

The Impact of Regional Trade Agreements and Trade Facilitation  
in the Middle East North Africa Region

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**Abstract**

*The Middle East and North Africa regions (MENA) trade performance over the past two decades has been disappointing. Efforts to boost trade through a plethora of regional trade agreements (RTAs) are underway. This study examines the potential contribution of regional trade agreements, as well as trade facilitation improvements in enhancing the development prospects of the region. Using the Global Trade Analysis Project (GTAP) model and database, both intra-regional integration and integration with the EU are observed to have a favorable impact on welfare in the MENA region. The welfare gains from integrating with the EU are observed to be at least twice as much as intra-regional integration. Furthermore, these welfare gains are observed to at least triple when the implementation of the RTAs are complemented with trade facilitation improvements.*

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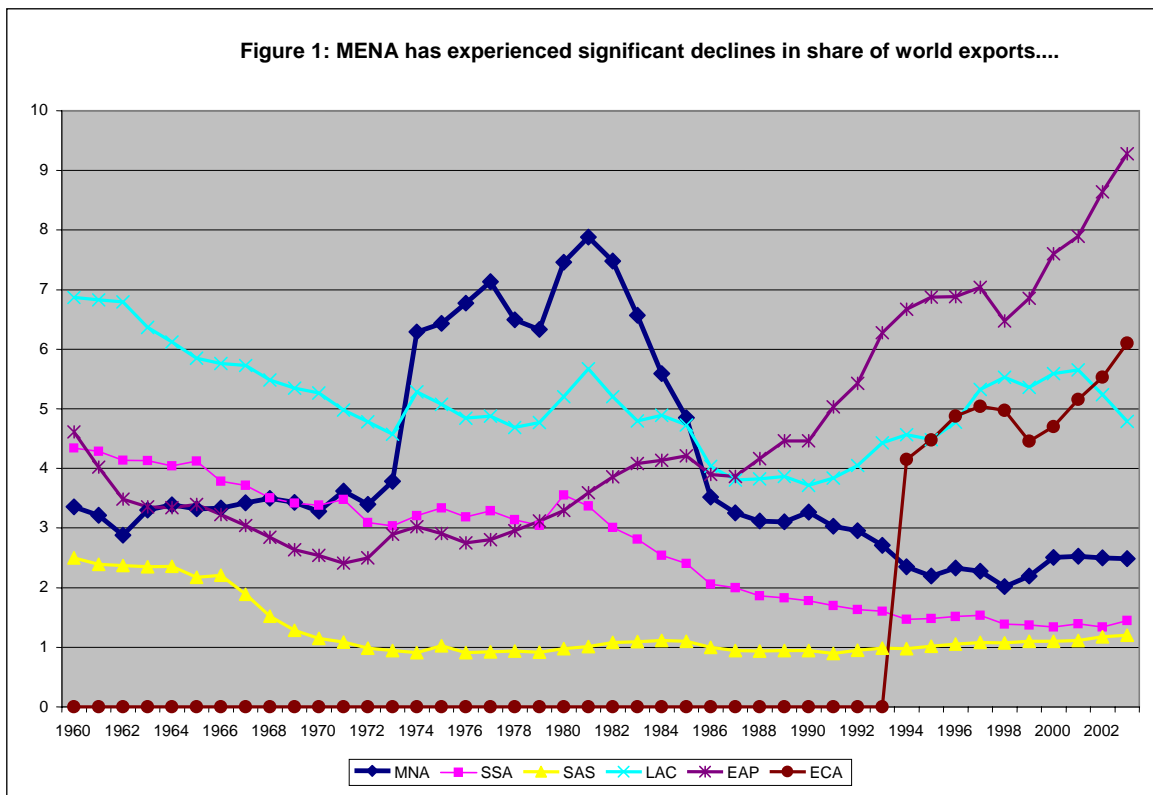
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## Introduction

The integration of the Middle East and North Africa (MENA) region's economy into global economy through trade and investment flows is essential for the welfare, growth, and job creation prospects of the region. Triggered in part by the collapse of oil prices in the 1980's, the share of MENA in global trade has declined sharply from about 8% in 1981 to some 2.5% in recent years, thereby becoming one of the least integrated regions of the world (figure 1). This contrasts with the positive acceleration in the share of trade experienced by other regions. For instance, in 1985, MENA's share in world trade (4.7%) was higher than East Asia Pacific (4.2%), however, by 2003, East Asia Pacific's share in world exports was about four times higher than that of MENA.



The dismal trade performance points to a lost opportunity in benefiting from integration with the rest of the global economy. Based on a constant market share analysis, if MENA maintained its 1985 share in world exports (which was already relatively low), it would have received some US\$2 trillion in extra export revenues over the 1986-2003 period, or an annual average of some US\$110 billion in export revenues. Compared to current

export levels (US\$166 billion in 2002), the extra export proceeds would have made significant contributions to economic growth and job creation prospects in the region.

This study will focus on how liberalization of MENA's trade regime, within the context of the regional trade agreements, and trade facilitation reforms may help to revive MENA trade and thus contribute to welfare, economic growth and job creation prospects in the region.

