appropriate candidates for integration. Then, the examination is done based on the six mentioned gravity models. Conclusion on this debate comes out from the combination of results of these six gravity models.

5.5.1 Finding a Potential Group of Countries in the MENA Region

In the last region investigated in this study, we try to find a potential group of countries which might be appropriate candidates for integration. To find the potential group, two steps are done. In the first step, it is tried to find potential groups of countries within the MENA region based on the descriptive analysis which was mentioned in the previous chapter. Second step investigates suitability of these groups to be integrated based on the fixed effects and random effects estimators.

Step 1: Finding Potential Groups of Countries within the MENA Region:

There are three procedures in this step:

Procedures 1: Finding Potential Groups Containing Two Countries

a) Finding potential groups containing two economies, is done based on Table 4.26 in descriptive analysis (chapter 4). This table shows the direction of exports (ascending or descending) through the years from each economy to its partners. A basic selection is performed by choosing pairs with ascending exports to each other through the years. For instance, by looking at Albania as an exporter in Table 4.26, it is determined that exports from Albania to Egypt, Jordan, Syria and Turkey is ascending through the years. Moreover, exports from Egypt, Jordan, Syria and Turkey (as exporters) to Albania (as the importer) are also ascending through the years. Therefore, in the basic selection, we have

pairs such as Albania-Egypt, Albania-Jordan, Albania-Syria and Albania-Turkey. The same is done for all economies.

b) Among selected pairs, ones with less than 7 appropriate conditions based on tables 4.3, 4.5, 4.7, 4.9, 4.11, 4.13, 4.15, 4.17, 4.19, 4.21, 4.23 and 4.25 will be removed. These tables show appropriate conditions in the perspective of independent variables related to each pair. for instance in Table 4.3, on the one hand, cell with color green related to independent variable, number 4(absolute value of difference of GDP growth) , and economy, turkey, (as a partner of Albania) shows the potential suitability of the pair Albania-turkey for integration in the perspective of independent variable "absolute value of GDP growth". on the other hand, cell related to independent variable, number 7(absolute value of difference of budget deficit), and economy, Turkey, (as a partner of Albania) shows likely unsuitability of the pair Albania-Turkey for integration in the perspective of independent variable "absolute value of difference of budget deficit". For all pairs selected in the part 'a' we compute the number of cells with green color (showing appropriate condition) and remove ones for which number of green color are less than 7. Hence, based on this explanation the pair Albania-Syria selected in previous section is removed because the appropriate conditions for this pair in the perspective of independent variables are less than seven.

c) The last procedure to find groups containing two economies is adding pairs that are considered the most important partners to each other based on sum and average of exports in tables 4.2, 4.4, 4.6, 4.8, 4.10, 4.12, 4.14, 4.16, 4.18, 4.20, 4.22 and 4.24. For instance, based on Table 4.2, it is determined that Croatia is one of the most important partners (importer from Albania) for Albania and Albania is also one of the most important partners (importer from Croatia) for Croatia (based on Table 4.6). Therefore, the pair Albania-Croatia is added to groups containing two economies which might be suitable candidates for integration. Table 5.15 shows procedures a, b and c for pairs containing Albania.

Table 5.15 Procedures of finding potential groups containing 2 countries include Albania

Selected pairs (based on part a)	removed pairs (based on part b)	added pairs (based on part c)	Final potential pairs
Albania-Egypt			Albania-Egypt
Albania-Jordan			Albania-Jordan
Albania-Syria	Albania-Syria		
Albania-Turkey			Albania-Turkey
		Albania-Croatia	Albania-Croatia

The same procedures are performed for all economies. Table 5.16 shows all final potential pairs which might be suitable candidates for integration in our sample. In this table, the first column shows all economies (other than Mauritania) from the MENA region in our sample.

Table 5.16 All potential groups containing 2 countries for integration

Albania	Croatia _ Egypt _ Jordan _ Turkey
Algeria	Lebanon _ Morocco _ Tunisia _Turkey
Croatia	Egypt _ Israel _ Morocco _ Turkey
Egypt	Jordan _ Lebanon _ Mauritania _ Morocco _ Syria _ Turkey
Israel	Jordan _ Turkey
Jordan	Lebanon _ Morocco _ Syria _ Tunisia
Lebanon	Mauritania _ Morocco _ Syria
Morocco	Syria _ Tunisia _ Turkey
Syria	Tunisia _ Turkey
Tunisia	Turkey

In addition, partners (importers or exporters) of each economy are presented in front of the economy (second column)[15]. All in all, there are 35 potential groups containing two economies which might be suitable candidates for integration.

Procedure 2: Finding Potential Groups Containing Three Countries

Finding potential groups containing 3 countries is performed based on Table 5.16. This Procedure is explained by an example. In Table 5.16 Croatia is in front of Albania and Egypt also, is in front of Croatia and Albania. Therefore a group containing Albania, Croatia and Egypt is obtained. These three countries in this group are linked to each other two by two. Again, Croatia is in front of Albania and Israel is in front of Croatia but not in front of Albania. Hence, a group containing Albania, Croatia and Israel is not considered as a potential group. The same is happened for the group containing Albania, Croatia and Morocco because Croatia is a partner of Albania, and Morocco is a partner for Croatia but not for Albania so there is no group containing Albania, Croatia and Morocco. Finally, we have the pairs Albania-Croatia, Croatia-Turkey and also Albania-Turkey. Hence a group containing Albania, Croatia and Turkey is considered as a potential group. By doing this Procedure for all economies and their partners, 40 groups containing three countries are achieved which are presented in Table 5.17.

[15] There are no repeated pairs in this table. For instance, Albania is not mentioned in front of Egypt because, Egypt is already in front of Albania. Put differentially, there is no difference between the pairs Albania-Egypt and Egypt-Albania.

Table 5.17 All potential groups containing 3 countries for integration

Albania-Croatia-Egypt Albania-Croatia-Turkey Albania-Egypt-Jordan Albania-Egypt-Turkey	Algeria-Lebanon-Morocco Algeria-Lebanon-Tunisia Algeria-Lebanon-Turkey Algeria-Morocco-Tunisia Algeria-Morocco-Turkey Algeria-Tunisia-Turkey	Croatia-Egypt-Morocco Croatia-Egypt-Turkey Croatia-Israel-Turkey Croatia-Morocco-Turkey
Egypt-Jordan-Lebanon Egypt-Jordan-Morocco Egypt-Jordan-Syria Egypt-Lebanon-Mauritania Egypt-Lebanon-Morocco Egypt-Lebanon-Syria Egypt-Lebanon-Turkey Egypt-Morocco-Syria Egypt-Morocco-Turkey Egypt-Syria-Turkey	Jordan-Lebanon-Morocco Jordan-Lebanon-Syria Jordan-Lebanon-Tunisia Jordan-Morocco-Syria Jordan-Morocco-Tunisia Jordan-Syria-Tunisia	Lebanon-Morocco-Syria Lebanon-Morocco-Tunisia Lebanon-Morocco-Turkey Lebanon-Syria-Tunisia Lebanon-Syria-Turkey Lebanon-Tunisia-Turkey
Morocco-Syria-Tunisia Morocco-Syria-Turkey Morocco-Tunisia-Turkey	Syria-Tunisia-Turkey	

Procedure 3: Finding Potential Groups Containing Four and Five Countries

We try to find the potential groups composed of 4 countries based on the groups in Table 5.16 and Table 5.17. The following example shows this procedure. The procedure is started with the first group in the Table 5.17, which is “Albania-Croatia-Egypt”. Among all partners of Croatia and Egypt, which can be seen in Table 5.16 (e.g. Israel, Jordan, Lebanon, Mauritania, Morocco,

Syria and Turkey) Turkey is the only one that is a partner for Croatia and Egypt as well as a partner of Albania. Hence, the first group composed of 4 countries is “Albania-Croatia-Egypt-Turkey”. Table 5.18 shows all potential groups composed of 4 countries gained by doing the same procedure on all groups in Table 5.17.

Table 5.18 All potential groups contain of 4 countries for integration

1. **Albania-Croatia-Egypt**-Turkey
2. **Algeria-Lebanon-Morocco**-Tunisia 3. **Algeria-Lebanon-Morocco**-Turkey
4. **Algeria-Lebanon-Tunisia**-Turkey
5. **Algeria-Morocco-Tunisia**-Turkey
6. **Croatia-Egypt-Morocco**-Turkey
7. **Egypt-Jordan-Lebanon**-Morocco 8. **Egypt-Jordan-Lebanon**-Syria
9. **Egypt-Jordan-Morocco**-Syria
10. **Egypt-Lebanon-Morocco**-Syria 11. **Egypt-Lebanon-Morocco**-Turkey
12. **Egypt-Lebanon-Syria**-Turkey
13. **Egypt-Morocco-Syria**-Turkey
14. **Jordan-Lebanon-Syria**-Tunisia
15. **Jordan-Morocco-Syria**-Tunisia
16. **Lebanon-Morocco-Syria**-Tunisia 17. **Lebanon-Morocco-Syria**-Turkey
18. **Lebanon-Morocco-Tunisia**-Turkey
19. **Lebanon-Syria-Tunisia**-Turkey
20. **Morocco-Syria-Tunisia**-Turkey

Table 5.16 and Table 5.18 are the start points to finding potential groups composed of five countries. First, imagine the first group in Table 5.18 which is “Albania-Croatia-Egypt-Turkey”. Then, consider all partners of Croatia, Egypt and Turkey which can be seen in Table 5.16 (e.g. Israel, Jordan, Lebanon, Mauritania, Morocco and Syria). None of these countries can be added

to the group “Albania-Croatia-Egypt-Turkey” because of the following reasons based on Table 5.16:

- Israel is not a partner of Albania;
- Jordan is not a partner of Croatia and Turkey;
- Lebanon is not a partner of Albania and Croatia;
- Mauritania is not a partner of Albania, Croatia and Turkey;
- Morocco is not a partner of Albania and
- Syria is not a partner of Albania.

The first group of 5 countries is “Algeria-Lebanon-Morocco-Tunisia-Turkey”, which is originated from the second group (“Algeria-Lebanon-Morocco-Tunisia”) in Table 5.18. Among all partners of Lebanon, Morocco, and Tunisia, Turkey is the only one which is a partner of Algeria, Lebanon, Morocco and Tunisia. Table 5.19 shows all potential groups composed of 5 countries gained by doing the same procedure on all groups in Table 5.18.

Table 5.19 All potential groups containing 5 countries for integration

1. **Algeria-Lebanon-Morocco-Tunisia**-Turkey
2. **Egypt-Jordan-Lebanon-Morocco**-Syria
3. **Egypt-Lebanon-Morocco-Syria**-Turkey
4. **Jordan-Lebanon-Morocco-Syria**-Tunisia
5. **Lebanon-Morocco-Syria-Tunisia**-Turkey

Countries in Table 5.19 are expected to be the best candidates for integration because of having the most similarities with each other based on three mentioned procedures. Hence, by integrating these countries a group of countries is achieved include: Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey.

5.5.2 Gravity Model of Trade Integration of 8 Selected Countries in the MENA Region based on Rose (2000)'s Specifications

Based on Table 5.20, among all variables investigated by Rose (2000) economic size, distance and convergence in GDP per capita are statistically significant determinants of the volume of exports. However, variables such as common border, common language and common colony are found to be insignificant determinants of exports volume based on Rose (2000)'s specification and the random effects estimation. However, the Hausman test confirms consistency of coefficients estimated by the random effects. Hence, the null hypothesis of the random effects estimation is not rejected.

Based on the random effects estimation, the magnitude of the coefficient of economic size suggests that a one percent increase in economic size increases the volume of exports by about .34 percent. Moreover, a one percent increase in distance between two countries in the sample of countries estimated in this study decreases exports volume by about .84 percent.

Table 5.20 Results of gravity model by Rose (2000), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Rose (2000)**, 8 selected countries from the MENA region*

Estimation Method	RE	*Std. Error*	*p-value*
CONSTANT	-13.563 ***	1.937	<0.00001
ln ECOSIZE	0.338 ***	0.033	<0.00001
ln DIS	-0.841 ***	0.166	<0.00001
COMBOR	0.423	0.435	0.331
COMLANG	-0.084	0.393	0.831
COMCOL	-0.092	0.549	0.867
ln GDPCAP	0.112 ***	0.041	0.006
P-value of Hausman test	0.0933992		

As mentioned, all dummy variables are statistically insignificant determinant of exports volume. However, convergence in GDP per capita is statistically significant and has a negative impact on the volume of exports. Put differentially, the lower the absolute value of difference of GDP per

capita between two countries the lower the volume of exports. A one percent decrease in absolute value of difference of GDP per capita between two countries decreases the volume of exports by .11 percent.

5.5.3 Gravity Model of Trade Integration of 8 Selected Countries in MENA Region based on Sapir (2001)'s Specifications

The random effects estimation in Table 5.21 confirms that economic size has a highly significant impact on the volume of exports between countries. The magnitude of the coefficients suggests that a one percent increase in economic size raises the volume of exports by about .38 percent. The coefficient of distance is also strongly negative, implying that a one percent increase in distance between two countries decreases the volume of exports by about .98 percent. However, having the same language is not statistically significant determinant of exports volume between the countries. The Hausman test confirms the consistency of coefficients estimated by the random effects.

Table 5.21 Results of gravity model by Sapir (2001), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Sapir (2001)**, 8 selected countries from the MENA region*

Estimation Method	**RE**	***Std. Error***	***p-value***
CONSTANT	-13.965 ***	1.749	<0.00001
ln ECOSIZE	0.383 ***	0.029	<0.00001
ln DIS	-0.978***	0.133	<0.00001
COMLANG	-0.066	0.311	0.832
P-value of Hausman test		0.284693	

5.5.4 Gravity Model of Trade Integration of 8 Selected Countries in the MENA Region based on Egger (2002)'s Specifications

Based on Egger (2002)'s specification and Table 5.22 variables such as economic size, distance and income similarity have the expected sign and are statistically significant determinants of the exports volume. Speaking the same language is lowly significant determinant of the exports volume with a negative impact. On the other hand, convergence in GDP per capita is highly significant with a negative impact on the exports volume. By taking into account the Hausman test, it is concluded that coefficients estimated by the random effects are not consistence. Therefore, the null hypothesis of the random effects is rejected and the fixed effects estimation is used as an alternative to the random effects estimation. The following results are achieved based on the fixed effects estimation.

The coefficient of variable ‘economic size’ confirms that exports volumes between countries are positively related to this variable. If economic size of two countries in a given pair increases by one percent, exports volume increases by .38 percent. In addition, coefficient of distance is strongly negative, implying that a one percent increase in distance decreases the volume of exports by about .78 percent.

Among dummy variables, common border is statistically insignificant. Surprisingly, a common language has a negative impact on the exports volume. More specifically, the exports volume between two countries which share a common language is 1.29 percent less than for two countries that do not share a common language based on the fixed effects estimation. Income similarity has a positive impact on the exports volume. By positive impact it is meant here that if incomes of two countries in a given pair become similar by one percent, the volume of exports increases by about .75 percent. However, convergence in GDP per capita is statistically significant and has a negative impact on the volume of exports. A one percent decrease in absolute value of difference of GDP per capita between two countries decreases the volume of exports by .10 percent.

Table 5.22 Results of gravity model by Egger (2002), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
*Based on model **Egger (2002)**, 8 selected countries from the MENA region*

Estimation Methods	RE	*Std. Error*	*p-value*	FE	*Std. Error*	*p-value*
CONSTANT	-12.720***	1.929	<0.00001	-15.387 ***	1.816	<0.00001
ln ECOSIZE	0.355 ***	0.034	<0.00001	0.380 ***	0.033	<0.00001
ln DIS	-0.893 ***	0.165	<0.00001	-0.780 ***	0.138	<0.00001
COMBOR	0.267	0.423	0.528	0.219	0.341	0.520
COMLANG	-0.653 *	0.348	0.061	-1.293 ***	0.330	0.0001
S	0.757 ***	0.195	0.0001	0.751 ***	0.176	0.00002
ln GDPCAP	0.121 ***	0.041	0.003	0.101 **	0.039	0.011
Algeria				0.631	0.461	0.171
Egypt				0.717	0.460	0.120
Jordan				2.428 ***	0.461	<0.00001
Lebanon				1.010 **	0.462	0.029
Morocco				1.046 **	0.463	0.024
Syria				2.381 ***	0.460	<0.00001
Tunisia				1.599 ***	0.455	0.0004
P-value of Hausman test		0.0111351				

5.5.5 Gravity Model of Trade Integration of 8 Selected Countries in the MENA Region based on Peridy (2005)'s Specifications

Among gravity variables introduced in Peridy (2005), economic size and distance are known statistically significant determinants of the exports volume with the expected sign based on the random effects variables. However, the random effects estimation shows that common border and common language are statistically insignificant. The magnitude of the p-value by the Hausman test confirms that the coefficients estimated by the random effects are consistence. Therefore, based on the random effects estimation a one percent increases in economic size increases the volume of exports by about .38 percent. In addition, the coefficient of distance in the fixed effects estimation confirms that a one percent increase in distance between two countries decreases the

exports volume by about .90 percent. Table 5.23 shows the results derived from Peridy (2005)'s specifications.

Table 5.23 Results of gravity model by Peridy (2005), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010 [Double Log Specification], Dependent Variable: Ln (Exports) Based on model ***Peridy (2005)****, 8 selected countries from the MENA region*			
Estimation Methods	**RE**	***Std. Error***	***p-value***
CONSTANT	-14.5784 ***	1.89663	<0.00001
ln ECOSIZE	0.383032 ***	0.0294238	<0.00001
ln DIS	-0.898258 ***	0.16402	<0.00001
COMBOR	0.354224	0.422292	0.40181
COMLANG	-0.0711319	0.311696	0.81954
P-value of Hausman test	0.250424		

5.5.6 Gravity Model of Trade Integration of 8 Selected Countries in the MENA Region based on Warin, Wunnava et al (2008)'s Specifications

Among the gravity variables introduced by Warin, Wunnava et al (2008) in Table 5.24, distance, and convergence in debt, market size and relative difference in terms of factor endowment are known statistically significant determinants of the volume of exports between the countries investigated in this section based on the random effects estimation. However, the null hypothesis of the random effects estimation is rejected again by the Hausman test. Hence, the fixed effects estimation takes into account and shows that distance, convergence in debt and market size are highly significant determinants of the exports volume. Also, variables like income similarity and factor endowment are statistically significant at 0.05 and 0.10 levels. All of these significant variables have the expected sign. Based on the fixed effects estimation, coefficient of distance shows that a one percent increase in distance between two countries decreases the volume of exports by about .91 percent.

Table 5.24 Results of gravity model by Warin, Wunnava et al (2008), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010 [Double Log Specification], Dependent Variable: Ln (Exports) Based on model ***Warin*, Wunnava et al *(2008)***, *8 selected countries from the MENA region*						
Estimation Methods	**RE**	***Std. Error***	***p-value***	**FE**	***Std. Error***	***p-value***
CONSTANT	-15.775 ***	3.564	0.0002	-22.368 ***	3.942	<0.0001
ln DIS	-1.045 ***	0.260	0.0001	-0.910 ***	0.246	0.00034
ln INT	0.012	0.151	0.937	0.164	0.152	0.282
ln BUDG	0.003	0.060	0.960	0.010	0.060	0.863
ln DEBT	-0.314 ***	0.095	0.001	-0.315 ***	0.096	0.001
G	0.896 ***	0.140	<0.0001	1.070 ***	0.144	<0.0001
S	0.469	0.348	0.180	0.706 **	0.337	0.038
R	-0.350 *	0.188	0.065	-0.370 *	0.189	0.053
Algeria				0.925	0.681	0.177
Egypt				1.101	0.670	0.103
Jordan				2.082 ***	0.719	0.004
Lebanon				1.828 ***	0.688	0.009
Morocco				0.872	0.724	0.230
P-value of Hausman test			0.0213312			

In addition, based on the fixed effects estimator, if absolute value of difference of government debt of two countries decreases by one percent, volume of export increases by about .32 percent.

Among Hecksher Ohlin variables, the coefficient of market size confirms that if market size of two countries increases by one percent the volume of exports increases by 1.07 percent. Moreover, a one percent increase in the variable income similarity of two countries increases the volume of exports by about .71 percent with 0.05 level of significant. In addition, if relative difference of two countries in terms of factor endowment increases by one percent, volume of exports decreases by .37 percent with 0.10 level of significant. However, variables such as convergence in interest rate and budge are insignificant determinants of volume of exports based on the fixed effects estimation.

5.5.7 Gravity Model of Trade Integration of 8 Selected Countries in the MENA Region based on Warin, Wunnava et al (2009)'s Specifications

Based on Table 5.25, among all variables introduced by Warin, Wunnava et al (2009), economic size, distance and convergence in debt are statistically significant determinant of volume of exports based on the random effects estimation. Theses significant variables have the expected sign as well.

Table 5.25 Results of gravity model by Warin, Wunnava et al (2009), eight countries from the MENA region

Random effects and fixed effects Estimations 1995-2010
[Double Log Specification], Dependent Variable: Ln (Exports)
Based on model ***Warin*****, Wunnava et al *(2009)*, *8 selected countries from the MENA region***

Estimation Methods	**RE**	***Std. Error***	***p-value***
CONSTANT	-13.8131 ***	3.10828	0.00002
ln ECOSIZE	0.382186 ***	0.0593417	<0.00001
ln DIS	-0.997565 ***	0.218527	<0.00001
COMBOR	0.208117	0.579651	0.72000
COMLANG	0.271826	0.442211	0.53956
COMCOL	-0.559841	0.627242	0.37333
ln BUDG	-0.0891495	0.0612483	0.14732
ln INF	0.0521304	0.0549342	0.34396
ln DEBT	-0.294787 ***	0.0963539	0.00257
ln EXP	0.0334927	0.0477802	0.48425
ln RES	-0.0175414	0.0500584	0.72645
ln GDPCAP	0.124365	0.0773456	0.10967
P-value of Hausman test	0.918363		

The Hausman test confirms that coefficients estimated by the random effects estimation are the same as the ones estimated by the fixed effects due to the fact that p-value of this test is 0.918363. Therefore, it is safe to go through the coefficients estimated by the random effects estimator.

The coefficient of economic size confirms that a one percent increase in this variable increases the volume of exports by about .38 percent. Moreover a one percent increase in distance between two countries increases the volume of exports between those countries by about 1%. Also, if absolute value of difference of government debt of two countries decreases by one percent, volume of exports increases by about .29 percent based on the random effects estimator.

5.5.8 Country Fixed Effects in 8 Selected Countries from the MENA Region

Lastly, we briefly mention the symmetric country dummy variables that are proxies for countries' participation as either source of exports or origin of imports within the eight selected countries from the MENA region. Among all models, two model of Egger (2002) and Warin (2008) rejects the null hypothesise of the random effects estimation. Interestingly, based on the fixed effects estimation of these two models the most active country in terms of exports during the period observed have been Jordan, Syria and Tunisia based on Egger (2002) model. However, based on Warin (2008) model, the most active country in terms of exports during the period observed have been Jordan and Lebanon.

CHAPITRE 6 CONCLUSION AND POLICY IMPLICATIONS

Our analysis shows that the prospect for further integration of the three regions is promising and looks encouraging, but many challenges still have to be overcome. These challenges could be such as political relationships or some existing economic blocks which provide a first stepping stone to a larger currency union. Although the time-frame of this study ranges from 1995 to 2010, the research was conducted during the occurrence of important developments that are challenging the strength of the European Union. As such challenges could be the Greek crisis and the German treat to break the Euro. In late 2009 fears of a sovereign debt crisis developed among investors concerning Greek's ability to meet its debt obligations due to strong increase in government levels (Higgins and Klitgaard 2012).

Our results confirm that the gravity model is applicable to the three regions based on the traditional gravity variables: economic size and distance. Higher economic size and lower distance between the countries leads to deeper trade flow between the countries. In addition, analysis of the three regions show that exports volume between the countries is positively and significantly correlated with the product of the economic size of the countries in a given pair. The effects of the other variables vary among the three regions investigated in this study. Conclusion on each region is explained separately.

As the further research, a comparison between three regions of the Mediterranean Union, the MENA region and the eight countries could be performed. In this study, these three regions were treated independently. However, appraising the influence of different variables on one region could be different for the other regions. This investigation can strengthen the outcomes of this research as well as performing a cross comparison among the 3 regions.

6.1 Conclusion on the Mediterranean Union

This section has answered based on which criteria the Mediterranean Union countries could be integrated together. Results of all models represented in this study confirm that volume of exports between economies in the Mediterranean Union is consistence with the assumption of the gravity model based on two most basic and traditional gravity variables: economic size and distance.

All models show that economic size is a strong determinant of the economic integration in the Mediterranean Union countries with a positive impact. However, distance is considered as a barrier of exports volume between economies in the Mediterranean Union with a high significant role. Higher distance between countries in the Mediterranean Union leads to lower bilateral trade intensity.

Among dummy variables, common language is significant by most of the models in which this variable is included. Countries which share a common language trade more with each other than those which do not share a common language. However, the two other dummy variables, common border and common colony are not statistically significant determinants of the volume of exports between countries in the Mediterranean Union.

Furthermore, in the Mediterranean Union converging living standards do not lead to increased bilateral trade intensity. Likewise, countries with converging amounts of interest rate, budget deficit, inflation, and government debt and government expenditure share weak trade ties.

However, convergence in reserve position is lowly statistical significant determinant of the exports volume between the countries in the Mediterranean Union with the expected sign based on the model of Warin, Wunnava et al (2009).

Among Hecksher Ohlin variables, market size is highly significant determinant of bilateral trade flows between the countries in the Mediterranean Union. The larger the market sizes of two countries the higher the volume of exports between those countries. Moreover, income similarity is known to be a significant determinant of the volume of exports between the countries in the Mediterranean Union with a negative impact based on the model introduced by Egger (2002). However, relative difference of two countries in terms of factor endowment does not determine integration in the Mediterranean Union countries.

6.2 Conclusion on the MENA Region

This section has answered based on which criteria the MENA region countries could be integrated together. Results of all models represented in this study confirm that the volume of exports between the economies in the MENA region is consistence with the assumption of the gravity model based on two most basic and traditional gravity variables: economic size and distance. All models show that economic size is a highly significant determinant of integration

between the economies in the MENA region with a positive impact. However, distance is considered as a barrier of bilateral trade between the economies in the MENA region with a high significant role. Higher distance between the countries in the MENA region leads to lower bilateral trade intensity.

Among dummy variables, common language is known to be significant by all models in which this variable is included. Countries which share a common language trade more with each other than those which do not share a common language. Common colony is statistically significant determinant of exports volume between the countries in the MENA region with a positive impact. Indeed, countries which have experienced a colonial link at any time, trade more than those which have not experienced a colonial link. However, the other dummy variable, common border is not statistically significant determinant of the volume of exports between the countries in the MENA region.

The augmented gravity model illustrates that, for the MENA region, convergence in variables such as interest rate, budget deficit, inflation, government debt, government expenditure, reserve position and GDP per capita is a weak determinant of economic integration.

Among Hecksher Ohlin variables, market size is highly significant determinant of exports volume between the countries in the MENA region. The larger the markets size of two countries the higher the bilateral trade between those countries. However, income similarity and relative difference of two countries in terms of factor endowment do not determine integration between the economies in the MENA region.

6.3 Conclusion on Eight Selected Countries from the MENA Region

This section has answered based on which criteria the third group of countries in our sample could be integrated together. The results of all models represented in this study confirm that the volume of exports between eight selected economies in the MENA region is consistence with the assumption of the gravity model based on two most basic and traditional gravity variables: economic size and distance. All models show that economic size is a highly significant determinant of integration between eight selected economies in the MENA region with a positive impact. However, distance is considered as a barrier of the bilateral trade between these economies in the MENA region with a high significant role.

Among dummy variables, common border and common colony are insignificant determinants of the volume of exports between the selected countries in the MENA region based on all models. However, common language is known significant determinant of the exports volume only by model of Egger (2002). This variable is insignificant by all other models in which this variable is included.

Convergence in interest rate, budget deficit, inflation, and government expenditure and reserve position do not determine integration in the selected countries from the MENA region. However, convergence in government debt is a highly statistical significant determinant of exports volume between the selected countries in the MENA region with the expected sign based on two models in which this variable is investigated.

Among Hecksher Ohlin variables, market size is highly significant determinant of the integration between countries in the selected counties from the MENA region. The larger the markets size of two countries the higher the volume of exports between those countries. Moreover, income similarity is known significant determinant of the volume of exports between countries in the selected counties from the MENA region with a positive impact by both model in which this variable is investigated. However, the relative difference of two countries in terms of factor endowment is lowly significant determinant of the exports volume between economies in the selected counties in the MENA region.

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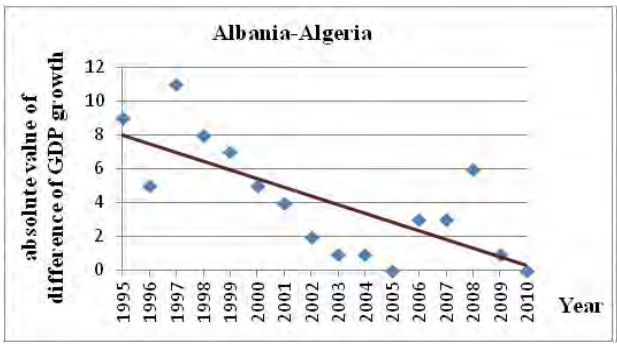
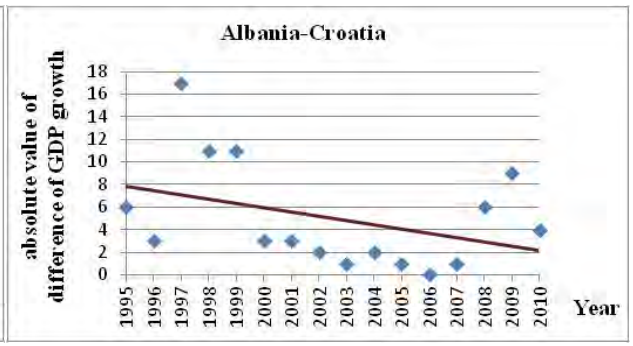
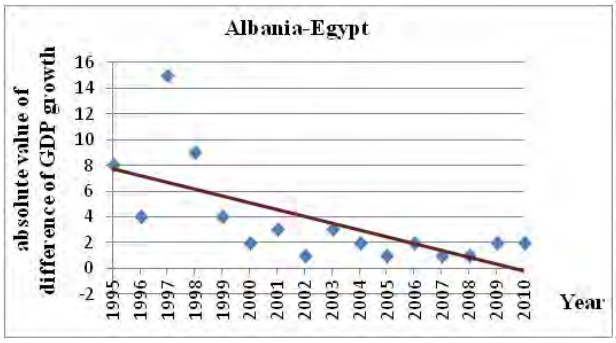
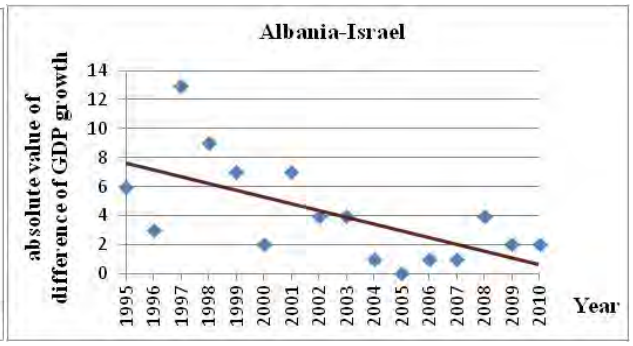
APPENDICES

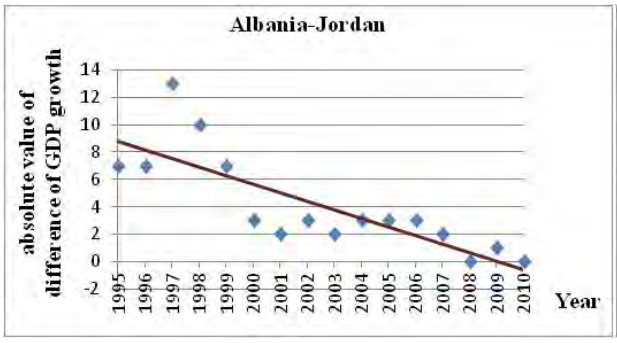
APPENDIX I: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF GDP GROWTH' OF ALL PAIRS

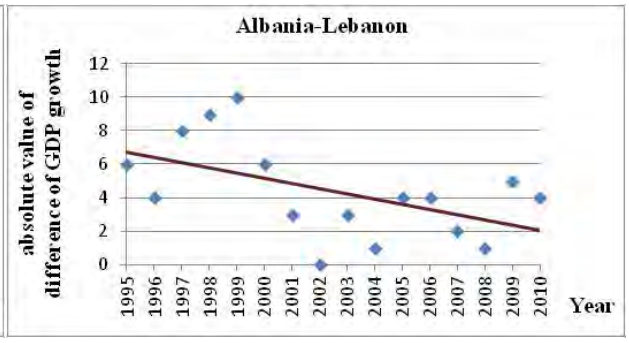


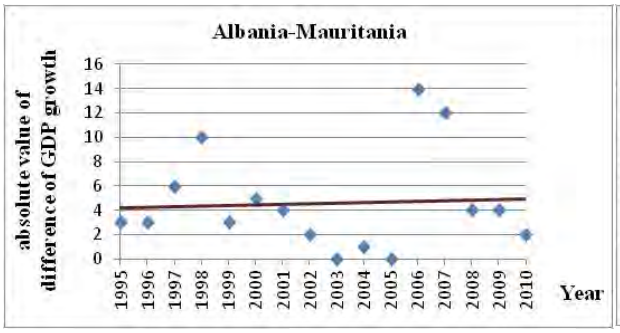


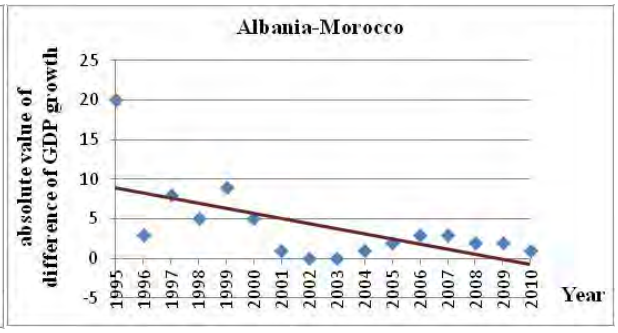


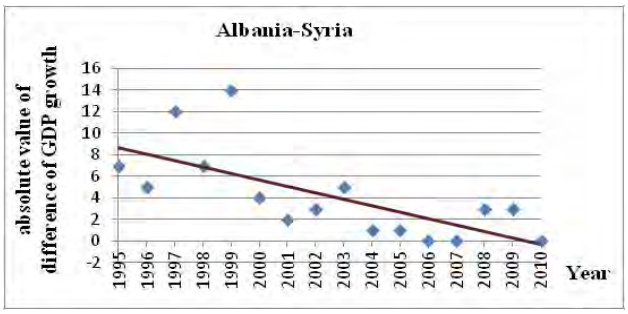


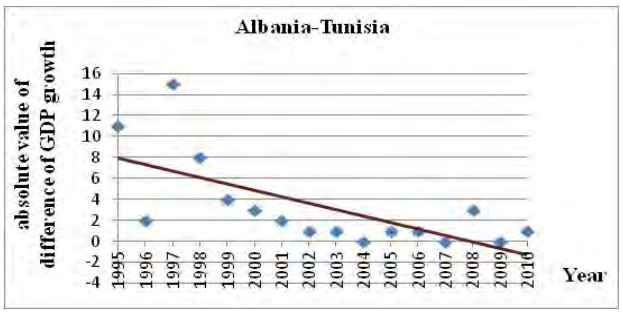





Albania-Mauritania
absolute value of difference of GDP growth
Year


Albania-Morocco
absolute value of difference of GDP growth
Year


Albania-Syria
absolute value of difference of GDP growth
Year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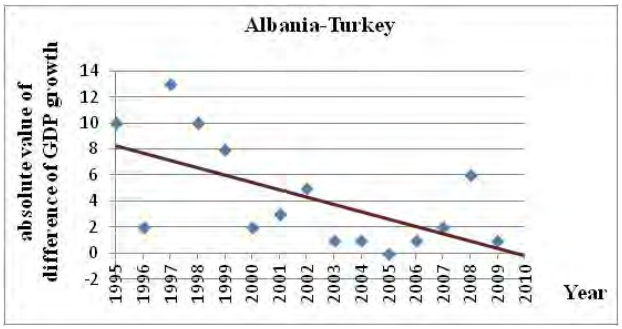
absolute value of difference of GDP growth
Year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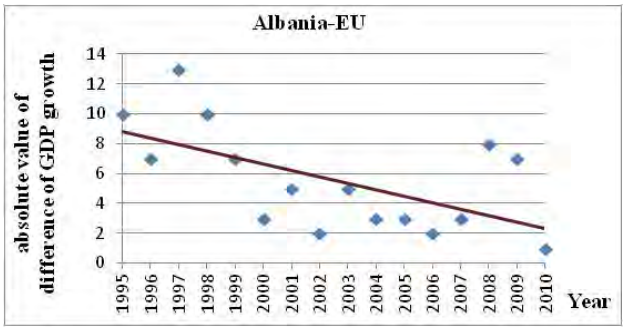
absolute value of difference of GDP growth
Year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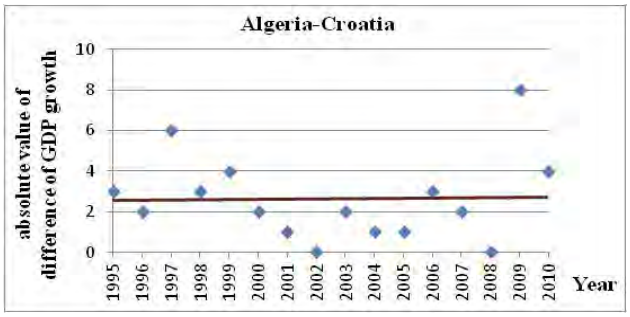
absolute value of difference of GDP growth
Year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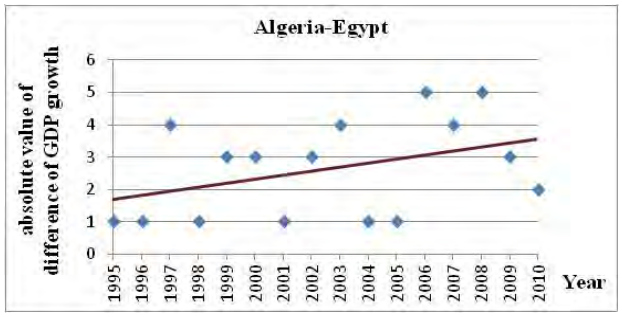
absolute value of difference of GDP growth
Year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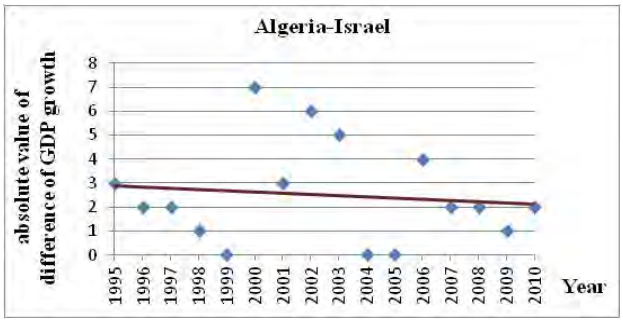
absolute value of difference of GDP growth
Year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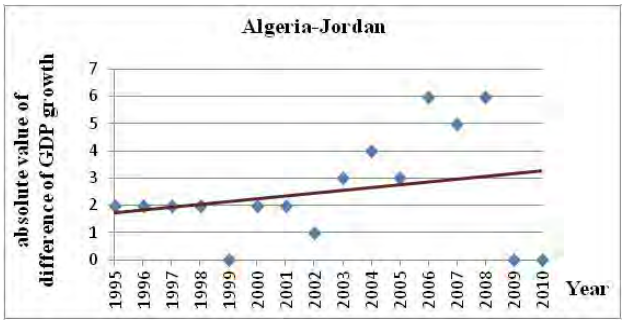
absolute value of difference of GDP growth
Year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absolute value of difference of GDP growth
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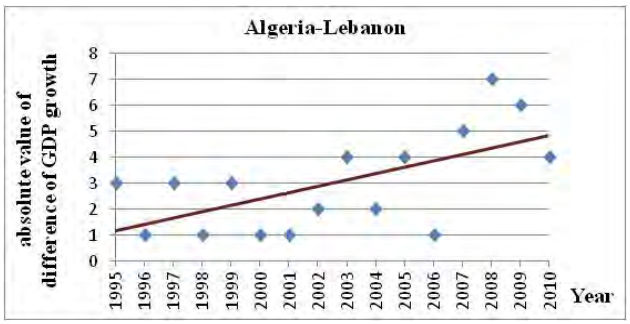
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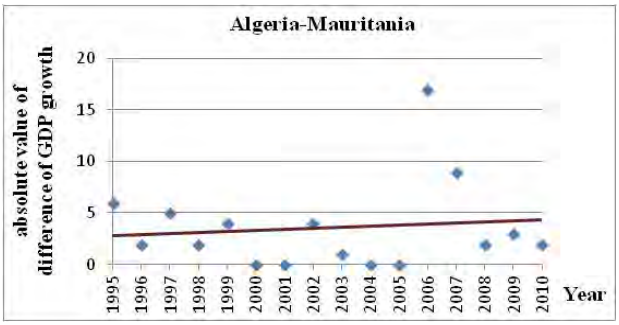
absolute value of difference of GDP growth
Year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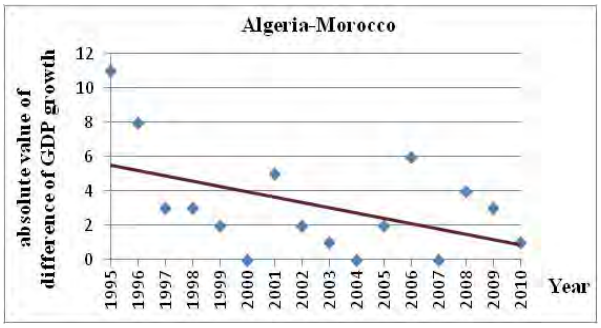
absolute value of difference of GDP growth
Year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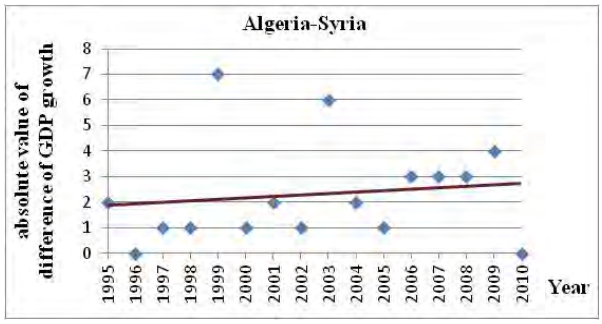
absolute value of difference of GDP growth
Year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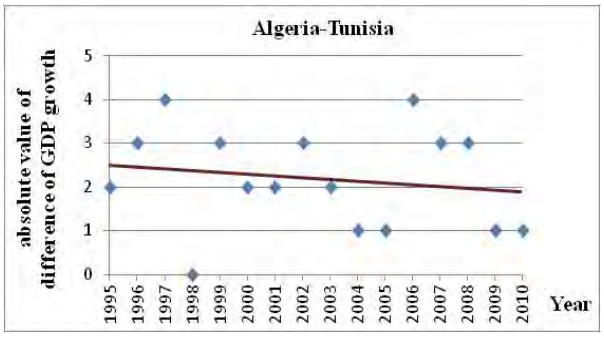
absolute value of difference of GDP growth
Year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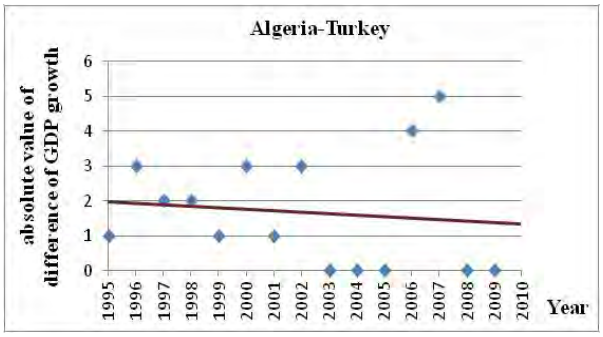
absolute value of difference of GDP growth
Year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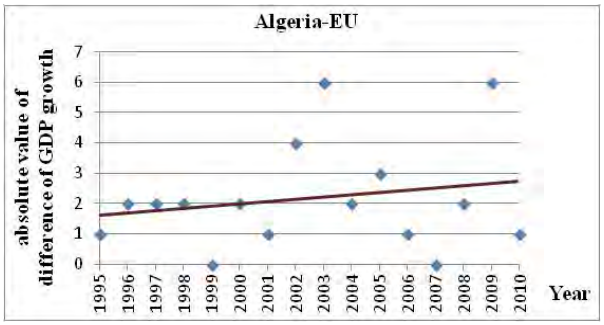
absolute value of difference of GDP growth
Year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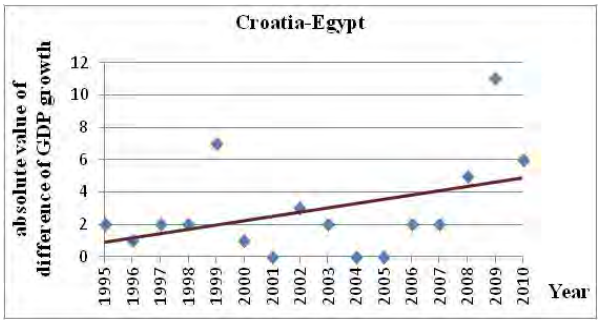
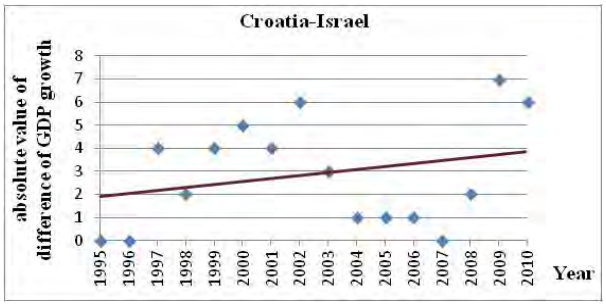
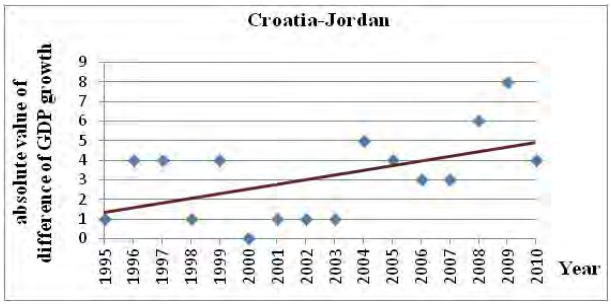
absolute value of difference of GDP growth
Year


Croatia-Egypt
absolute value of difference of GDP growth
Year


Croatia-Israel
absolute value of difference of GDP growth
Year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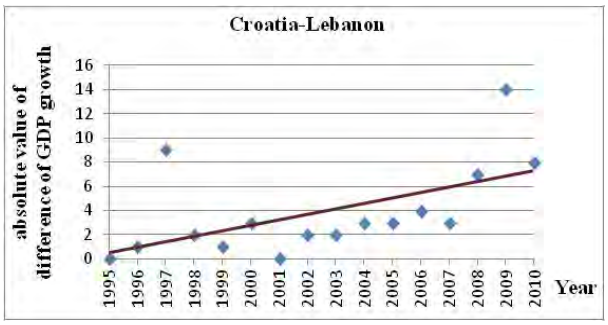
absolute value of difference of GDP growth
Year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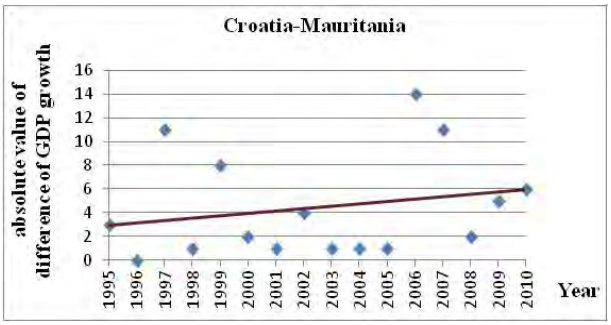
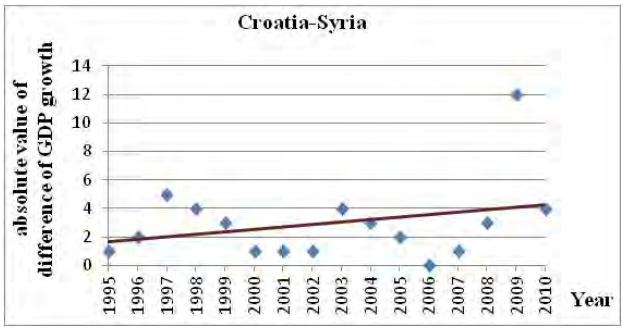
absolute value of difference of GDP growth
Year


Croatia-Mauritania
absolute value of difference of GDP growth
Year

Croatia-Morocco
absolute value of difference of GDP growth
Year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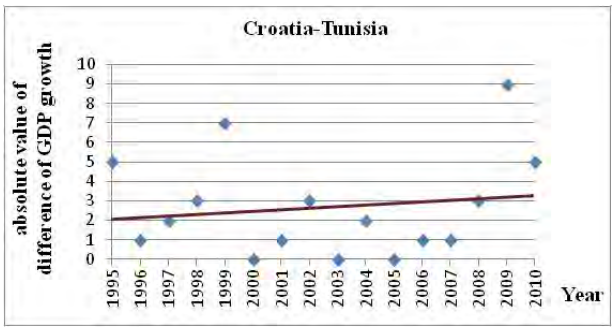
absolute value of difference of GDP growth
Year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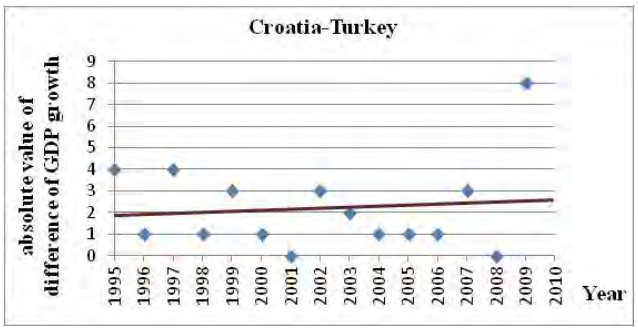
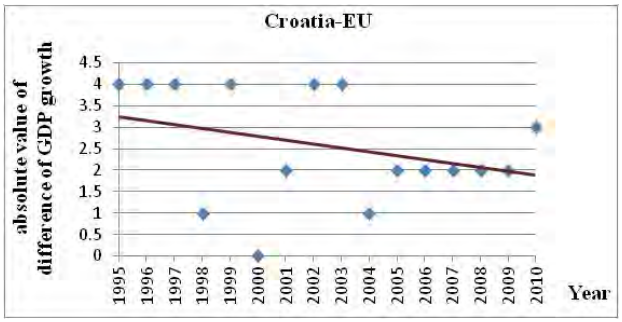
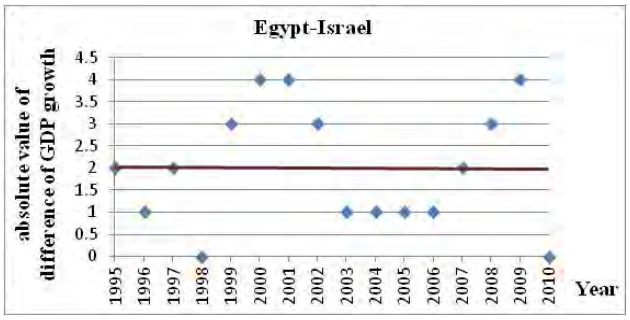
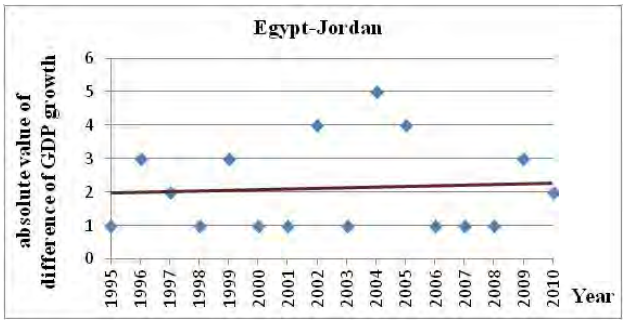
absolute value of difference of GDP growth
Year


Croatia-Turkey
absolute value of difference of GDP growth
Year


Croatia-EU
absolute value of difference of GDP growth
Year


Egypt-Israel
absolute value of difference of GDP growth
Year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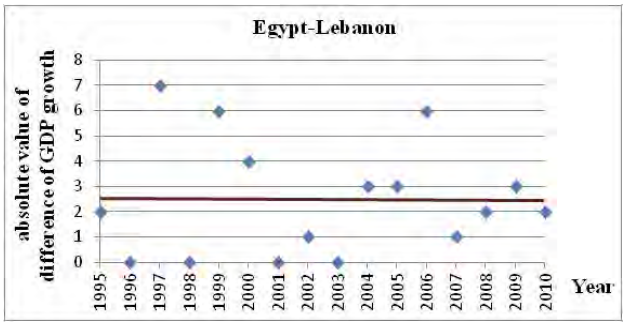
absolute value of difference of GDP growth
Year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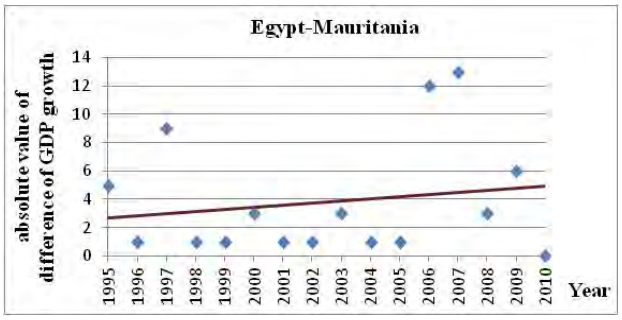
absolute value of difference of GDP growth
Year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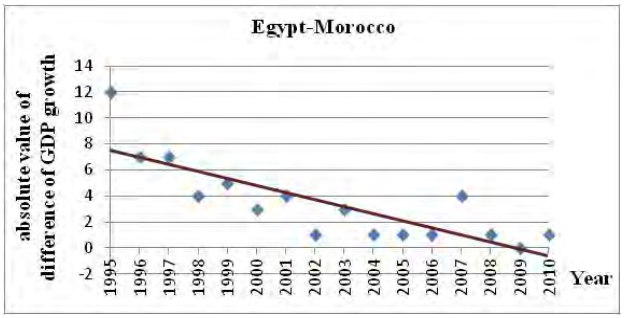
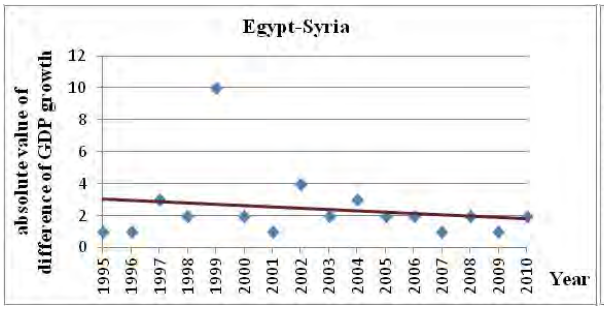
absolute value of difference of GDP growth
Year


Egypt-Morocco
absolute value of difference of GDP growth
Year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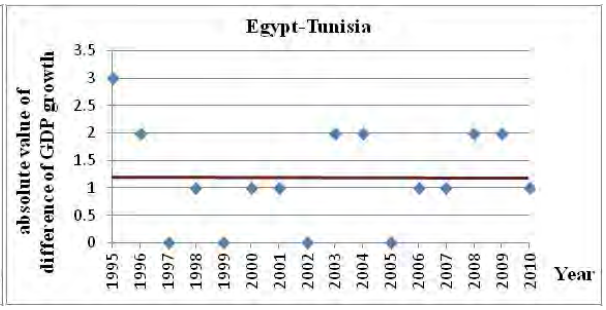
absolute value of difference of GDP growth
Year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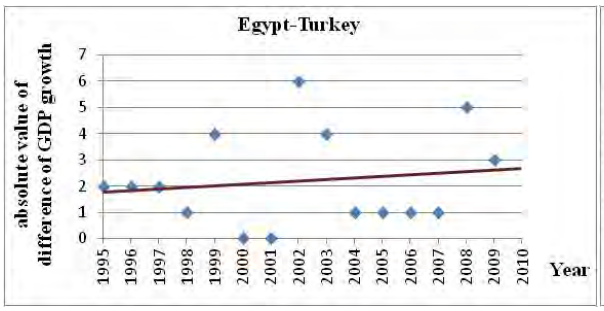
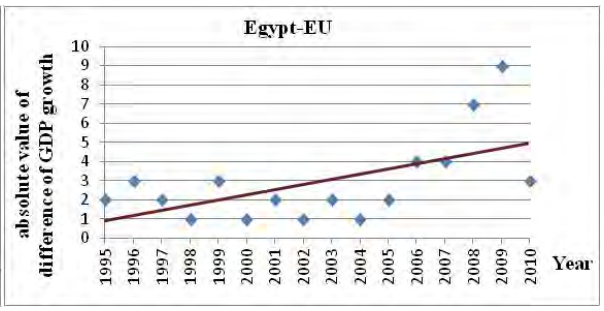
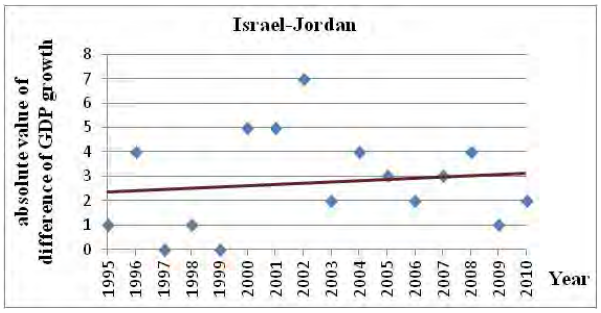
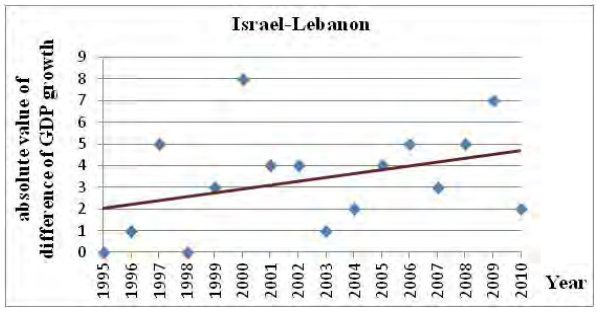
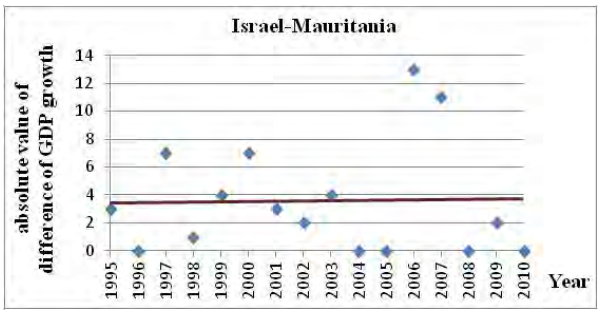
absolute value of difference of GDP growth
Year

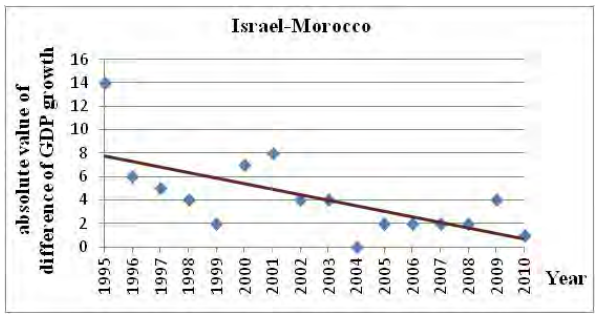

Egypt-Turkey
absolute value of difference of GDP growth
Year

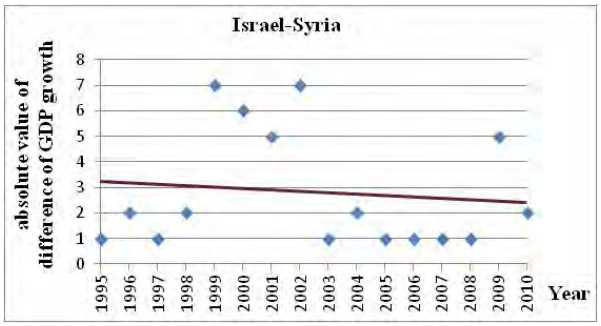

Egypt-EU
absolute value of difference of GDP growth
Year

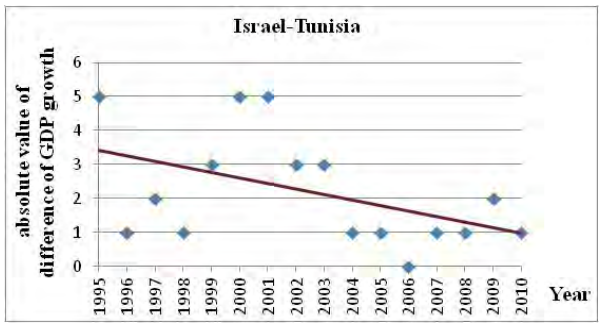

Israel-Jordan
absolute value of difference of GDP growth
Year

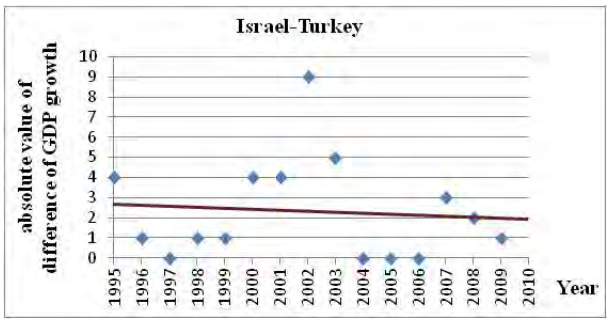

Israel-Lebanon
absolute value of difference of GDP growth
Year

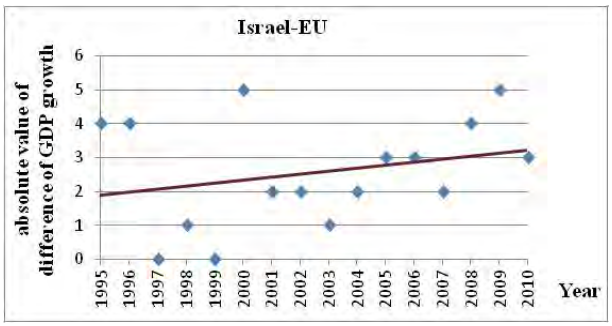

Israel-Mauritania
absolute value of difference of GDP growth
Year

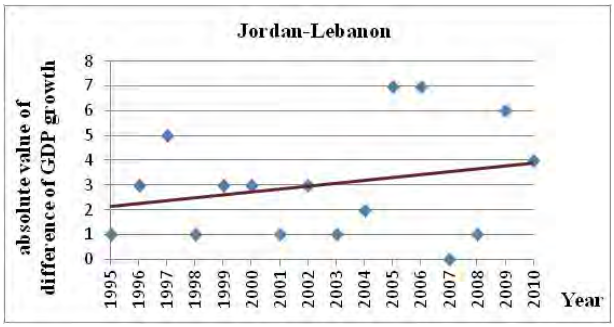

Israel-Morocco
absolute value of difference of GDP growth
Year

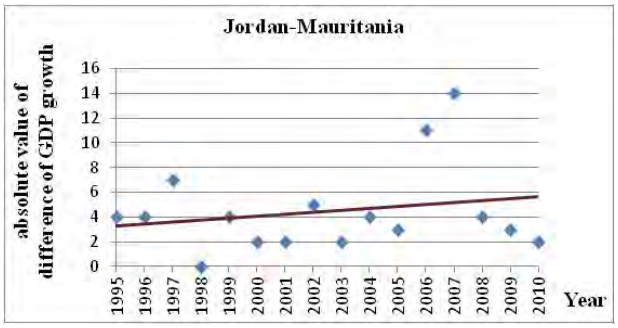

Israel-Syria
absolute value of difference of GDP growth
Year


Israel-Tunisia
absolute value of difference of GDP growth
Year


Israel-Turkey
absolute value of difference of GDP growth
Year


Israel-EU
absolute value of difference of GDP growth
Year


Jordan-Lebanon
absolute value of difference of GDP growth
Year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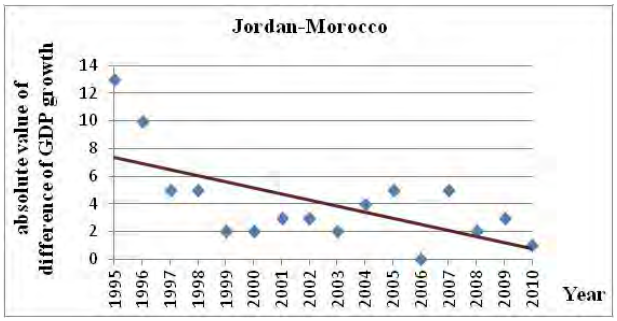
absolute value of difference of GDP growth
Year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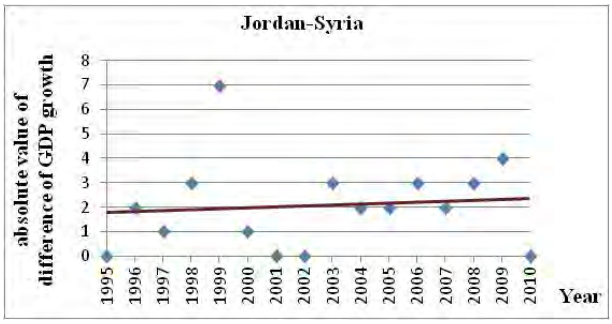
absolute value of difference of GDP growth
Year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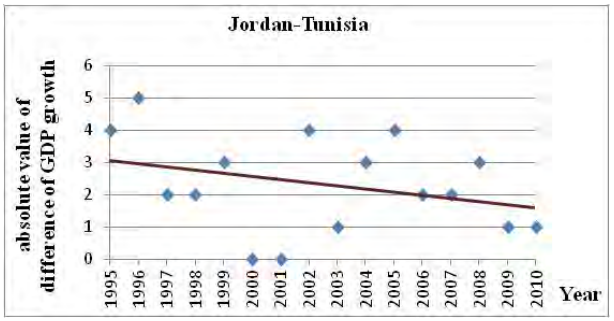
absolute value of difference of GDP growth
Year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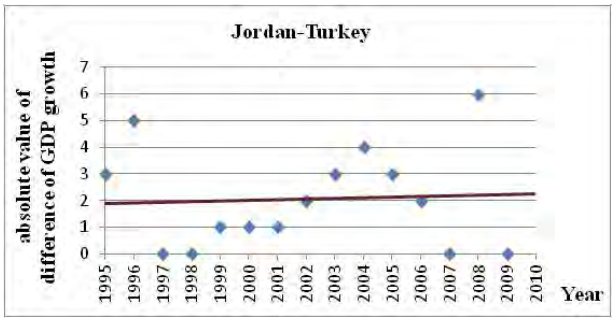
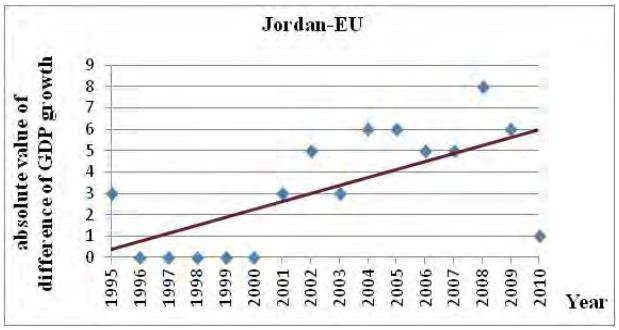
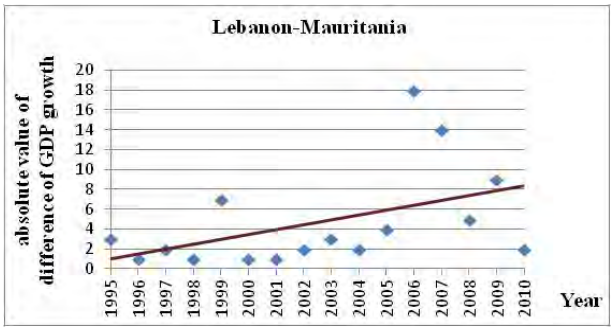
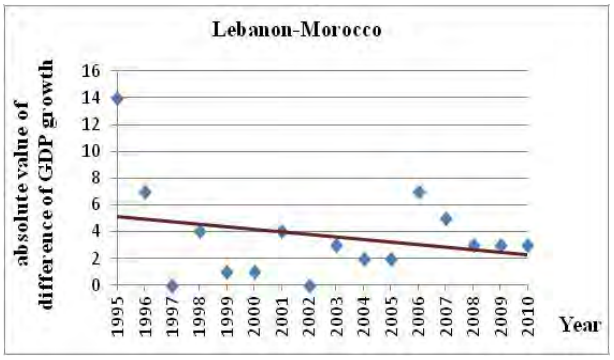
absolute value of difference of GDP growth
Year


Jordan-Turkey
absolute value of difference of GDP growth
Year


Jordan-EU
absolute value of difference of GDP growth
Year


Lebanon-Mauritania
absolute value of difference of GDP growth
Year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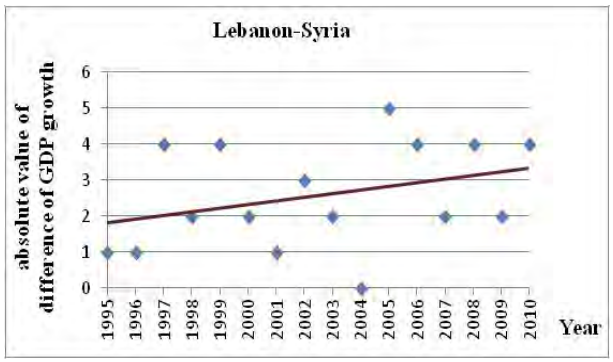
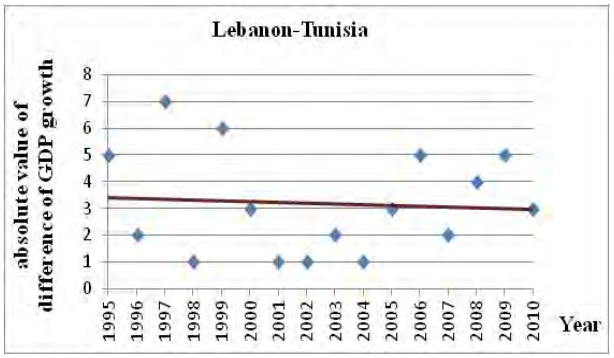
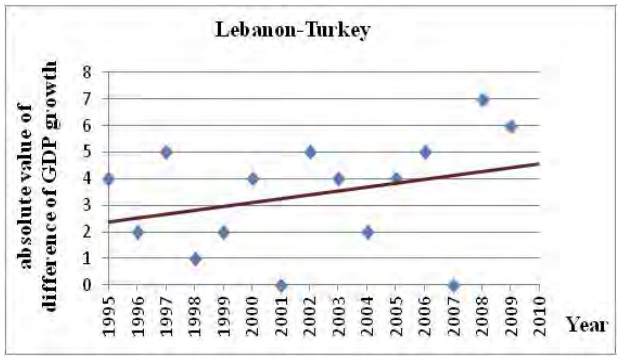
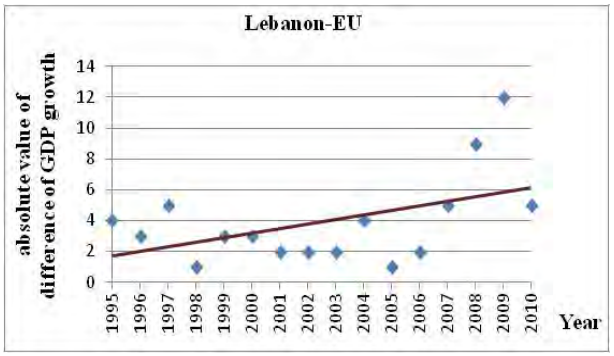
absolute value of difference of GDP growth
Year

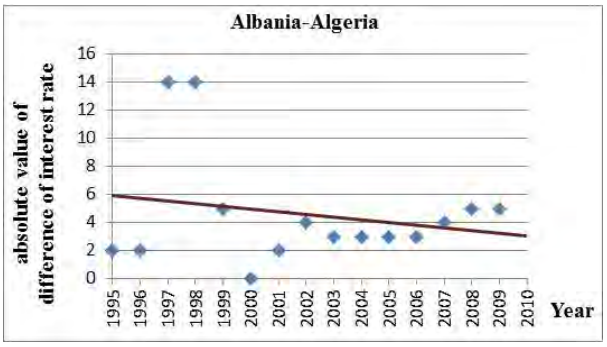

Lebanon-Syria
absolute value of difference of GDP growth
Year

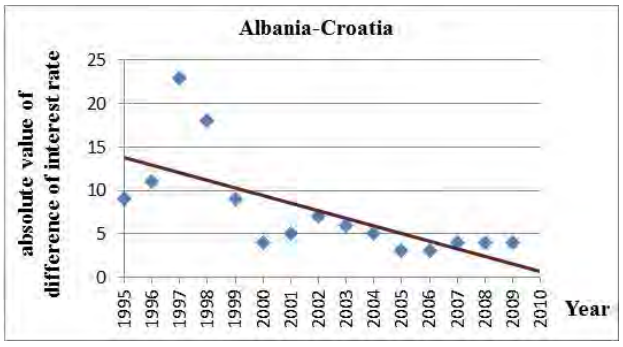

Lebanon-Tunisia
absolute value of difference of GDP growth
Year

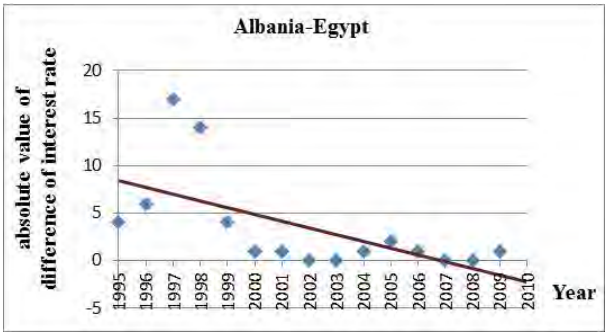

Lebanon-Turkey
absolute value of difference of GDP growth
Year

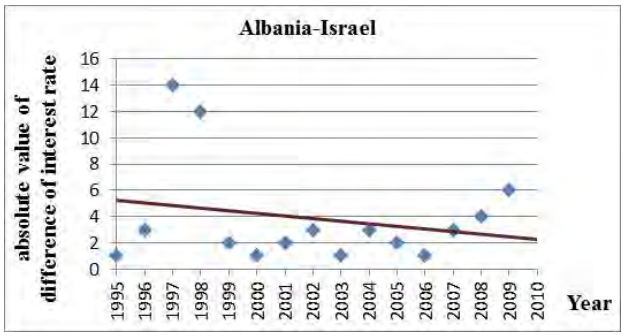

Lebanon-EU
absolute value of difference of GDP growth
Year

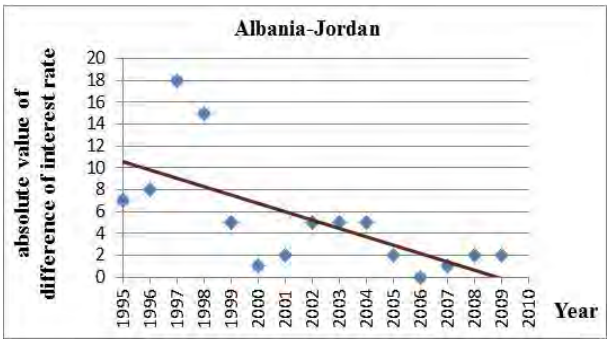
APPENDIX II: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF INTEREST RATE' OF ALL PAIRS

