The impact of Regional Trade Agreements on North African countries' foreign trade and economic welfare, evidence from Algeria and the European Union Association Agreement.

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Abstract

North African countries trade performance for the last two decades has been disappointing. Efforts to boost trade through regional trade agreements are wide spread. The aim of this paper is to provide additional empirical evidence from the Algeria and the European Union Regional Trade Agreement (Algeria-EU RTA) on the impact of regional memberships on North African countries' foreign trade and economic welfare. This study involves both an ex-ante and ex-post analysis. The former is mainly based on observations of trade movements and trade indicator calculations, whereas the latter is based on both quantitative methods, using the Lloyd and McLaren model and qualitative evaluation using a Vinerian Approach. This research covers a 10-year period (2000-2010).The ex-ante analysis shows that the Algeria-EU Association Agreement was undertaken with two natural trading partners, and thus was expected to create trade and improve economic welfare. This is confirmed by the ex-post analysis as the qualitative study shows that the agreement has positively influenced Algerian trade and led to trade creation in most of the sectors (non-hydrocarbon). Moreover, it is indicated that Algerian economic welfare increased after the implementation of the Association Agreement and confirmed the statement and findings of several of past studies. Nonetheless, it is important to mention that the trade creation occurred mainly in imports

rather than exports. Thus, the quantitative study reveals that although economic welfare increased after the Association Agreement implementation it remained negative. This leads to the conclusion that although the regional membership may create trade, for North African countries, it may not be sufficient to overcome export issues and regulate trade.

Key Words: Algeria; EU; RTA; Foreign Trade; Trade Creation and Trade Diversion.

1. Introduction

In the last fifteen years the phenomenon of Regional Trade Agreements (RTAs), also known as Free Trade Agreements (FTAs), has experienced a significant and constant increase. Most of the industrial, developed and developing countries are either members or in a process of negotiating membership of a regional trade partnership (Wang, 2010). It is acknowledged that the European Union (EU) has the most extensive network of RTAs including both developed and developing countries (Panagravia, 2002). Among these partnerships, the Euro-Mediterranean agreements (Euro-Med) are raising many debates concerning the actual impact of these agreements on trade performance (Peridy, 2005). In particular, it is argued that despite such trade partnerships, Mediterranean countries have been experiencing a disappointing trade performance for the last two decades. It is reported that the share of the North African countries (combined with the Middle-Eastern nations) in the global trade has dropped from 8% in 1981 to 2.5% in 2004 (Dennis, 2006). In this respect, it is warned that RTAs can negatively impact trade performance of both members and non-members by diverting more trade from non-members than it would create mong members (Freund and Ornelas, 2010). The purpose of this paper is to provide additional empirical evidence from the Algeria and the European Union Regional Trade Agreement (Algeria-EU RTA) on the impact of RTAs on North African countries' foreign trade and economic welfare. The present study is structured as follow; (1) a brief review of literature is conducted covering the debate over the creation and diversion effects of RTAs, (2) the research methodology is presented and (3) the results are discussed.

2. Literature Review: Trade creation and trade diversion

In theory, RTAs are expected to increase the volume of trade, and enhance economic welfare among member countries. The deeper integration brought by the new wave of RTAs has constituted an essential inspiration for the expansion of the FTAs in the last decade. However, since Viner's (1950) study of the customs union issue a debate has taken place on whether expansion of intra-bloc trade under RTAs is not at the expanse of extra-bloc trade. Viner's approach involves two important concepts, namely; trade creation and trade diversion. According to this approach, trade creation refers to "*the expansion of overall trade by a PTA country to the benefit of its economy*". Whereas, trade diversion is considered as "*the expansion of trade between PTA partners, that supplants erstwhile imports from non-PTA countries at a higher resource cost than would be otherwise*" (De Rosa, 2007:2).

Several studies have claimed that RTAs significantly contribute to increasing trade among the country members and thus would positively impact the economic welfare of these countries (Allen et al., 1996; Sapir, 2000; Clausing, 2001; Magee, 2008). In this regard, Allen et al (1996) conducted research on the EU-RTA, using an econometric approach, based on data such as demand between home producers, other EU producers, and non-EU producers. The authors concluded that the European FTA created trade for both EU and non-EU producers. Similarly, Sapir (2000) found that Andean community, Closer Economic Relations (CER), ASEAN Free Trade Area (AFTA) and European Free Trade Area (EFTA) have created more trade internally than they have diverted trade from the rest of the world. However, the effects of Latin American Integration Association (LAIA) and MERCOSUR were inconclusive. Only NAFTA has been found to be net trade diverting. Moreover, Clausing (2001) investigated the effect of the Canada-United States trade agreement (CUSFTA) of 1988 and concluded that trade creation occurred in most sectors. Equally, Magee (2008) used a panel of 133 countries

between 1980 and 1998. The author found that although the RTAs' positive impact was limited the latter has created more trade than it has diverted.

Conversely, other studies have demonstrated that RTAs may improve intra-regional trade at the expense of trade with outsiders (diversion), thus reducing economic welfare (Adams et al., 2003; Krugman and Obstfield, 2003; Romalis, 2007). In this respect, Adams et al (2003:100) have severely criticised past studies conducted on RTAs' effects on trade, and where they have been found to create trade. They stated "*these studies have been assessed, at best, only by reference to the point estimates from various cross sections*" and argued that new research has been conducted using more rigorous statistical tests. They found that among 18 RTAs examined in detail, 12 have resulted in more trade diversion from non-members than trade creation with members (concerning merchandise trade provisions). Moreover, they suggested that RTAs with high levels of liberalisation, such as the EU, NAFTA and MERCOSUR, have been unsuccessful at creating significant trade inside the region and therefore have reduced economic welfare effect. To summarise, the empirical results found by Adams et al (2003) totally contradict the results mentioned previously. Furthermore, Krugman and Obstfeld (2003) illustrated these negative effects through the South American example. When in 1991 Argentina, Brazil, Paraguay and Uruguay created a free trade area called MERCSOUR, the volume of trade among these countries tripled within four years following the agreement.

Nonetheless, the authors stated that a study in 1996, conducted by the World Bank's chief trade economist, showed that the increase in the volume of trade within the region was at the expense of the trade that would have taken place with the rest of the world. In addition, the report argued that member countries were purchasing higher cost products from neighbour instead of lower cost products still heavily taxed from non-members countries. In other words, the pact diverted trade instead of creating it, and therefore reduced world welfare. Equally,

Romalis (2007) studied the creation/diversion effect in the NAFTA agreement. The author found that the agreement has diverted more trade from EU countries.

Eventually, several scholars acknowledged that the creation and diversion effects depend on a number of factors that may influence the RTA's impact. In fact, Wonnacot and Lutz (1989), Krugman (1991), Bhagwati (2008); and Freund and Omelas (2010) argued that RTAs are more likely to create trade and enhance economic welfare when formed with nearby countries that already trade extensively with each other (natural trading partner). Frankel et al. (1995) confirmed that factors such as physical proximity, similarity in sizes and GNP, common borders and common languages improve the probability for trade creation. Additionally, Grimwade (2000) has argued that the effects of RTAs on trade and economic welfare depend on the nature of the agreement. The author suggested that a number of factors may lead the agreement to create or divert trade, these are:

- The larger the area covered by the agreement, the greater the trade created.
- A high degree of complementarity between countries leads to greater probabilities of trade diversion.
- A high level of competition between members may increase possibilities of trade creation.
- High external tariffs (for non-members) induce trade diversion.