### **Regional Trade Agreements in MENA**

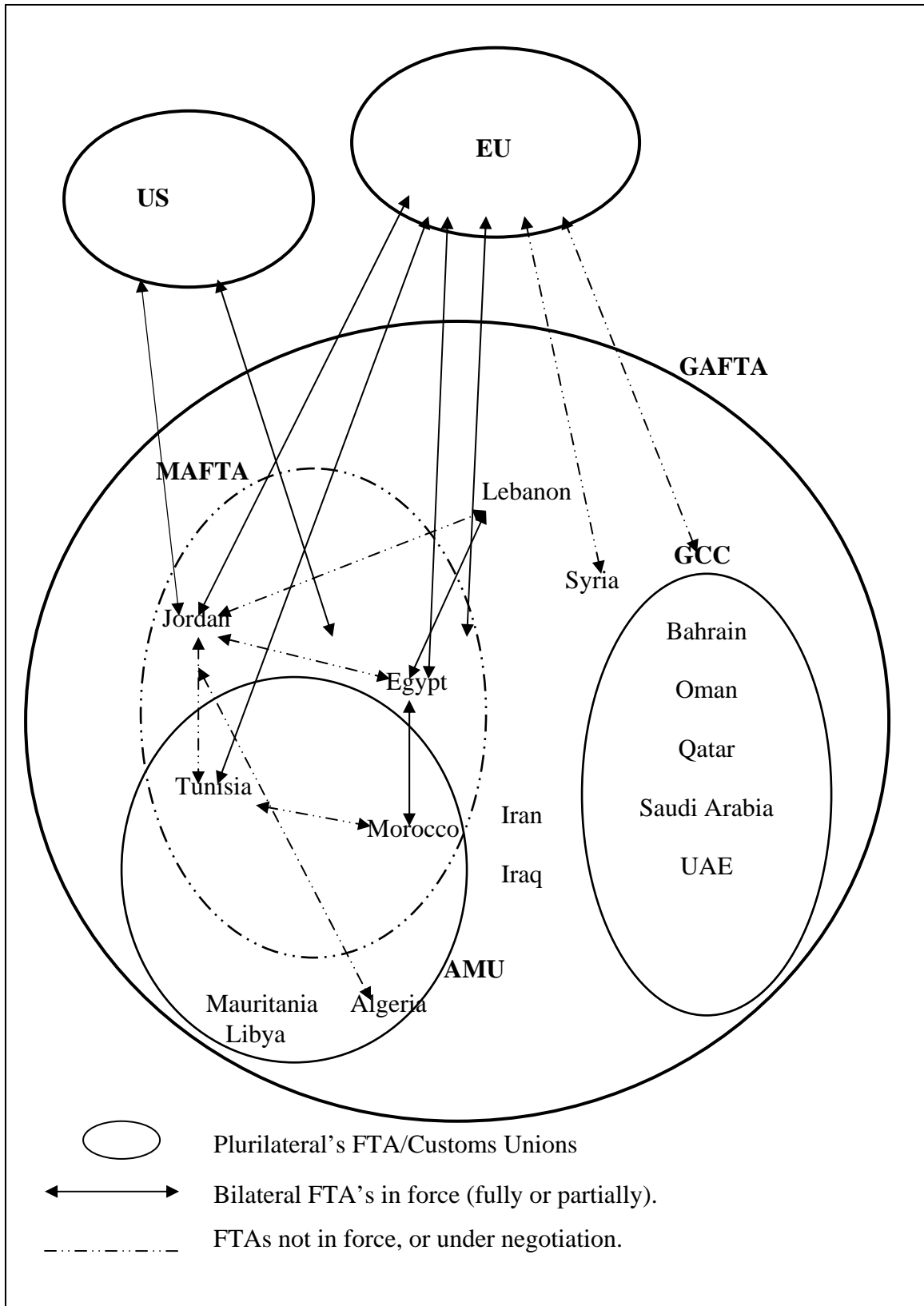
MENA countries are liberalizing their trade regime through various bilateral and regional preferential trade agreements. Indeed, this has evolved into a complicated web of overlapping trade agreements involving bilateral, sub-regional, and regional trading partners (figure 2).

At the regional level, the Greater Arab Free Trade Agreement (GAFTA) is the most comprehensive agreements, with regards country coverage, though a host of other sub-regional free trade agreements also exist (appendix 1).<sup>2</sup> In spite of efforts to promote intra-regional trade among MENA countries, intra-MENA trade remains low. Using a gravity model, Al-Atrash and Yousef (2000) estimate that overall intra-Arab trade should be 10-15 percent higher than what is observed. Miniesy, Nugent, and Yousef (2004), also using a gravity model, predict that if a full fledged free trade area among Arab countries of the MENA region were established, intra-MENA trade could be increased by another 147 percent. These results, among others, raise the fundamental question as to why intra-MENA trade is so low. Explanations found in the literature are policy-induced factors such as: restrictive trade policies, including tariff and non-tariff barriers; delays and costs in customs clearances; inhospitable investment climates; high transportation and communication costs; and the dominance of the public sector in MENA countries.

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<sup>2</sup> These include the Arab Maghreb Union (AMU); Gulf Co-operation Council (GCC); Mediterranean Free Trade Agreement (MAFTA).

**Figure 2: Overlapping web of FTAs involving MENA countries**



Source: Author

Fundamental structural factors such as similarity of production and export structures, differences in per capita income, and small size of the region tend to encourage more inter-regional trade rather than intra-regional trade. Furthermore, previous international economic sanctions (e.g. Iraq and Libya) and neighboring political tensions, such as disagreements among Maghreb countries concerning the Western Sahara, also constrain intra-MENA integration. Indeed, one study suggests that the socio-political problems are at the core of the lack of integration among Maghreb countries rather than economic fundamentals.

More significant, perhaps, besides liberalization at the intra-MENA level, is the preferential liberalization with developed country trading partners. The most widespread in terms of country coverage are the Euro-Mediterranean Agreements (EMA). EMAs are currently in force in Egypt (2004), Israel (2000), Jordan (2002), Lebanon (2003), Morocco (2000), and Tunisia (1998). An interim association agreement, with the Palestinian Authority, has been in place since 1997, and association agreements with Algeria (2002) and Syria (2004) have been concluded though yet to enter into force (see appendix 1 for further details). Negotiations are also ongoing for an EU-GCC free trade area. These agreements are part of efforts to establish a Euro-Mediterranean Free-trade area, under the so-called “Barcelona Process”.

Results of studies attempting to quantify the impact of RTAs in the MENA region are mixed. Most studies have used computable general equilibrium (CGE) models. While few studies obtain negative welfare effects (Brown et al, 1997; Hoekman and Konan, 1999), in general, the results of the majority of studies suggest that, the static efficiency gains from tariff liberalization lead to small but positive net welfare effects, however, welfare gains are more significant when non tariff barriers (deeper integration issues) are taken into account. For instance, under a GAFTA cum EMA tariff liberalization scenario in a CGE model, Konan (2003), estimates the static welfare gains to Tunisia and Egypt to be about 3.03% and 0.01% of base income respectively. However, the removal of non-tariff barriers imposing frictional costs on international trade transactions leads to a 7.71% and 2.74% increase in welfare for Tunisia and Egypt respectively. Similarly, Rutherford, Rutstrom and Tarr (2000), using data for a “representative” Arab Mediterranean Country in a CGE model, show that eliminating tariffs on all imports

from the EU results in a 0.1% and 1.6% increase in welfare in the short-run and long-run respectively. However, when both tariff and non-tariff barriers are taken into account, including the harmonization of standards, and a more efficient trading environment, the welfare impact increases to 3.7% in the short-run and 4.7% in the long-run. Lastly, an earlier study on Egypt, using a CGE model, suggests that larger welfare gains from an FTA would result only from the elimination of regulatory barriers and red tape measures, and a shallow agreement would merely be trade diversionary and lead to a small welfare decline (Konan and Maskus 1997).