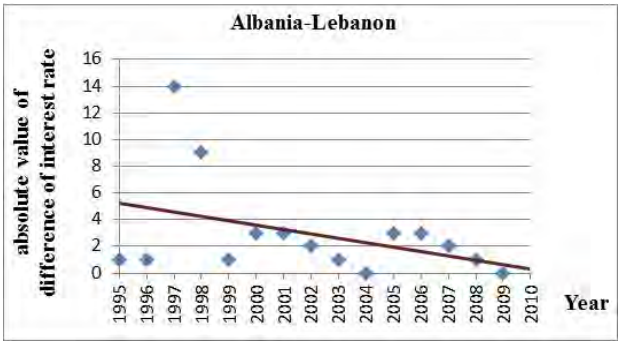


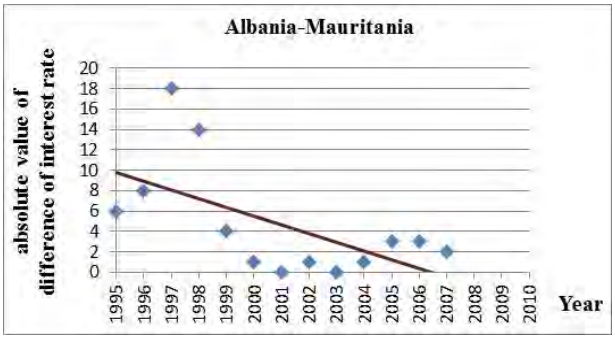


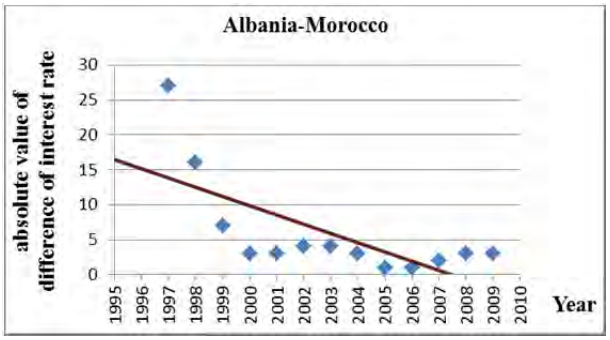


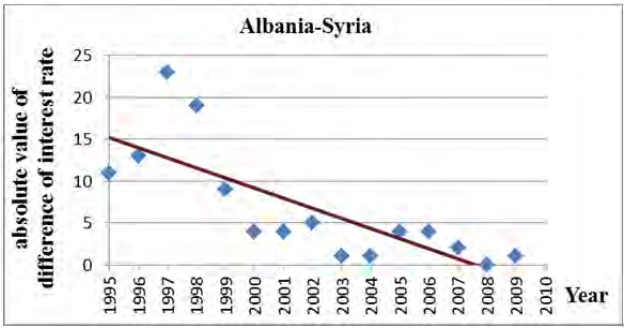


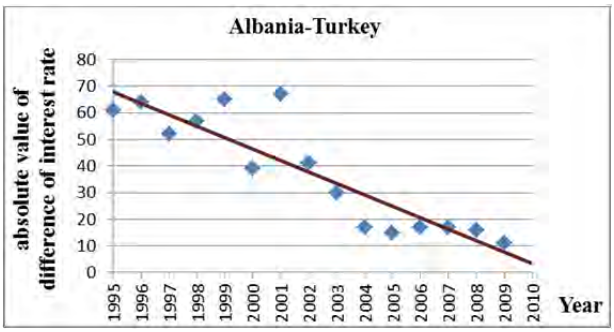


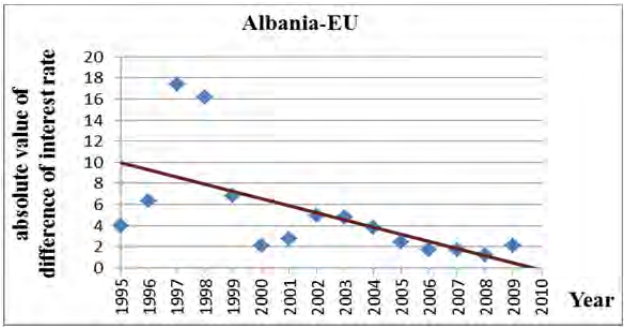


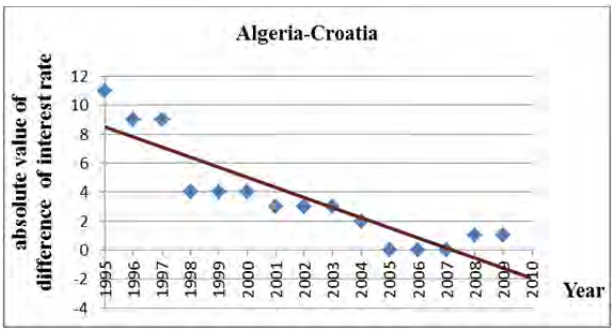


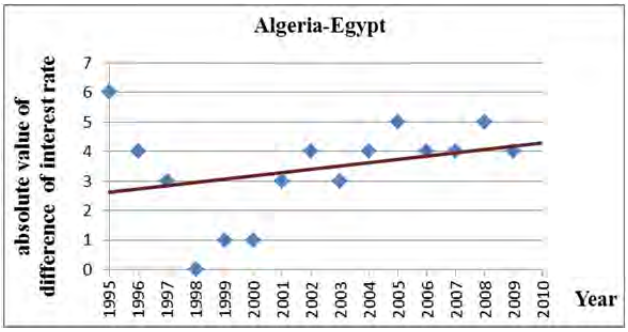


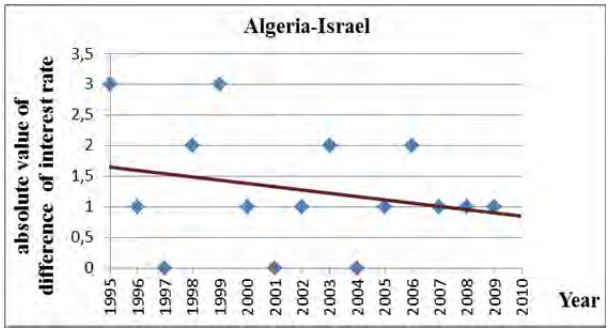

Albania-Syria
absolute value of difference of interest rate
Year

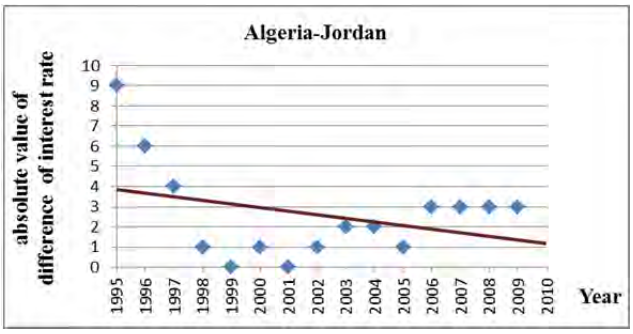

Albania-Turkey
absolute value of difference of interest rate
Year

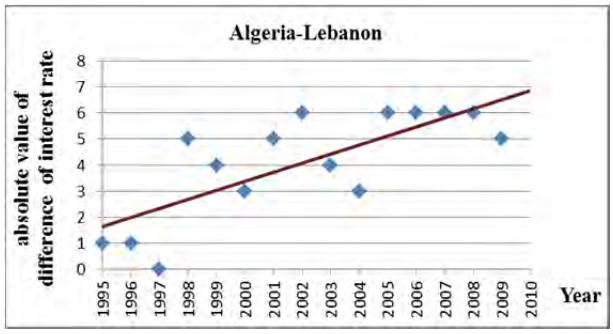

Albania-EU
absolute value of difference of interest rate
Year

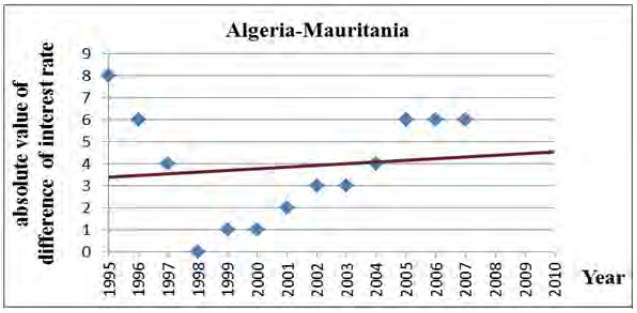

Algeria-Croatia
absolute value of difference of interest rate
Year

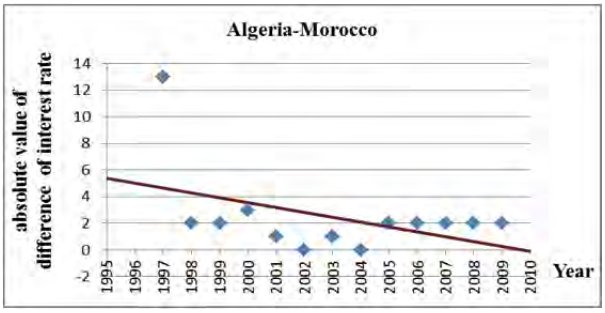

Algeria-Egypt
absolute value of difference of interest rate
Year

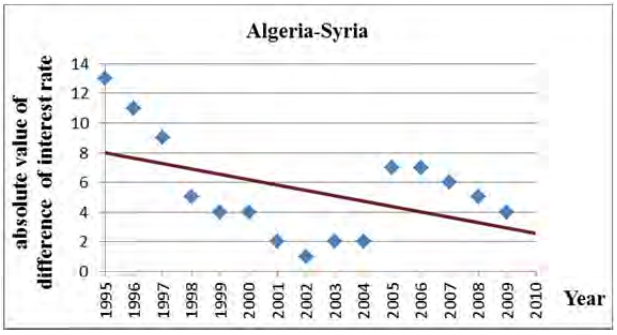

Algeria-Israel
absolute value of difference of interest rate
Year

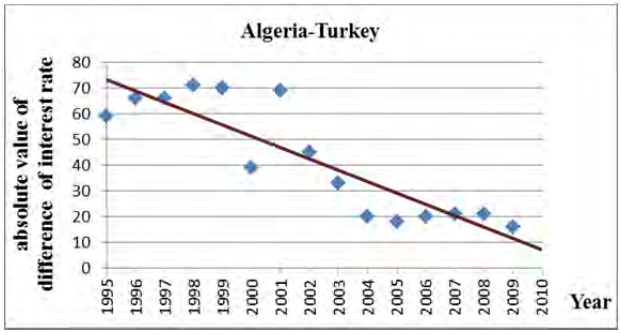

Algeria-Jordan
absolute value of difference of interest rate
Year

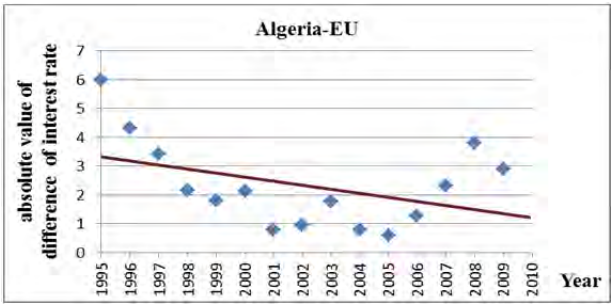

Algeria-Lebanon
absolute value of difference of interest rate
Year

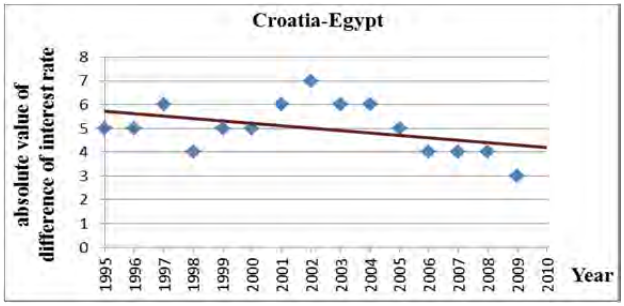

Algeria-Mauritania
absolute value of difference of interest rate
Year

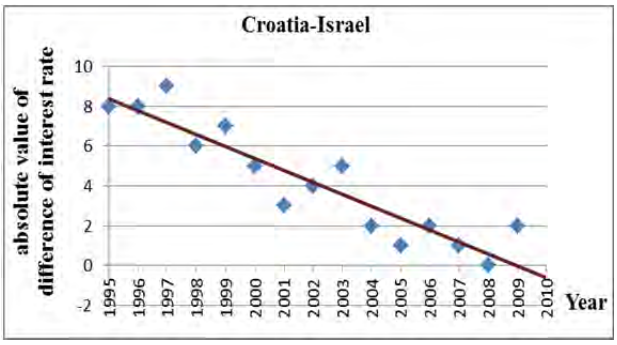

Algeria-Morocco
absolute value of difference of interest rate
Year

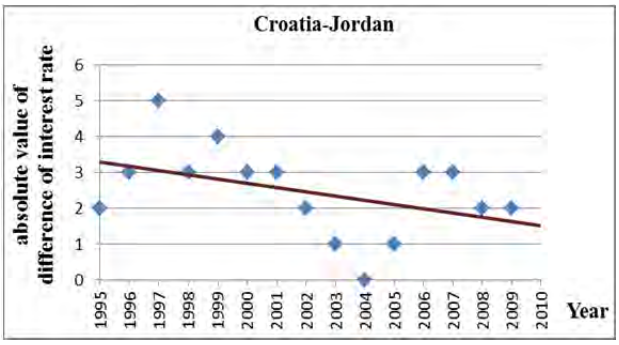

Algeria-Syria
absolute value of difference of interest rate
Year

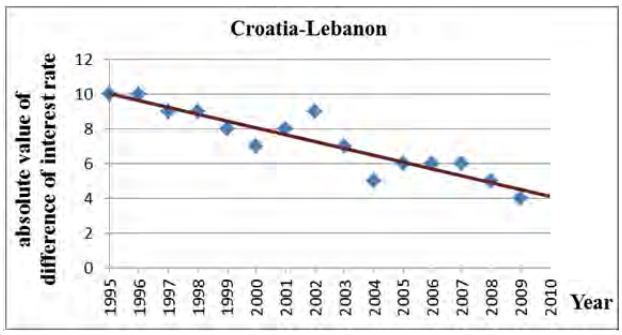

Algeria-Turkey
absolute value of difference of interest rate
Year

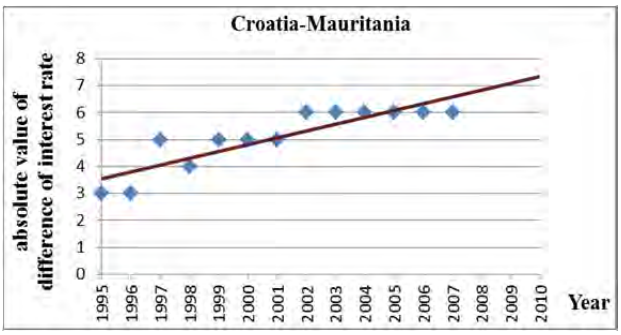

Algeria-EU
absolute value of difference of interest rate
Year

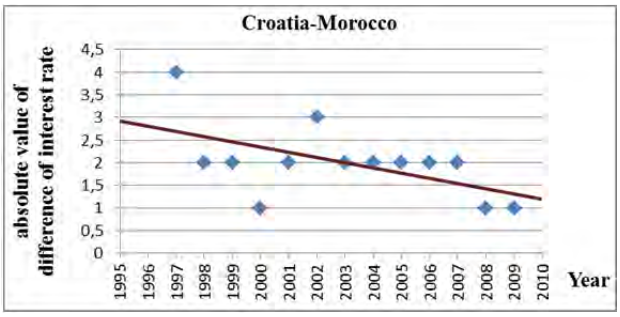

Croatia-Egypt
absolute value of difference of interest rate
Year

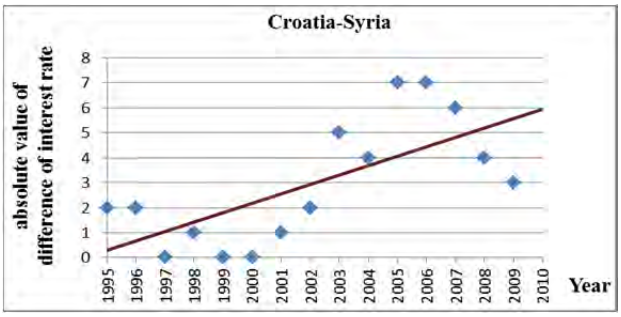

Croatia-Israel
absolute value of difference of interest rate
Year

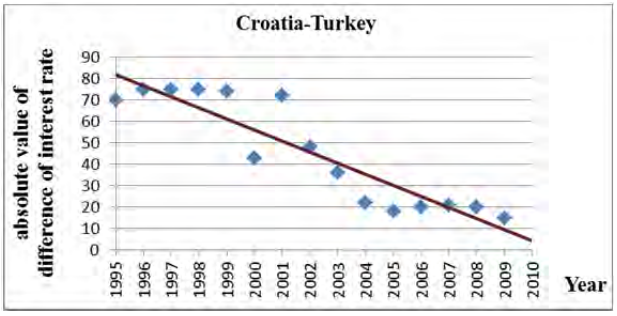

Croatia-Jordan
absolute value of difference of interest rate
Year

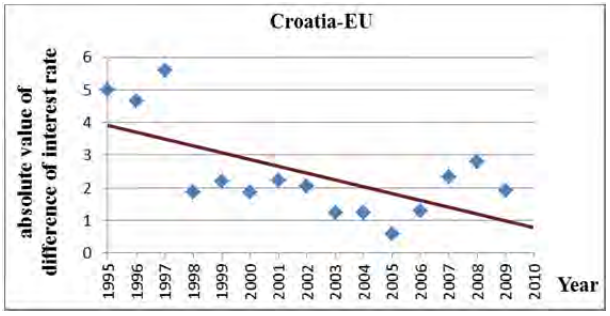

Croatia-Lebanon
absolute value of difference of interest rate
Year

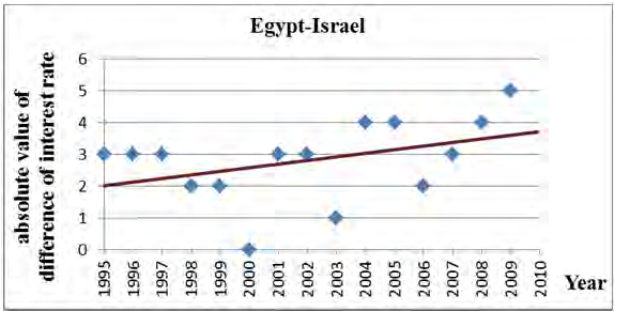

Croatia-Mauritania
absolute value of difference of interest rate
Year

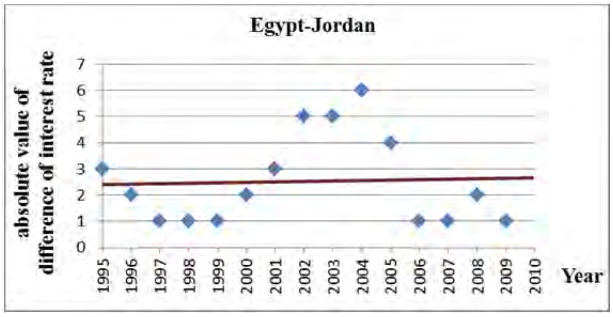

Croatia-Morocco
absolute value of difference of interest rate
Year

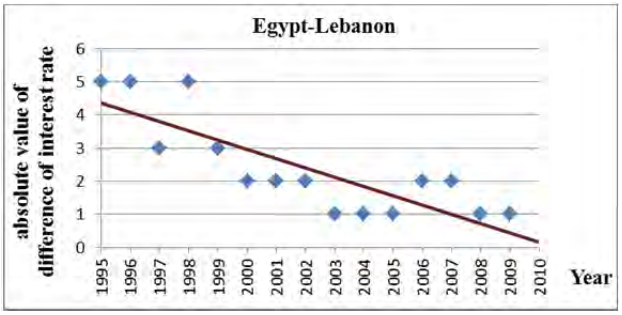

Croatia-Syria
absolute value of difference of interest rate
Year

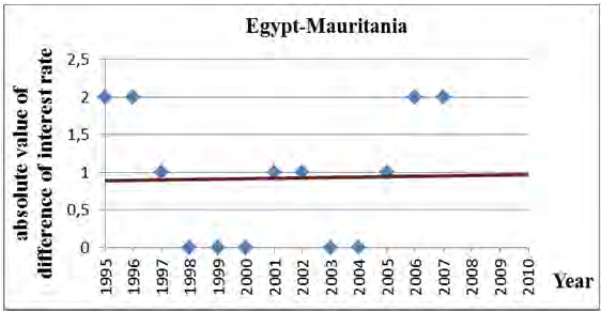

Croatia-Turkey
absolute value of difference of interest rate
Year

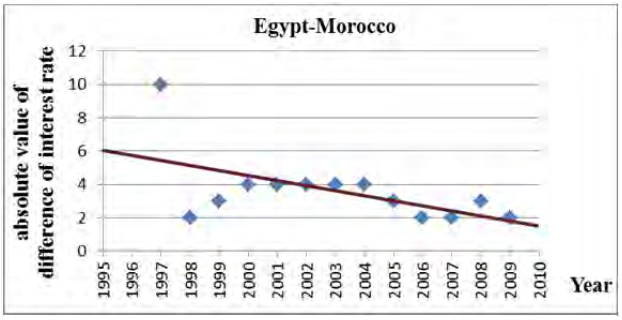

Croatia-EU
absolute value of difference of interest rate
Year

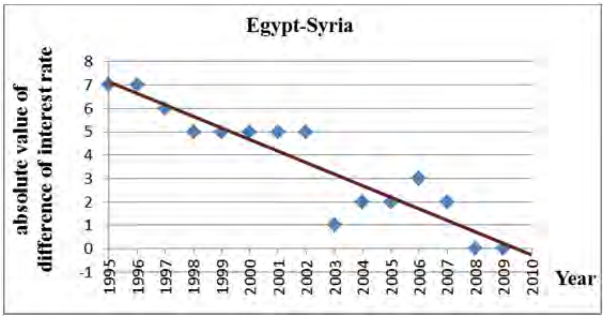

Egypt-Israel
absolute value of difference of interest rate
Year

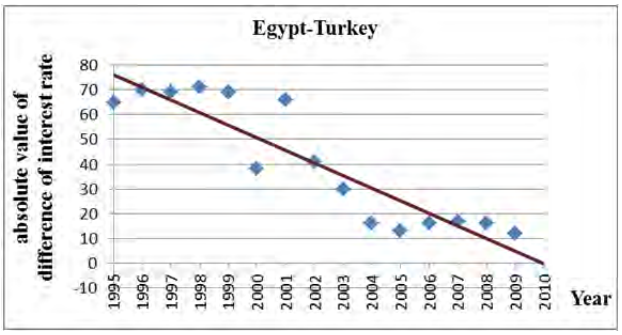

Egypt-Jordan
absolute value of difference of interest rate
Year

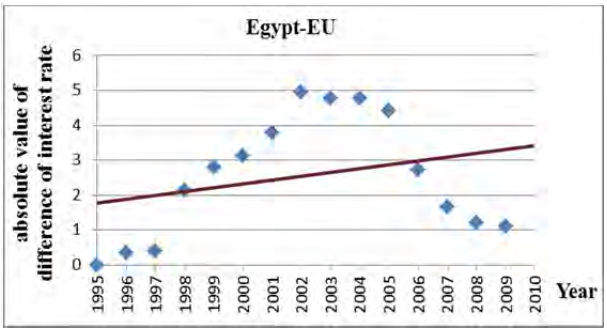

Egypt-Lebanon
absolute value of difference of interest rate
Year

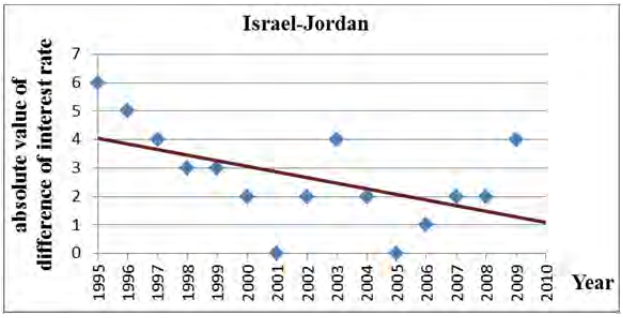

Egypt-Mauritania
absolute value of difference of interest rate
Year

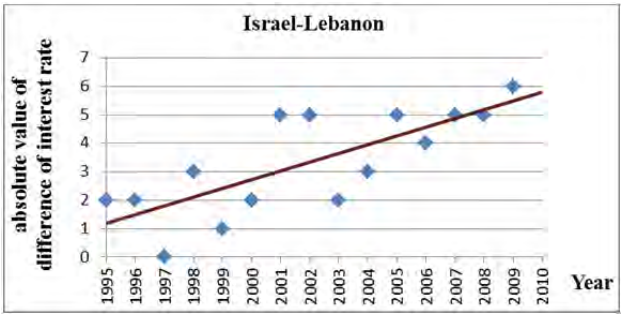

Egypt-Morocco
absolute value of difference of interest rate
Year

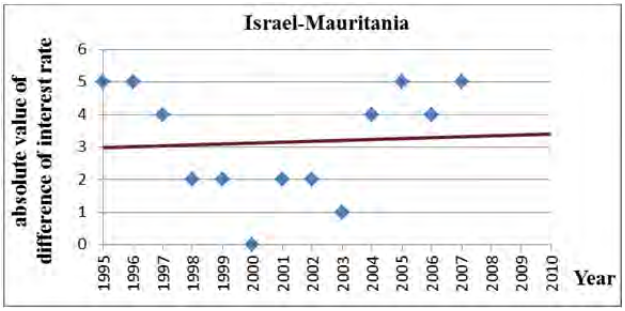

Egypt-Syria
absolute value of difference of interest rate
Year

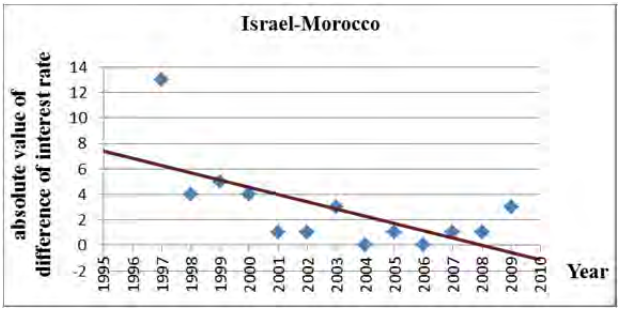

Egypt-Turkey
absolute value of difference of interest rate
Year

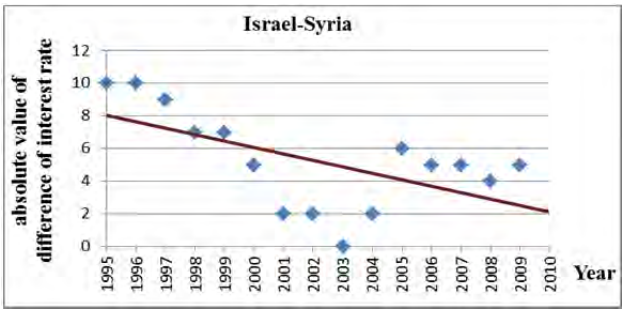

Egypt-EU
absolute value of difference of interest rate
Year

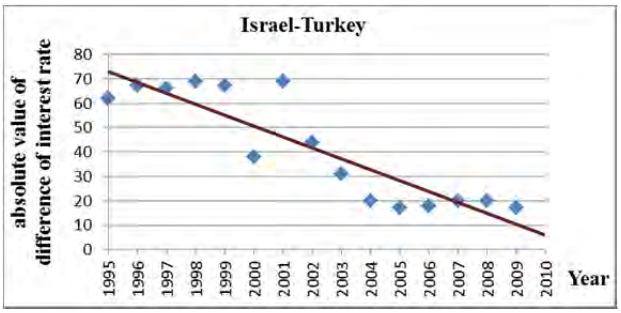

Israel-Jordan
absolute value of difference of interest rate
Year

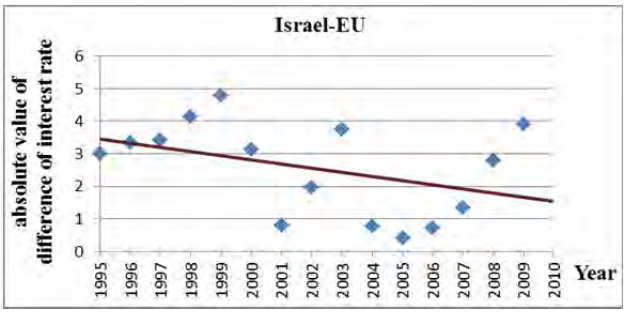

Israel-Lebanon
absolute value of difference of interest rate
Year

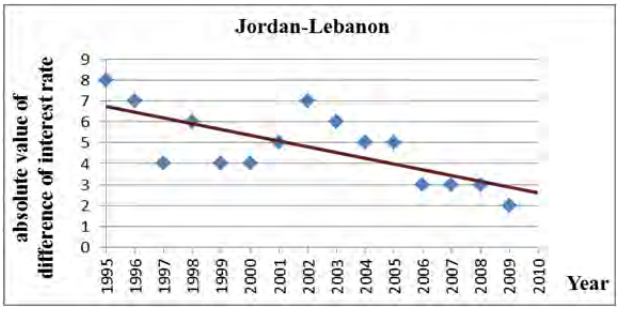

Israel-Mauritania
absolute value of difference of interest rate
Year

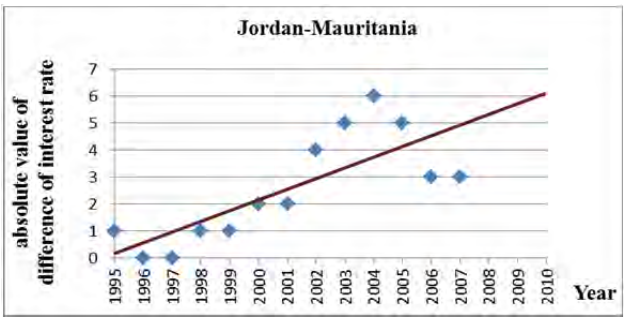

Israel-Morocco
absolute value of difference of interest rate
Year

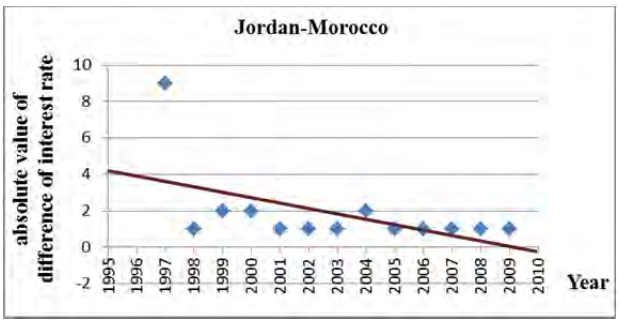

Israel-Syria
absolute value of difference of interest rate
Year

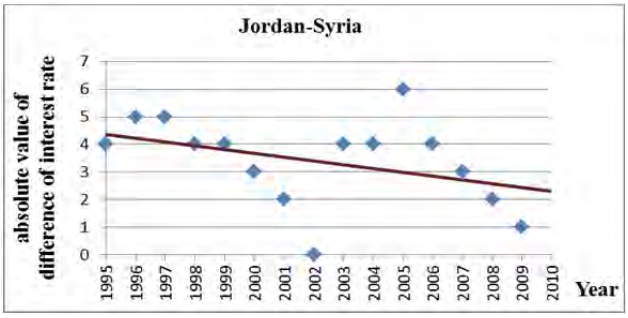

Israel-Turkey
absolute value of difference of interest rate
Year

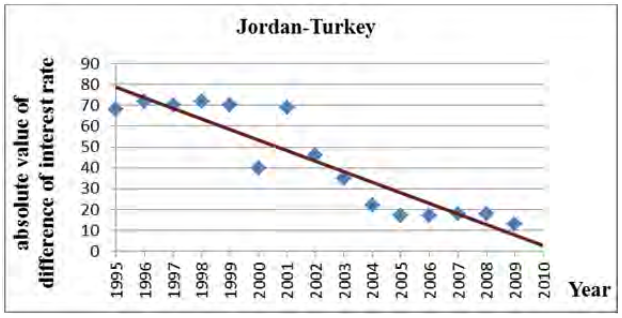

Israel-EU
absolute value of difference of interest rate
Year

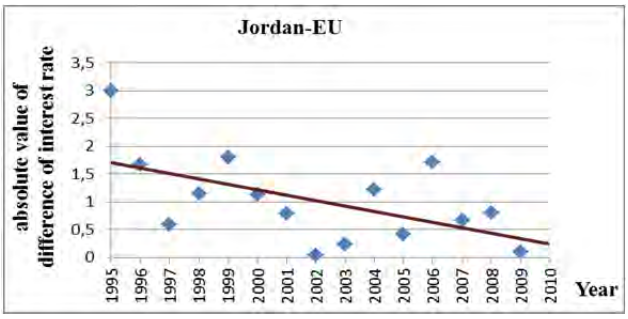

Jordan-Lebanon
absolute value of difference of interest rate
Year

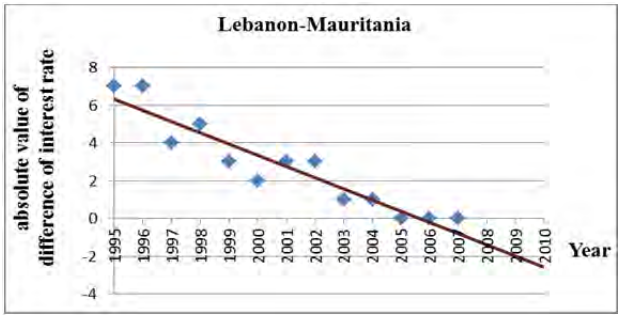

Jordan-Mauritania
absolute value of difference of interest rate
Year

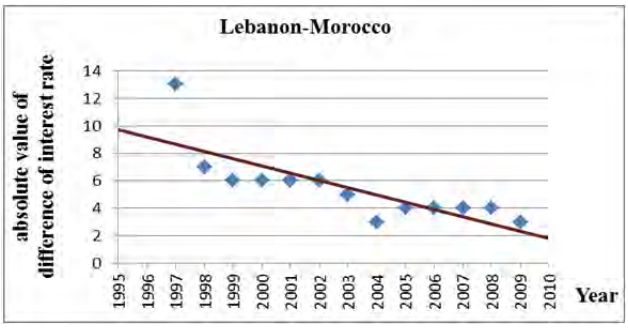

Jordan-Morocco
absolute value of difference of interest rate
Year

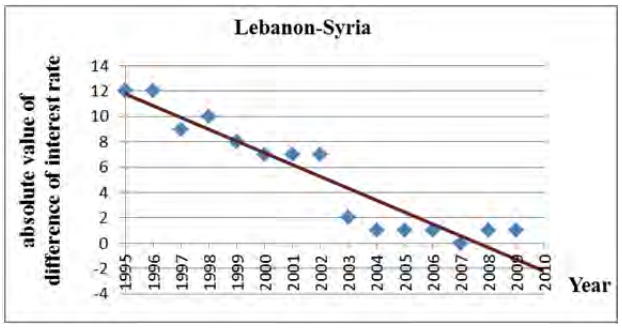

Jordan-Syria
absolute value of difference of interest rate
Year

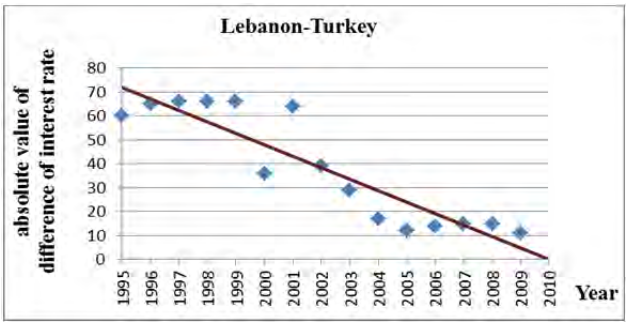

Jordan-Turkey
absolute value of difference of interest rate
Year

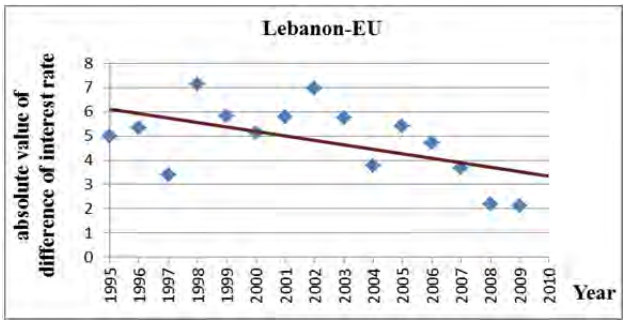

Jordan-EU
absolute value of difference of interest rate
Year

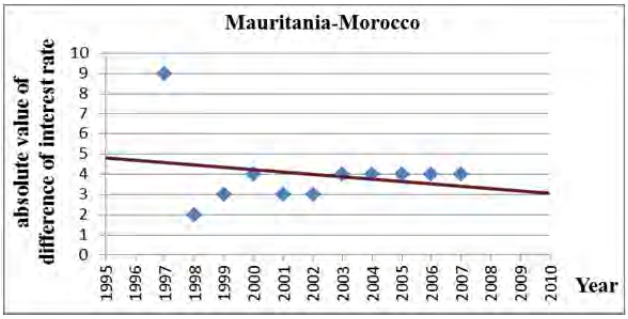

Lebanon-Mauritania
absolute value of difference of interest rate
Year

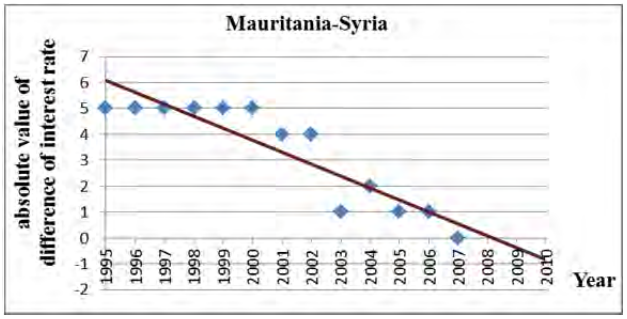

Lebanon-Morocco
absolute value of difference of interest rate
Year

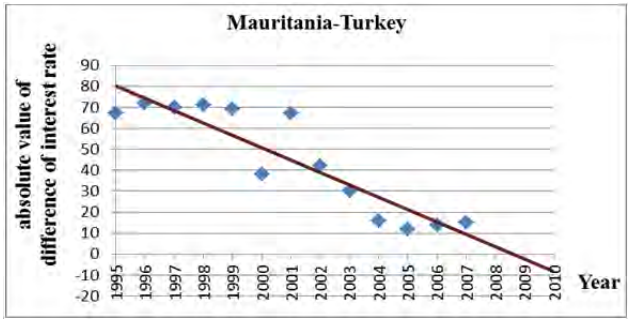

Lebanon-Syria
absolute value of difference of interest rate
Year

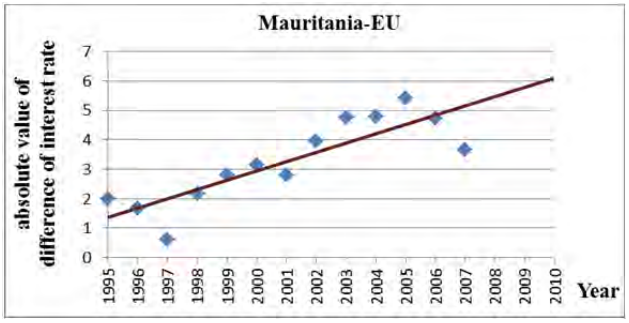

Lebanon-Turkey
absolute value of difference of interest rate
Year

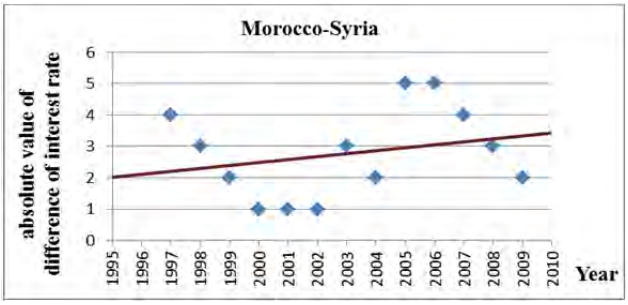

Lebanon-EU
absolute value of difference of interest rate
Year

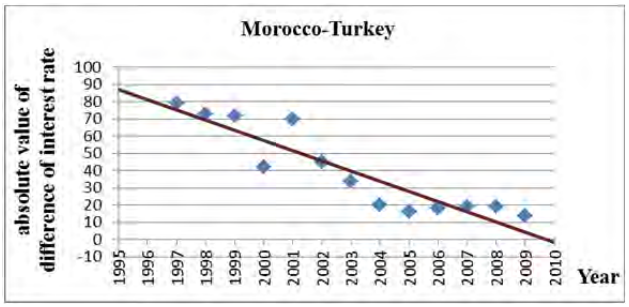

Mauritania-Morocco
absolute value of difference of interest rate
Year

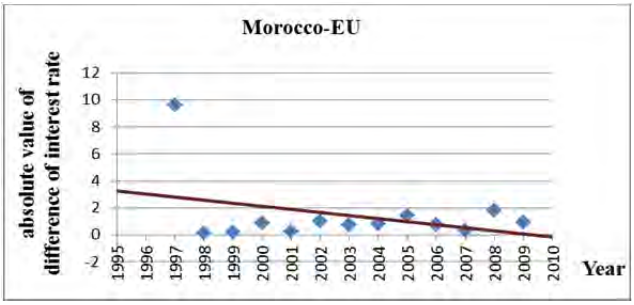

Mauritania-Syria
absolute value of difference of interest rate
Year

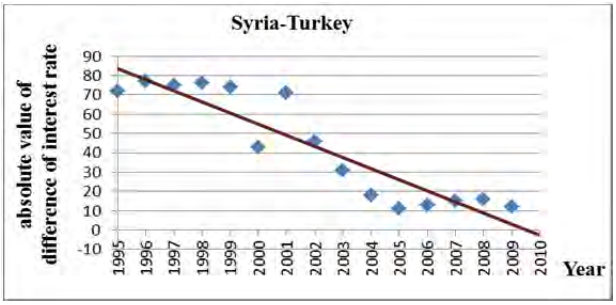

Mauritania-Turkey
absolute value of difference of interest rate
Year

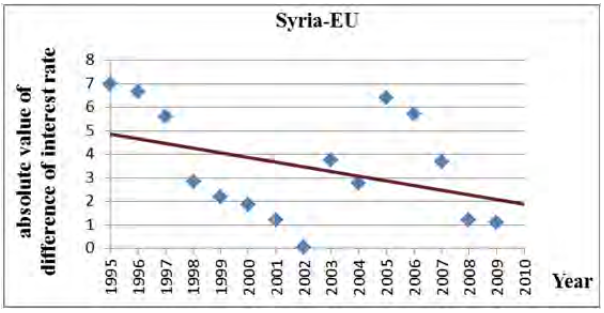

Mauritania-EU
absolute value of difference of interest rate
Year

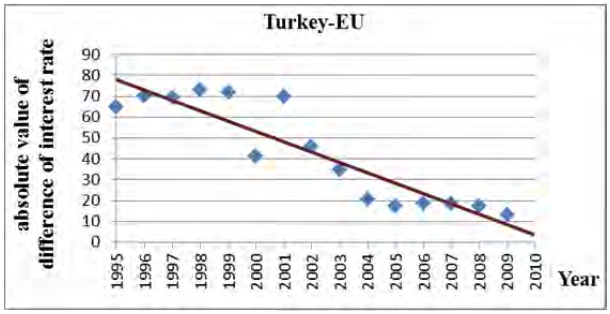

Morocco-Syria
absolute value of difference of interest rate
Year


Morocco-Turkey
absolute value of difference of interest rate
Year

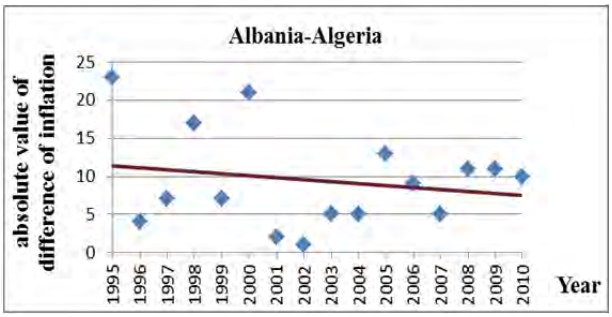

Morocco-EU
absolute value of difference of interest rate
Year

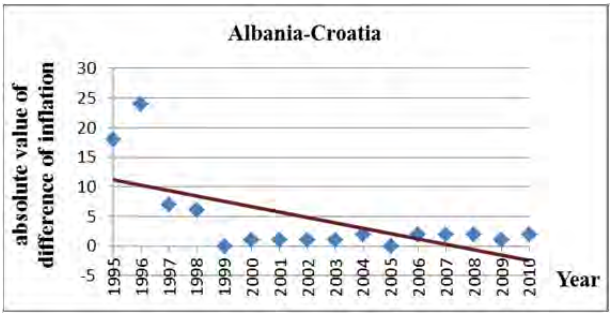

Syria-Turkey
absolute value of difference of interest rate
Year

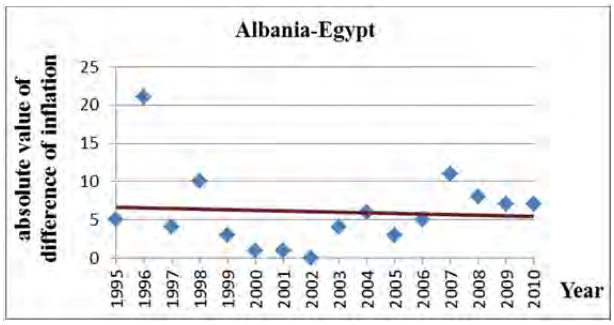

Syria-EU
absolute value of difference of interest rate
Year

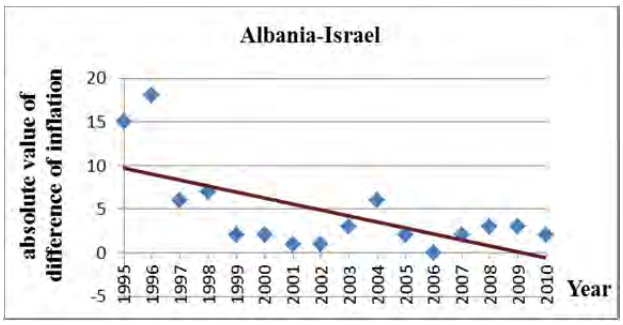

Turkey-EU
absolute value of difference of interest rate
Year

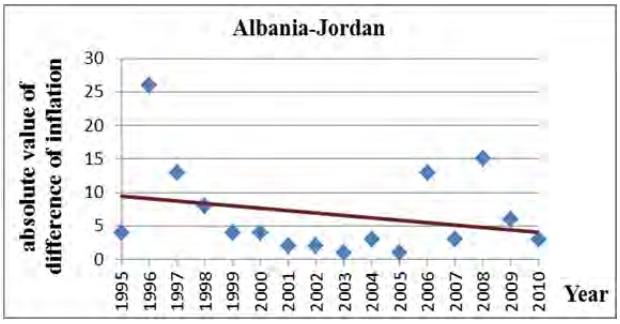
APPENDIX III: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF INFLATION' OF ALL PAIRS

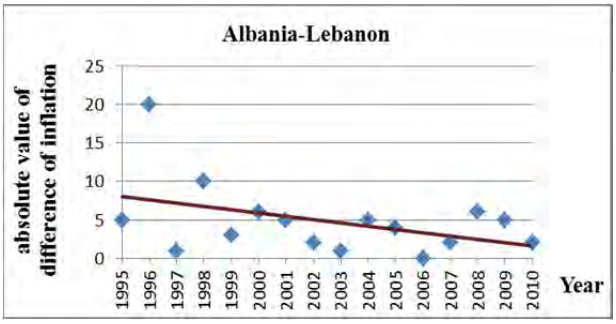


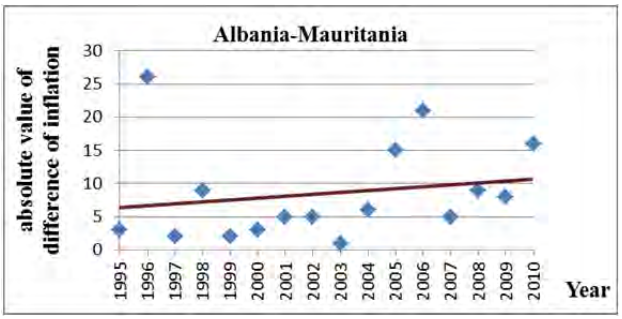


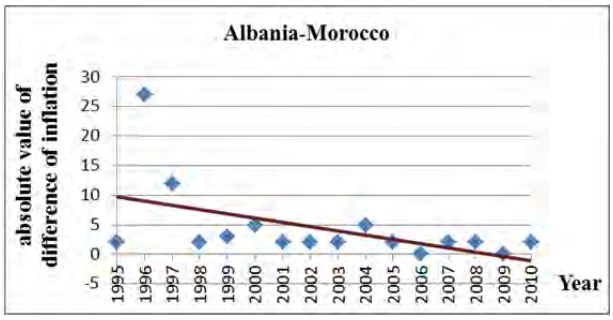


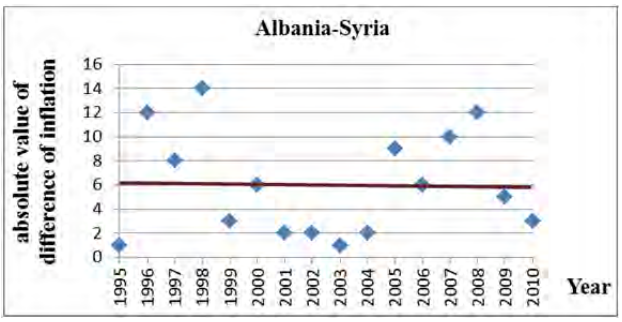


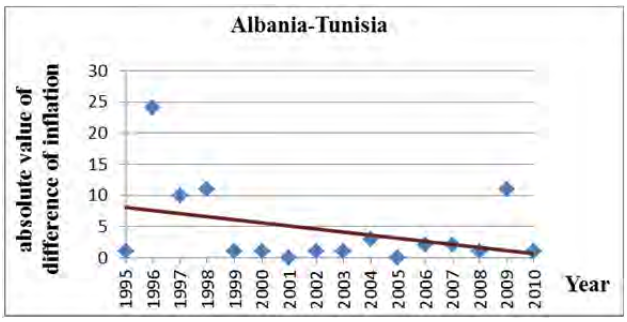


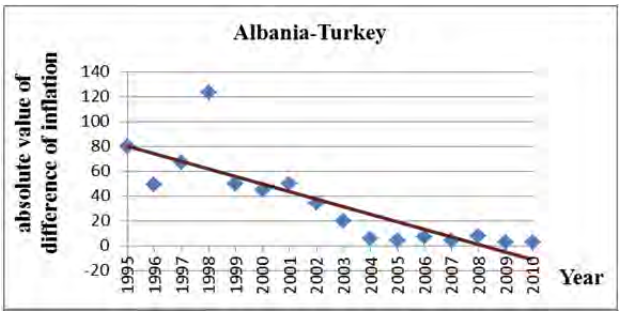


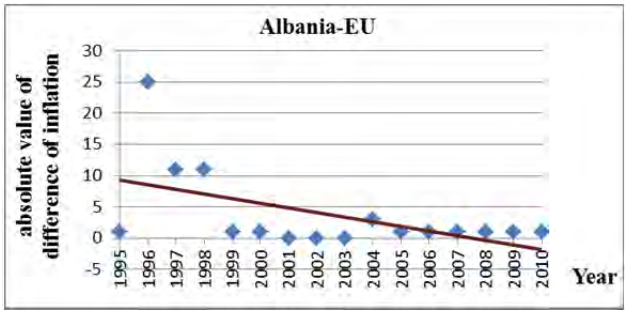


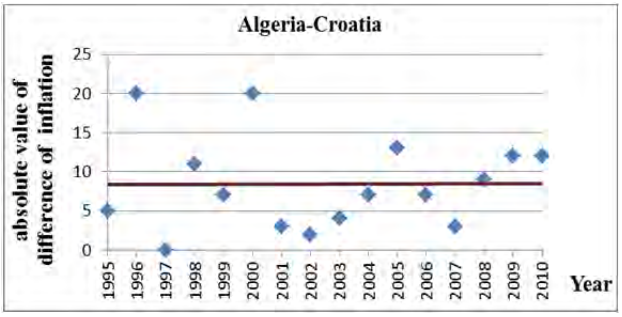


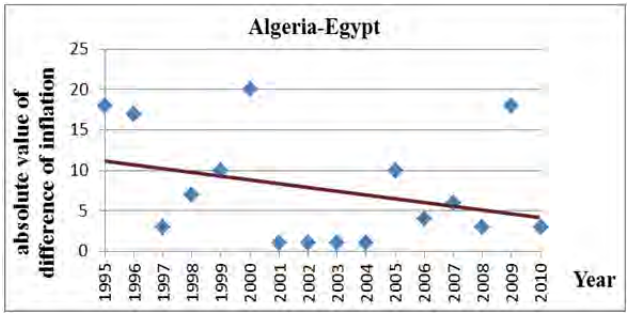

Albania-Syria
absolute value of difference of inflation
Year

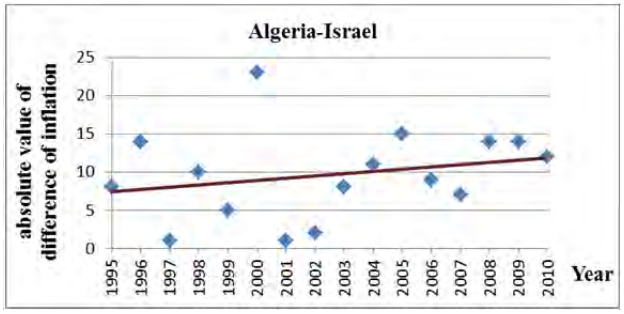

Albania-Tunisia
absolute value of difference of inflation
Year

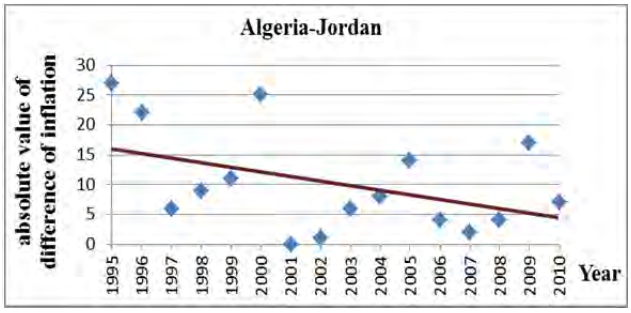

Albania-Turkey
absolute value of difference of inflation
Year

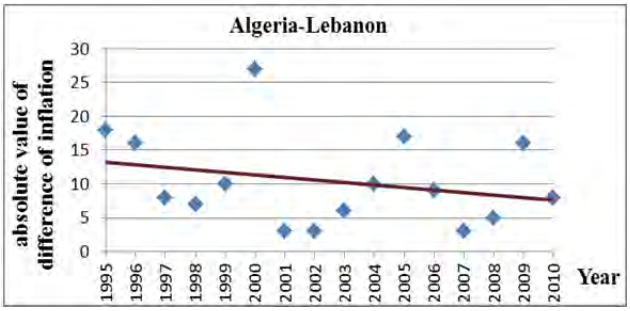

Albania-EU
absolute value of difference of inflation
Year

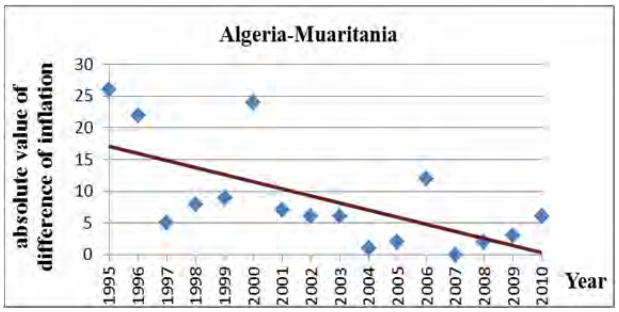

Algeria-Croatia
absolute value of difference of inflation
Year

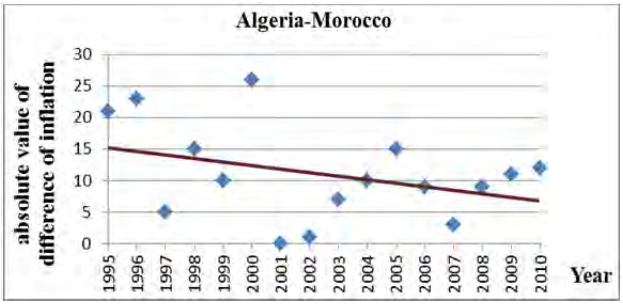

Algeria-Egypt
absolute value of difference of inflation
Year

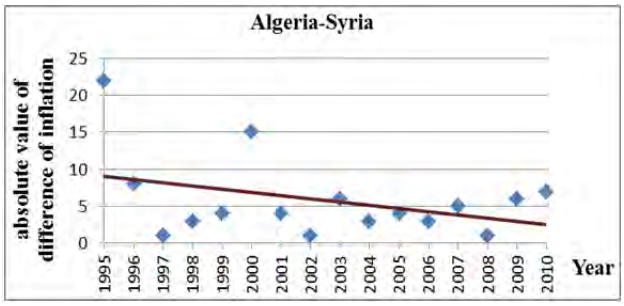

Algeria-Israel
absolute value of difference of inflation
Year

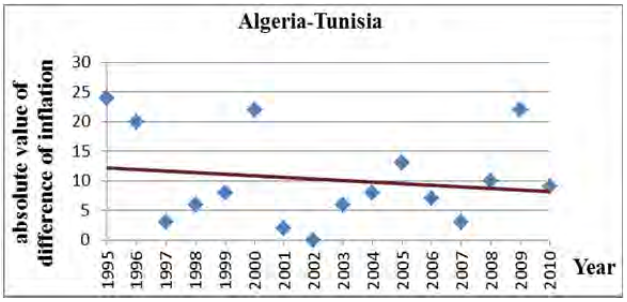

Algeria-Jordan
absolute value of difference of inflation
Year

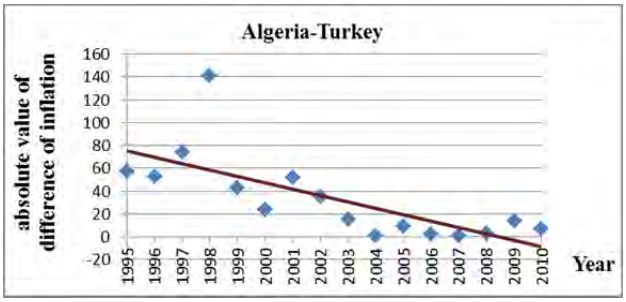

Algeria-Lebanon
absolute value of difference of inflation
Year

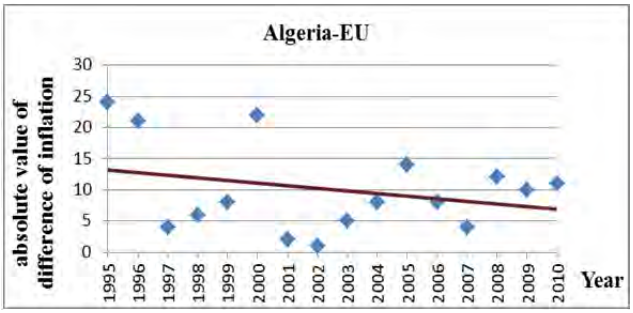

Algeria-Muaritania
absolute value of difference of inflation
Year

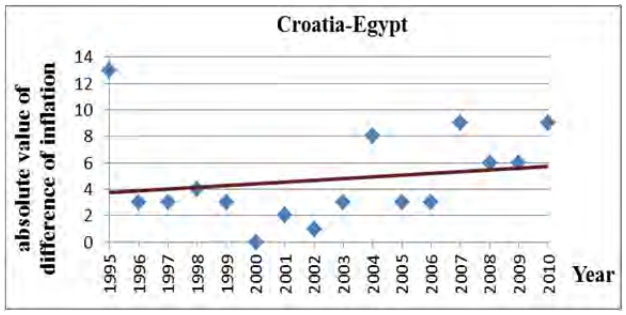

Algeria-Morocco
absolute value of difference of inflation
Year

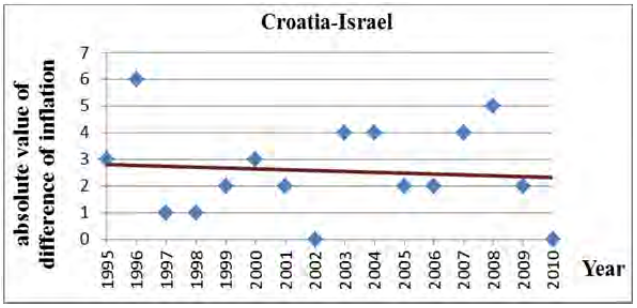

Algeria-Syria
absolute value of difference of inflation
Year

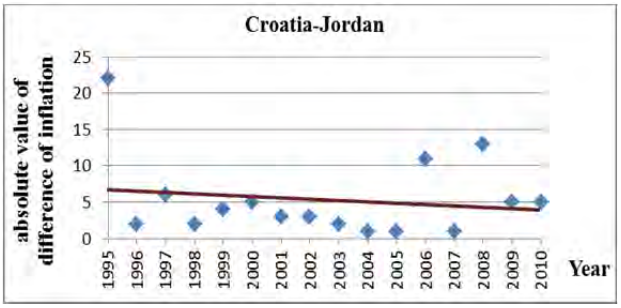

Algeria-Tunisia
absolute value of difference of inflation
Year

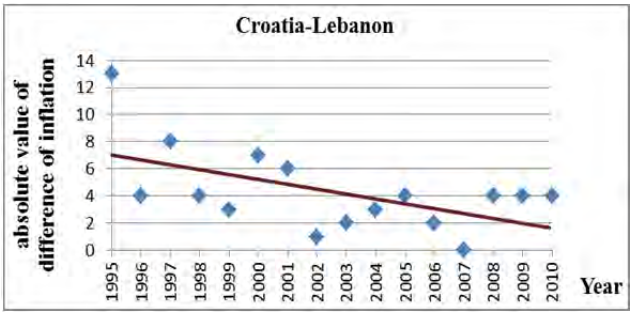

Algeria-Turkey
absolute value of difference of inflation
Year

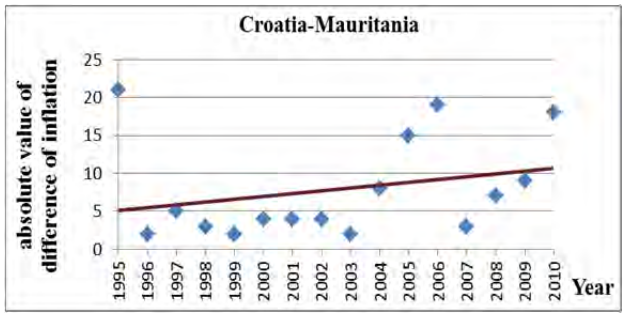

Algeria-EU
absolute value of difference of inflation
Year

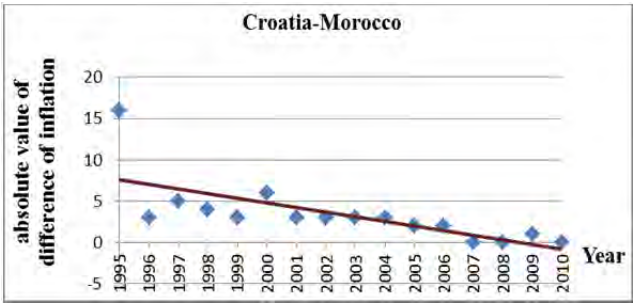

Croatia-Egypt
absolute value of difference of inflation
Year

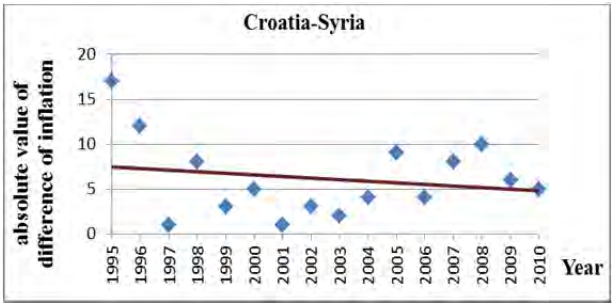

Croatia-Israel
absolute value of difference of inflation
Year

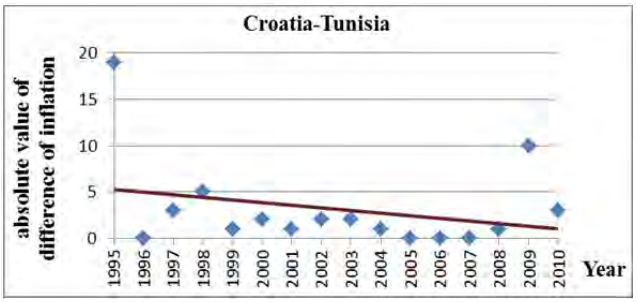

Croatia-Jordan
absolute value of difference of inflation
Year

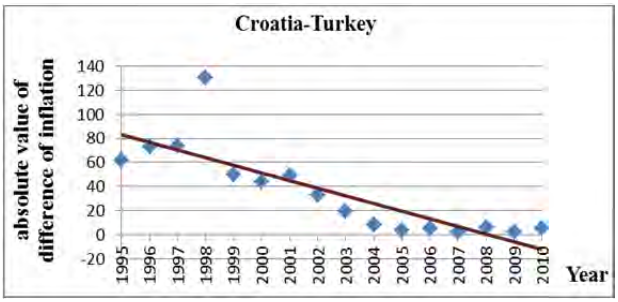

Croatia-Lebanon
absolute value of difference of inflation
Year

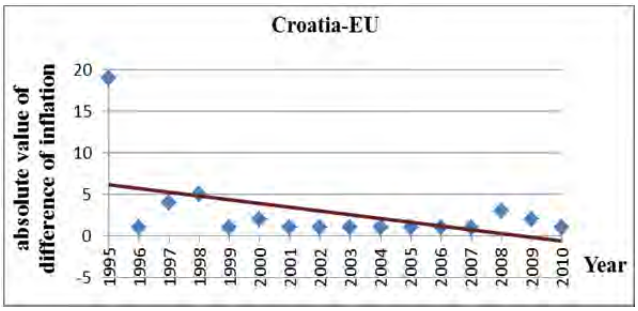

Croatia-Mauritania
absolute value of difference of inflation
Year

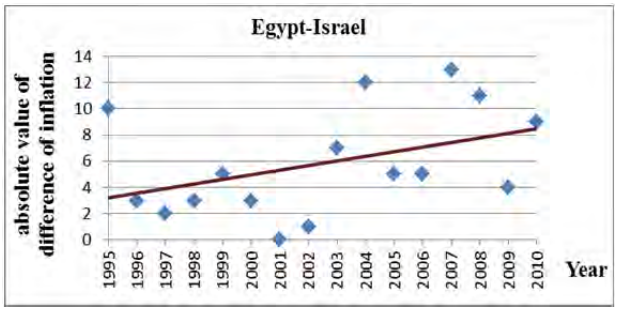

Croatia-Morocco
absolute value of difference of inflation
Year

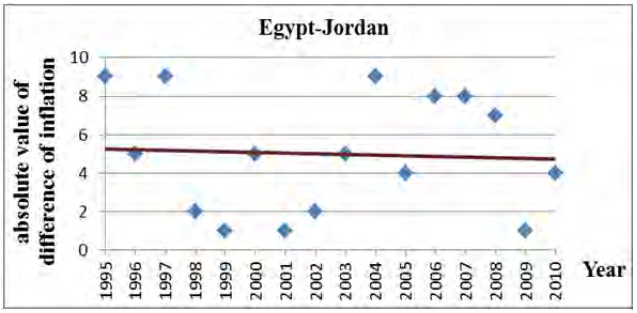

Croatia-Syria
absolute value of difference of inflation
Year


Croatia-Tunisia
absolute value of difference of inflation
Year

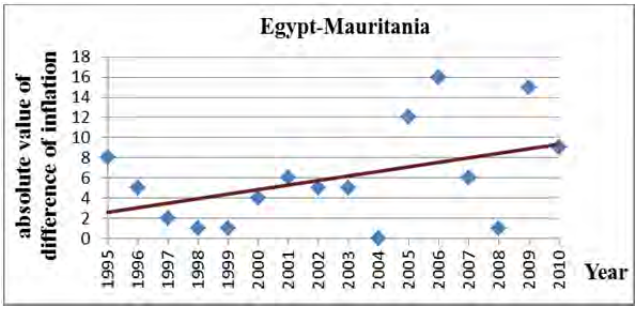

Croatia-Turkey
absolute value of difference of inflation
Year

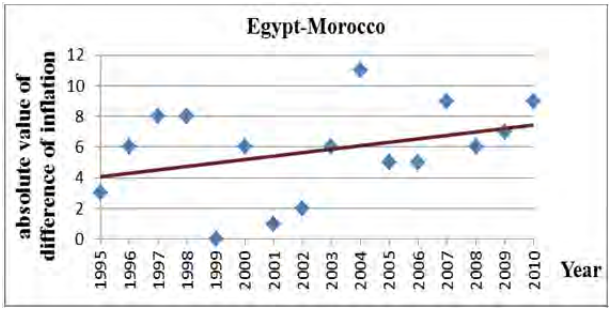

Croatia-EU
absolute value of difference of inflation
Year

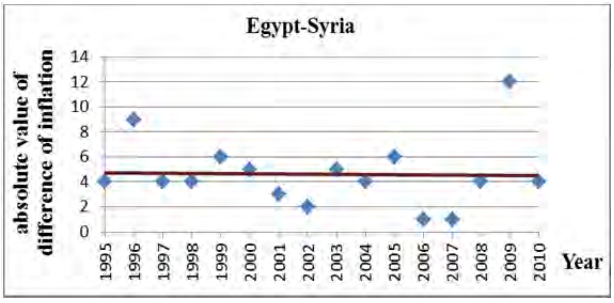

Egypt-Israel
absolute value of difference of inflation
Year

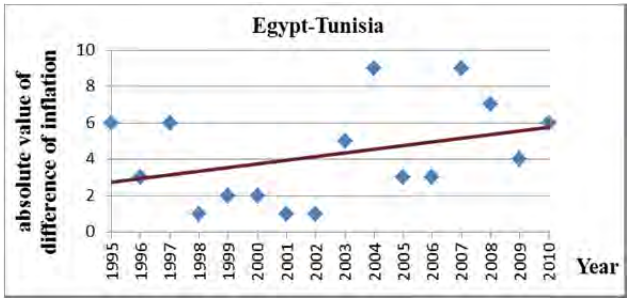

Egypt-Jordan
absolute value of difference of inflation
Year

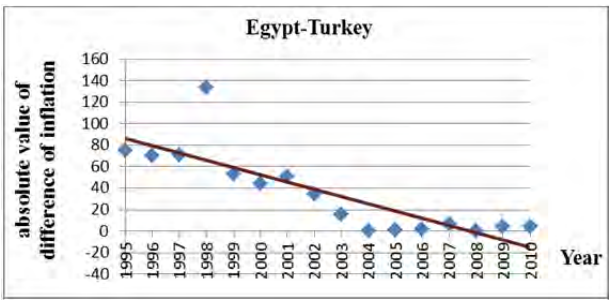
Egypt-Lebanon
absolute value of difference of inflation
Year

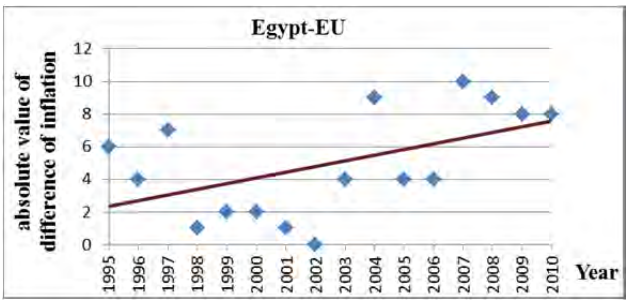

Egypt-Mauritania
absolute value of difference of inflation
Year

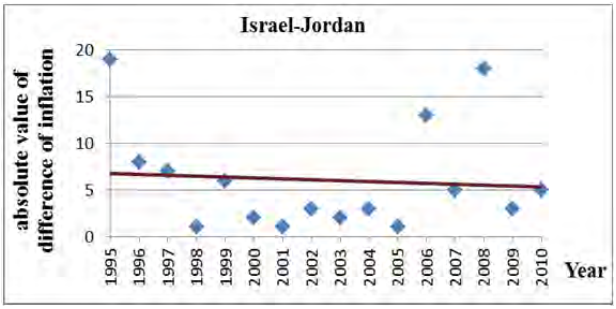

Egypt-Morocco
absolute value of difference of inflation
Year

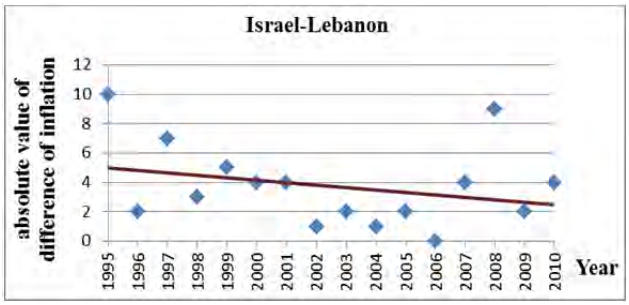

Egypt-Syria
absolute value of difference of inflation
Year

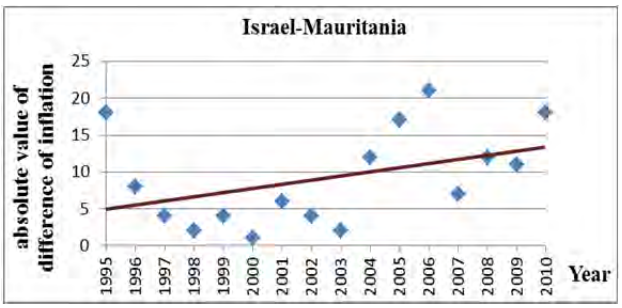

Egypt-Tunisia
absolute value of difference of inflation
Year

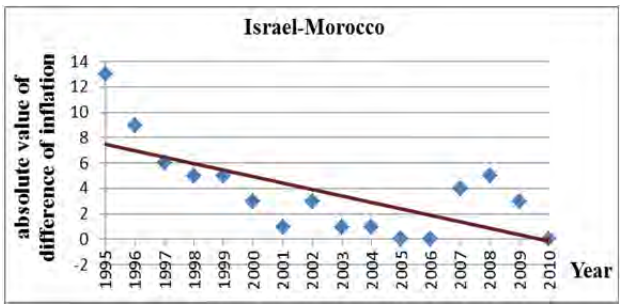

Egypt-Turkey
absolute value of difference of inflation
Year

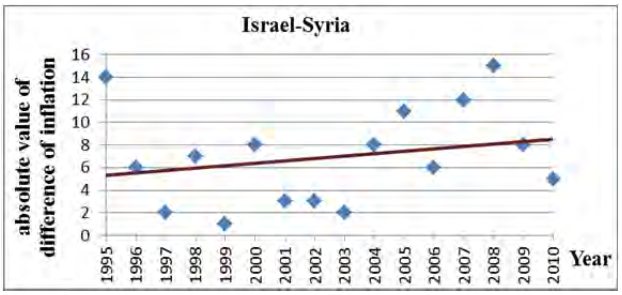

Egypt-EU
absolute value of difference of inflation
Year

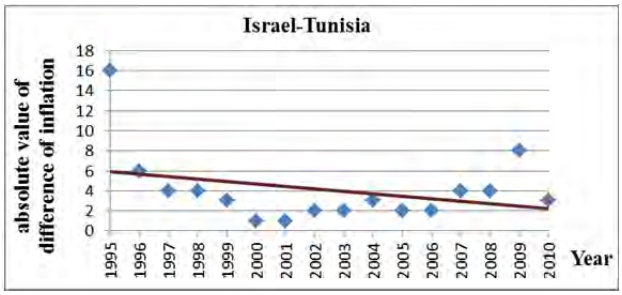

Israel-Jordan
absolute value of difference of inflation
Year

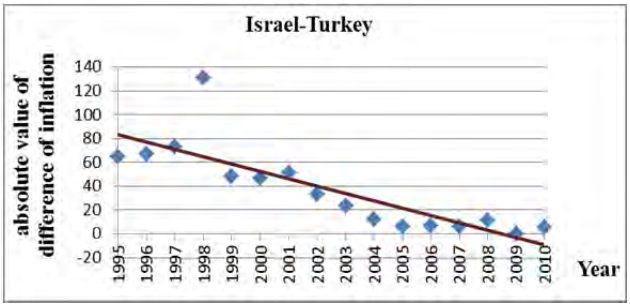

Israel-Lebanon
absolute value of difference of inflation
Year

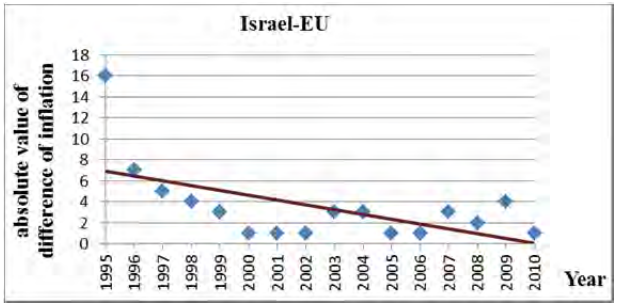

Israel-Mauritania
absolute value of difference of inflation
Year

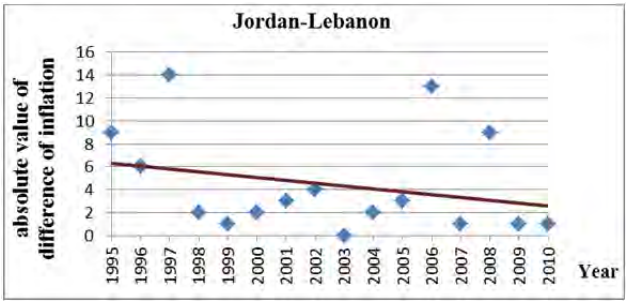

Israel-Morocco
absolute value of difference of inflation
Year

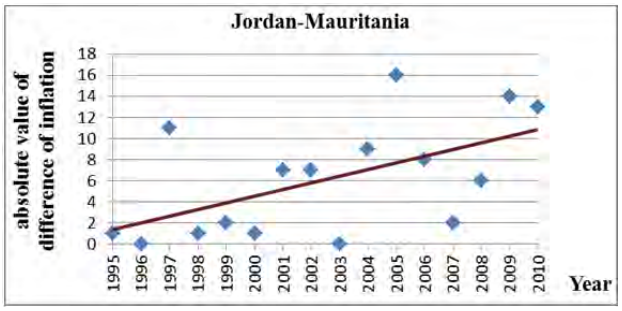

Israel-Syria
absolute value of difference of inflation
Year

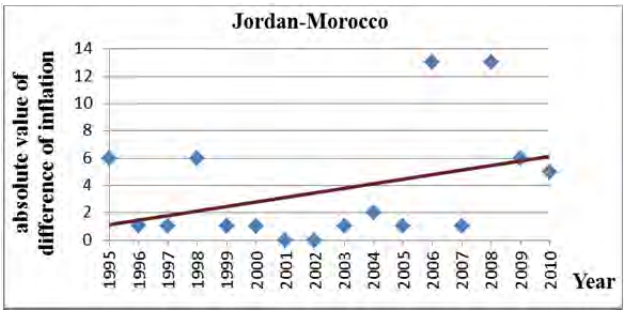

Israel-Tunisia
absolute value of difference of inflation
Year

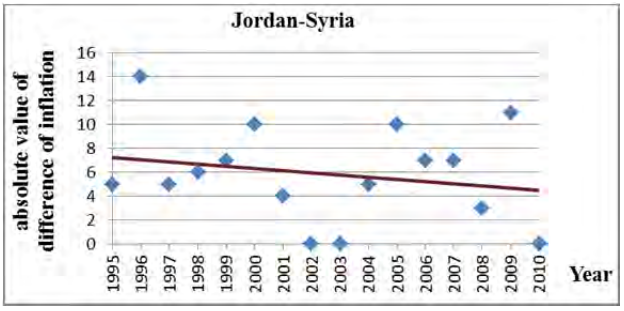

Israel-Turkey
absolute value of difference of inflation
Year

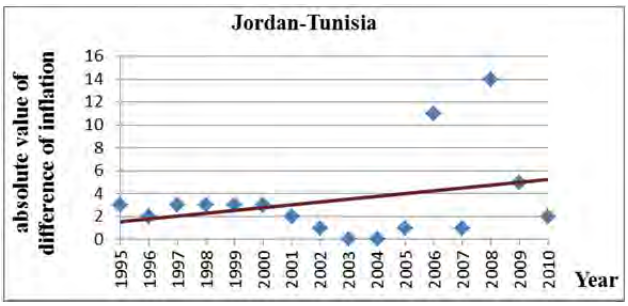

Israel-EU
absolute value of difference of inflation
Year

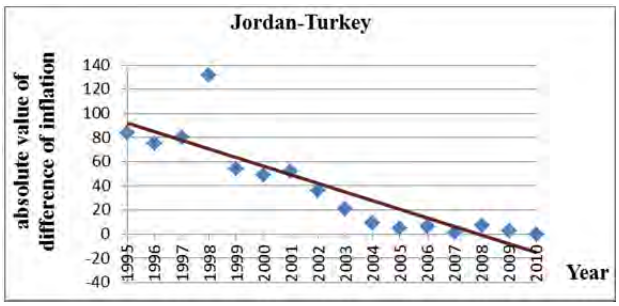

Jordan-Lebanon
absolute value of difference of inflation
Year

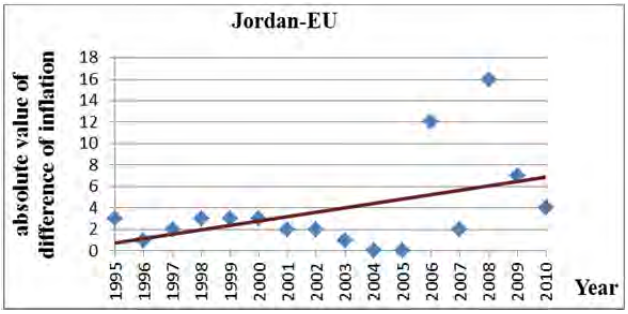

Jordan-Mauritania
absolute value of difference of inflation
Year

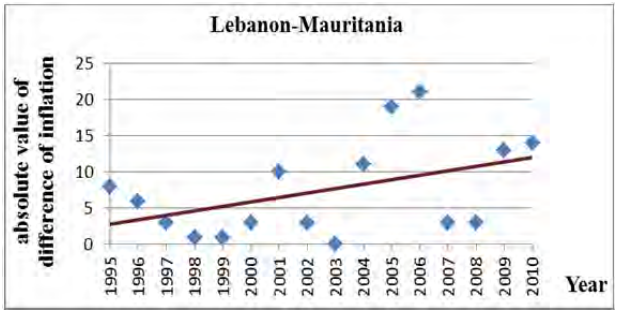

Jordan-Morocco
absolute value of difference of inflation
Year

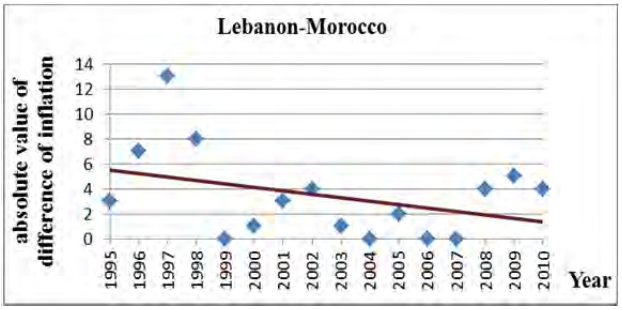

Jordan-Syria
absolute value of difference of inflation
Year

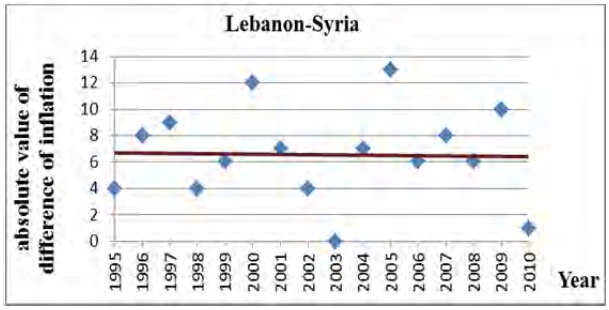

Jordan-Tunisia
absolute value of difference of inflation
Year

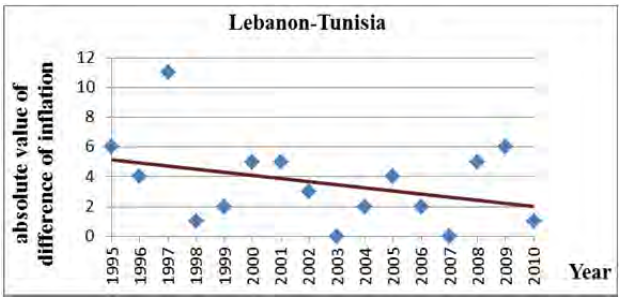

Jordan-Turkey
absolute value of difference of inflation
Year

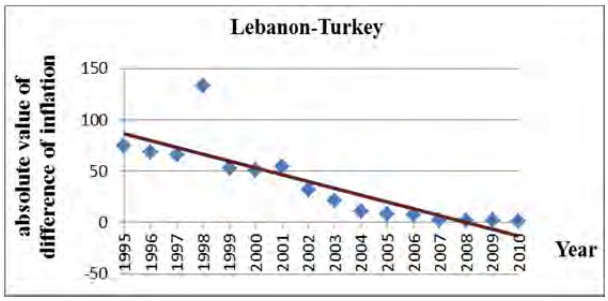

Jordan-EU
absolute value of difference of inflation
Year

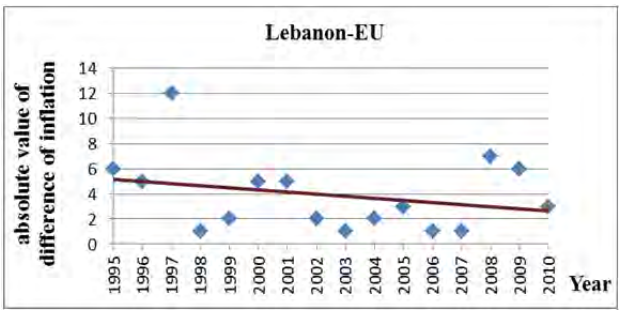

Lebanon-Mauritania
absolute value of difference of inflation
Year

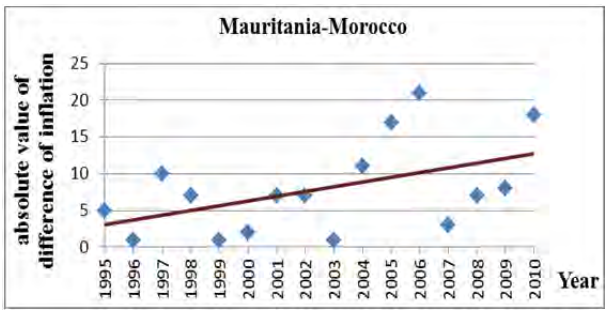

Lebanon-Morocco
absolute value of difference of inflation
Year

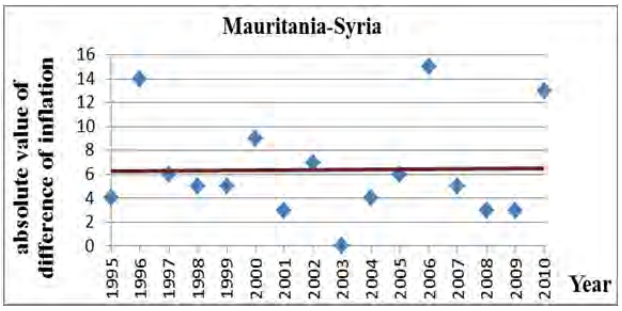

Lebanon-Syria
absolute value of difference of inflation
Year

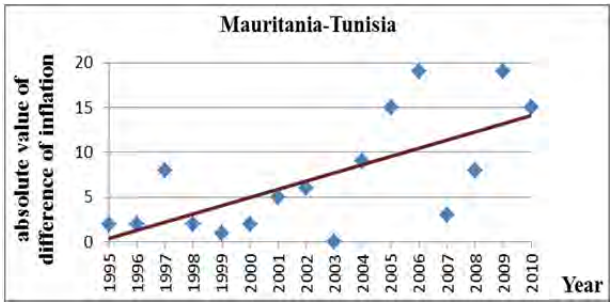

Lebanon-Tunisia
absolute value of difference of inflation
Year

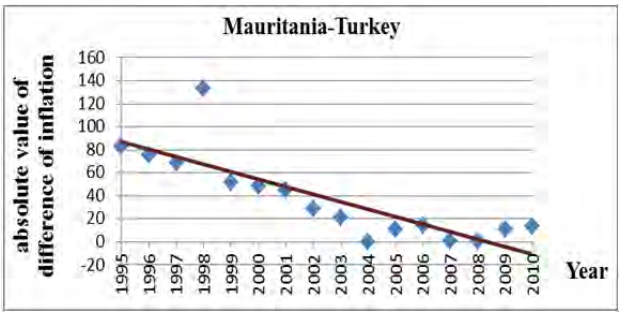

Lebanon-Turkey
absolute value of difference of inflation
Year

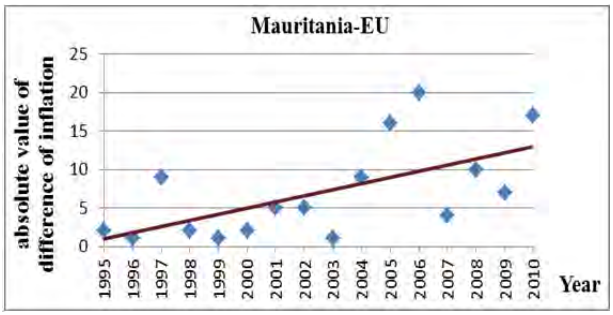

Lebanon-EU
absolute value of difference of inflation
Year

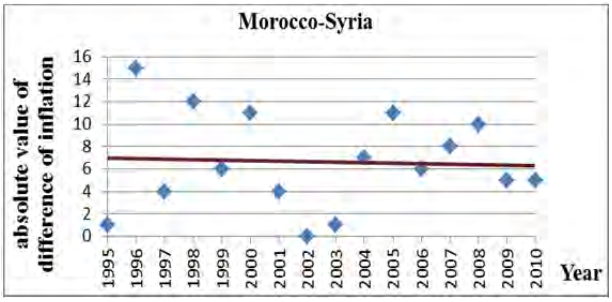

Mauritania-Morocco
absolute value of difference of inflation
Year

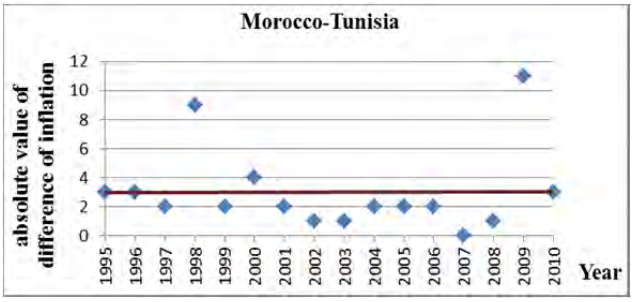

Mauritania-Syria
absolute value of difference of inflation
Year

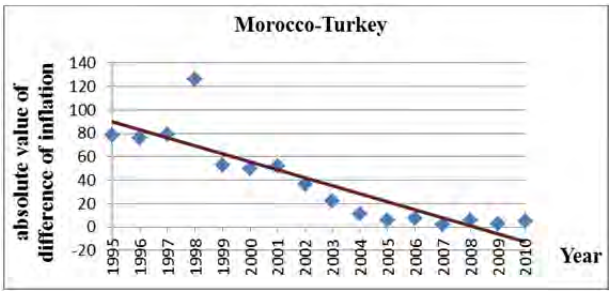

Mauritania-Tunisia
absolute value of difference of inflation
Year

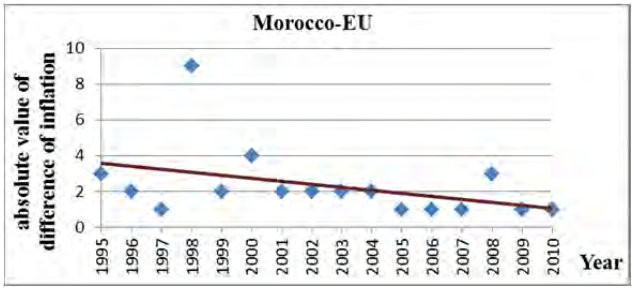

Mauritania-Turkey
absolute value of difference of inflation
Year

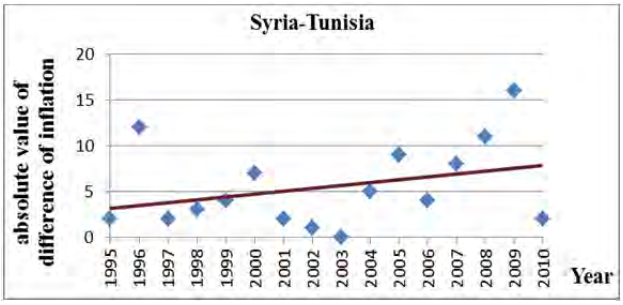

Mauritania-EU
absolute value of difference of inflation
Year

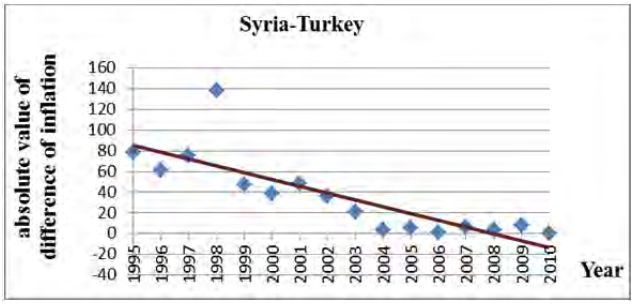

Morocco-Syria
absolute value of difference of inflation
Year

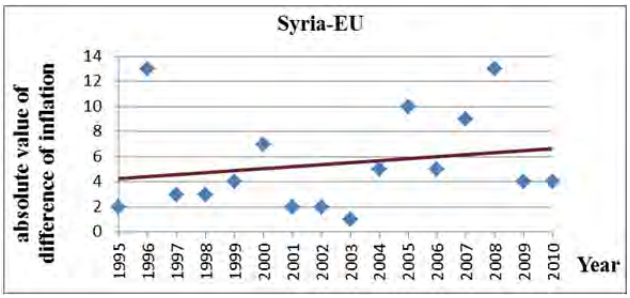

Morocco-Tunisia
absolute value of difference of inflation
Year

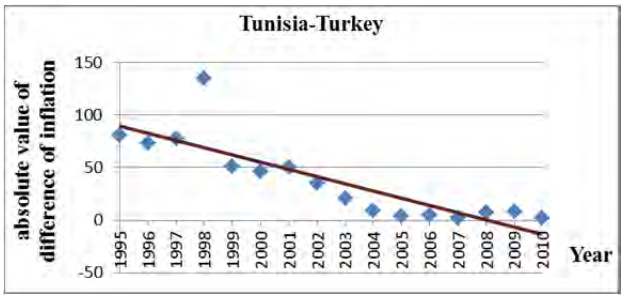

Morocco-Turkey
absolute value of difference of inflation
Year

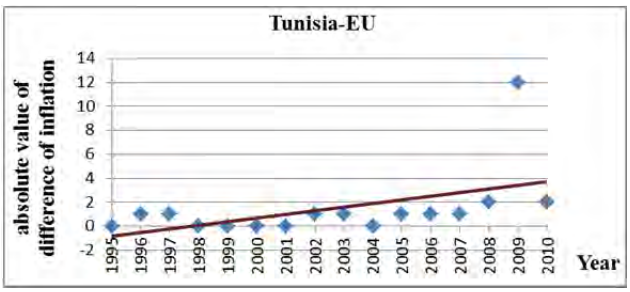

Morocco-EU
absolute value of difference of inflation
Year

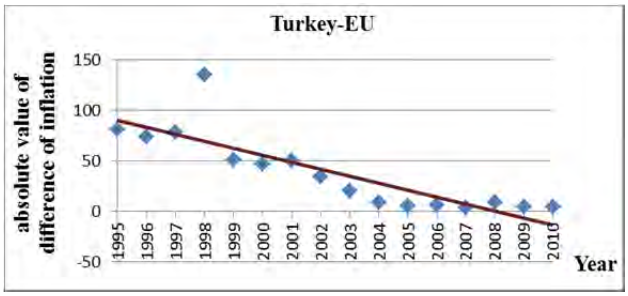

Syria-Tunisia
absolute value of difference of inflation
Year


Syria-Turkey
absolute value of difference of inflation
Year

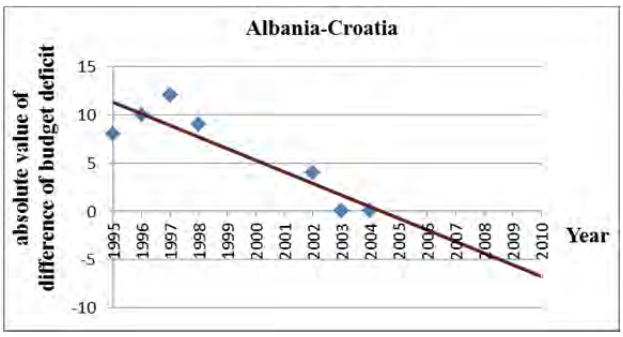

Syria-EU
absolute value of difference of inflation
Year

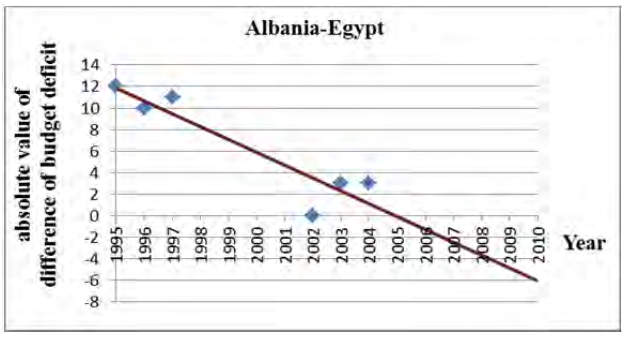

Tunisia-Turkey
absolute value of difference of inflation
Year

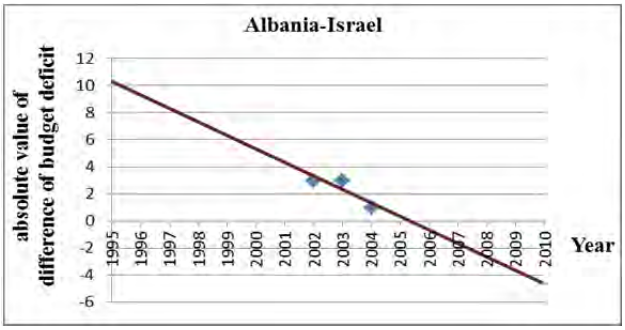

Tunisia-EU
absolute value of difference of inflation
Year

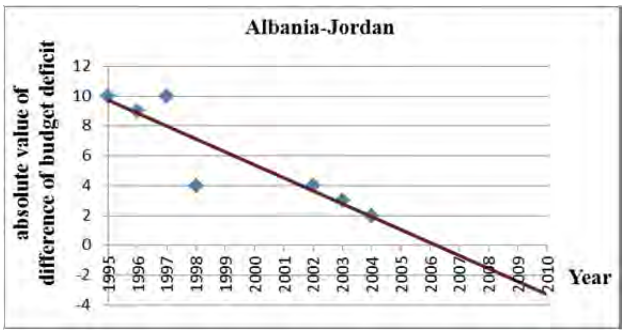

Turkey-EU
absolute value of difference of inflation
Year

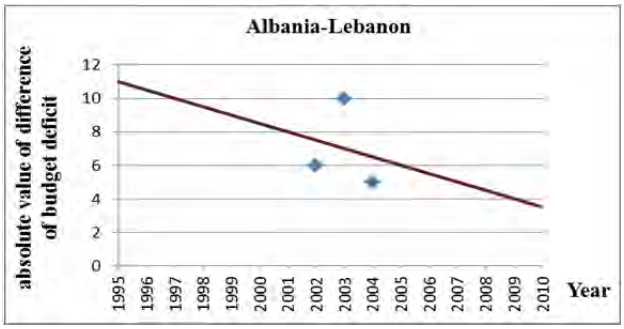
APPENDIX IV: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF BUDGET DEFICIT' OF ALL PAIRS