Similarly, Plummer et al (32:2010) have added other factors that may also affect the RTA's impact. They stated that:

- A RTA may be trade diverting if it encourages trade between "unnatural" trade partners
- The larger the difference between countries' comparative advantage, the more likely is to create trade
- The less the country's comparative advantage depends on commodities the greater the probability of trade diversion.

3. Methodology: Assessing a RTA's impact

The evaluation of the potential and actual impacts of a RTA is conducted essentially using economic data and statistics, as well as using a number of assessment methods. The study's results are often dependant on assumptions employed in the models and the availability of data. It is argued that in the case of non-availability of these latter, formal and structured interviews and questionnaires may then be useful. It is important to conduct the economic assessment of the RTA's influence both before (ex-ante) and after (ex-post) to enforcement. The analysis of the potential effects prior to the RTA implementation will help to clarify the position of the country before joining the partnership, as well as its potential impact. Similarly, assessing the actual impact of the RTA after its implementation will indicate whether the outcomes of the partnership match the expectations. Overall, the purpose of such assessment is to determine whether creating or joining a RTA is advantageous for the countries involved (Plummer et al, 2010).

3.1. Ex-ante evaluation

This research is based on methods using economic trade indicators covering imports and exports data and to determine the level of the country's interdependence. In other words, the extent to which the potential country member of RTA already trades with the region's member (prior to joining the partnership). This analysis is mainly based on observations of trade movements and trade indicator calculations. These are: regional interdependence, revealed comparative advantages and regional orientation indicator.

3.2. Ex-post evaluation

For the ex-post assessment, both quantitative and qualitative evaluations are conducted. This is undertaken by observing and calculating changes in Algerian imports and exports after the RTA's entry into force. With respect to the qualitative assessment, a Vinerian approach is applied. The latter is based on a comparison between imports and production movements prior to and after implementing the RTA. Nonetheless, the main disadvantage of this method is that it is a purely descriptive technique and does not quantify the creation or diversion of trade (Plummer et al., 2010). The interpretation of these comparisons is based on the following principles:

- A rise in imports from RTA partners which would be accompanied by a decline in domestic production leads to trade creation

- An augmentation in imports from RTA partners which would be accompanied by a fall in non-RTA partners' imports leads to trade diversion

- An increase in total imports where imports from non-RTA partners are constant or rising indicates that there is no trade diversion (positive welfare effect)

- An increase in total imports where both imports from non-RTA partners and domestic production decline, and

  — The drop in imports from non-RTA partners is greater than the drop in domestic production, implying that trade diversion exceeds trade creation, thus indicating a negative welfare effect; or

  — The fall in imports from non-RTA partners is smaller than the fall in domestic production, implying that trade creation exceeds trade diversion, thus indicating a positive welfare effect.

- A decline in total imports indicates that there is no trade creation (negative welfare effect).

Turning to the quantitative evaluation, it attempts to quantify the welfare effect that the RTA would have on the member countries. Lloyd and Maclaren (2004) reported that the economic welfare of a member country is related to three indicators - trade volume, intra-union terms of trade and extra-union terms of trade. The authors mentioned that a positive relationship exists between these indicators and the member country's welfare. In other words, an increase in trade volume as a result of the RTA leads to an improvement in economic welfare. In order to calculate the trade movements after the RTA implementation, a model developed by Lloyd and Maclaren (2004) based on observed trade values is used. This model computes changes in trade volume, terms of trade, and economic welfare. The formula for the change in trade volume is as follows (Plummer et al, 2010:83).

$$\sum_{p} t_{mp}\, u^{0}_{mp}(m^{1}_{p} - m^{0}_{p})$$

Where

p *indicates* a partner country

t_{mp} is the import-weighted ad valorem tariff on imports from partner country p in the base period

u^{0}_{mp} is the unit value of imports from partner country p in the base period

m^{1}_{p} is the quantity of imports from partner country p in the new period

m^{0}_{p} is the quantity of imports from partner country p in the base period.

Whereas the formula for the change in terms of trade is:

$$\sum_{p}{}' x_p^E \left(u_{xp}^1 - u_{xp}^E\right) - \sum_{p}{}' m_p^E \left(u_{mp}^1 - u_{mp}^E\right)$$

Where

p indicates a partner country

x_p^E is the extrapolated quantity of exports to partner country p in the new period

u_{xp}^1 is the unit value of exports to partner country p in the new period

u_{xp}^E is the extrapolated unit value of exports to partner country p in the new period

m_p^E is the extrapolated quantity of imports from partner country p in the new period

u_{mp}^1 is the unit value of imports from partner country p in the new period

u_{mp}^E is the extrapolated unit value of imports from partner country p in the new period.

The addition of changes in trade volumes and terms of trade permits quantification of the welfare effect of the RTA on the involved economy. Nevertheless, this method does not separate the effects on trade due to the RTA's entry into force or due to other factors such as changes in incomes, prices and transports. Therefore, in order to solve this issue, it is necessary to calculate trade movements before the establishment of the partnership and compare them with actual values.

3.3. Data Collection

The data employed are mainly statistics regarding foreign trade figures, such as imports, exports and trade balances. Reliable sources are used, such as the United Nation Conference on Trade and Development database (UNCTAD), the World Bank, the International Monetary Fund, the World Integrated Trade Solution, the United Nations Commodity Trade Statistics Database, the European Union, the Algerian Ministry of Trade, Algeria Export (Algex), the Algerian Office of National Statistics and the Algerian Customs Board. Access to these sources was via their official websites. Finally, it is important to emphasise that as regards the Algerian websites, some technical issues were faced when collecting data. Thus, certain statistics have been collected by direct communication with these organisations' employees.

4. Results and Discussion

It is argued that the trade impact of a RTA is of primary interest as it is mostly a commercial agreement and is consequently intended to influence trade (Plummer et al, 2010). The Literature Review revealed that this influence can be either positive or negative. On the other hand, it was also reported that the outcome of joining a RTA depends on a set of initial factors. These factors are mainly related to intraregional trade levels, comparative advantages and trade orientation between the partners (Grimwade, 2000; Plummer et al, 2010).

4.1. Ex-ante analysis

To begin with, the ex-ante analysis covers a five-year period prior to A.A implementation (2000-2005). It determines the economic regions that Algeria trades with most. Then, it examines a number of trade indicators regarding the EU-Algeria economic region.

These are:

- Intraregional Trade Indicator
- Intraregional Trade Intensity
- Revealed Comparative Advantages
- Regional Orientation Index.

4.1.1. Dynamics of Algerian foreign trade

The following graph (Figure 4.1) shows the Algerian trade share averages by destination during the period 2000-2005 for both imports and exports.