Hence, even though tariff liberalization efforts, unilaterally or preferentially, are important in improving the price incentive structure for trade, increasingly, the importance of other trade-related complementary policies, such as, transport and telecommunication services, customs procedures, ports efficiency, standards and technical regulations, flexibility of factor markets, etc are being recognized as an important component in enhancing a countries trade performance. In other words, tariff reforms alone, though important, are insufficient in optimizing the potential contribution of trade to the development (welfare, growth, jobs etc) agenda. Hence, while considering the potential impact of tariff liberalization envisaged under the various free trade agreements, this study will take into account the contribution of improvements to trade facilitation on MENA trade and growth performance.

### **Quantifying the Impact of Trade Facilitation: Brief Literature Review**

Recent quantitative studies on trade facilitation continue to show its importance. Using a probit model, Hummels (2001) estimates that each day saved in shipping time, in part due to faster customs clearance, is equivalent to about 0.5 percentage point reduction in ad valorem tariffs.<sup>3</sup> UNCTAD (2001), observes that a 1 percent reduction in the cost of maritime and air transport services in developing countries could increase global GDP by some US\$ 7 billion. Fink, Mattoo and Neagu (2002), using both OLS regression and probit models, observe that a 10 percent decrease in the bilateral price of phone calls is associated with an 8 percent increase in bilateral trade. Using a more comprehensive

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<sup>3</sup>Admittedly, the benefit of each day saved to a trader will differ by product.

measure of trade facilitation (including indicators of port efficiency, customs environment, regulatory environment, and service sector) in a gravity model, Wilson, Mann, and Otsuki (2004) observe a \$377 billion increase in global trade of manufacturing goods arising from improvements in trade facilitation. Furthermore they find that the response of exports to unilateral improvements in trade facilitation exceeds that of imports.

All the above studies use partial equilibrium techniques and are somewhat limited in providing estimates of the welfare impacts of trade facilitation. Feeding estimates from Wilson et al. study into a CGE (GTAP) model, Hertel and Keeney (2005) observe that the combined global benefits from the liberalization of merchandise and services trade of \$150 billion in welfare gains is boosted by \$110 billion p.a. with the addition of trade facilitation. Fox, François and Londono-Kent (2003) and OECD (2003) extended the analysis of trade facilitation within the GTAP framework by explicitly accounting for both direct and indirect trade facilitation costs. The former study observes that trade facilitation improvements between the U.S Mexican border would yield \$1.8 billion and \$1.4 billion per year in welfare gains to the Mexican and U.S. economy respectively. The latter study estimates that a reduction in trade transactions costs of about 1% of the value of world trade would yield aggregate welfare gains of some \$40 billion.

### **MENA and Trade Facilitation**

Though work on the quantitative impact of trade facilitation is gaining importance, very limited quantitative work has been undertaken for the MENA region. Anecdotal evidence (and individual country analyses) on trade facilitation situation in MENA countries does however point to the need for improvements. Customs procedures in many MENA countries are noted to be burdensome, due to: several documentary requirements; multiple agencies with duplicative roles involved in the clearance process; and subjective application of procedures, especially in customs valuation. This causes uncertainty amongst traders and leads to significant costs and delays in customs clearance. The 2001 Investment Climate Assessment for Algeria found that it takes some 11.7 days to clear goods through customs, and in some cases up to 44 days. In Syria, this average is around 15 days, with the typical firm having waited over 30 days for an imported shipment

sometime in the year. Zarrouk (2003) shows that MENA companies spend some 95 person-days a year dealing with trade transactions and that trading costs, excluding customs duties and domestic taxes, average some 10.6% of the value of goods. These trading costs arose from (in descending order): customs clearance, public sector corruption, mandatory product standards and certification of conformity, transshipment regulation, and entry visa restrictions for business visits.

Furthermore, weaknesses in the provision of seamlessly integrated multimodal transportation system (air, maritime, rail and road) are observed to significantly add costs and delays to the trading environment. In the maritime subsector, these weaknesses have been attributed to regulations favoring national carriers; restrictions on private sector participation; and cumbersome administrative procedures. Road transportation, an important conduit for intra-regional trade, also faces significant challenges. Zarrouk (2000) reports some of the existing impediments in road transportation to include: restrictions on driving foreign trucks on weekends, denial of visa to drivers, foreign trucks unloading in a country must return to country of origin without cargo; various fiscal charges and surcharges on road transport, and special permit requirements for refrigerated trucks. Devlin and Yee (2005) also highlight the fragmented nature of the trucking industry in some MENA countries. The importance of having an efficient transportation system is all the more important given global trends in sourcing, just-in-time production, supply chain management, and outward processing trade. For instance, it is reported that Tunisia lost a new factory, by a German car part manufacturer, to Eastern Europe due to logistic constraints (Muller-Jentsch, 2005). Indeed, awareness of the importance of trade facilitation by some MENA countries has already led some trade facilitation reforms, albeit at varying speeds.<sup>4</sup>

## **Methodology**

To investigate the impact of regional integration and trade facilitation, this study adopts a computable general equilibrium (CGE) methodology. CGE models have been widely used in trade policy analysis due to, inter alia, their ability to capture economy wide

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<sup>4</sup>For instance, under Tunisia's Export Development Project, trade facilitation reforms have led to imported goods being cleared from ports in 3 days, compared to 8 days prior to the commencement of the project.



interactions. The Global Trade Analysis Project (GTAP) model has been one of the leading models used in analyzing the impact of multilateral and regional trade liberalization schemes, and more recently on second generation trade issues including trade facilitation, hence its use for this study. The standard GTAP model is a static, multi-region, multi-sector, CGE model operating under assumptions of perfect competition and constant returns to scale. The behavioral functions describing production and consumption decisions are further discussed in appendix 2. Hertel (1997) discusses full details of the GTAP model.

However, since there is no explicit sector in the GTAP model capturing trade facilitation, modeling trade facilitation, within the GTAP framework is more challenging, nonetheless some work has commenced in this area. Following the approach pursued by Hertel, Walmsley and Itakura (2001), trade facilitation has been introduced into CGE (including GTAP) models via technical progress in trading activities. According to this approach, traded goods incur indirect trade transactions costs (otherwise referred to as “iceberg” costs) in proportion to how long their transit is. Longer transit periods are associated with higher costs and a melting down of the value of the good. High transit costs may result from cumbersome custom procedures, port congestion, poor intermodal transportation services etc. Furthermore, low trading volumes as well as distance may result in higher transport costs thus contributing to higher trade transactions cost. Hence, improvements to trade facilitation will help reduce transit times and associated costs, thereby, leading to a lower destination price of the traded goods. However, OECD (2003) argues that this “iceberg-type” representation of trade transactions costs (TTC) seems very appropriate for indirect cost components such as border clearance times, but does not capture directly incurred trade transactions costs such as resulting from costs for providing the necessary documentation. In recognition of these shortcomings, Fox et al (2003) and OECD (2003) have incorporated trade facilitation into the GTAP model by splitting trade transactions costs into two parts: the indirect TTC (iceberg costs) and a tax component, capturing the direct TTC.