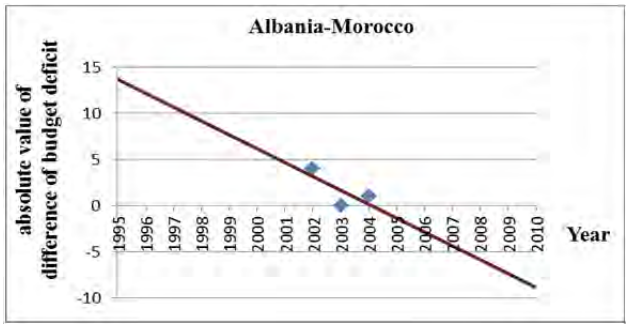


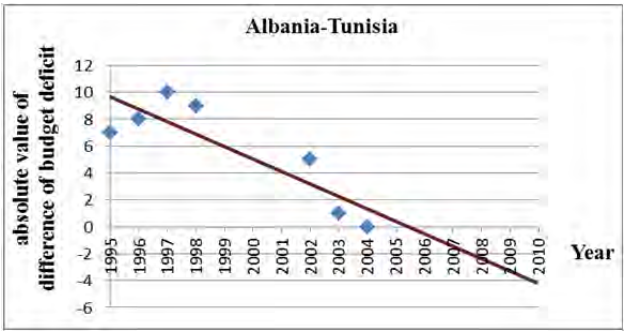


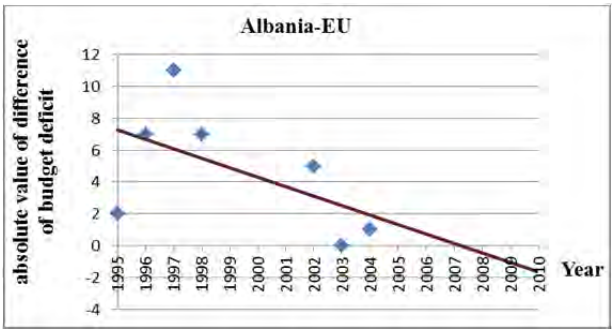


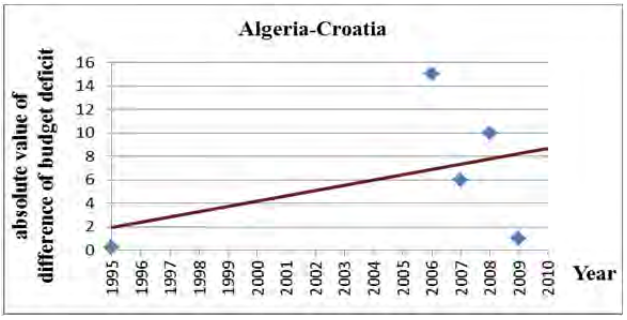


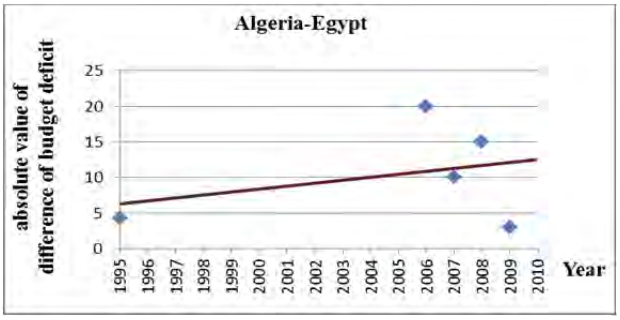


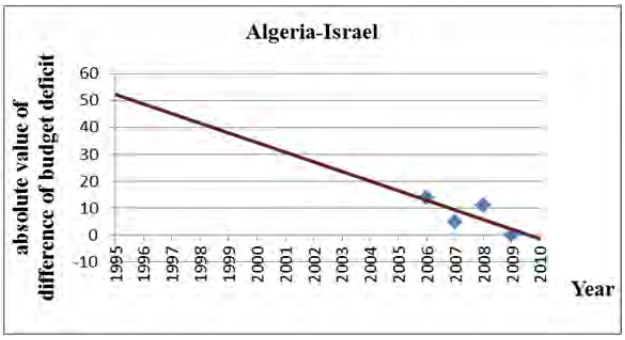


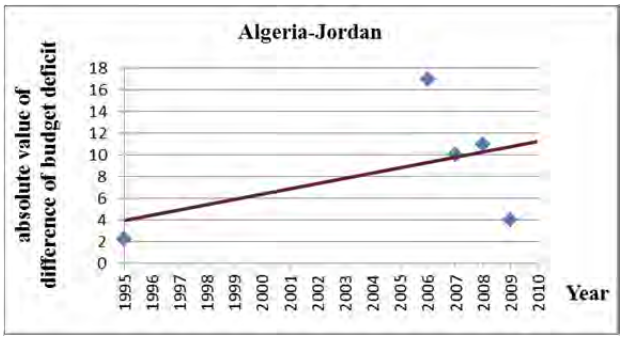


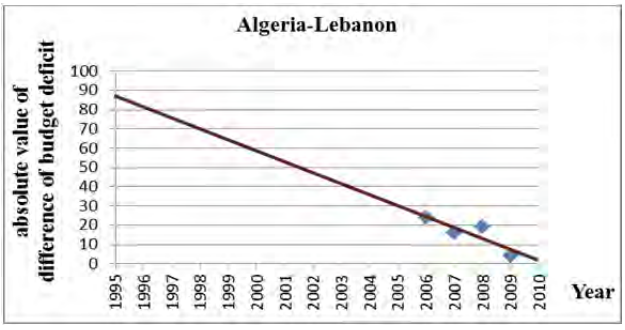


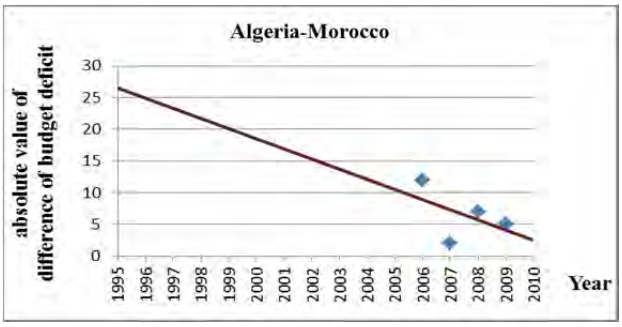

Algeria-Croatia
absolute value of difference of budget deficit
Year

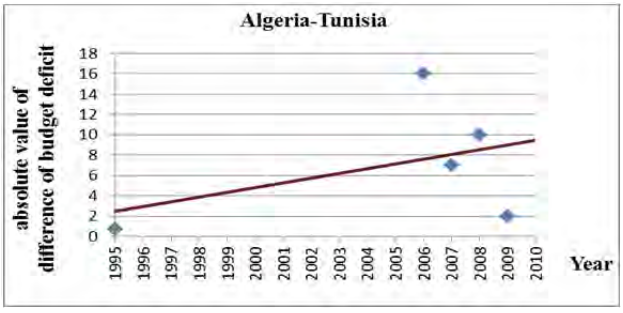

Algeria-Egypt
absolute value of difference of budget deficit
Year

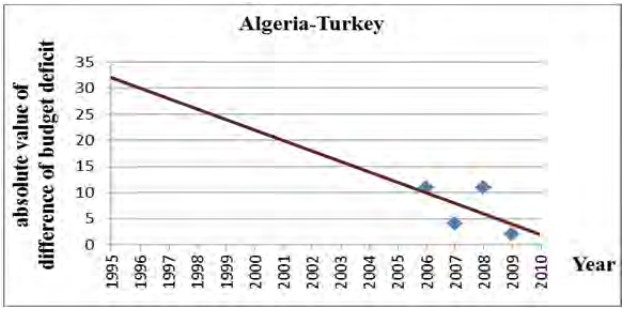

Algeria-Israel
absolute value of difference of budget deficit
Year

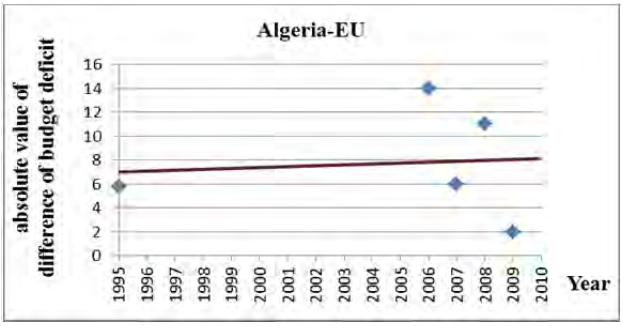

Algeria-Jordan
absolute value of difference of budget deficit
Year

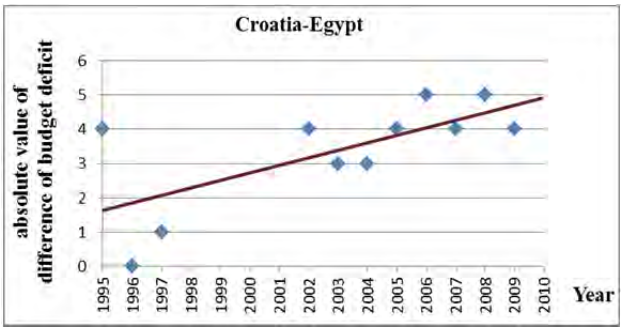

Algeria-Lebanon
absolute value of difference of budget deficit
Year

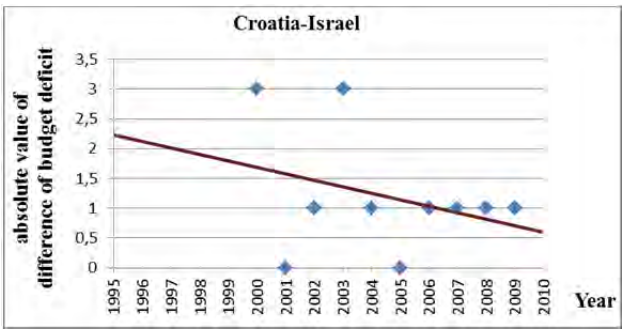

Algeria-Morocco
absolute value of difference of budget deficit
Year

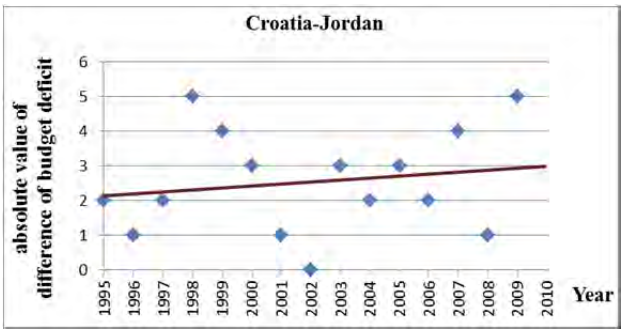

Algeria-Tunisia
absolute value of difference of budget deficit
Year

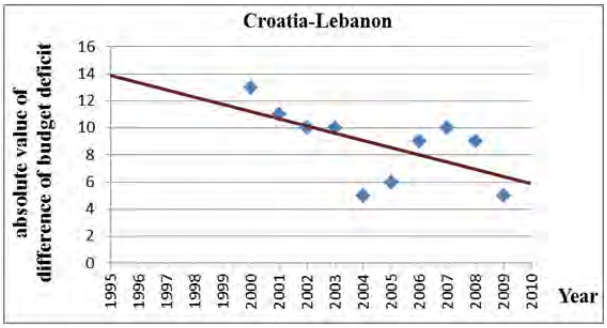

Algeria-Turkey
absolute value of difference of budget deficit
Year

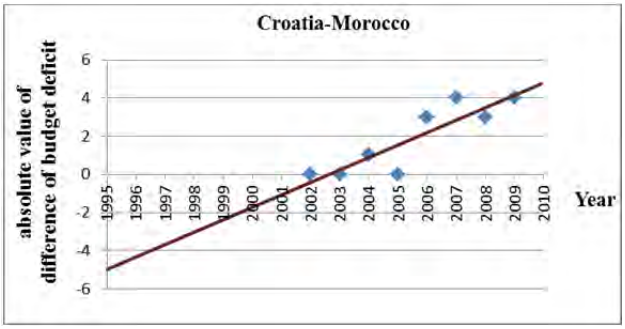

Algeria-EU
absolute value of difference of budget deficit
Year

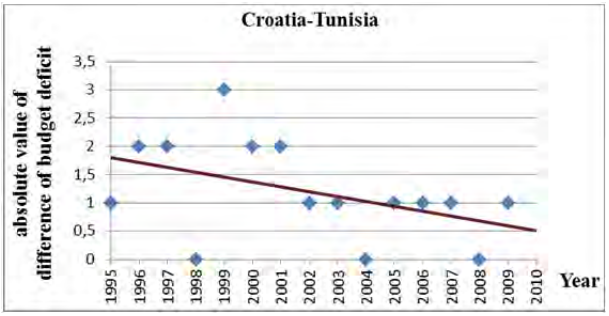

Croatia-Egypt
absolute value of difference of budget deficit
Year

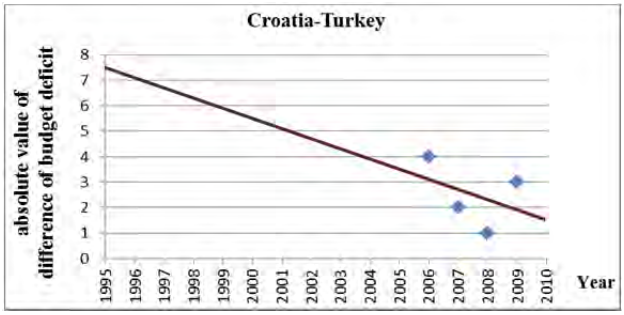

Croatia-Israel
absolute value of difference of budget deficit
Year

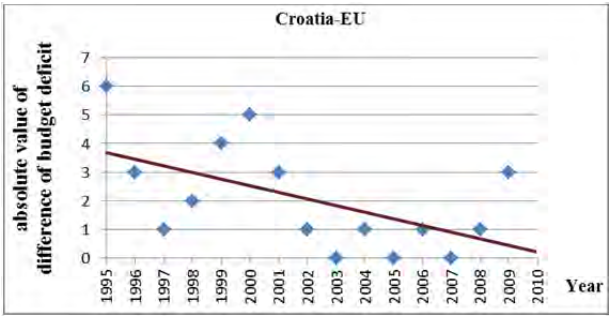

Croatia-Jordan
absolute value of difference of budget deficit
Year

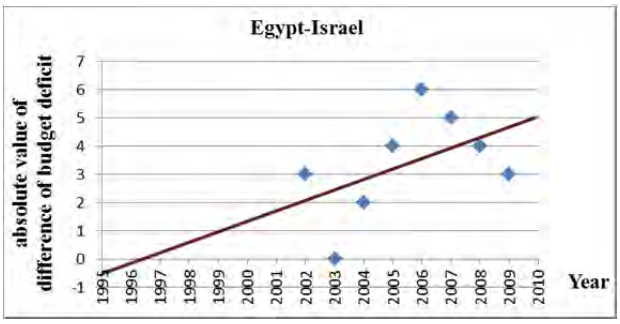

Croatia-Lebanon
absolute value of difference of budget deficit
Year

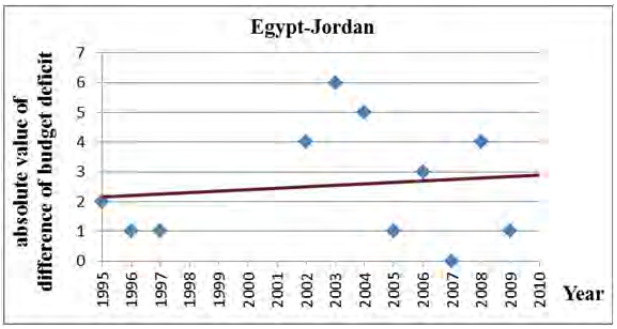

Croatia-Morocco
absolute value of difference of budget deficit
Year

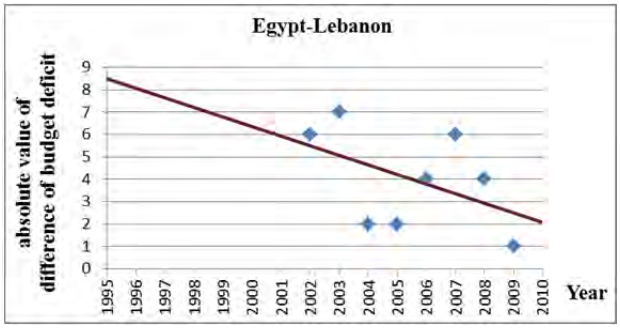

Croatia-Tunisia
absolute value of difference of budget deficit
Year

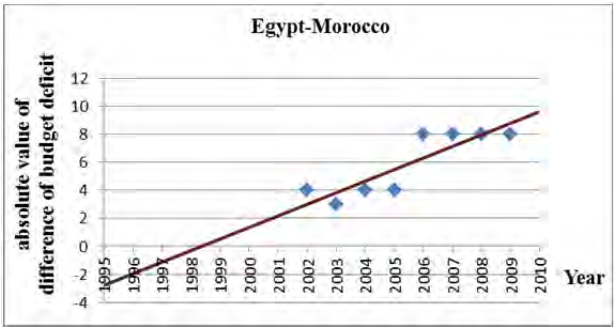

Croatia-Turkey
absolute value of difference of budget deficit
Year

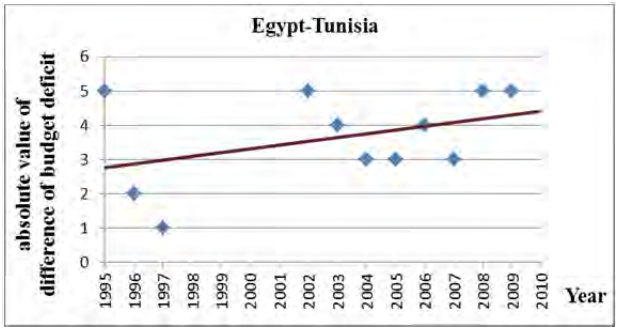

Croatia-EU
absolute value of difference of budget deficit
Year

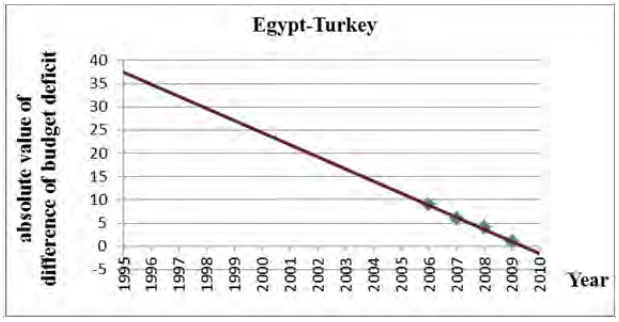

Egypt-Israel
absolute value of difference of budget deficit
Year

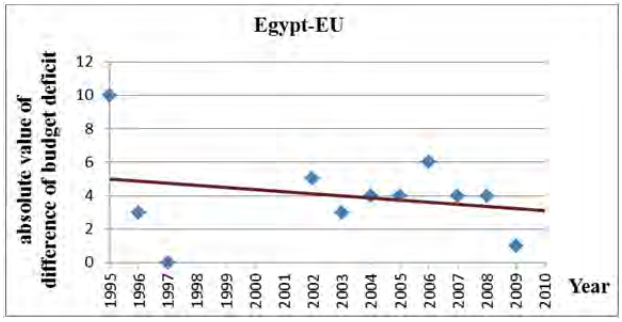

Egypt-Jordan
absolute value of difference of budget deficit
Year

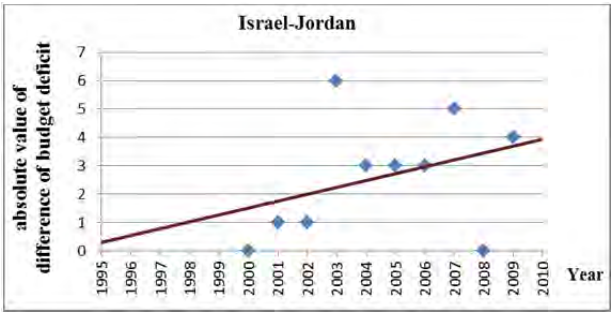

Egypt-Lebanon
absolute value of difference of budget deficit
Year

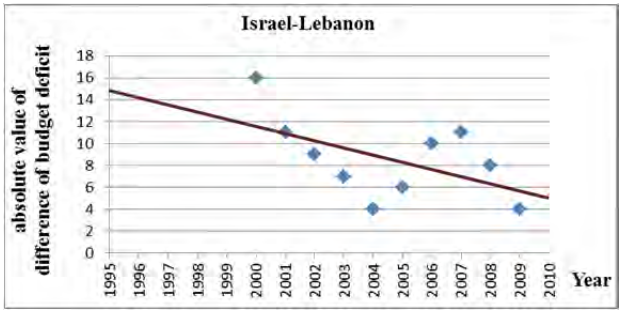

Egypt-Morocco
absolute value of difference of budget deficit
Year

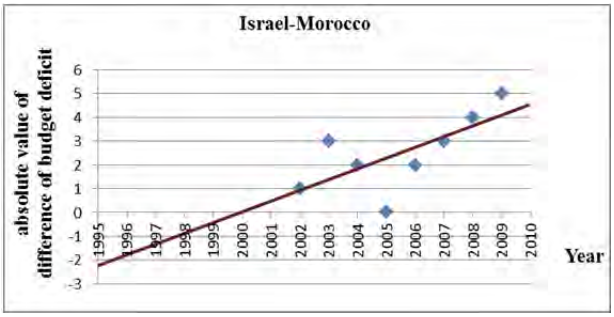

Egypt-Tunisia
absolute value of difference of budget deficit
Year

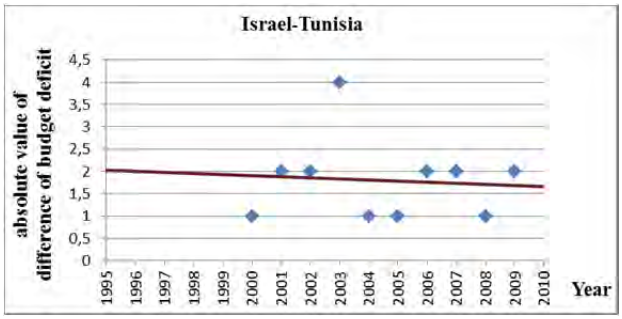

Egypt-Turkey
absolute value of difference of budget deficit
Year

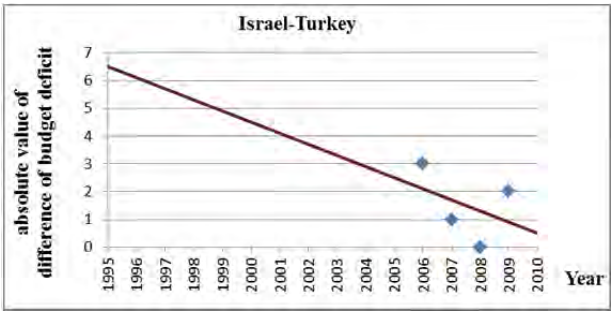

Egypt-EU
absolute value of difference of budget deficit
Year

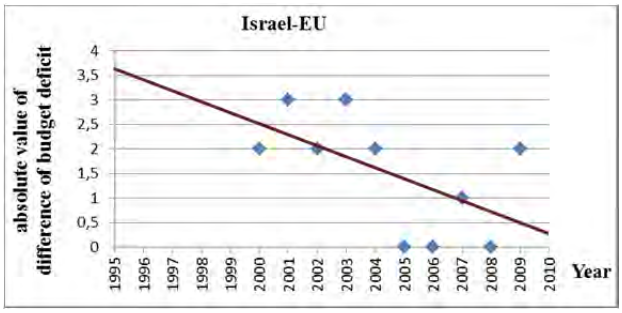

Israel-Jordan
absolute value of difference of budget deficit
Year

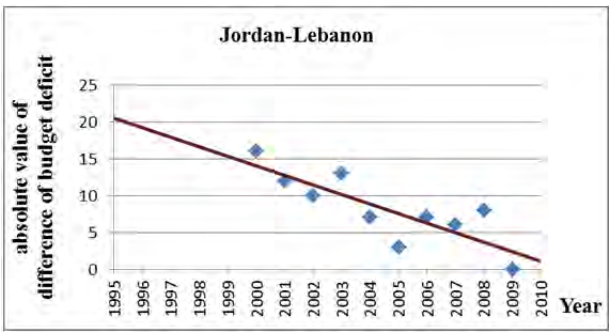

Israel-Lebanon
absolute value of difference of budget deficit
Year

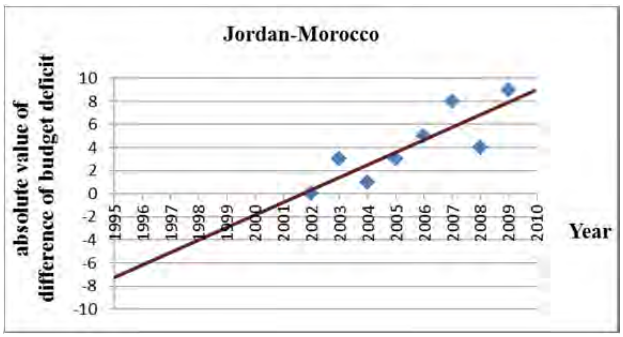

Israel-Morocco
absolute value of difference of budget deficit
Year

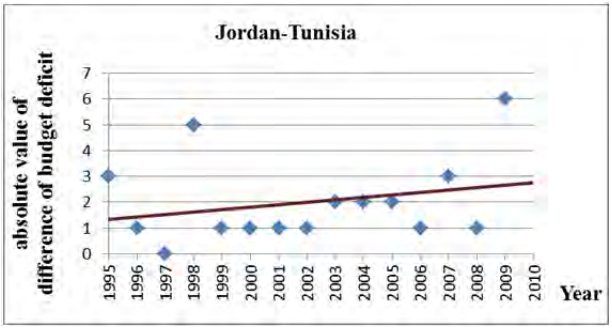

Israel-Tunisia
absolute value of difference of budget deficit
Year

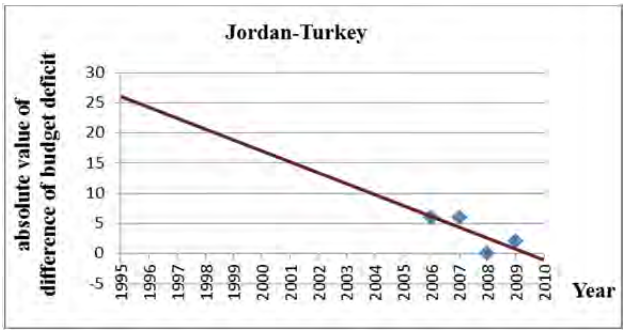

Israel-Turkey
absolute value of difference of budget deficit
Year

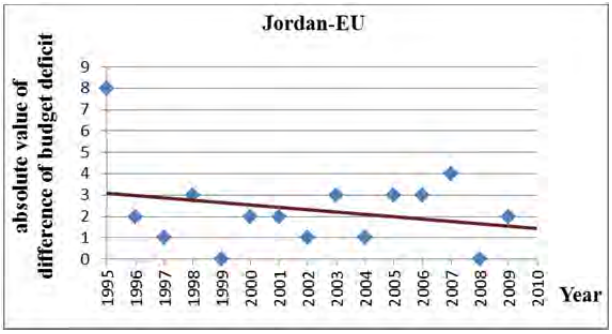

Israel-EU
absolute value of difference of budget deficit
Year

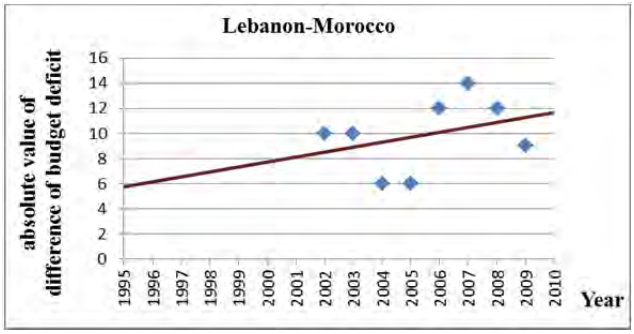

Jordan-Lebanon
absolute value of difference of budget deficit
Year

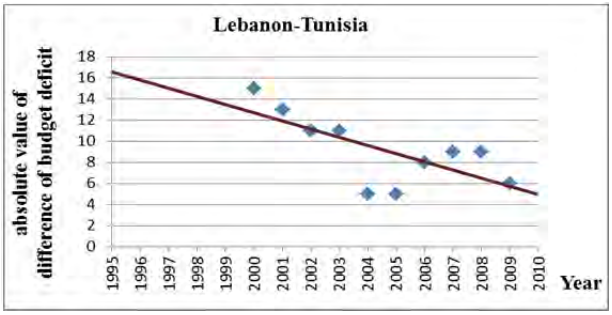

Jordan-Morocco
absolute value of difference of budget deficit
Year

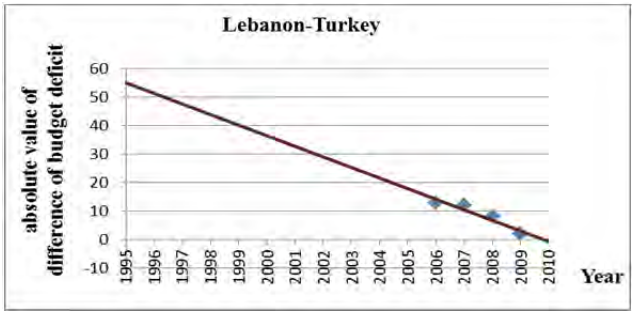

Jordan-Tunisia
absolute value of difference of budget deficit
Year

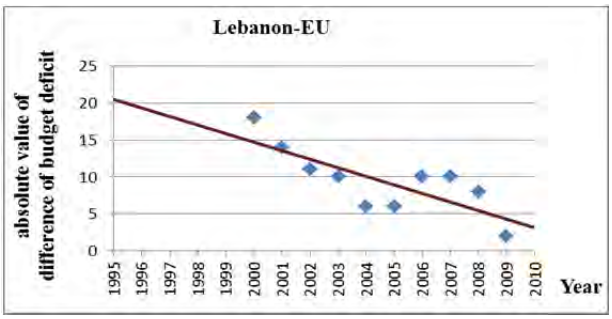

Jordan-Turkey
absolute value of difference of budget deficit
Year

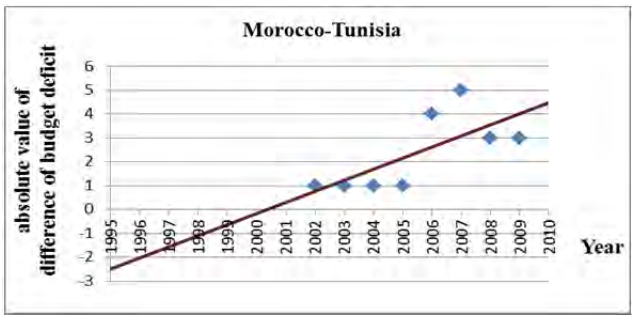

Jordan-EU
absolute value of difference of budget deficit
Year

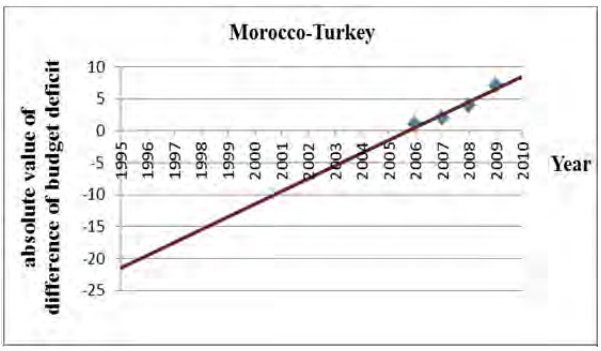

Lebanon-Morocco
absolute value of difference of budget deficit
Year

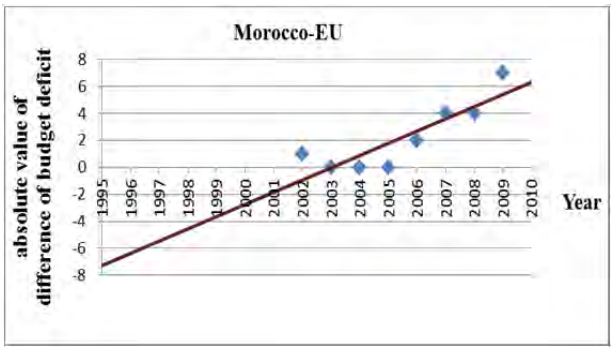

Lebanon-Tunisia
absolute value of difference of budget deficit
Year

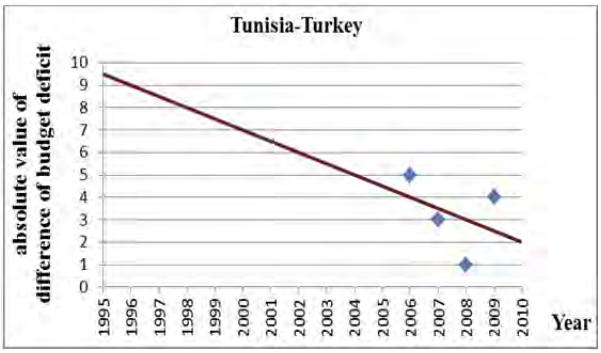

Lebanon-Turkey
absolute value of difference of budget deficit
Year

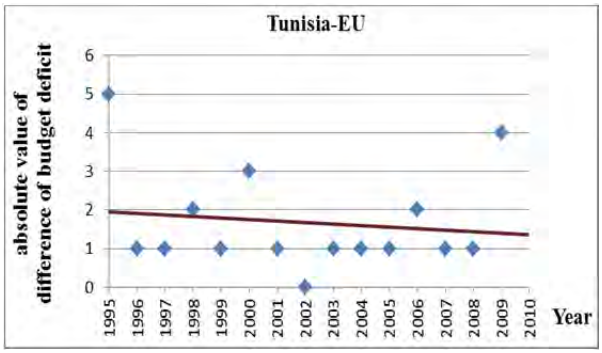

Lebanon-EU
absolute value of difference of budget deficit
Year

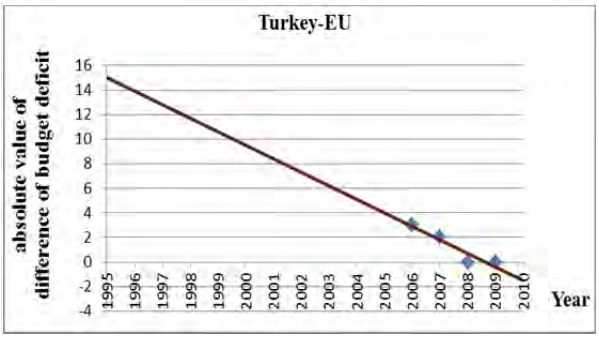

Morocco-Tunisia
absolute value of difference of budget deficit
Year


Morocco-Turkey
absolute value of difference of budget deficit
Year

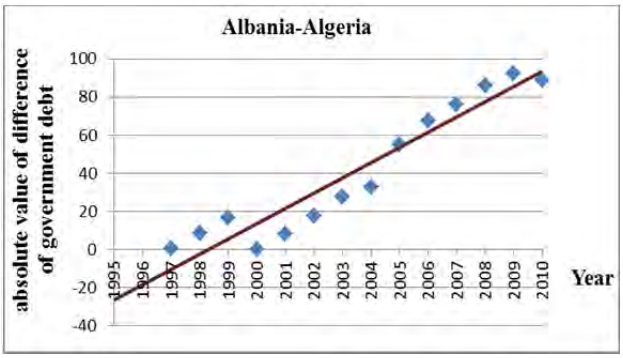

Morocco-EU
absolute value of difference of budget deficit
Year

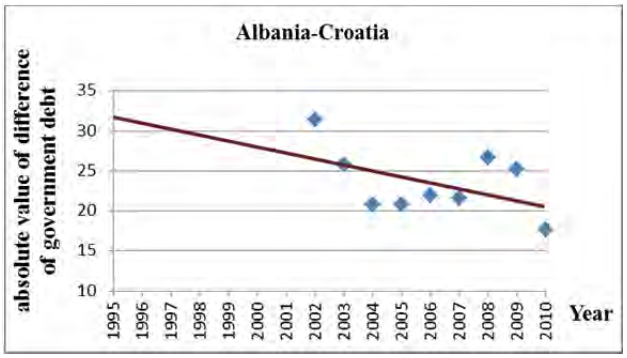

Tunisia-Turkey
absolute value of difference of budget deficit
Year

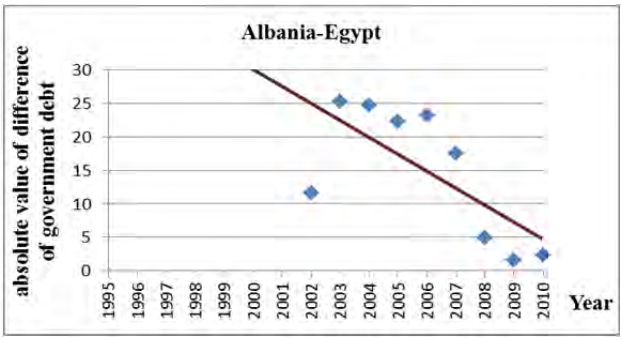

Tunisia-EU
absolute value of difference of budget deficit
Year

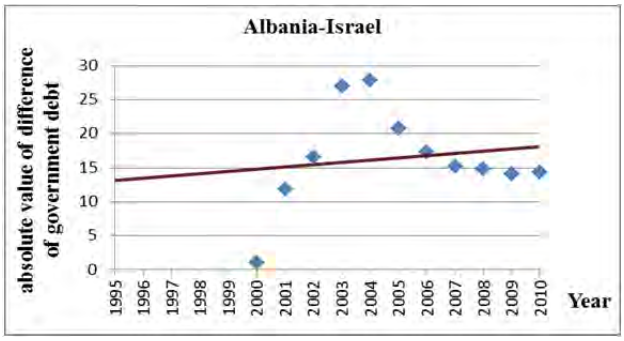

Turkey-EU
absolute value of difference of budget deficit
Year

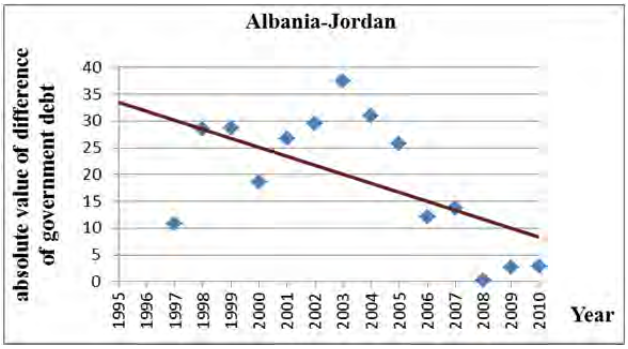
APPENDIX V: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF GOVERNMENT DEBT' OF ALL PAIRS

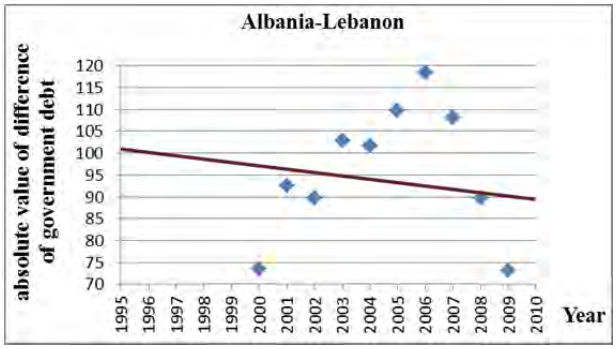


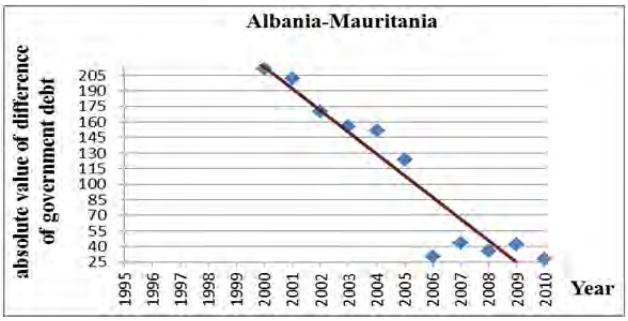


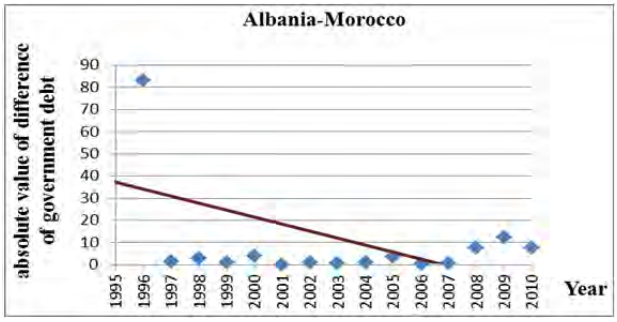


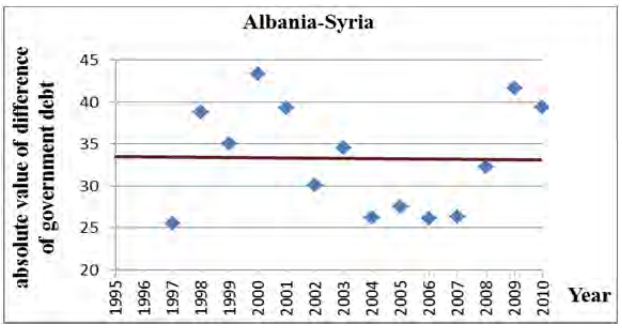


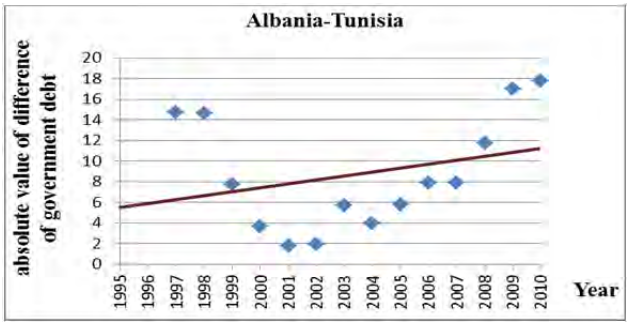









Albania-Syria
absolute value of difference of government debt
Year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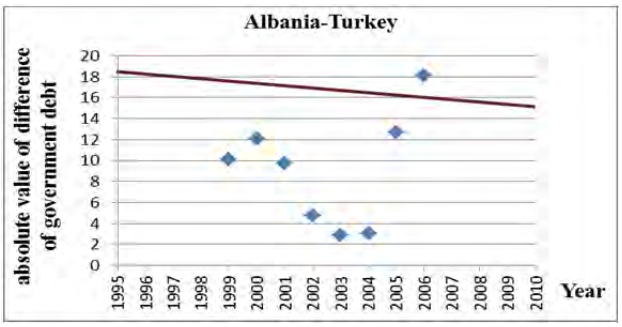
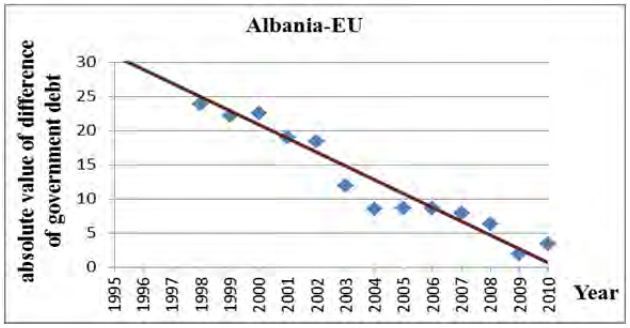
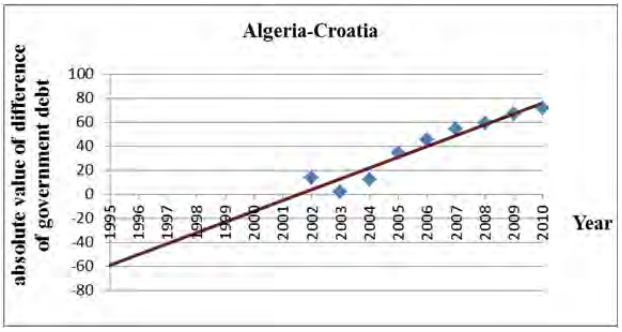
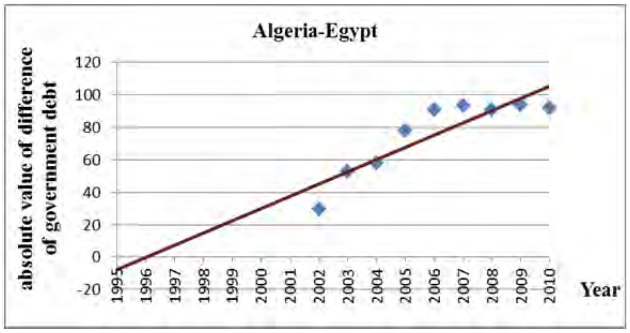
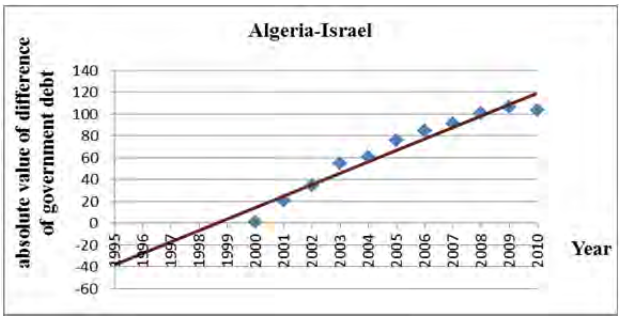
absolute value of difference of government debt
Year

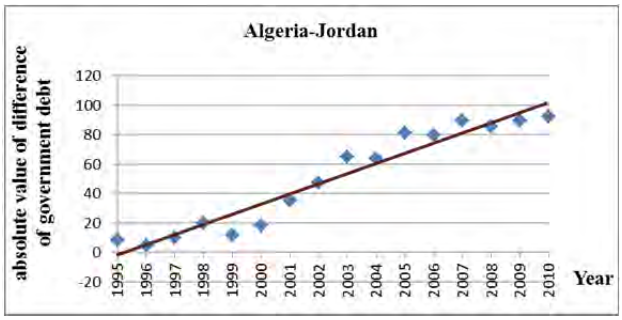

Albania-Turkey
absolute value of difference of government debt
Year

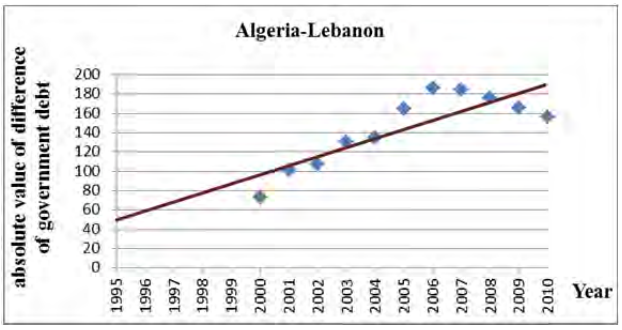

Albania-EU
absolute value of difference of government debt
Year

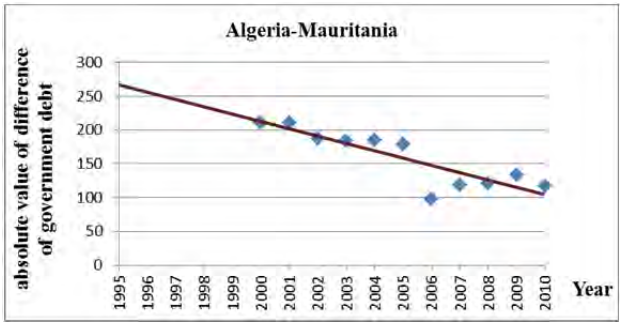

Algeria-Croatia
absolute value of difference of government debt
Year

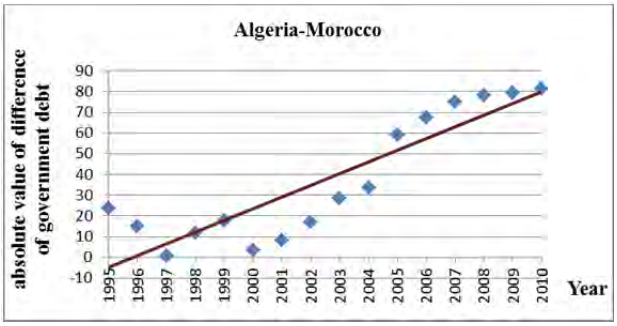

Algeria-Egypt
absolute value of difference of government debt
Year

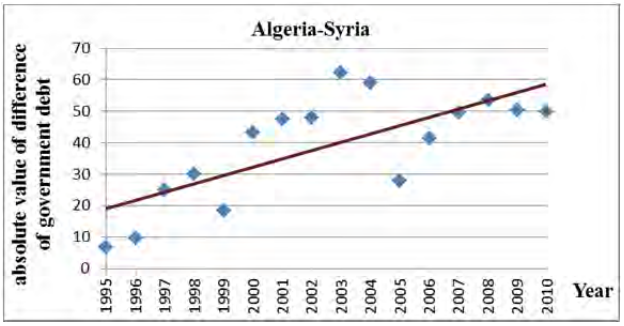

Algeria-Israel
absolute value of difference of government debt
Year

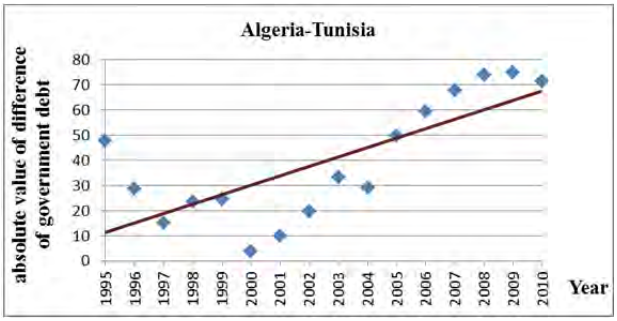

Algeria-Jordan
absolute value of difference of government debt
Year

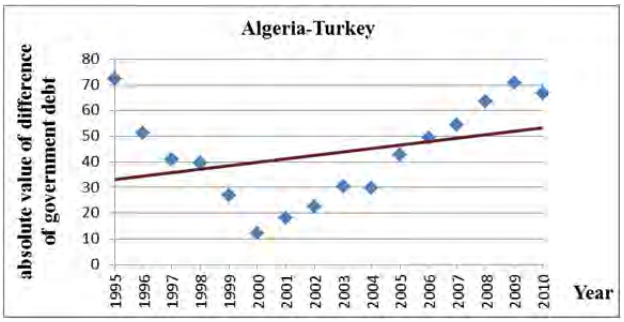

Algeria-Lebanon
absolute value of difference of government debt
Year

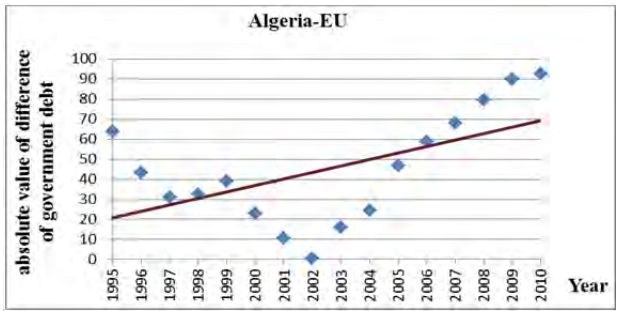

Algeria-Mauritania
absolute value of difference of government debt
Year

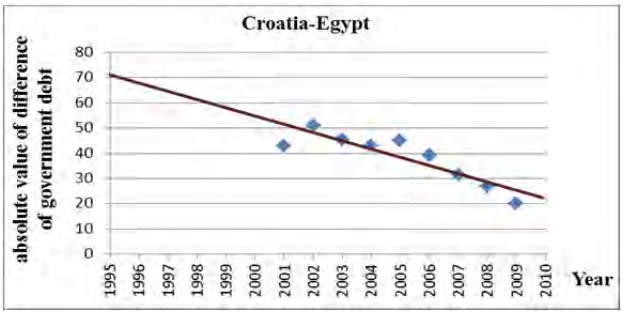

Algeria-Morocco
absolute value of difference of government debt
Year

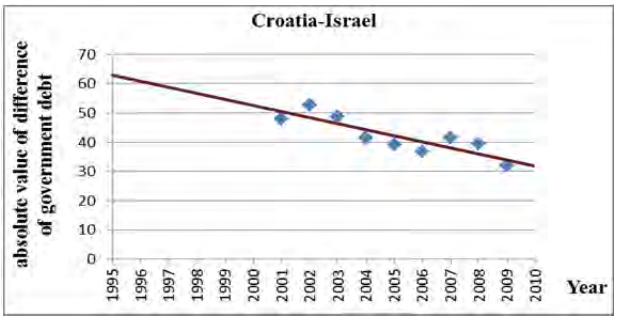

Algeria-Syria
absolute value of difference of government debt
Year

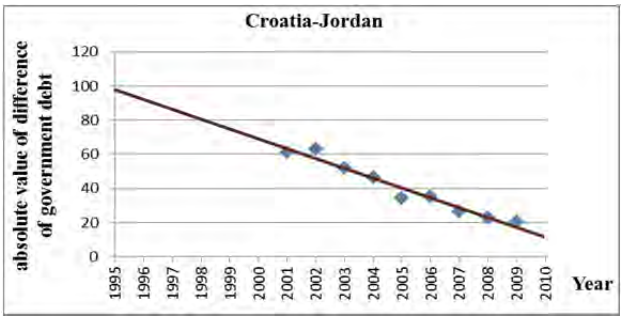

Algeria-Tunisia
absolute value of difference of government debt
Year


Algeria-Turkey
absolute value of difference of government debt
Year


Algeria-EU
absolute value of difference of government debt
Year


Croatia-Egypt
absolute value of difference of government debt
Year


Croatia-Israel
absolute value of difference of government debt
Year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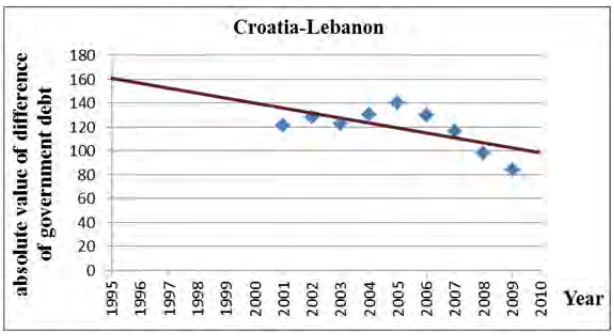
absolute value of difference of government debt
Year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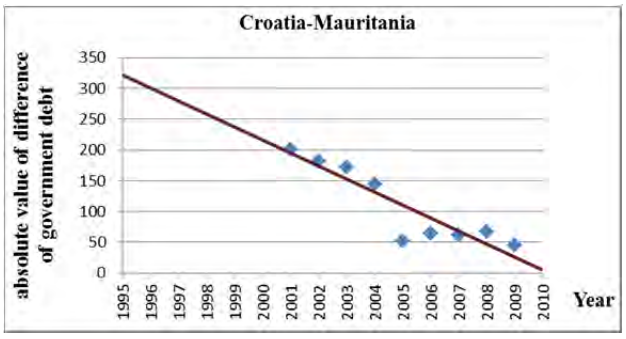
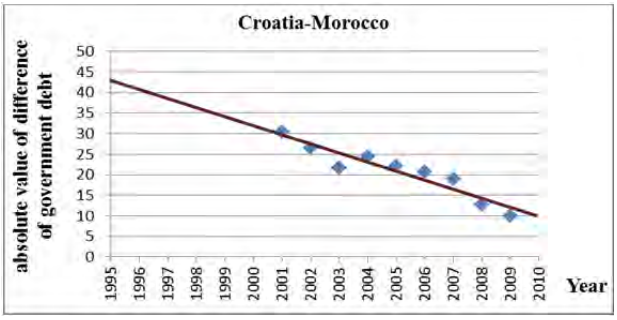
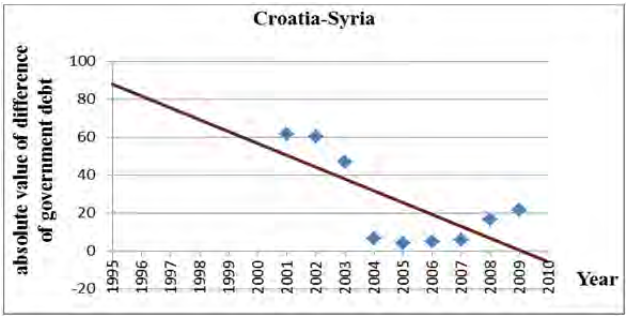
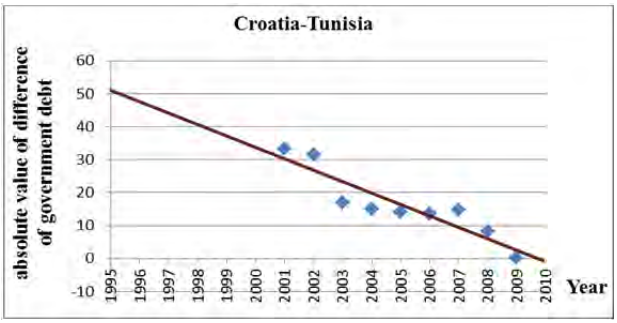
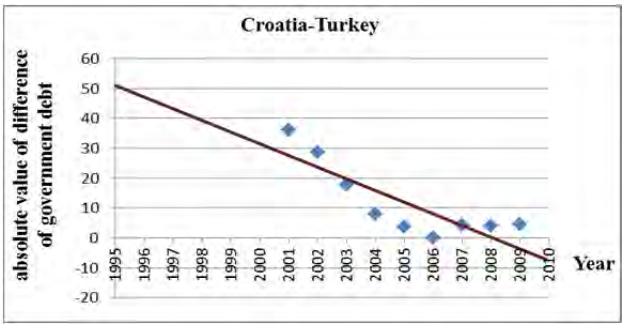
absolute value of difference of government debt
Year

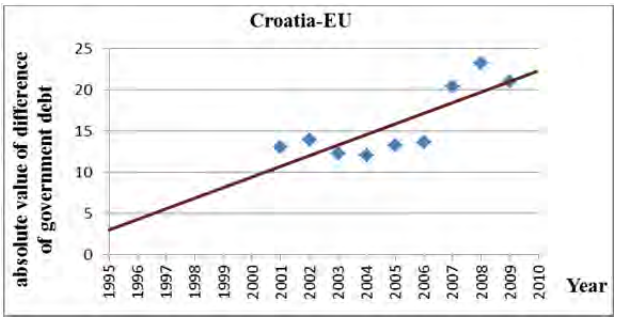

Croatia-Mauritania
absolute value of difference of government debt
Year

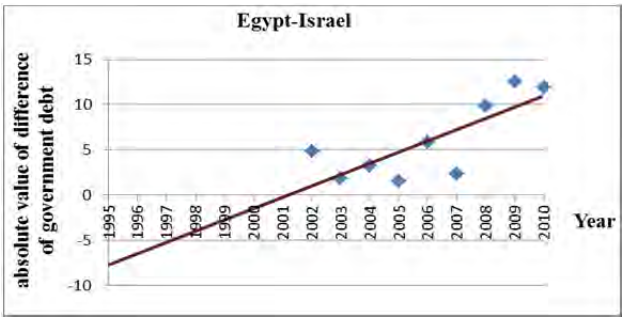

Croatia-Morocco
absolute value of difference of government debt
Year

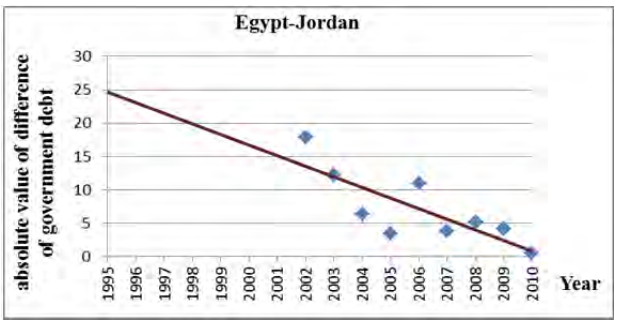

Croatia-Syria
absolute value of difference of government debt
Year

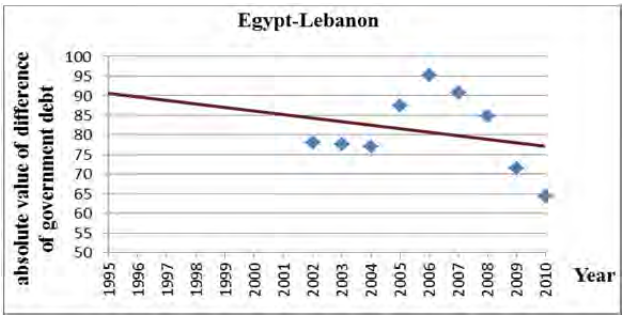

Croatia-Tunisia
absolute value of difference of government debt
Year

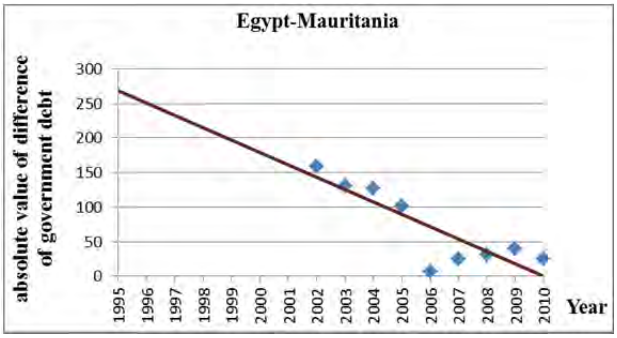

Croatia-Turkey
absolute value of difference of government debt
Year

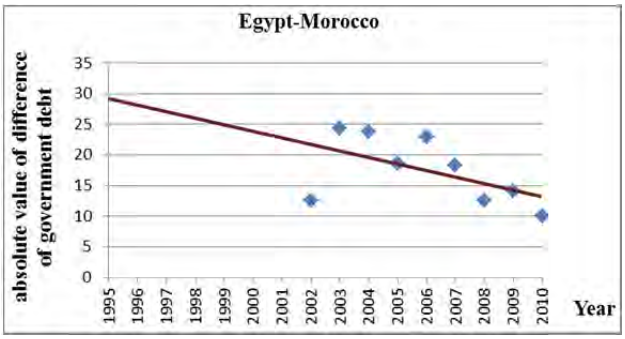

Croatia-EU
absolute value of difference of government debt
Year

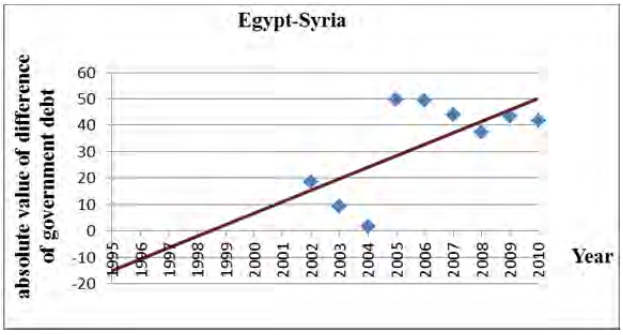

Egypt-Israel
absolute value of difference of government debt
Year

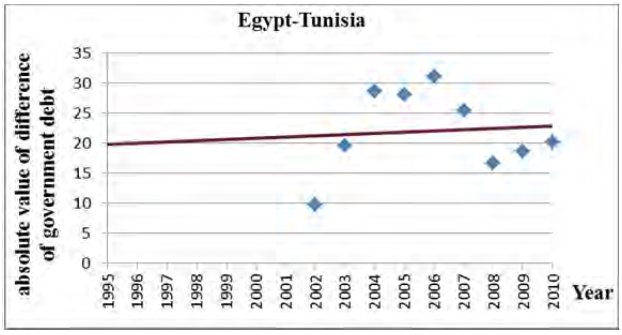

Egypt-Jordan
absolute value of difference of government debt
Year

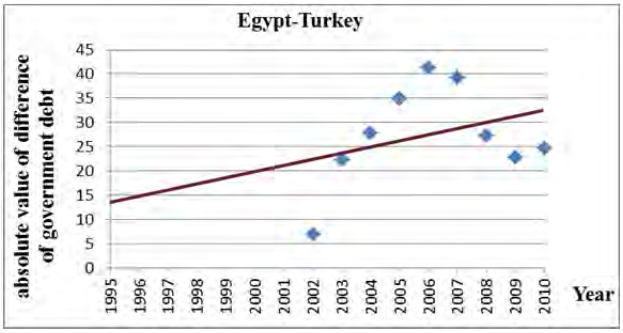

Egypt-Lebanon
absolute value of difference of government debt
Year

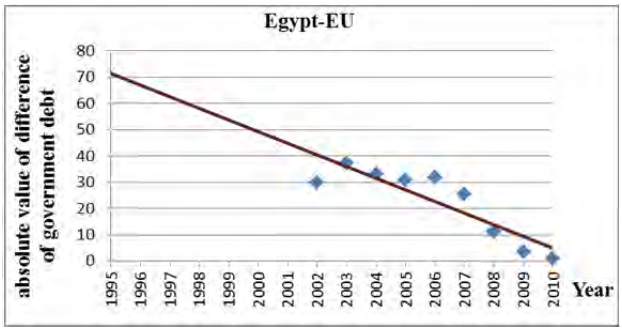

Egypt-Mauritania
absolute value of difference of government debt
Year

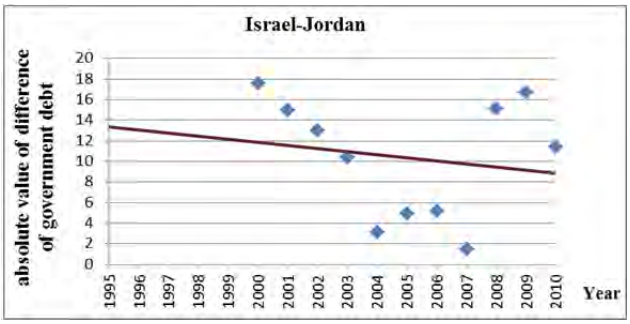

Egypt-Morocco
absolute value of difference of government debt
Year

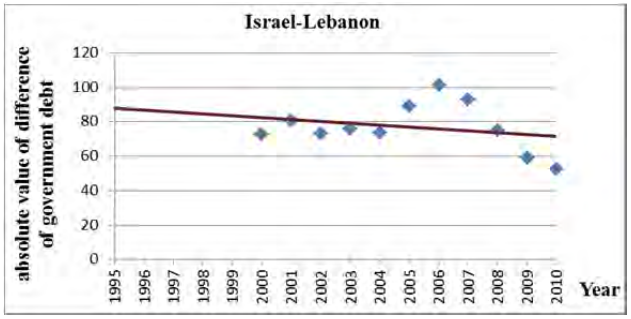

Egypt-Syria
absolute value of difference of government debt
Year

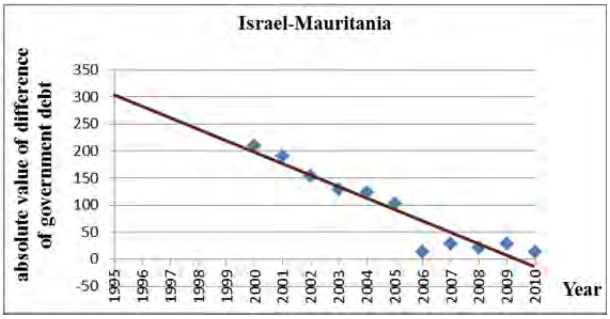

Egypt-Tunisia
absolute value of difference of government debt
Year

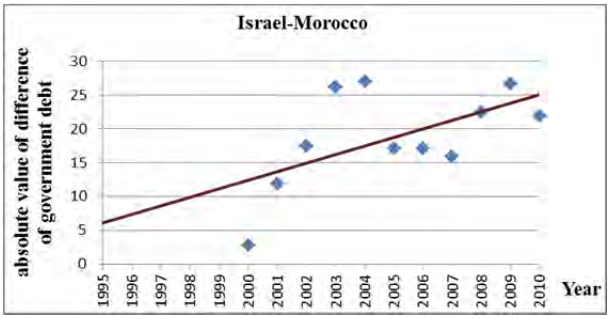

Egypt-Turkey
absolute value of difference of government debt
Year

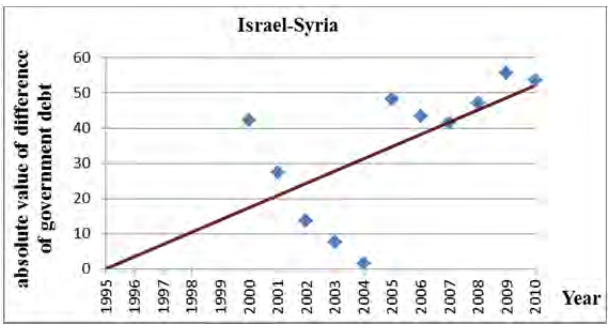

Egypt-EU
absolute value of difference of government debt
Year

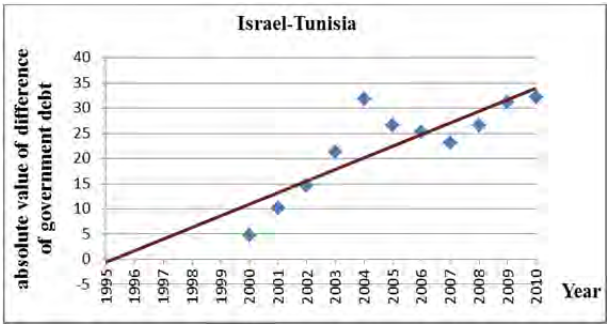

Israel-Jordan
absolute value of difference of government debt
Year

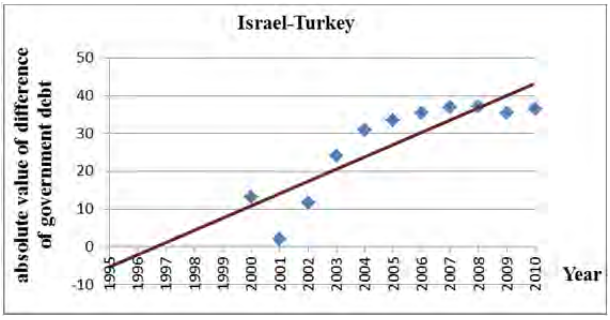

Israel-Lebanon
absolute value of difference of government debt
Year

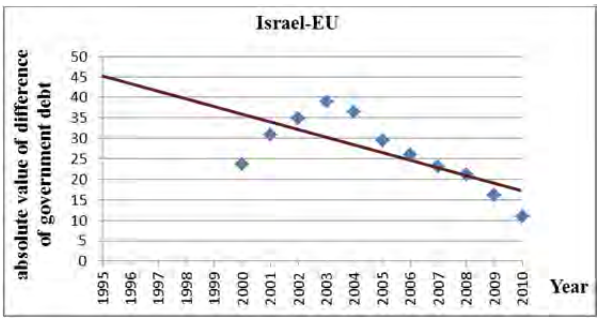

Israel-Mauritania
absolute value of difference of government debt
Year

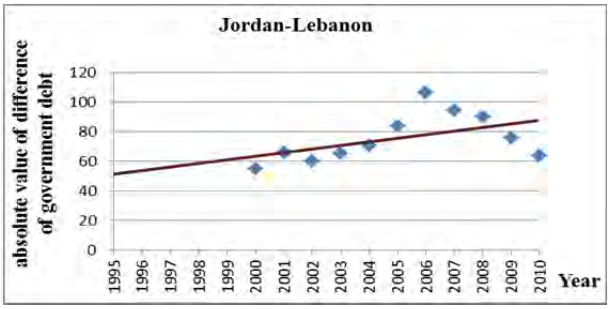

Israel-Morocco
absolute value of difference of government debt
Year

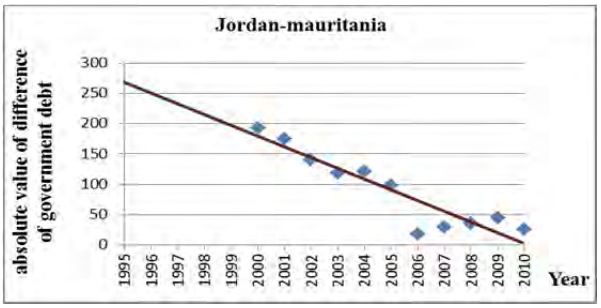

Israel-Syria
absolute value of difference of government debt
Year

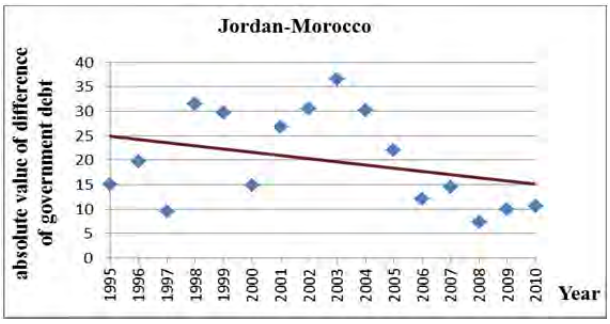

Israel-Tunisia
absolute value of difference of government debt
Year

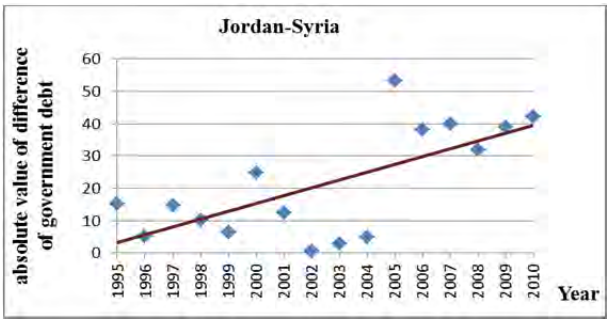

Israel-Turkey
absolute value of difference of government debt
Year


Israel-EU
absolute value of difference of government debt
Year


Jordan-Lebanon
absolute value of difference of government debt
Year


Jordan-mauritania
absolute value of difference of government debt
Year


Jordan-Morocco
absolute value of difference of government debt
Year


Jordan-Syria
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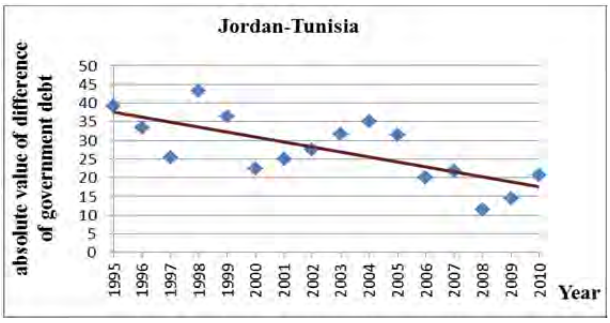
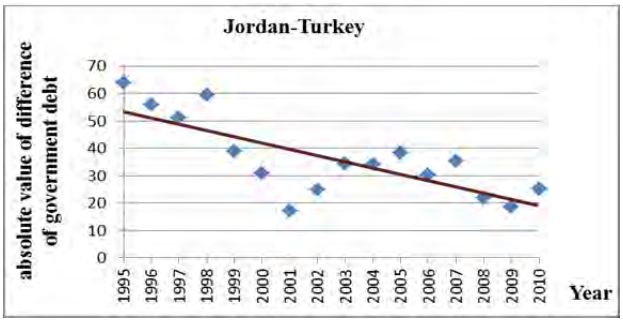
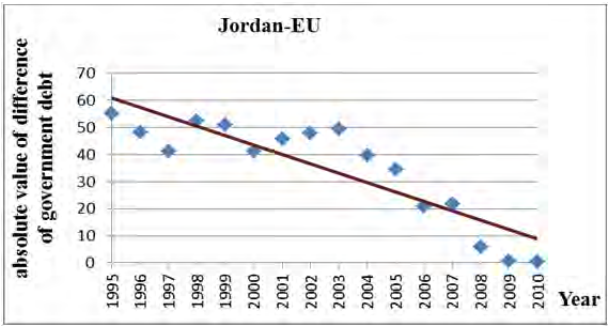
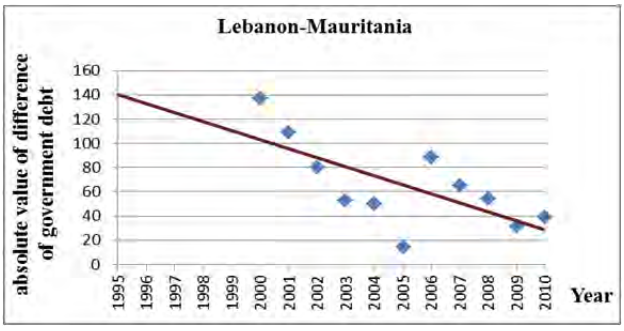
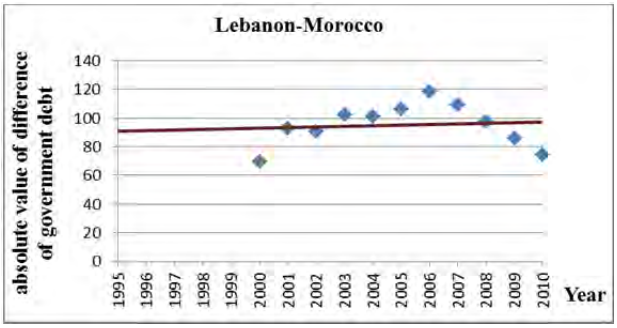
Year

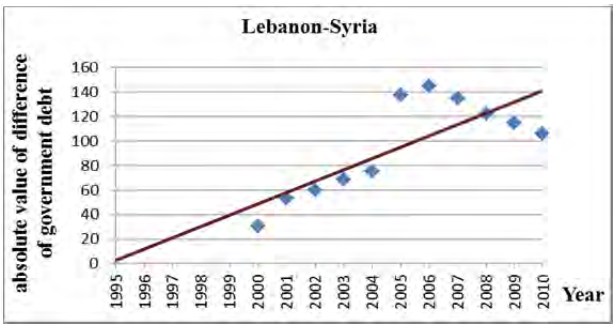

Jordan-Tunisia
absolute value of difference of government debt
Year

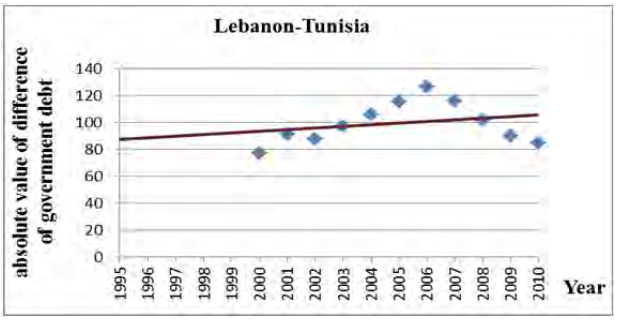

Jordan-Turkey
absolute value of difference of government debt
Year

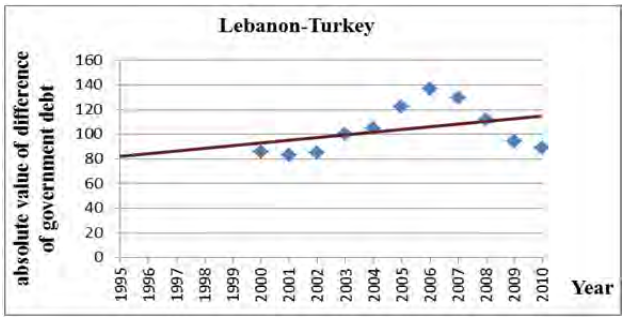

Jordan-EU
absolute value of difference of government debt
Year

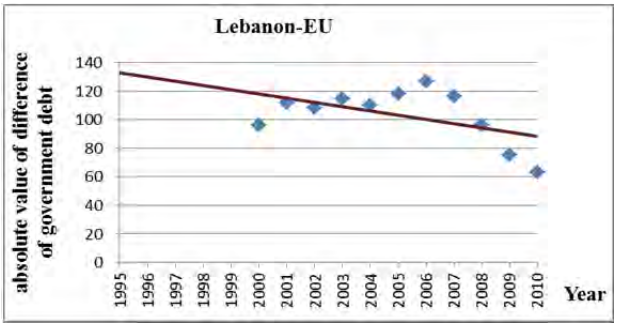

Lebanon-Mauritania
absolute value of difference of government debt
Year

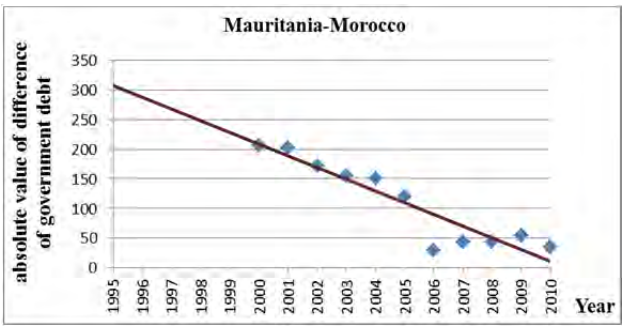

Lebanon-Morocco
absolute value of difference of government debt
Year

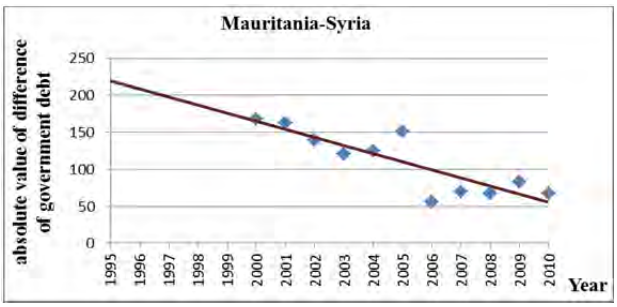

Lebanon-Syria
absolute value of difference of government debt
Year

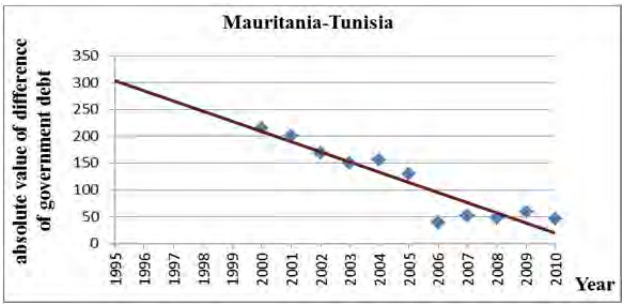

Lebanon-Tunisia
absolute value of difference of government debt
Year

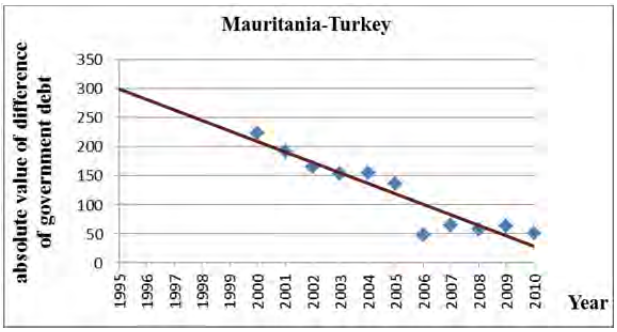

Lebanon-Turkey
absolute value of difference of government debt
Year

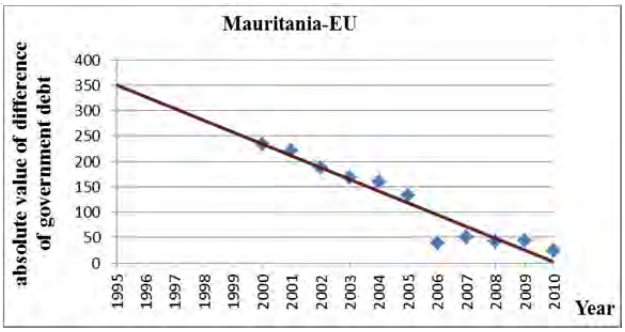

Lebanon-EU
absolute value of difference of government debt
Year

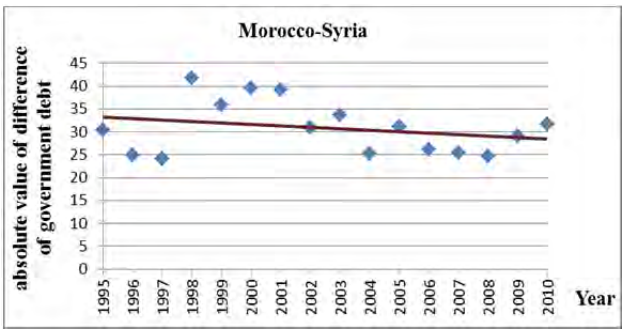

Mauritania-Morocco
absolute value of difference of government debt
Year

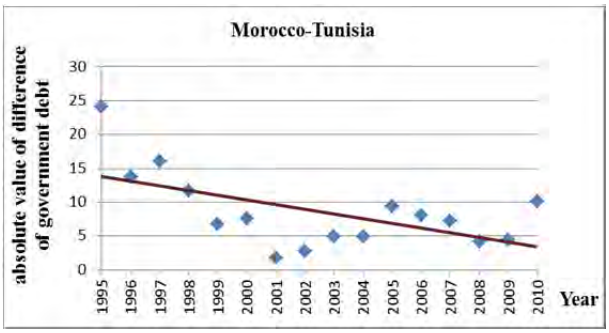

Mauritania-Syria
absolute value of difference of government debt
Year

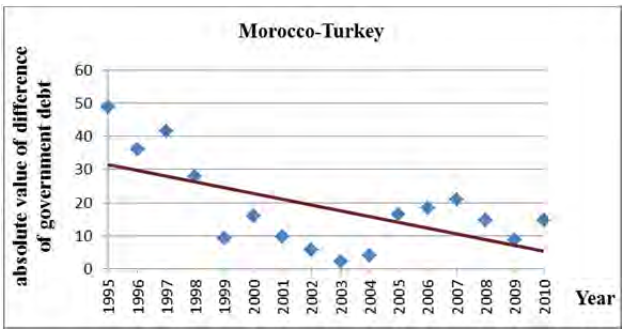

Mauritania-Tunisia
absolute value of difference of government debt
Year

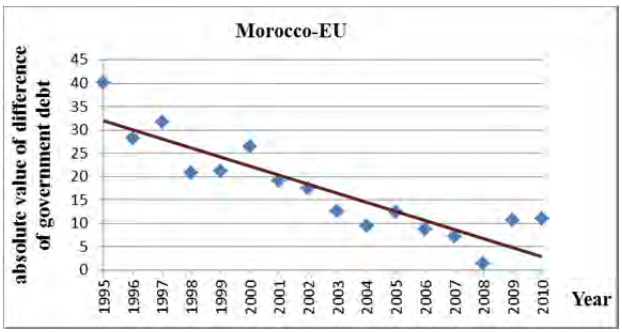

Mauritania-Turkey
absolute value of difference of government debt
Year

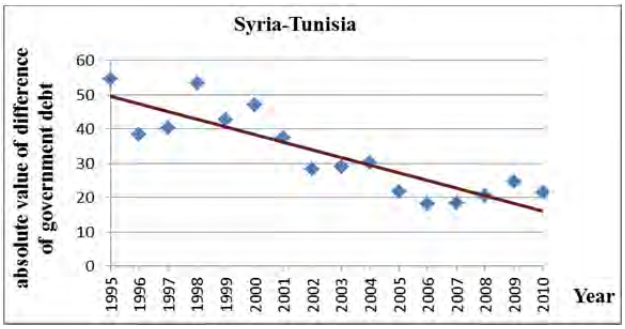

Mauritania-EU
absolute value of difference of government debt
Year

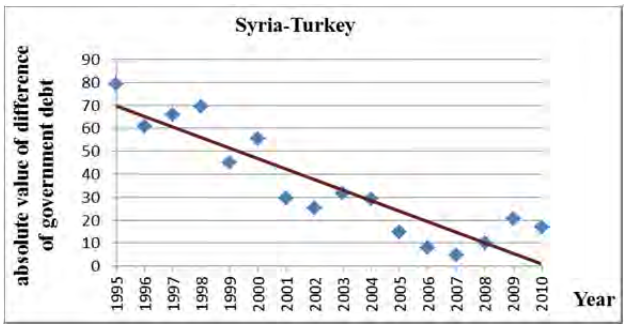

Morocco-Syria
absolute value of difference of government debt
Year

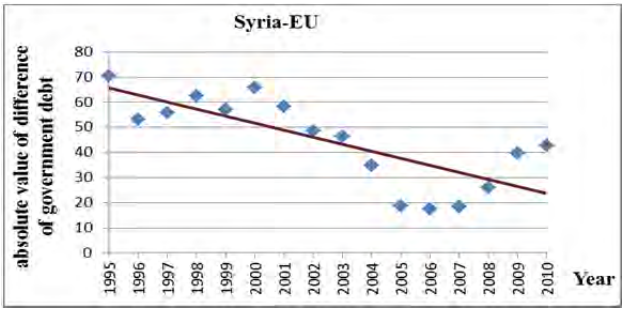

Morocco-Tunisia
absolute value of difference of government debt
Year

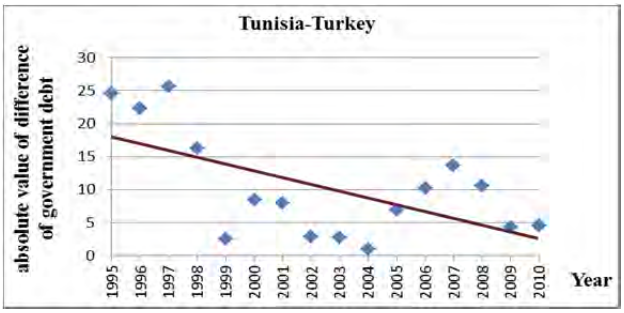

Morocco-Turkey
absolute value of difference of government debt
Year

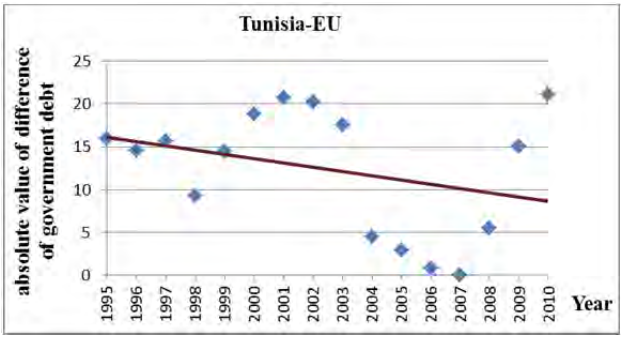

Morocco-EU
absolute value of difference of government debt
Year

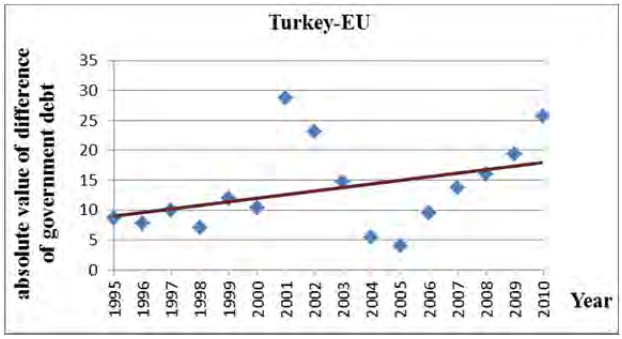

Syria-Tunisia
absolute value of difference of government debt
Year


Syria-Turkey
absolute value of difference of government debt
Year

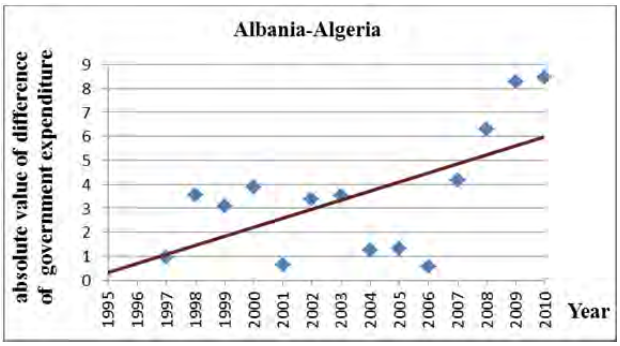

Syria-EU
absolute value of difference of government debt
Year

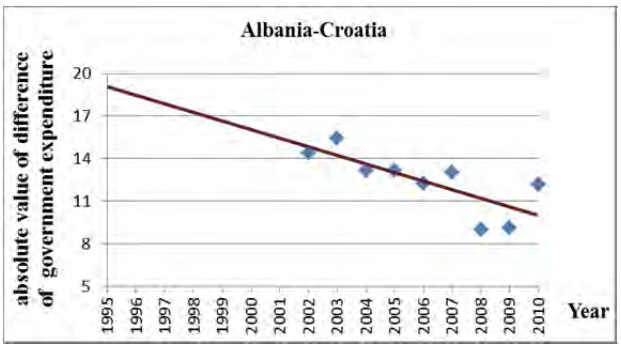

Tunisia-Turkey
absolute value of difference of government debt
Year

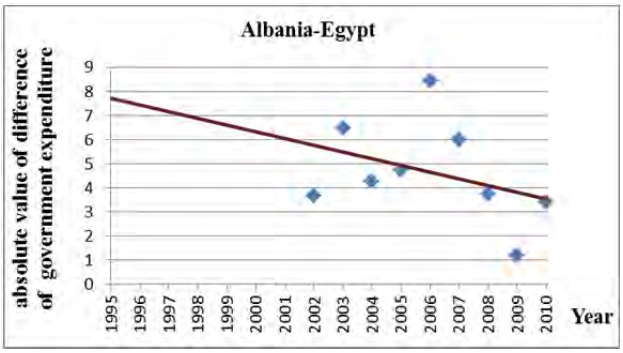

Tunisia-EU
absolute value of difference of government debt
25
20
15
10
5
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

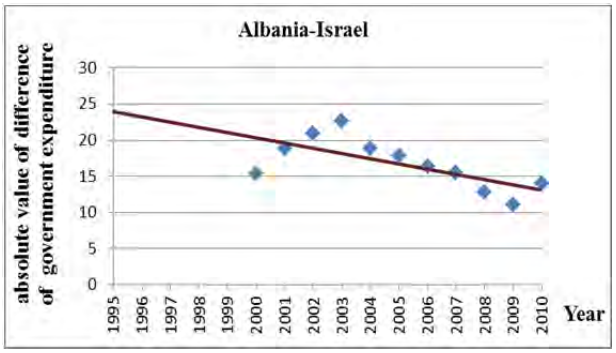

Turkey-EU
absolute value of difference of government debt
35
30
25
20
15
10
5
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

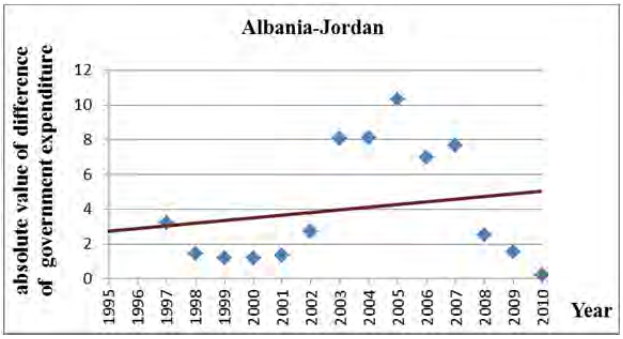
APPENDIX VI: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF GOVERNMENT EXPENDITURE' OF ALL PAIRS