Figure 4.1: Average of Algerian Trade share by economic regions (2000-2005).
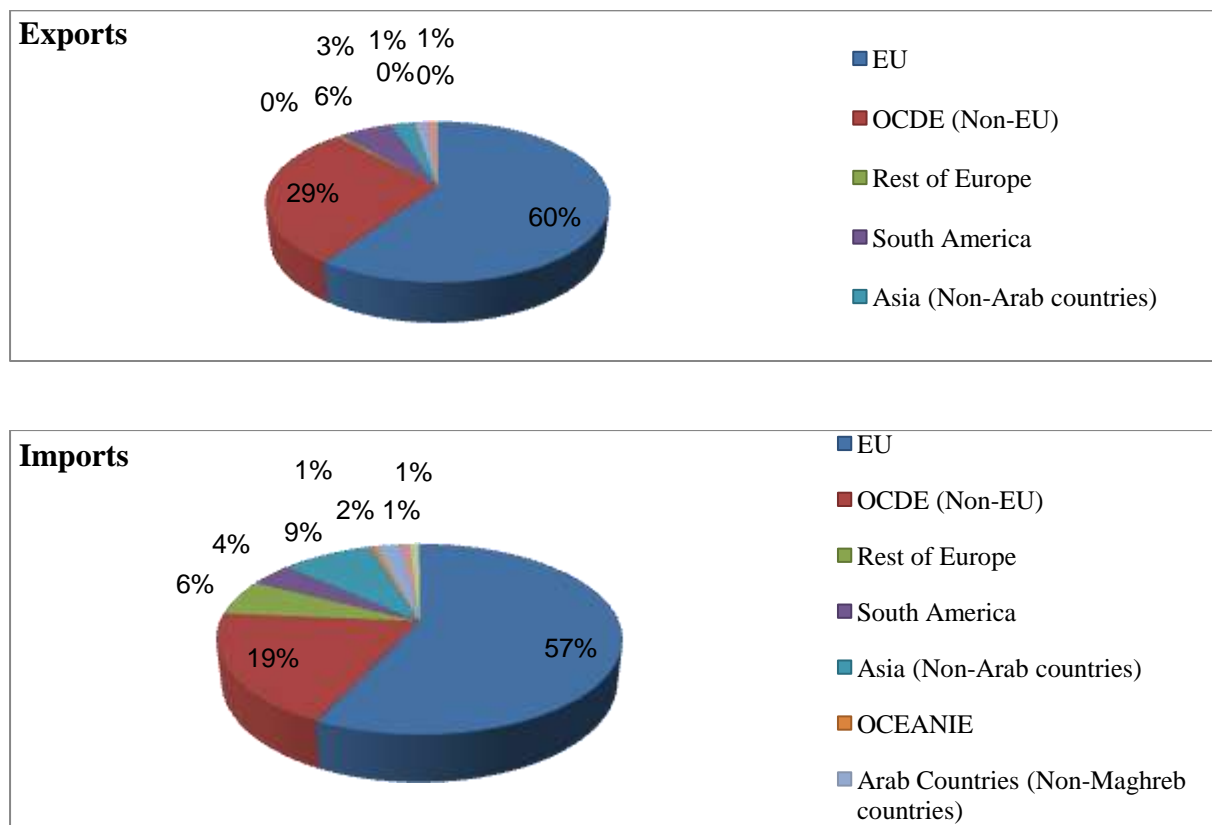
Source: Calculated by the author on the bases of Algerian Customs department data

From Figure 4.1, it can be seen that between 2000 and 2005, the EU share of imports and exports were on average around 57% and 60% respectively. Next were the Convention on the

Organisation for Economic Co-operation and Development (OECD) countries with a 19% share for imports and 29% for exports. As regards the remaining economic regions, it can be noticed that their overall share did not account for more than 20% in both imports and exports. It is concluded that prior to the implementation of the Association Agreement, the EU was the largest trading partner of Algeria.

4.1.2. Trade Indicators

A trade indicator is defined as *"an index or a ratio used to describe and assess the state of trade flows and trade patterns of a particular economy"* (Mikic and Gilbert, 2007:30).

Regional Trade Interdependence

Regional Trade Interdependence indicators are a set of ratios that calculate the extent to which countries already trade with each other (before joining a RTA). Two main indicators are generally used for this purpose, namely, Intraregional Trade Share and Intraregional Trade Intensity. These can be used for a single country or a group of countries to measure the regional direction of trade. High values for both indicators mean that countries in the proposed RTA have low trade costs compared with outsiders. Hence, the RTA may be beneficial as it boosts trade between "natural" trading partners (Plummer et al, 2010).

Intraregional Trade Share

The ITS is defined as "*the ratio of trade between countries in the proposed region over the total trade of all those countries*". This indicator illustrates the level of trade within the region compared to the overall trade of all regional members (Plummer et al, 2004:33).

Its formula is:

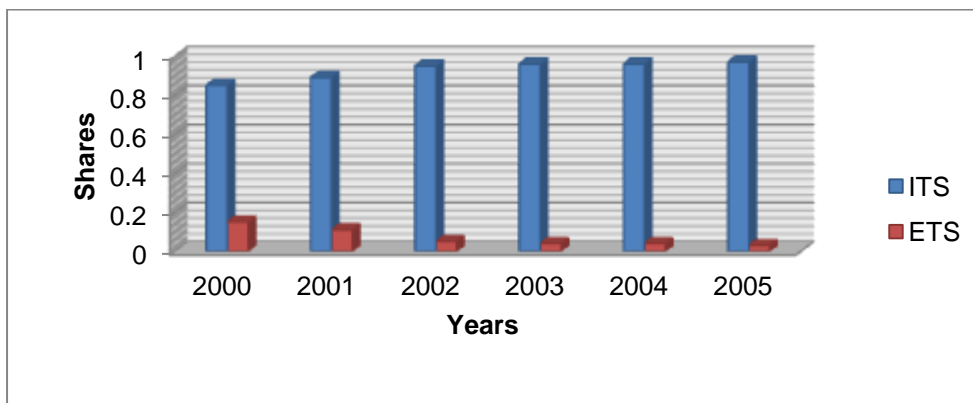$$ITS = \frac{Tii}{Ti} \qquad\qquad 0 \leq ITS \leq 1$$

Where

Tii = exports of region *i* to region *i* plus imports of region *i* from region *i*

Ti = total exports of region *i* to the world plus total imports of region *i* from the world

NB: It is also possible to calculate the Extra-regional Trade Shares (ETS) by using the following formula ETS= 1-ITS (Lapadre et al, 2009)

Figure 4.2: ITS and ETS shares for Algeria-EU FTA (2000-2005).

Source: Calculated by the author based on Eurostat and United Nations Conference on Trade and Development, statistics division (UNCTAD STAT) databases, (2011a)

As demonstrated by Figure 4.2, it is clear that throughout the period shares for Algeria-EU FTA were constantly high. A gradual increase can be observed between 2000 and 2005 from 0.85 to 0.97. However, concerning the ETS, it is apparent that shares were relatively low over the whole period. This reflects the high level of intra-regional trade in the EU-Algeria area already existing before the A.A.

Interregional Trade Intensity

Intraregional trade intensity is defined as *"the intraregional trade share divided by the share of the region's total trade in world trade"*. This indicator shows whether countries tend to trade more with member countries inside the agreement area (when the indicator is more than 1) or more with outsiders (when the indicator is less than 1) (Plummer et al, 34:2004).
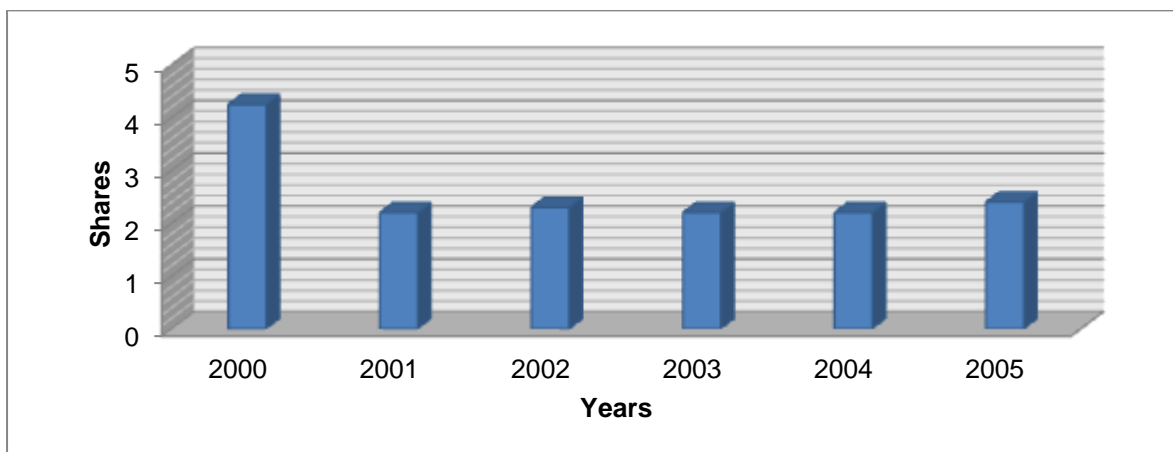
Its formula is as follow:

$$ITI = \frac{Tii/Ti}{Ti/TW}$$

Where

Tii = exports of region *i* to region *i* plus imports of region *i* from region *i*

Ti = total exports of region *i* to the world plus total imports of region *i* from the world

TW = total world exports plus total world imports.