This study adopts the Fox et al (2003) and OECD (2003) methodology in estimating the effects of trade facilitation. Nonetheless, given the lack of data, it still remains a

challenge to be able to estimate what the trade transactions cost is for MENA countries. This study uses the results from Zarrouk (2003) survey, which suggest that inefficiencies in trade facilitation amount to some 10.6% of the value of traded goods. This amount is taken as the total trade transactions cost arising from inefficiencies. However, in order to adopt the above methodology we break this into an indirect (iceberg) and a direct TTC (tax component). To obtain the iceberg component we adopt Hummels (2001) estimate that each day saved in shipping time, in part due to faster customs clearance, is equivalent to a 0.5 percentage point reduction in ad valorem tariffs. The results of the Zarrouk (2003) survey suggest that average clearance from ports in MENA countries ranges between some two to ten days, hence the indirect cost component of the TTC is estimated to be 3%. The remaining 7.6% is attributed to the average direct cost component. Given the generally higher documentary requirements needed for agricultural goods it is assumed that the direct trade transactions cost for agricultural goods is twice that of non-agricultural goods. Hence the direct TTC for agricultural goods is about 12%, whereas that for non-agricultural trade is about 4%.<sup>5</sup> As discussed earlier, the indirect TTC are introduced as technical progress in importing.<sup>6</sup>

## **Data**

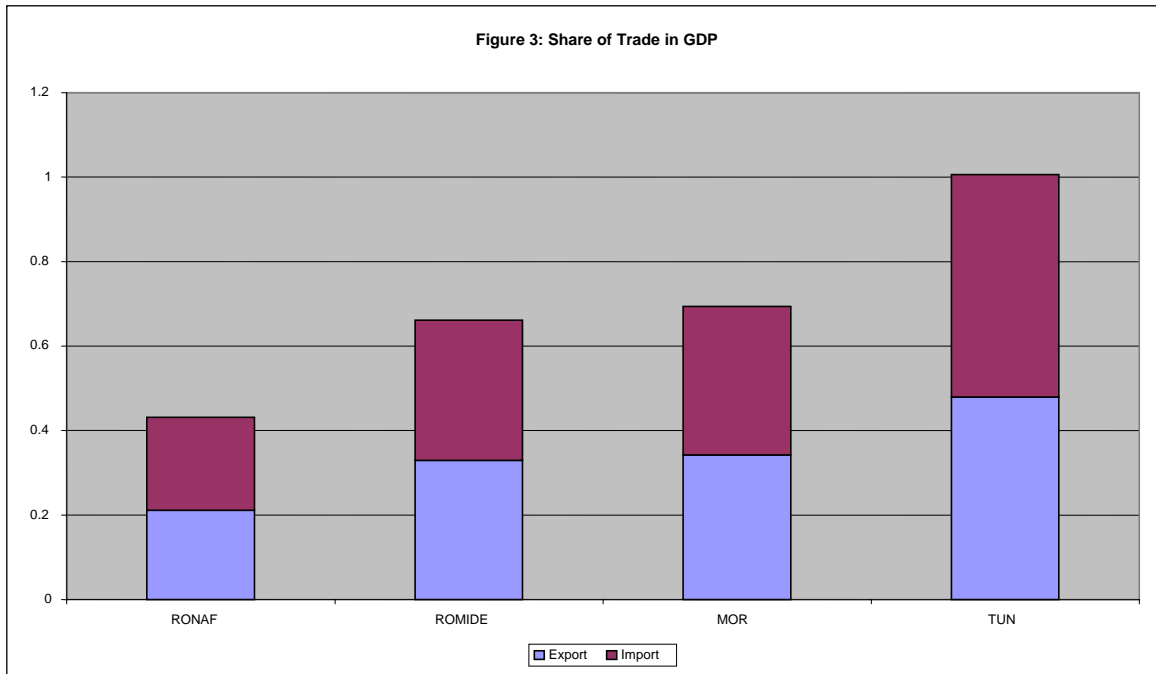
The model used for this study draws data from the GTAP 6 Data base. Although this version of the GTAP database allows for 87 regions and 57 commodities, its coverage of MENA is rather limited. The database has separate data for Morocco and Tunisia, while the rest of MENA is aggregated into “the rest of North Africa” (RONAF), and “the rest of the Middle East” (ROMIDE). The current study uses a 13 region by 16 commodity aggregation, which captures all the MENA sub-regions, key trading partners and key commodities. Details of the aggregation are provided in appendix 3 table A1.

Trade (imports plus exports) is important for the various MENA sub-regions, with its

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<sup>5</sup> The direct TTC are incorporated into the analysis by using the “Altax” option within GTAP to adjust the benchmark trade duties accordingly.

<sup>6</sup> Changes are made to the “ams” variable in the GTAP model.



share of GDP ranging from 43% in the rest of North Africa to about 100% in Tunisia (figure 3). With regards trading partners, the EU is the most important one, accounting for up to 70% of Tunisia’s trade. The “Rest of the Middle East” shows a somewhat more diversified structure in its direction of trade, with the EU accounting for less than 22% of exports as well as imports (further details in appendix3 tables A2 and A3).