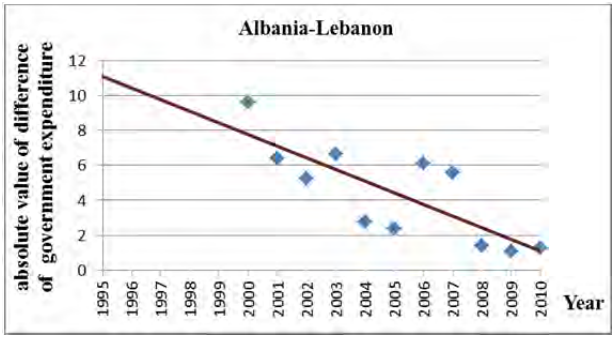


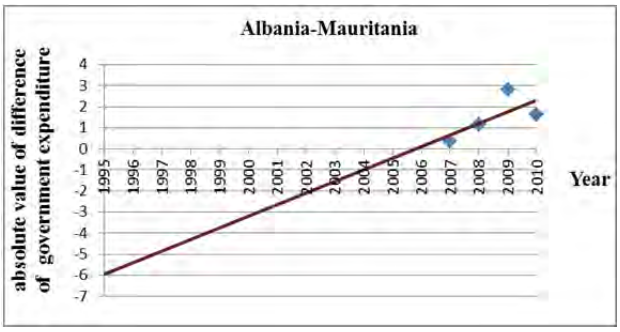


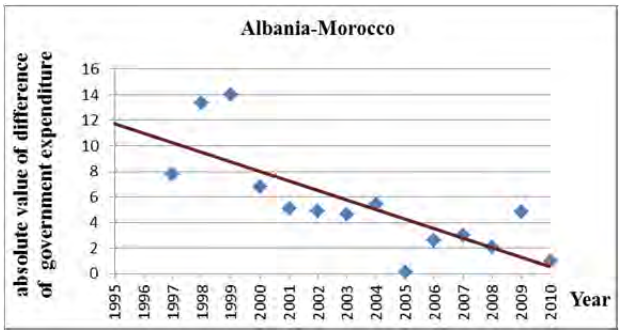


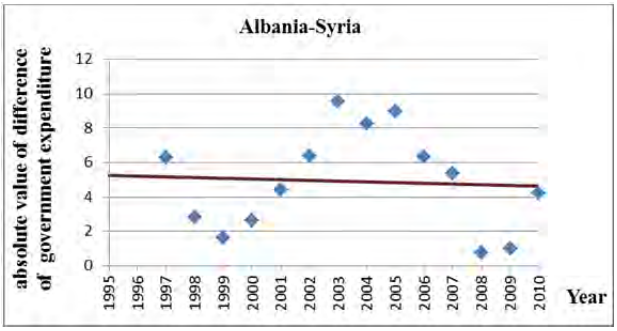


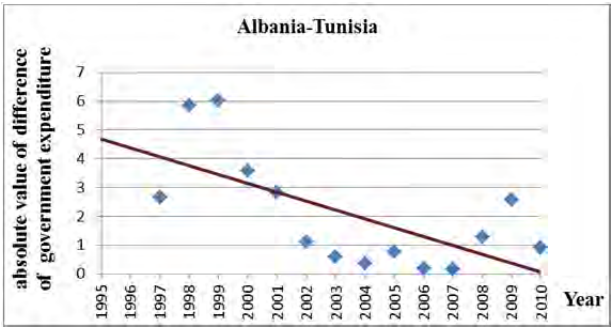


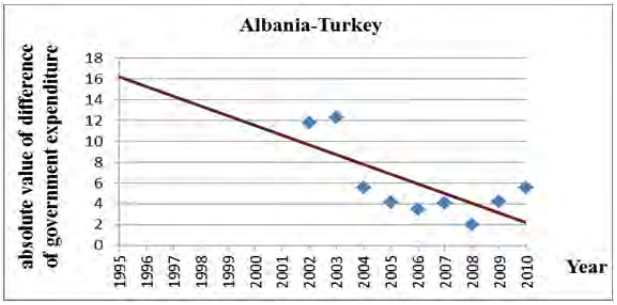


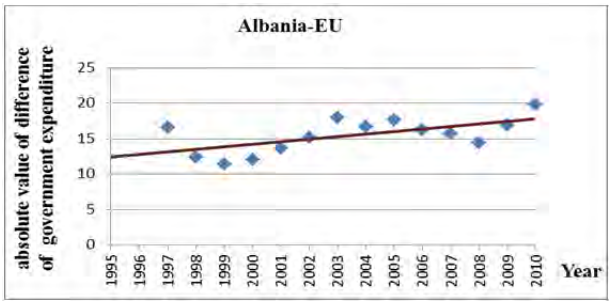


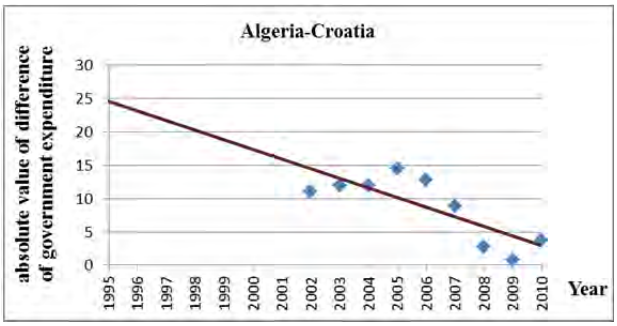


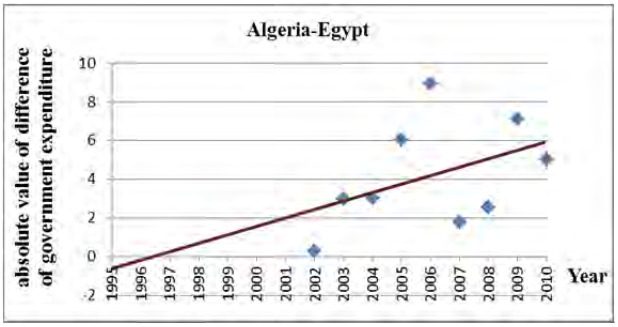

Albania-Syria
absolute value of difference of government expenditure
Year

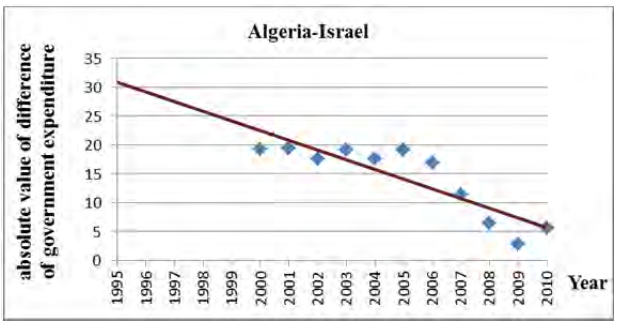

Albania-Tunisia
absolute value of difference of government expenditure
Year

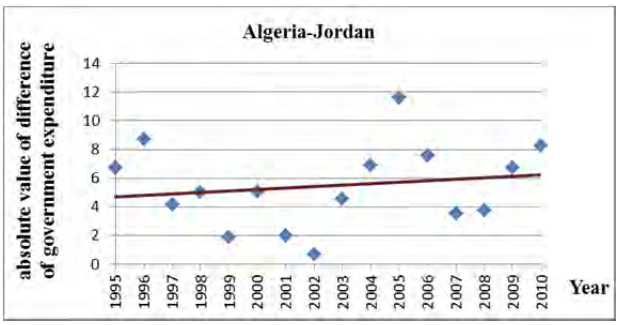

Albania-Turkey
absolute value of difference of government expenditure
Year

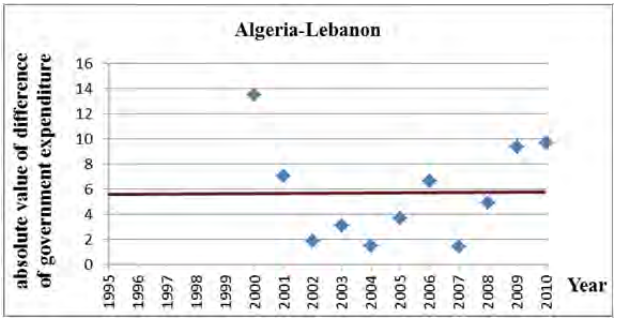

Albania-EU
absolute value of difference of government expenditure
Year

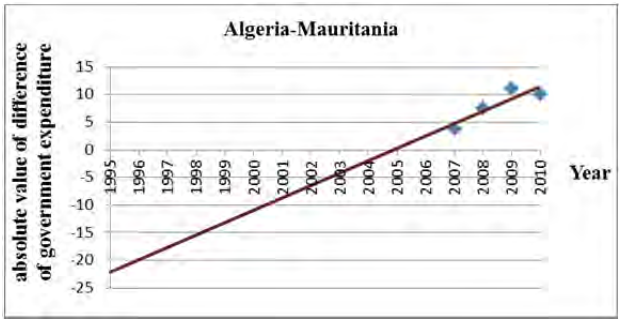

Algeria-Croatia
absolute value of difference of government expenditure
Year

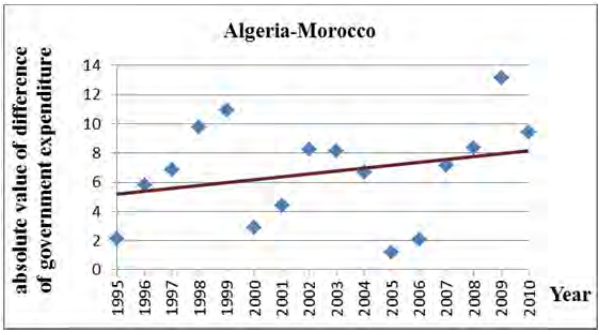

Algeria-Egypt
absolute value of difference of government expenditure
Year

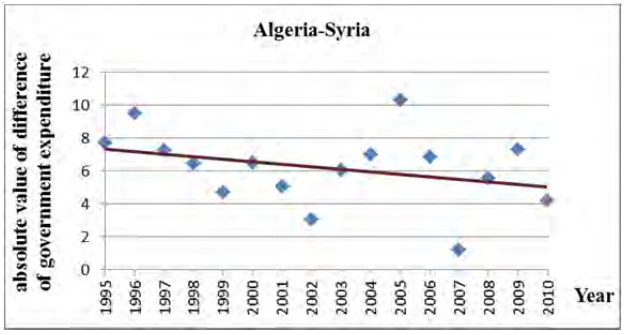

Algeria-Israel
absolute value of difference of government expenditure
Year

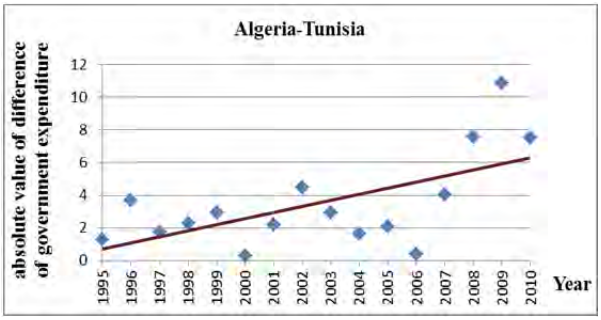

Algeria-Jordan
absolute value of difference of government expenditure
Year

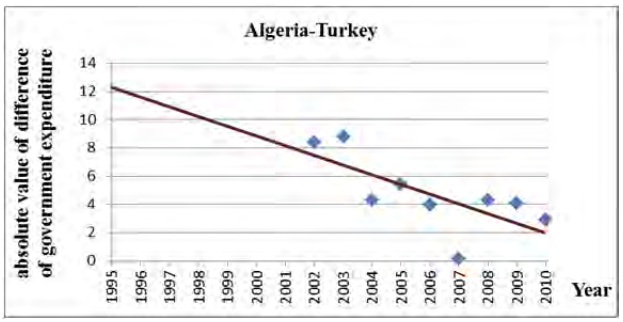

Algeria-Lebanon
absolute value of difference of government expenditure
Year

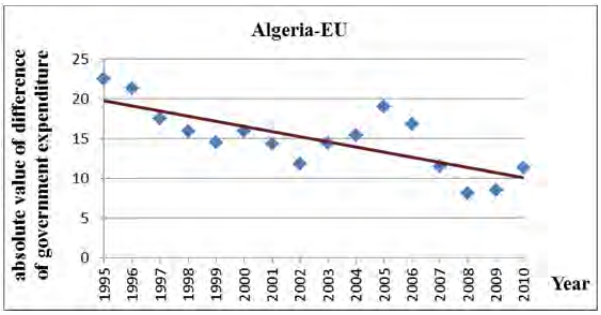

Algeria-Mauritania
absolute value of difference of government expenditure
Year

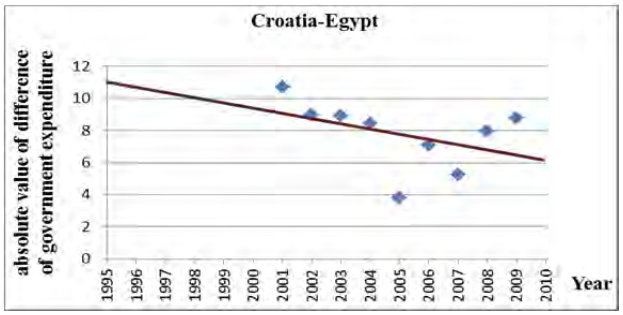

Algeria-Morocco
absolute value of difference of government expenditure
Year

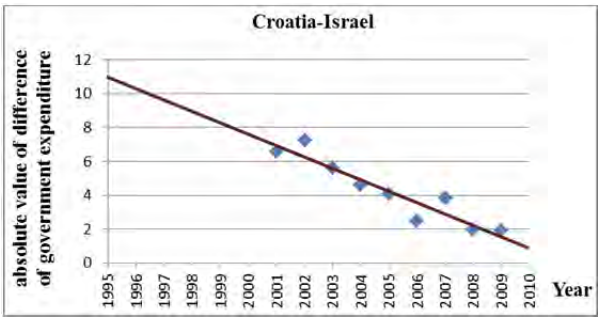

Algeria-Syria
absolute value of difference of government expenditure
Year

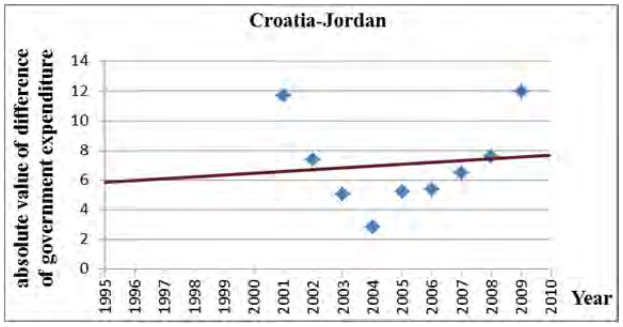

Algeria-Tunisia
absolute value of difference of government expenditure
Year


Algeria-Turkey
absolute value of difference of government expenditure
Year


Algeria-EU
absolute value of difference of government expenditure
Year


Croatia-Egypt
absolute value of difference of government expenditure
Year


Croatia-Israel
absolute value of difference of government expenditure
Year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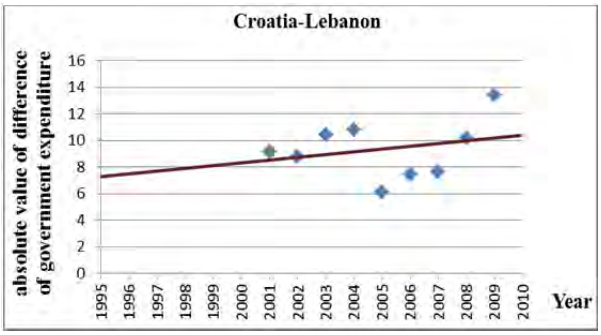
absolute value of difference of government expenditure
Year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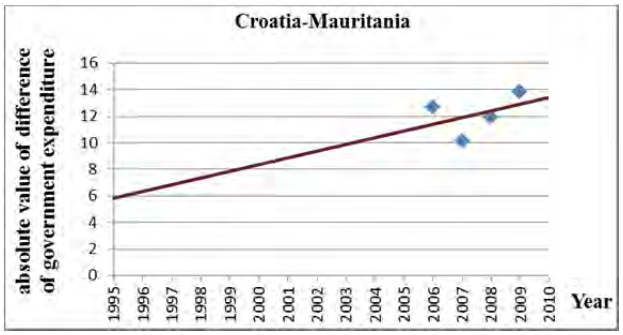
absolute value of difference of government expenditure
Year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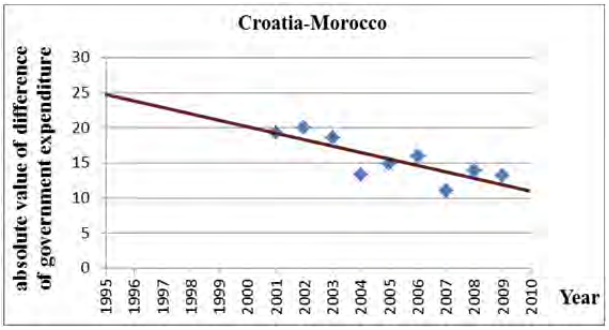
absolute value of difference of government expenditure
Year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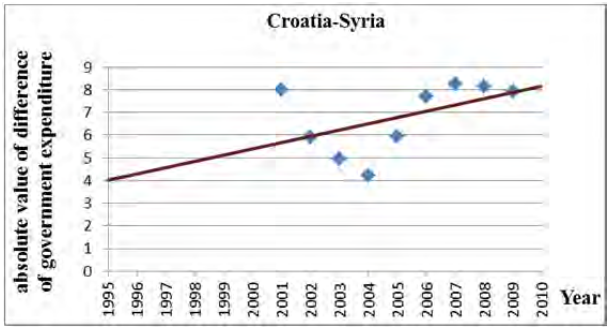
absolute value of difference of government expenditure
Year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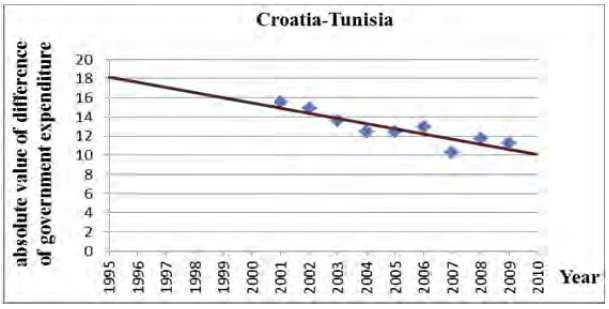
absolute value of difference of government expenditure
Year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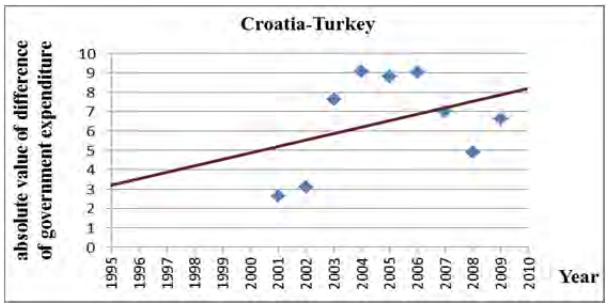
absolute value of difference of government expenditure
Year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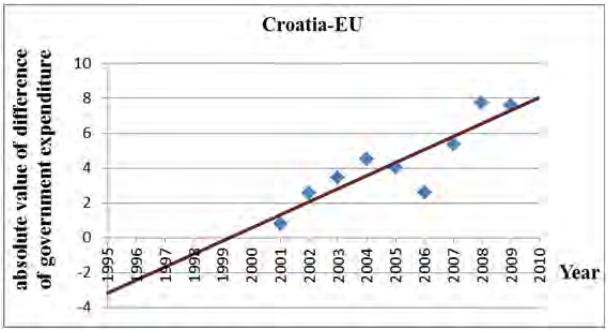
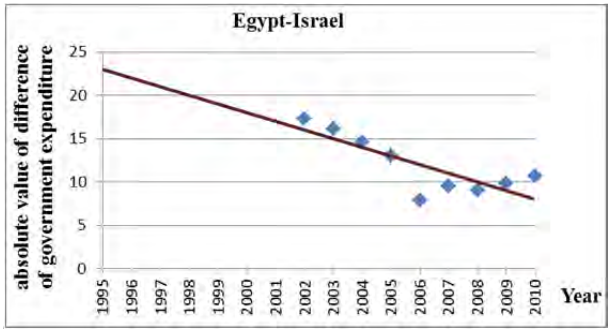
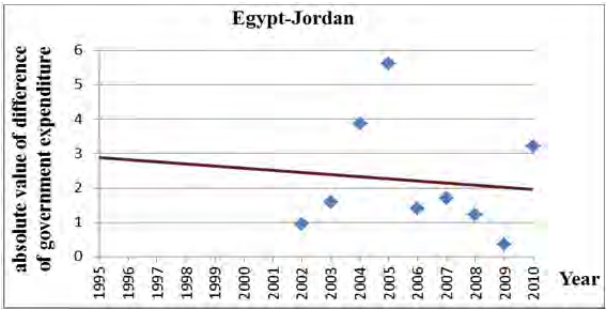
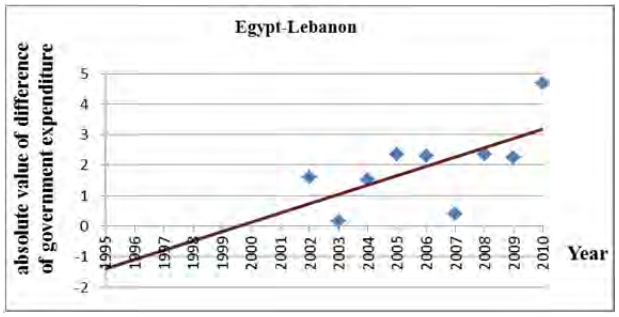
absolute value of difference of government expenditure
Year


Croatia-EU
absolute value of difference of government expenditure
Year


Egypt-Israel
absolute value of difference of government expenditure
Year


Egypt-Jordan
absolute value of difference of government expenditure
Year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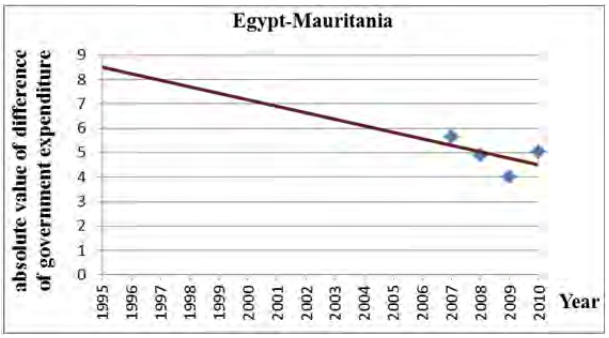
absolute value of difference of government expenditure
Year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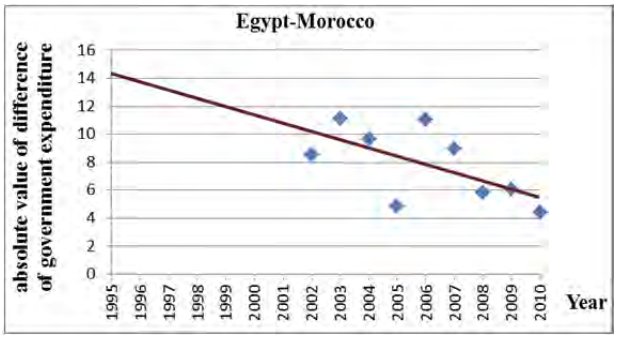
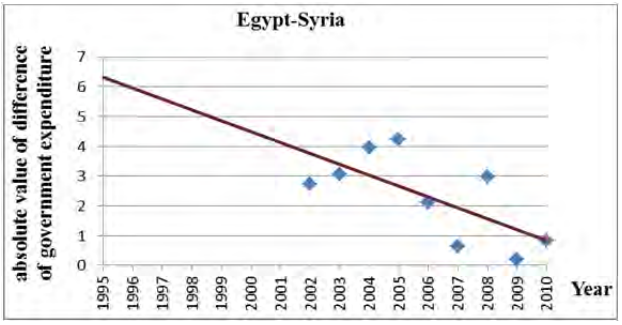
absolute value of difference of government expenditure
Year


Egypt-Morocco
absolute value of difference of government expenditure
Year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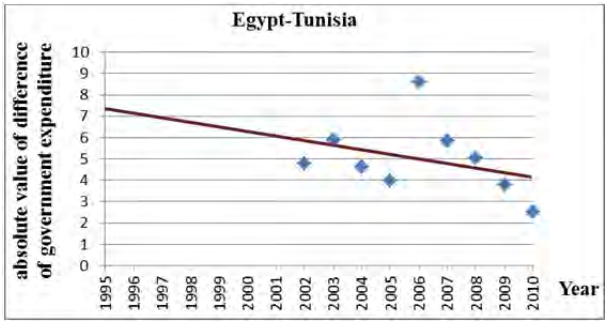
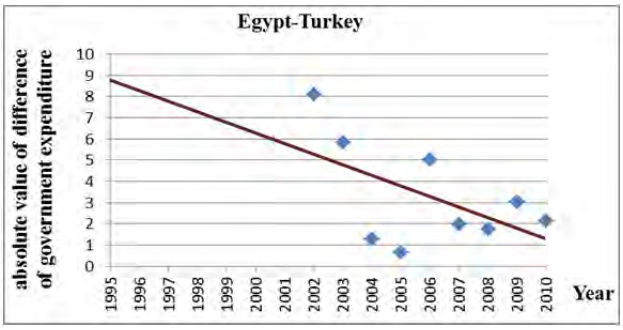
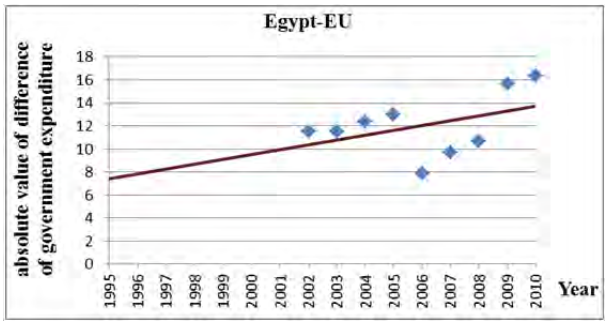
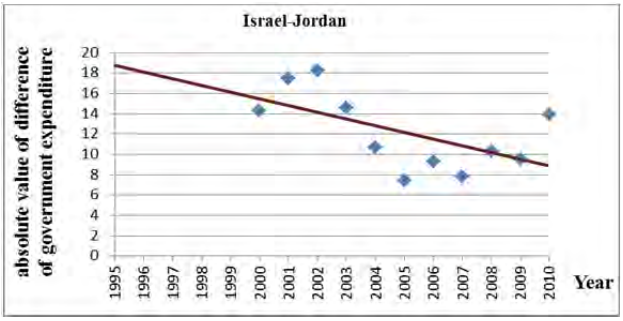
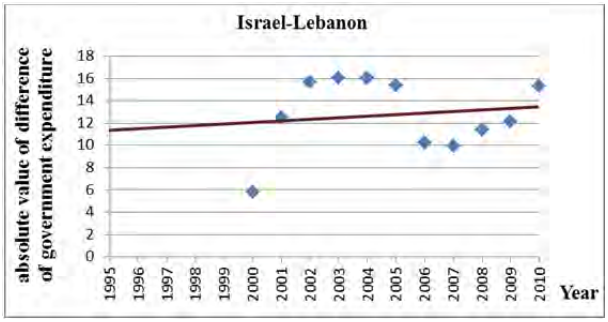
absolute value of difference of government expenditure
Year

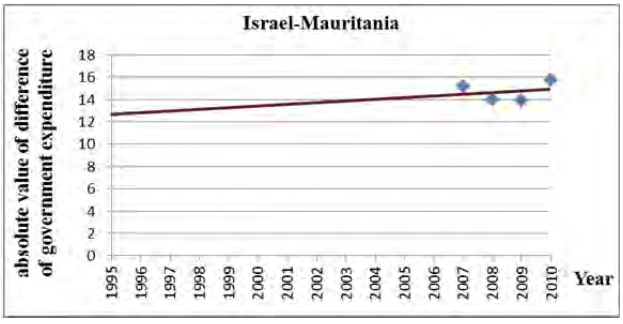

Egypt-Tunisia
absolute value of difference of government expenditure
Year

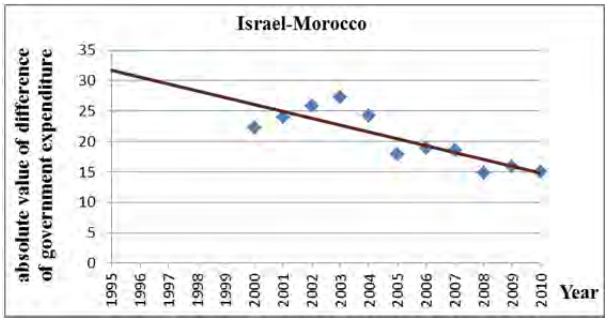

Egypt-Turkey
absolute value of difference of government expenditure
Year

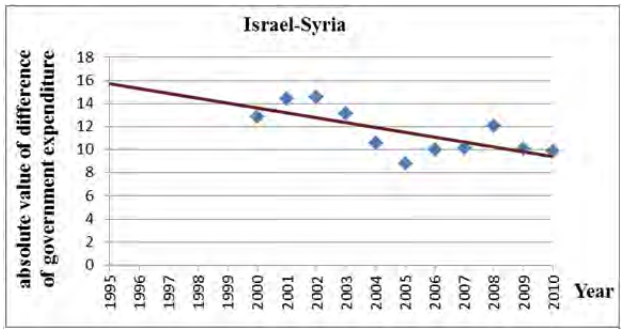

Egypt-EU
absolute value of difference of government expenditure
Year


Israel-Jordan
absolute value of difference of government expenditure
Year


Israel-Lebanon
absolute value of difference of government expenditure
Year


Israel-Mauritania
absolute value of difference of government expenditure
Year


Israel-Morocco
absolute value of difference of government expenditure
Year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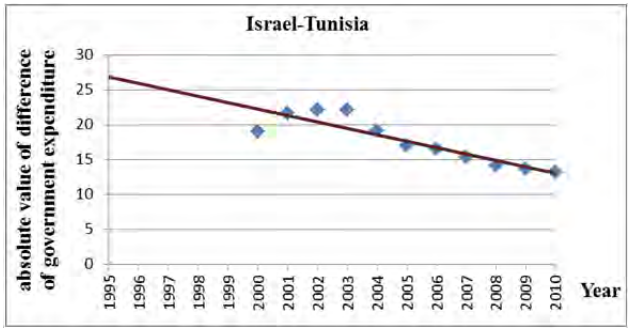
absolute value of difference of government expenditure
Year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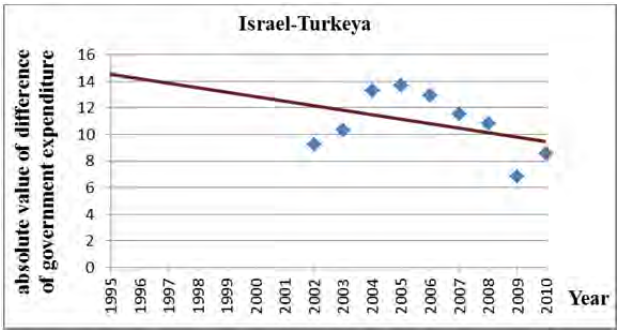
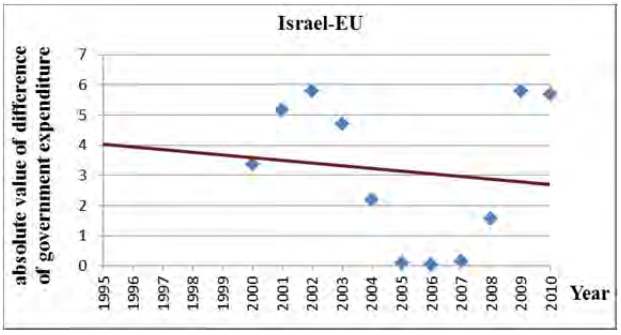
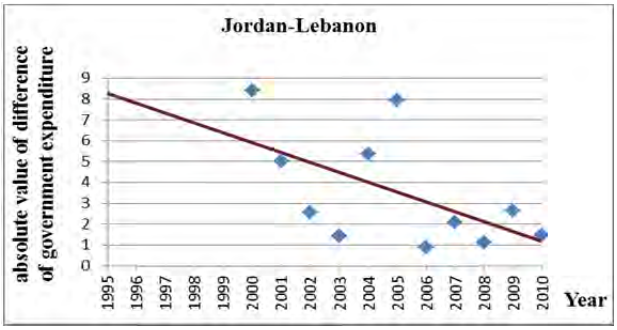
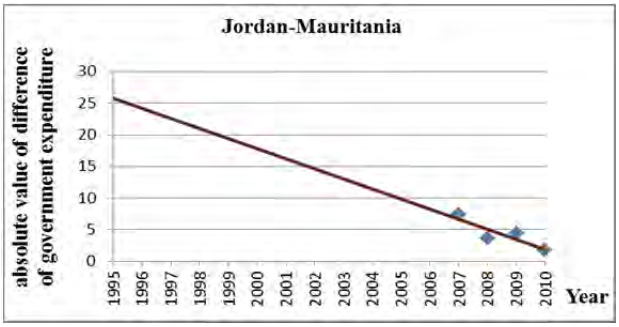
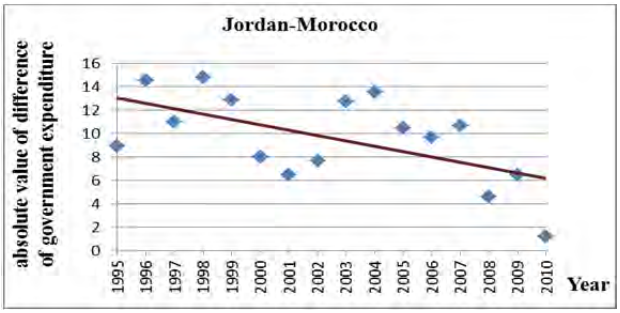
absolute value of difference of government expenditure
Year


Israel-Turkeya
absolute value of difference of government expenditure
Year


Israel-EU
absolute value of difference of government expenditure
Year


Jordan-Lebanon
absolute value of difference of government expenditure
Year


Jordan-Mauritania
absolute value of difference of government expenditure
Year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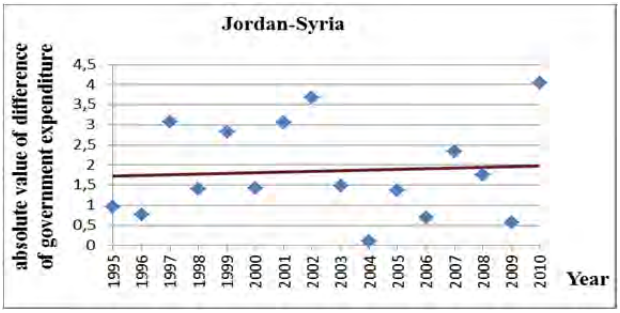
Year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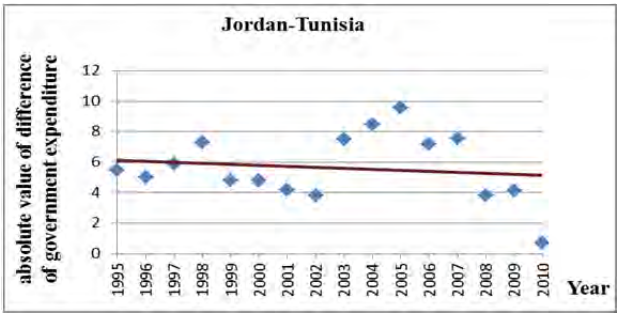
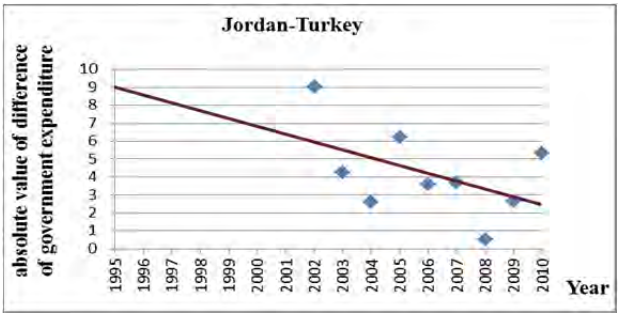
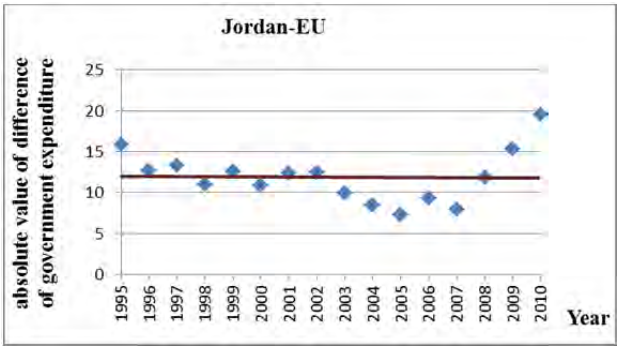
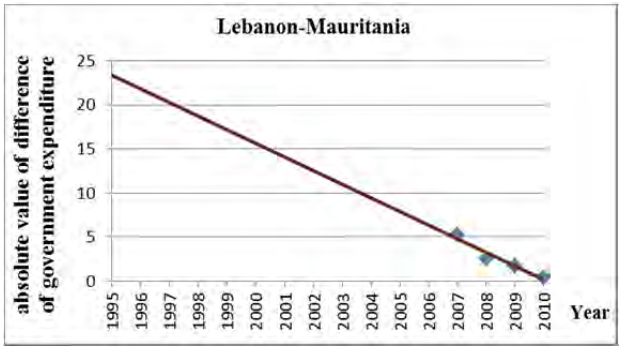
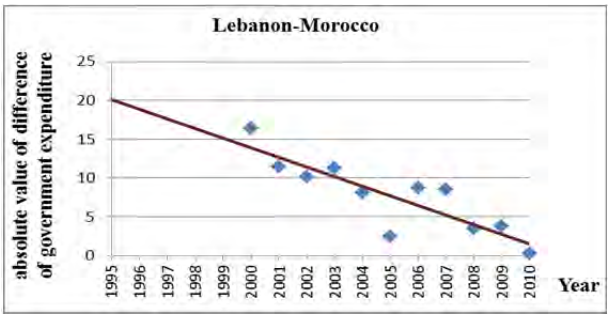

Jordan-Tunisia
absolute value of difference of government expenditure
Year


Jordan-Turkey
absolute value of difference of government expenditure
Year


Jordan-EU
absolute value of difference of government expenditure
Year


Lebanon-Mauritania
absolute value of difference of government expenditure
Year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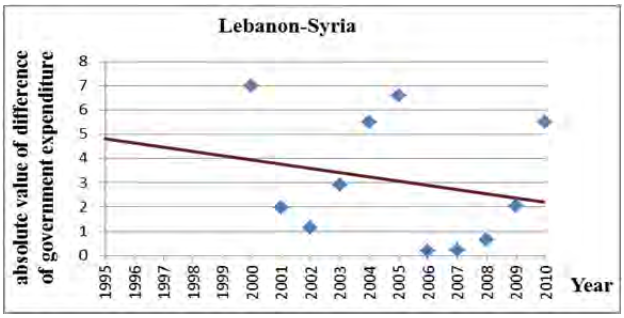
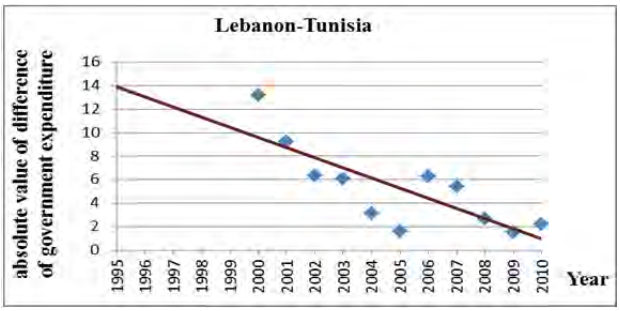
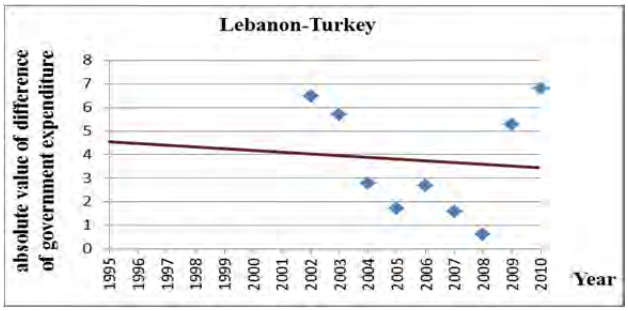
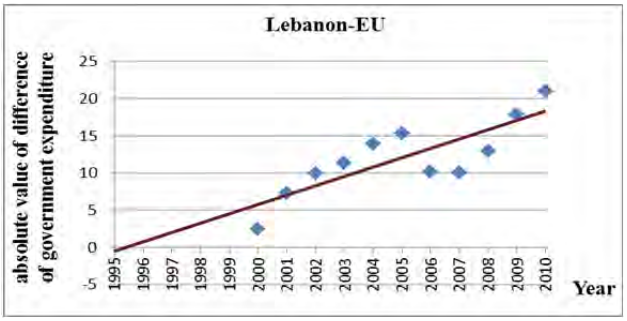
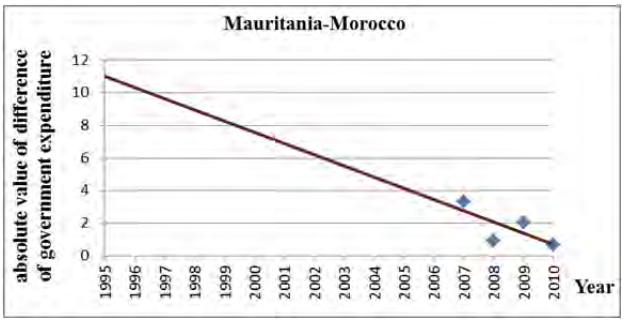
absolute value of difference of government expenditure
Year

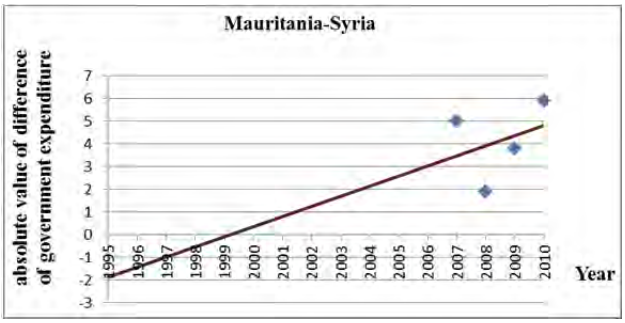

Lebanon-Syria
absolute value of difference of government expenditure
Year

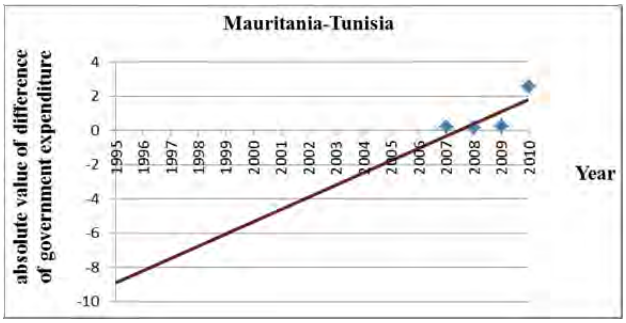

Lebanon-Tunisia
absolute value of difference of government expenditure
Year


Lebanon-Turkey
absolute value of difference of government expenditure
Year


Lebanon-EU
absolute value of difference of government expenditure
Year


Mauritania-Morocco
absolute value of difference of government expenditure
Year


Mauritania-Syria
absolute value of difference of government expenditure
Year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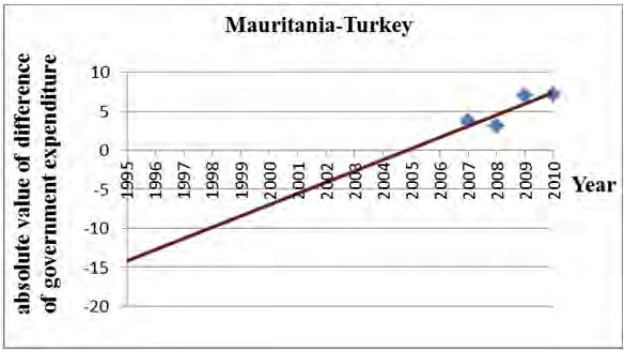
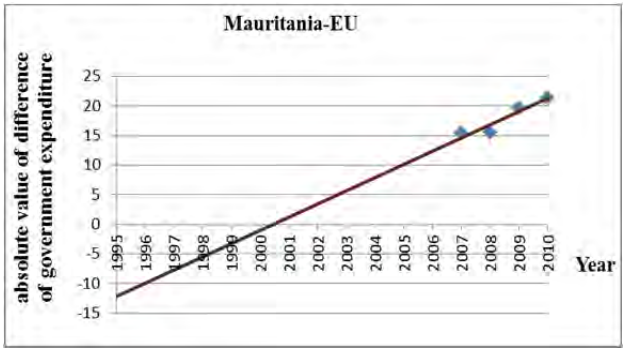
absolute value of difference of government expenditure
Year


Mauritania-Turkey
absolute value of difference of government expenditure
Year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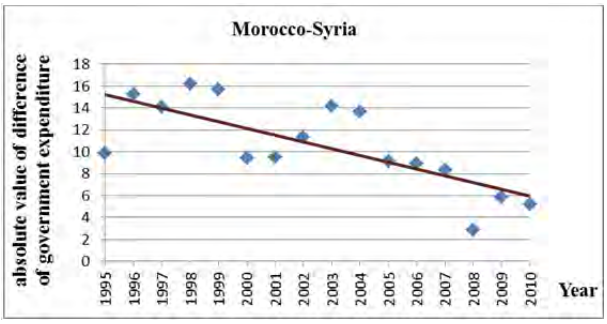
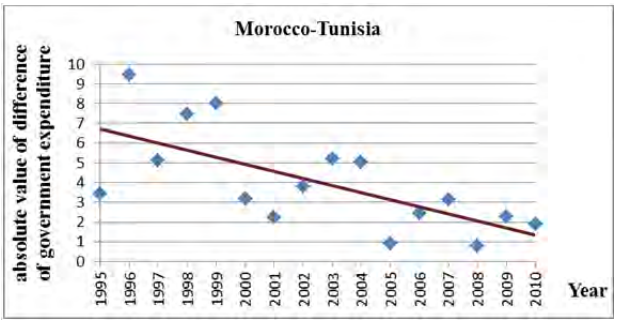
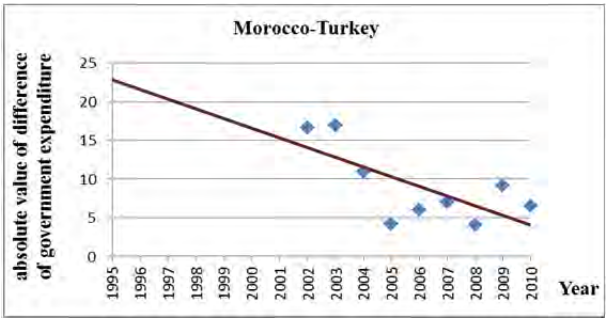
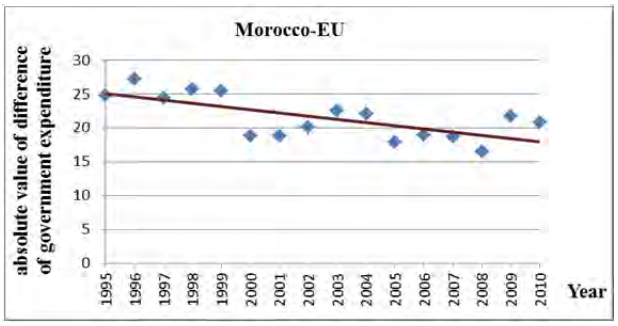
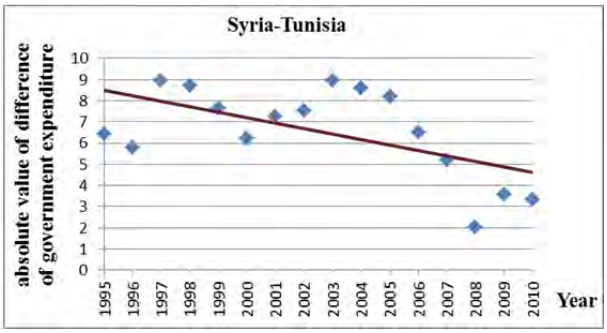
absolute value of difference of government expenditure
Year

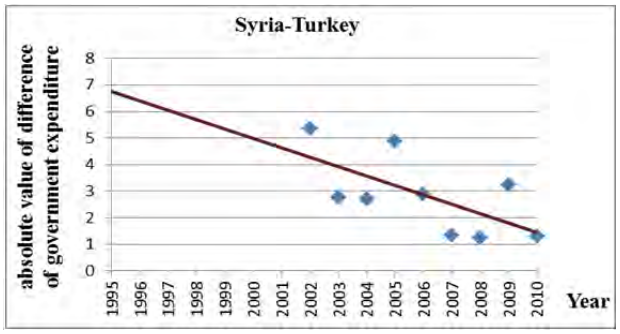

Morocco-Syria
absolute value of difference of government expenditure
Year

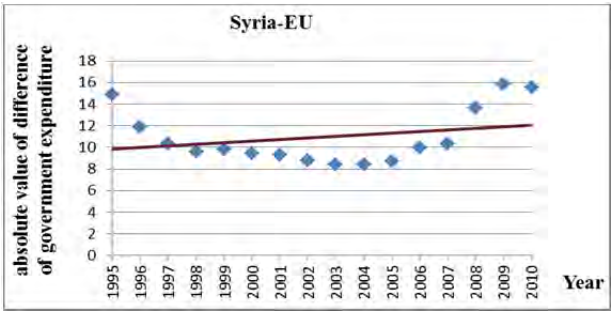

Morocco-Tunisia
absolute value of difference of government expenditure
Year

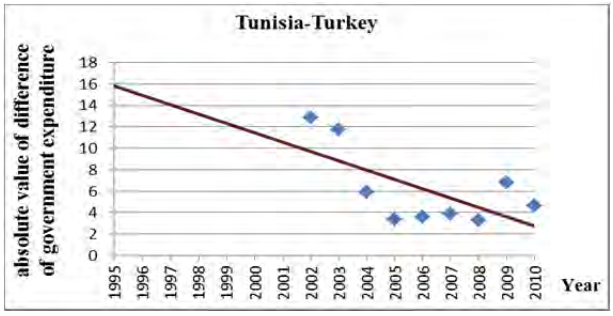

Morocco-Turkey
absolute value of difference of government expenditure
Year

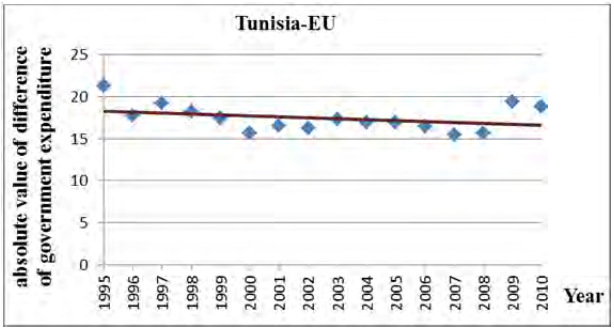

Morocco-EU
absolute value of difference of government expenditure
Year

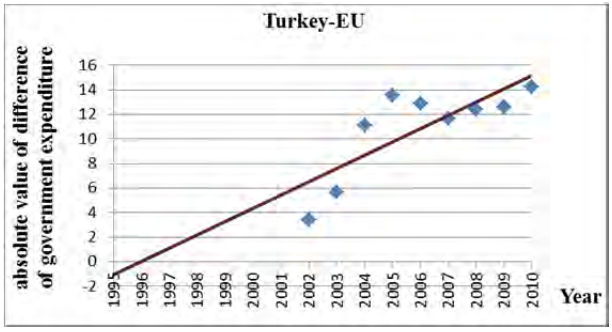

Syria-Tunisia
absolute value of difference of government expenditure
Year


Syria-Turkey
absolute value of difference of government expenditure
Year

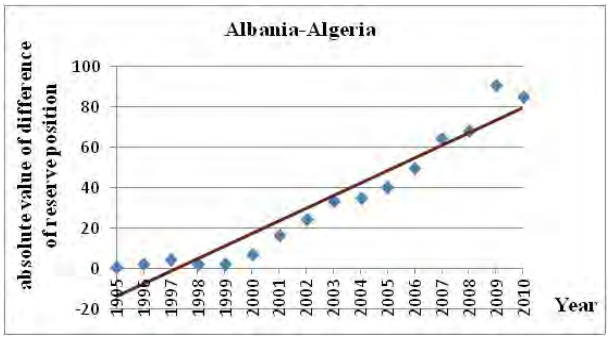

Syria-EU
absolute value of difference of government expenditure
Year

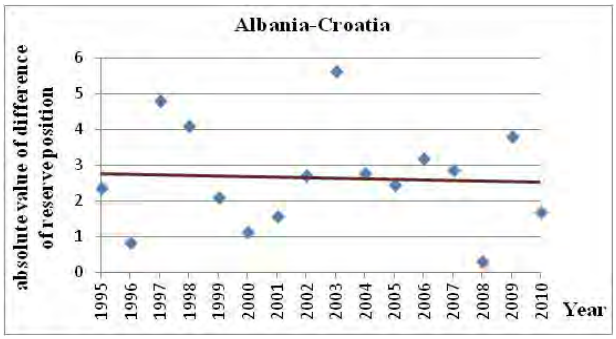

Tunisia-Turkey
absolute value of difference of government expenditure
Year

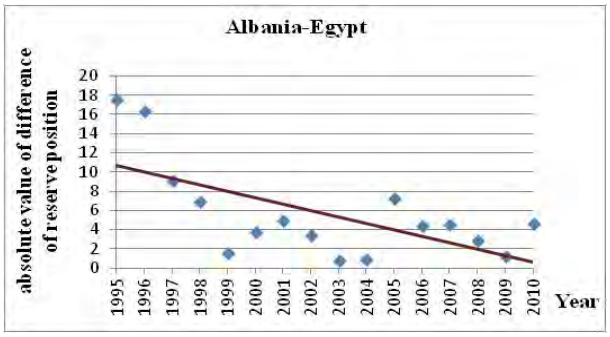

Tunisia-EU
absolute value of difference of government expenditure
Year

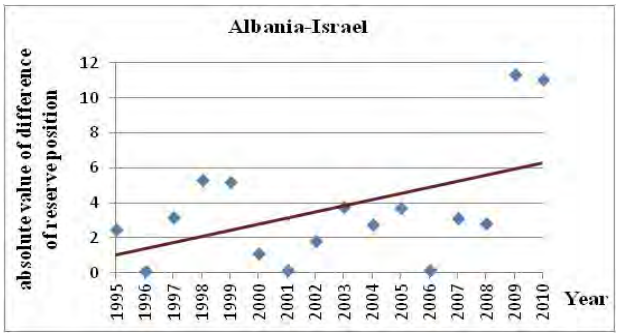

Turkey-EU
absolute value of difference of government expenditure
Year

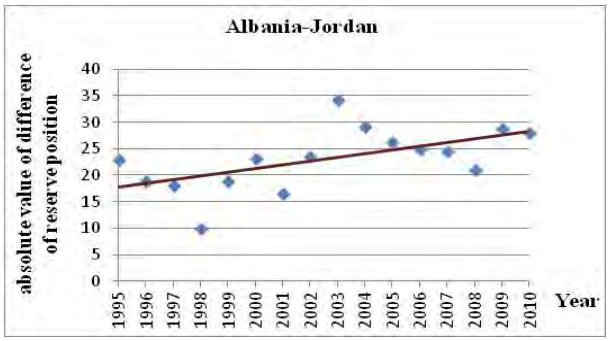
APPENDIX VII: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF RESERVE POSITION' OF ALL PAIRS

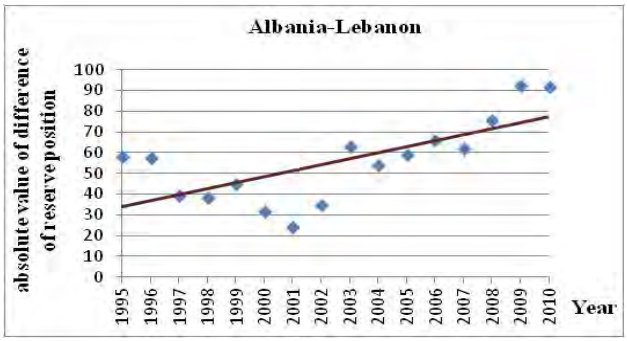


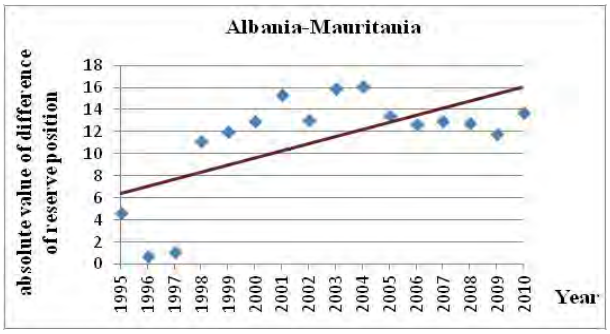


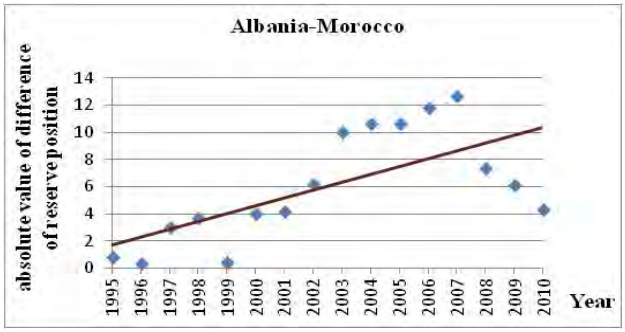


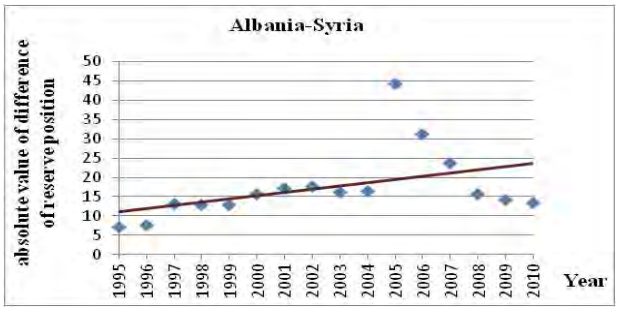


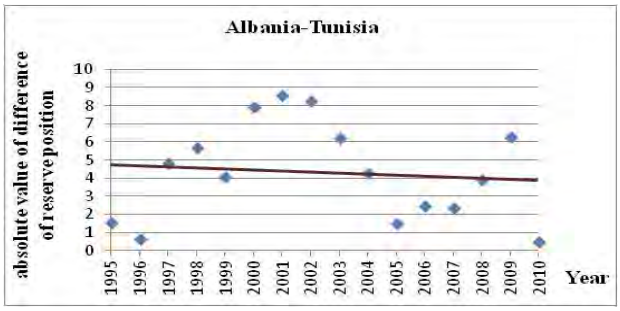


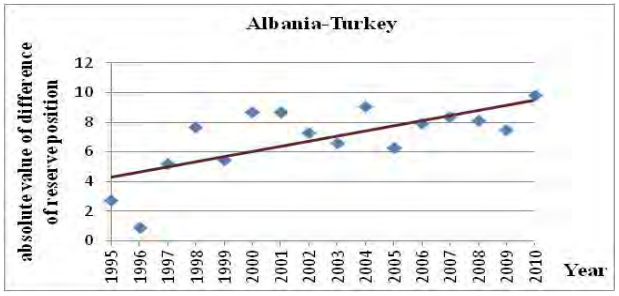


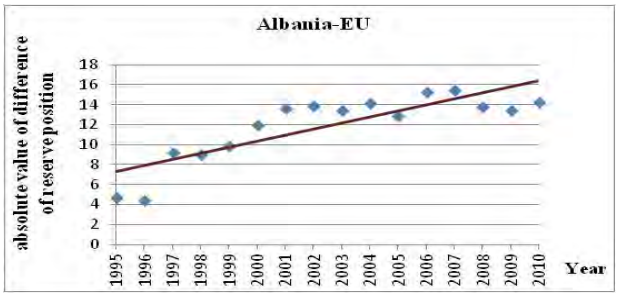


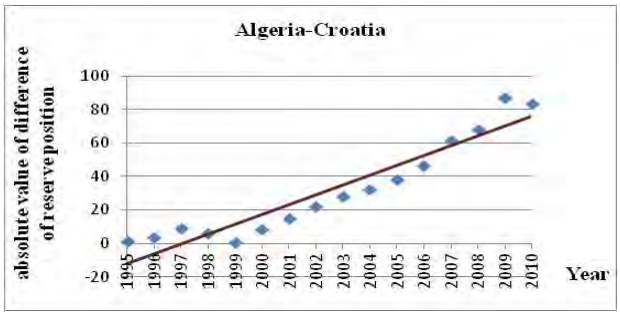


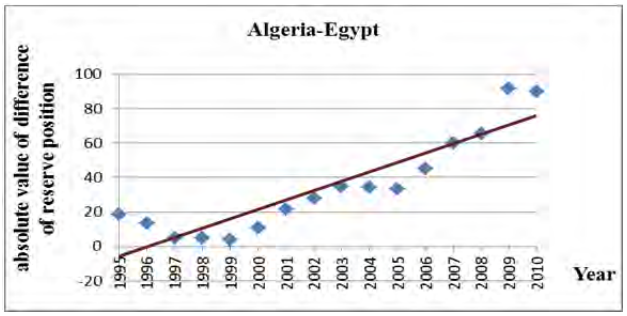

Albania-Syria
absolute value of difference of reserve position
Year

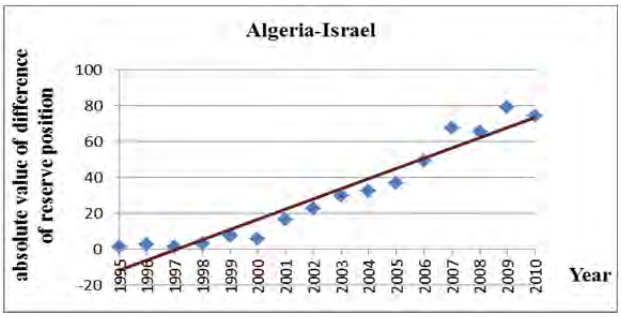

Albania-Tunisia
absolute value of difference of reserve position
Year

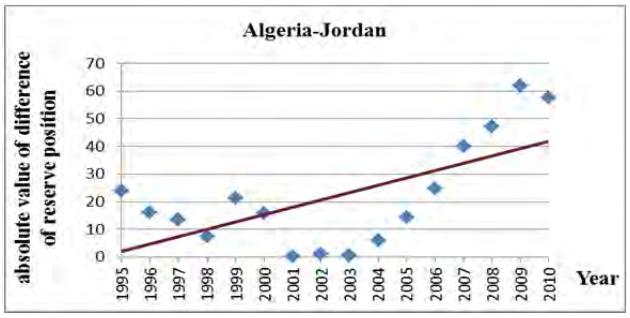

Albania-Turkey
absolute value of difference of reserve position
Year

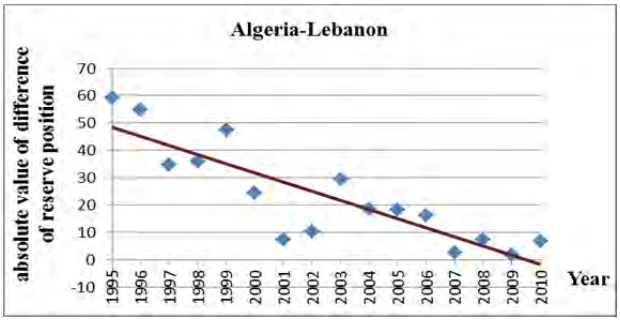

Albania-EU
absolute value of difference of reserve position
Year


Algeria-Croatia
absolute value of difference of reserve position
Year

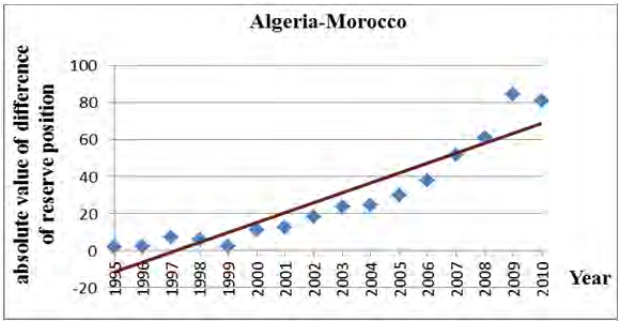

Algeria-Egypt
absolute value of difference of reserve position
Year

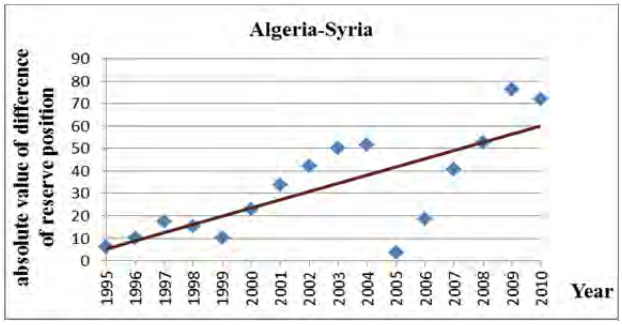

Algeria-Israel
absolute value of difference of reserve position
Year

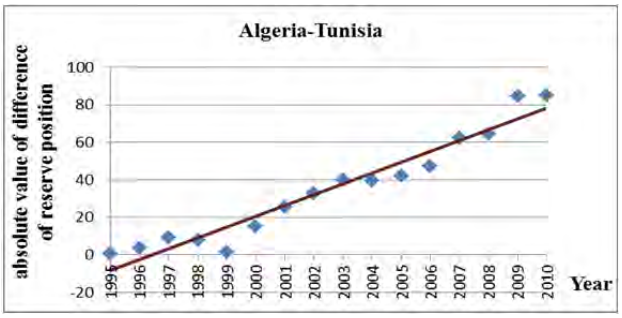

Algeria-Jordan
absolute value of difference of reserve position
Year

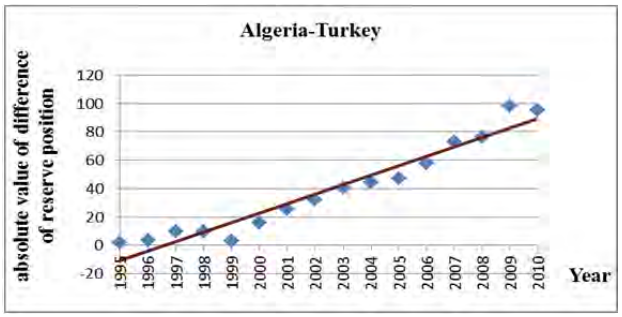

Algeria-Lebanon
absolute value of difference of reserve position
Year

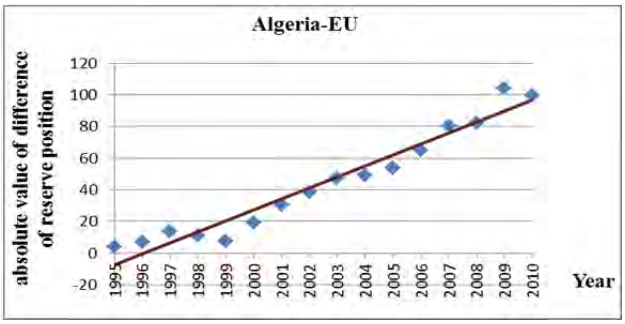
Algeria-Mauritania
absolute value of difference of reserve position
Year