Figure 4.3: ITT shares of the Algeria-EU FTA (2000-2005).

Source: Calculated by the author from UNCTAD STAT (2011) databases

As it may be seen from the figure 4.3, apart from 2000 where the share was the highest, shares were gradually increasing in much of the period. From 2001 to 2005, it increased from 2.2 to 2.4. This shows that the EU-Algeria FTA tends to have bias toward trading between its members rather than trading with outsiders.

It is stated that in international trade theory gains from trade results from specialisation in country's efficient areas, in other words sectors in which a country has comparative advantage. Balassa (1965) proposed the revealed comparative advantage (RCA) index as a tool to identify commodities in which a country has a comparative advantage. It is defined as

"*the ratio of a country's share of the commodity in the country's total exports to the share of world exports of the commodity in total world exports*" (Plummer et al, 38:2010).

A country is considered to have a comparative advantage on a selected sector if the index is greater than one. The following graph (Figure 4.4) shows average RCAs of Algeria between 2000 and 2005 for its six major sectors using the Standard International Trade Classification, Rev.3 (SITC) (UNSTATS, 2011b).

Figure 4.4: RCA of the main sectors of Algeria (2000-2005).
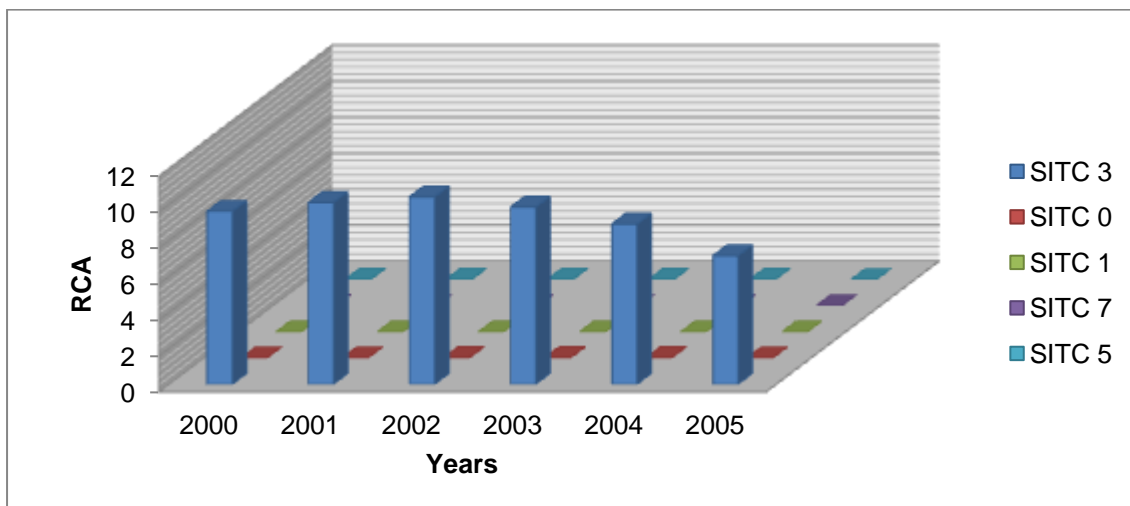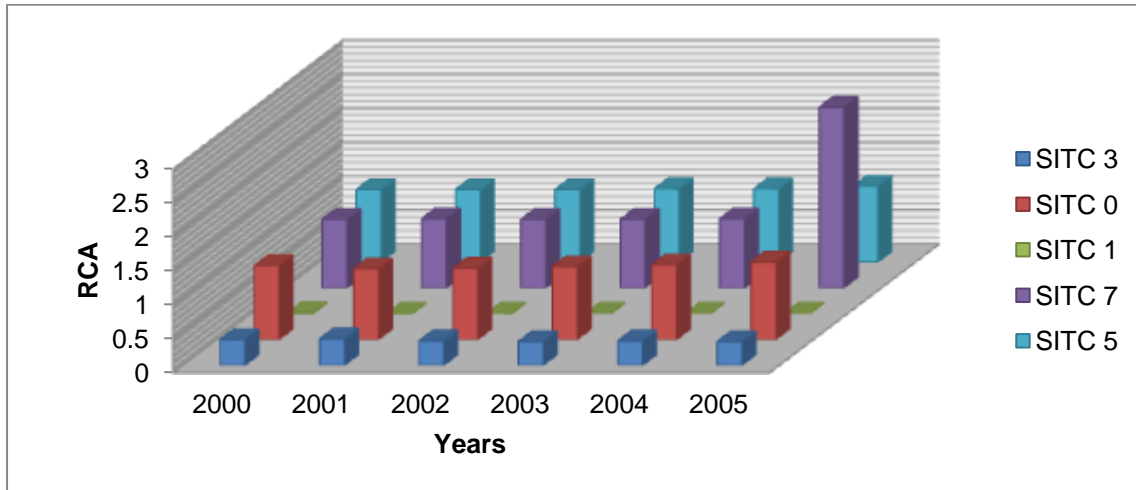

Source: Calculated by the author based on UNCTAD STAT database, (2011)

From Figure 4.4, it can be seen that apart from the energy sector (SITC 3), where the RCA was on average approximately around 9, all the remaining sectors had a RCA below 1. This shows that the energy sector is the only sector where Algeria has a comparative advantage.

The next graph (Figure 4.5) deals with the RCA of the EU.

**Figure 4.5:** RCA of the main sectors of the EU (2000-2005)

Source: Calculated by the author based on UNCTAD database, (2011a)

From Figure 4.5, it is clear that the EU has three RCAs. Indeed, in 2005, figures of 1.14, 2.66 and 1.12 were recorded for food and live animals (SITC 0), machinery and transport equipment (SITC 7) and chemicals and related products sectors respectively. Nonetheless, in both the energy and the beverage and tobacco sectors, the EU did not have a comparative advantage. To sum up, from the Figures 4.4 and 4.5, it can be concluded that Algeria and the EU have large differences in their respective RCAs.

Regional Orientation Index

The ROI reflects whether a country's exports of a product are more oriented toward a particular region than other destinations. It is defined *"as the ratio of two shares. The numerator is the share of the country's exports of the product to the region of interest in the country's total exports to the region"*. A country is considered to have a regional bias in exports of a certain product when the index is greater than one (Plummer et al, 39:2010).