### **Simulations:**

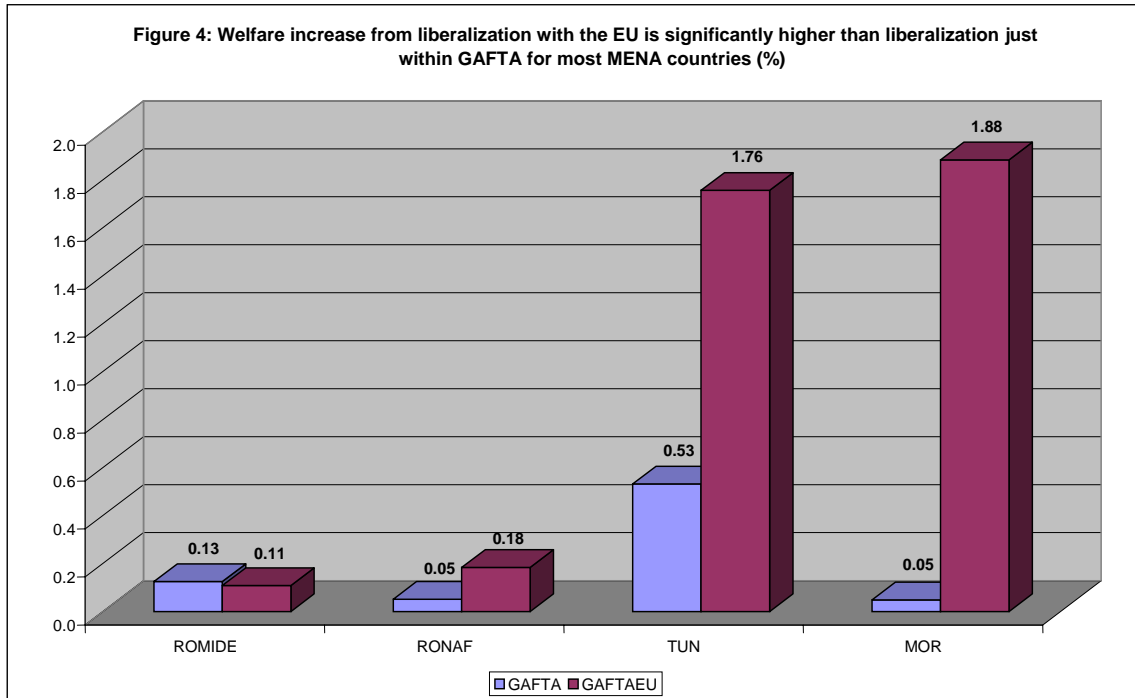
Two types of simulations are performed. The first considers the impact of a MENA free trade area, similar to GAFTA, by abolishing all import tariffs existing between MENA countries. The second simulation considers the impact of a free trade area between MENA and the EU, by abolishing all import tariffs on non-agricultural goods and reducing all agricultural tariffs by 50%, thereby reflecting the lower degree of liberalization in agriculture under the EMAs. The second experiment thus encompasses the first. For both simulations, the counterfactual simulation with and without trade facilitation (TF) improvements is undertaken. The trade facilitation improvements were applied to all tradeables, except oil, gas and petroleum products. Hence, in total, four simulations are implemented:

- MENA free trade without trade facilitation (GAFTA)
- MENA-EU free trade without trade facilitation (GAFTAEU)

- MENA free trade with trade facilitation (GAFTA+TF)
- MENA-EU free trade with trade facilitation(GAFTA-EU+TF)

## Results and Discussion:

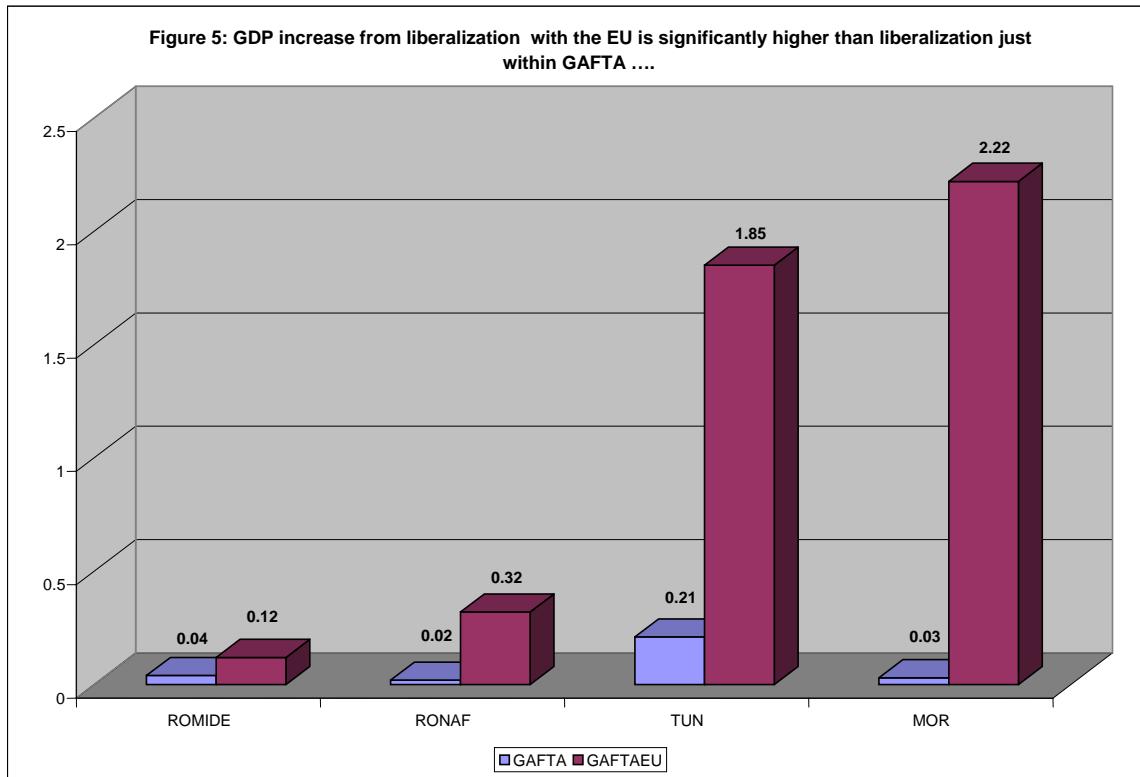
### *Non-Trade Facilitation FTA simulations*



The welfare gains to MENA from implementing the free trade agreements are positive. Under GAFTA, the total static welfare gains to MENA amounts to \$913 million, a 0.1% boost to regional income. Under GAFTA-EU, the static welfare gains to MENA increase to some \$1.84 billion, a 0.21% boost to regional income. These results show that integration with the EU provides significantly greater welfare gains than only intra-MENA trade. This is mainly due to the much larger size of the EU market and the greater importance of EU trade compared with intra-regional trade.

The distribution of the welfare gains however reveal marked differences in gains to trade liberalization between the various MENA sub-regions. Under GAFTA, Tunisia gained the most with a 0.53% increase in welfare, followed by relatively less substantial gains to the Rest of the Middle East (0.13%), Morocco (0.05%) and the Rest of North Africa (0.05%) (figure 4). Under GAFTA-EU, both Morocco (1.88%) and Tunisia (1.72%) gained the most followed by the rest of North Africa (0.18%). The differences in the

results between each of the MENA sub-regions are in general proportional with the degree of trade expansion (Figure A1). For instance, Morocco, which had the highest expansion in trade (exports and imports) under GAFTA/EU, also recorded the highest welfare gains. Whereas “the rest of the Middle East”, which had the least expansion in trade also had the least increase in welfare (0.11%). Furthermore, the EU accounts for at least 55% of trade with the other MENA sub-regions, other than the “the rest of the Middle East”, thereby accounting for the higher welfare gains accruing to Morocco, Tunisia and “the rest of North Africa”. It is important to recognize that ROMIDE includes a heterogeneous group of countries e.g. Jordan, Iran and Saudi Arabia (dominant economy), hence the results for each country within the group are likely to vary greatly. Based on the earlier results, it is reasonable to expect ROMIDE countries with a high share of trade with the EU will do much better than those that trade less with the ROMIDE.