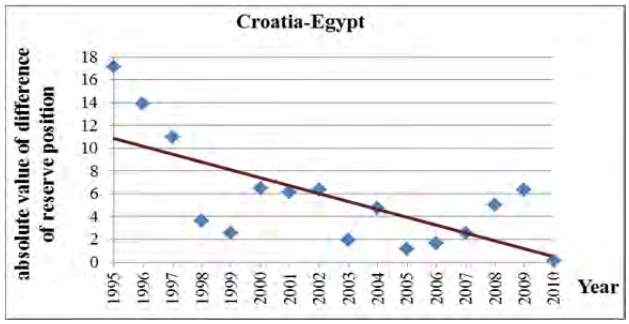

Algeria-Morocco
absolute value of difference of reserve position
Year

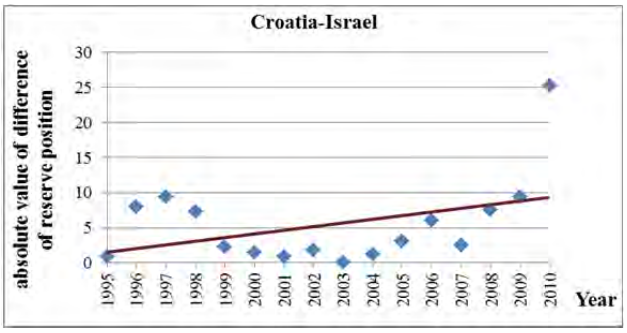

Algeria-Syria
absolute value of difference of reserve position
Year

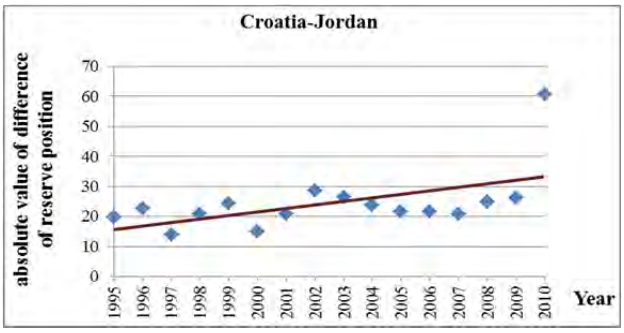

Algeria-Tunisia
absolute value of difference of reserve position
Year

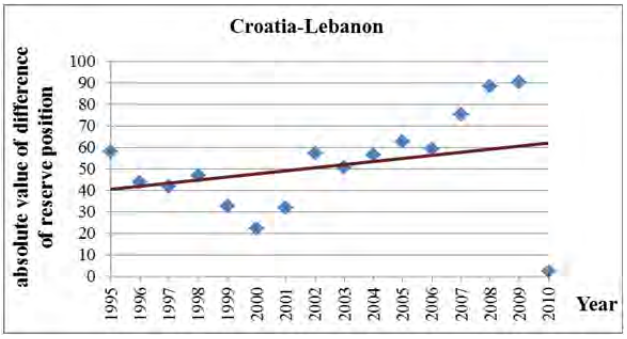

Algeria-Turkey
absolute value of difference of reserve position
Year

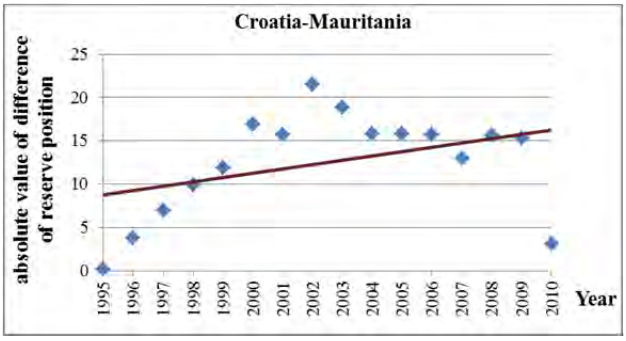

Algeria-EU
absolute value of difference of reserve position
Year

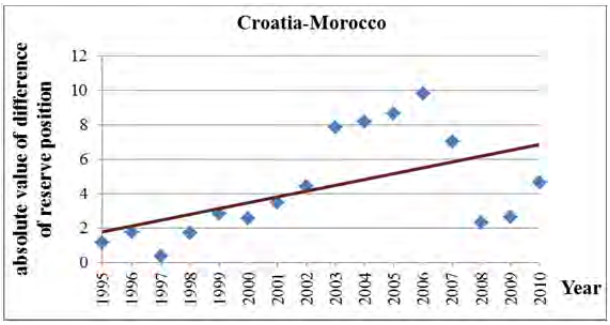

Croatia-Egypt
absolute value of difference of reserve position
Year

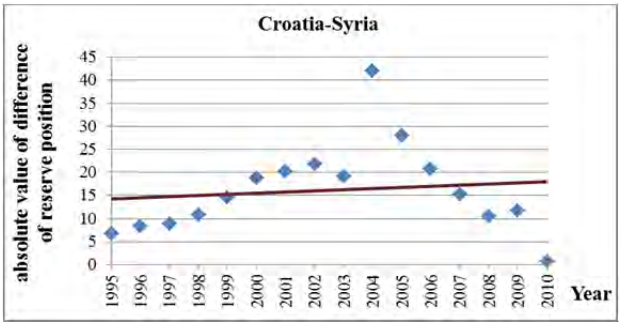

Croatia-Israel
absolute value of difference of reserve position
Year

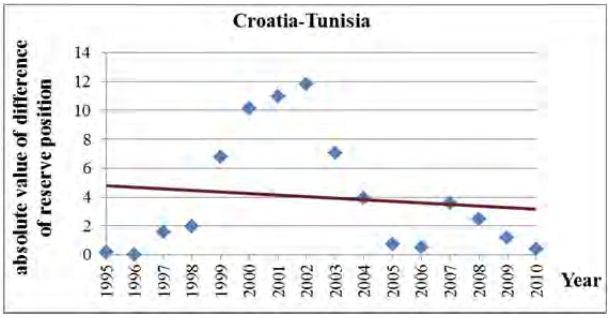

Croatia-Jordan
absolute value of difference of reserve position
Year

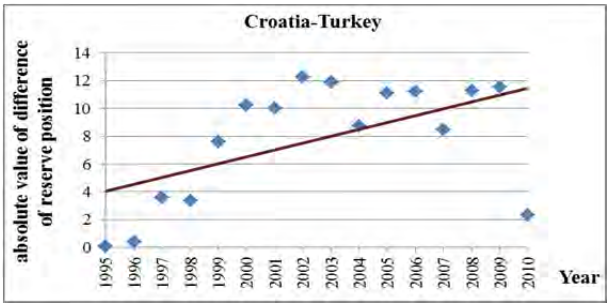

Croatia-Lebanon
absolute value of difference of reserve position
Year

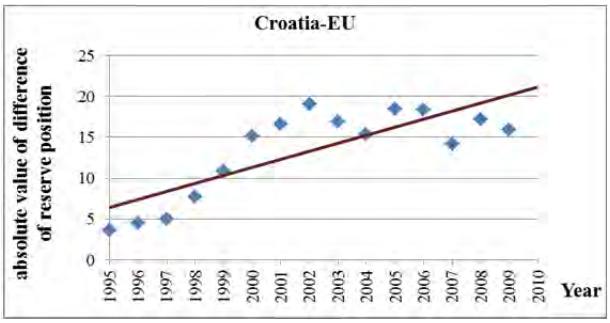

Croatia-Mauritania
absolute value of difference of reserve position
Year

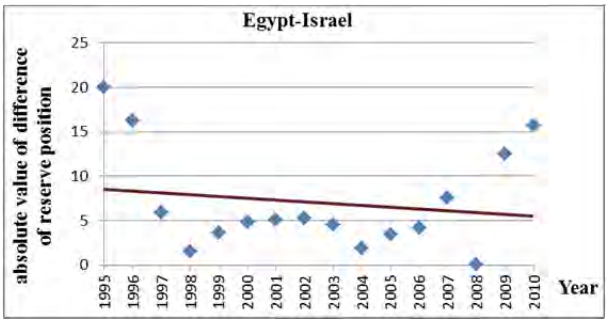

Croatia-Morocco
absolute value of difference of reserve position
Year

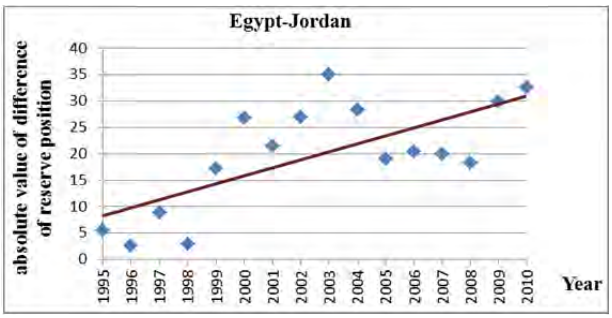

Croatia-Syria
absolute value of difference of reserve position
Year

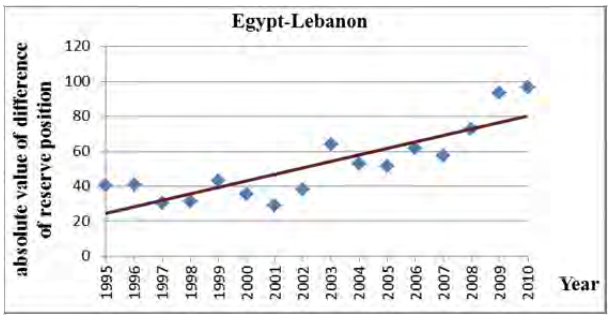

Croatia-Tunisia
absolute value of difference of reserve position
Year

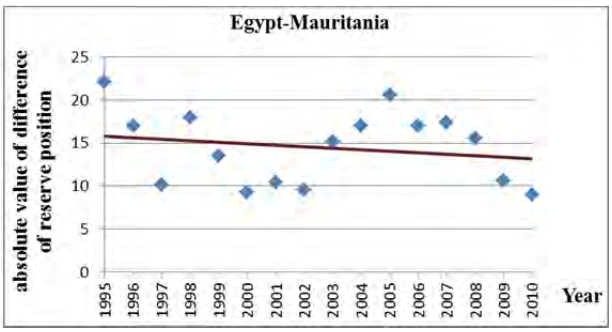

Croatia-Turkey
absolute value of difference of reserve position
Year

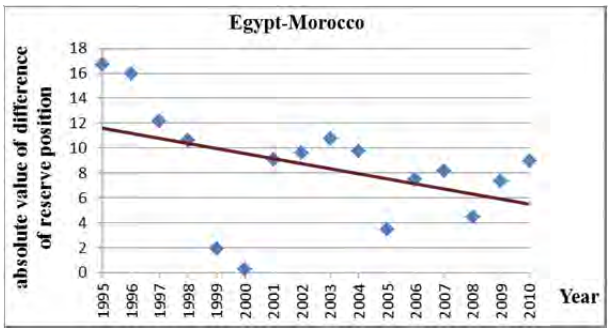

Croatia-EU
absolute value of difference of reserve position
Year

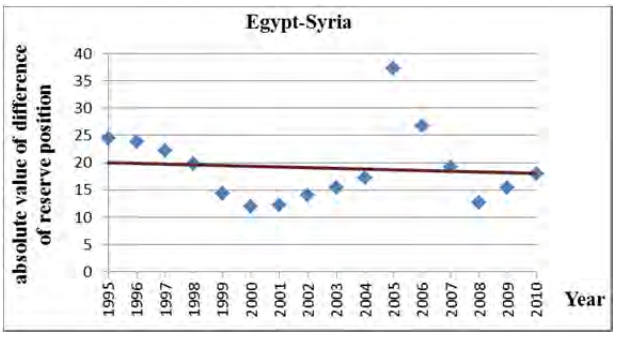

Egypt-Israel
absolute value of difference of reserve position
Year

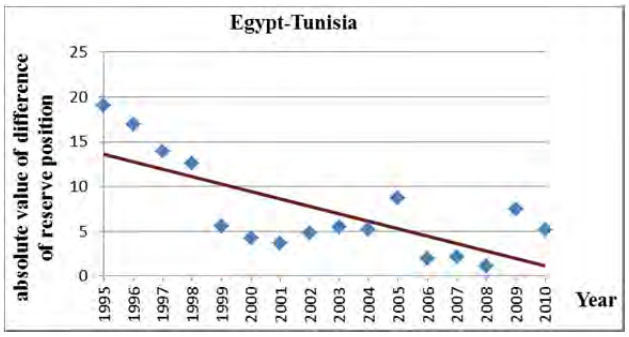

Egypt-Jordan
absolute value of difference of reserve position
Year

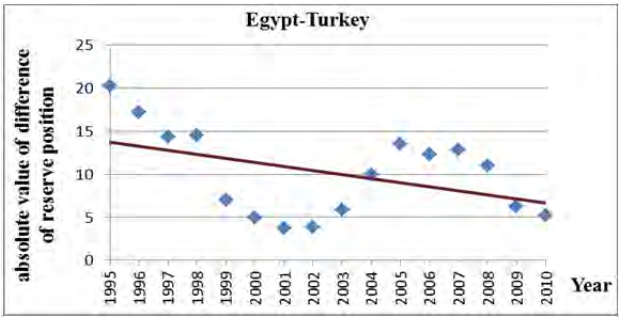

Egypt-Lebanon
absolute value of difference of reserve position
Year

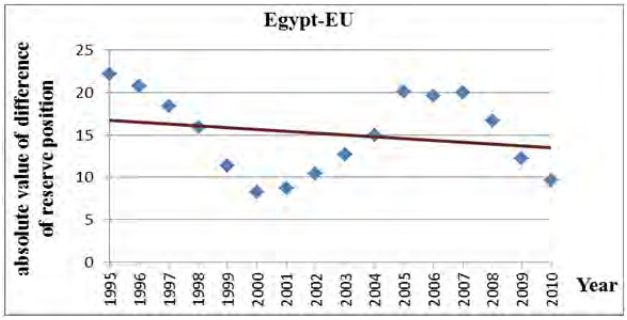

Egypt-Mauritania
absolute value of difference of reserve position
Year

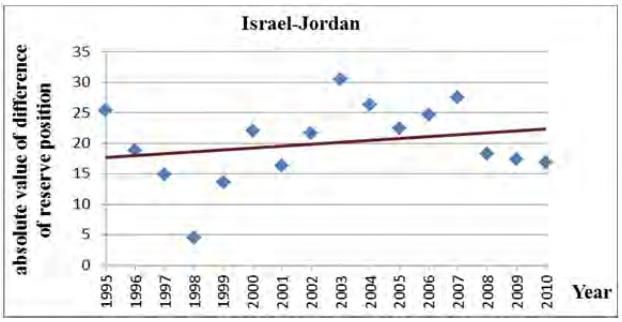

Egypt-Morocco
absolute value of difference of reserve position
Year

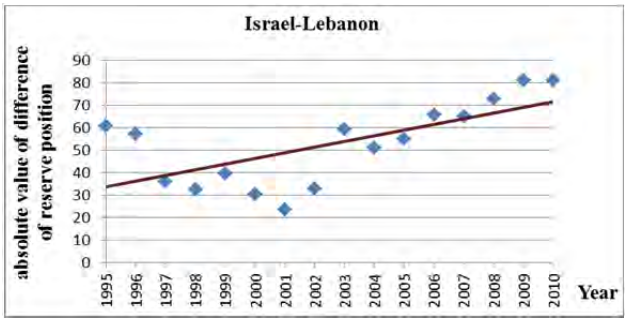

Egypt-Syria
absolute value of difference of reserve position
Year

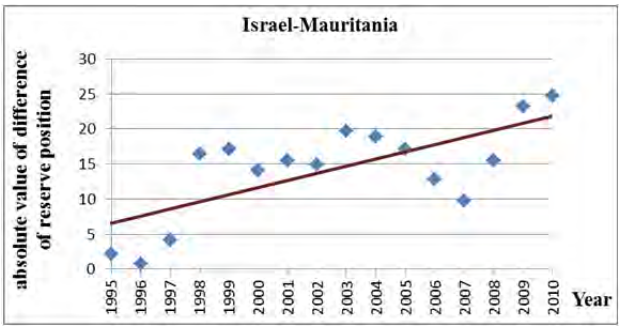

Egypt-Tunisia
absolute value of difference of reserve position
Year

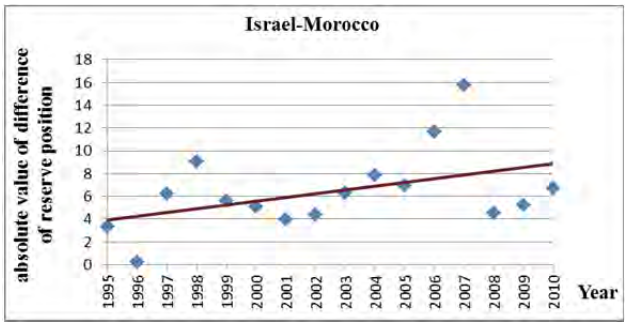

Egypt-Turkey
absolute value of difference of reserve position
Year

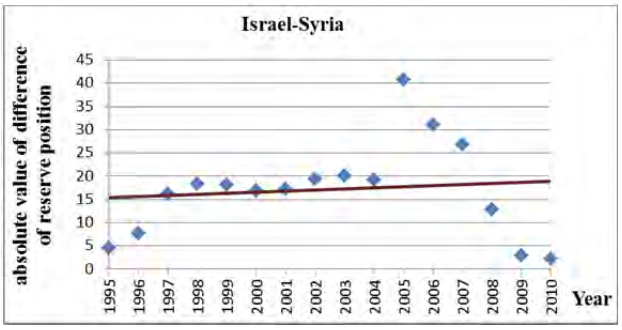

Egypt-EU
absolute value of difference of reserve position
Year

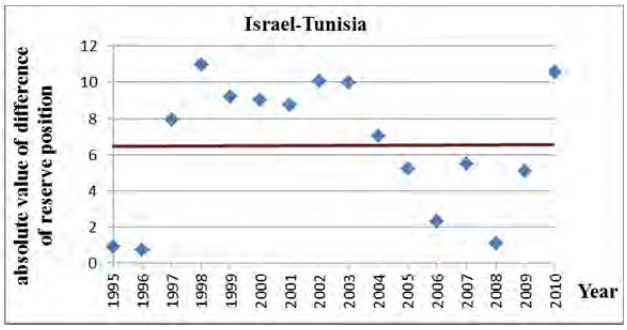

Israel-Jordan
absolute value of difference of reserve position
Year

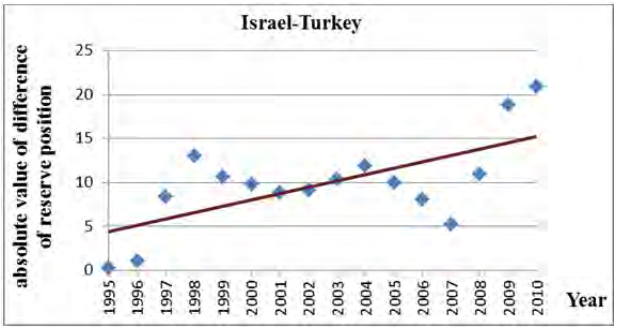

Israel-Lebanon
absolute value of difference of reserve position
Year

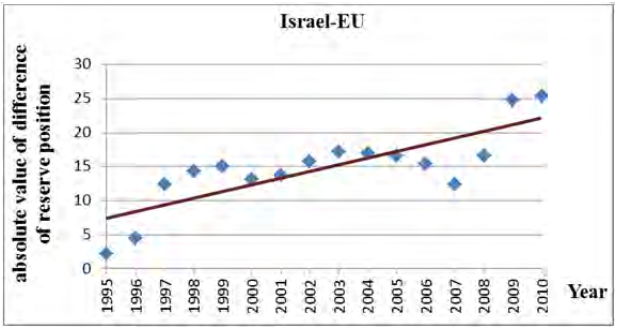

Israel-Mauritania
absolute value of difference of reserve position
Year

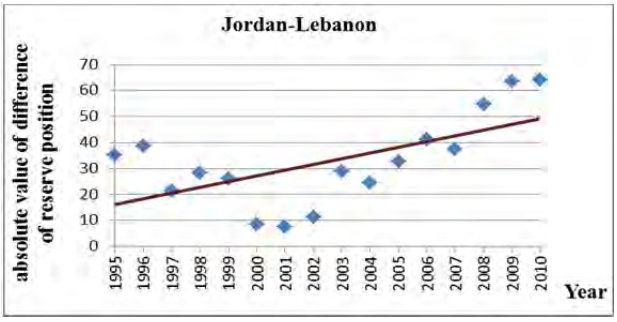

Israel-Morocco
absolute value of difference of reserve position
Year

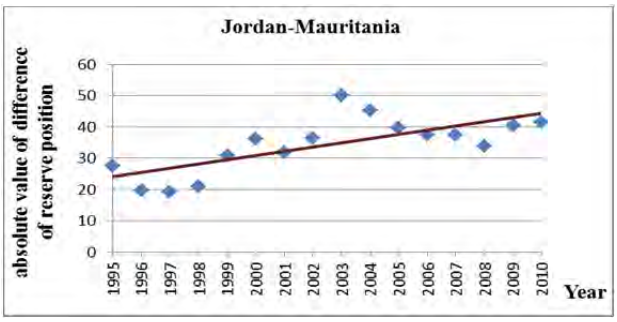

Israel-Syria
absolute value of difference of reserve position
Year

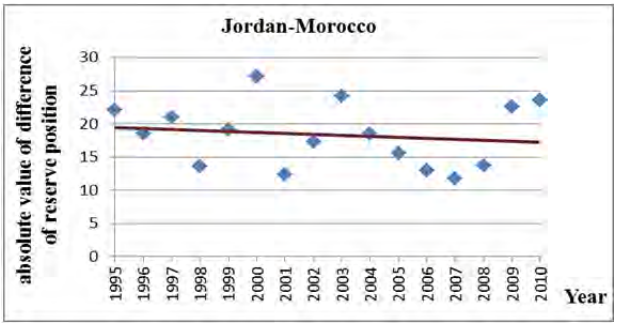

Israel-Tunisia
absolute value of difference of reserve position
Year

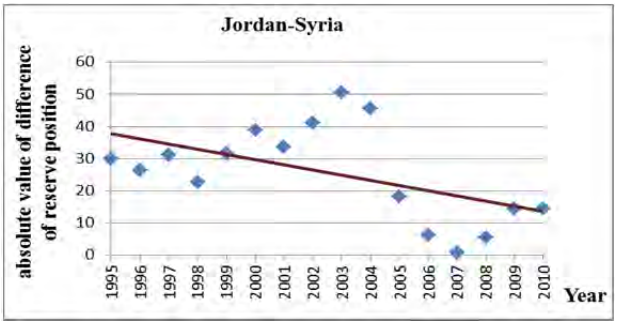

Israel-Turkey
absolute value of difference of reserve position
Year

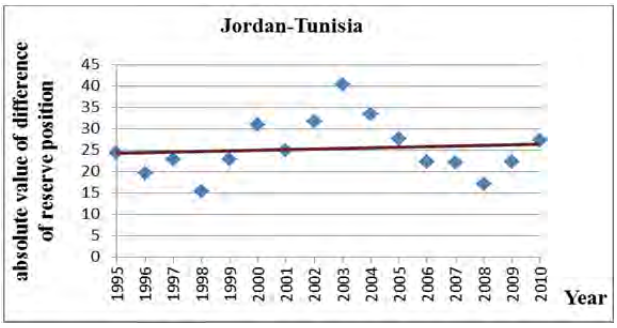

Israel-EU
absolute value of difference of reserve position
Year

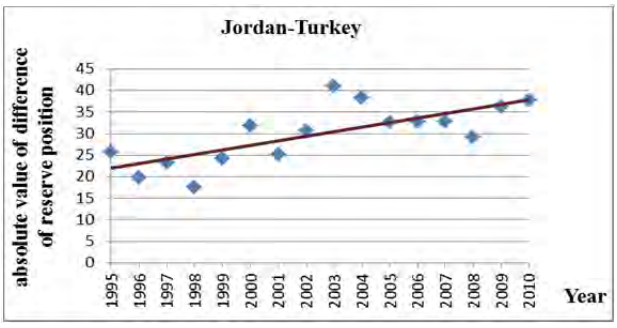

Jordan-Lebanon
absolute value of difference of reserve position
Year

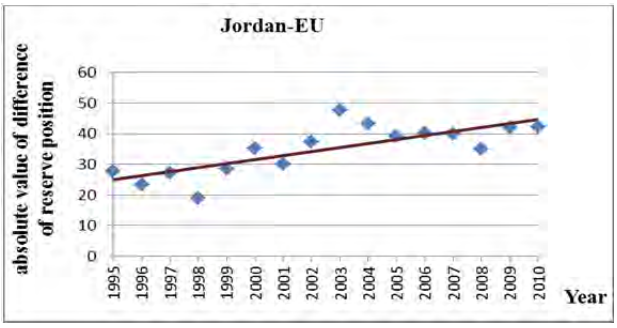

Jordan-Mauritania
absolute value of difference of reserve position
Year

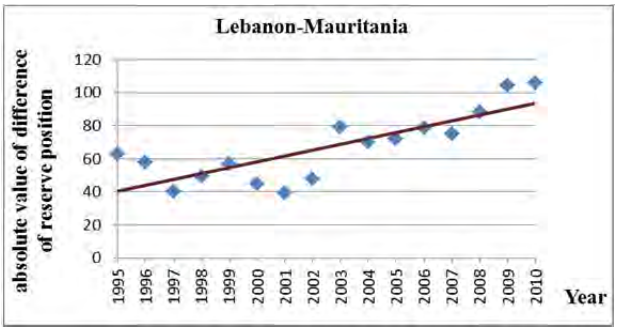

Jordan-Morocco
absolute value of difference of reserve position
Year

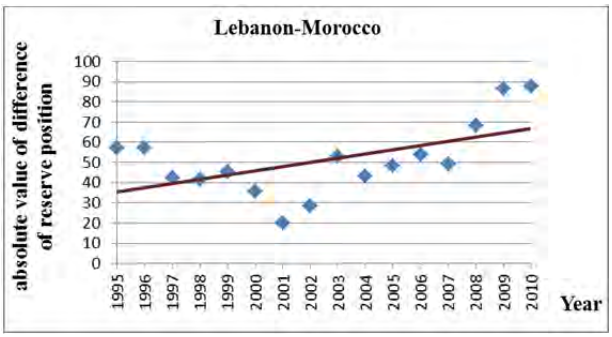

Jordan-Syria
absolute value of difference of reserve position
Year

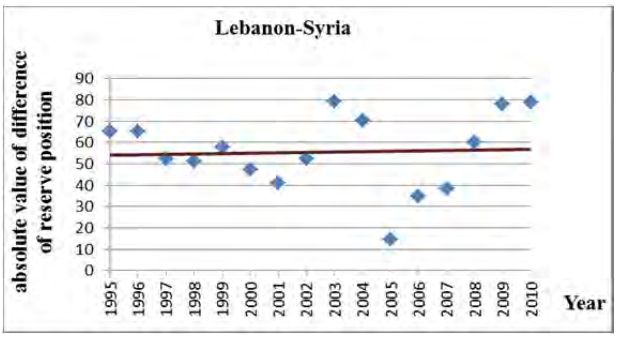

Jordan-Tunisia
absolute value of difference of reserve position
Year

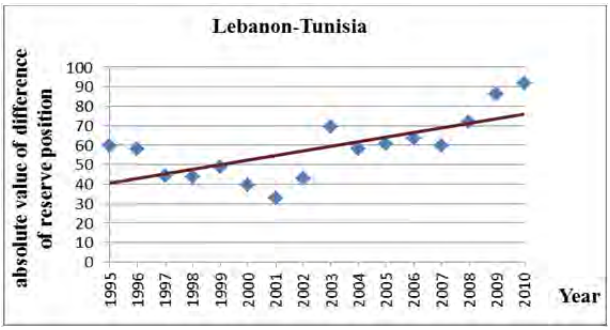

Jordan-Turkey
absolute value of difference of reserve position
Year

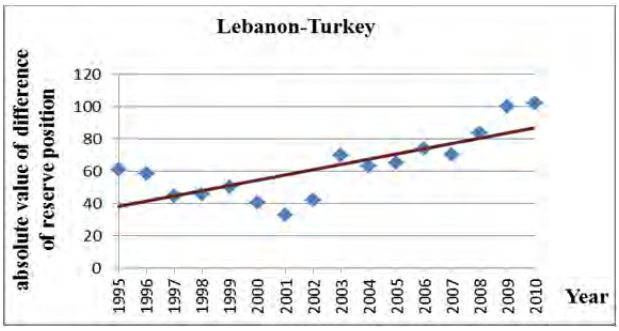

Jordan-EU
absolute value of difference of reserve position
Year

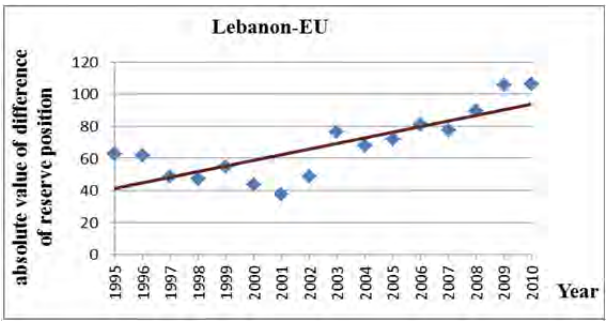

Lebanon-Mauritania
absolute value of difference of reserve position
Year

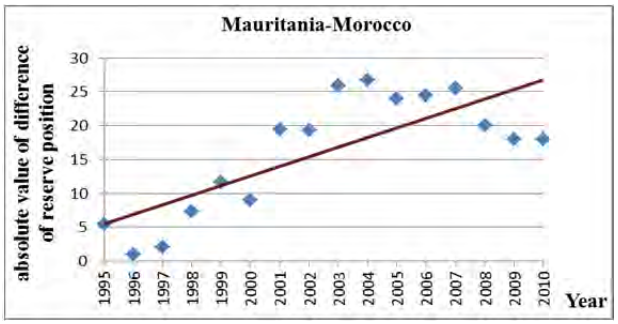

Lebanon-Morocco
absolute value of difference of reserve position
Year

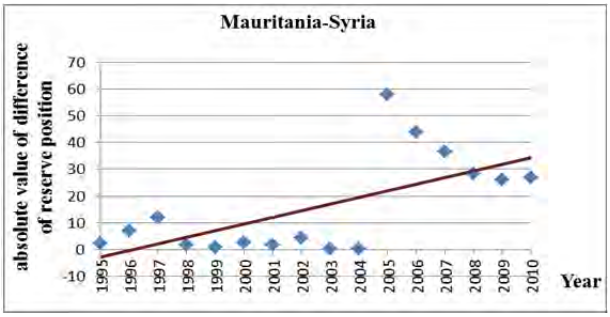

Lebanon-Syria
absolute value of difference of reserve position
Year

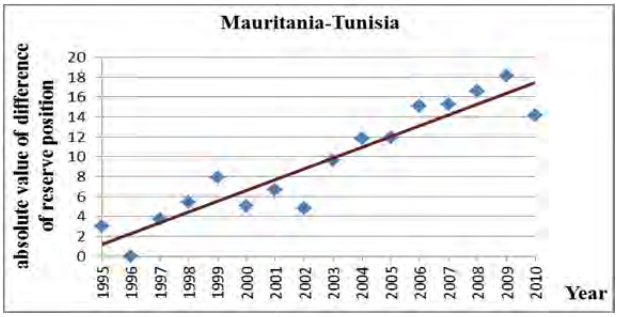

Lebanon-Tunisia
absolute value of difference of reserve position
Year

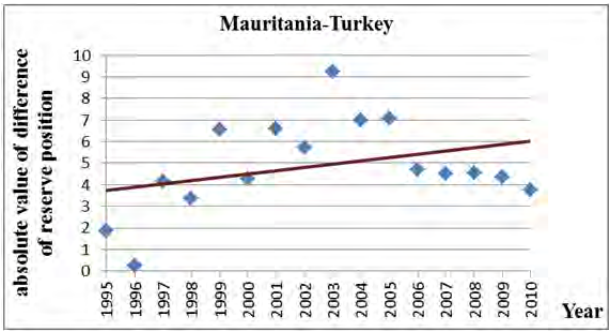

Lebanon-Turkey
absolute value of difference of reserve position
Year

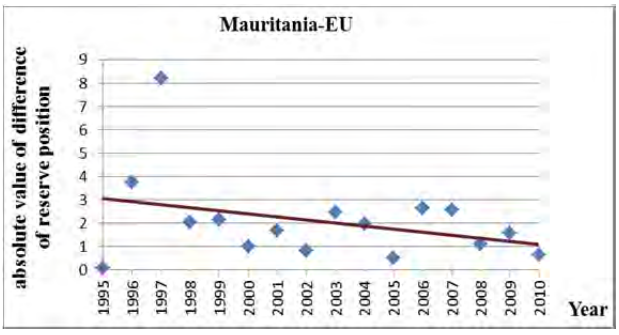

Lebanon-EU
absolute value of difference of reserve position
Year

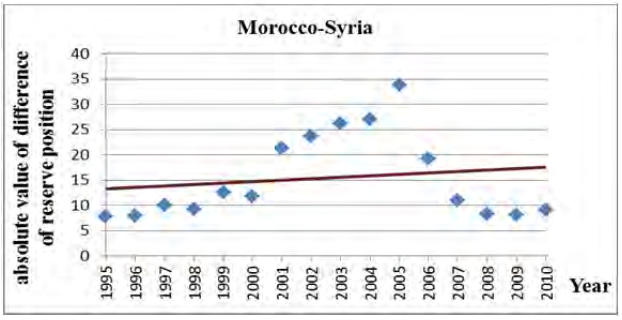

Mauritania-Morocco
absolute value of difference of reserve position
Year

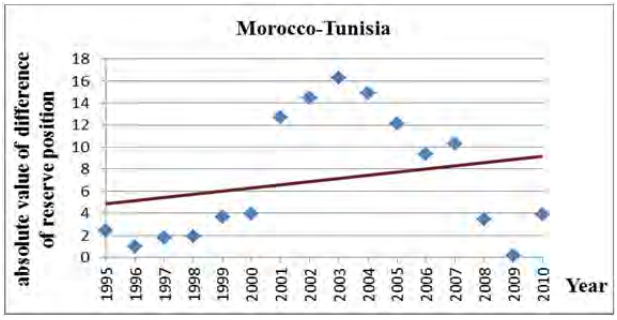

Mauritania-Syria
absolute value of difference of reserve position
Year

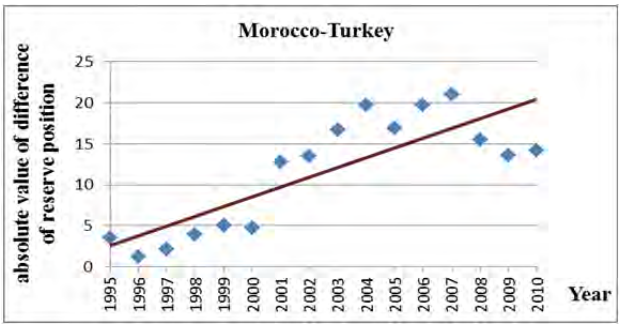

Mauritania-Tunisia
absolute value of difference of reserve position
Year

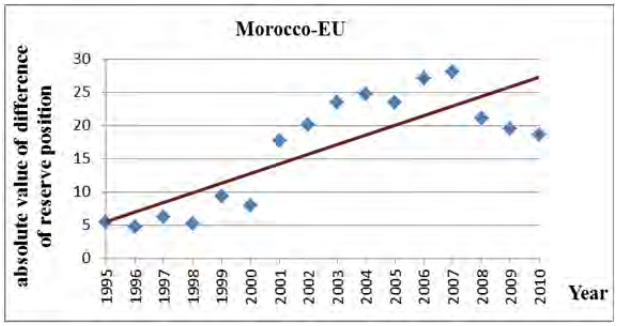

Mauritania-Turkey
absolute value of difference of reserve position
Year

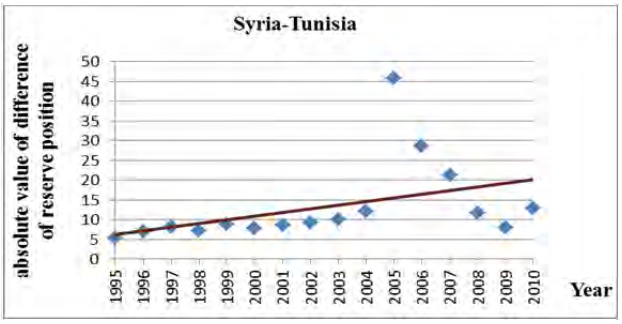

Mauritania-EU
absolute value of difference of reserve position
Year

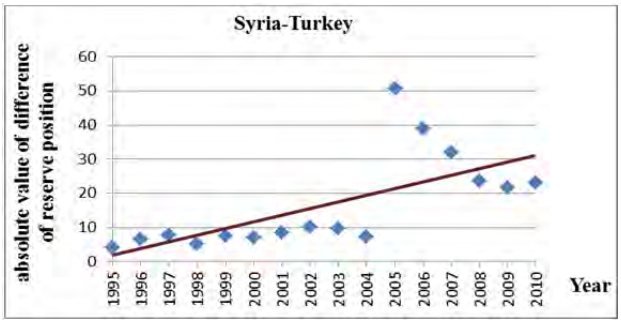

Morocco-Syria
absolute value of difference of reserve position
Year

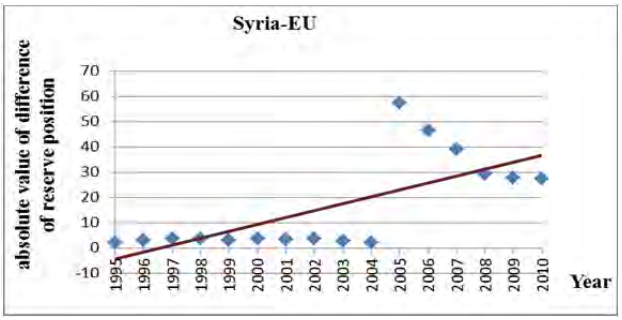

Morocco-Tunisia
absolute value of difference of reserve position
Year

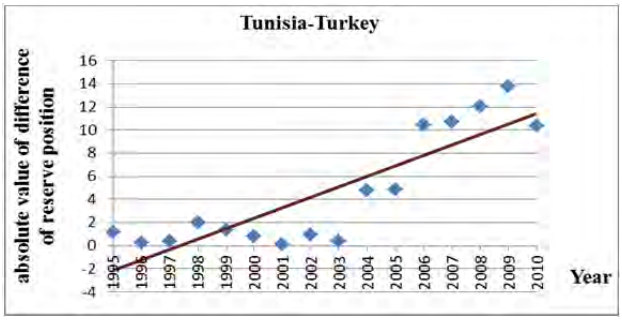

Morocco-Turkey
absolute value of difference of reserve position
Year

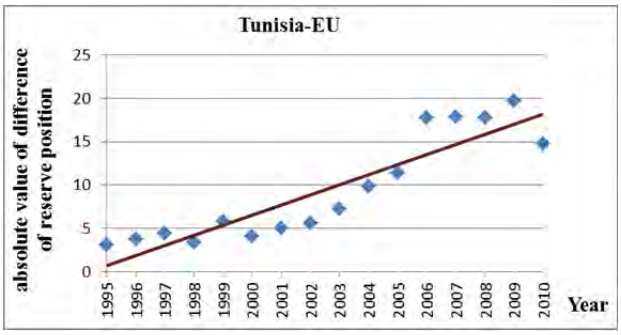

Morocco-EU
absolute value of difference of reserve position
Year

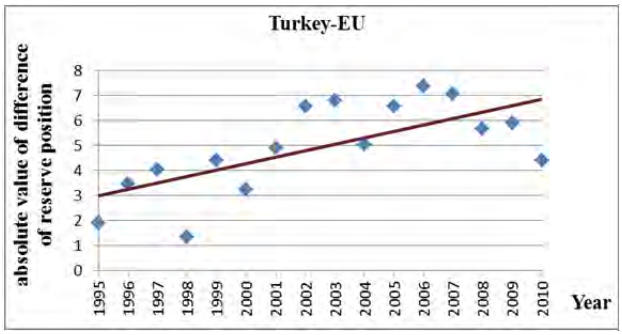

Syria-Tunisia
absolute value of difference of reserve position
Year


Syria-Turkey
absolute value of difference of reserve position
Year

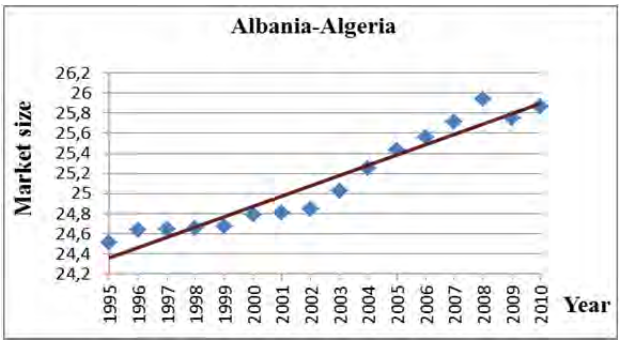

Syria-EU
absolute value of difference of reserve position
Year

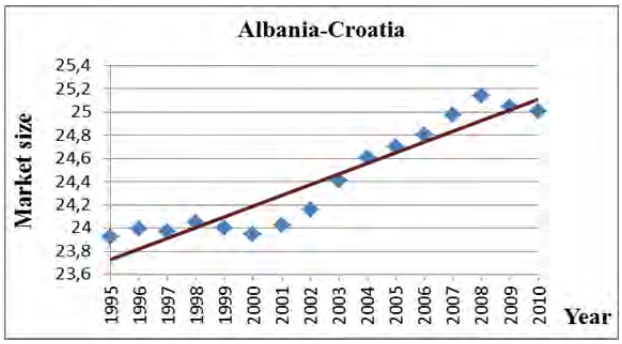

Tunisia-Turkey
absolute value of difference of reserve position
Year

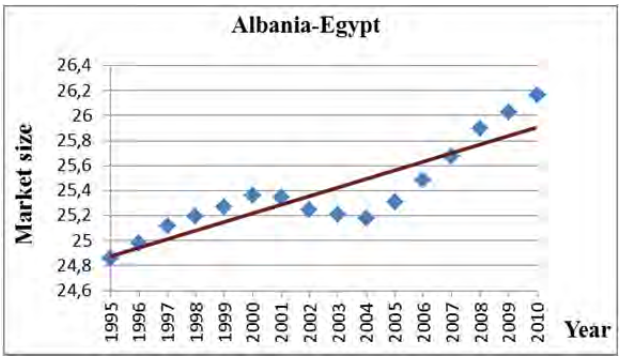

Tunisia-EU
absolute value of difference of reserve position
Year

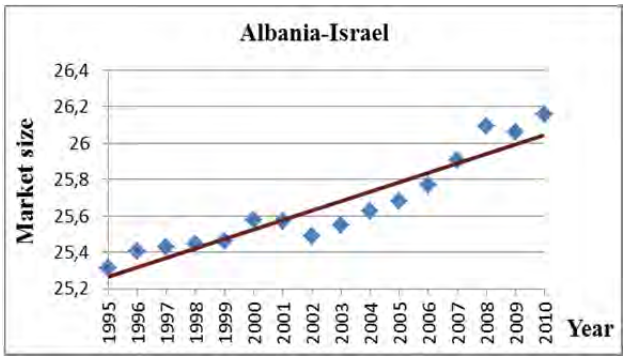

Turkey-EU
absolute value of difference of reserve position
Year

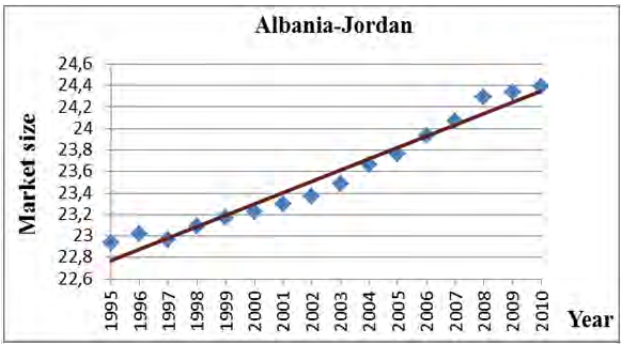
APPENDIX VIII: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'MARKET SIZE' OF ALL PAIRS

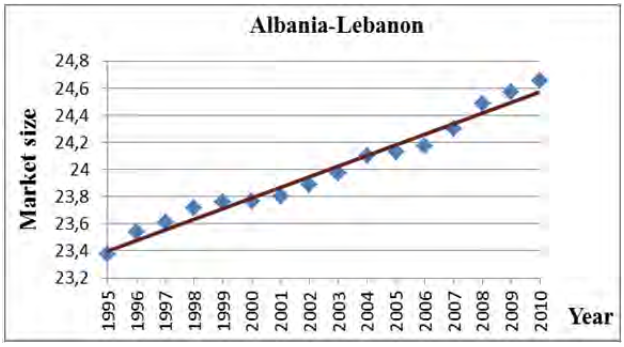


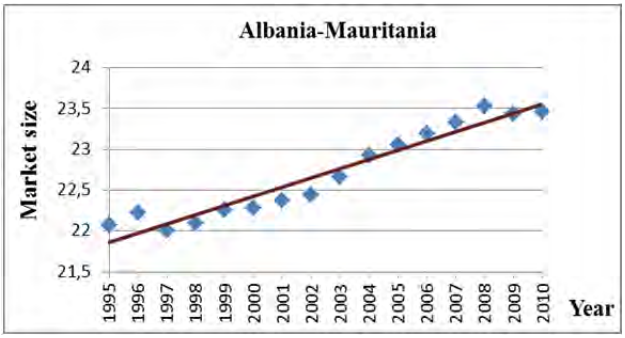


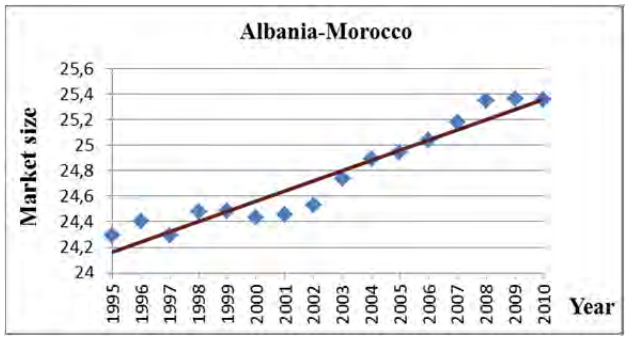


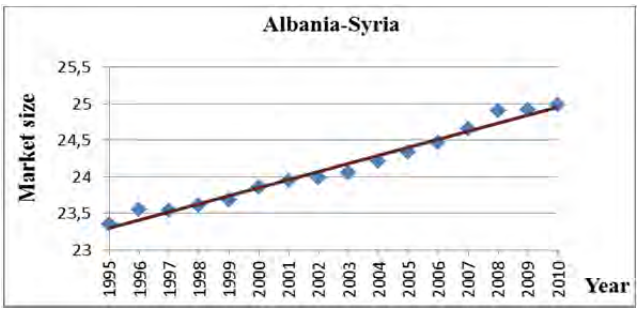


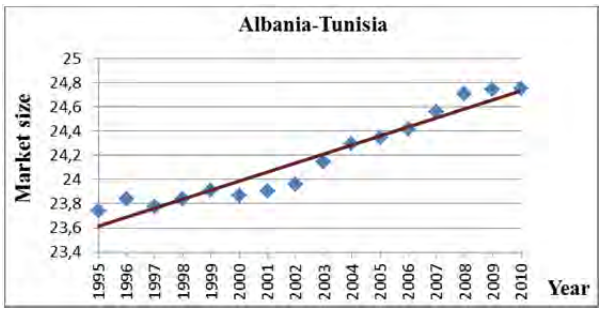


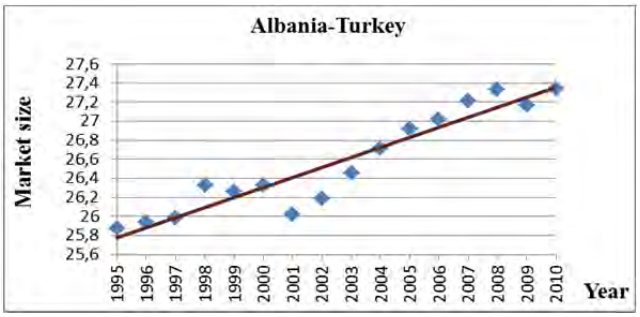


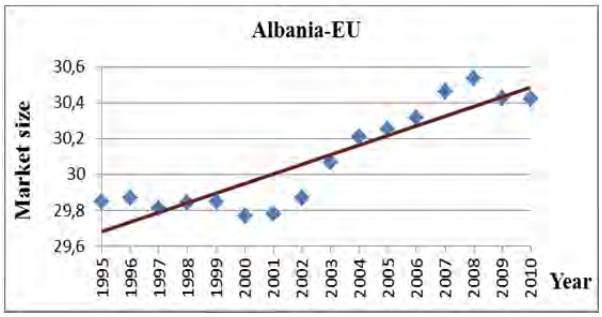


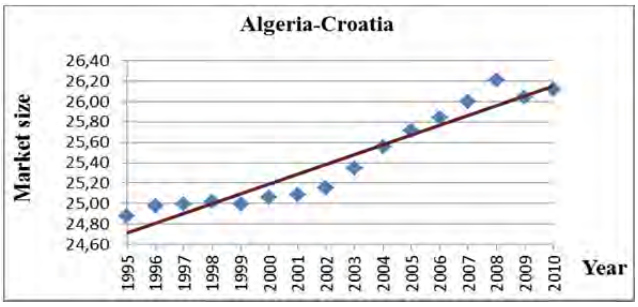


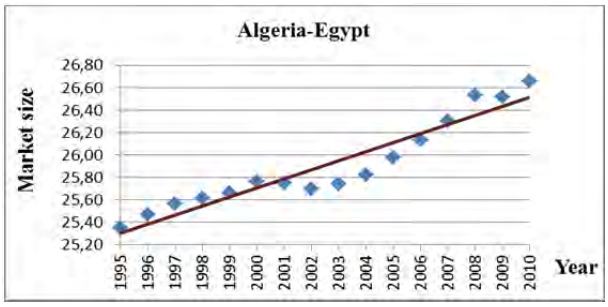

Albania-Syria
Market size
Year

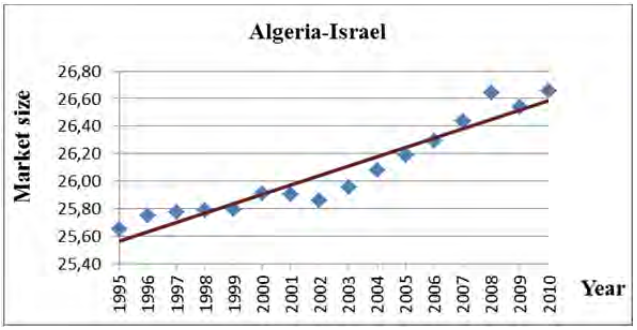

Albania-Tunisia
Market size
Year

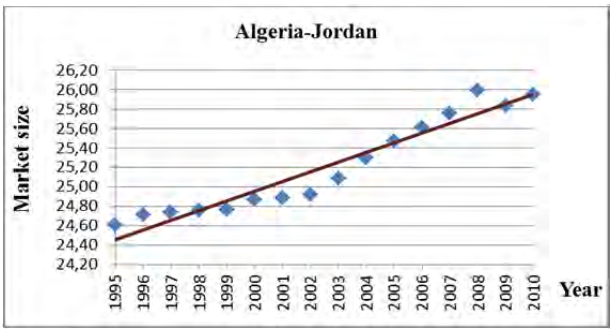

Albania-Turkey
Market size
Year

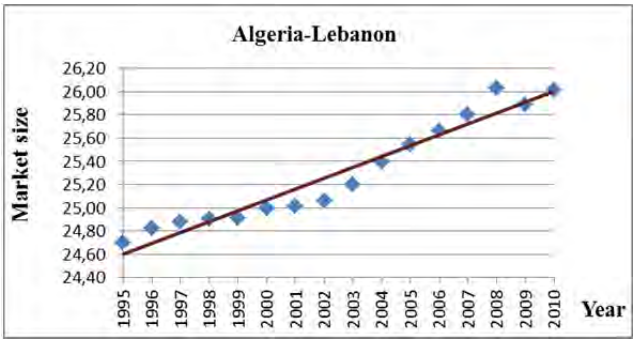

Albania-EU
Market size
Year

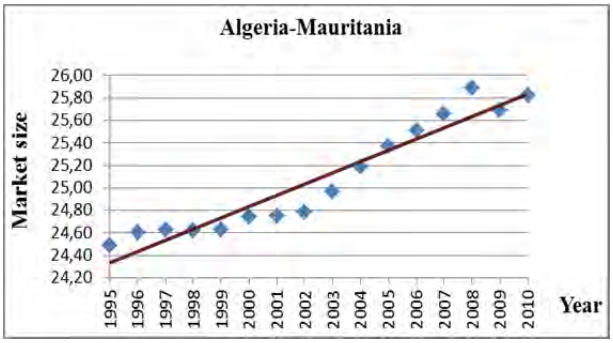

Algeria-Croatia
Market size
Year

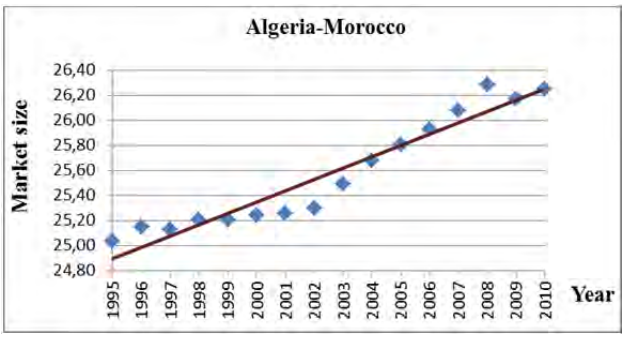

Algeria-Egypt
Market size
Year

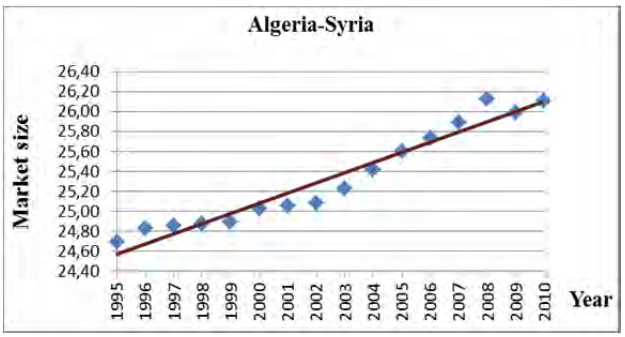

Algeria-Israel
Market size
Year

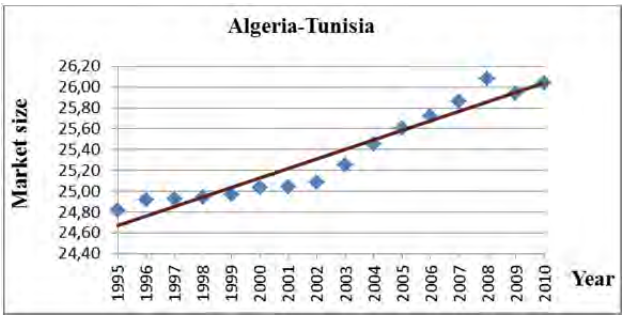

Algeria-Jordan
Market size
Year

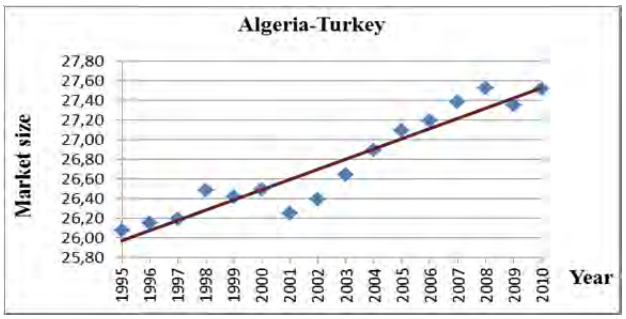

Algeria-Lebanon
Market size
Year

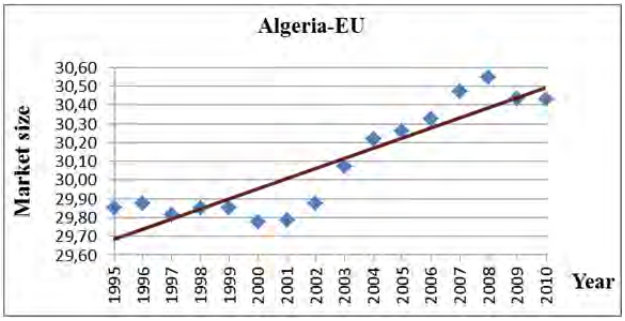

Algeria-Mauritania
Market size
Year

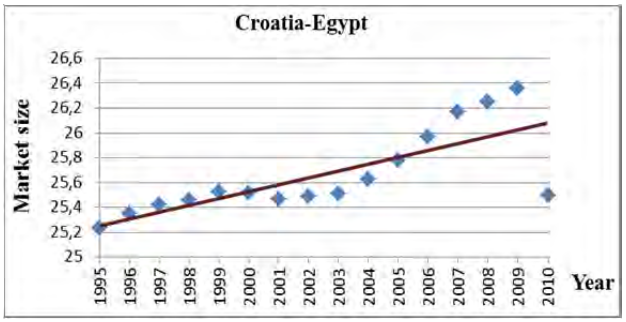

Algeria-Morocco
Market size
Year

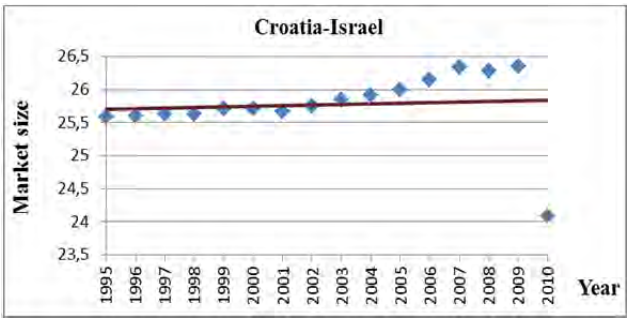

Algeria-Syria
Market size
Year

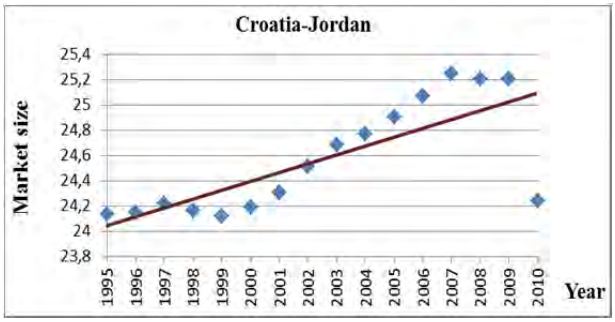

Algeria-Tunisia
Market size
Year

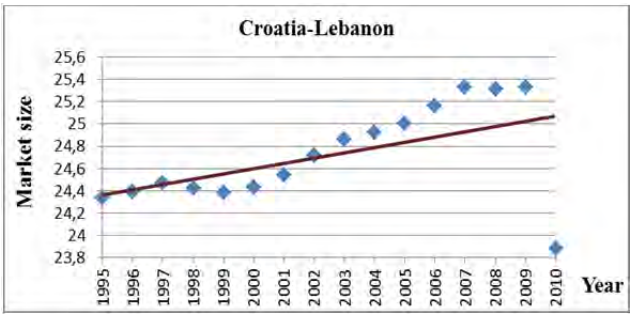

Algeria-Turkey
Market size
Year

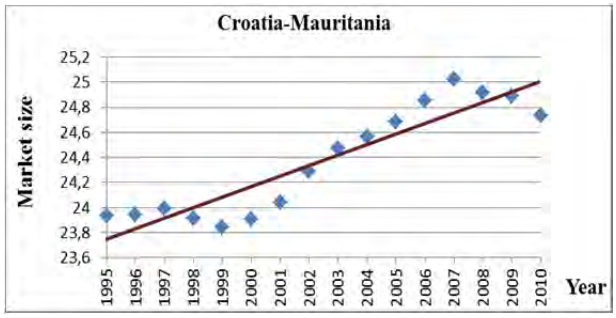

Algeria-EU
Market size
Year

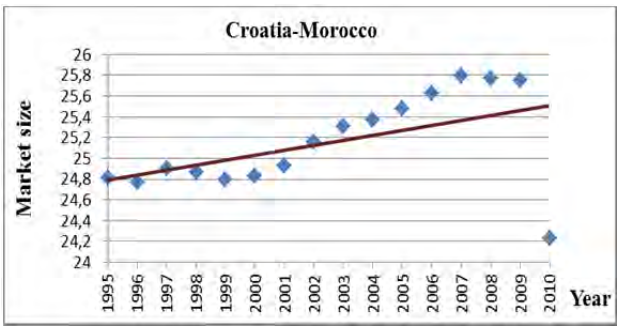

Croatia-Egypt
Market size
Year

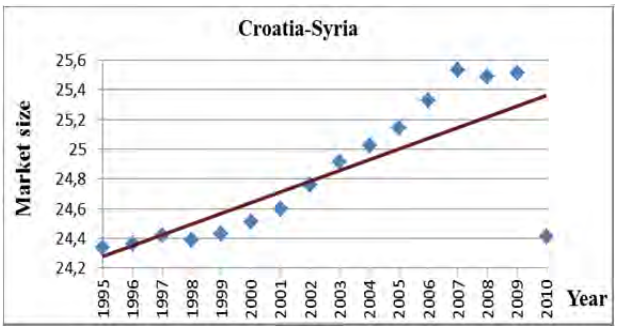

Croatia-Israel
Market size
Year

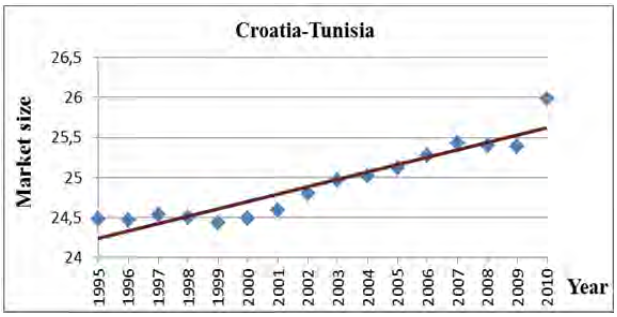

Croatia-Jordan
Market size
Year

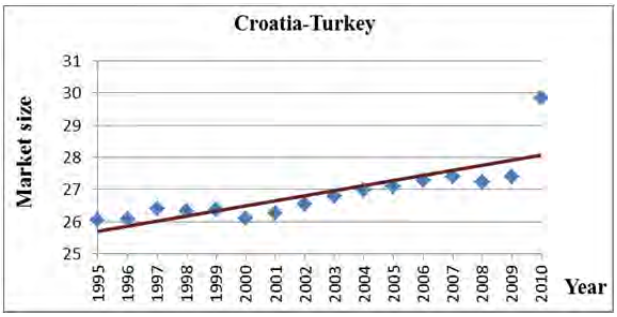

Croatia-Lebanon
Market size
Year

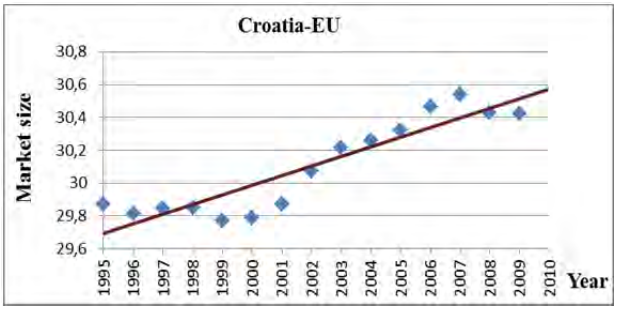

Croatia-Mauritania
Market size
Year

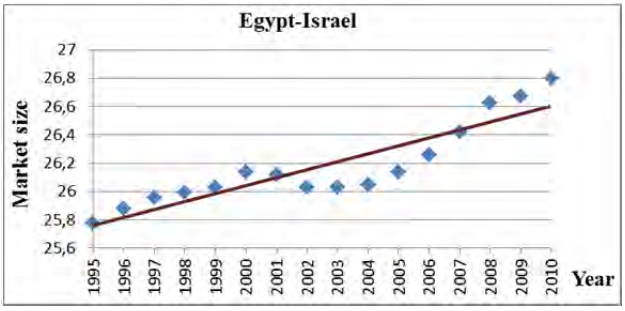

Croatia-Morocco
Market size
Year

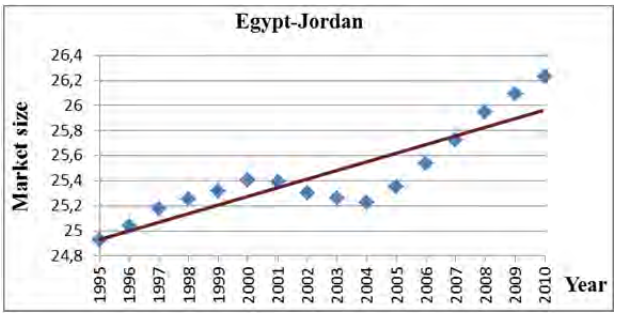

Croatia-Syria
Market size
Year

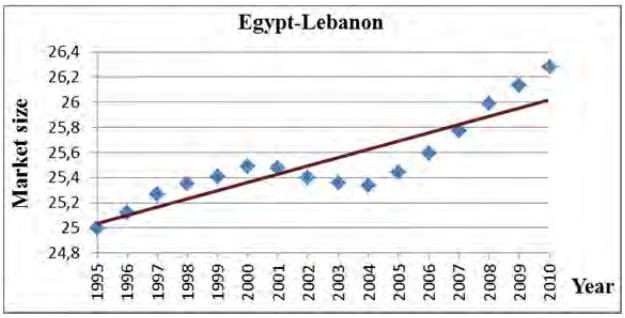

Croatia-Tunisia
Market size
Year

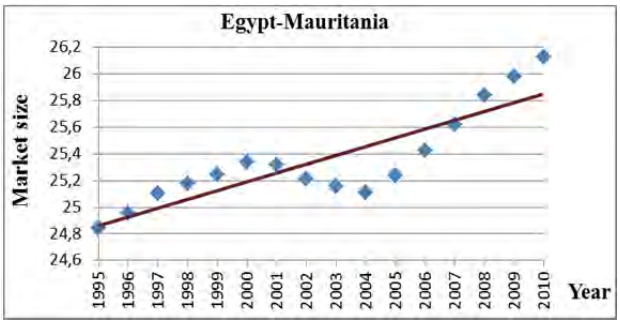

Croatia-Turkey
Market size
Year

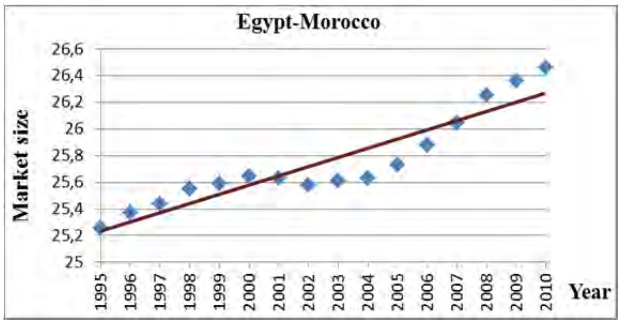

Croatia-EU
Market size
Year

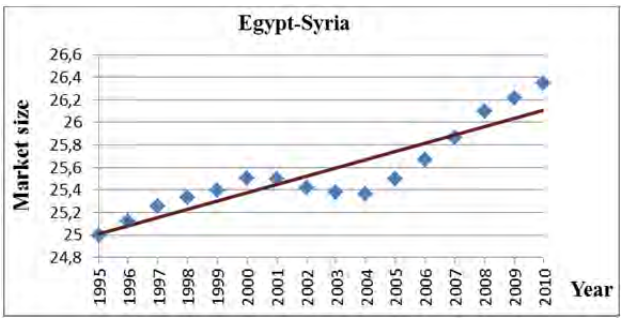

Egypt-Israel
Market size
Year

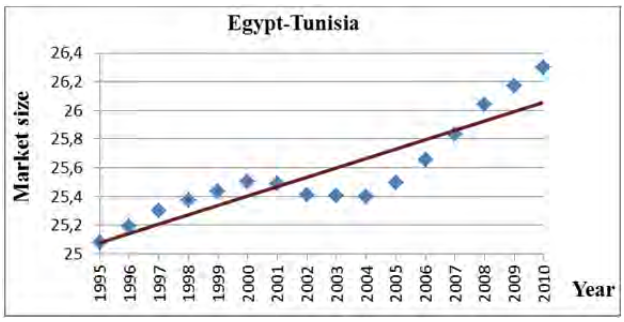

Egypt-Jordan
Market size
Year

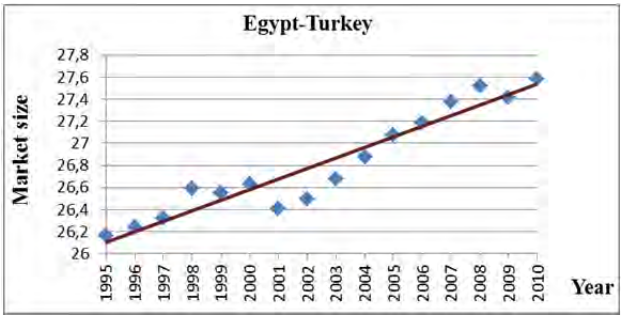

Egypt-Lebanon
Market size
Year

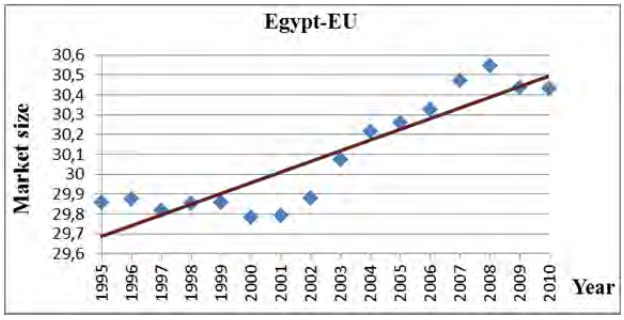

Egypt-Mauritania
Market size
Year

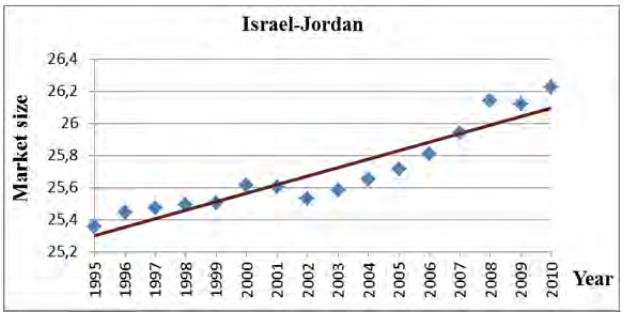

Egypt-Morocco
Market size
Year

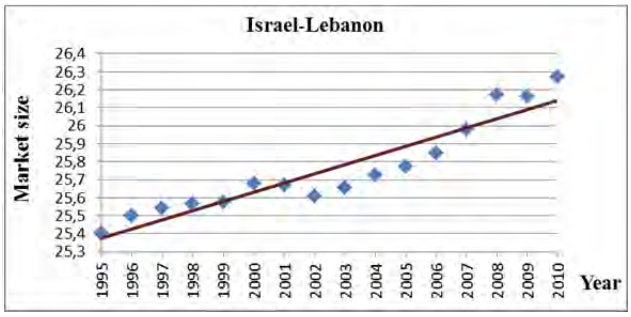

Egypt-Syria
Market size
Year

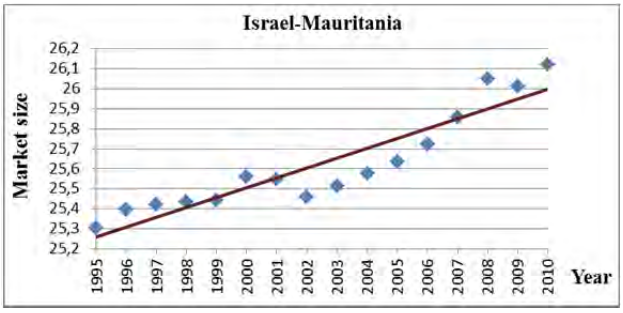

Egypt-Tunisia
Market size
Year

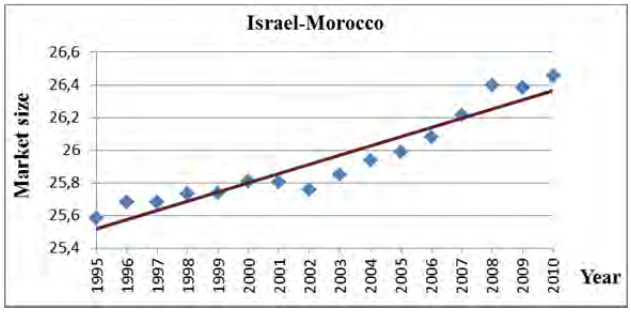

Egypt-Turkey
Market size
Year

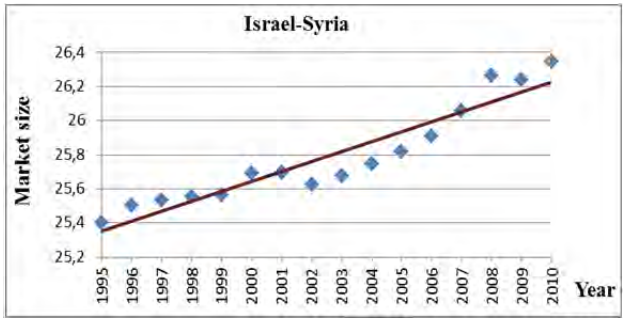

Egypt-EU
Market size
Year

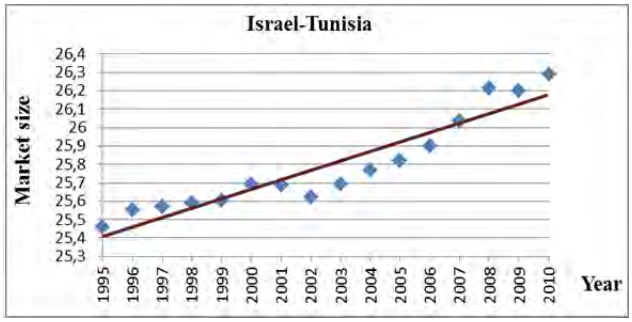

Israel-Jordan
Market size
Year

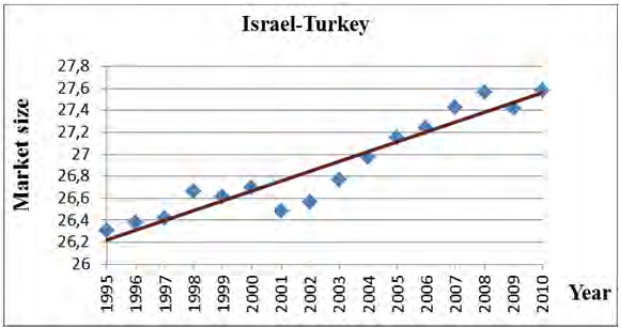

Israel-Lebanon
Market size
Year

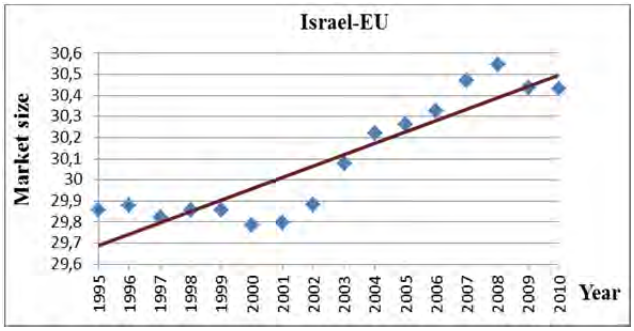

Israel-Mauritania
Market size
Year

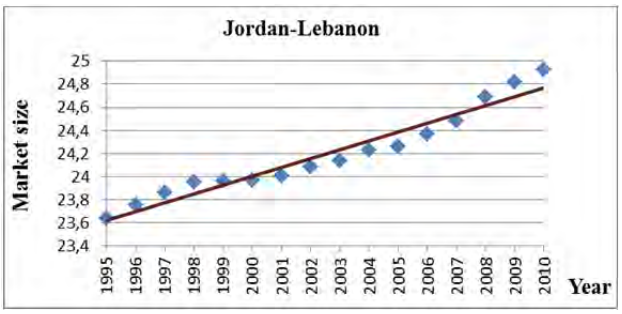

Israel-Morocco
Market size
Year

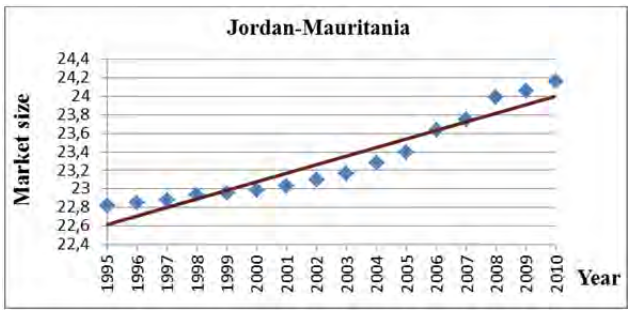

Israel-Syria
Market size
Year

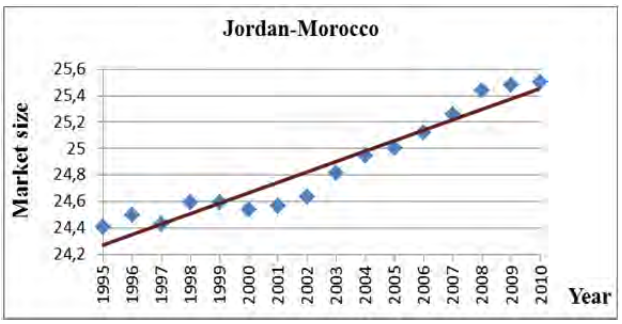

Israel-Tunisia
Market size
Year

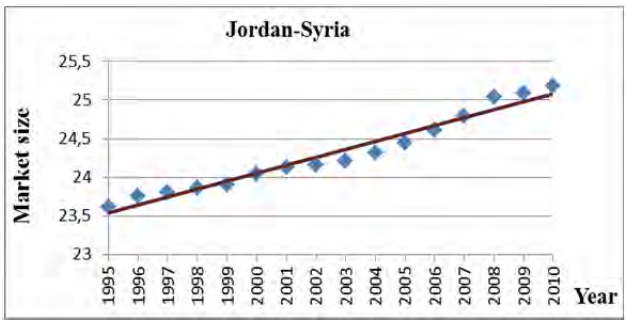

Israel-Turkey
Market size
Year

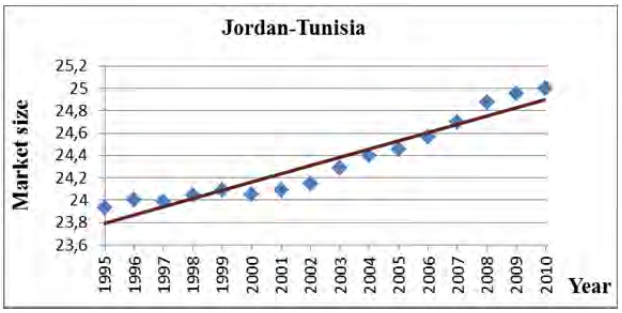

Israel-EU
Market size
Year

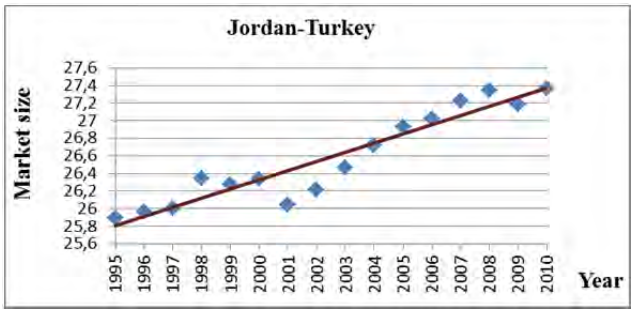

Jordan-Lebanon
Market size
Year

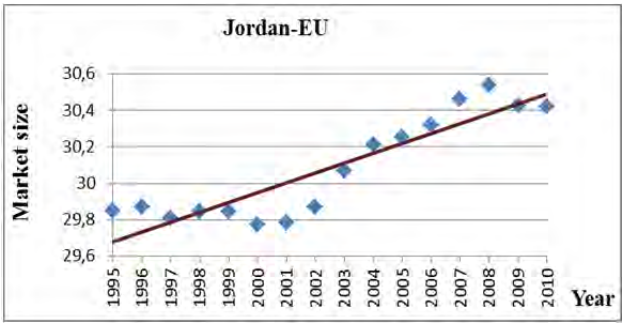

Jordan-Mauritania
Market size
Year

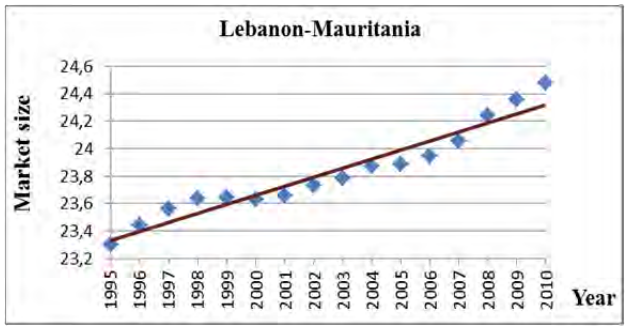

Jordan-Morocco
Market size
Year

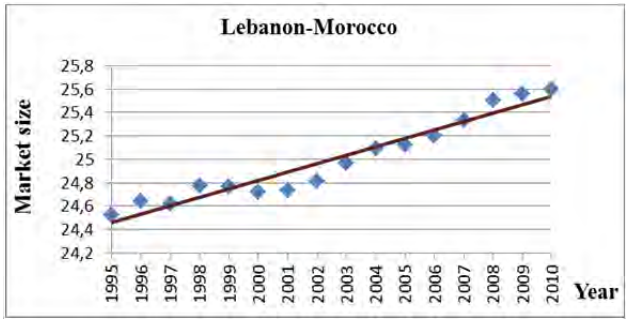

Jordan-Syria
Market size
Year

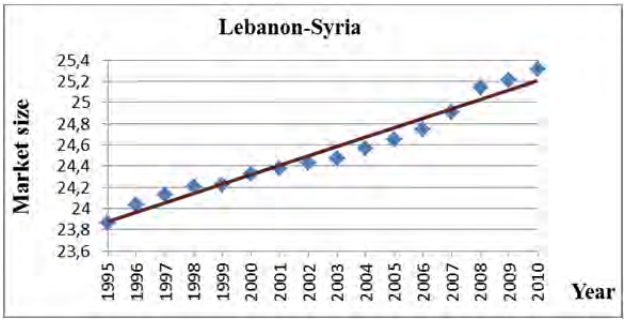

Jordan-Tunisia
Market size
Year

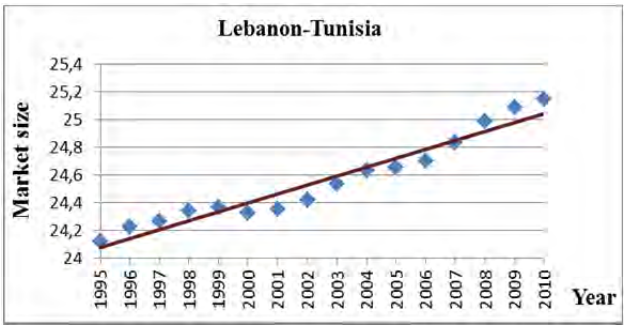

Jordan-Turkey
Market size
Year

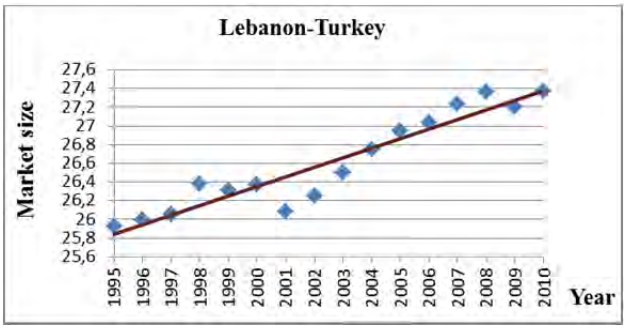

Jordan-EU
Market size
Year

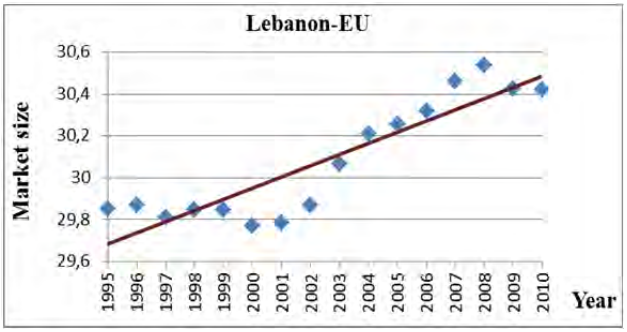

Lebanon-Mauritania
Market size
Year

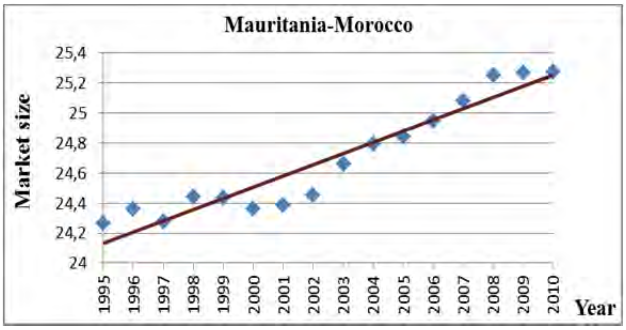

Lebanon-Morocco
Market size
Year

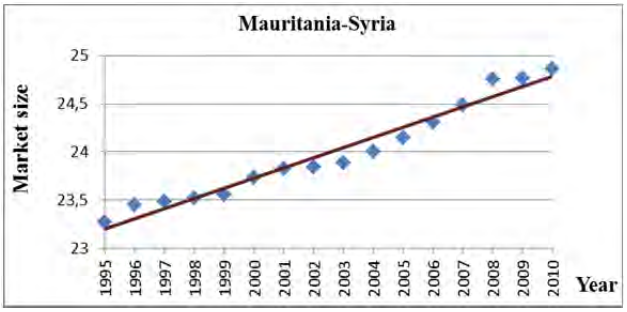

Lebanon-Syria
Market size
Year

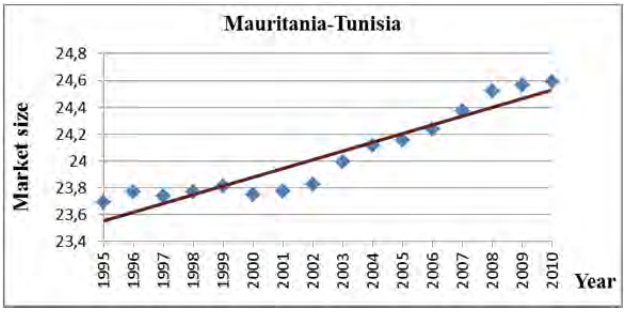

Lebanon-Tunisia
Market size
Year

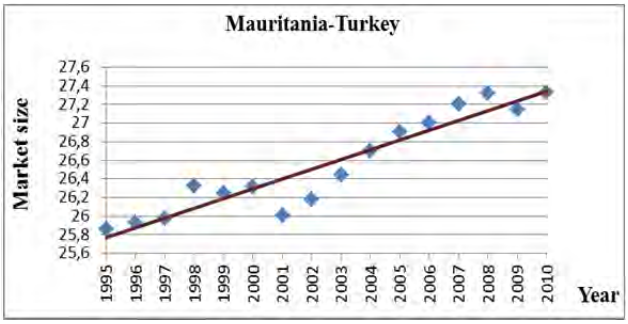

Lebanon-Turkey
Market size
Year

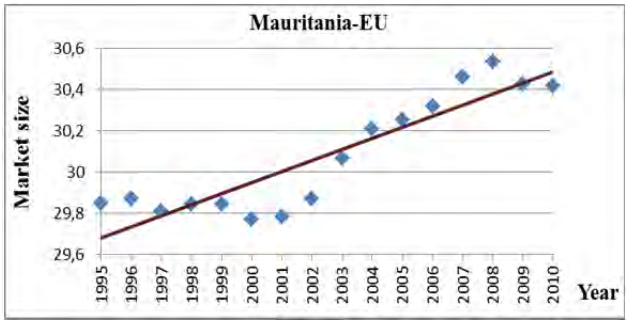

Lebanon-EU
Market size
Year

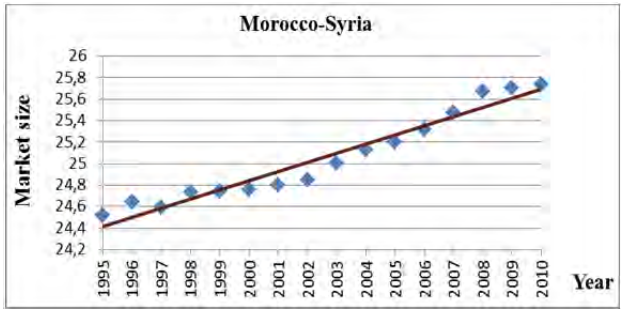

Mauritania-Morocco
Market size
Year

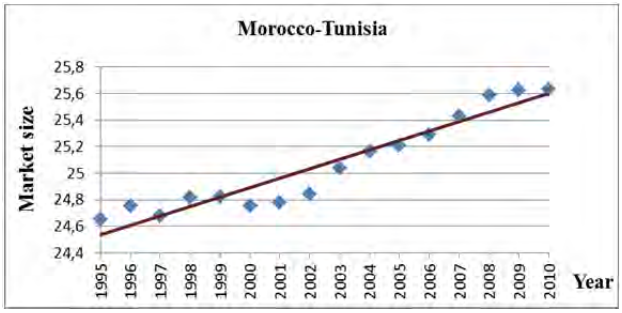

Mauritania-Syria
Market size
Year

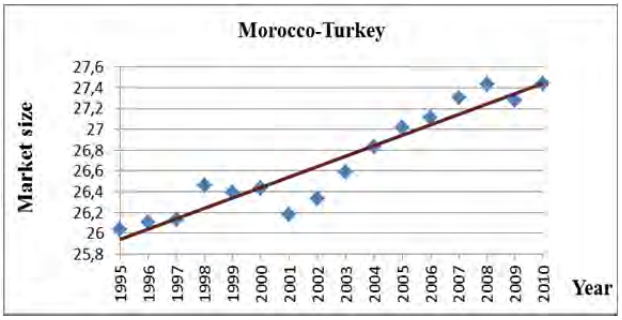

Mauritania-Tunisia
Market size
Year

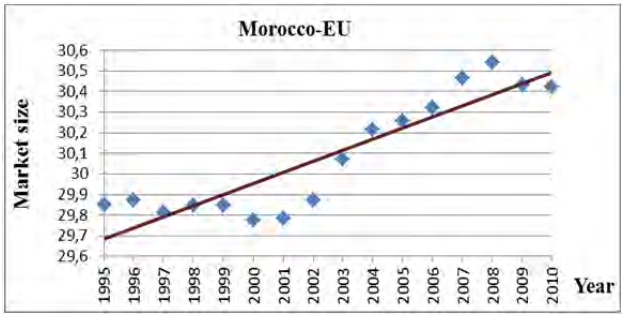

Mauritania-Turkey
Market size
Year

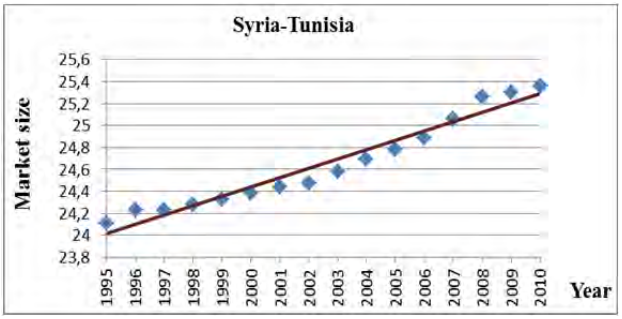

Mauritania-EU
Market size
Year

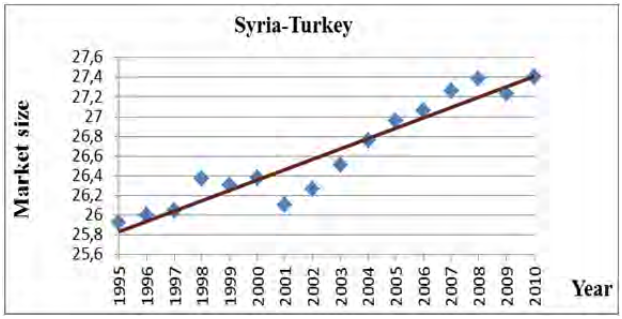

Morocco-Syria
Market size
Year

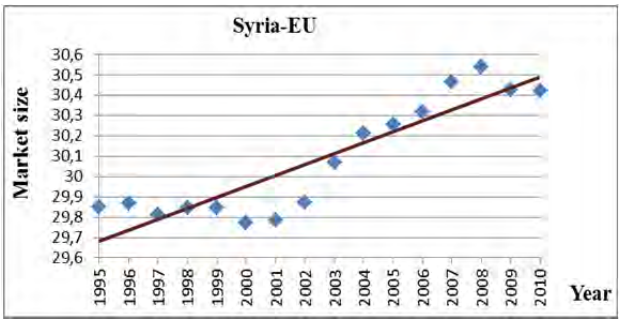

Morocco-Tunisia
Market size
Year

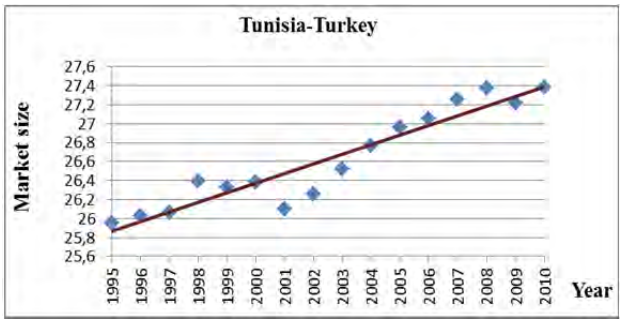

Morocco-Turkey
Market size
Year

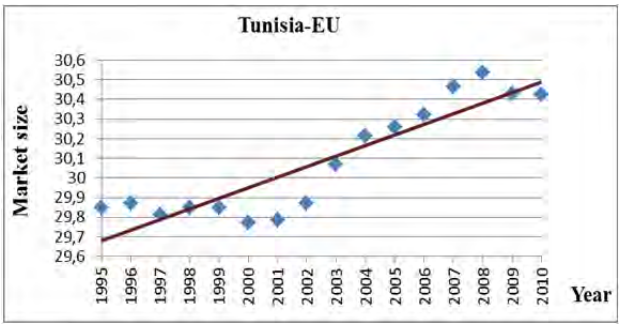

Morocco-EU
Market size
Year

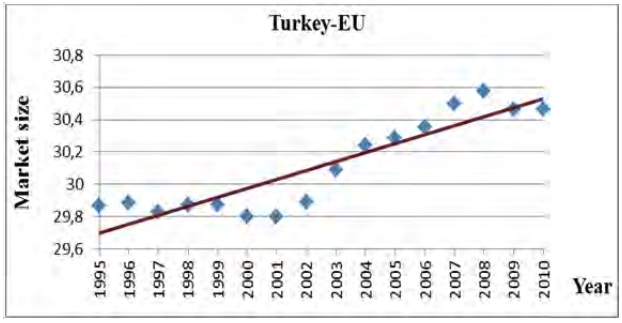

Syria-Tunisia
Market size
Year


Syria-Turkey
Market size
Year

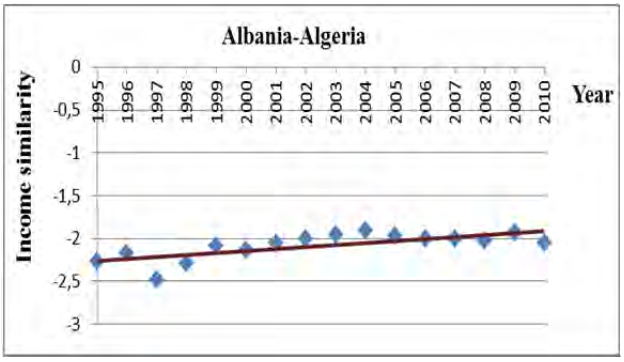

Syria-EU
Market size
Year

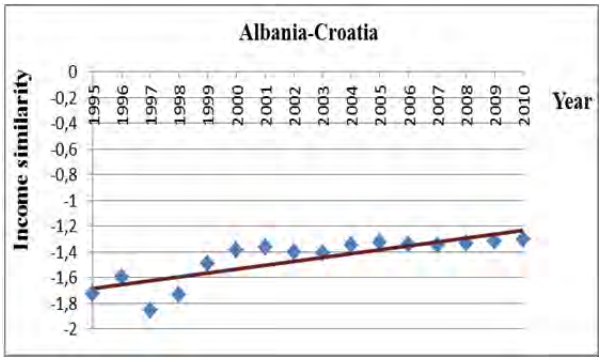

Tunisia-Turkey
Market size
Year

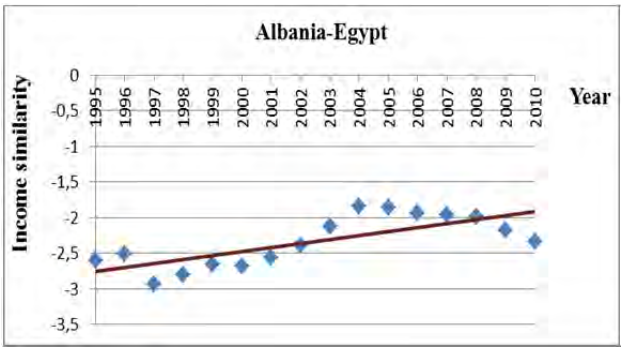

Tunisia-EU
Market size
Year

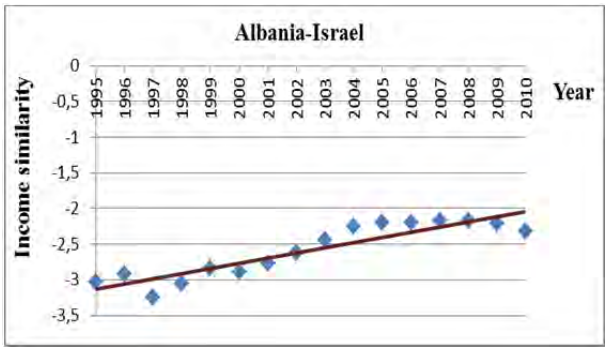

Turkey-EU
Market size
Year

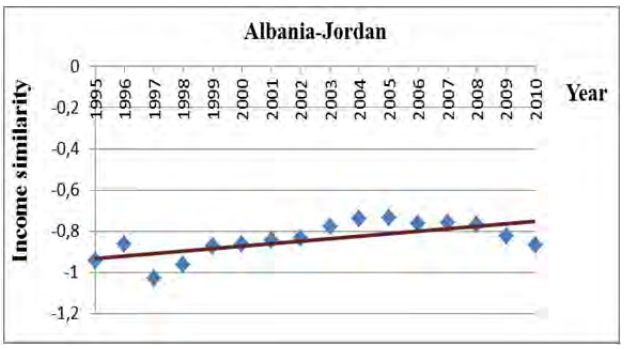
APPENDIX IX: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'INCOME SIMILARITY' OF ALL PAIRS

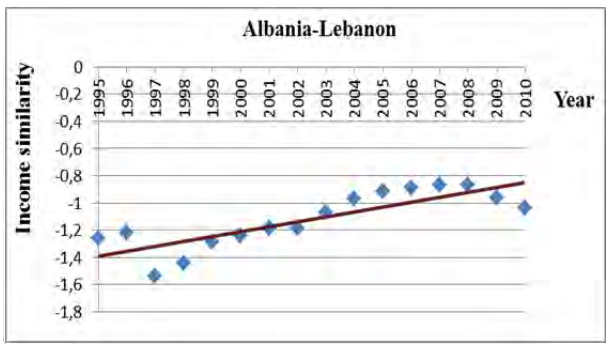


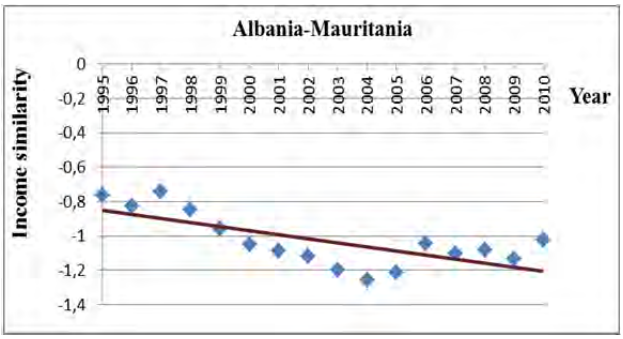


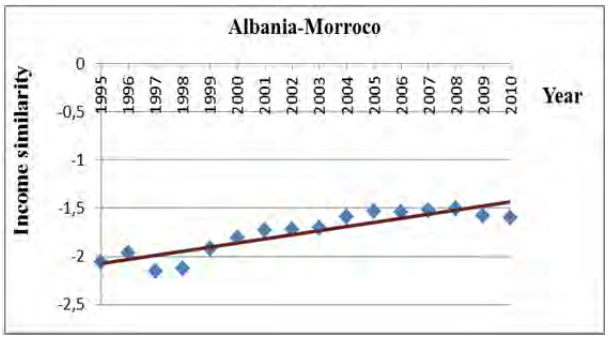


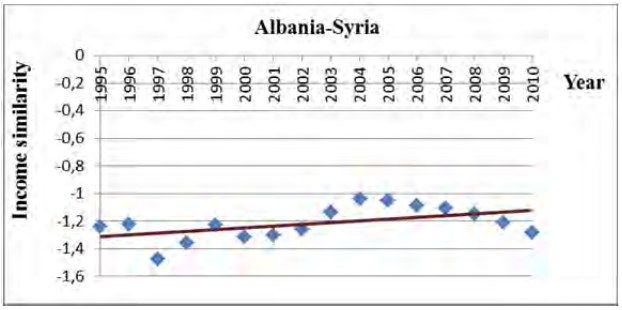


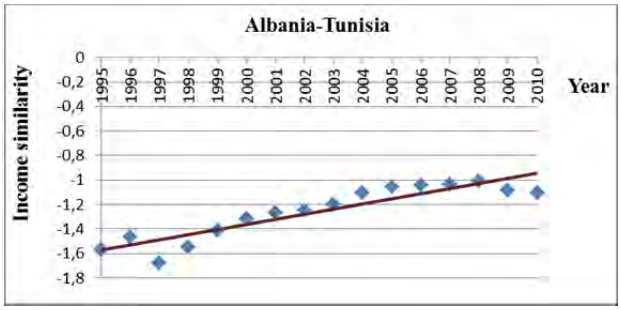


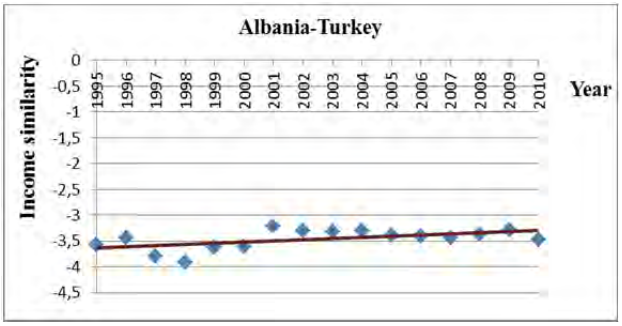


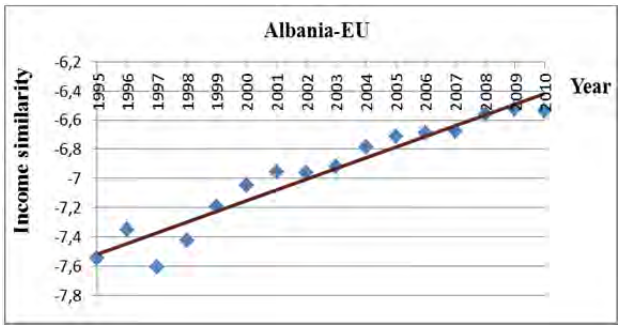


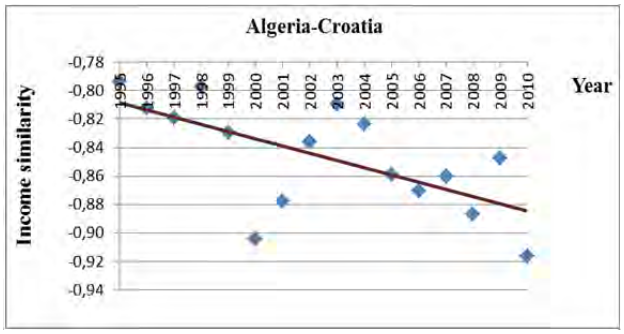


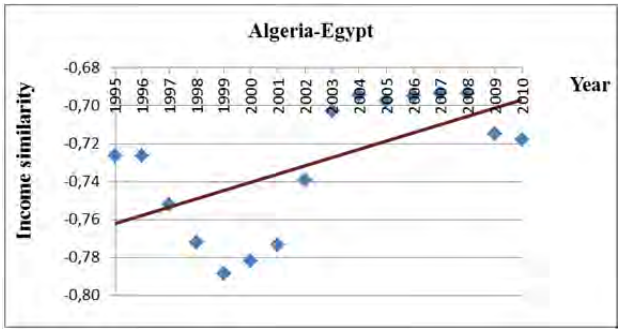

Albania-Syria
Income similarity
Year

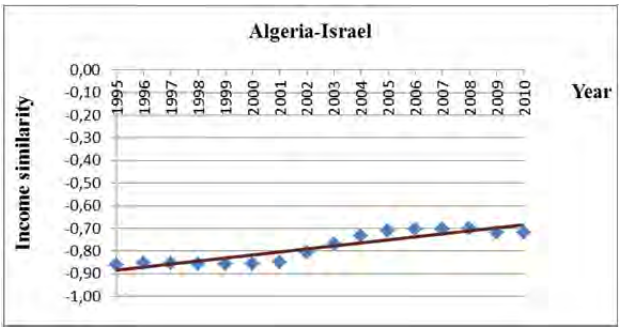

Albania-Tunisia
Income similarity
Year

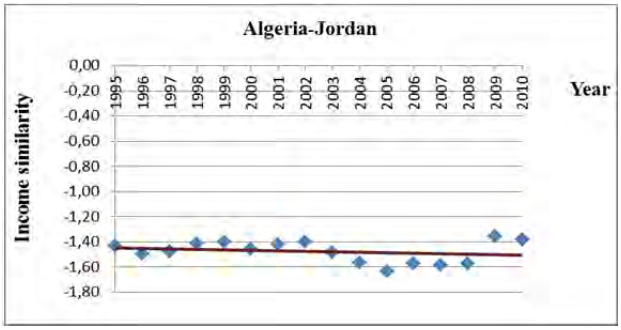

Albania-Turkey
Income similarity
Year

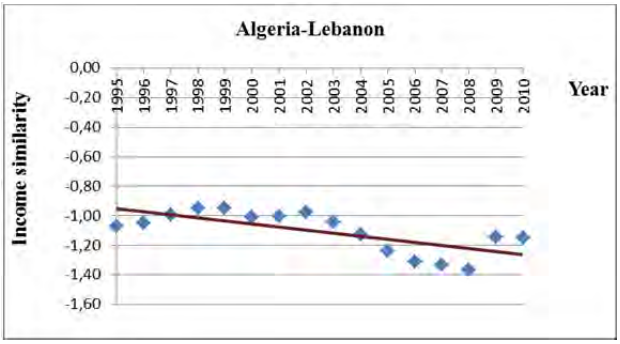

Albania-EU
Income similarity
Year

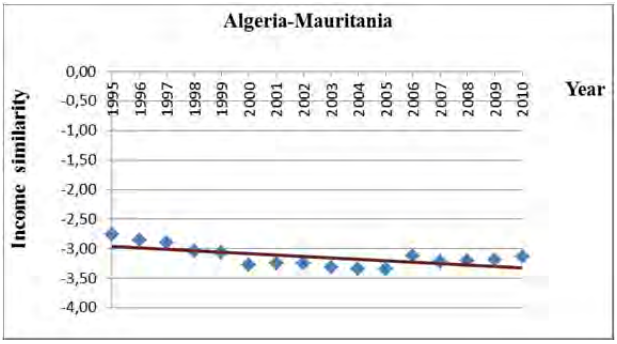

Algeria-Croatia
Income similarity
Year

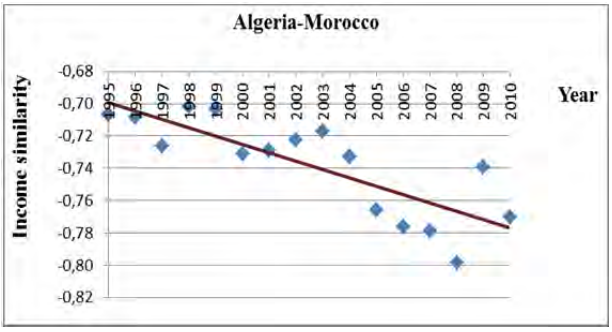

Algeria-Egypt
Income similarity
Year

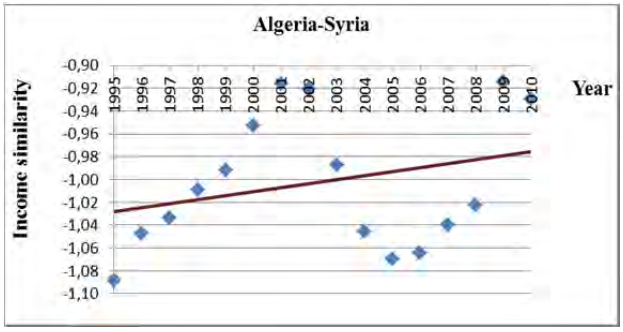

Algeria-Israel
Income similarity
Year

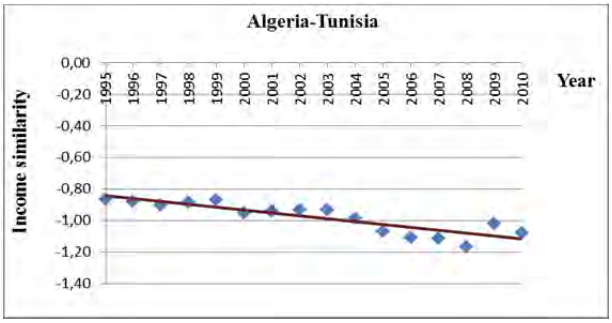

Algeria-Jordan
Income similarity
Year

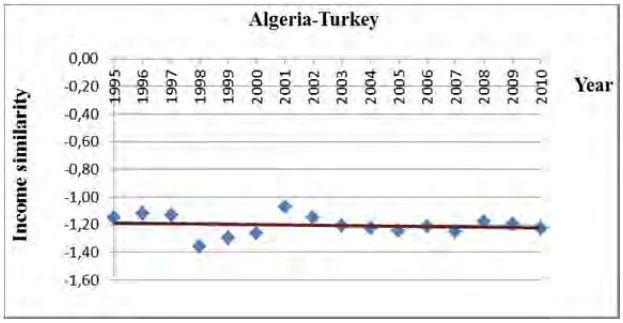

Algeria-Lebanon
Income similarity
Year

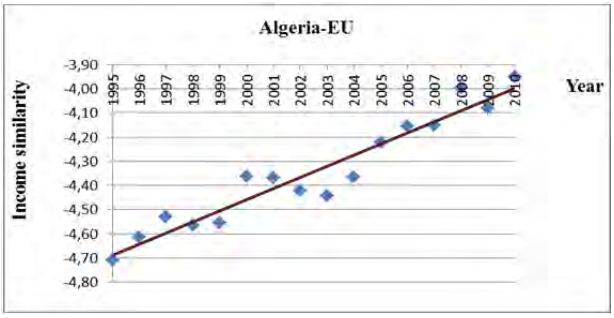

Algeria-Mauritania
Income similarity
Year

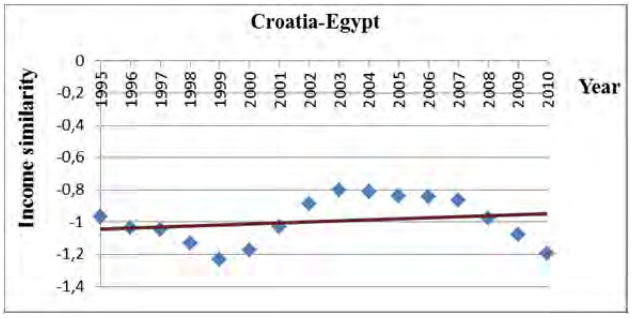

Algeria-Morocco
Income similarity
Year

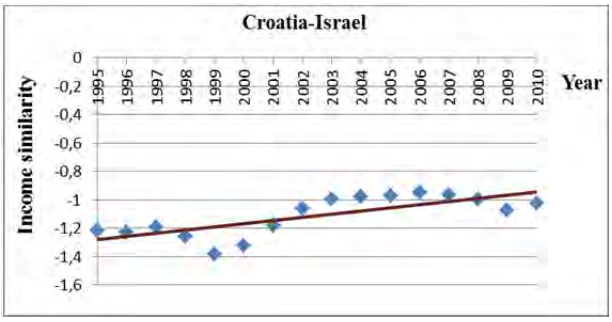

Algeria-Syria
Income similarity
Year

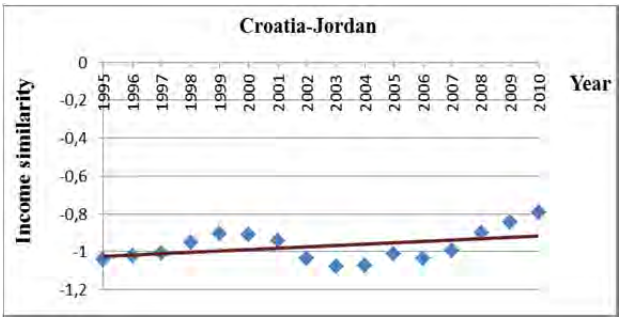

Algeria-Tunisia
Income similarity
Year

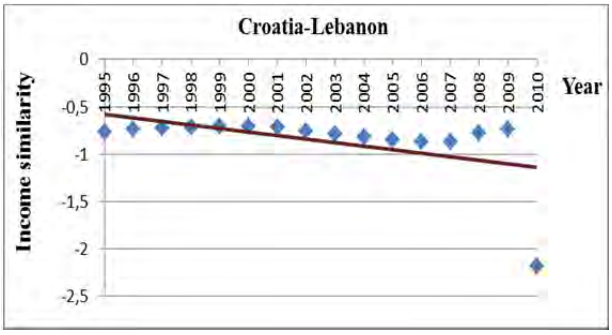

Algeria-Turkey
Income similarity
Year

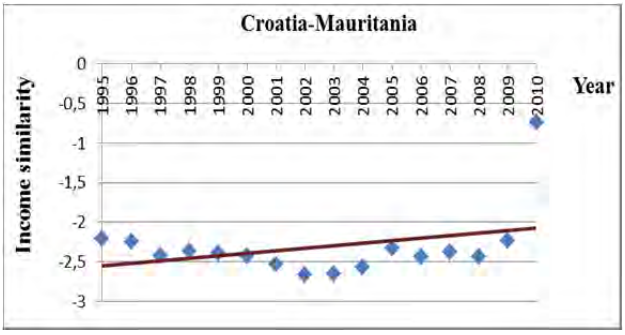

Algeria-EU
Income similarity
Year

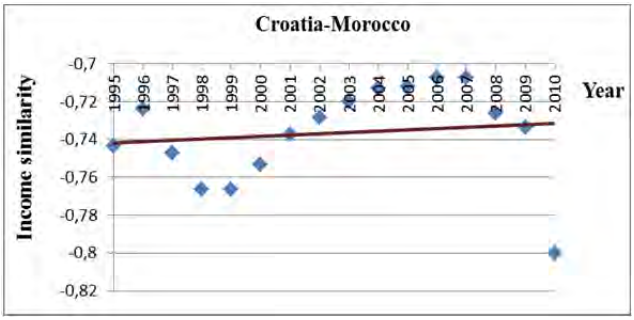

Croatia-Egypt
Income similarity
Year

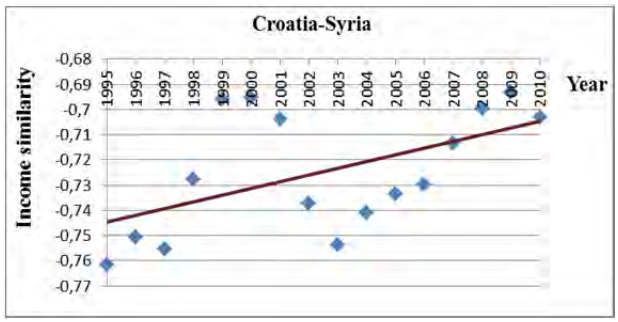

Croatia-Israel
Income similarity
Year

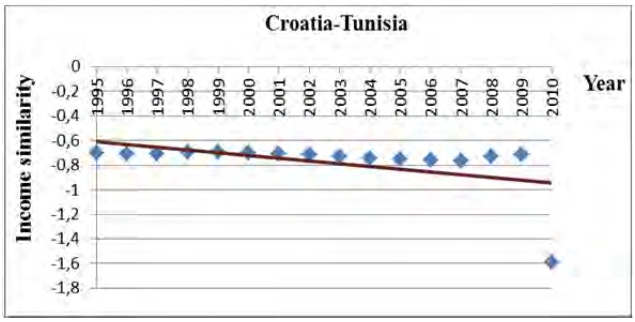

Croatia-Jordan
Income similarity
Year

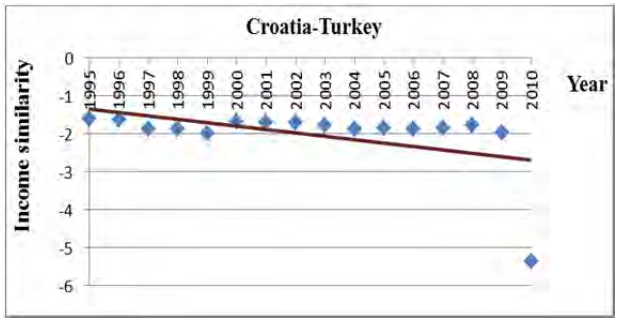

Croatia-Lebanon
Income similarity
Year

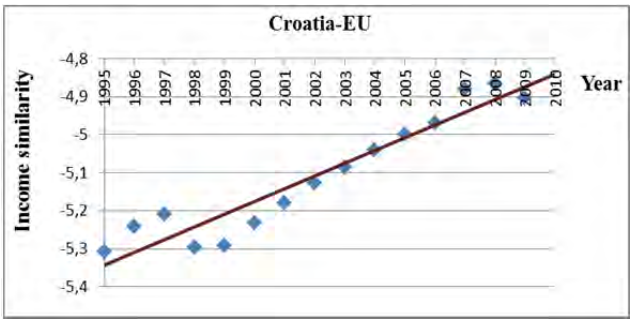

Croatia-Mauritania
Income similarity
Year

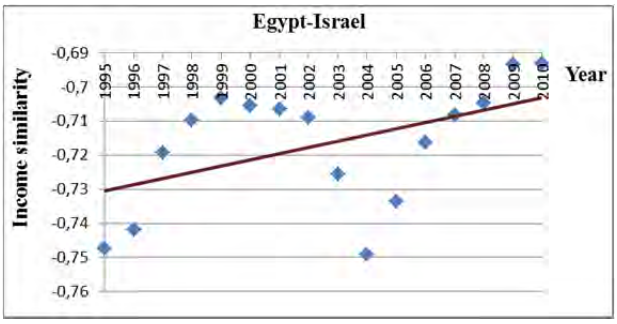

Croatia-Morocco
Income similarity
Year

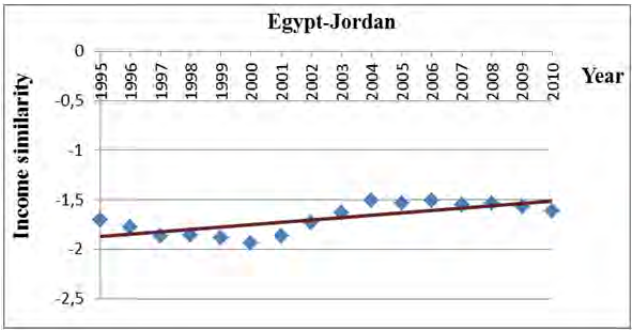

Croatia-Syria
Income similarity
Year

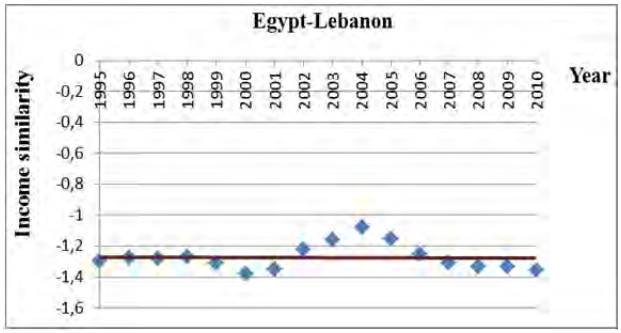

Croatia-Tunisia
Income similarity
Year

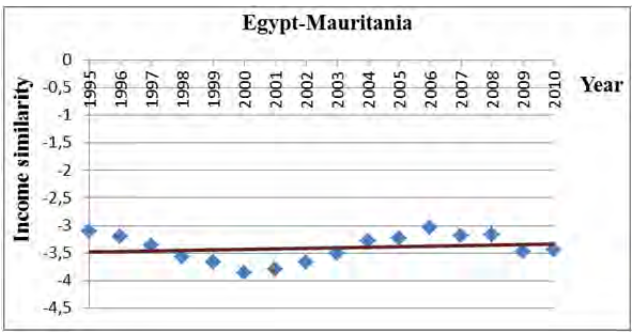

Croatia-Turkey
Income similarity
Year

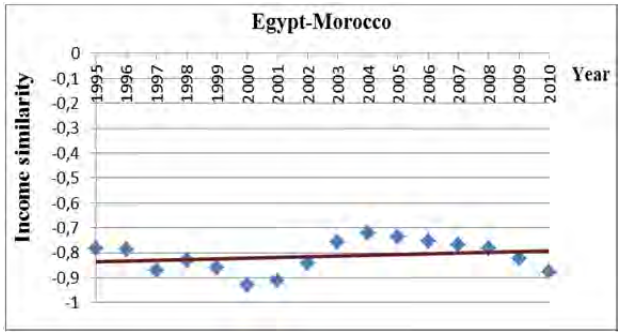

Croatia-EU
Income similarity
Year

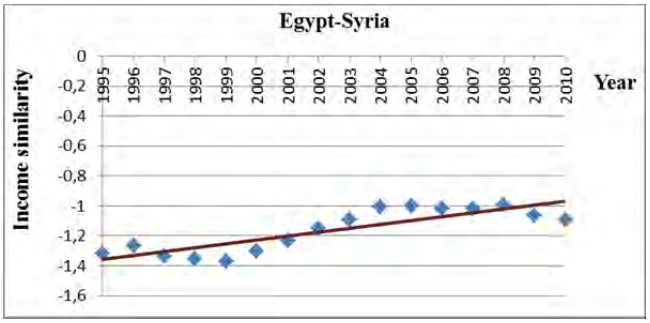

Egypt-Israel
Income similarity
Year

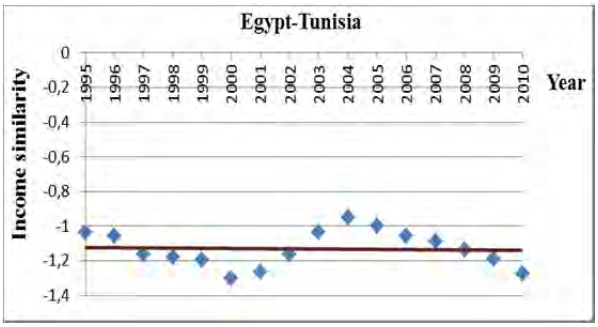

Egypt-Jordan
Income similarity
Year

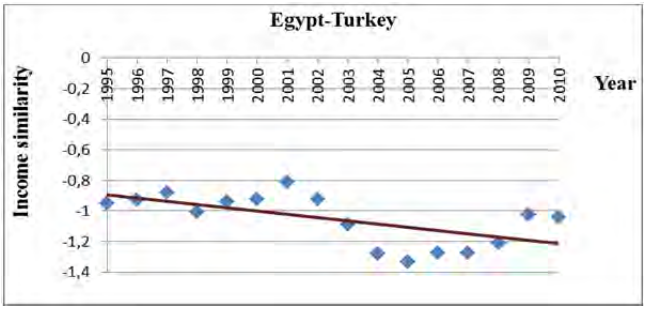

Egypt-Lebanon
Income similarity
Year

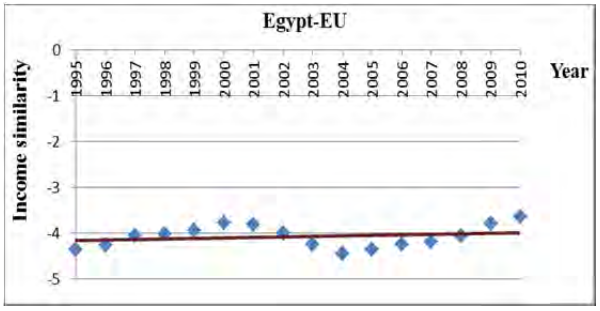

Egypt-Mauritania
Income similarity
Year

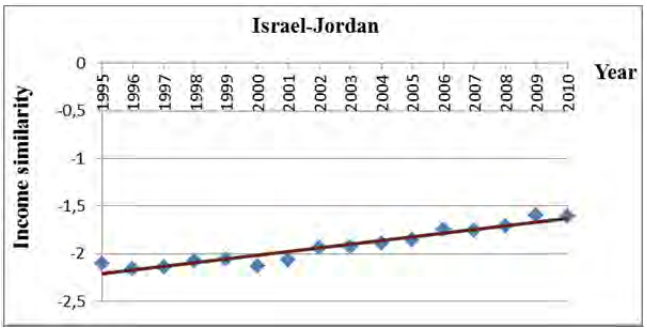

Egypt-Morocco
Income similarity
Year

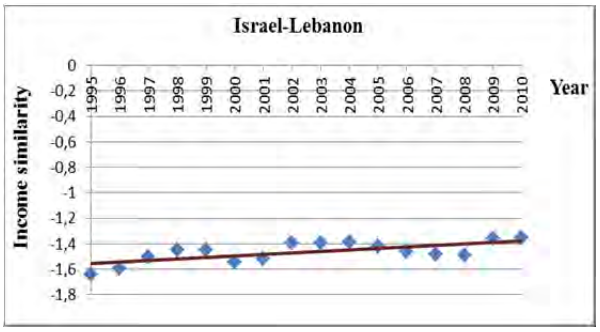

Egypt-Syria
Income similarity
Year

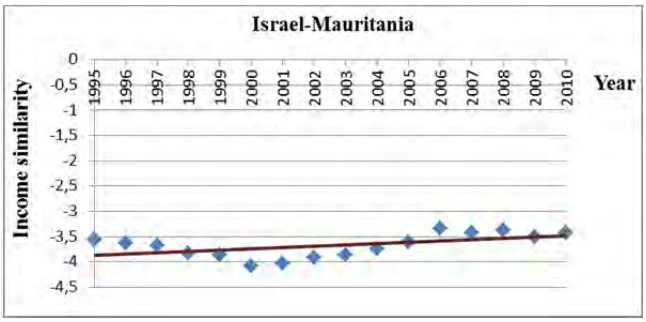

Egypt-Tunisia
Income similarity
Year

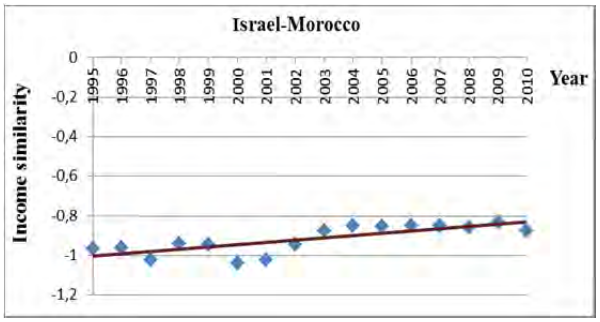

Egypt-Turkey
Income similarity
Year

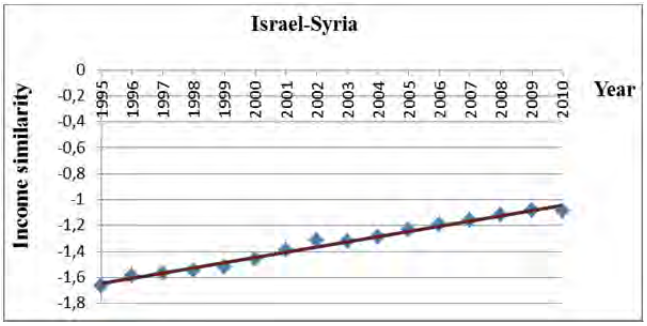

Egypt-EU
Income similarity
Year


Israel-Jordan
Income similarity
Year


Israel-Lebanon
Income similarity
Year


Israel-Mauritania
Income similarity
Year


Israel-Morocco
Income similarity
Year


Israel-Syria
Income similarity
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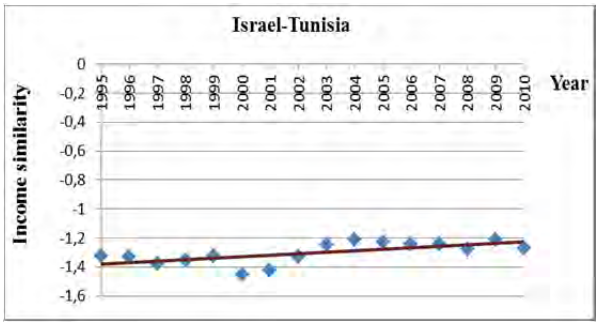
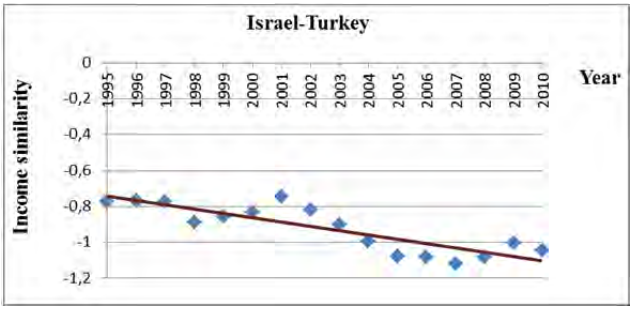
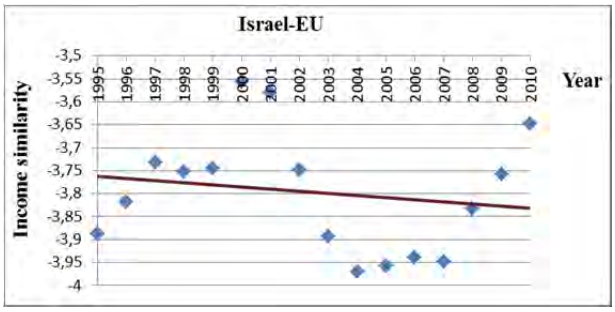
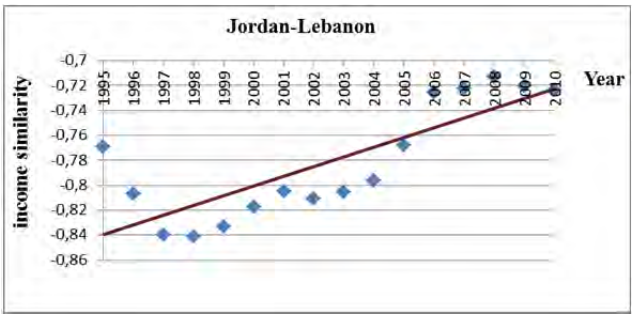
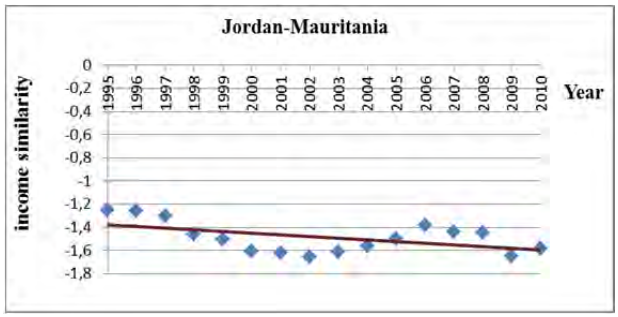
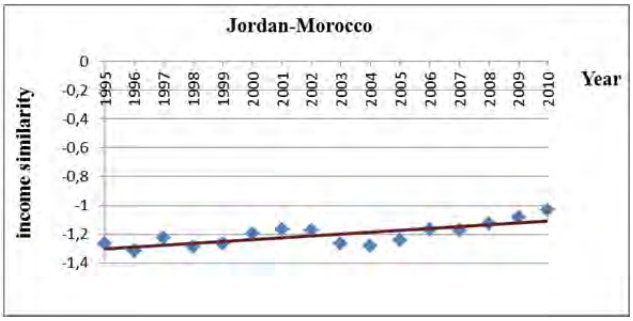