Figure 4.6: Regional Orientation Index of Algeria with EU and Non-EU countries classified by sector.
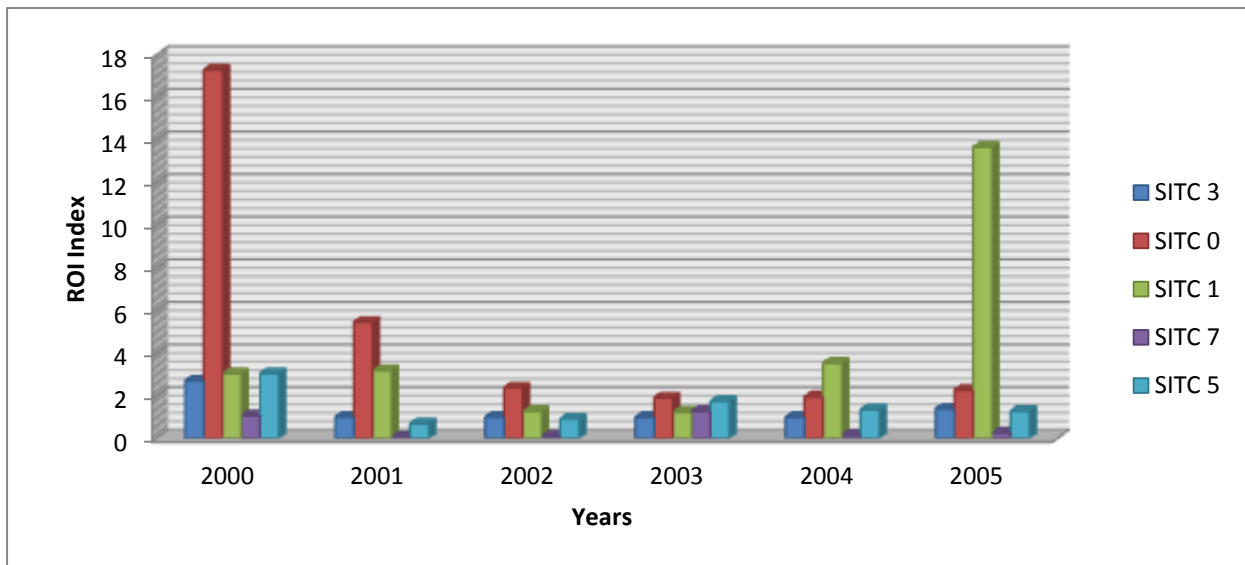
Source: Calculated by the author based on the UNCTAD STAT database (2011a)

From the bar chart (Figure 4.6), it can be stated that food and live animals, beverage and tobacco, manufactured goods, chemicals and related products, and energy sectors were higher than 1. While the machinery and transport equipment sector was lower than 1. This reflects that Algerian trade is more oriented toward the EU area.

4.1.3.   Findings

The present section has examined Algerian trade patterns and trade indicators before joining the A.A. It has been found that Algerian trade patterns were oriented mostly toward the EU area. Moreover, regional interdependence trade indicators were high, which indicates that the two partners were initially natural trading partners. Furthermore, the revealed comparative advantages indexes of both parties were considerably different. It is therefore concluded that the agreement was potentially more likely to create trade and improve economic welfare. Nonetheless, combining the revealed comparative advantage index and regional orientation, it

is stated that when the former is below 1 and the second is above 1, it may lead to a trade diversion (Plummer et al, 2010). The next analysis examines actual trade effects of the A.A.

4.2. Ex-post analysis

The ex-post analysis covers a four year period after the A.A implementation (2005-2009). As mentioned in the previous chapter, this section contains both qualitative and quantitative studies.
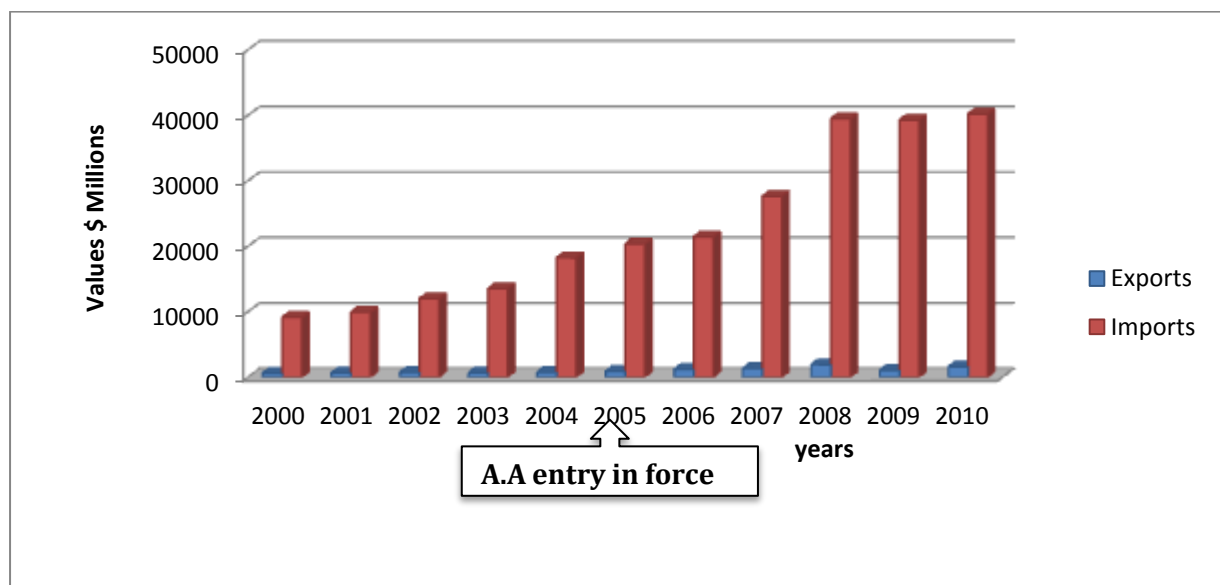
4.2.1.   Qualitative analysis

The first part of this section employs a qualitative approach based on trade movement's observation.

Dynamics of Algerian trade

An examination of the movements of the Algerian trade between 2000 and 2010 is conducted through the following figure (figure 4.7).

**Figure 4.7:** Evolution of Algerian Non-hydrocarbon Trade in $ millions (2000-2010).

Source: Algerian Customs department (2011)

From Figure 4.7, it is clear that non-hydrocarbon imports were considerably greater than the non-hydrocarbon exports; which illustrates the high dependence of the Algerian economy on hydrocarbon exports. Moreover, it can be seen that Algerian imports were significantly increasing all through the period. However, after the implementation of the A.A faster growth was recorded, as between 2000 and 2005 the rise was around $11 billion, whereas between 2005 and 2010 the increase was approximately $20 billion.

With the exports, the same pattern was observed and once more the progression appeared to be faster. The rise between 2000 and 2005 was around $295 million, while the increase between 2005 and 2010 was about $700 million. Nonetheless, these movements do not illustrate necessarily the direct influence of the A.A on the trade patterns. Thus, it would be useful to compare Algerian trade patterns changes between the EU and the non-EU countries (Figure 4.8).

Figure 4.8: Evolution of trade's values of the EU and the non-EU partners of Algeria in $ millions (2005-2010).