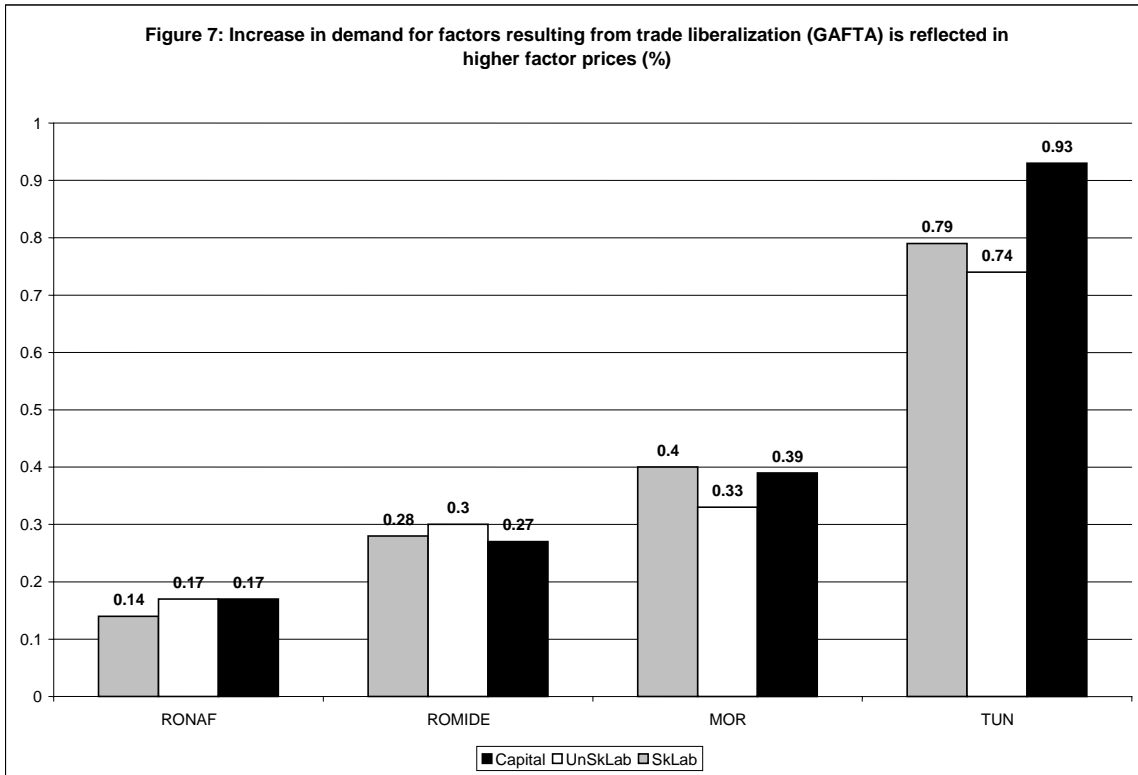
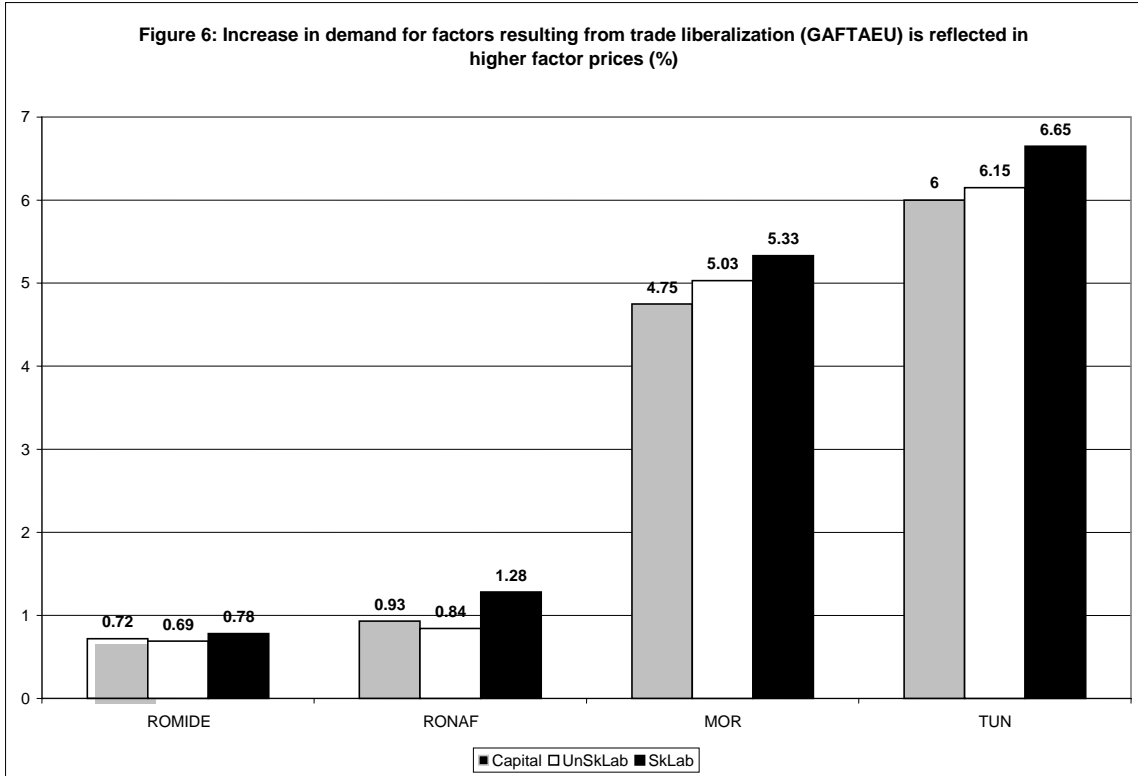
As with welfare, real GDP rises in both simulations for all the MENA sub-regions, ranging from 0.02% to 0.21% under GAFTA, and 0.12% to 2.22% under GAFTA/EU (figure 5). Similarly, Tunisia gains the most under GAFTA, and under GAFTA/EU both Morocco (2.22%) and Tunisia (1.85%) gain the most. It is also important to recognize

that the increase in GDP accrue from only the static gains to trade reforms, as the model does not take into account the dynamic gains, which could be even higher than the static gains.<sup>7</sup> Nonetheless, the increase points to an increase in economic activity, with concomitant favorable effects on factor markets. Not surprising, real wages (skilled and unskilled) increase in all MENA sub-regions in line with the GDP increase. For e.g. under the GAFTA-EU FTA both Morocco and Tunisia experience real wage increases between 5% and 7% (figure 6); the increase is more modest (0.3% to 1%) under GAFTA (figure 7). The rise in real wages is consistent with the fact that most MENA countries have comparative advantage in labor intensive goods. Hence liberalization of the trade regime should encourage the production of more labor intensive products thus leading to a relatively higher demand for labor and a rise in real wages. Given that the model adopts a full employment closure, it is reasonable to expect that the higher real wages would translate to increased employment. Hence the employment effects from the GAFTA-EU are likely to be significantly higher than from only GAFTA. Similarly, rents on capital also increase under both simulations thus pointing to the prospects of increased investment (foreign and domestic) and potential dynamic gains from trade; these gains are however not captured in this model, since it is a static model.