Israel-Tunisia
Income similarity
Year

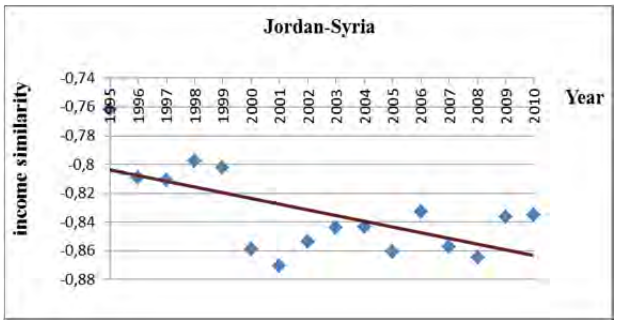

Israel-Turkey
Income similarity
Year

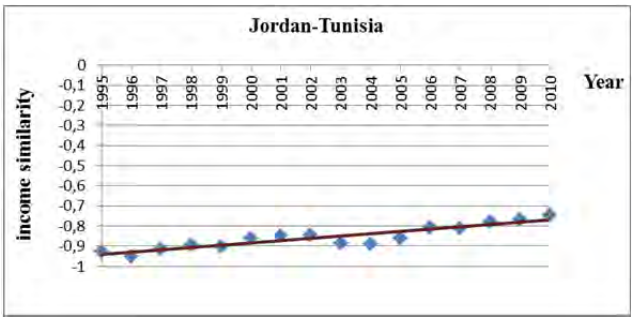

Israel-EU
Income similarity
Year

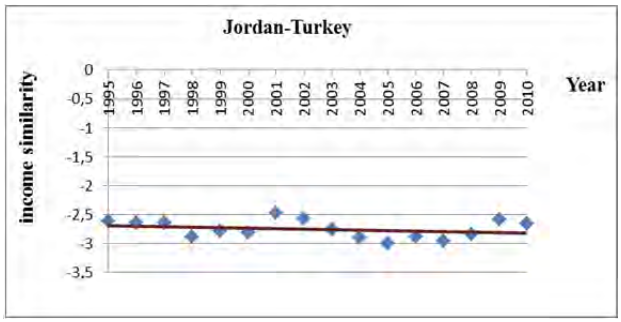

Jordan-Lebanon
income similarity
Year

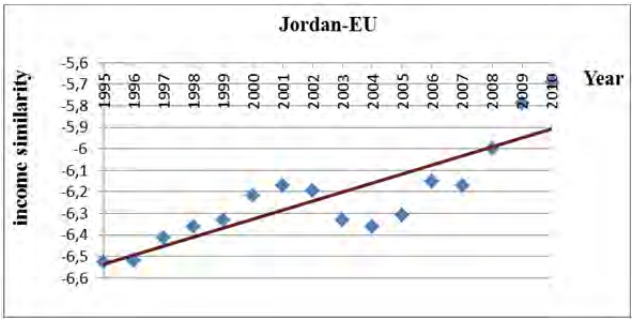

Jordan-Mauritania
income similarity
Year

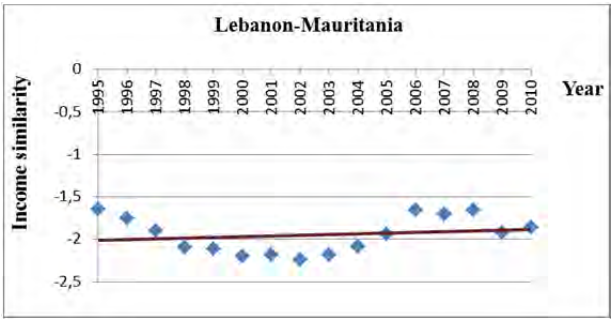

Jordan-Morocco
income similarity
Year

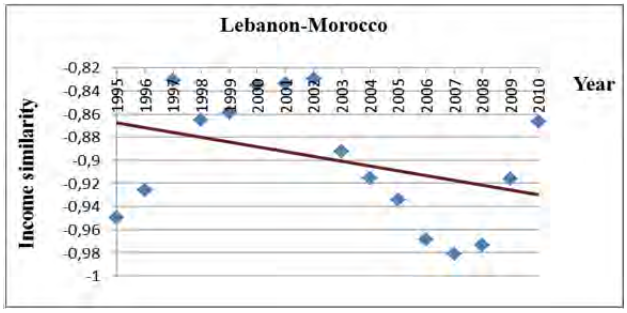

Jordan-Syria
income similarity
Year

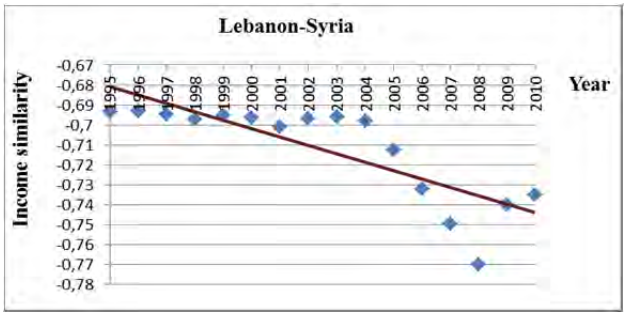

Jordan-Tunisia
income similarity
Year

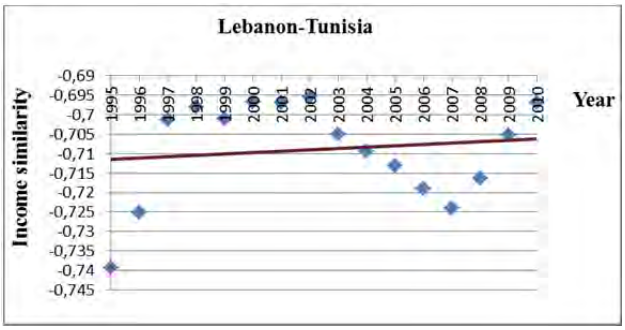

Jordan-Turkey
income similarity
Year

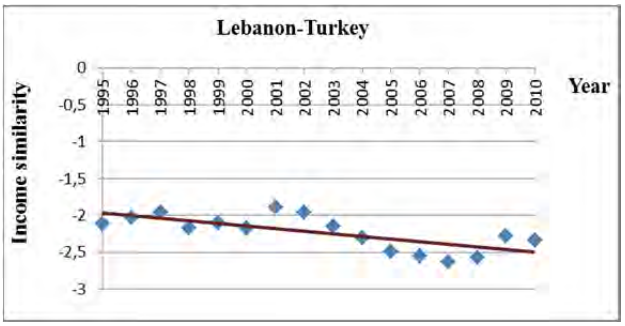

Jordan-EU
income similarity
Year

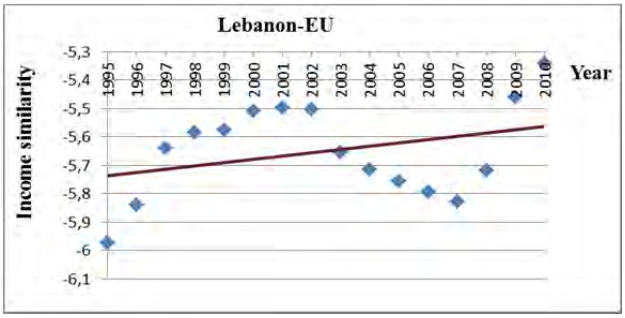

Lebanon-Mauritania
Income similarity
Year

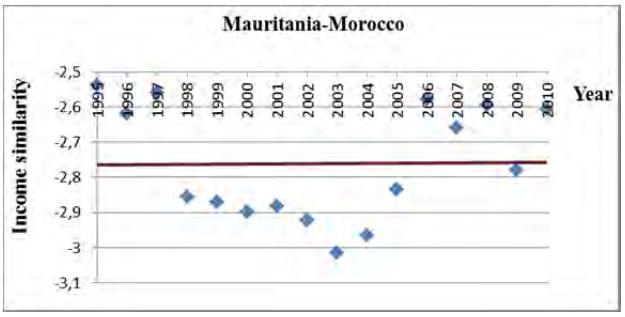

Lebanon-Morocco
Income similarity
Year

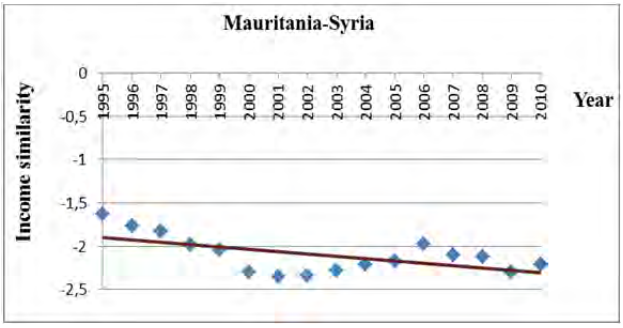

Lebanon-Syria
Income similarity
Year

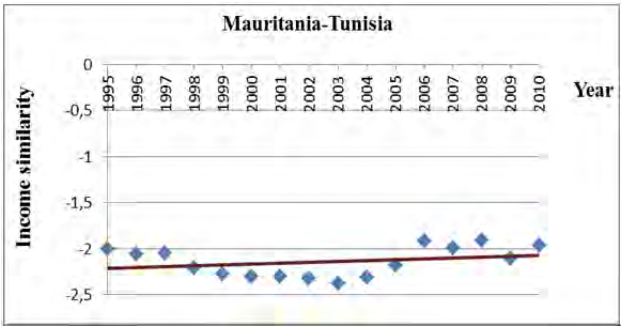

Lebanon-Tunisia
Income similarity
Year

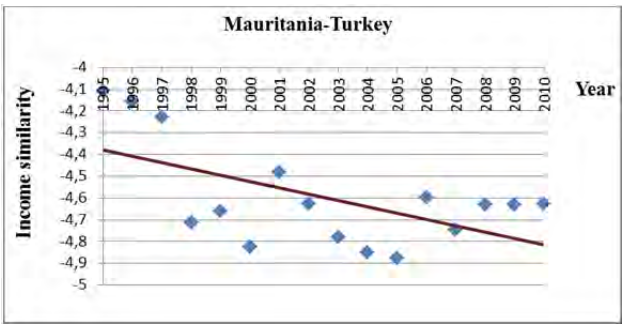

Lebanon-Turkey
Income similarity
Year

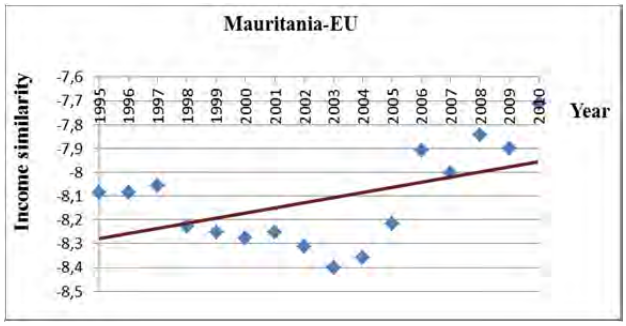

Lebanon-EU
Income similarity
Year

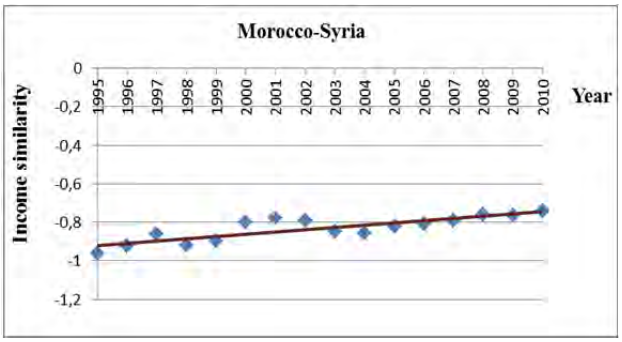

Mauritania-Morocco
Income similarity
Year

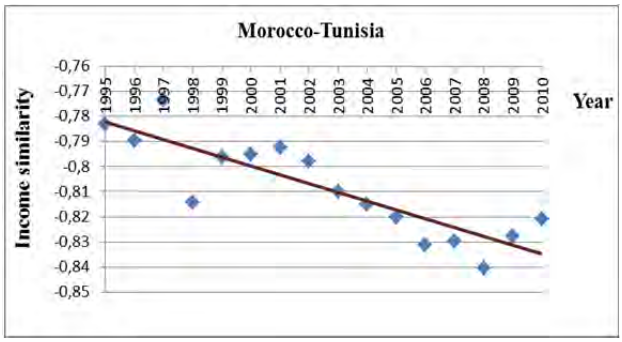

Mauritania-Syria
Income similarity
Year

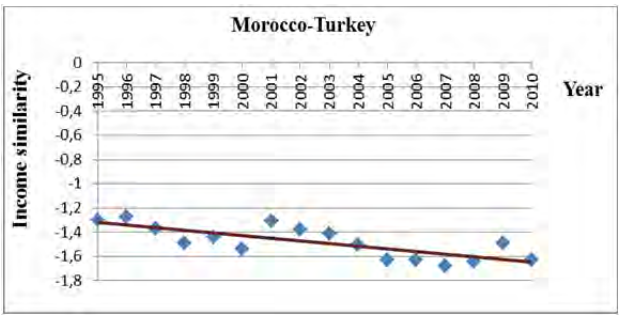

Mauritania-Tunisia
Income similarity
Year

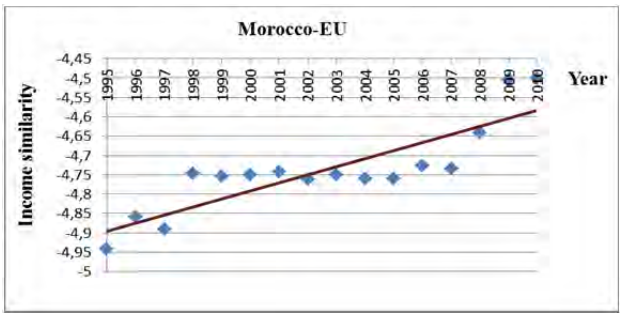

Mauritania-Turkey
Income similarity
Year

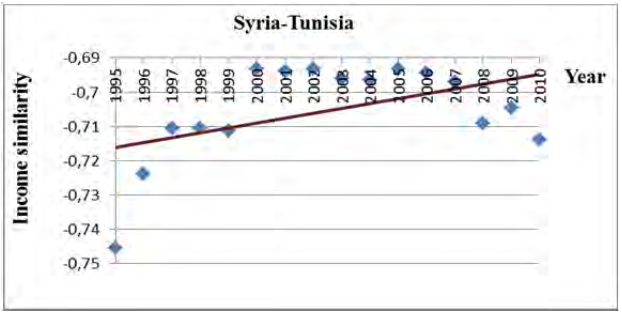

Mauritania-EU
Income similarity
Year

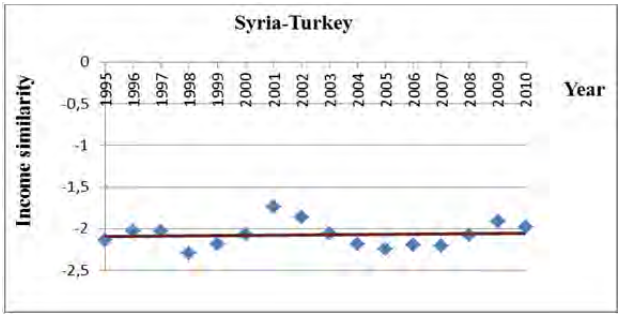

Morocco-Syria
Income similarity
Year

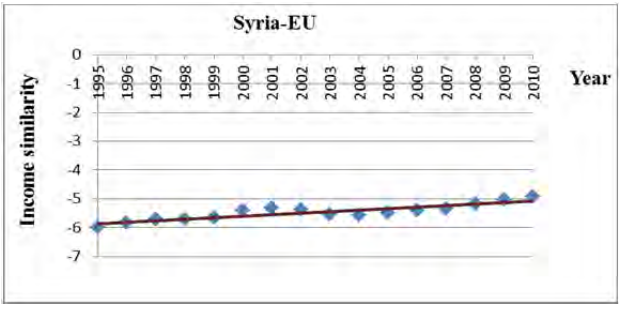

Morocco-Tunisia
Income similarity
Year

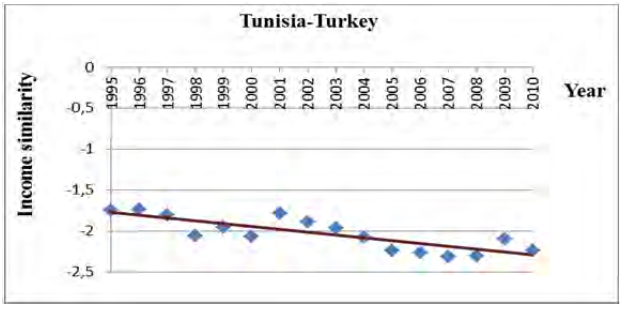

Morocco-Turkey
Income similarity
Year

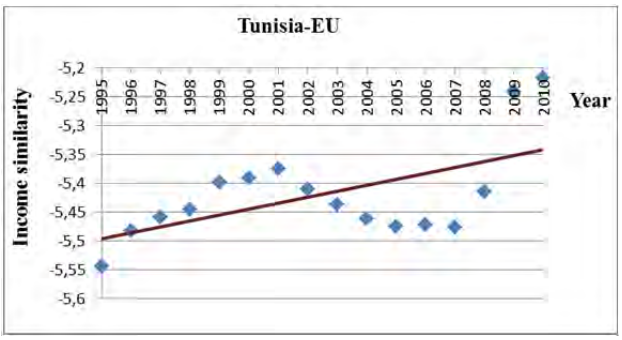

Morocco-EU
Income similarity
Year

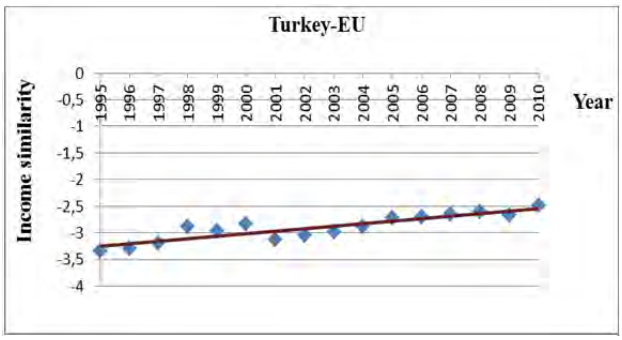

Syria-Tunisia
Income similarity
Year


Syria-Turkey
Income similarity
Year


Syria-EU
Income similarity
Year


Tunisia-Turkey
Income similarity
Year


Tunisia-EU
Income similarity
Year
-5,2
-5,25
-5,3
-5,35
-5,4
-5,45
-5,5
-5,55
-5,6
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010


Turkey-EU
Income similarity
Year
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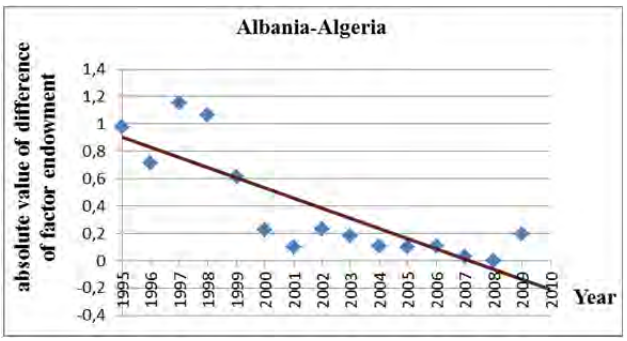
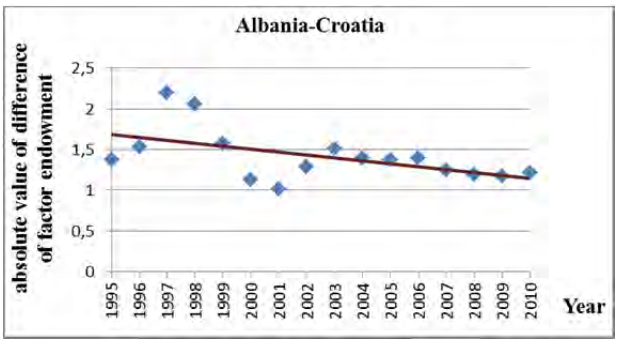
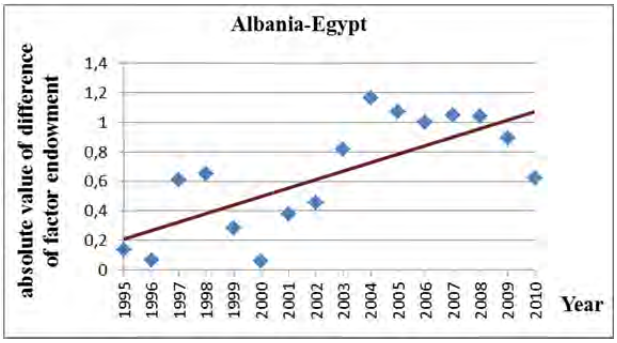
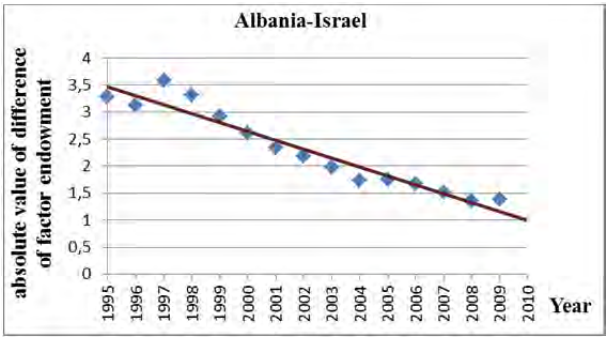
-0,5
-1
-1,5
-2
-2,5
-3
-3,5
-4
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

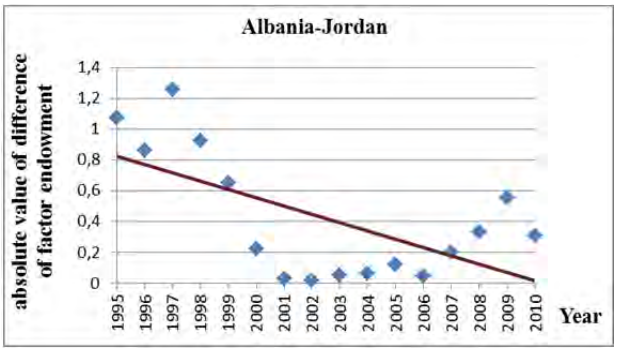
APPENDIXX: TREND LINE OF PLOT CHART (TLPC) FOR VARIABLE 'ABSOLUTE VALUE OF DIFFERENCE OF FACTOR ENDOWMENT' OF ALL PAIRS

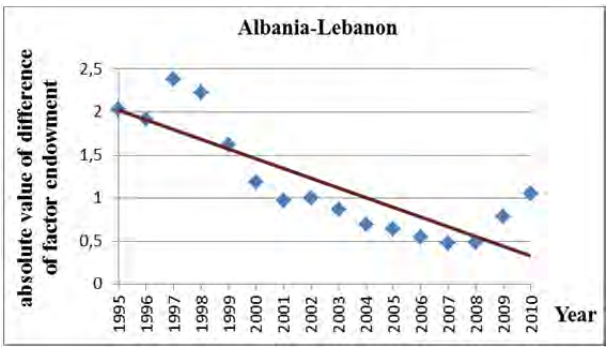


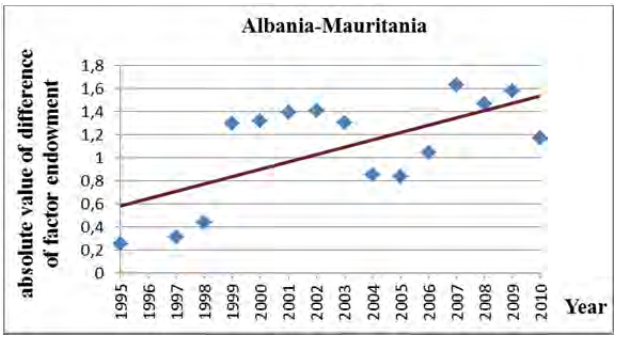


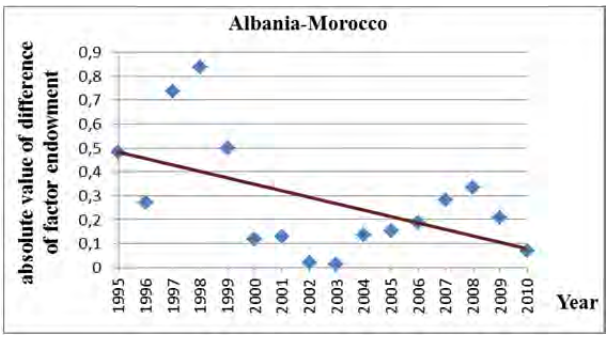


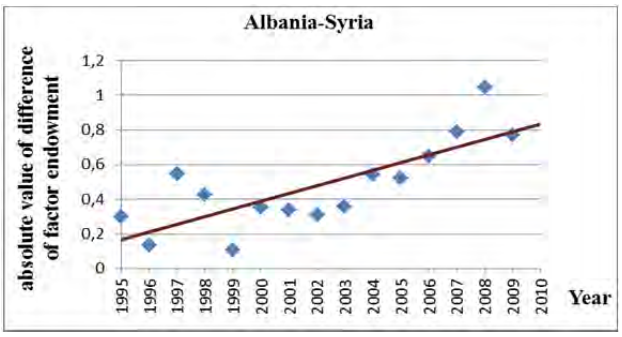


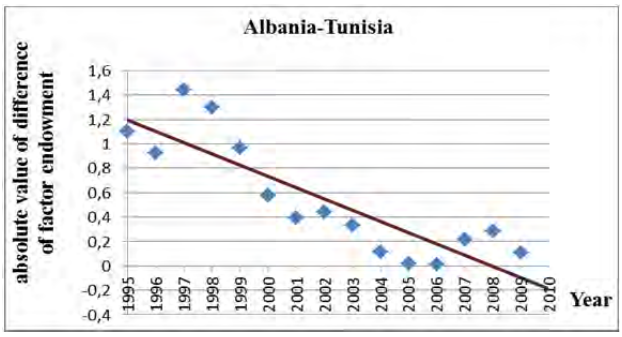


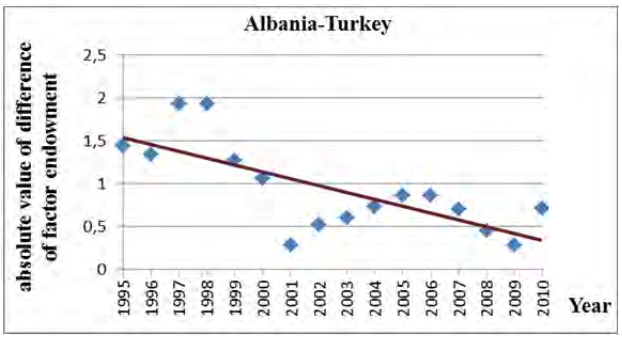


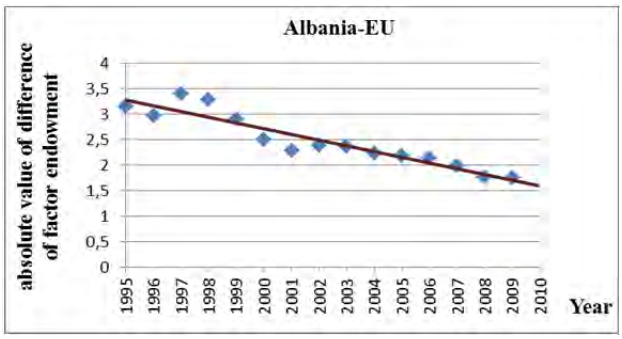


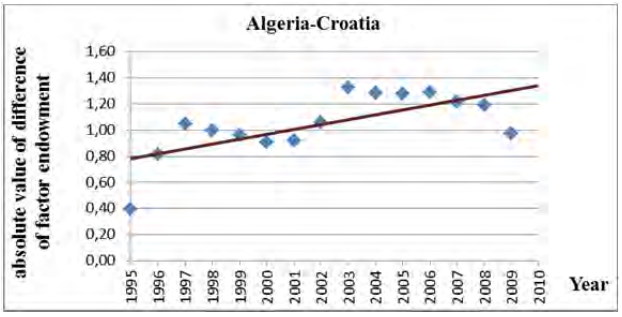


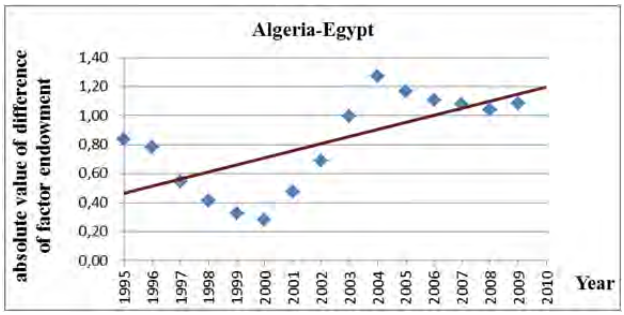

Albania-Syria
absolute value of difference of factor endowment
Year

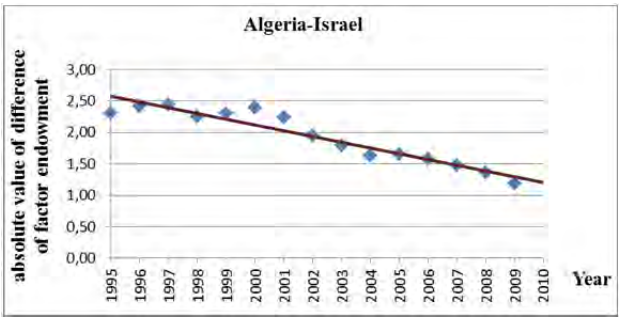

Albania-Tunisia
absolute value of difference of factor endowment
Year

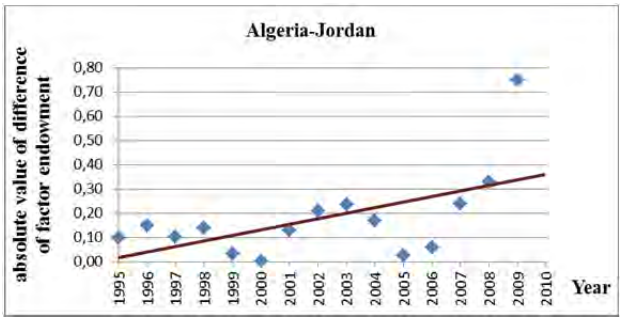

Albania-Turkey
absolute value of difference of factor endowment
Year

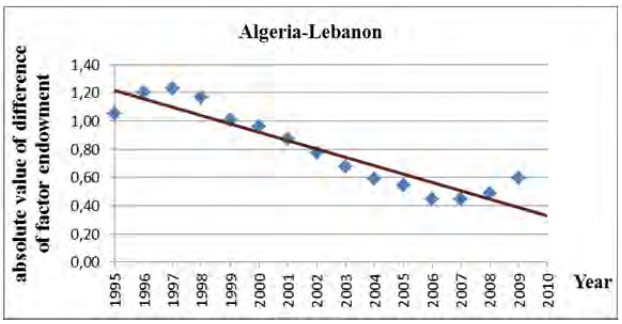

Albania-EU
absolute value of difference of factor endowment
Year

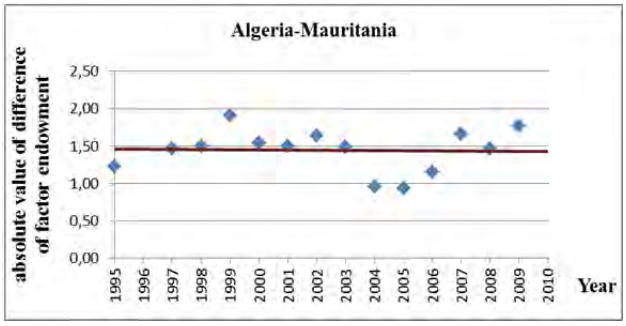

Algeria-Croatia
absolute value of difference of factor endowment
Year

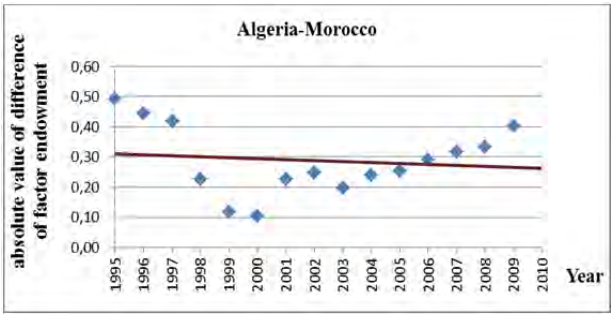

Algeria-Egypt
absolute value of difference of factor endowment
Year

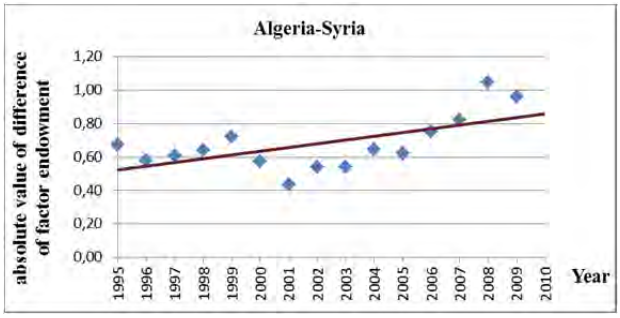

Algeria-Israel
absolute value of difference of factor endowment
Year

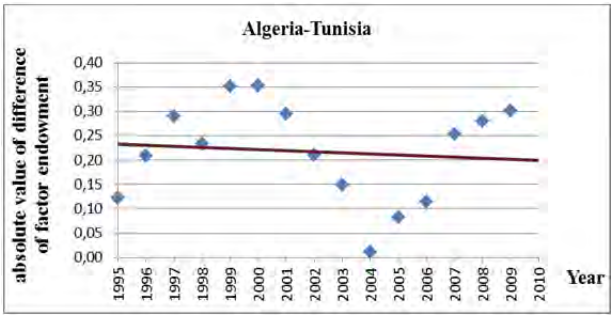

Algeria-Jordan
absolute value of difference of factor endowment
Year

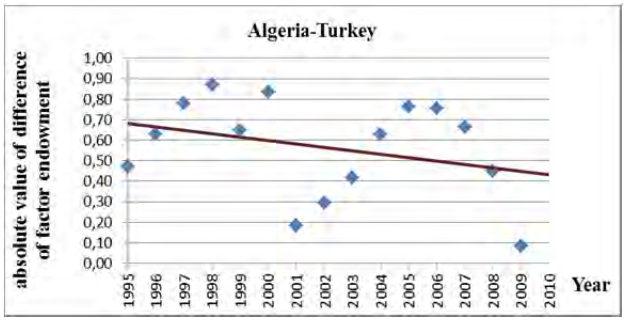

Algeria-Lebanon
absolute value of difference of factor endowment
Year

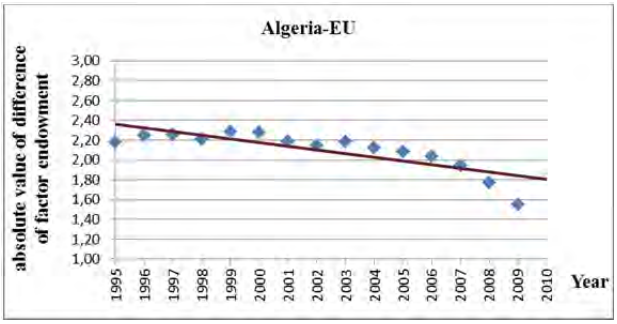

Algeria-Mauritania
absolute value of difference of factor endowment
Year


Algeria-Morocco
absolute value of difference of factor endowment
Year


Algeria-Syria
absolute value of difference of factor endowment
Year


Algeria-Tunisia
absolute value of difference of factor endowment
Year


Algeria-Turkey
absolute value of difference of factor endowment
Year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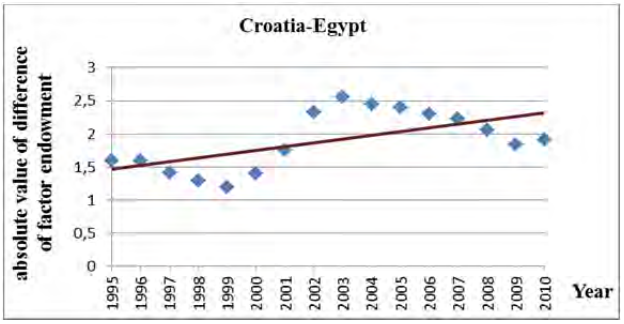
Year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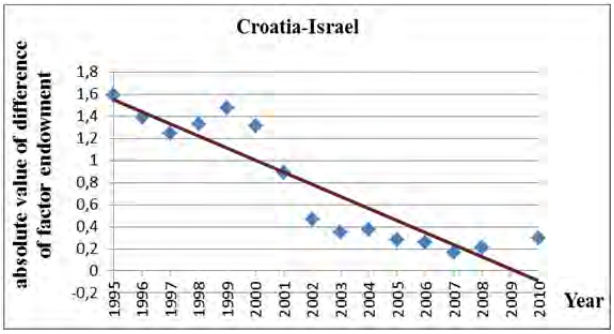
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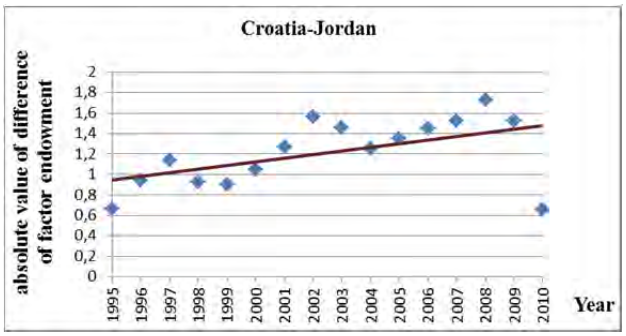
Year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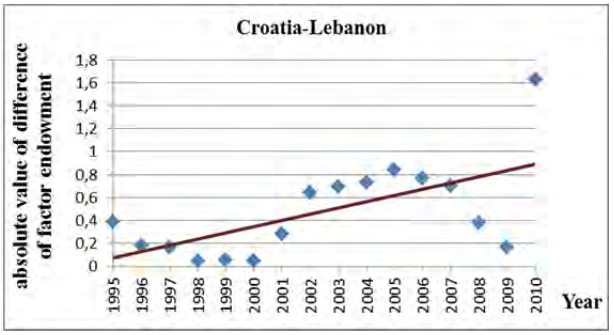
Year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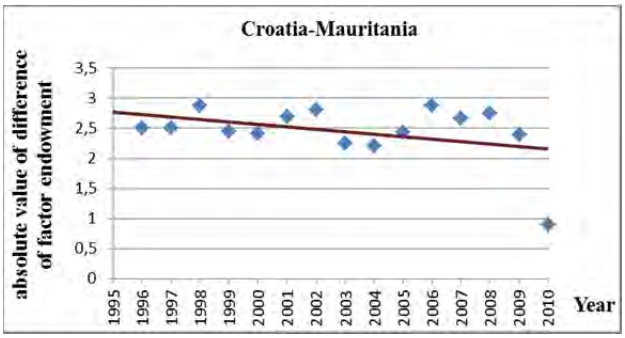
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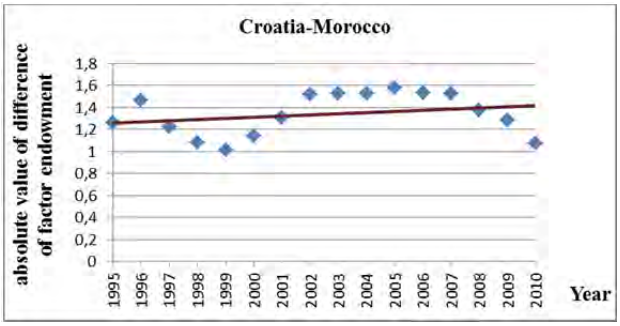
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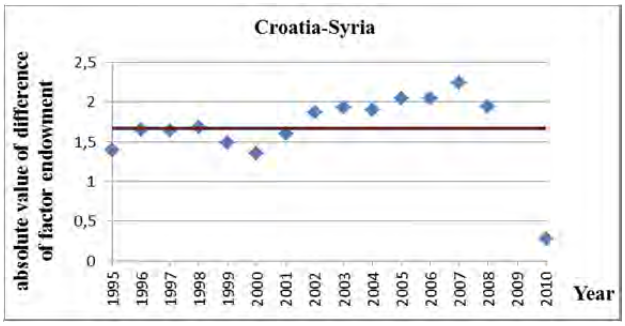
absolute value of difference of factor endowment
Year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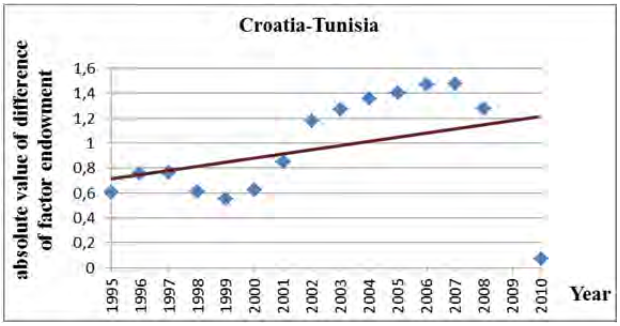
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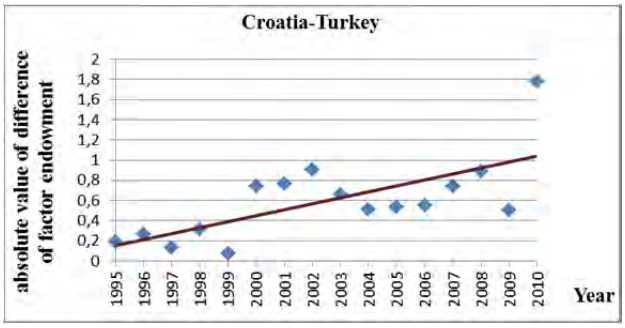
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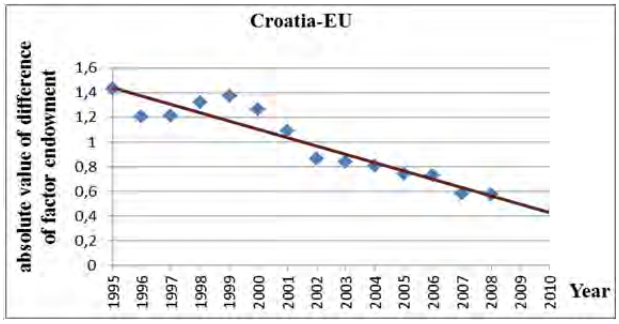
absolute value of difference of factor endowment
Year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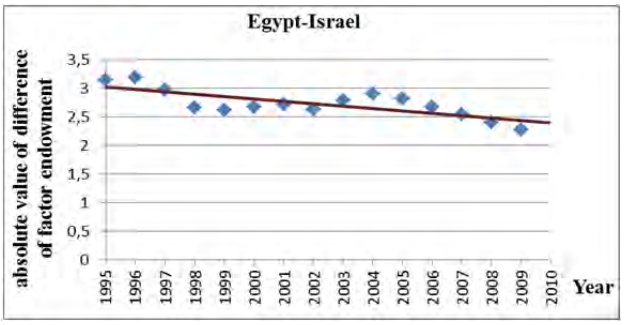
absolute value of difference of factor endowment
Year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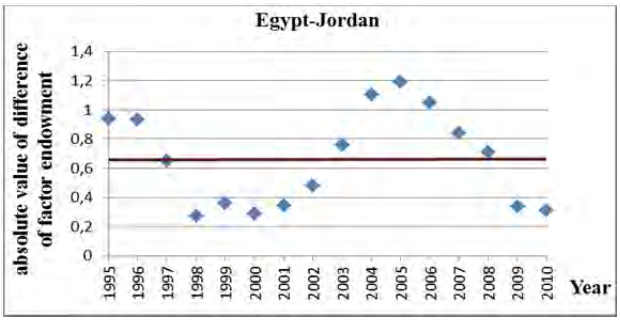
Year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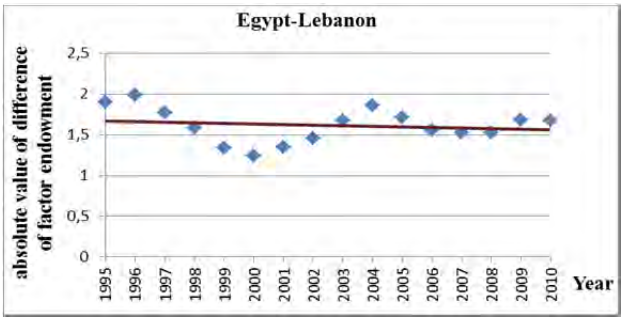
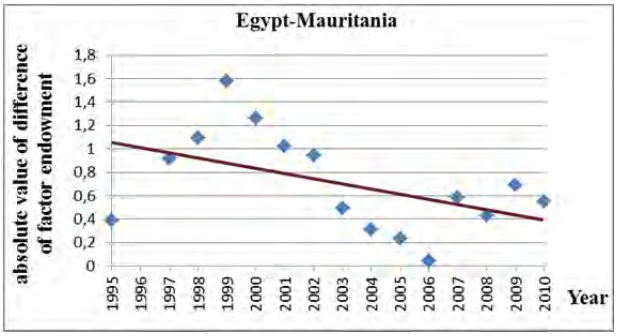
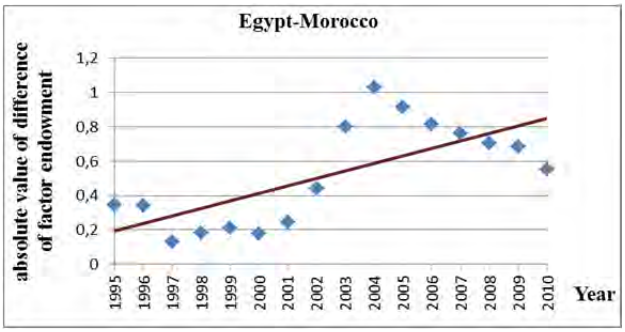
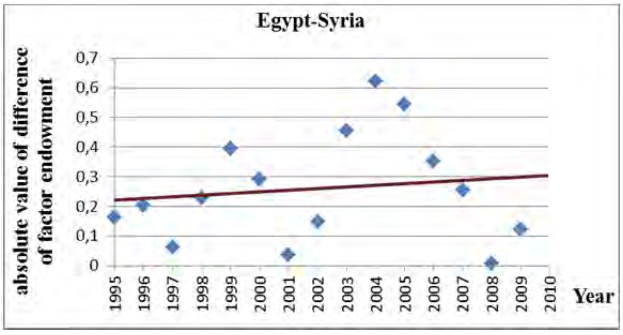
Year


Egypt-Lebanon
absolute value of difference of factor endowment
Year


Egypt-Mauritania
absolute value of difference of factor endowment
Year


Egypt-Morocco
absolute value of difference of factor endowment
Year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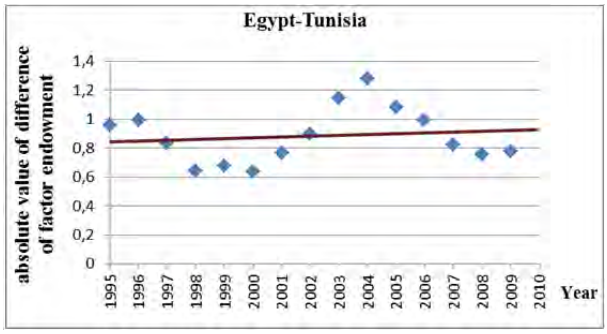
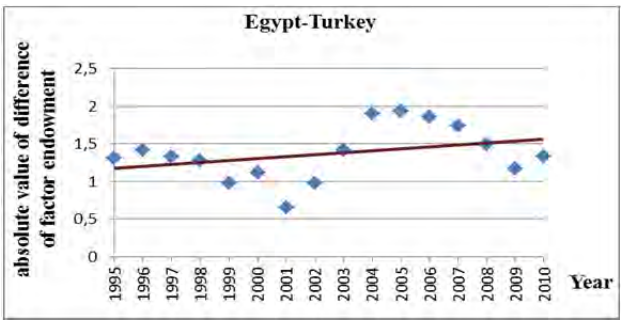
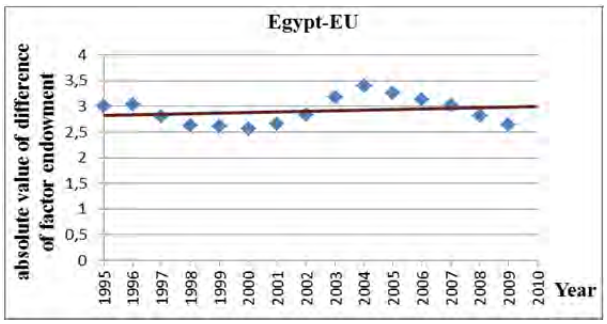
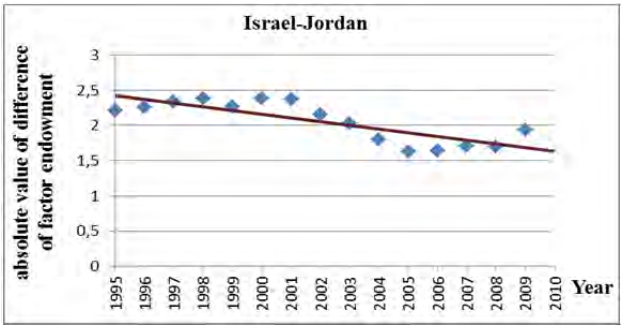
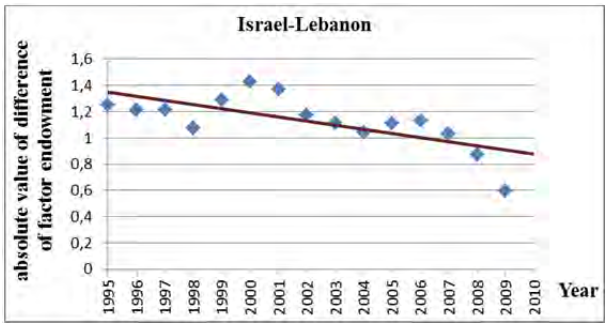
absolute value of difference of factor endowment
Year


Egypt-Tunisia
absolute value of difference of factor endowment
Year


Egypt-Turkey
absolute value of difference of factor endowment
Year


Egypt-EU
absolute value of difference of factor endowment
Year


Israel-Jordan
absolute value of difference of factor endowment
Year


Israel-Lebanon
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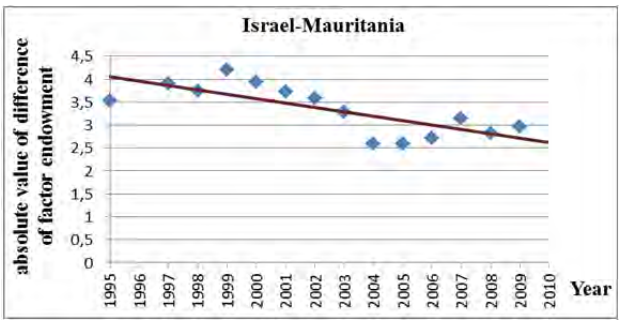
Israel-Mauritania
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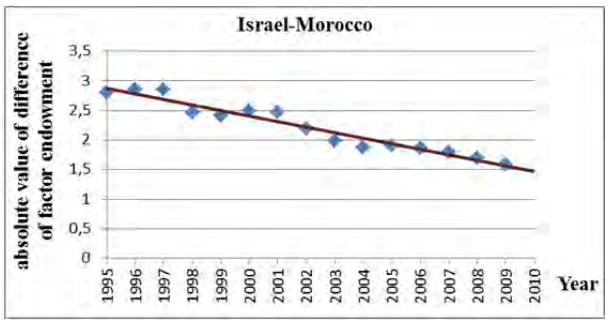
Israel-Morocco
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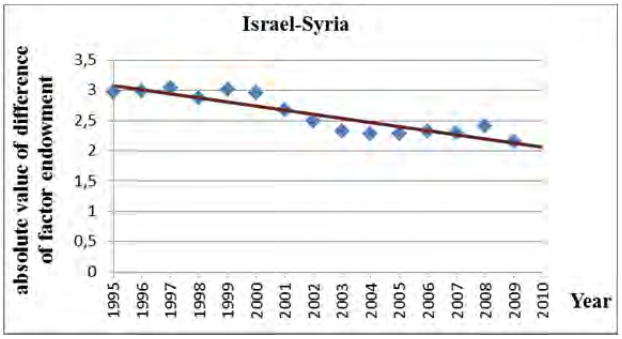
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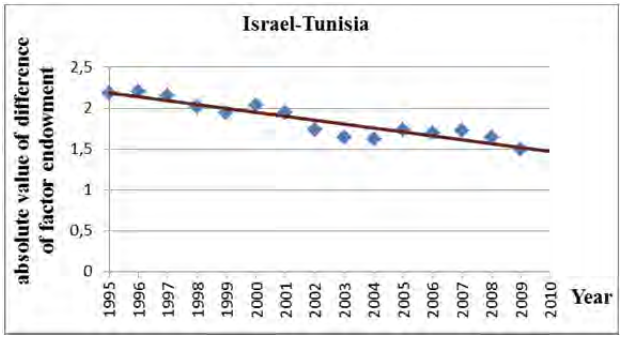
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absolute value of difference of factor endowment
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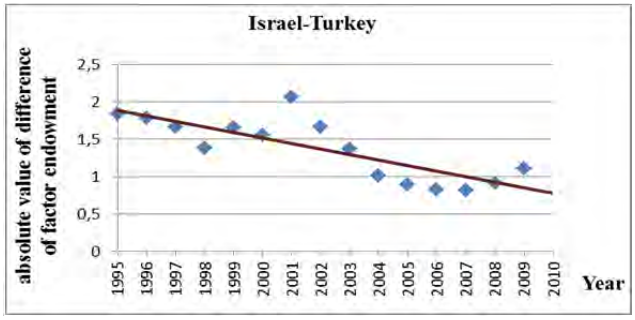
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absolute value of difference of factor endowment
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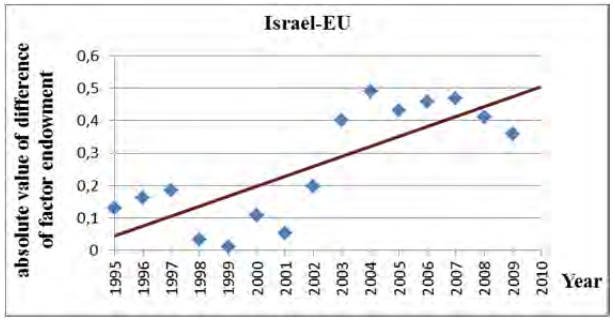
Israel-EU
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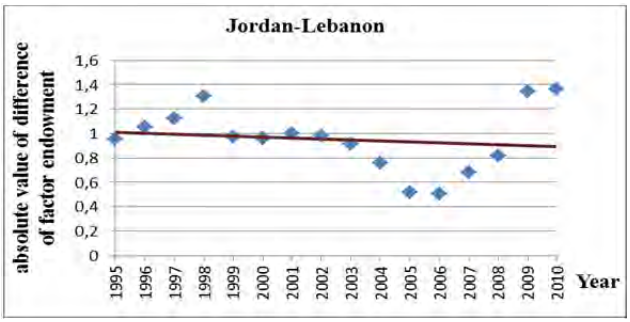
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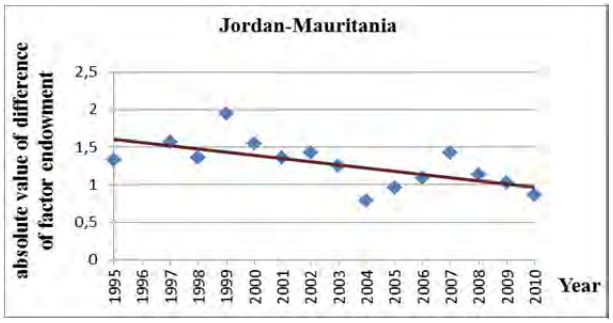
Jordan-Mauritania
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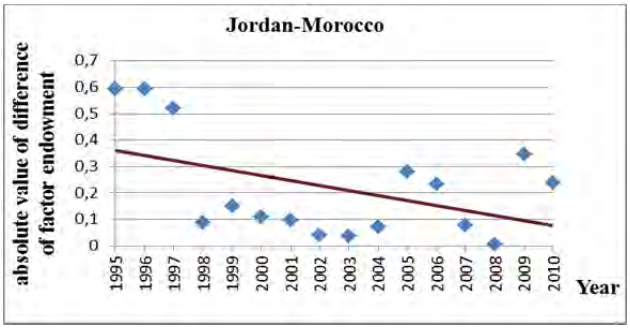
Jordan-Morocco
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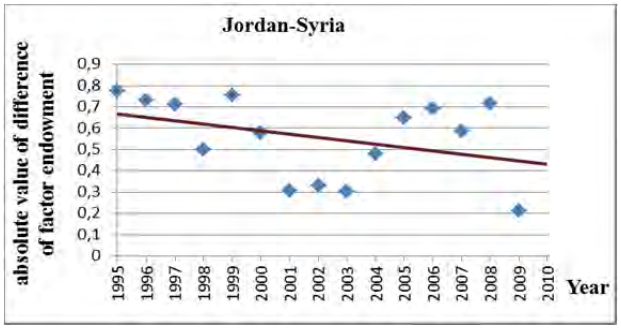
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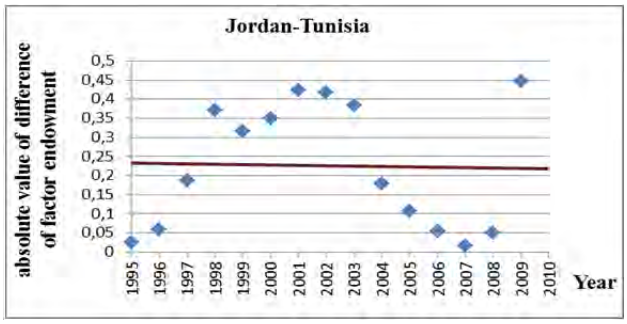
Jordan-Tunisia
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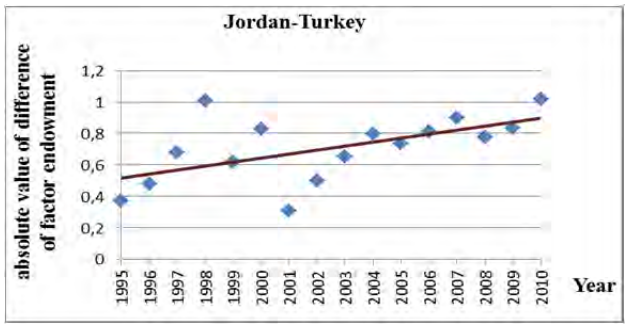
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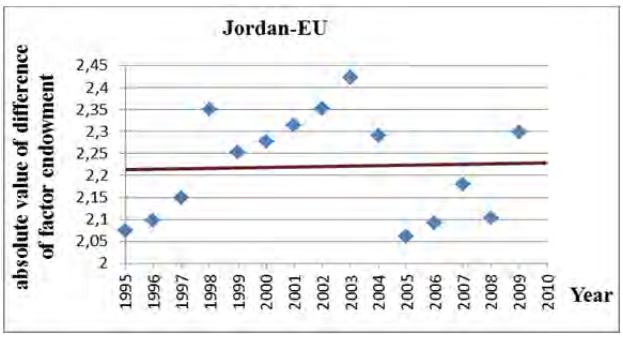
Jordan-EU
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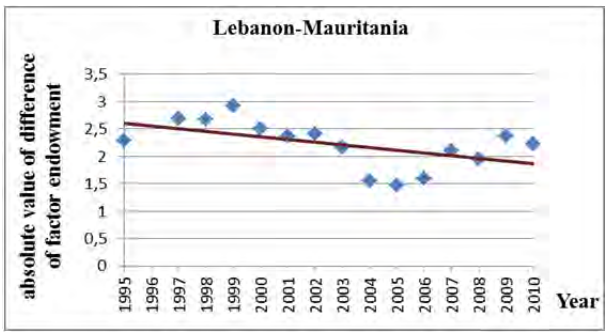
Lebanon-Mauritania
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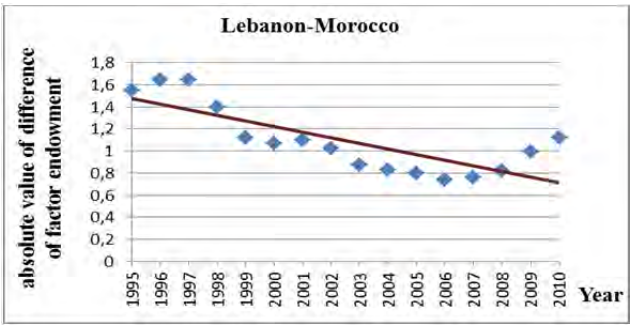
Lebanon-Morocco
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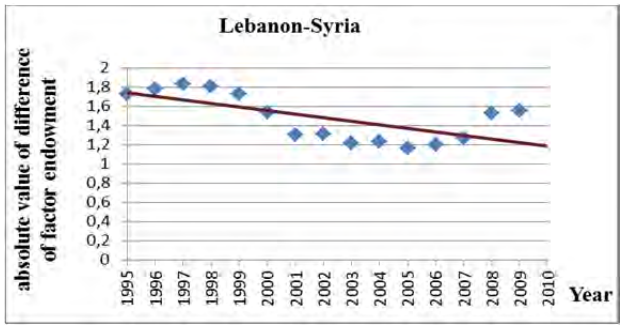
Lebanon-Syria
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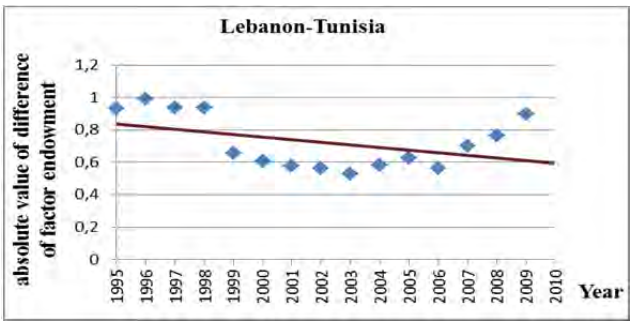
Lebanon-Tunisia
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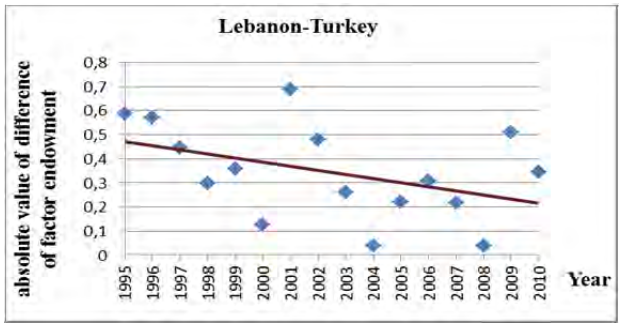
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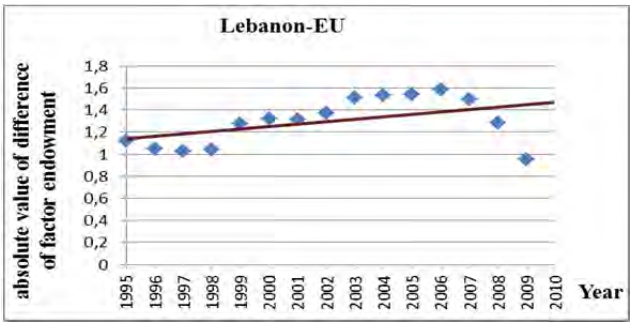
Year


Lebanon-EU
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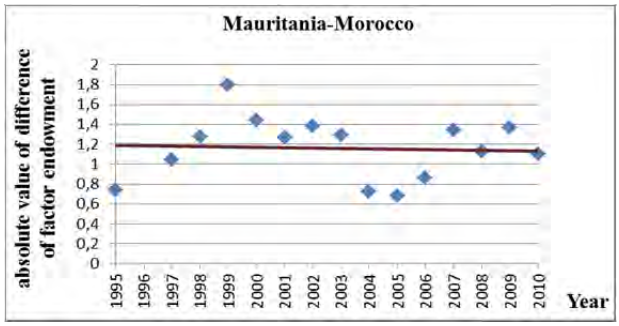
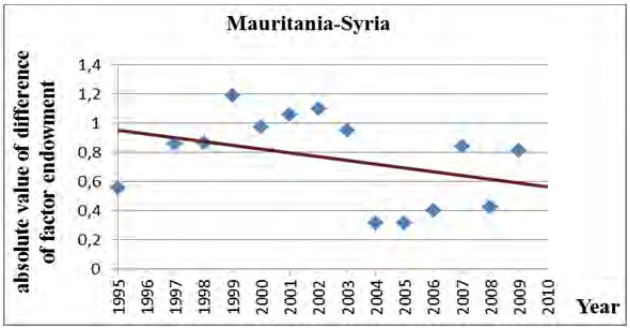
Year


Mauritania-Morocco
absolute value of difference of factor endowment
Year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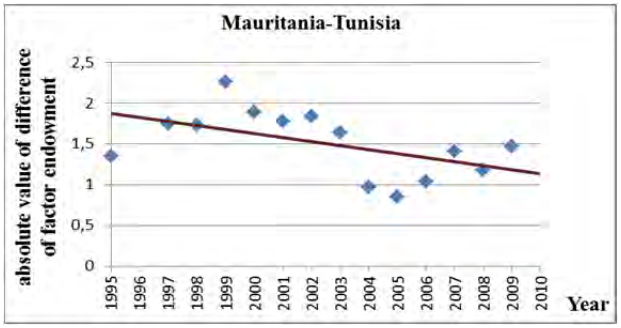
absolute value of difference of factor endowment
Year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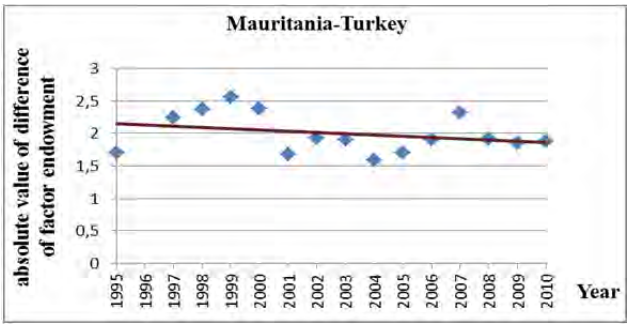
Year


Mauritania-Turkey
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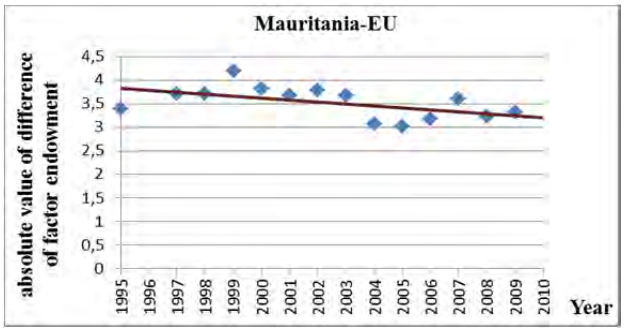
Year


Mauritania-EU
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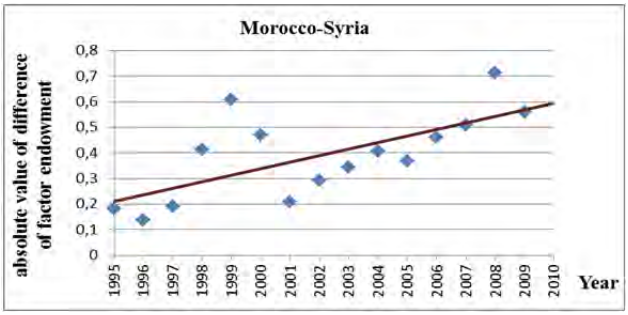
Year


Morocco-Syria
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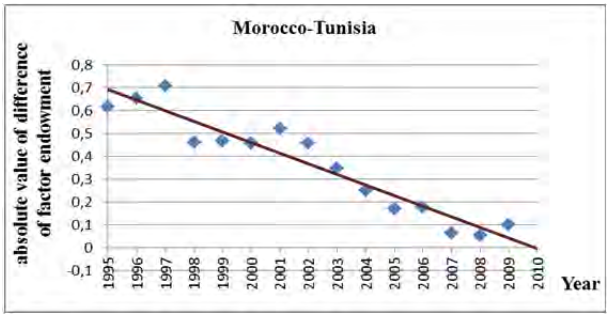
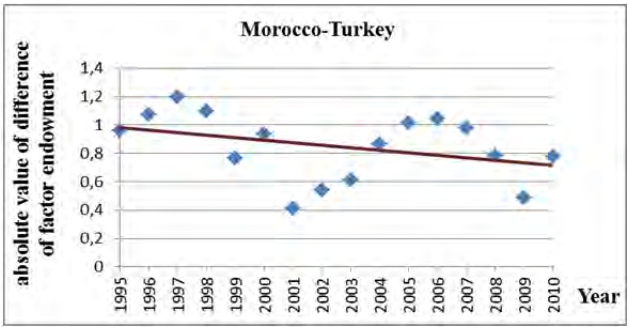
Year


Morocco-Tunisia
absolute value of difference of factor endowment
Year


Morocco-Turkey
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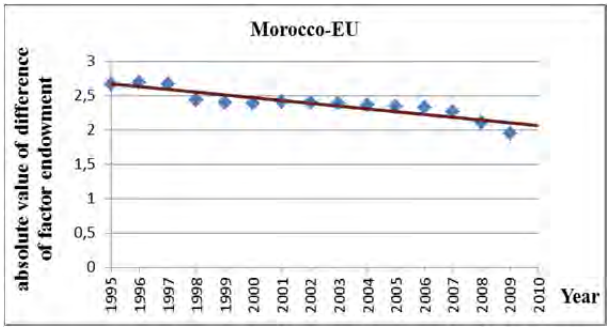
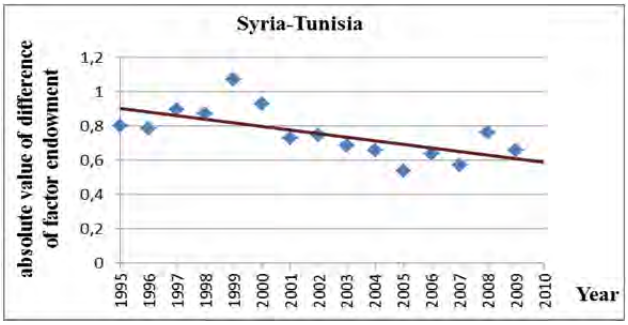
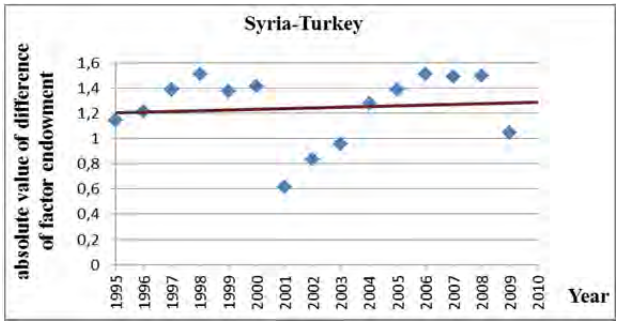
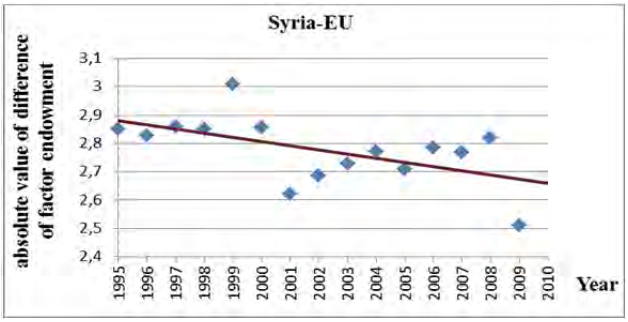
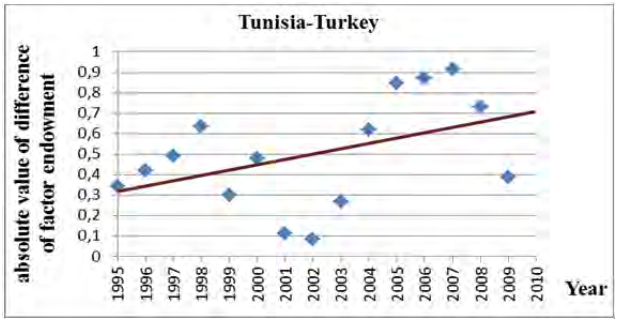
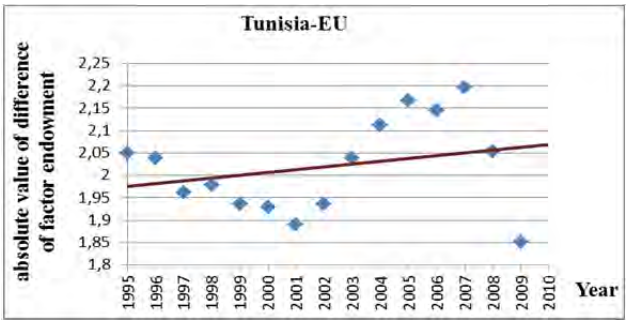

Morocco-EU
absolute value of difference of factor endowment
Year

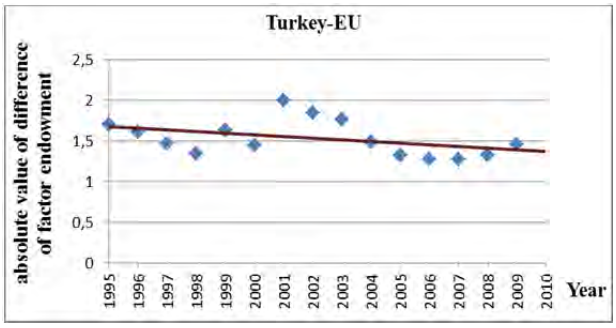

Syria-Tunisia
absolute value of difference of factor endowment
Year


Syria-Turkey
absolute value of difference of factor endowment
Year

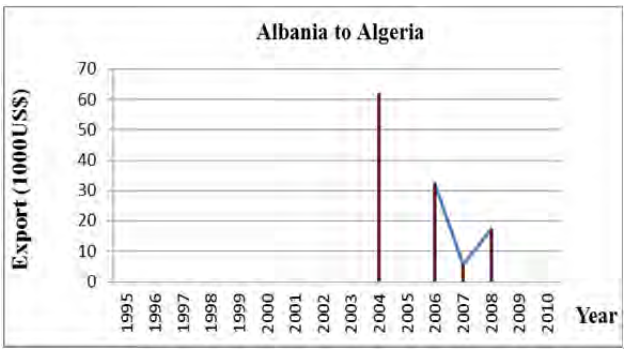

Syria-EU
absolute value of difference of factor endowment
3,1
3
2,9
2,8
2,7
2,6
2,5
2,4
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

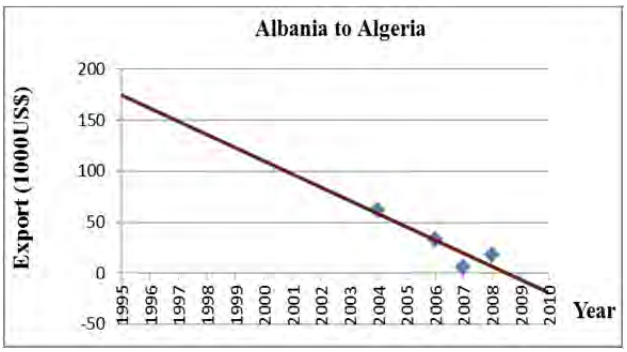

Tunisia-Turkey
absolute value of difference of factor endowment
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

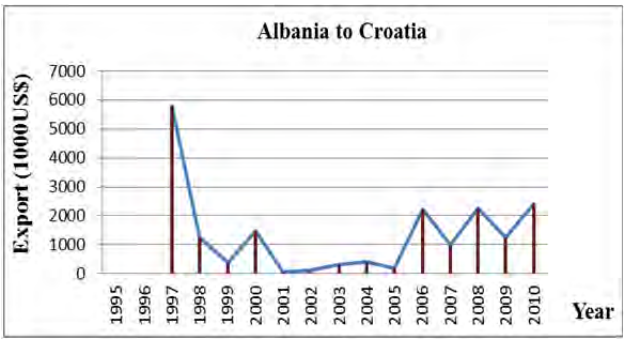

Tunisia-EU
absolute value of difference of factor endowment
2,25
2,2
2,15
2,1
2,05
2
1,95
1,9
1,85
1,8
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

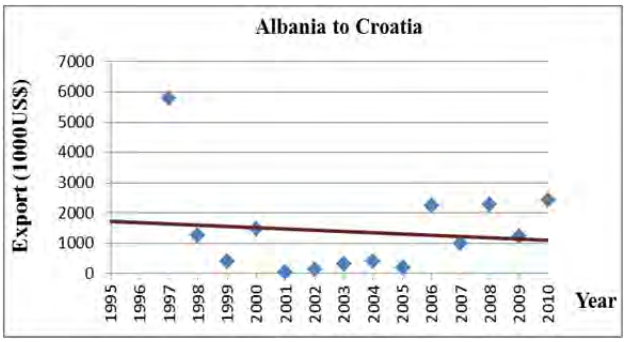

Turkey-EU
absolute value of difference of factor endowment
2,5
2
1,5
1
0,5
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

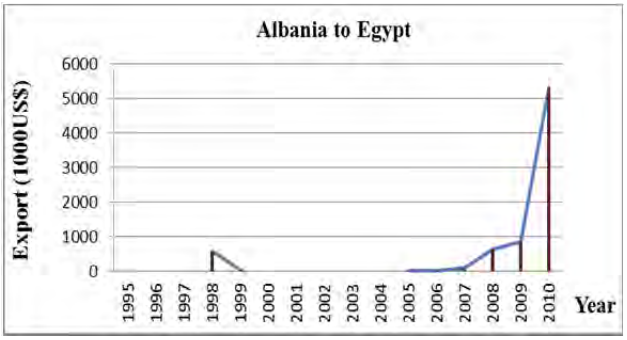
APPENDIX XI: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM ALBANIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