Exports
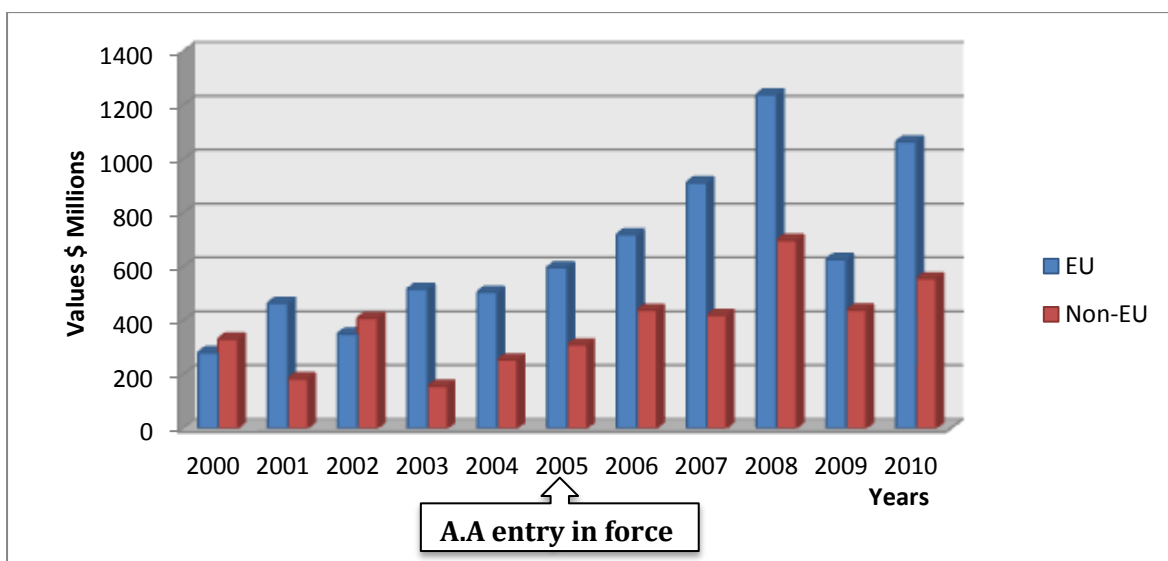
Imports
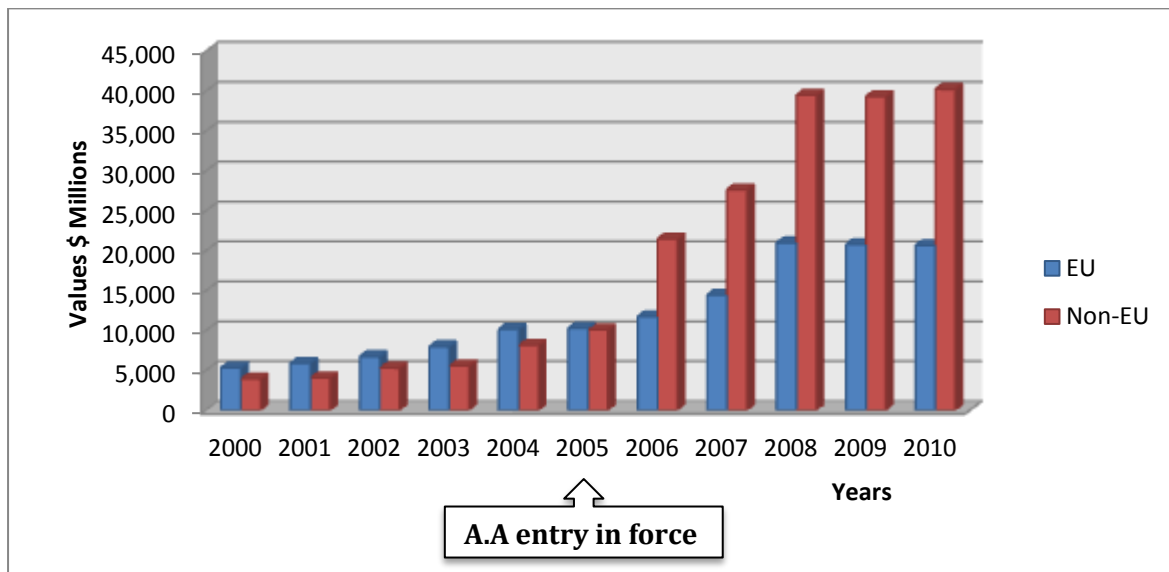
**Source:** Algerian Customs department (2011).

From the Figure 4.8, it can be concluded that both imports and exports from and to the EU were increasing more rapidly after the entry into force of the A.A. Between 2000 and 2005 the rise was by $300 million for exports and $5 billion for imports, whereas, between 2005 and 2010 the increase was by $500 million for exports and $10 billion for imports. However, it is also noticed that Algerian trade with non-EU countries was increasing over much of the period for both imports and exports. Moreover, between 2005 and 2010, imports from non-EU countries were higher and increasing considerably faster than imports from the EU countries. The drop in Algerian exports in the year 2008 was probably due to the worldwide financial crisis in 2008. Furthermore, it is important to note that although non-hydrocarbon exports increased after the A.A implementation, its value remains marginal compared with the imports' share. Finally, it can be concluded that the EU-Algeria FTA has positively influenced Algerian trade. The next section contains an analysis of the trade's movements by sector, showing the actual effect of the RTA on every sector.

<u>Dynamics of Algerian imports in the main sectors</u>

The following figures analyse the Algerian imports with EU and non-EU countries in comparison with the domestic production, by sector, between 2005 and 2008 (data for 2009 was unavailable). The selected sectors are the most traded sectors in the Algerian economy. These sectors are classified using Standard International Trade Classification, Rev.3 (SITC), they are;

- SITC 0: food and live animals
- SITC 5: chemicals and related products
- SITC 6: manufactured goods
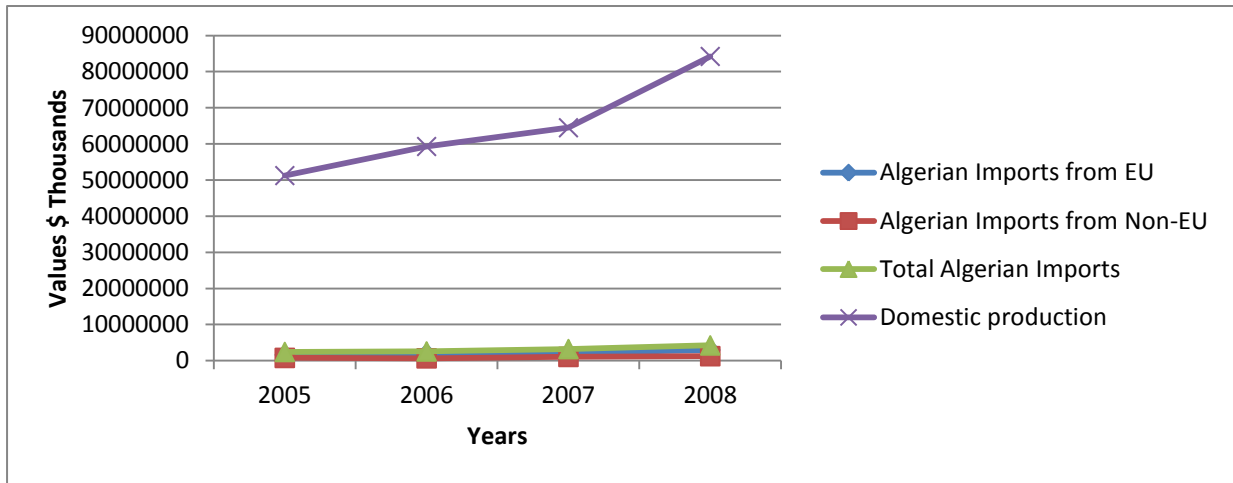- SITC 7: machinery and transport equipment