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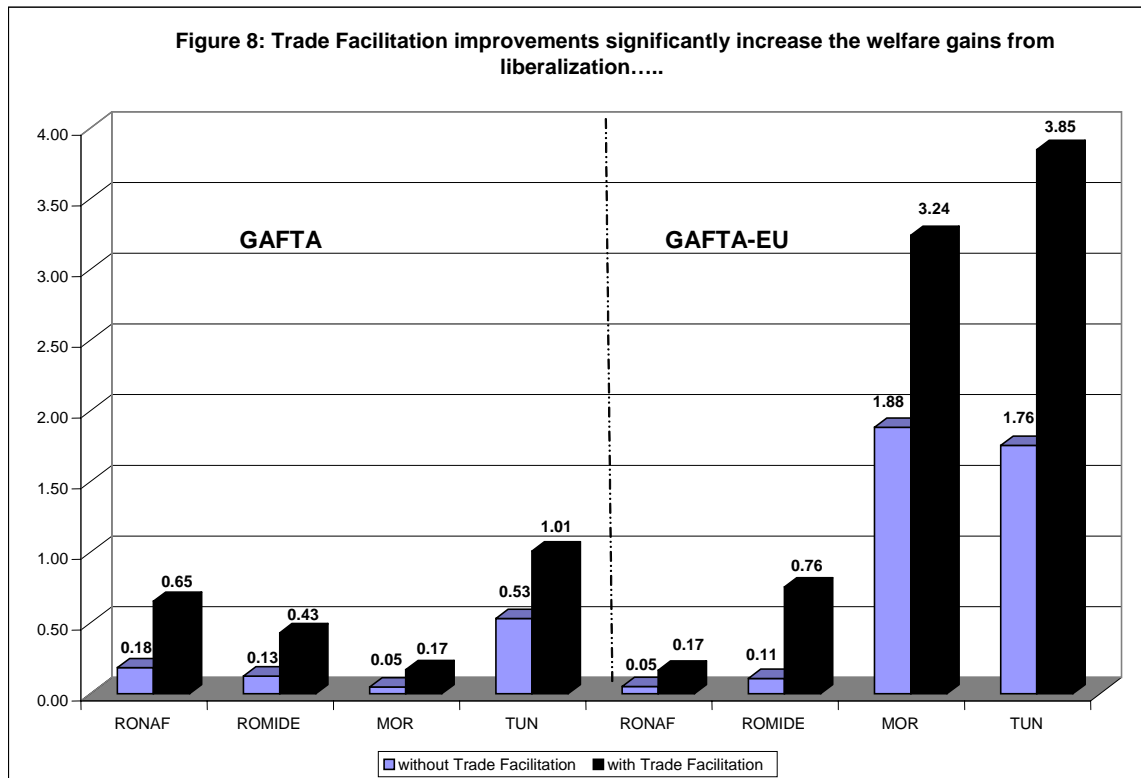
<sup>7</sup>Romer, P. (1993) shows that the benefits of an open trade orientation could be potentially higher than the static gains. In his growth model, Romer shows that a greater variety of inputs does more for production than higher quantities from a limited range.

Romer, P.M (1993) 'Innovation and Growth in the Global Economy'. *Journal Economic Literature* vol. 31 (1), pp 276-278.



### Trade Facilitation

The results confirm the significant gains to be realized in complementing trade liberalization with trade facilitation improvements. The addition of trade facilitation improvements to trade liberalization within GAFTA increases overall welfare gains to the MENA region from \$913 million to some \$3 billion (some 0.1% increase to base GDP), some three times. Similarly, the welfare gains under trade liberalization within GAFTA-EU increases from \$1.8 billion to \$7.2 billion (0.82% increase to base GDP), some four times with the inclusion of trade facilitation improvements.



As regards the distribution of the gains, all the various MENA sub-regions share in the significant welfare gains. Welfare gains to Morocco, RONAF, and ROMIDE, regions which had small welfare gains under GAFTA, are shown to at least triple when GAFTA is complemented with trade facilitation; in Tunisia the welfare gains almost doubled (figure 8). Similar significant benefits to the MENA regions are also observed when GAFTA-EU is complemented with trade facilitation improvements (figure 8). In both cases, the expansion in trade is proportional to the improvements in welfare, however, the increase in trade is not as significant as the welfare increases. For instance, in Morocco



trade changes by less than 5 percentage points (or less than 30%) under GAFTA-EU yet the welfare triples, thus suggesting that the channels through which trade facilitation impacts welfare go beyond increased trade. Decomposition of the welfare gains shows that most of the gains arise from allocative efficiency gains (the terms of trade effects are negative) under GAFTA-EU+TF.

Further decomposition of the welfare gains indicates that trade facilitation improvements from lowering indirect trade transactions costs tend to contribute more to the welfare gains than from the reductions in direct trade transactions costs.<sup>8</sup> For instance, some 83% of the additional welfare increase resulting from including trade facilitation improvements to GAFTA-EU resulted from reduction in the indirect trade transactions costs. Similar dominance of the impact of lowering indirect trade transactions costs over direct costs is also obtained in OECD (2003). These results point to the importance of addressing issues such as cumbersome customs procedures, port congestion, and poor intermodal transportation services, all of which, inter alia, add to the indirect trade transactions costs.

### **Summary and Policy Recommendations**

This study highlights the importance of RTA's and trade facilitation improvements to welfare and GDP growth prospects. Both intra-regional integration and integration with the EU are observed to have a favorable impact on trade, growth and welfare in the MENA region. The welfare gains obtained from integrating with the EU are observed to be at least twice as much as that from integrating only with GAFTA, thus pointing to the importance of enhanced trade with the EU. The distribution of the welfare gains are however skewed in favor of MENA countries that already have a high proportion of trade with the EU. This significant increase in welfare resulting from further integration with the EU calls for the need to address constraints that hinder the realization of the full benefits of trade with the EU. These include difficulties in meeting standards and technical regulations, rules of origin, and rigidities in domestic markets. The static gains from intra-MENA trade are also positive, though less than that from integration with the EU. We anticipate that the dynamic gains to be generated from increased investment

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<sup>8</sup>The decomposition was done using the sub-totals facility in GTAP.

flows to a free trade area amongst MENA countries to be more substantial than the static gains, and to reinforce deeper integration with the EU. Thereby underscoring the importance of addressing the various policy-induced constraints to intra-regional trade (see section on FTA's in MENA).