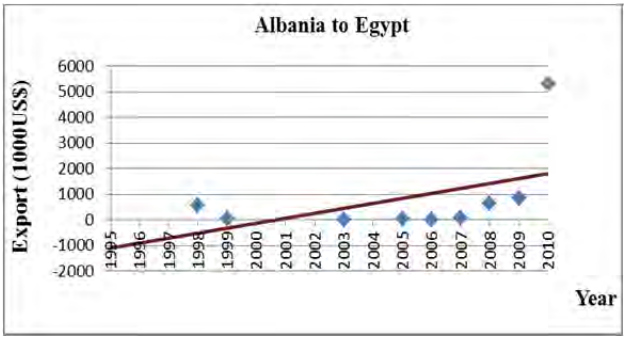


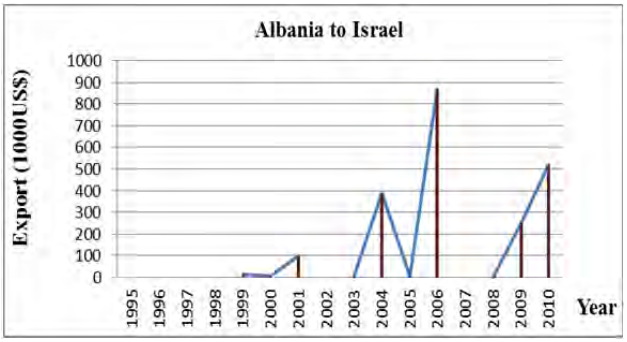


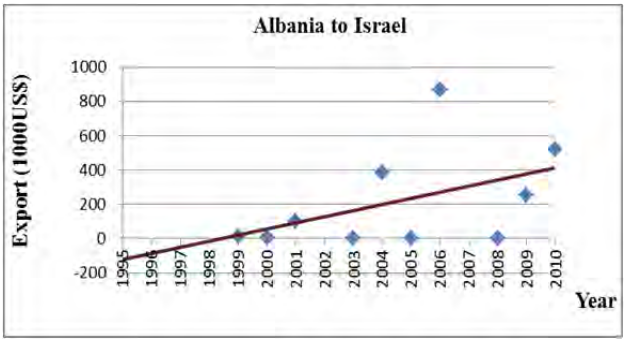


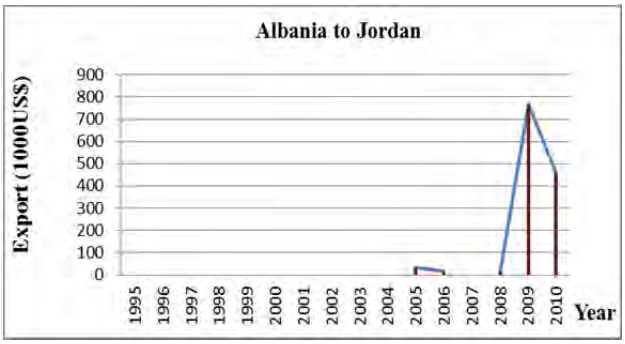


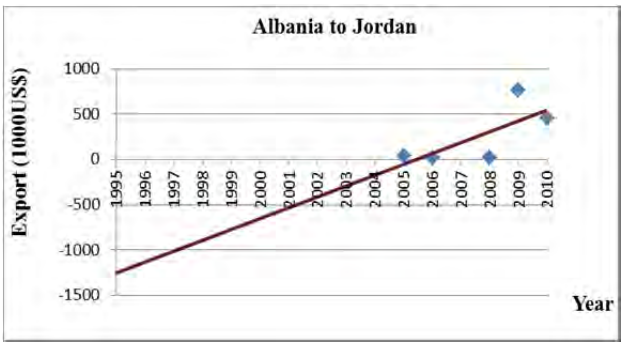


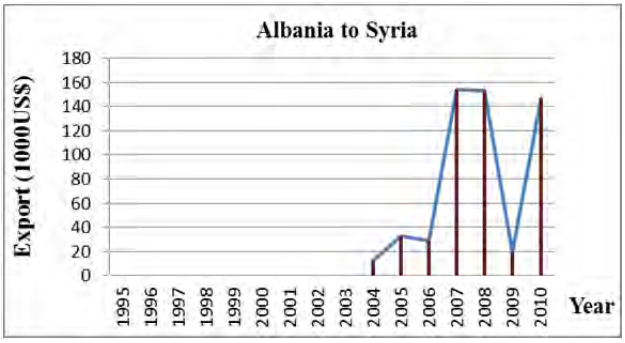


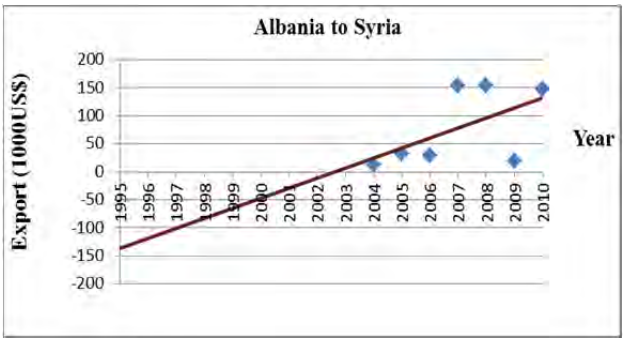


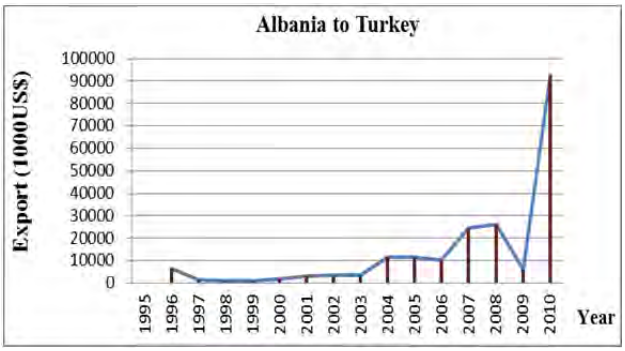


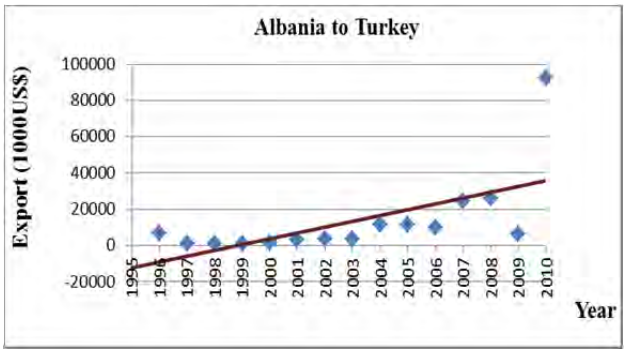

Albania to Jordan
Export (1000US$)
Year


Albania to Jordan
Export (1000US$)
Year

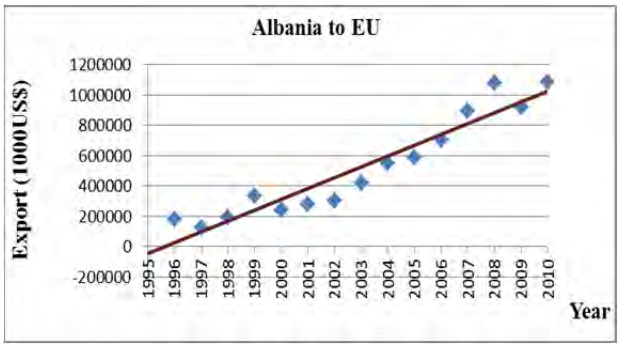

Albania to Syria
Export (1000US$)
Year


Albania to Syria
Export (1000US$)
Year

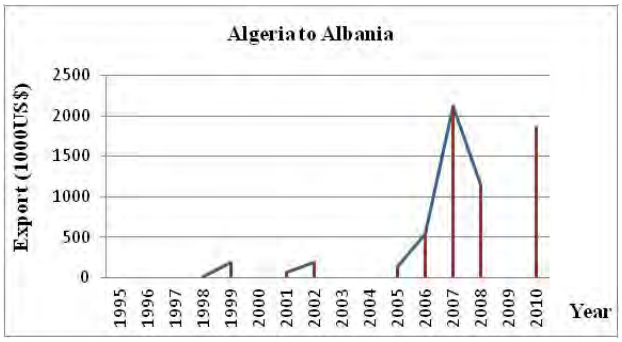

Albania to Turkey
Export (1000US$)
Year

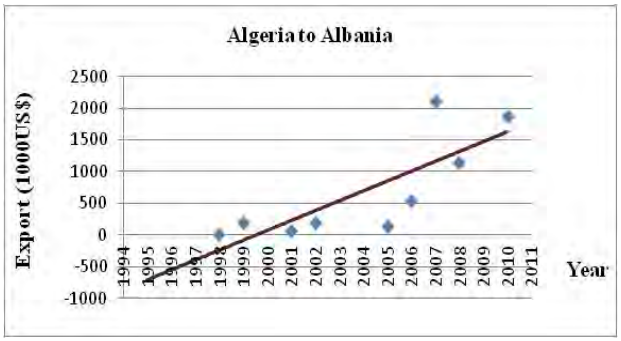

Albania to Turkey
Export (1000US$)
Year

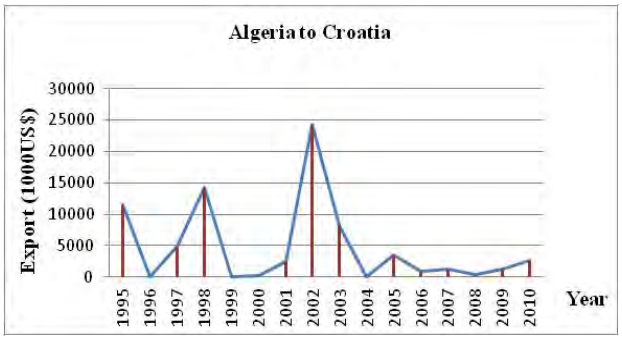
Albania to EU
Export (1000US$)
Year

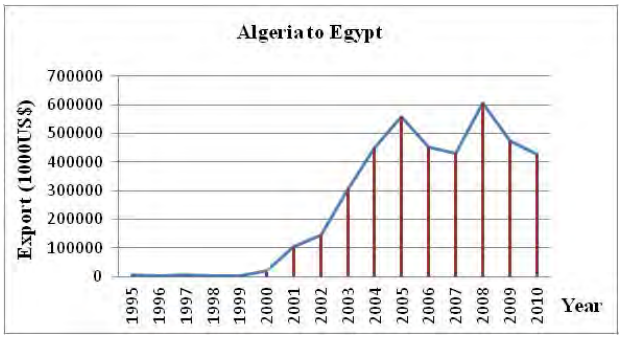

Albania to EU
Export (1000US$)
Year

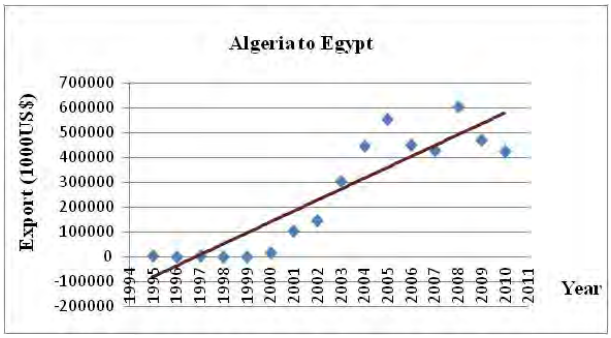
APPENDIX XII: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM ALGERIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

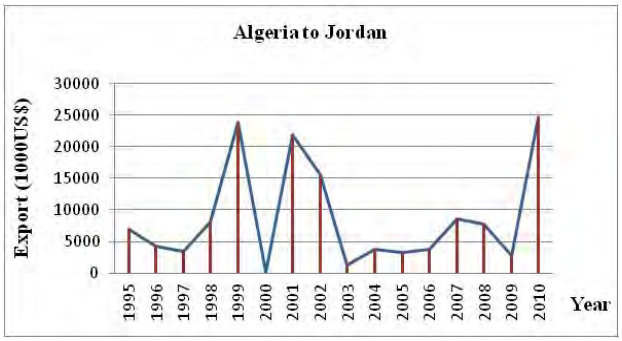


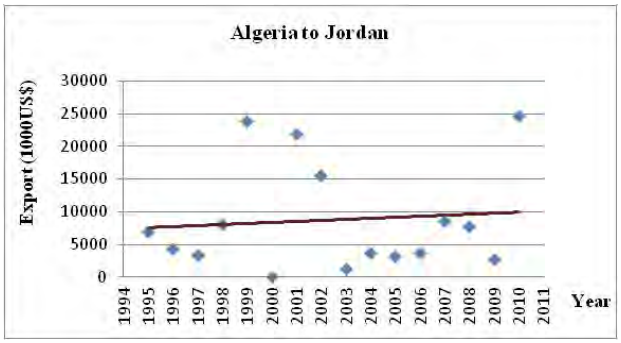


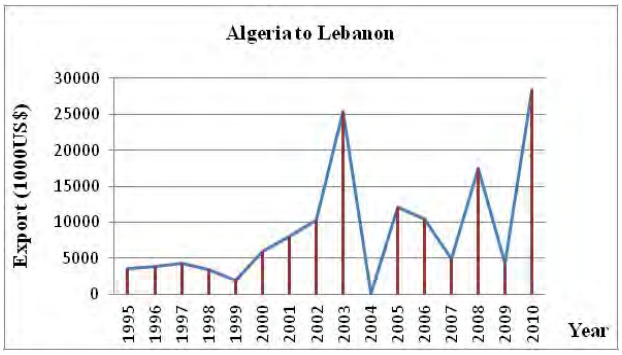


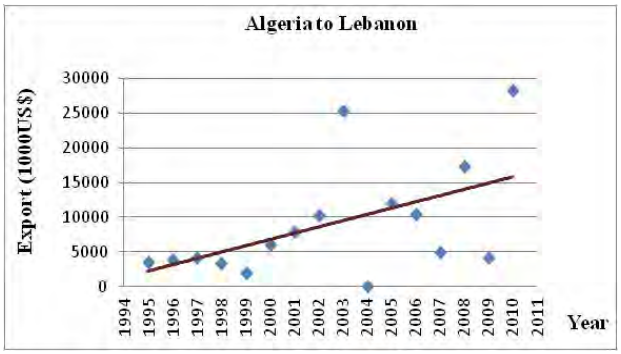


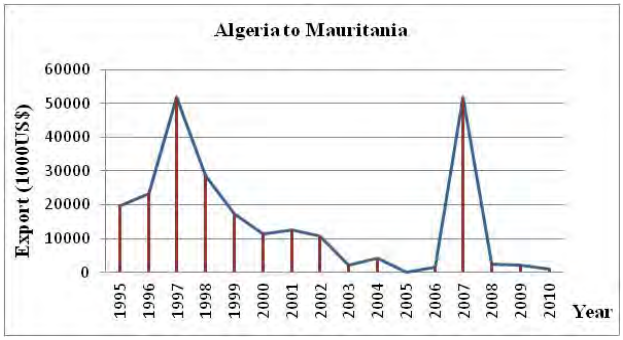


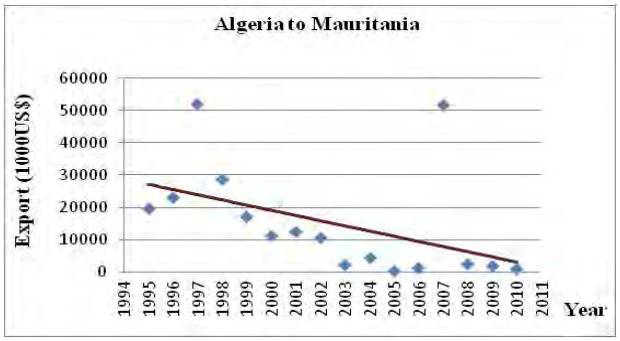


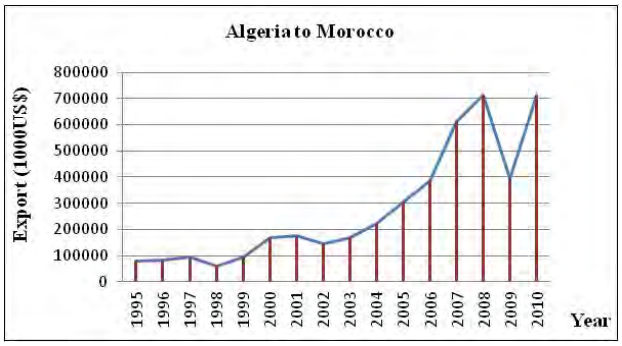


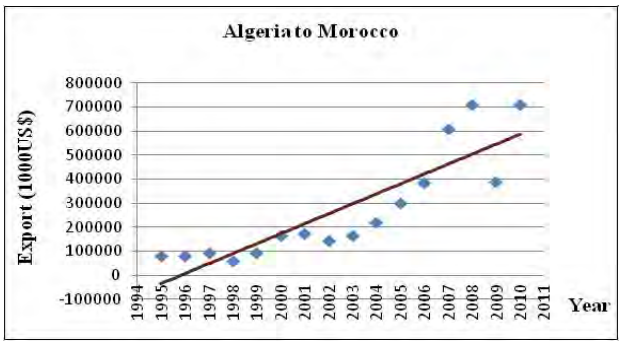

Algeria to Lebanon
Export (1000US$)
Year

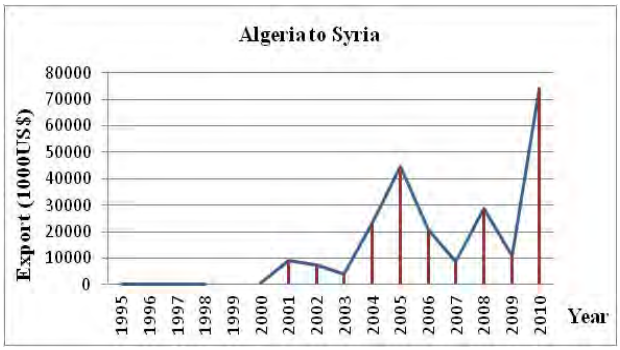

Algeria to Lebanon
Export (1000US$)
Year

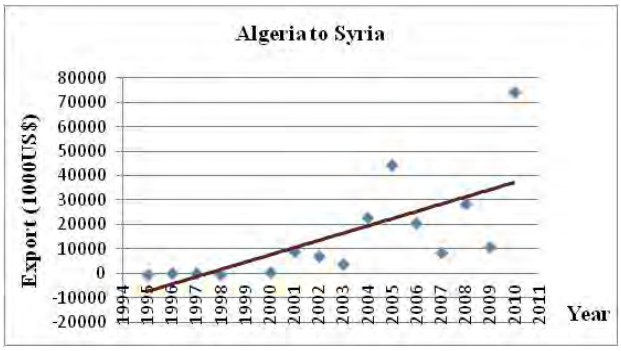

Algeria to Mauritania
Export (1000US$)
Year

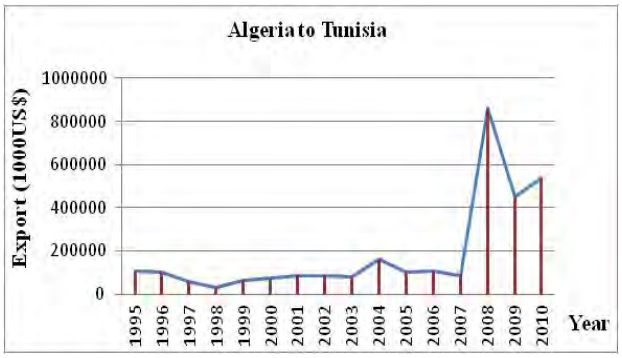

Algeria to Mauritania
Export (1000US$)
Year

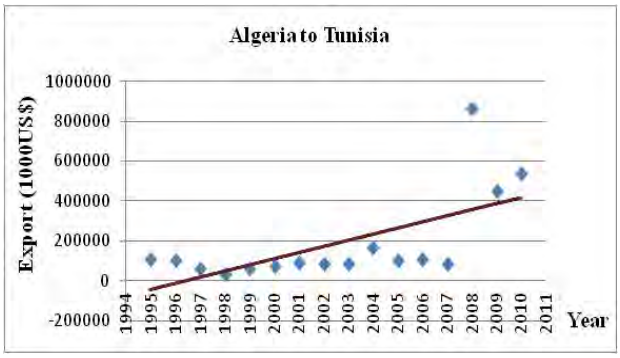

Algeria to Morocco
Export (1000US$)
Year

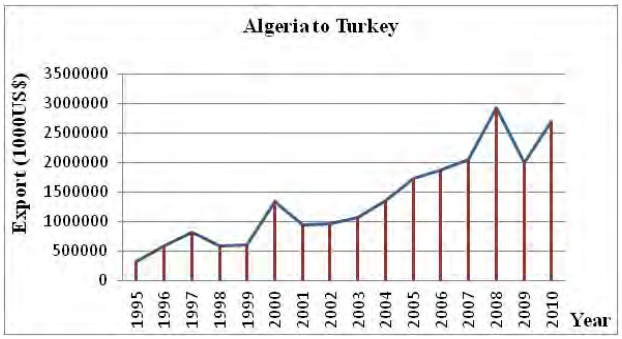

Algeria to Morocco
Export (1000US$)
Year

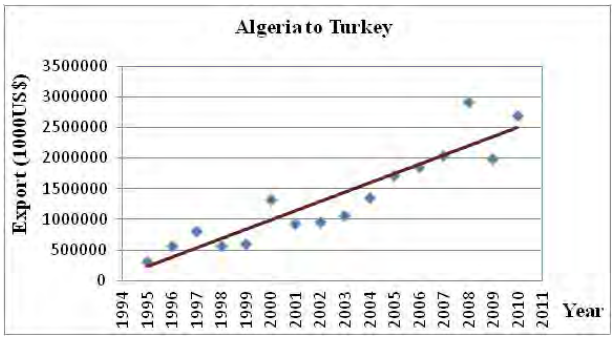

Algeria to Syria
Export (1000US$)
Year

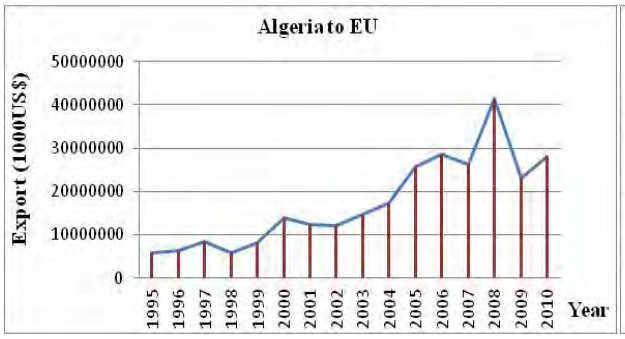

Algeria to Syria
Export (1000US$)
Year

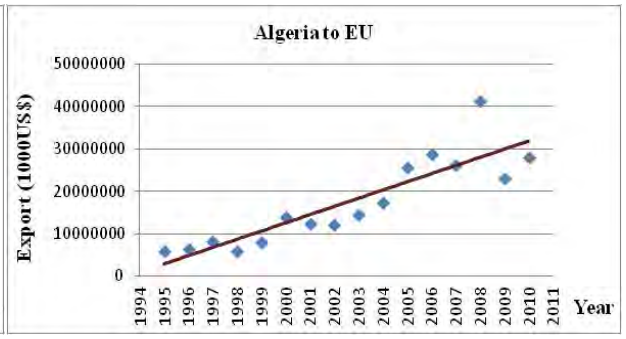

Algeria to Tunisia
Export (1000US$)
1000000
800000
600000
400000
200000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Algeria to Tunisia
Export (1000US$)
1000000
800000
600000
400000
200000
0
-200000
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year

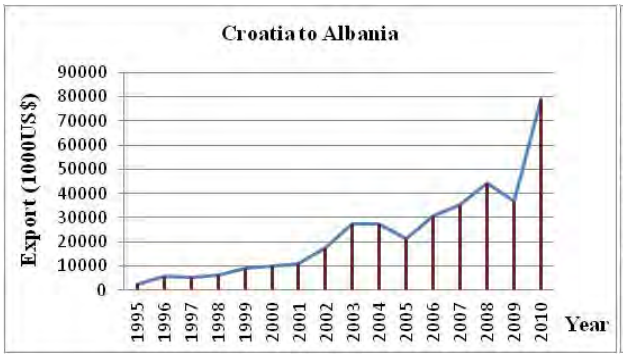

Algeria to Turkey
Export (1000US$)
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

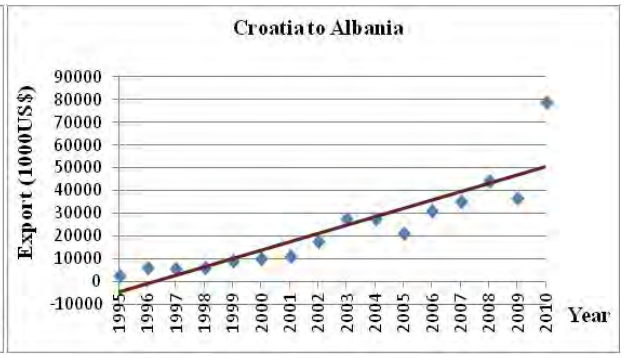

Algeria to Turkey
Export (1000US$)
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year

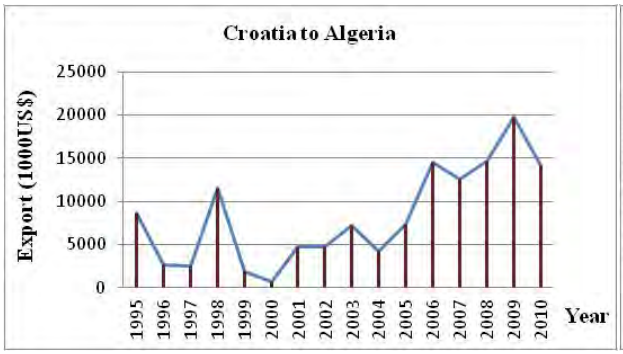

Algeria to EU
Export (1000US$)
50000000
40000000
30000000
20000000
10000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

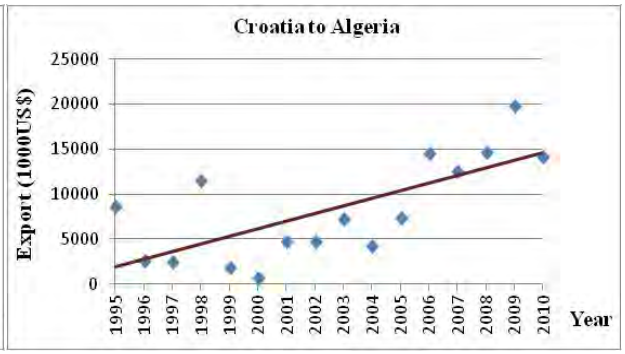

Algeria to EU
Export (1000US$)
50000000
40000000
30000000
20000000
10000000
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year

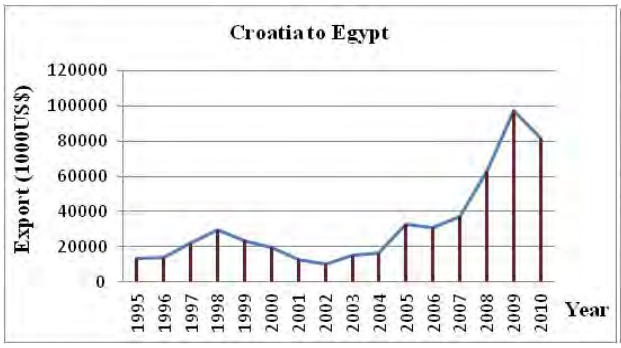
APPENDIX XIII: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM CROATIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

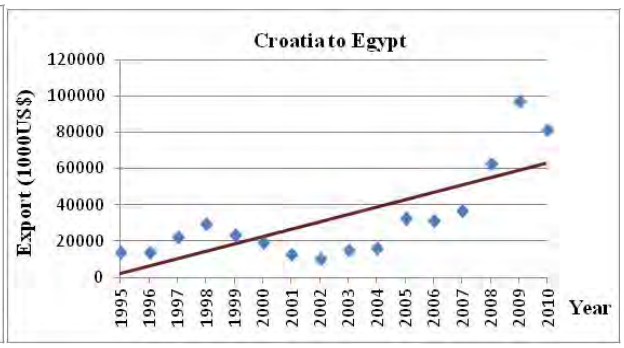


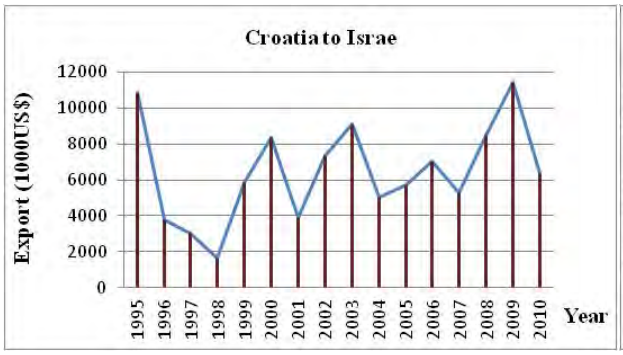


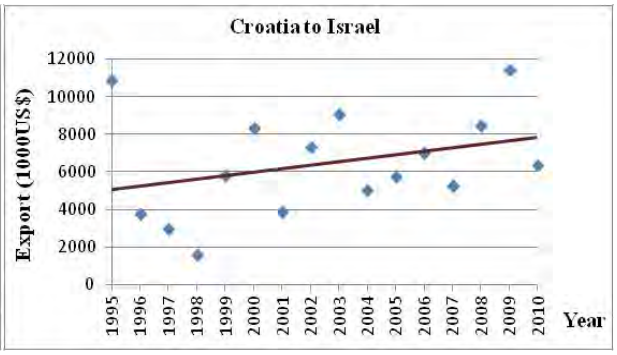


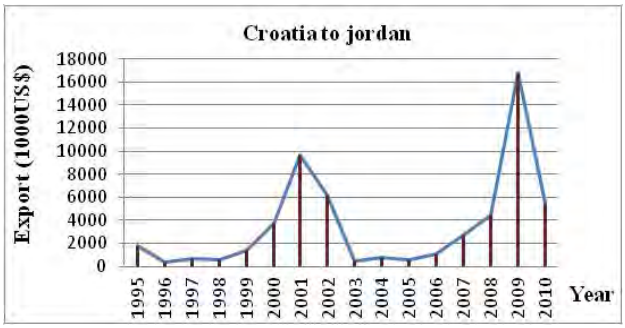


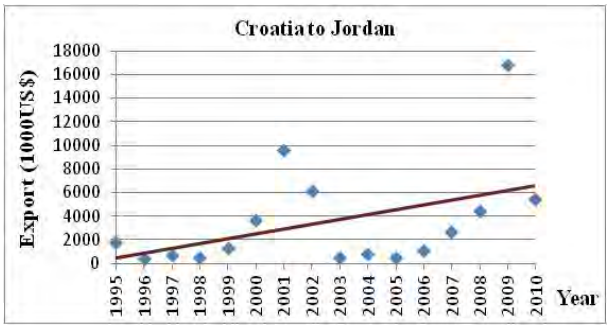


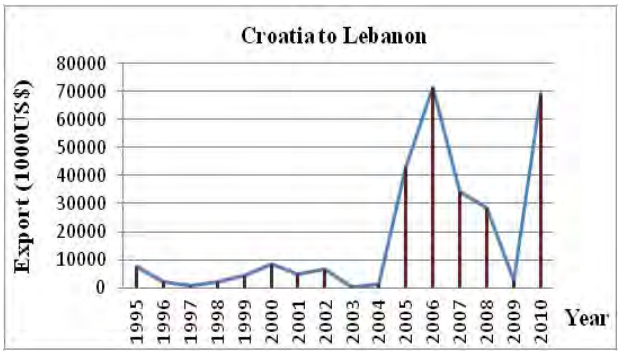


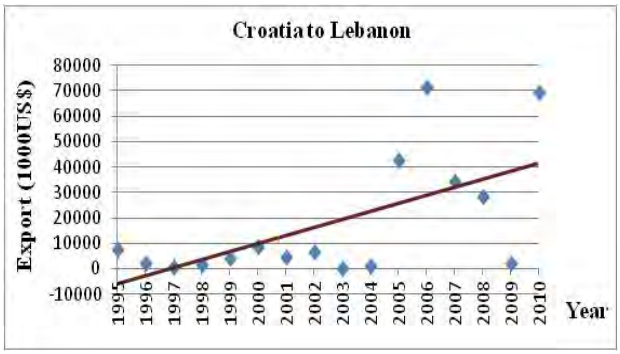


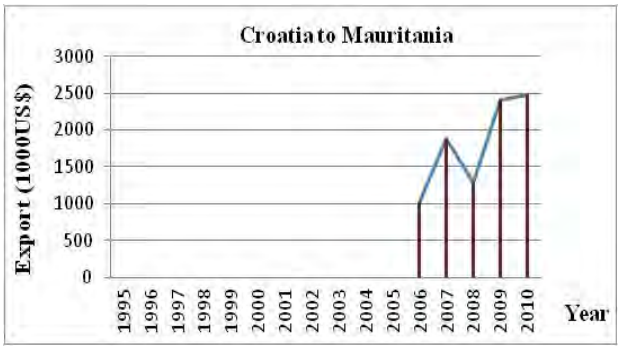


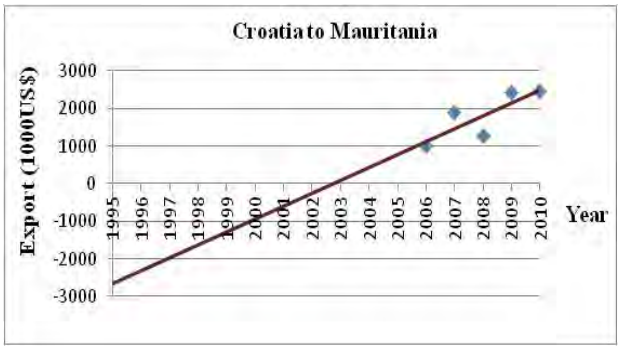

Croatia to jordan
Export (1000US$)
Year

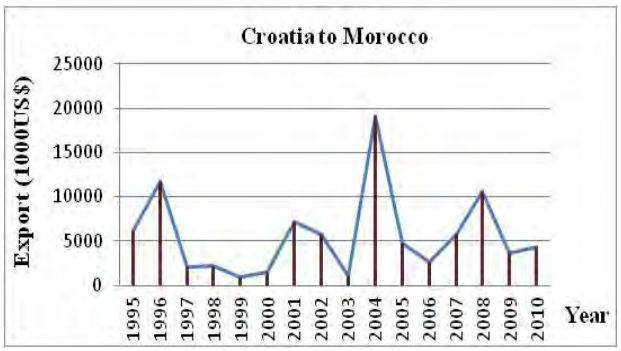

Croatia to Jordan
Export (1000US$)
Year

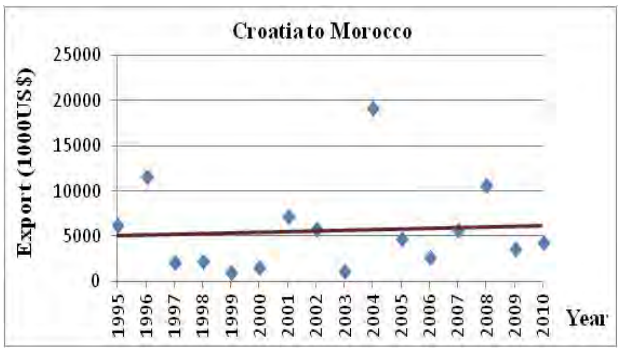

Croatia to Lebanon
Export (1000US$)
Year

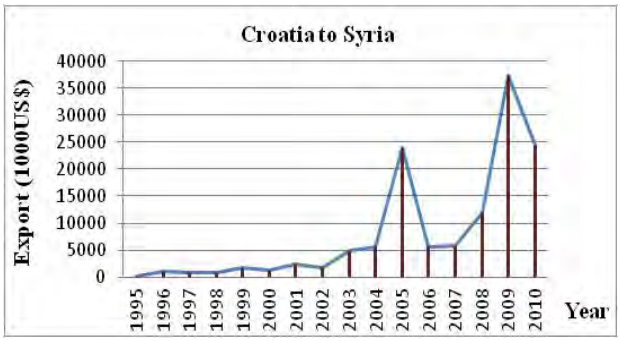

Croatia to Lebanon
Export (1000US$)
Year

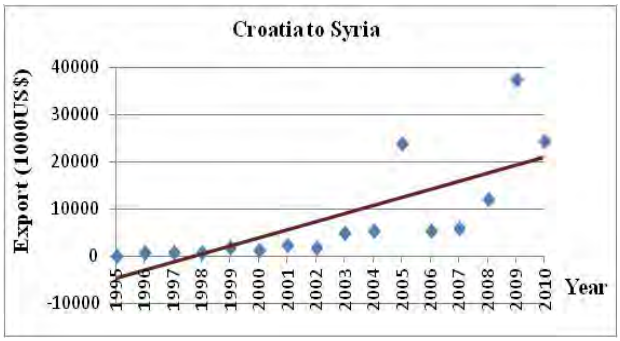

Croatia to Mauritania
Export (1000US$)
Year

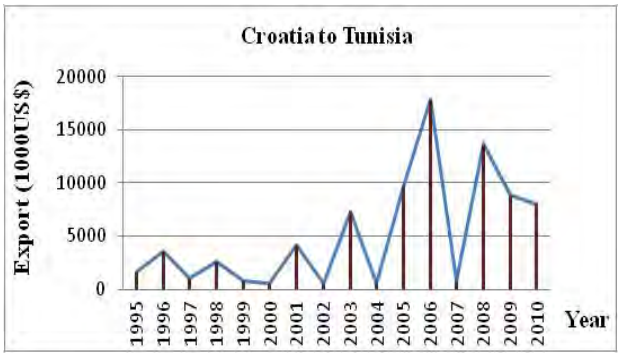

Croatia to Mauritania
Export (1000US$)
Year

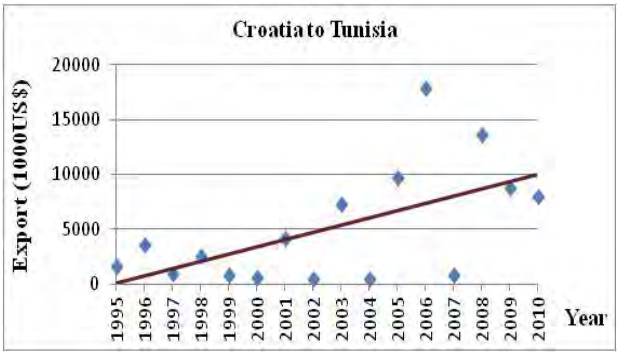

Croatia to Morocco
Export (1000US$)
Year

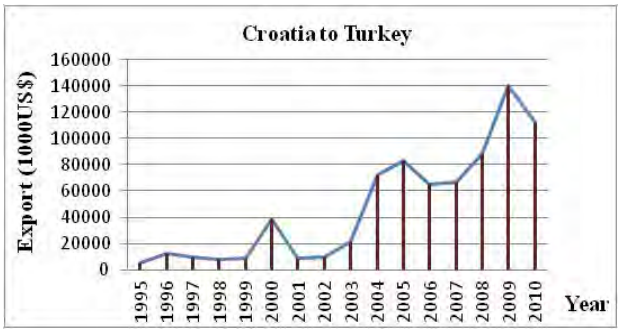

Croatia to Morocco
Export (1000US$)
Year

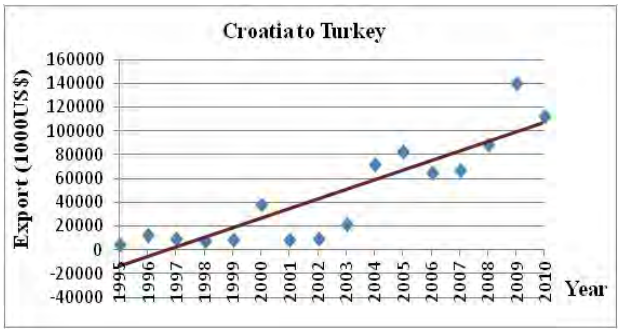

Croatia to Syria
Export (1000US$)
Year

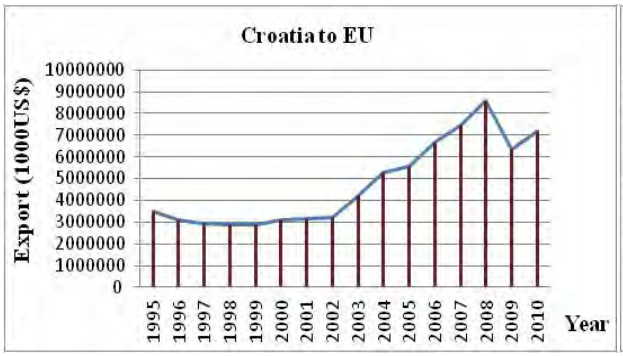

Croatia to Syria
Export (1000US$)
Year

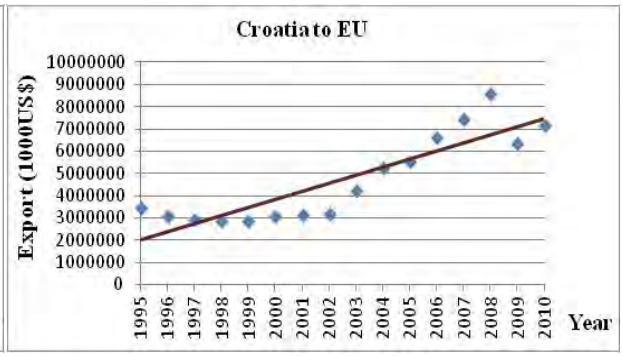

Croatia to Tunisia
Export (1000US$)
Year


Croatia to Tunisia
Export (1000US$)
Year

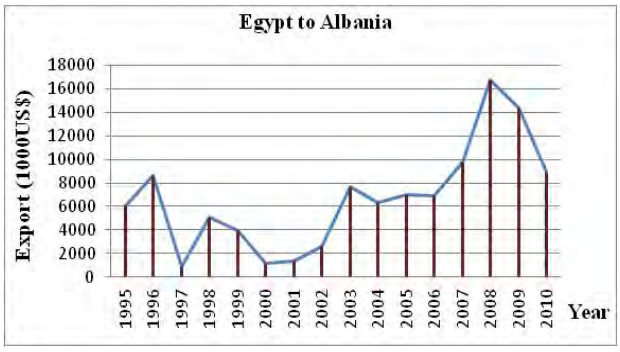

Croatia to Turkey
Export (1000US$)
Year

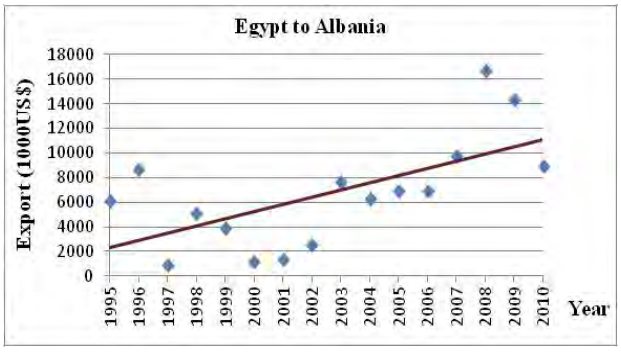

Croatia to Turkey
Export (1000US$)
Year

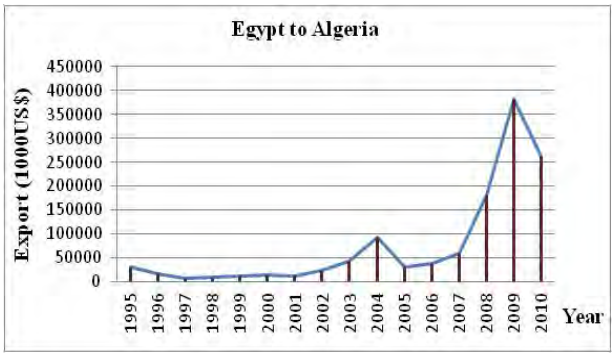

Croatia to EU
Export (1000US$)
Year

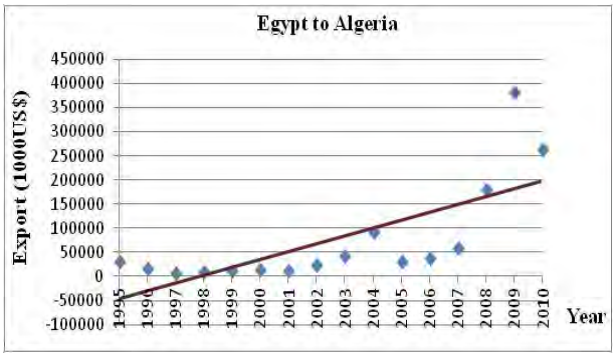

Croatia to EU
Export (1000US$)
Year

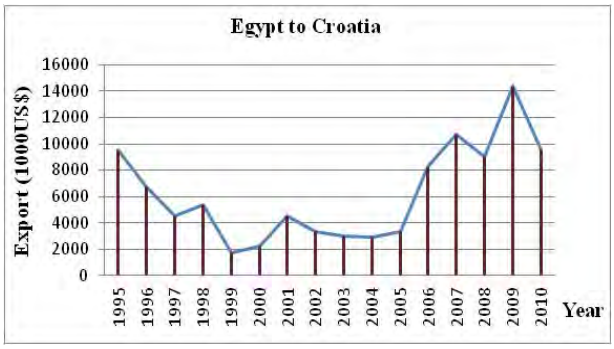
APPENDIX XIV STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM EGYPT. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

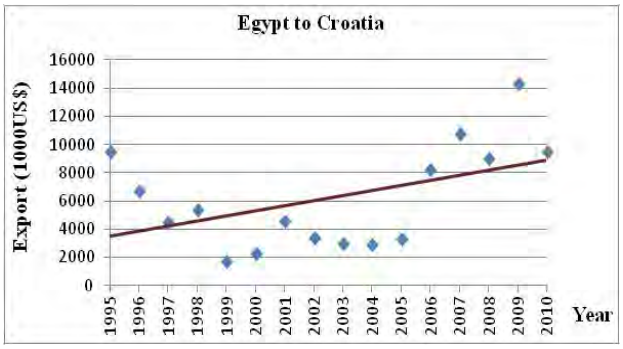


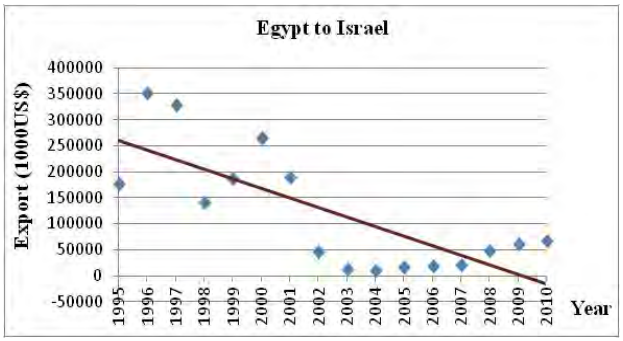


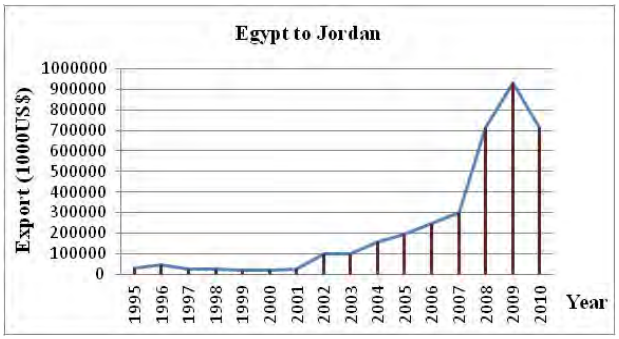


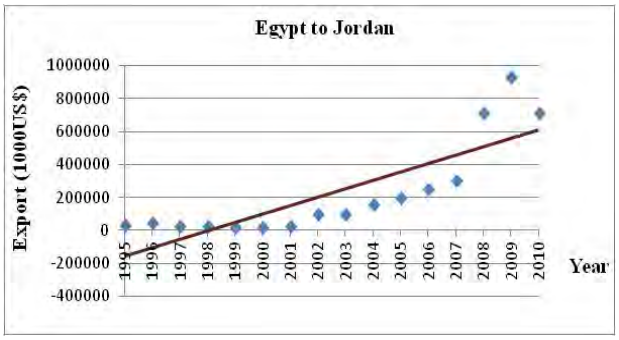


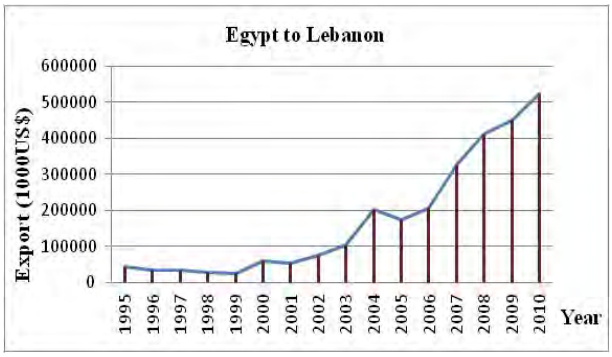


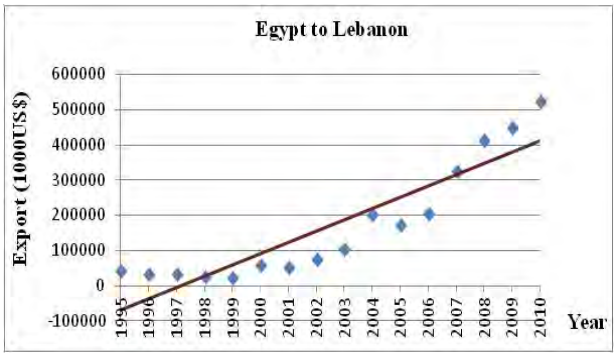


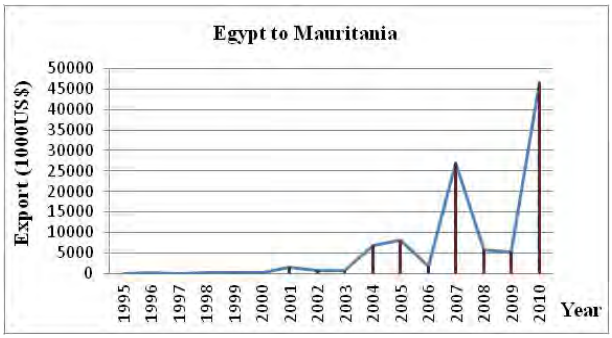


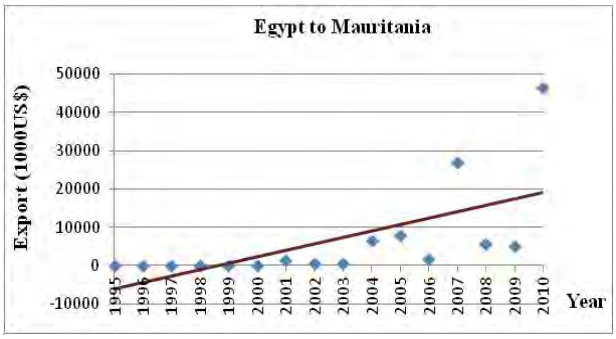

Egypt to Jordan
Export (1000US$)
Year


Egypt to Jordan
Export (1000US$)
Year

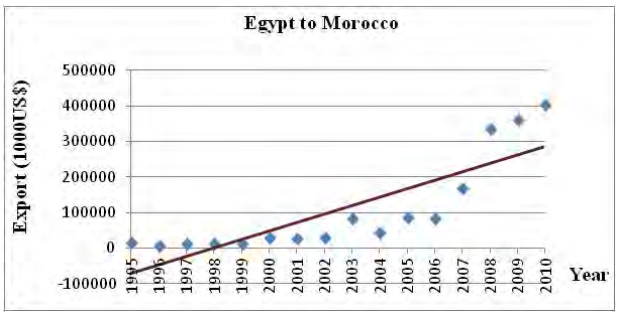

Egypt to Lebanon
Export (1000US$)
Year

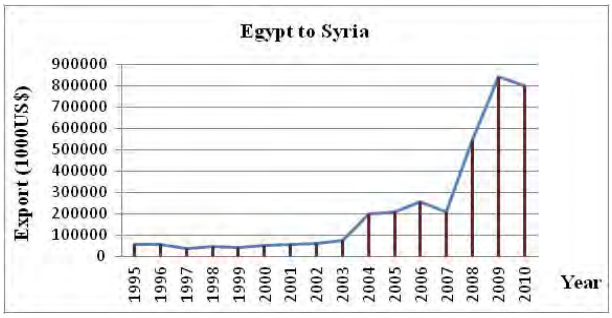

Egypt to Lebanon
Export (1000US$)
Year

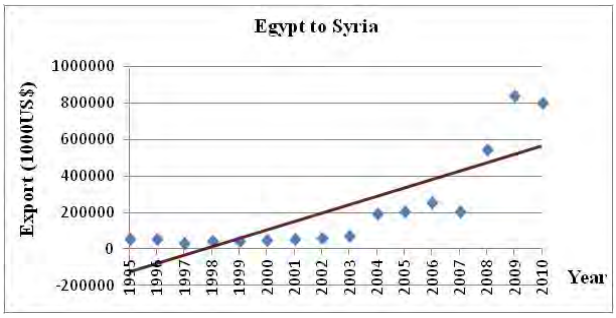

Egypt to Mauritania
Export (1000US$)
Year

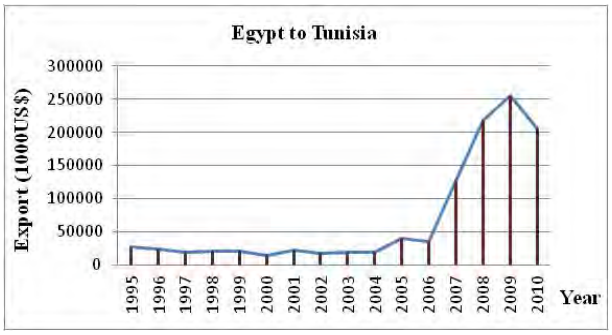

Egypt to Mauritania
Export (1000US$)
Year

Egypt to Morocco
Export (1000US$)
Year

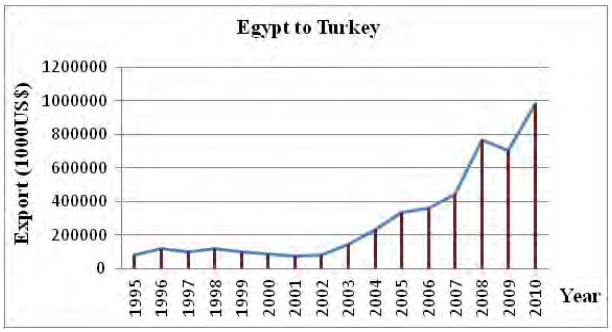

Egypt to Morocco
Export (1000US$)
Year


Egypt to Syria
Export (1000US$)
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Egypt to Syria
Export (1000US$)
1000000
800000
600000
400000
200000
0
-200000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Egypt to Tunisia
Export (1000US$)
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

Egypt to Tunisia
Export (1000US$)
300000
250000
200000
150000
100000
50000
0
-50000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Egypt to Turkey
Export (1000US$)
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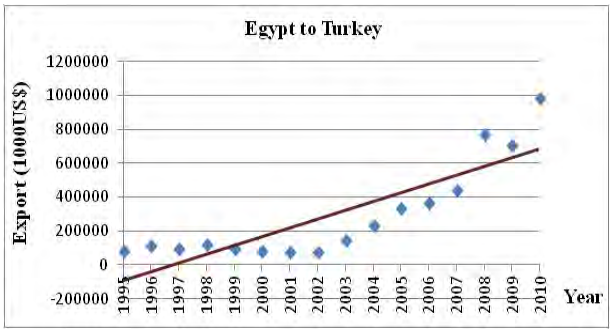
1000000
800000
600000
400000
200000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Egypt to Turkey
Export (1000US$)
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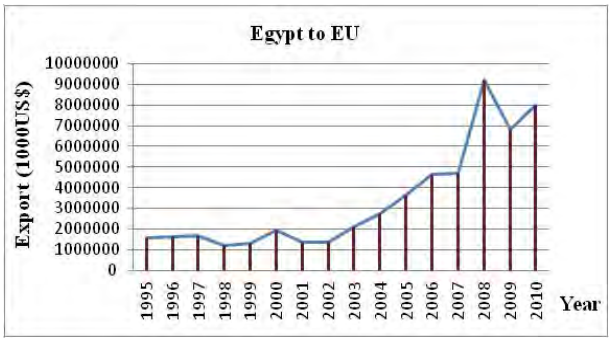
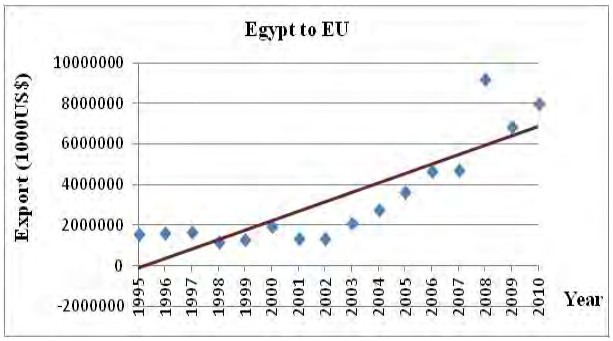
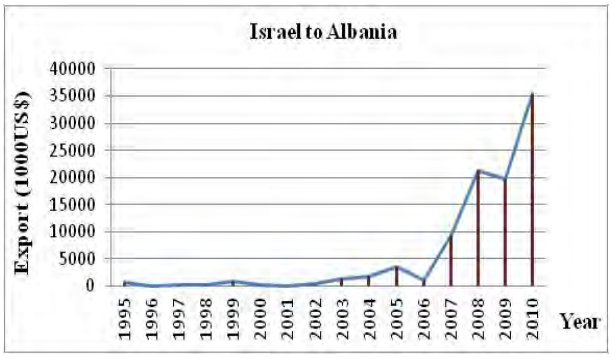
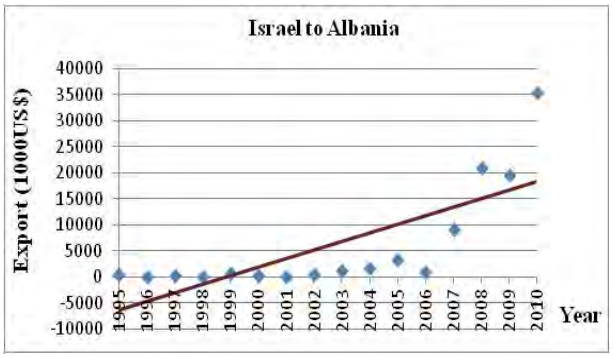
1000000
800000
600000
400000
200000
0
-200000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

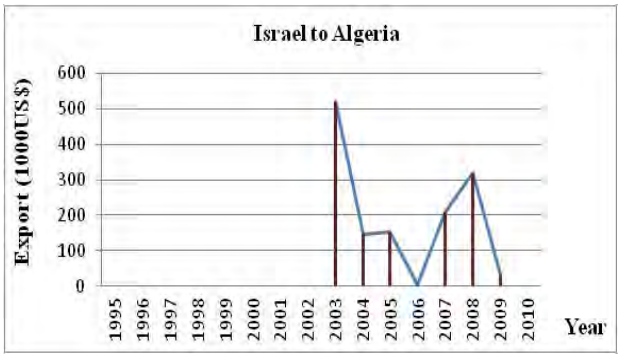

Egypt to EU
Export (1000US$)
10000000
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

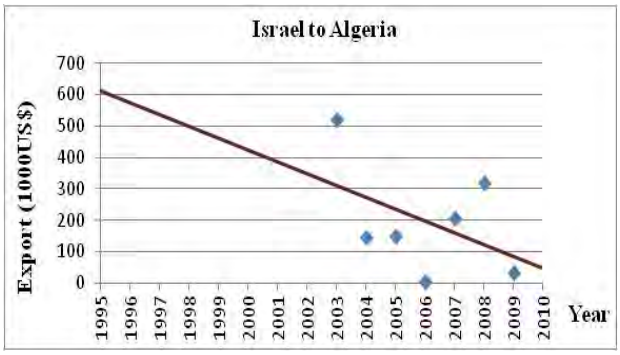

Egypt to EU
Export (1000US$)
10000000
8000000
6000000
4000000
2000000
0
-2000000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

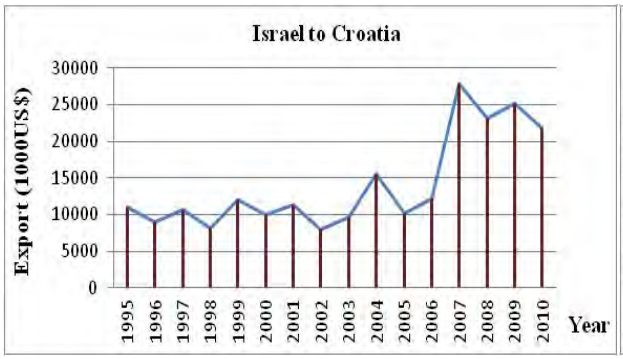
APPENDIX XV: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM ISRAEL. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

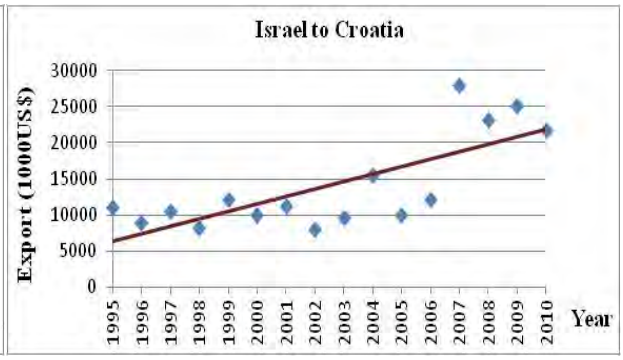


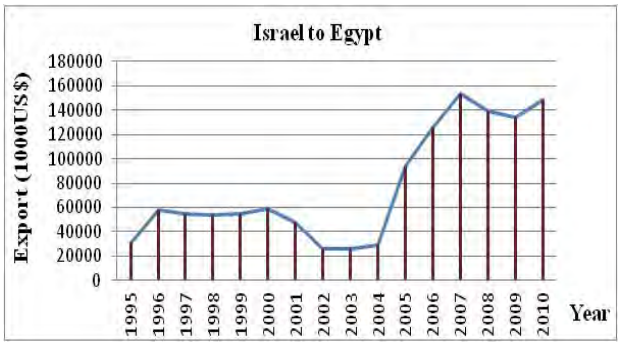


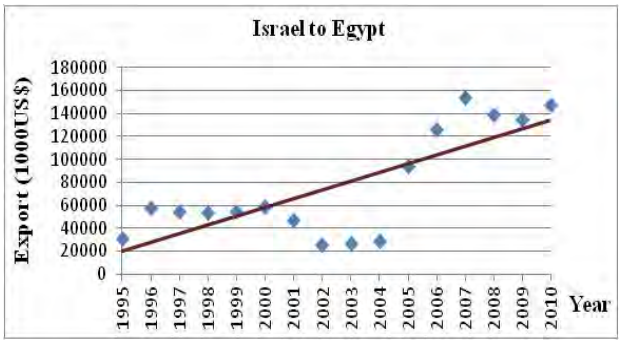


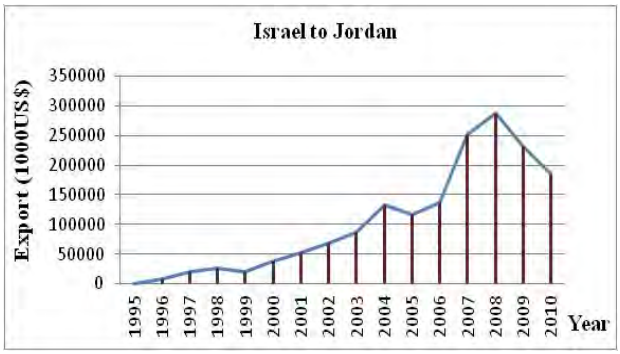


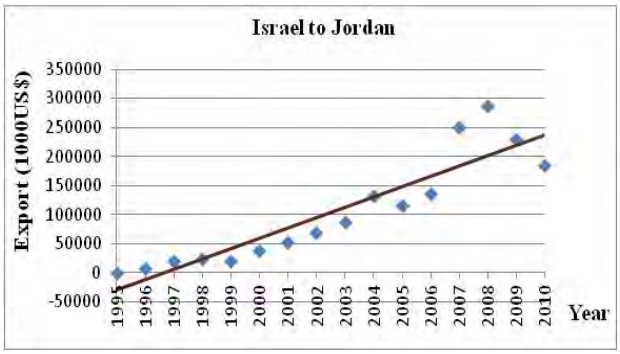


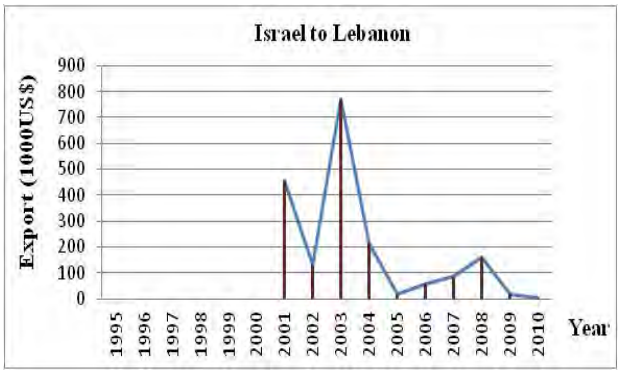


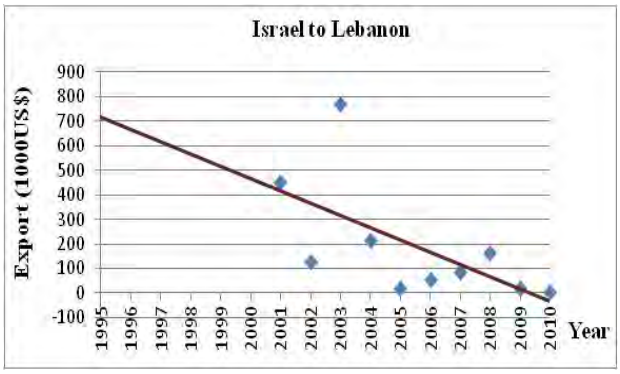

Israel to Egypt
Export (1000US$)
Year

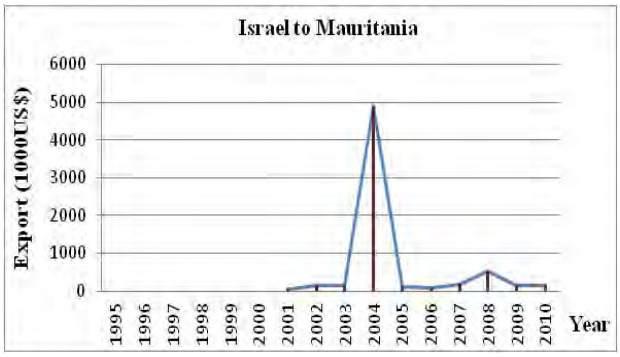

Israel to Egypt
Export (1000US$)
Year

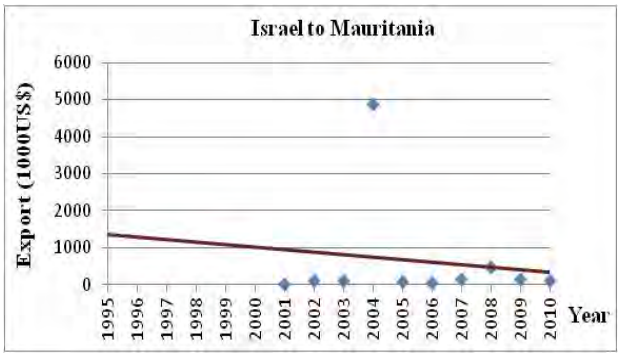

Israel to Jordan
Export (1000US$)
Year

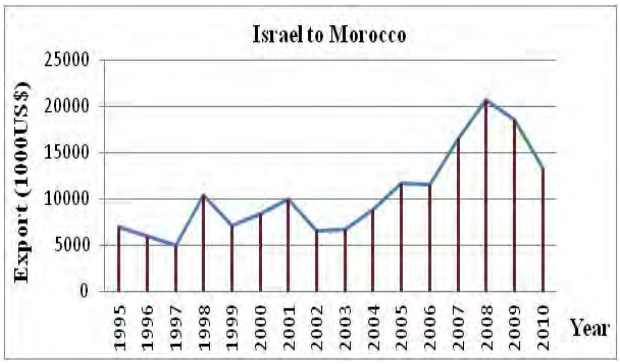

Israel to Jordan
Export (1000US$)
Year

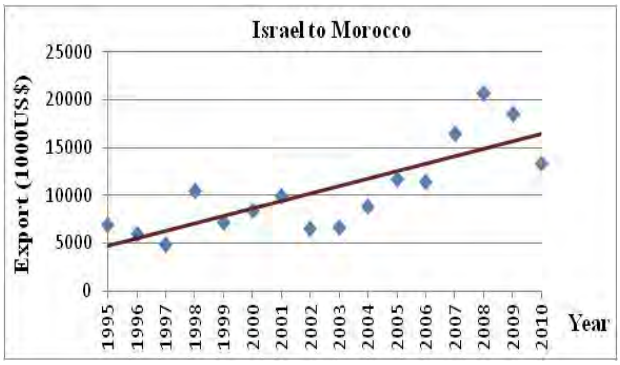

Israel to Lebanon
Export (1000US$)
Year

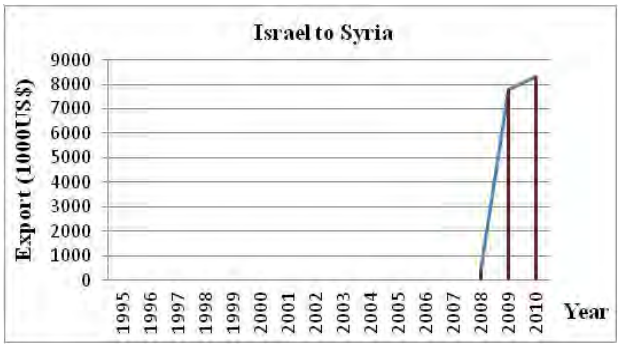

Israel to Lebanon
Export (1000US$)
Year

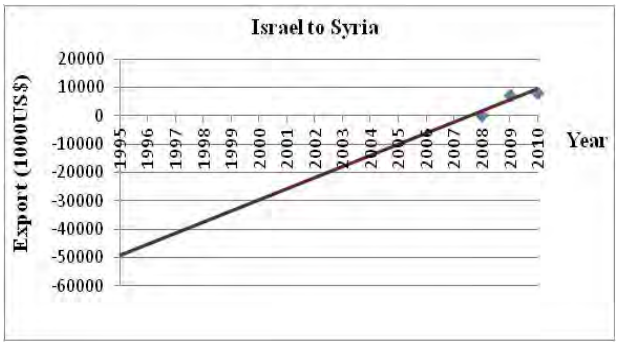

Israel to Mauritania
Export (1000US$)
Year

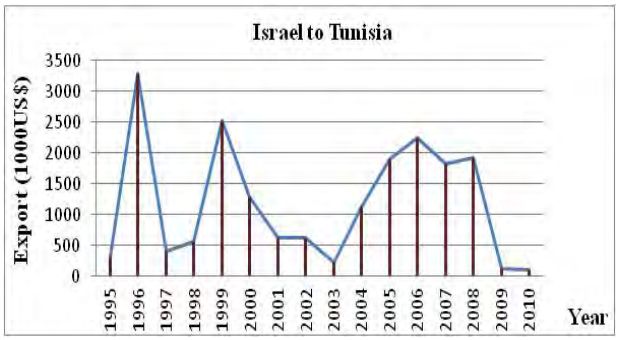

Israel to Mauritania
Export (1000US$)
Year

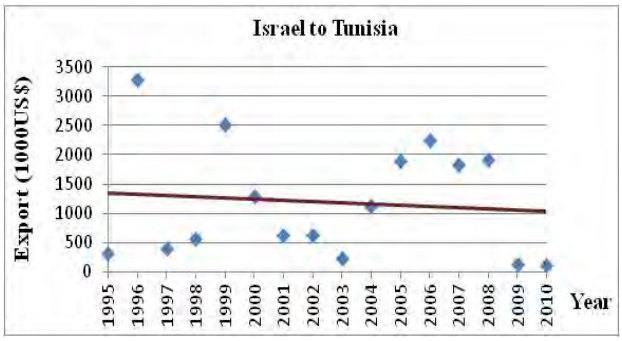

Israel to Morocco
Export (1000US$)
Year

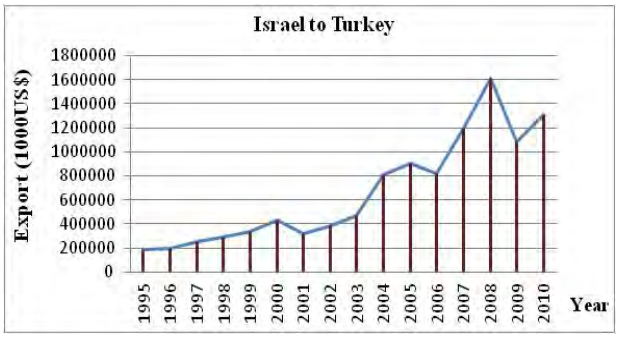

Israel to Morocco
Export (1000US$)
Year

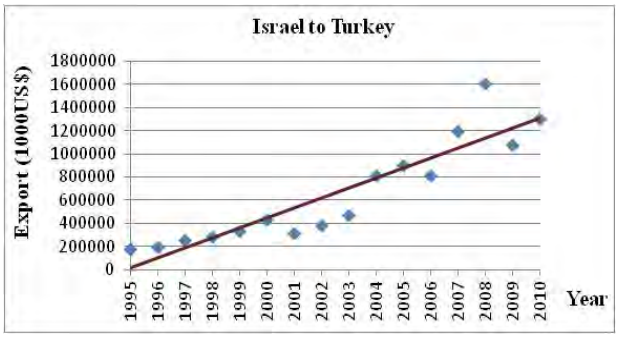

Israel to Syria
Export (1000US$)
Year


Israel to Syria
Export (1000US$)
Year

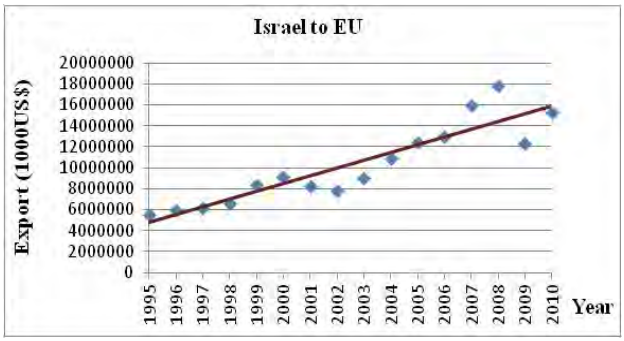

Israel to Tunisia
Export (1000US$)
Year


Israel to Tunisia
Export (1000US$)
Year

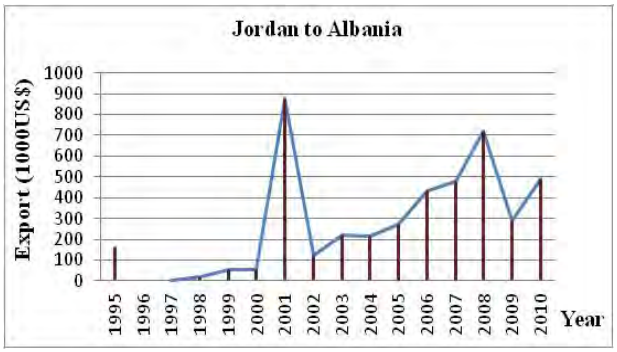

Israel to Turkey
Export (1000US$)
Year

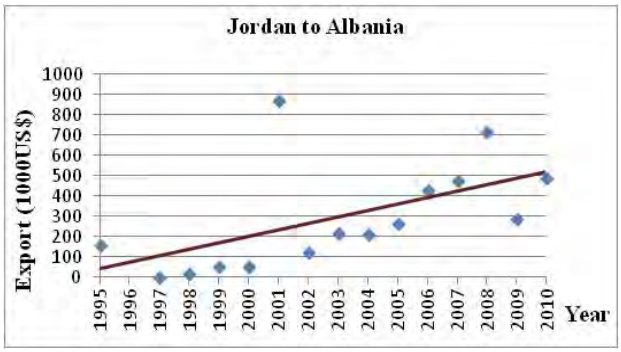

Israel to Turkey
Export (1000US$)
Year

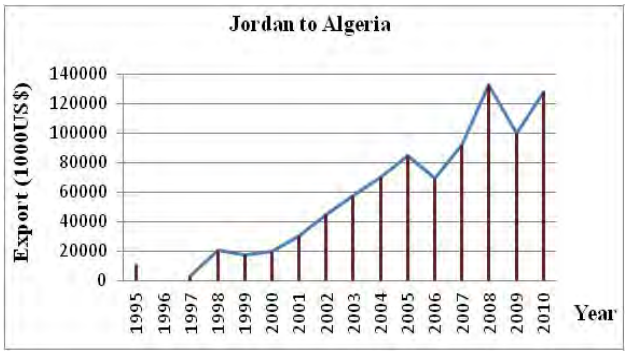
Israel to EU
Export (1000US$)
20000000
18000000
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

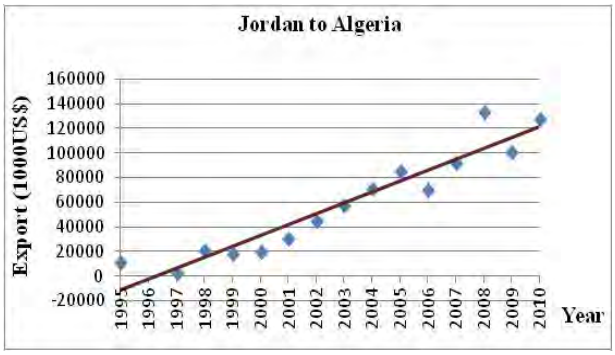

Israel to EU
Export (1000US$)
20000000
18000000
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

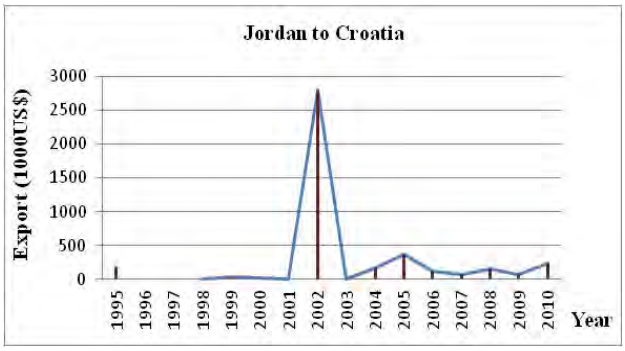
APPENDIX XVI: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM JORDAN. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

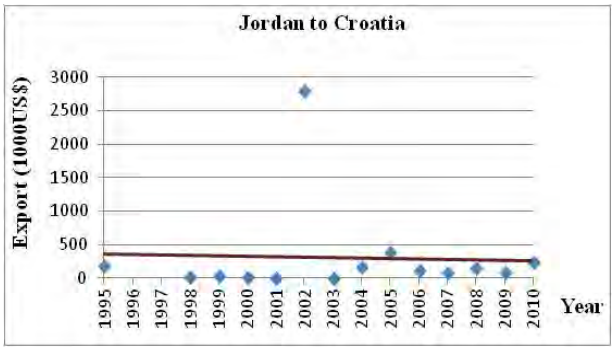


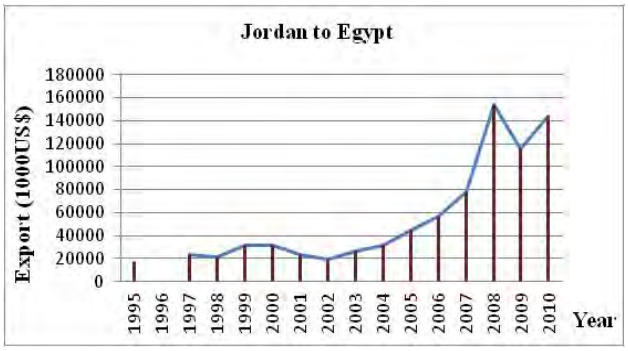


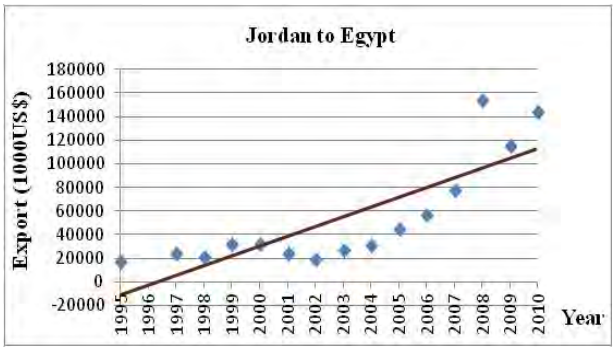




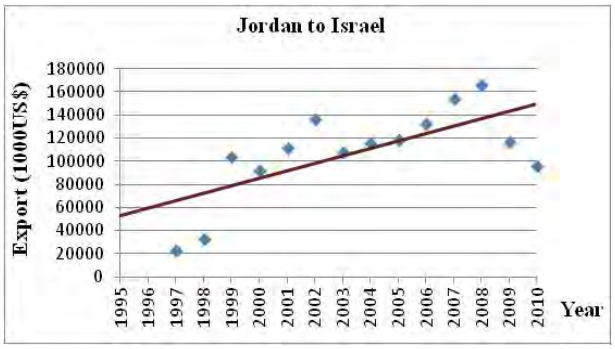


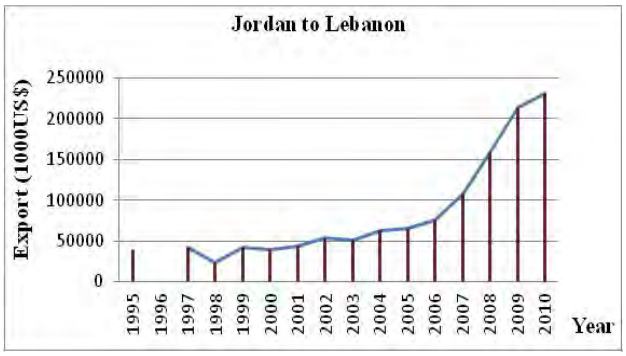


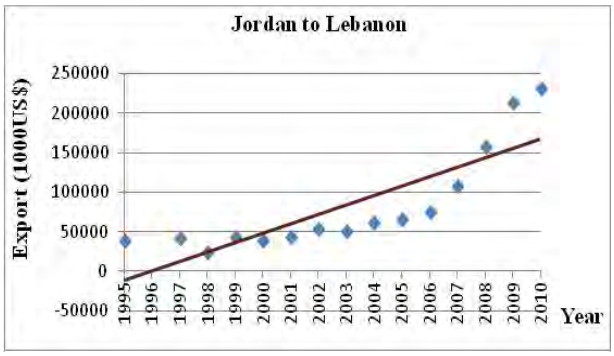


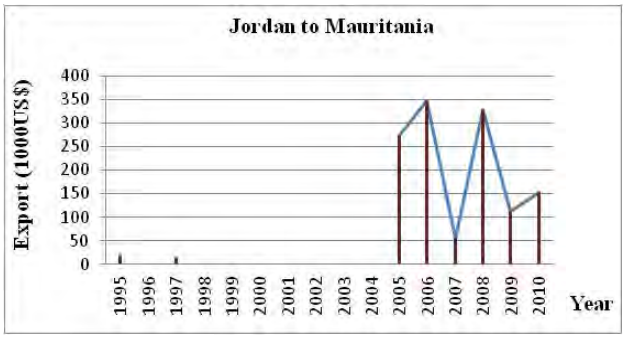


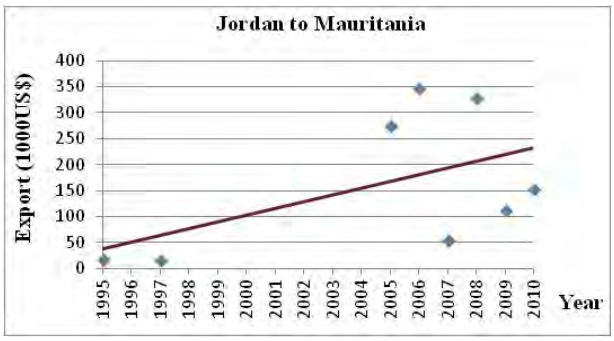
Jordan to Israel
Export (1000US$)
Year

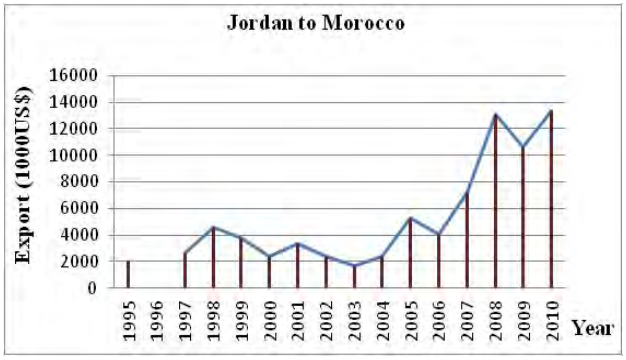

Jordan to Israel
Export (1000US$)
Year

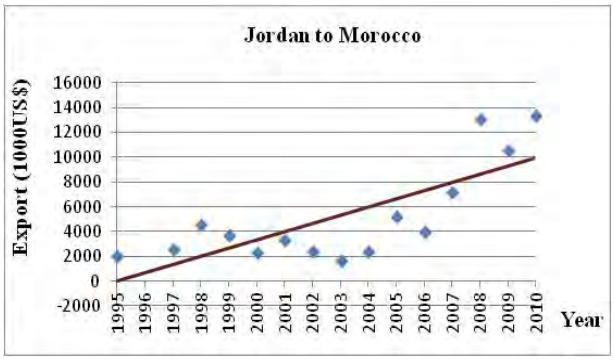

Jordan to Lebanon
Export (1000US$)
Year

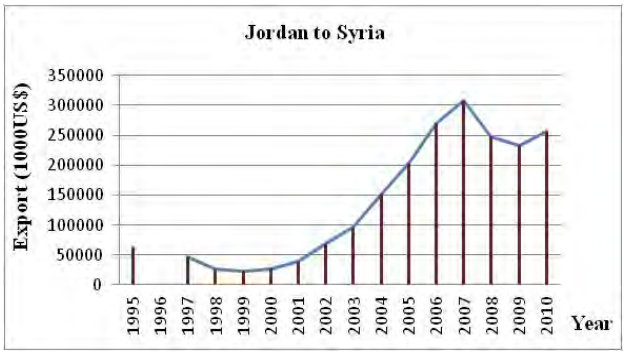

Jordan to Lebanon
Export (1000US$)
Year

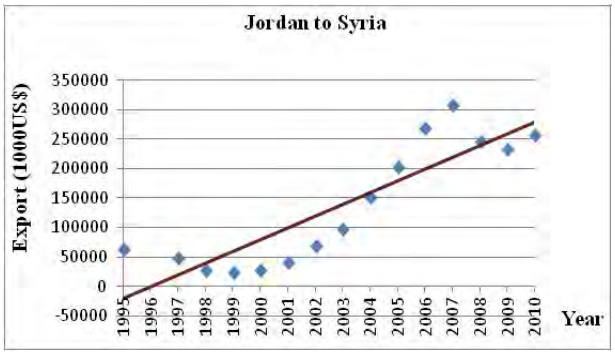

Jordan to Mauritania
Export (1000US$)
Year

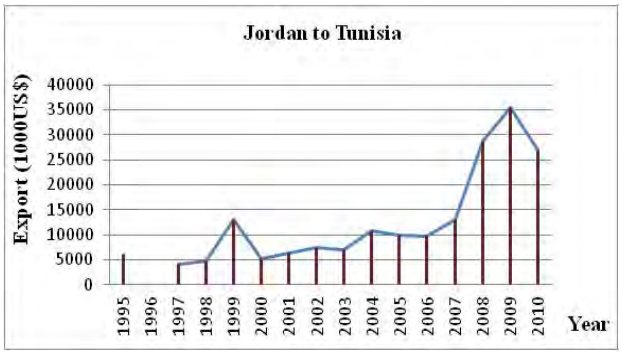

Jordan to Mauritania
Export (1000US$)
Year

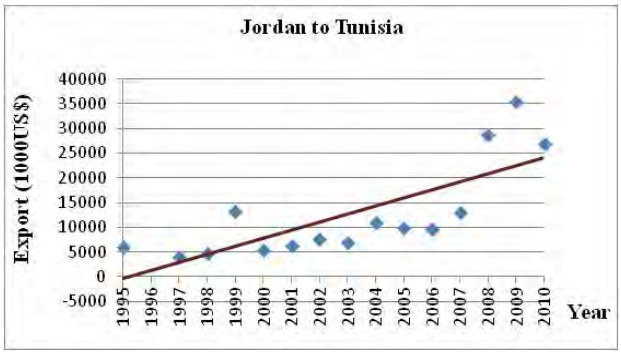

Jordan to Morocco
Export (1000US$)
Year

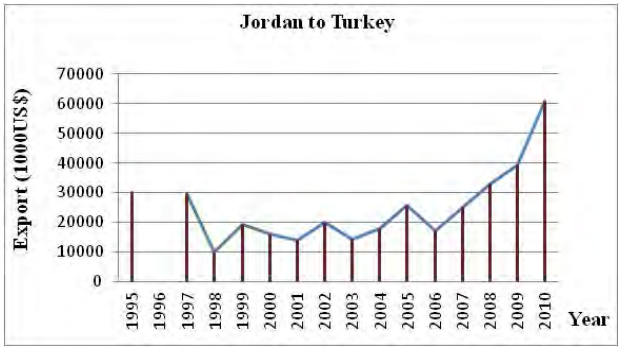

Jordan to Morocco
Export (1000US$)
Year

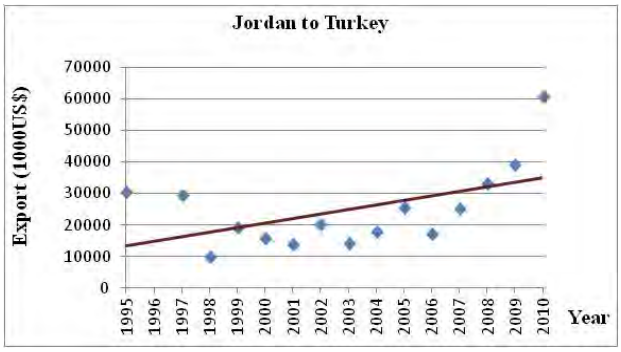

Jordan to Syria
Export (1000US$)
350000
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

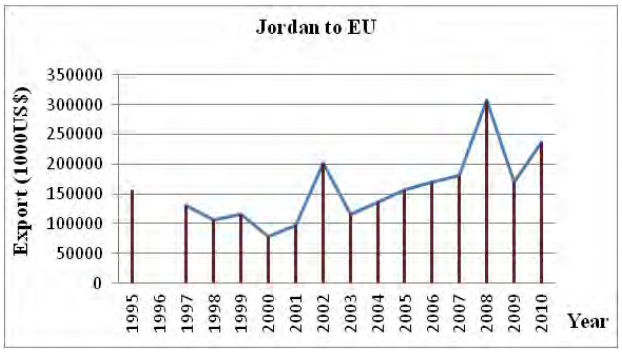

Jordan to Syria
Export (1000US$)
350000
300000
250000
200000
150000
100000
50000
0
-50000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

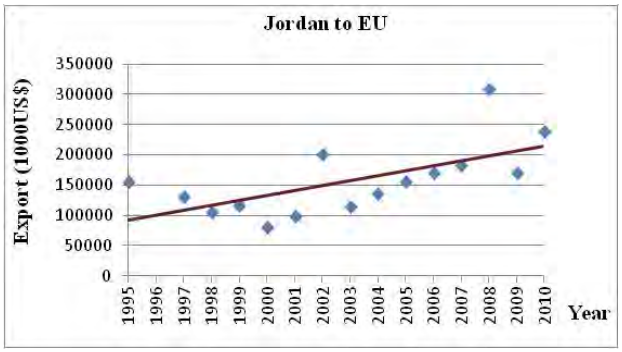

Jordan to Tunisia
Export (1000US$)
40000
35000
30000
25000
20000
15000
10000
5000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Jordan to Tunisia
Export (1000US$)
40000
35000
30000
25000
20000
15000
10000
5000
0
-5000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

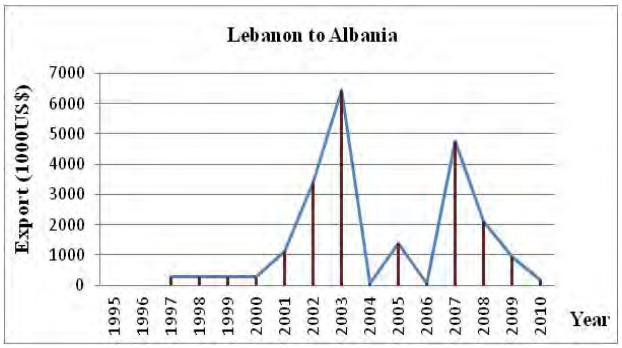

Jordan to Turkey
Export (1000US$)
70000
60000
50000
40000
30000
20000
10000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