Figure 4.9: Evolution of Algerian imports and domestic production in the food and live animals (SITC 0) sector, in $ thousands.
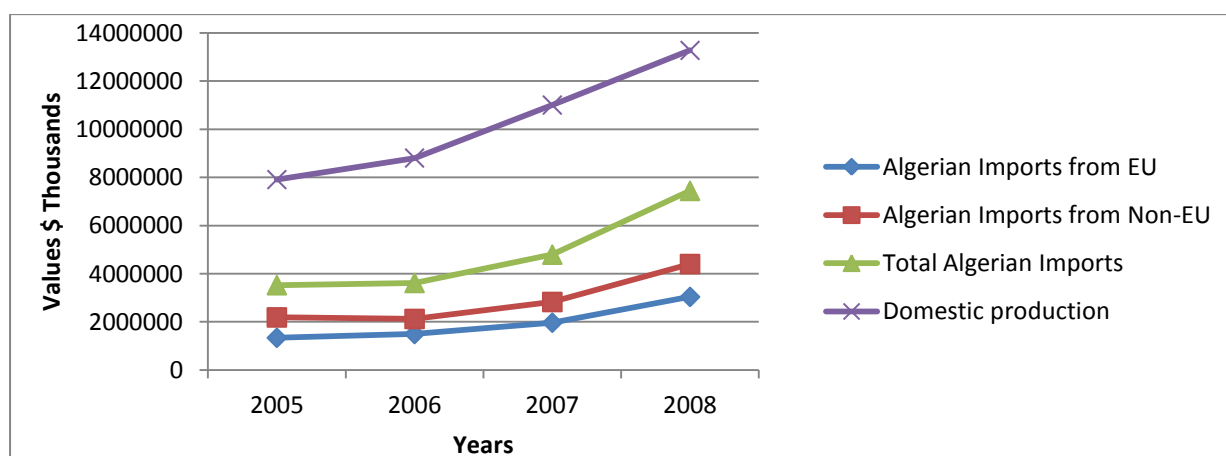
Source: UNCTAD STAT database (2011).

From Figure 4.9 it can be observed that for the food and live animals sector both Algerian imports and domestic production have increased since 2005.
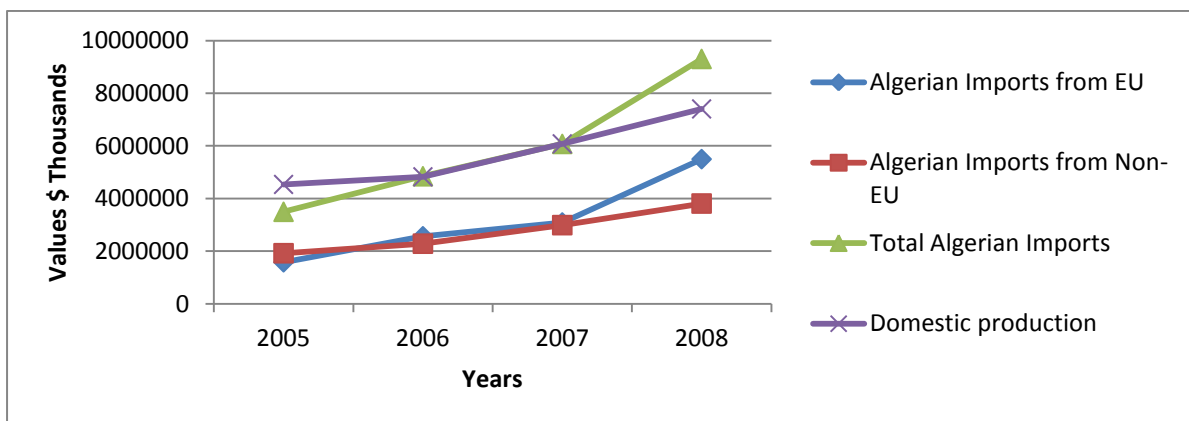
Figure 4.10: Evolution of Algerian imports and the domestic production in the chemicals and related products (SITC 5) sector, in $ thousands.

As can be seen from Figure 4.10, since 2005 there was a significant rise in domestic production in the chemicals and related products sector, while a slight increase was noticed in Algerian imports.

**Figure 4.11:** Evolution of Algerian imports and the domestic production in the manufactured goods (SITC 6) sector, in $ thousands.

It can be observed from Figure 4.11 that Algerian imports and domestic production were both increasing from 2005. However, total imports rose faster than domestic production.

Figure 4.12: Evolution of Algerian imports and the domestic production in the machinery and transport equipment (SITC 7) sector, in $ thousands.
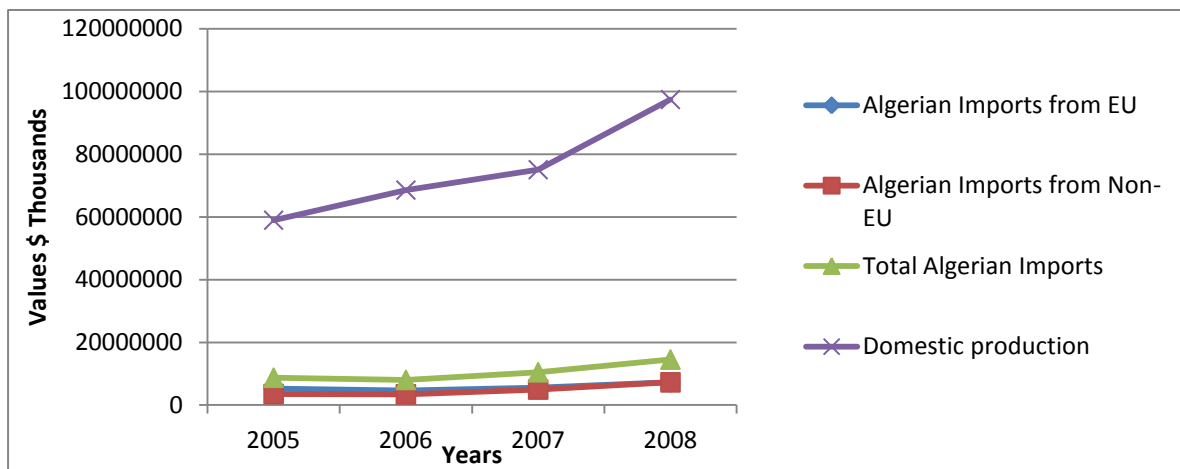
Source: UNCTAD STAT database (2011).

From Figure 4.12, it can be stated that both Algerian imports and domestic production were increasing throughout the period.

Findings

The qualitative study confirms the potential impact identified in the ex-ante analysis. It shows that both Algerian imports and exports from and to EU and non-EU countries have increased significantly since the implementation of the A.A. This growth was faster between 2005 and 2010 than in the period 2000-2005. This suggests that:

(1) No trade diversion has occurred as both imports and exports towards non-EU countries have increased, and

(2) Trade creation has taken place as the total Algerian trade has increased.

In other words, it reflects that the Association Agreement had increased trade between Algeria and the EU, and this was not at the expense of trade with non-EU partners.

Furthermore, the qualitative evaluation conducted on the most traded sectors in the Algerian economy shows that, in sectors such as chemicals and related products and machinery and transport equipment, both total imports and imports from non-EU countries have increased. This confirms that no trade diversion has occurred, and therefore a positive economic welfare has resulted. Nonetheless, the increase noted in non-hydrocarbon exports was marginal compared with the growth in imports' shares. This means that Algerian trade still has an imbalance and the agreement did not contribute to regulate. The next analysis attempts to approximately quantify the rise in economic welfare observed in the Algerian economy after the Association Agreement implementation**.**

4.2.2.   Quantitative Analysis

This analysis uses observed trade values to compute changes in volumes and terms of trade. The computation is realised according to a model developed by Lloyd and Mclaren (2004). This evaluation attempts to quantify the gain or loss engendered by Algeria from the EU partnership.

It is important to note that the evaluation is limited to only the most traded products. These are classified by sector, and do not include hydrocarbons which was not involved in the agreement. The selected sectors are classified using the SITC classification:

- ▪ SITC 0: food and live animals
- ▪ SITC 5: chemicals and related products
- ▪ SITC 6: manufactured goods
- ▪ SITC 7: machinery and transport equipment

The ex-ante analysis has shown that changes in exports were relatively marginal compared with changes in imports. Therefore, changes in trade volume calculations involve only imports**.** According to Lloyd and Maclaren's model, the total of bilateral changes in volumes

should be weighted by tariffs in a base period. In the present evaluation, 2004 is used as the base period, whereas 2009 is considered as the new period. Data on applied import tariffs are extracted from the International Customs Tariffs Bureau (ICTB). The changes in trade volume are computed using the following formula stated in the methodology (see 3.2).

The following table 4.1 shows the computations' results for changes in trade volume. 2004 has been chosen as the base period, while 2009 is the new period (See Appendix 4.6 for details regarding calculations). As regard the import-weighted ad valorem tariff, these have been calculated using the following formula (Lloyd and Maclaren, 2004):

$$mp = \sum_{m \in HS} \left(\frac{M_m t_m}{\sum_{m \in HS} M_m} \right)$$

Where *Mm* is the value of base period imports from the partner country in category *m* and *tm* is the base period *ad valorem* applied tariff on imports from the partner country in category *m*.

Table 4.1: Changes in trade volumes 2004-2009

	Changes in trade volume with EU ($)	Changes in Trade Volume with non-EU ($)	Total Changes in Trade Volume ($)
SITC 0	13,121,900	-7,958,972	5,162,928
SITC 5	-240,645,339	1,283,282	-2,925,626
SITC 6	240,645,336	1,745,396	242,390,732
SITC 7	4,382,982	210,744,239	215,127,221
Total	17,504,879	205,813,945	459,755,255

Source: Calculated by the author based on UNCTAD STAT database (2011a).

Table 4.1 shows that after implementation of the EU-Algeria A.A. Algerian trade has increased with both EU and non-EU countries. The rise is estimated to be around $460

million during the four first years of the agreement. This is positive, indicating that the EU-Algeria FTA has created trade internally and externally. However, this value is based only on the most imported products and not on all Algerian imports. Thus, this estimation should be considered as a representative value, and not the real value.

Changes in terms of trade

In order to complete the evaluation, changes in Algeria's terms of trade with respect to EU and non-EU partners are also calculated. According to Lloyd and Maclaren's model (2004) change in the terms of trade should be weighted by base period trade quantities. The formula presented in the methodology is used (see 3.2).

Table 4.2 shows the computations' results for changes in terms of trade between 2004 and 2009.

Table 4.2: Changes in terms of trade 2004-2009.

	Changes in terms of trade with EU ($)	Changes in terms of trade with non-EU ($)	Total Changes terms of trade Volume ($)
SITC 0	-339,686,289	-158,745,533	-498,431,822
SITC 5	-366, 987,433	5, 592,448.85	-361,394,984
SITC 6	22, 817,899.4	-1, 896,290,743	-1,873,472,844
SITC 7	58,622,231	-7,113,304	51,508,927
Total	-625,233,592	-2,056,557,131	-2,681,790,723

Source: calculated by the author based on UNCTAD STAT (2011).

It is clear from Table 4.2 that changes in the terms of trade with respect to EU countries and non-EU countries were approximately –$2.7 billion. This is negative, which reflects that 4 years after the entry into force of the A.A. economic welfare was reduced. Nevertheless, it is important to note that this trade index is based only on the non-hydrocarbon sector.

<u>Findings</u>

The quantitative study indicates that the EU-Algeria A.A has led to positive trade creation through an increase in intraregional and extra-regional trade. However, the agreement was unable to regulate the "huge" imbalance in Algerian imports and non-hydrocarbon exports. This has led to a decline in the non-hydrocarbon sector, in terms of trade, estimated at around $2.7 billion between 2004 and 2009.

5. Conclusion

The ex-ante analysis has shown that the EU-Algeria RTA was expected to increase trade within the region. This increase would not be at the expense of extra-regional trade as indicators showed that the two partners were initially natural trading partners and therefore the agreement was more likely to be trade creating rather than trade diverting. The Literature Review revealed that if a RTA is undertaken with natural trading partners, trade creation will be greater than trade diversion and economic welfare will increase (Baghwati, 2008).

This was confirmed by the ex-post analysis. The qualitative study showed that the A.A has positively influenced Algerian trade and led to trade creation in most of the sectors. This indicates that Algerian economic welfare increased after the A.A implementation and confirms the statement and findings of a number of past studies, who argued that RTAs create trade and improve economic welfare (Allen et al, 1996; Sapir, 2000; Baghwati, 2008).

On the other hand, the quantitative study indicated that although economic welfare increased after the A.A implementation, it remains negative. The evaluation, based on the general equilibrium model of Lloyd and Maclaren (2004), revealed that the loss in terms of trade was estimated at around $2.7 billion from the entry into force of the partnership. It can be concluded that, with respect to the EU-Algeria FTA's trade effects, the impact was positive

yet still insufficient to cover the existing imbalance between Algeria's imports and its non-hydrocarbon exports. This leads to the conclusion that the agreement did not fulfil the objective set by the Algerian government, which was reducing the non-hydrocarbon trade imbalance.

It is argued that a RTA alone is not sufficient to regulate this imbalance. An appropriate environment for exports has to be provided and companies should be also ready. This is not the case in Algeria. It is stated that although the government provides assistance to exporting companies, this remain insufficient and ineffective. It is also argued that most of the domestic companies do not consider exports as a priority and are more locally oriented; managers tend to focus on the growing and advantageous local market rather than risky foreign markets (Nancy et al, 2009). Finally, according to the World Bank (2010), Algeria was ranked 124 out of 183 countries in the "trading across borders" classification, which confirms that exports in non-hydrocarbon sectors do not play an important role in the economy of the country.

Limitations

This research has been limited by the difficulties of accessing data on Algerian trade and investment. Certain data had to be collected via direct private communication and through contacts working for the organisations concerned. Furthermore, some data displayed in these organisations' websites appeared to be inaccurate and imprecise. In addition, the research has suffered from inconsistencies of data. Indeed, it was observed that for particular trade data, organisations were providing different values. Consequently, it is important to highlight that, especially for the quantitative analysis, numerical findings should be considered only as indicative estimates and not as definitive values.

<u>Recommendations</u>

Overall, this dissertation has shown that the impact of the EU-Algeria A.A has had a positive, though marginal, influence on trade, economic welfare and inward investment into Algeria. It is argued that the small influence was due to internal inefficiencies in the Algerian economy. Therefore, in order to take full advantage of the Free Trade Area established between Algeria and the EU certain measures should be taken by the government with respect to non-hydrocarbon exports and inward FDI. The following are a number of recommendations that may be useful to achieve this aim:

- Define an export strategy with both qualitative and quantitative objectives, in order to assess and evaluate the improvements

- Develop an adequate and reliable infrastructure for exports

- Assist and help effectively domestic companies in their upgrading procedures and international certification processes

- Develop "export committees" which will belong to the Algerian chambers of commerce, and whose mission will be:

  — To identify companies with export potential

  — To offer training courses to managers who wish to export

  — To undertake export awareness campaigns targeted at Algerian domestic companies, in order to promote exports.

  — To assist and help domestic companies to develop their export activities by linking them with export channels. This can be facilitated by collaboration with Algerian embassies and consulates abroad.

  — To assist companies to participate in international fairs and exhibitions

  — To Identify barriers to inward investments

- Ensure there is effective co-ordination of data between all relevant government bodies in order to make available accurate and consistent information that will be beneficial to investors or researchers.

Finally, future research should investigate the role of government in increasing the non-hydrocarbon exports. It is acknowledged that exports play a significant role in improving economic growth (Balassa, 1978; Krueger, 1997; Onafowora and Owoye, 1998).

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