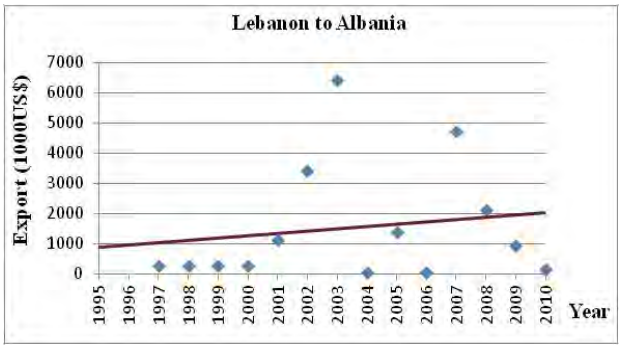

Jordan to Turkey
Export (1000US$)
70000
60000
50000
40000
30000
20000
10000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

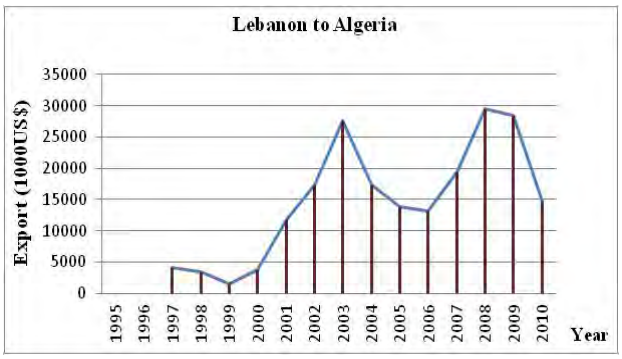

Jordan to EU
Export (1000US$)
350000
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

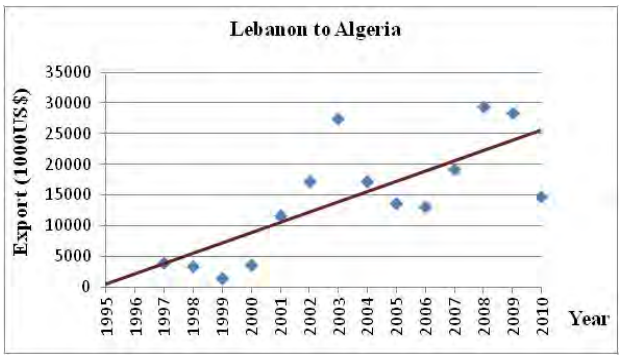

Jordan to EU
Export (1000US$)
350000
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

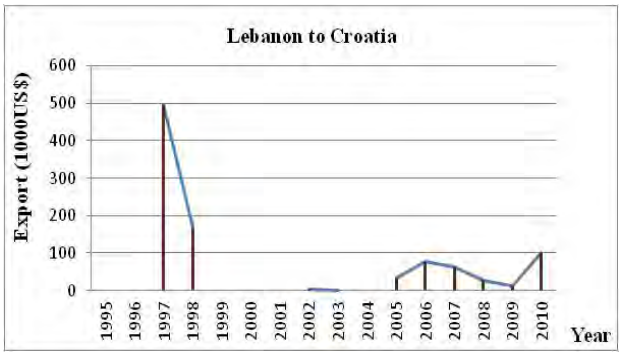
APPENDIX XVII: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM LEBANON. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

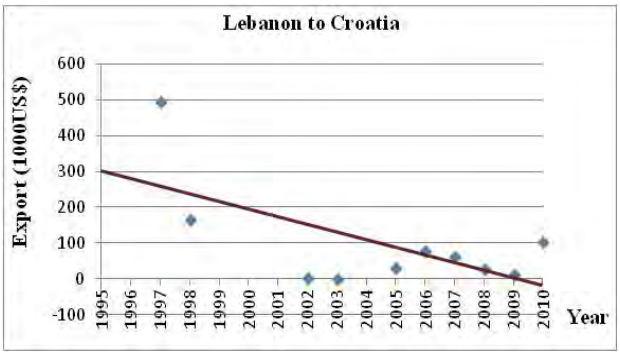


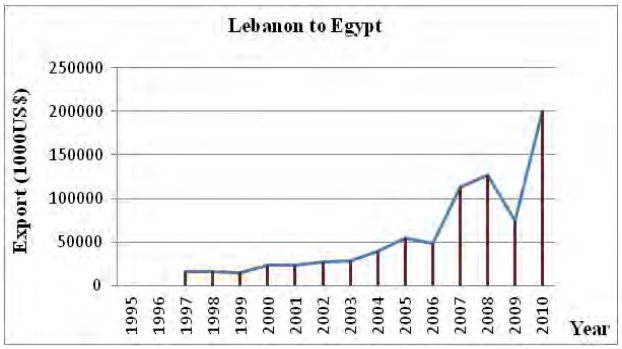


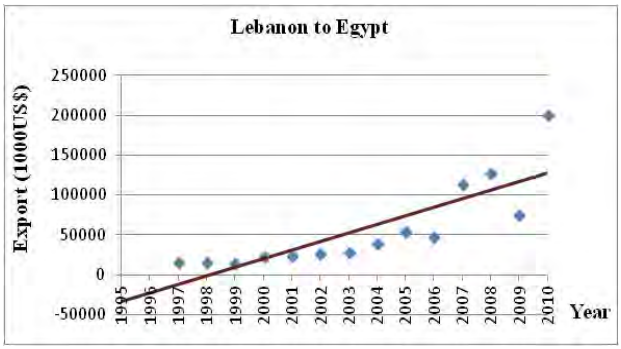


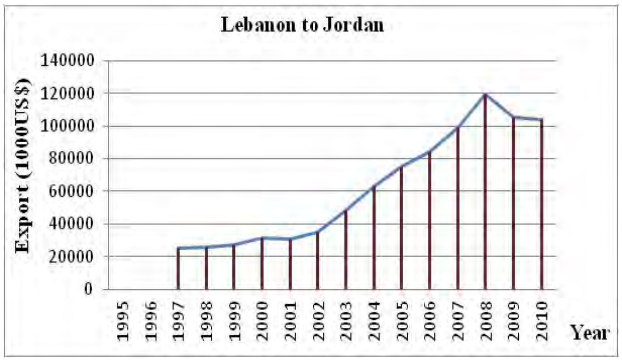


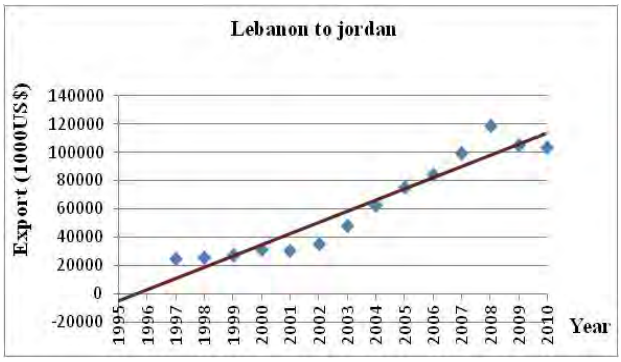


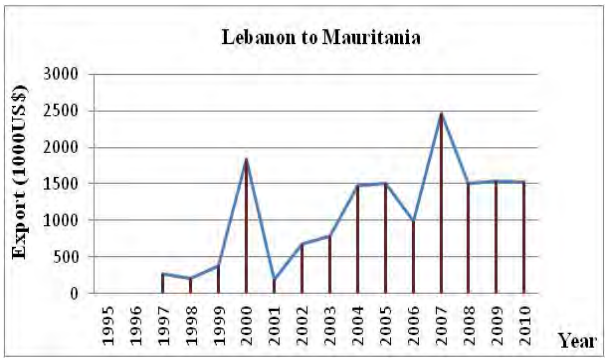


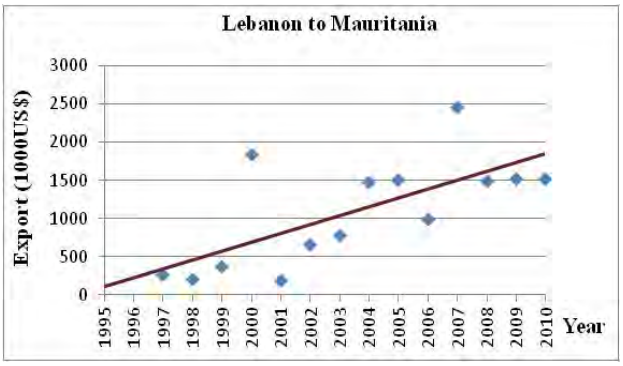


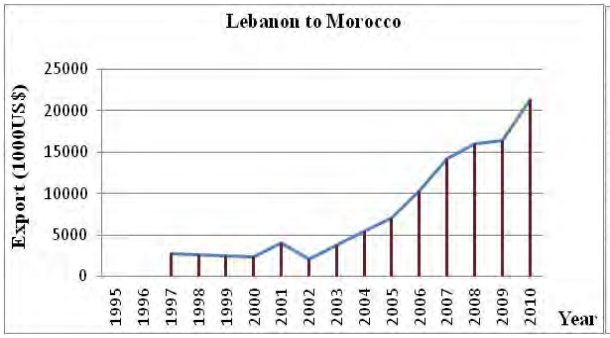


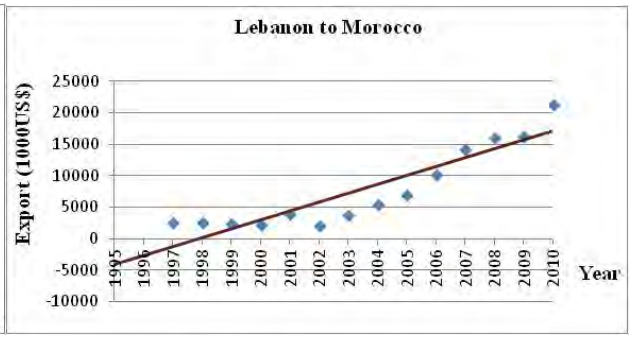

Lebanon to Jordan
Export (1000US$)
Year

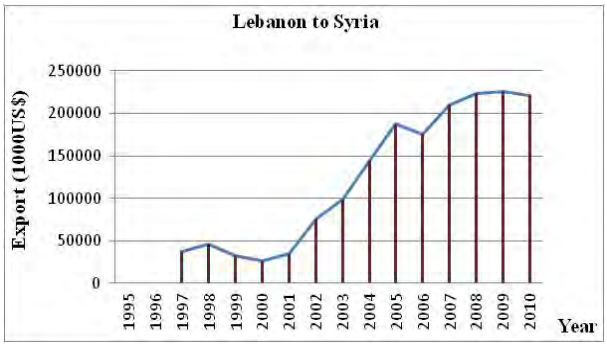

Lebanon to jordan
Export (1000US$)
Year

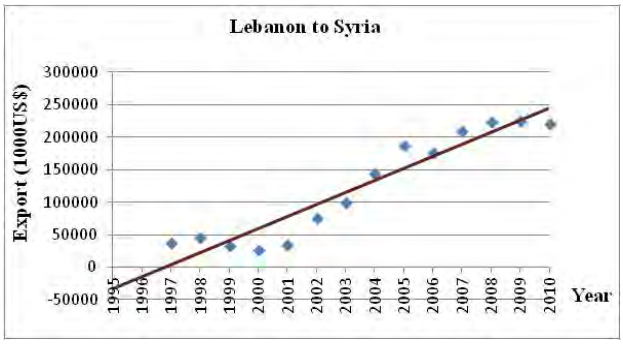

Lebanon to Mauritania
Export (1000US$)
Year

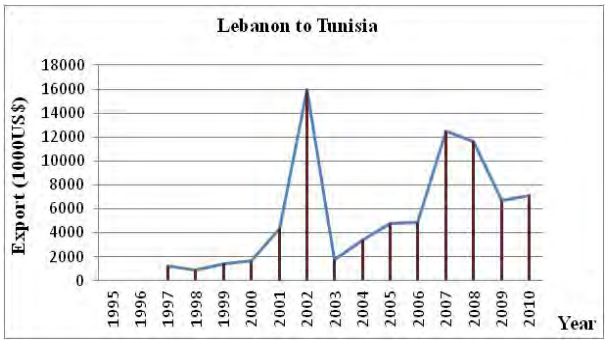

Lebanon to Mauritania
Export (1000US$)
Year

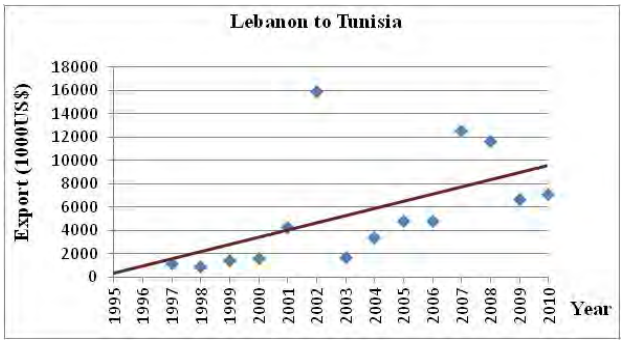

Lebanon to Morocco
Export (1000US$)
Year

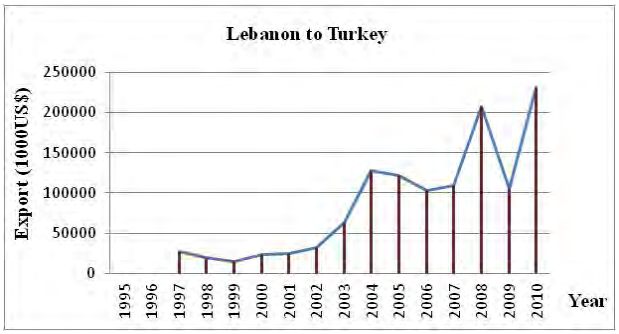

Lebanon to Morocco
Export (1000US$)
Year

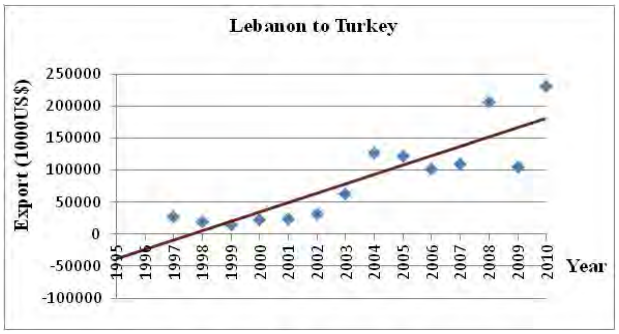

Lebanon to Syria
Export (1000US$)
Year

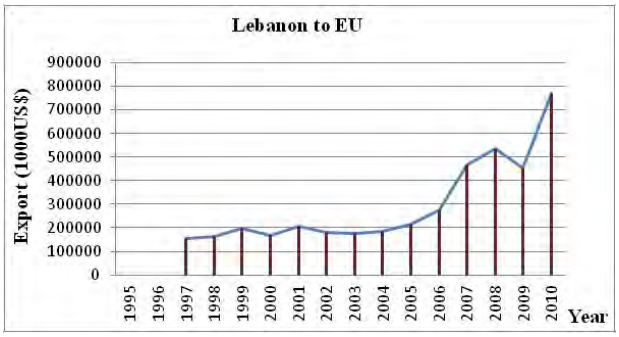

Lebanon to Syria
Export (1000US$)
Year

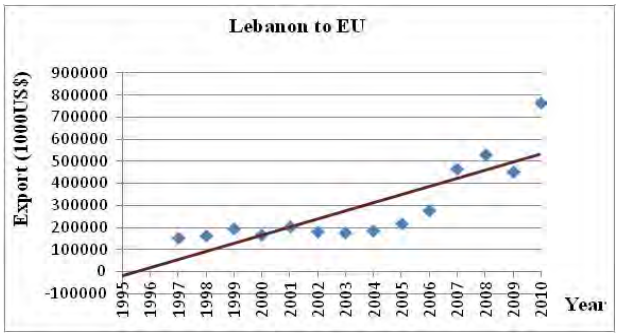

Lebanon to Tunisia
Export (1000US$)
Year


Lebanon to Tunisia
Export (1000US$)
Year

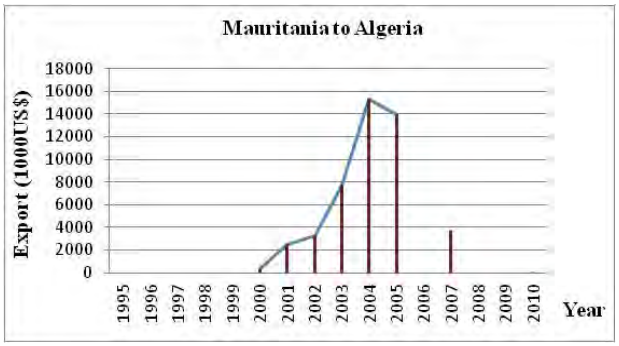

Lebanon to Turkey
Export (1000US$)
Year

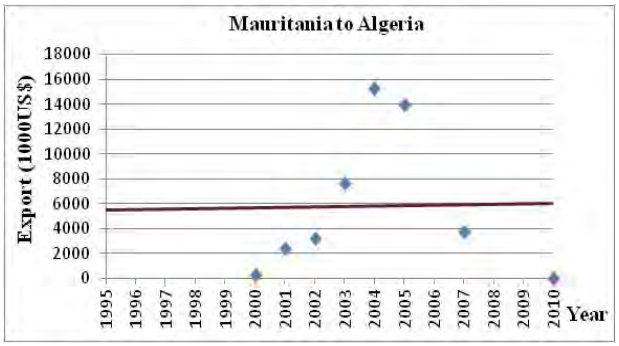

Lebanon to Turkey
Export (1000US$)
Year

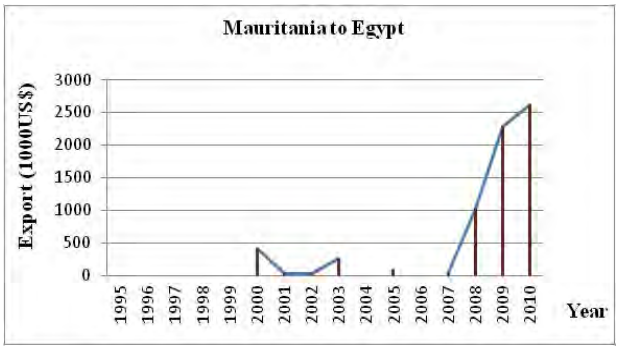

Lebanon to EU
Export (1000US$)
Year

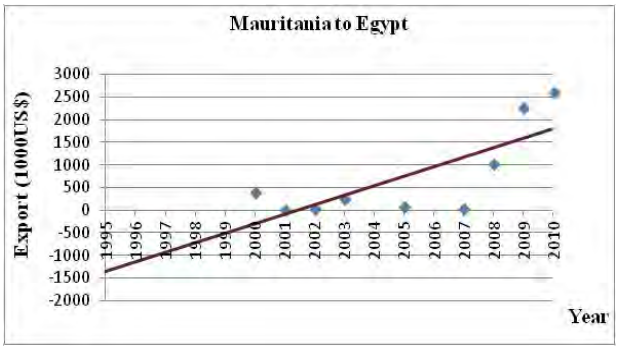

Lebanon to EU
Export (1000US$)
Year

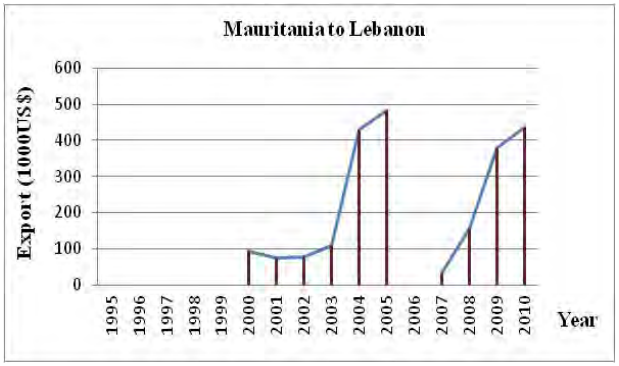
APPENDIX XVIII: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM MAURITANIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

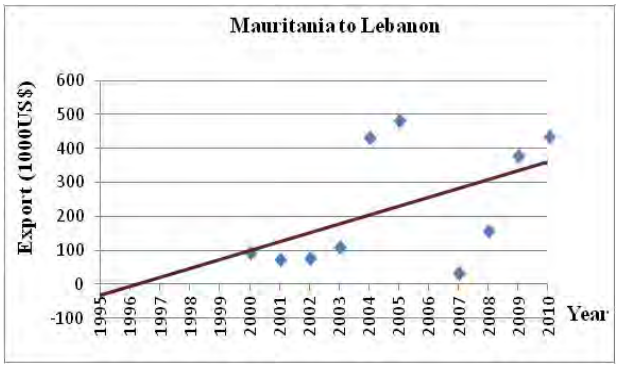


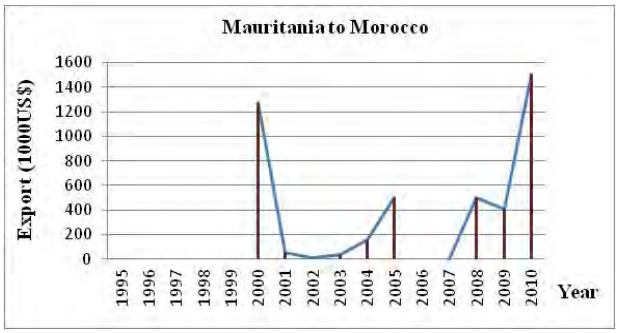


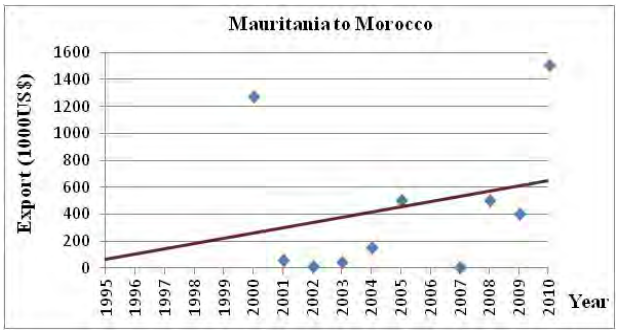


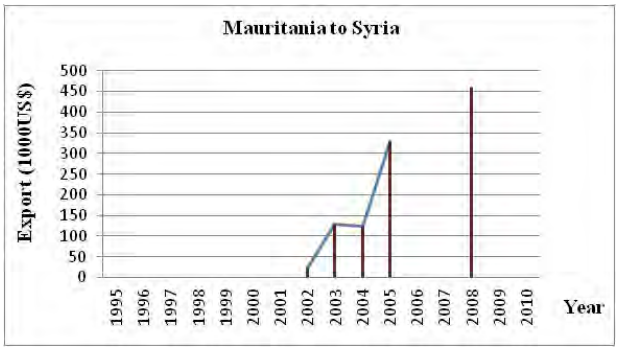


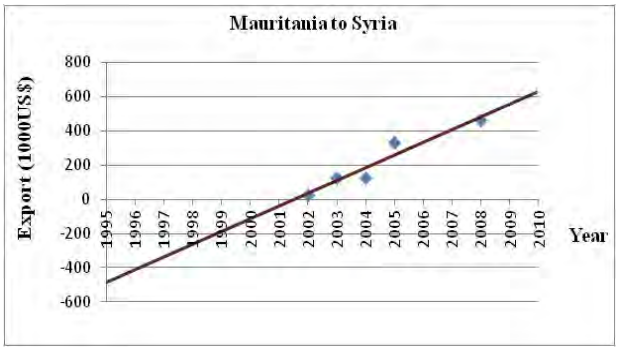


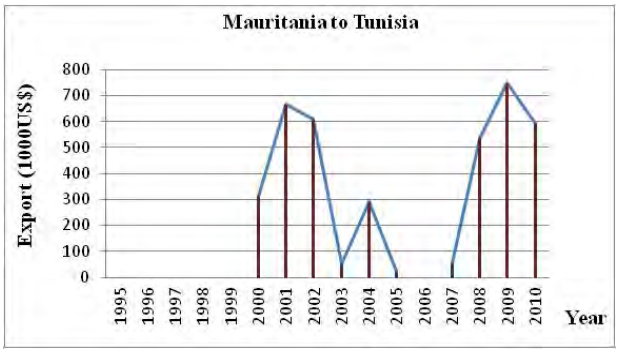


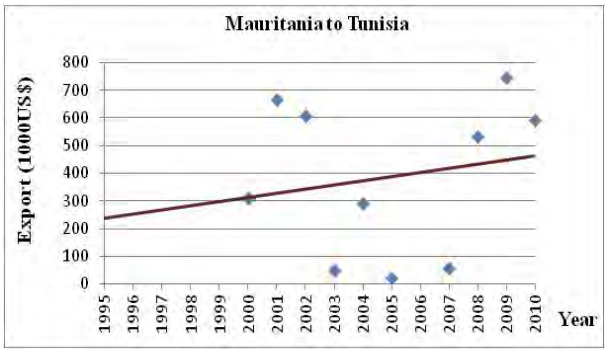


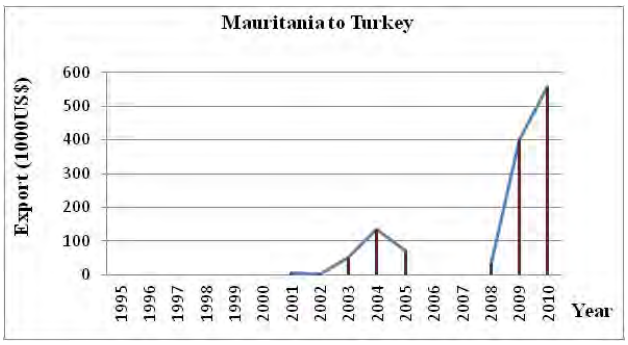


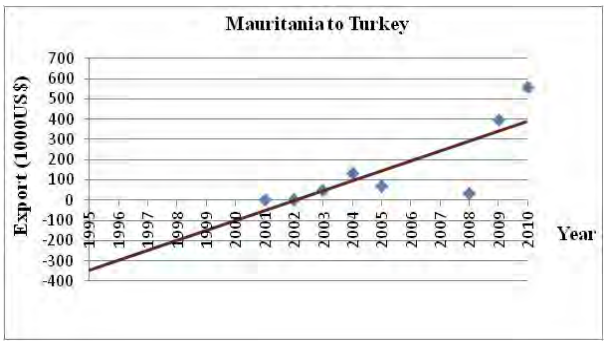

Mauritania to Syria
Export (1000US$)
Year

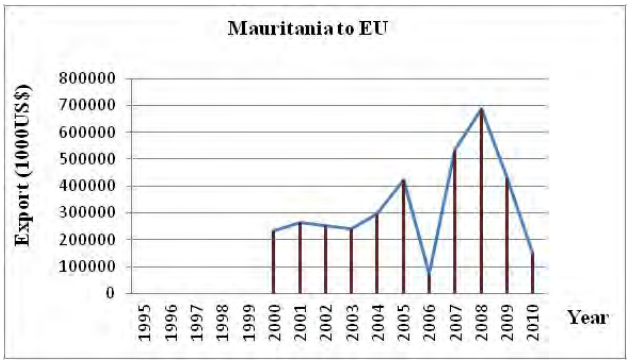

Mauritania to Syria
Export (1000US$)
Year

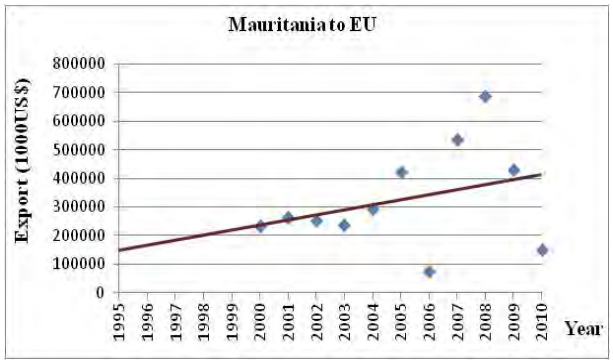

Mauritania to Tunisia
Export (1000US$)
Year


Mauritania to Tunisia
Export (1000US$)
Year

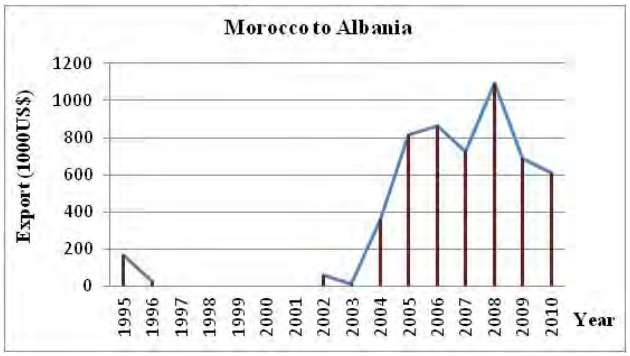

Mauritania to Turkey
Export (1000US$)
Year

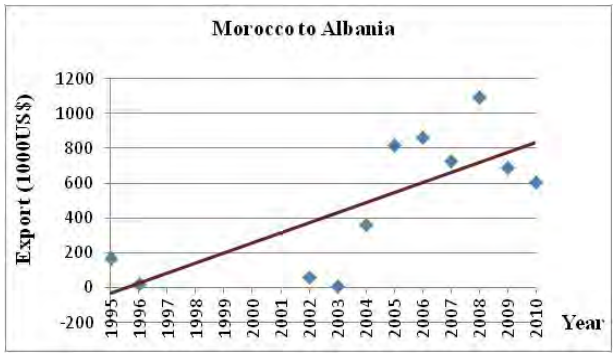

Mauritania to Turkey
Export (1000US$)
Year

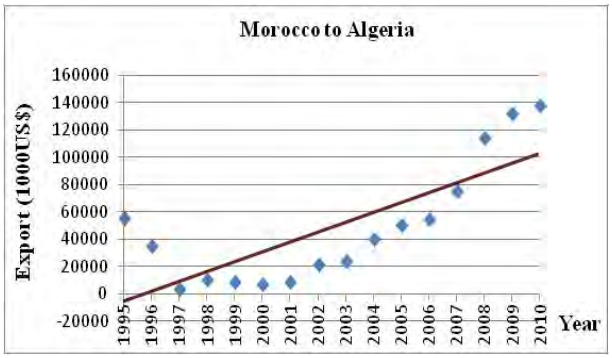

Mauritania to EU
Export (1000US$)
Year

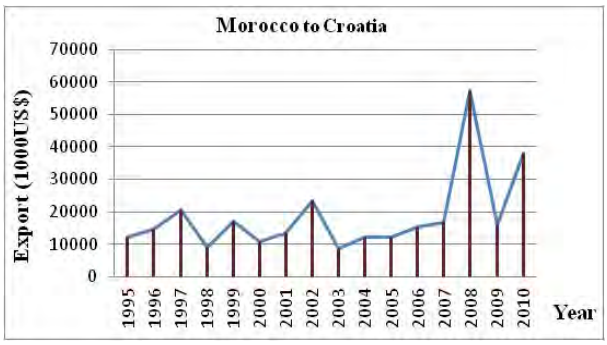

Mauritania to EU
Export (1000US$)
Year

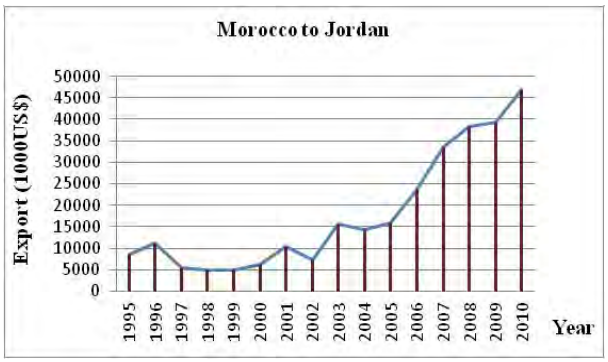
APPENDIX XIX: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM MOROCCO. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

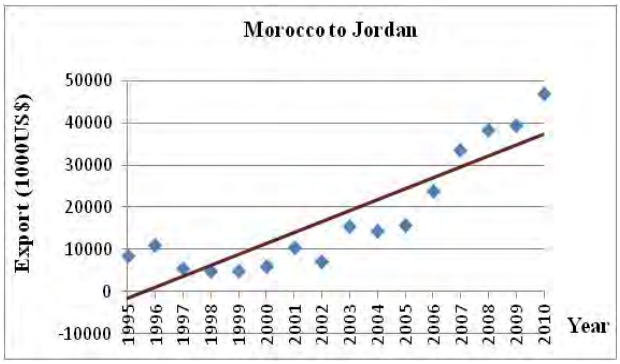


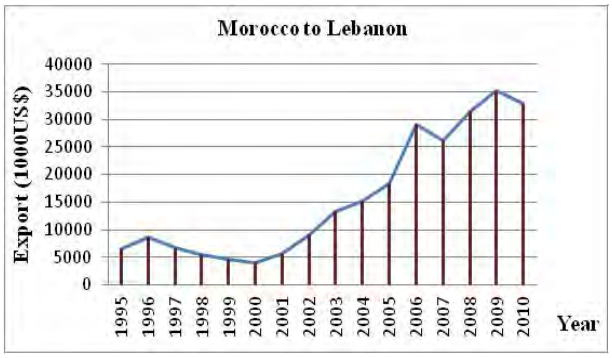


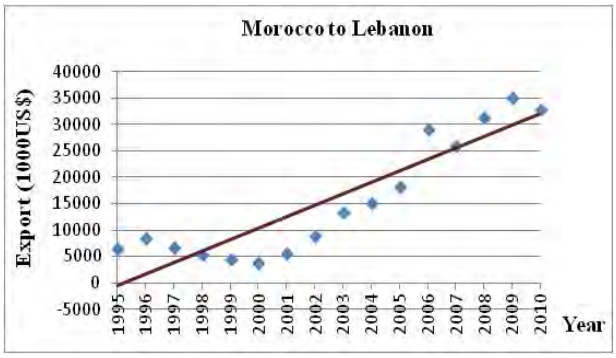




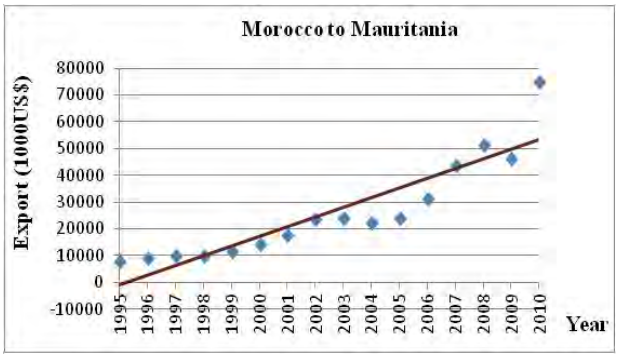

Morocco to Jordan
Export (1000US$)
Year

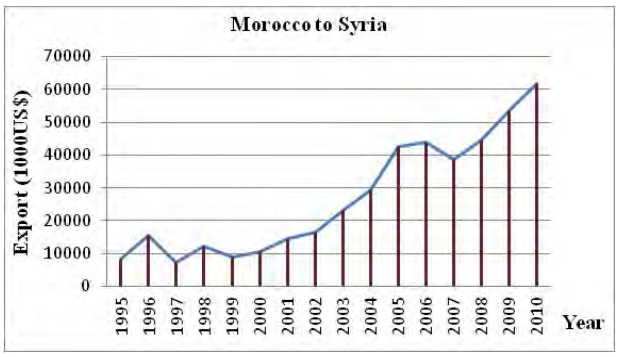

Morocco to Jordan
Export (1000US$)
Year

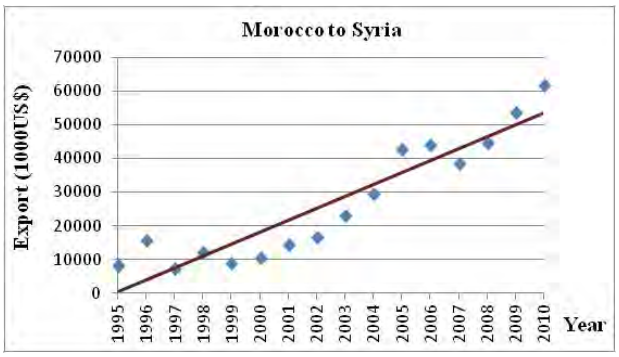

Morocco to Lebanon
Export (1000US$)
Year

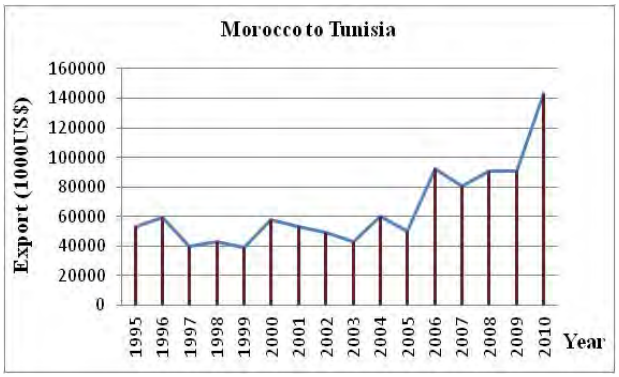

Morocco to Lebanon
Export (1000US$)
Year

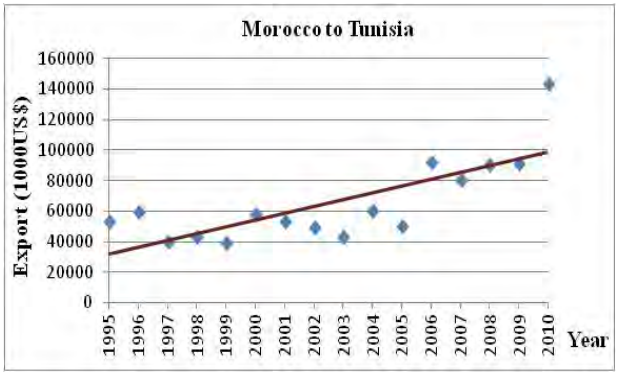
Morocco to Mauritania
Export (1000US$)
Year

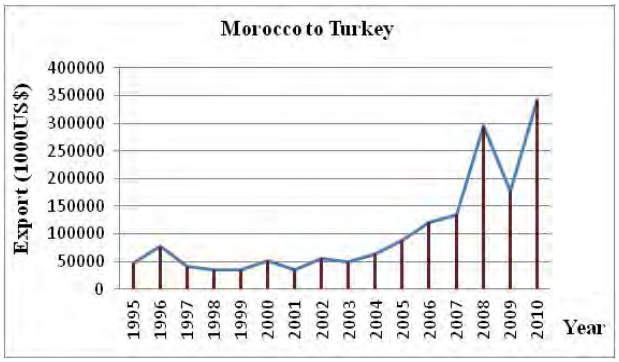

Morocco to Mauritania
Export (1000US$)
Year

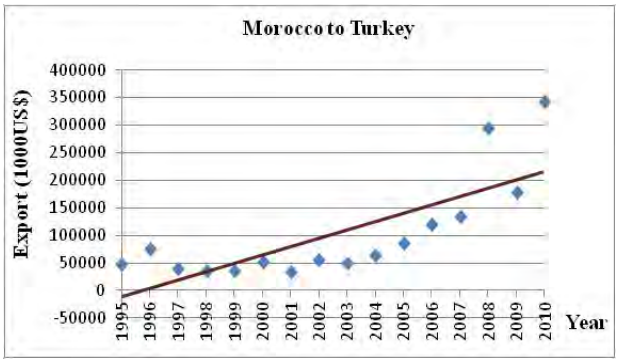

Morocco to Syria
Export (1000US$)
Year


Morocco to Syria
Export (1000US$)
Year

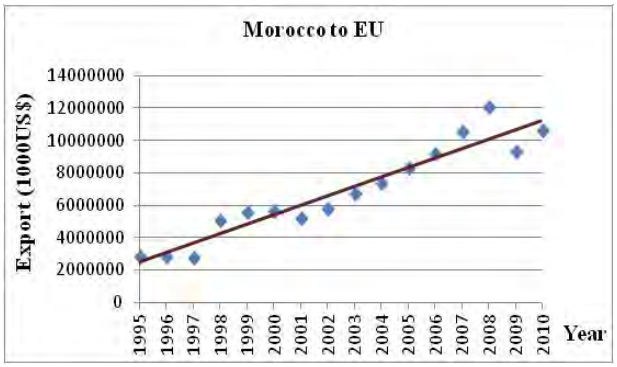

Morocco to Tunisia
Export (1000US$)
160000
140000
120000
100000
80000
60000
40000
20000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Morocco to Tunisia
Export (1000US$)
160000
140000
120000
100000
80000
60000
40000
20000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

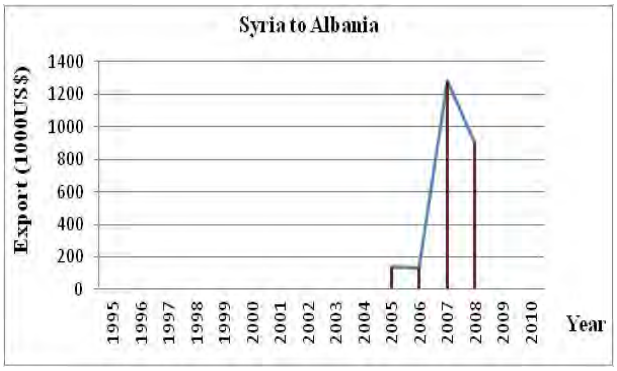

Morocco to Turkey
Export (1000US$)
400000
350000
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

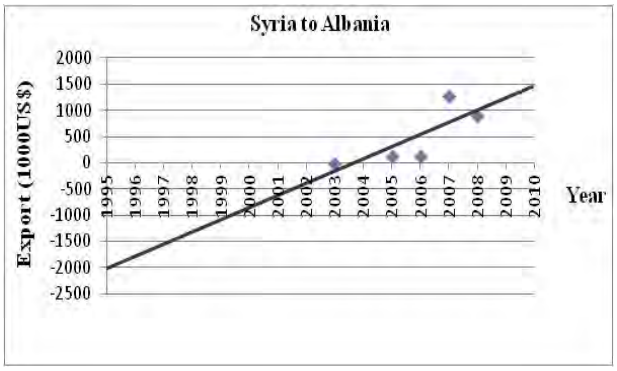

Morocco to Turkey
Export (1000US$)
400000
350000
300000
250000
200000
150000
100000
50000
0
-50000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

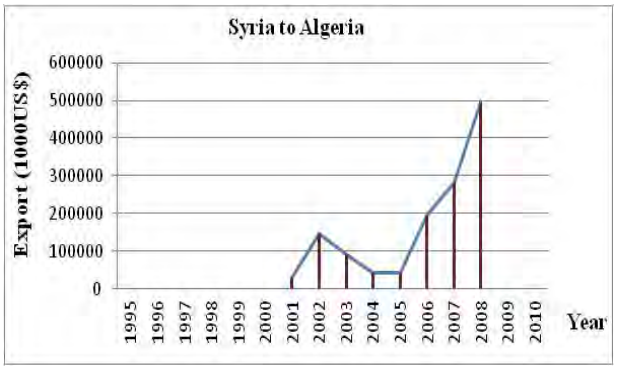
Morocco to EU
Export (1000US$)
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

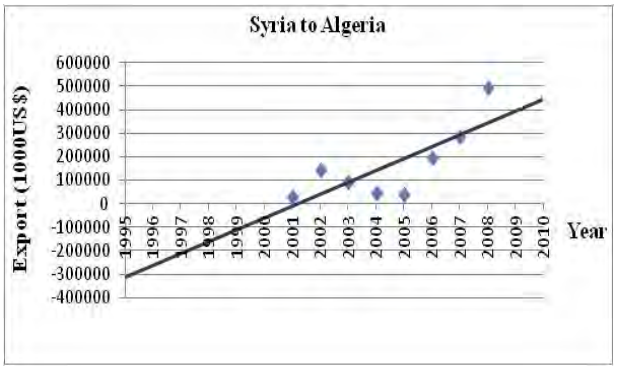

Morocco to EU
Export (1000US$)
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

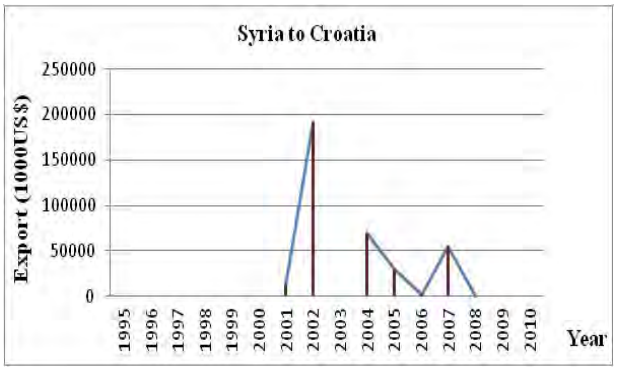
APPENDIX XX: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM SYRIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

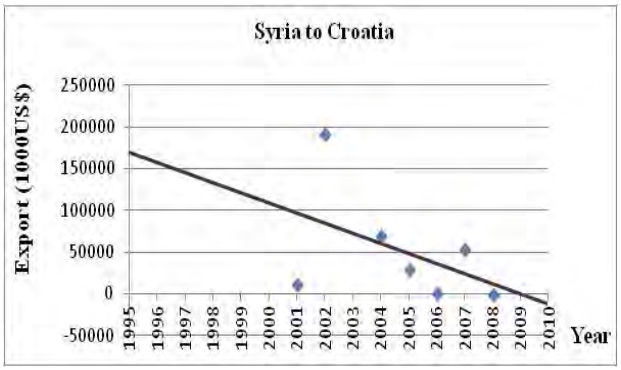


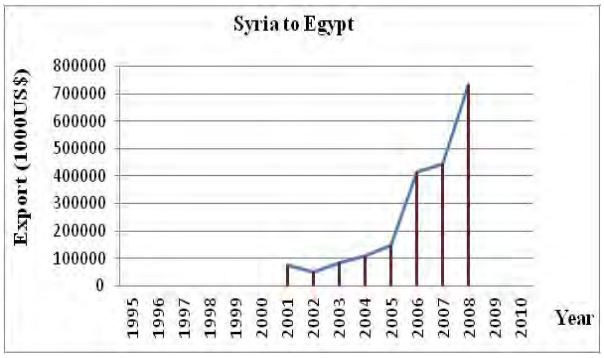


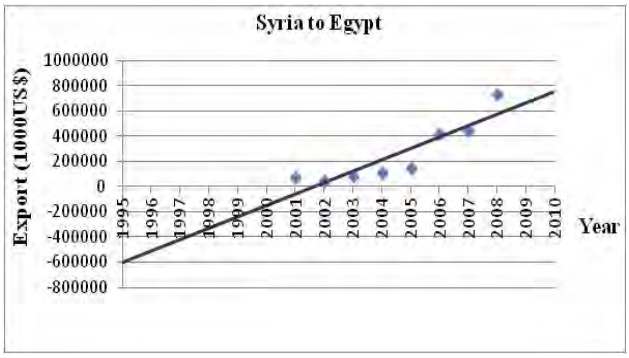


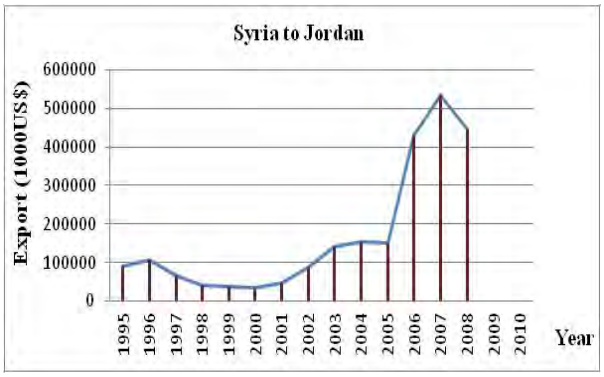


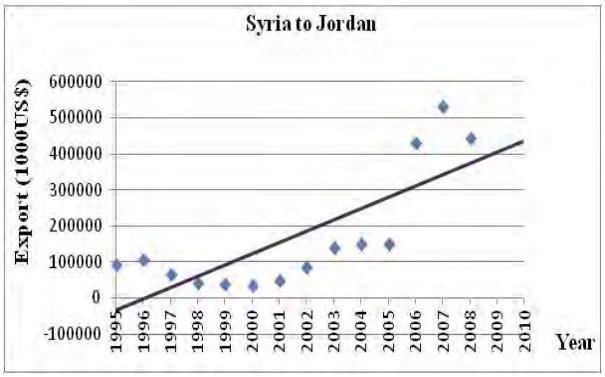


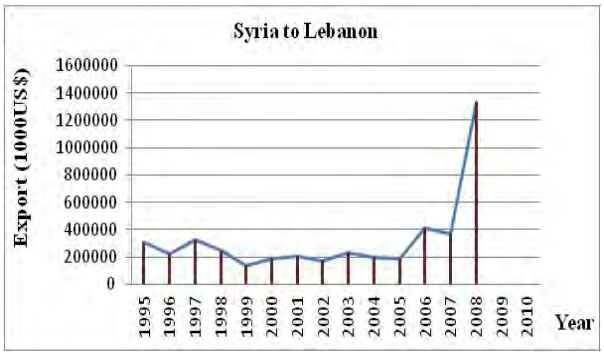



Syria to Egypt
Export (1000US$)
800000
700000
600000
500000
400000
300000
200000
100000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Egypt
Export (1000US$)
1000000
800000
600000
400000
200000
0
-200000
-400000
-600000
-800000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Jordan
Export (1000US$)
600000
500000
400000
300000
200000
100000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Jordan
Export (1000US$)
600000
500000
400000
300000
200000
100000
0
-100000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Lebanon
Export (1000US$)
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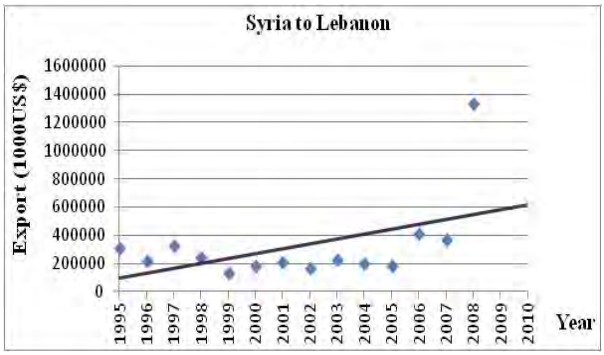
1400000
1200000
1000000
800000
600000
400000
200000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Lebanon
Export (1000US$)
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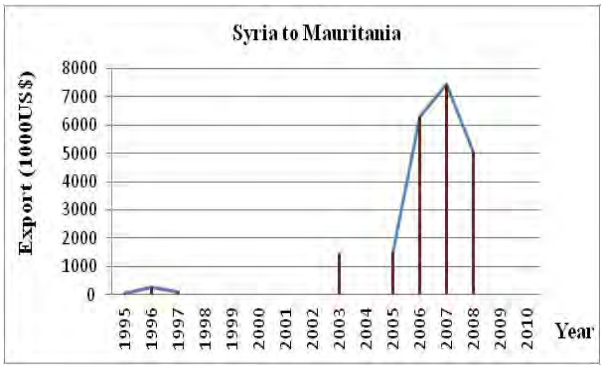
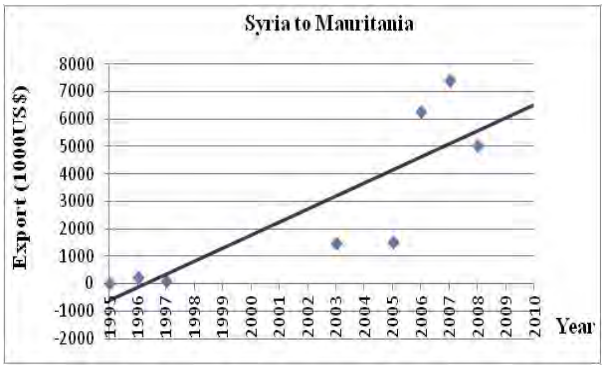
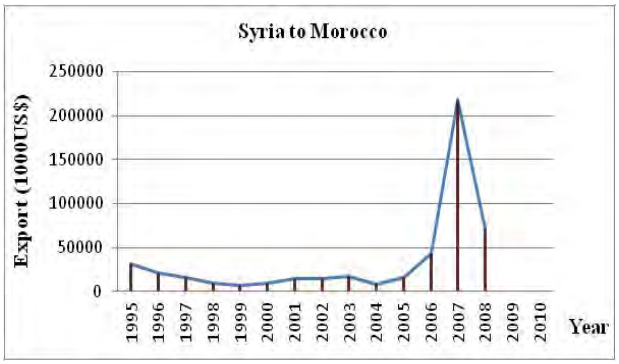
1400000
1200000
1000000
800000
600000
400000
200000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Mauritania
Export (1000US$)
8000
7000
6000
5000
4000
3000
2000
1000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Mauritania
Export (1000US$)
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Morocco
Export (1000US$)
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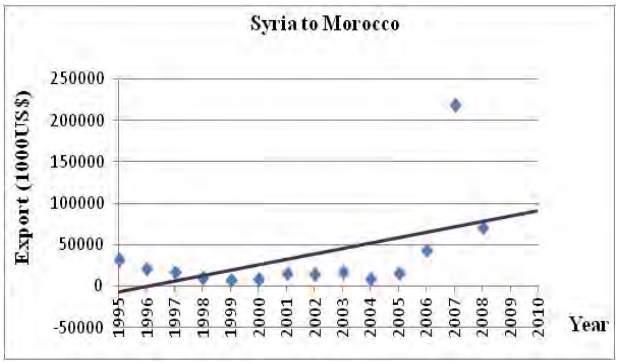
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Morocco
Export (1000US$)
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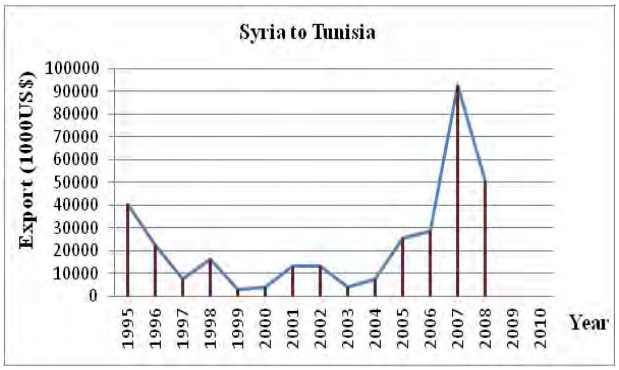
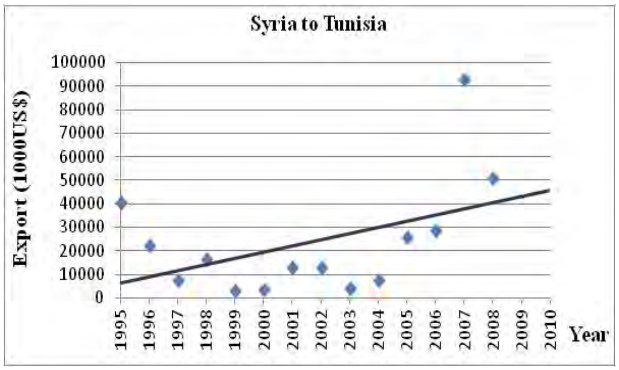
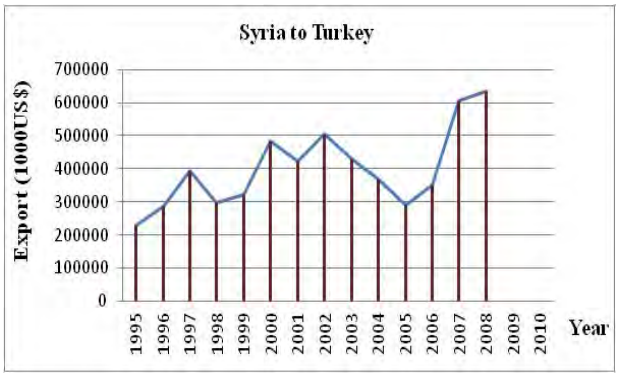
200000
150000
100000
50000
0
-50000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Tunisia
Export (1000US$)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Tunisia
Export (1000US$)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Turkey
Export (1000US$)
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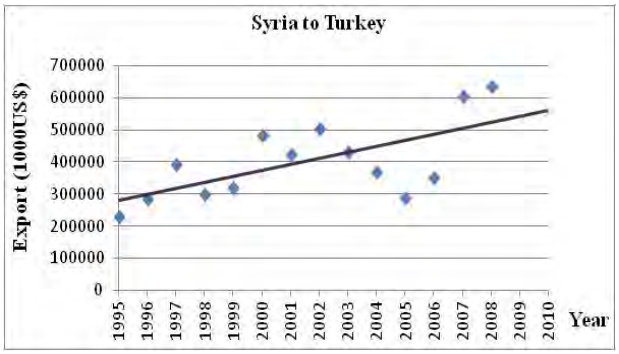
600000
500000
400000
300000
200000
100000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Syria to Turkey
Export (1000US$)
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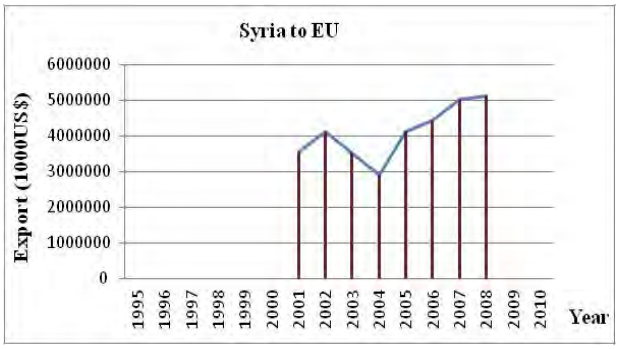
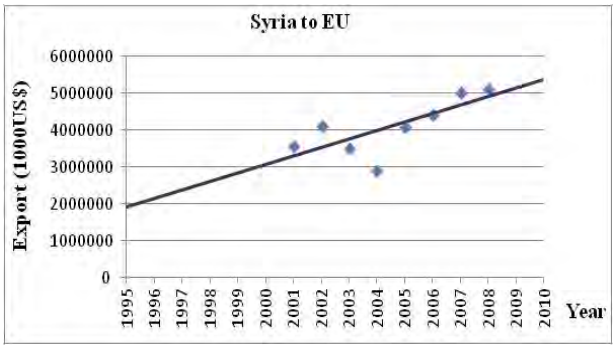
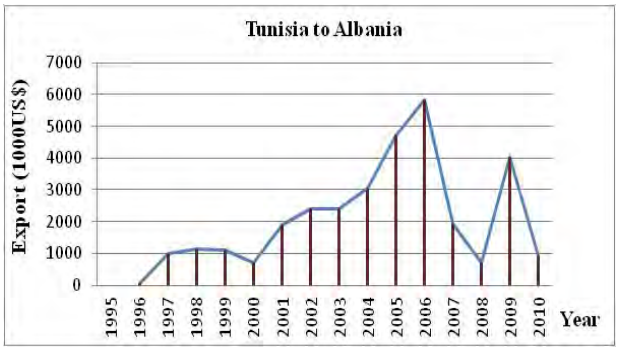
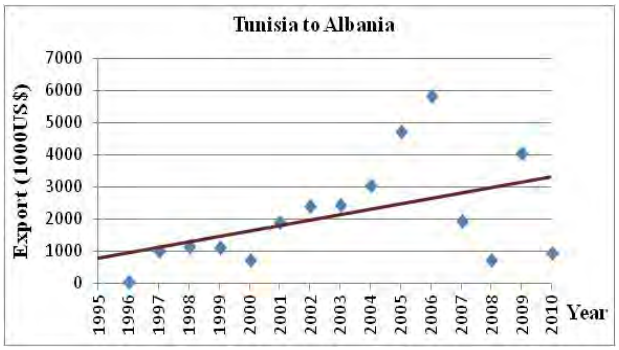
600000
500000
400000
300000
200000
100000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

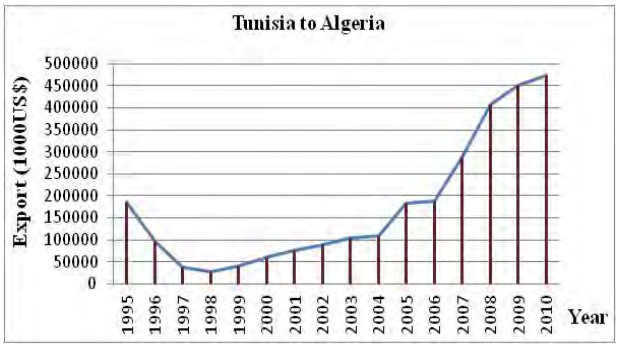

Syria to EU
Export (1000US$)
6000000
5000000
4000000
3000000
2000000
1000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

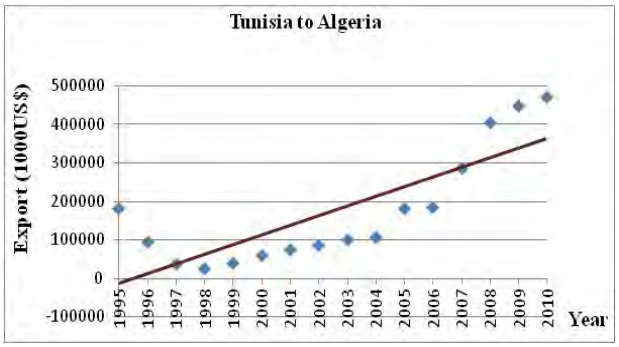

Syria to EU
Export (1000US$)
6000000
5000000
4000000
3000000
2000000
1000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

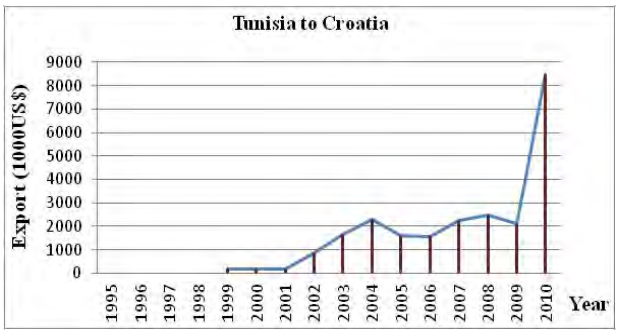
APPENDIX XXI: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM TUNISIA. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

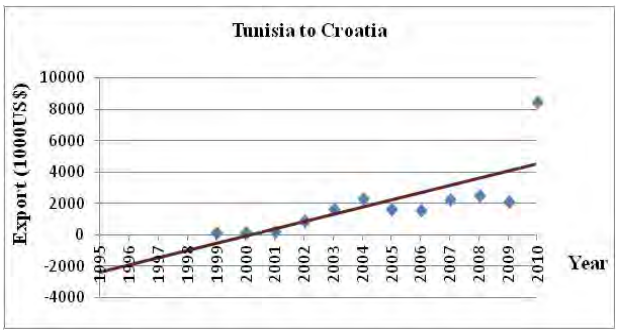


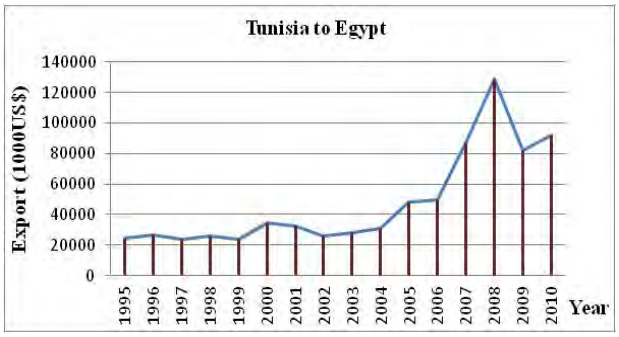


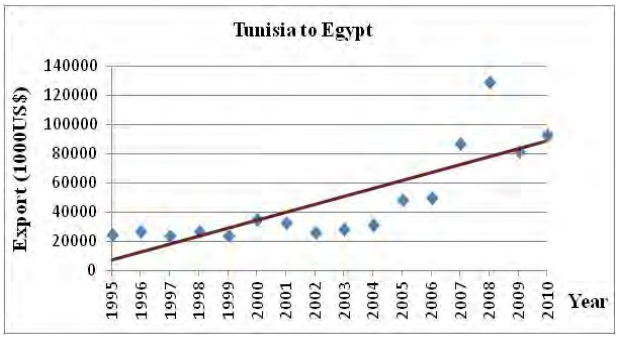


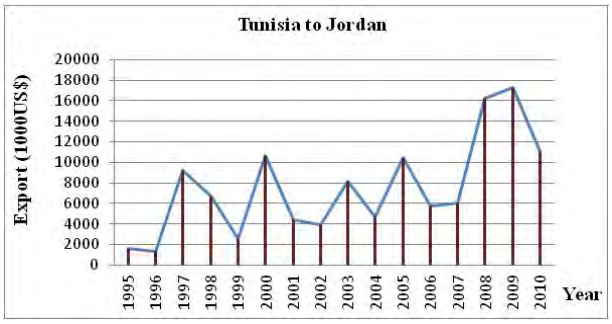


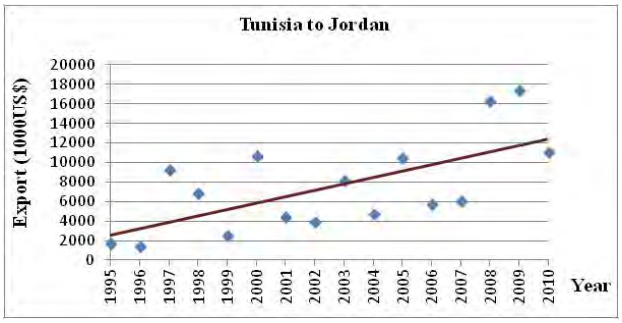


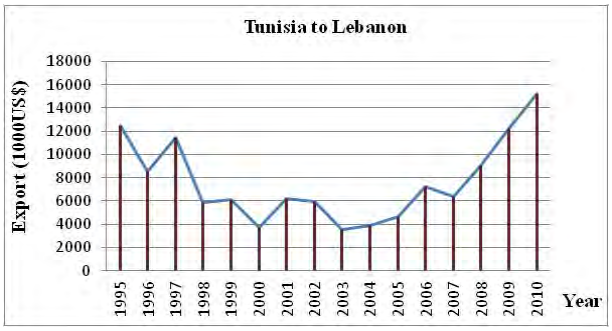


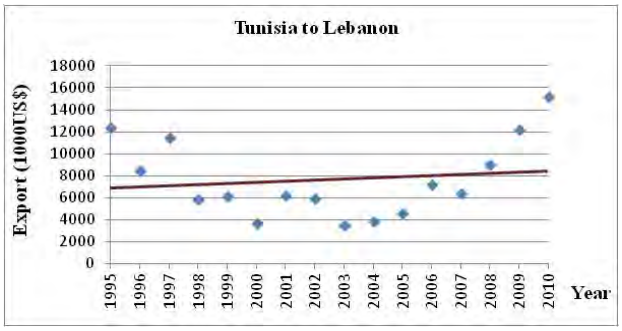


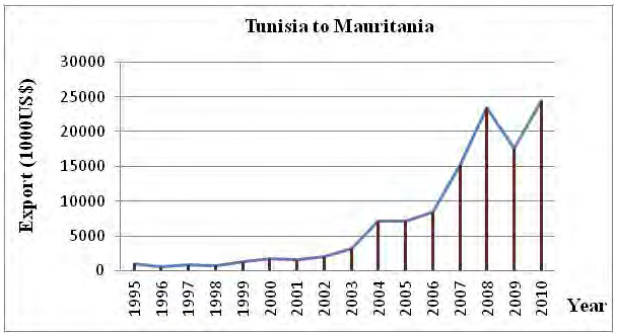


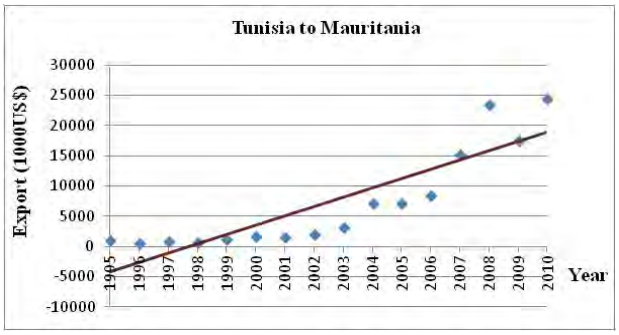

Tunisia to Jordan
Export (1000US$)
Year

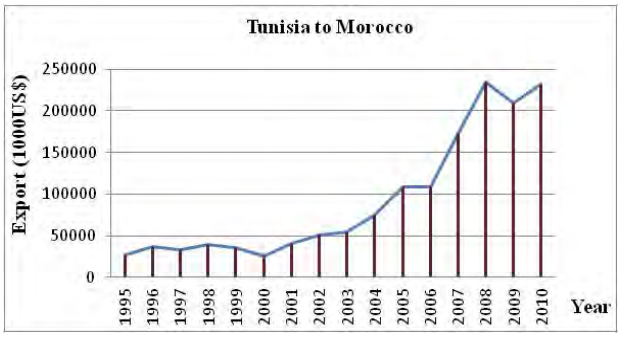

Tunisia to Jordan
Export (1000US$)
Year

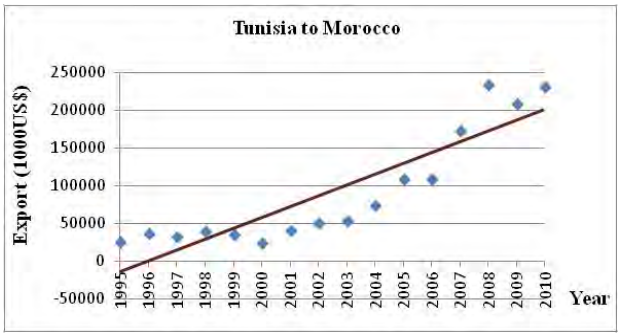

Tunisia to Lebanon
Export (1000US$)
Year

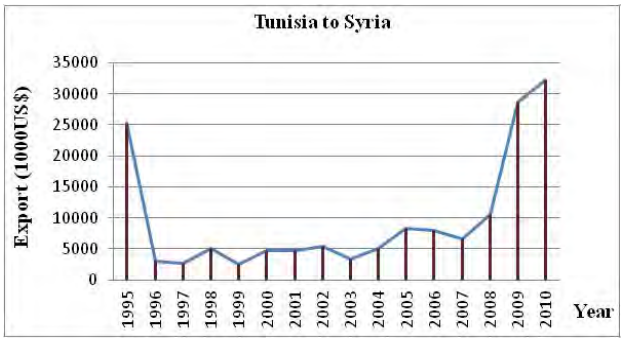

Tunisia to Lebanon
Export (1000US$)
Year

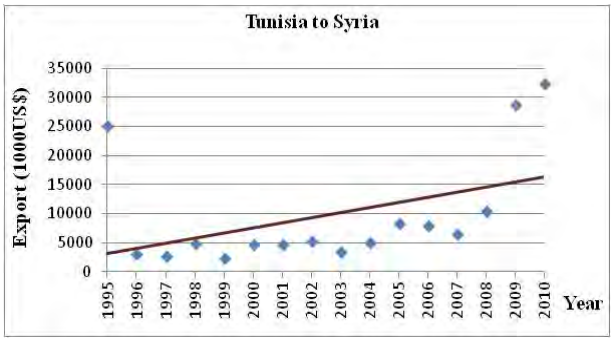

Tunisia to Mauritania
Export (1000US$)
Year

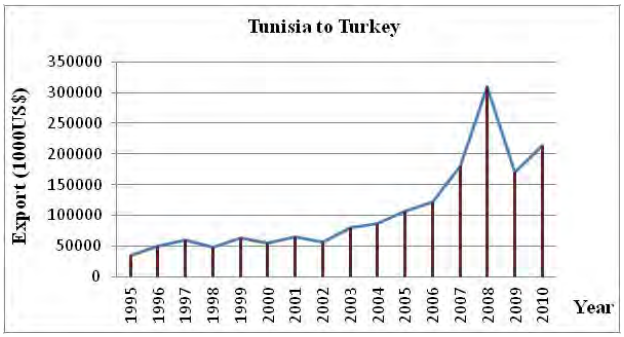

Tunisia to Mauritania
Export (1000US$)
Year


Tunisia to Morocco
Export (1000US$)
Year


Tunisia to Morocco
Export (1000US$)
Year


Tunisia to Syria
Export (1000US$)
35000
30000
25000
20000
15000
10000
5000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Tunisia to Syria
Export (1000US$)
35000
30000
25000
20000
15000
10000
5000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Tunisia to Turkey
Export (1000US$)
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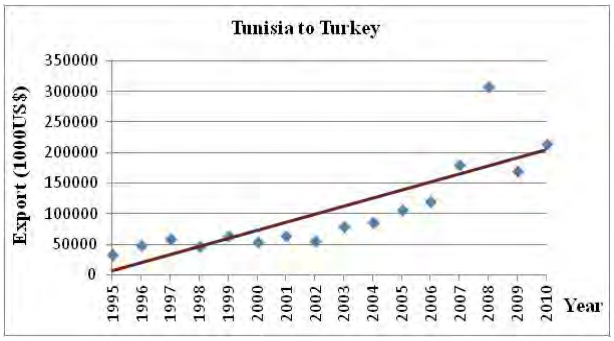
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Tunisia to Turkey
Export (1000US$)
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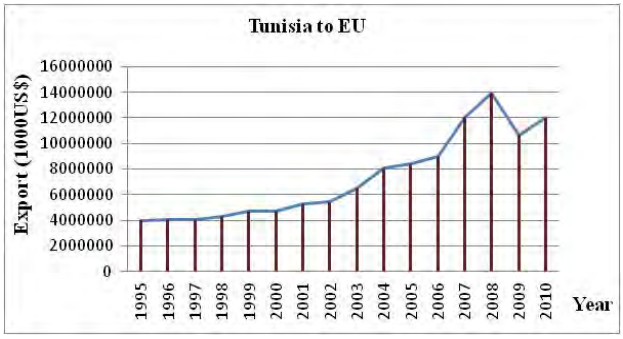
300000
250000
200000
150000
100000
50000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Tunisia to EU
Export (1000US$)
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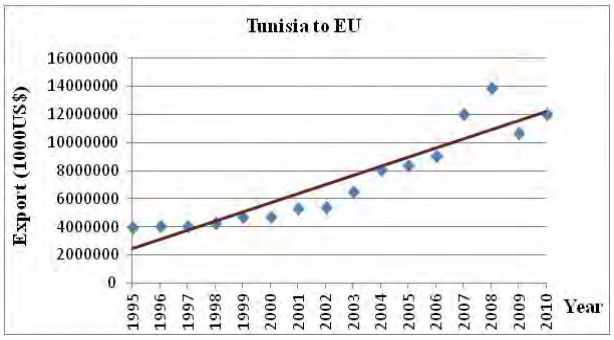
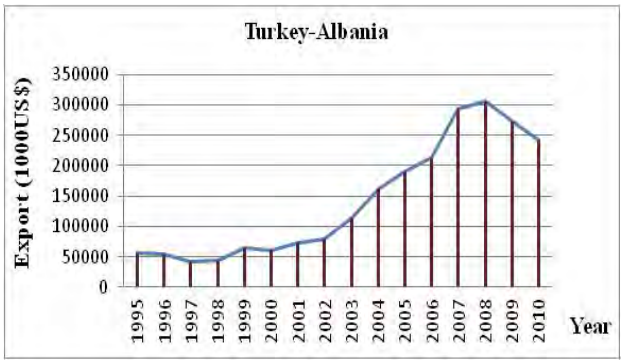
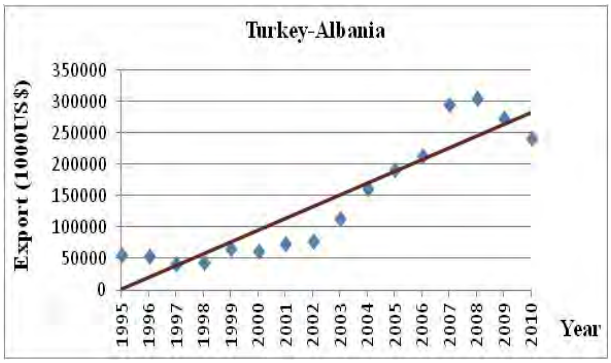
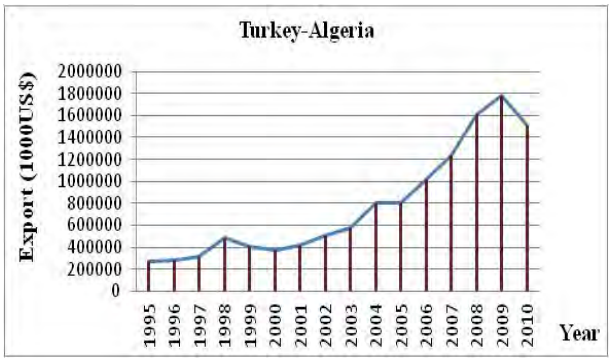
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

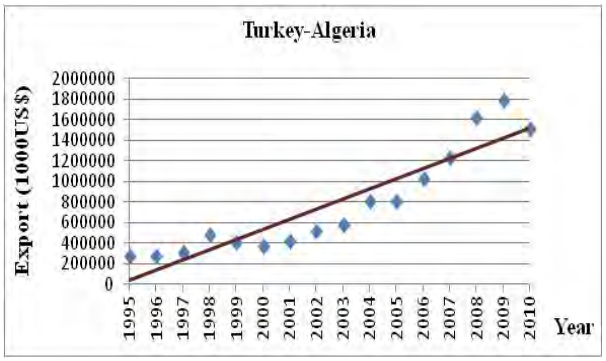

Tunisia to EU
Export (1000US$)
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year

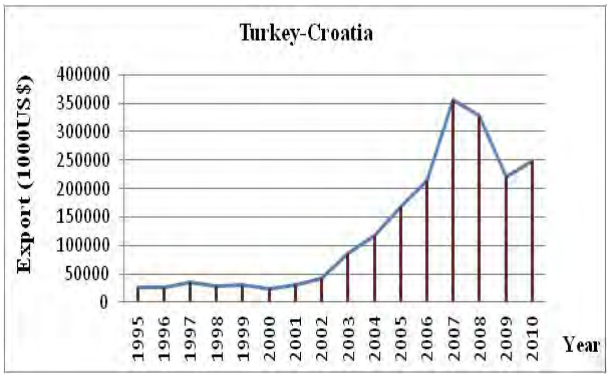
APPENDIX XXII: STATUS OF EXPORT FOR ALL PAIRS ORIGINATED FROM TURKEY. LEFT PANELS: AMOUNT OF EXPORT, RIGHT PANELS: TLPC OF EXPORT.

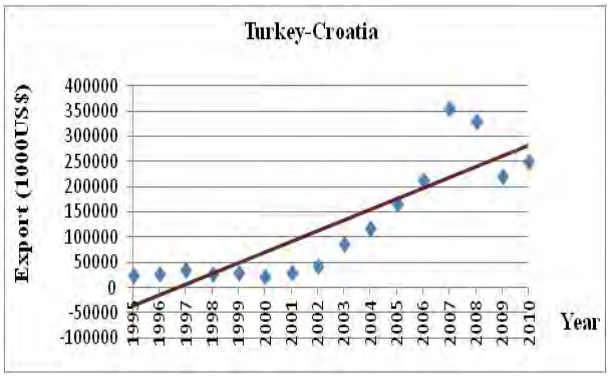


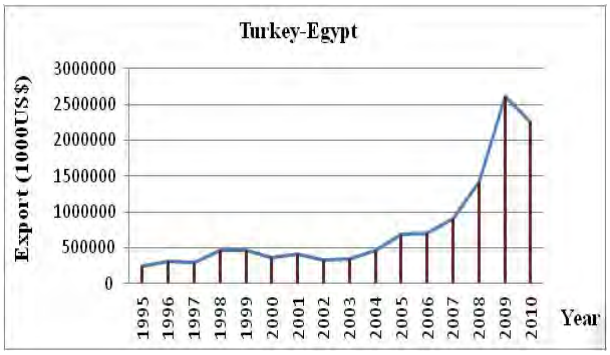


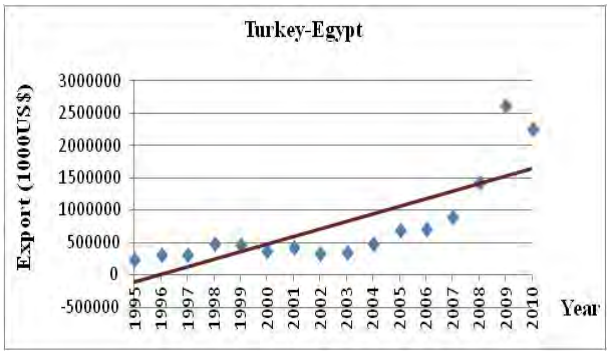









Turkey-Egypt
Export (1000US$)
3000000
2500000
2000000
1500000
1000000
500000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Turkey-Egypt
Export (1000US$)
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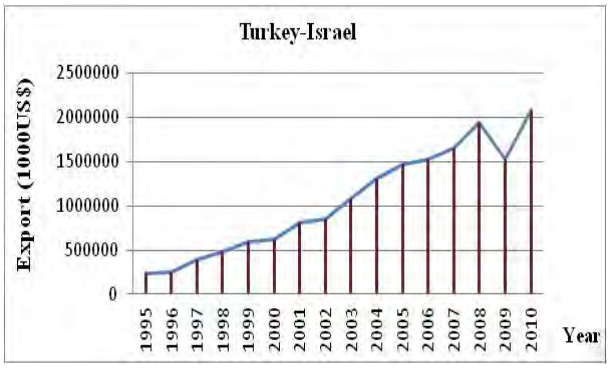
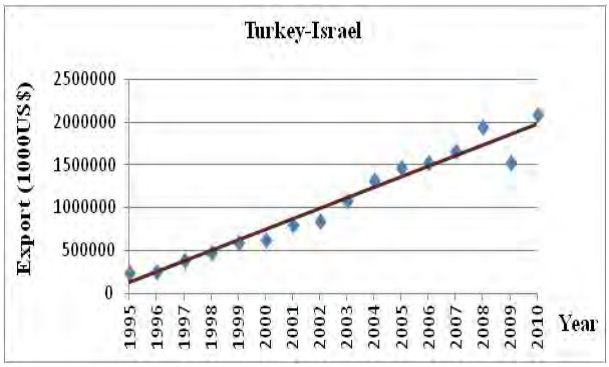
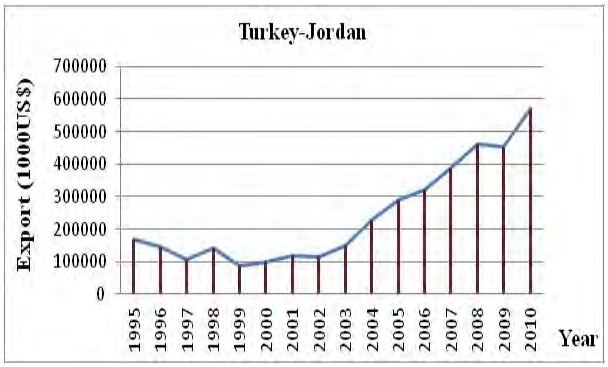
2500000
2000000
1500000
1000000
500000
0
-500000
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Turkey-Israel
Export (1000US$)
2500000
2000000
1500000
1000000
500000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year


Turkey-Israel
Export (1000US$)
2500000
2000000
1500000
1000000
500000
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Year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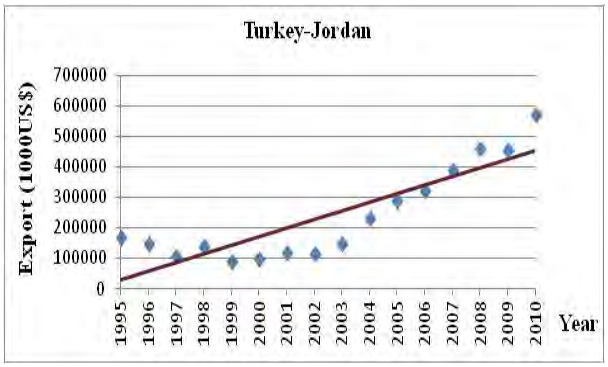
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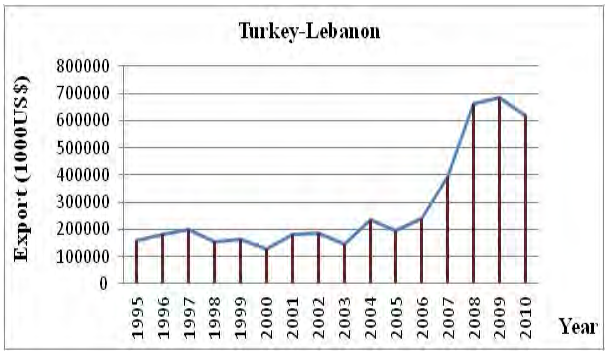
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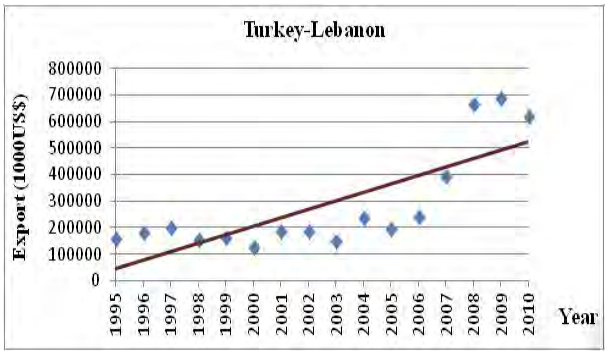
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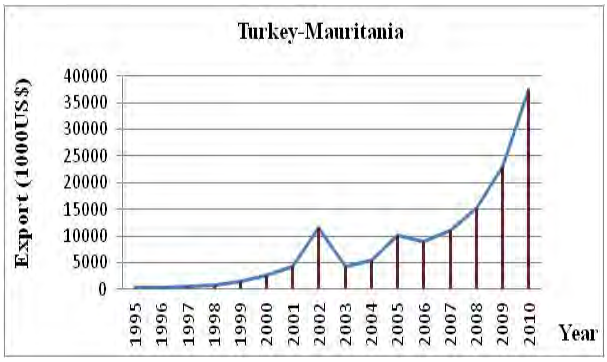
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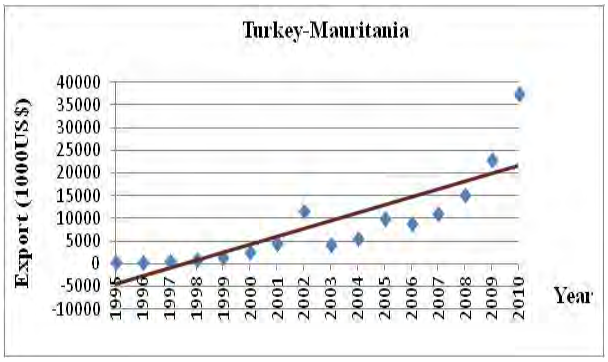
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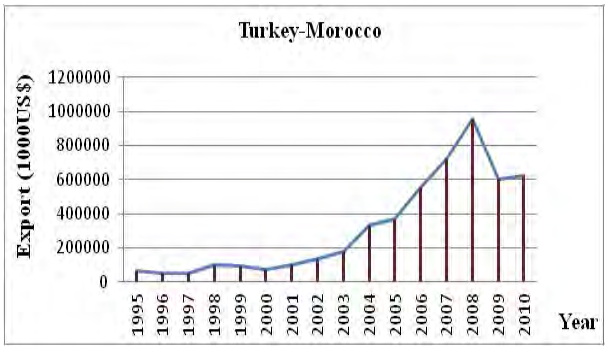
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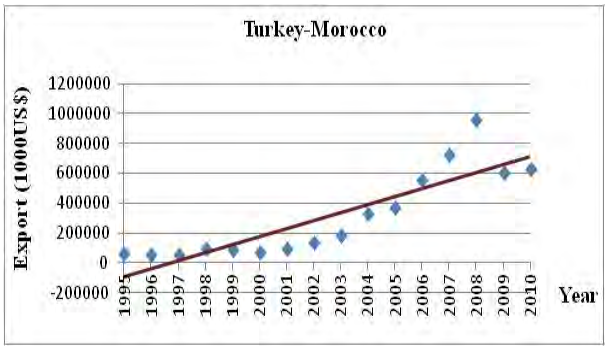
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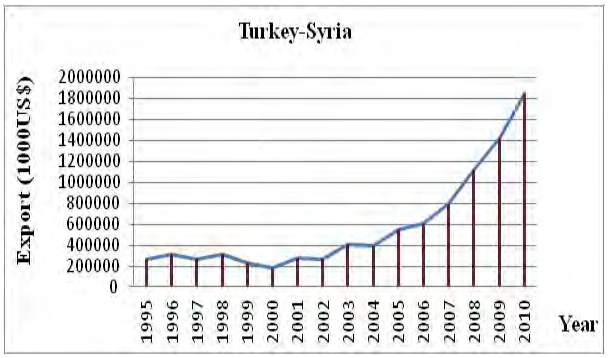
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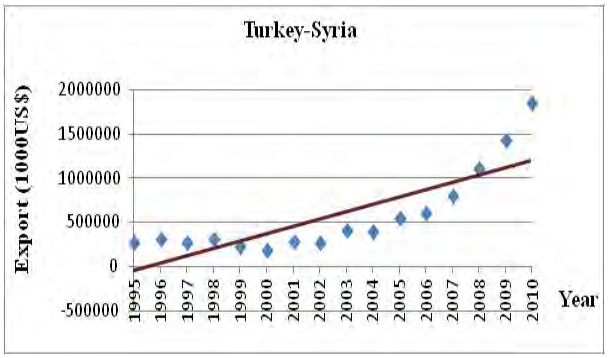
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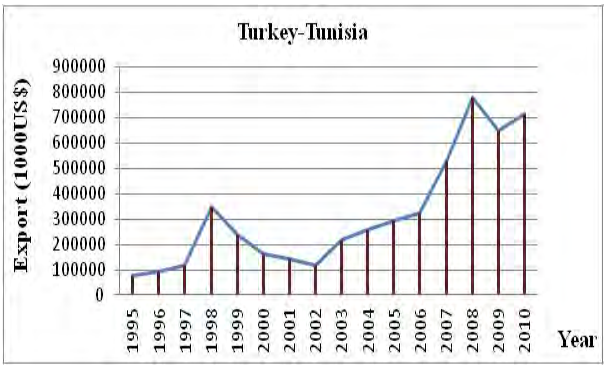
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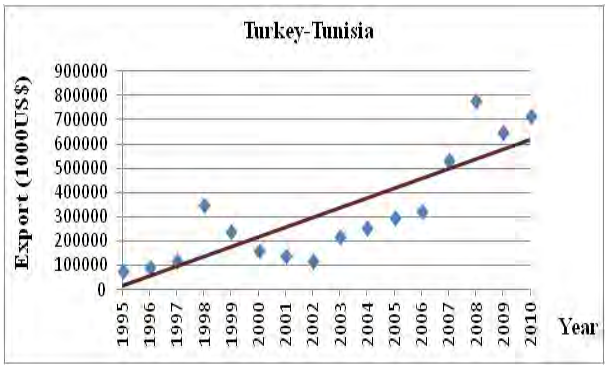
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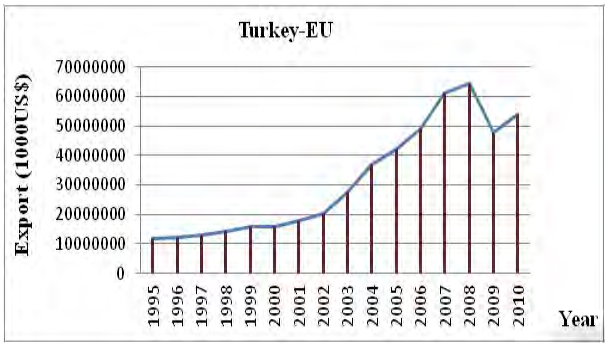
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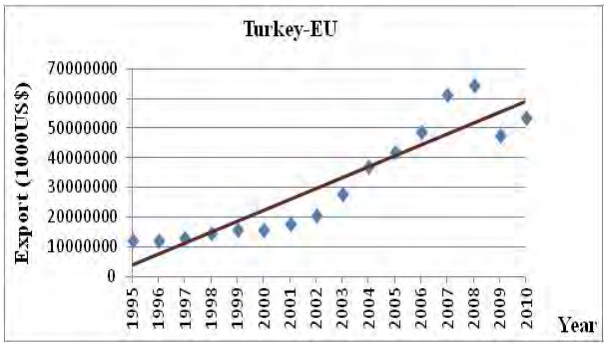
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