Incorporation of trade facilitation improvements are also observed to at least triple the welfare gains compared to the scenario without trade facilitation, thus pointing to the substantial gains to be realized by MENA countries in addressing existing inefficiencies in trade facilitation, in particular those arising from high indirect trade transactions costs. Given the existing evidence on the status of trade facilitation in the MENA region, it would appear that significant gains could be reaped from streamlining cumbersome custom procedures including customs valuation and import requirements on standards and technical regulations. Modernizing customs and adhering to WTO disciplines on customs valuation, import licensing, technical barriers to trade (TBT), and sanitary and phytosanitary standards (SPS) may be a first step in this direction. Furthermore, addressing port congestion and improving transshipment regulation including the facilitation of a seamlessly integrated multimodal transportation system should yield high dividends.

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## Appendix 1: Regional FTA's in MENA

### GAFTA

Though there exist various sub-regional initiatives, such as the Gulf Cooperation Council, Arab Maghreb Union, and the Mediterranean Free Trade Area, and Greater Arab Free Trade Area (GAFTA). In terms of country coverage, GAFTA is the most comprehensive, as it was signed by (22) countries on 19 February 1997, under an Arab League initiative, and has been in force since 1 January 1998. The dead line for the full implementation of the free trade area, by the higher income Arab countries, is 2005; less developed members have a transition period of up to 2010 to fully implement the free trade area. The agreement covers both trade in industrial and agricultural goods, however certain exceptions were allowed during the transition period. Under the rules of origin, goods are required to have at least 40% of their value added. With the exception of Somalia, all members are reported to be implementing the program.

### Euro-Mediterranean Agreements (EMA)

In general, the EMA agreements provide for an asymmetric liberalization of their trade regimes, with the EU liberalizing faster. Immediately upon entry into force, the Mediterranean partners benefit from duty and quota-free access to the EC markets in industrial goods (this excludes processed agricultural products). The Mediterranean countries are however expected to fully liberalize their trade in industrial goods over a 12-year transition period (15 in the case of Egypt). With regards non-industrial goods, reciprocal liberalization is selective; the agreements cover raw and processed agricultural and fishery products and include mutual concessions such as, zero tariffs, reduced import duties (both within and out of quota), and increased tariff quotas. The rules of origin in these agreements do provide for diagonal cumulation of origin.

### Gulf Co-operation Council (GCC)

GCC was created in 1981 by Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. By 1983, a free trade area in goods (agricultural and non-agricultural) had been realized. The rules of origin require that for goods to qualify as originating, the value-added be at least 40% and the producing plant be at least 51% owned by GCC nationals. Since the establishment of the FTA, efforts have been ongoing to create a customs union; this objective was achieved in 2003 (two years before the 2005 dead line) with the adoption of an across-the-board common external tariff (CET) of 5%. The adoption of a common currency is envisaged by 2010.

### Arab Maghreb Union

The Arab Maghreb Union was established in 1989 by Algeria, Libya, Mauritania, Morocco and Tunisia, with the objective of, *inter alia*, establishing a free trade area in goods, services and factors of production by 1992. A customs union and a common market were envisaged to be established by 1995 and 2000 respectively. To date, at least 20 conventions and agreements have been signed. Nonetheless, the FTA is yet to be fully established, and integration between countries in the regions is weak.

### Mediterranean Arab Free Trade Area

In 2001, Jordan, Egypt, Morocco, and Tunisia, all of which have an association agreement with the EU, initiated the Mediterranean Arab Free Trade Area (MAFTA), otherwise referred to as "Aghadir Process". The process, seeks to, *inter alia*, create a free trade area amongst member countries by 2006. The Aghadir Declaration envisages the new free trade area to be extended to the other Arab countries in the Mediterranean.

## Appendix 2: Model Description

The detailed equations are provided in Hertel (1997).<sup>9</sup> This appendix describes key functional forms used in the main aspects of the model. Production takes place through a nested structure. At the top nest, value-added and intermediate inputs are combined in accordance with a Leontief production function (i.e. fixed proportions). Value-added is formed through combinations of labor (skilled and unskilled), land, natural resources, and capital using the CES functional form. Similarly, the CES function is used to form intermediate goods through the combination of imported and domestically produced goods (Armington assumption). At the lowest nest, imported bundles are formed through CES combinations of imported goods from each region.

On the demand side, there exists a single regional household that collects all incomes and spends on private, government, and national savings in accordance with a Cobb-Douglas utility function (constant shares). Private and government expenditures are exhausted over commodities in accordance with a constant difference elasticity demand system and Cobb-Douglas utility function respectively. All savings are used for investment, hence investment is savings driven. However, since this is a static model, the investment affects the level of economic activity in the current period. Investment funds are allocated across regions through a “global bank”, in accordance with the rates of return to capital across regions. Transport margins are also derived through another global sector. Whilst capital is mobile across sectors and regions, labor is assumed to be immobile across countries.

Demand equals supply in all markets, however, there may exist a price wedge between prices paid by consumers and prices received by producers due to the various forms of market interventions (e.g. taxes and subsidies). The availability of such policy variables on international trade, makes it possible to simulate the effects of tariff liberalization initiatives under Regional Trade Agreements, through changes to import tariffs or export subsidies, where applicable.

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<sup>9</sup> Available at: <https://www.gtap.agecon.purdue.edu/resources/download/86.pdf>

### Appendix 3

**Table A1. Regional and Commodity Aggregation**

Regions (13)	Commodities (16)
Morocco, Tunisia, rest of Middle East, rest of North Africa, EU, Central and Eastern Europe, US, rest of North America, Japan, East Asia, China, rest of World,	food, manufactures, services, oil & gas, apparel, electronic equipment, transport and machinery, Fruits and vegetables, Communication, sea & air transport, other transport, chemical & plastics, petroleum products, textiles, fish and live animals.

**Table A2: Direction of Exports (as share of total exports)**

	EU	MOR	TUN	ROMIDE	RONAF
RONAM	0.024	0.021	0.011	0.013	0.022
EU	0.547	0.598	0.705	0.211	0.581
ROW	0.093	0.11	0.072	0.112	0.103
MOR	0.003	0	0.005	0.004	0.005
TUN	0.003	0.004	0	0.001	0.008
EA	0.046	0.049	0.022	0.191	0.034
ROMIDE	0.029	0.026	0.03	0.085	0.034
RONAF	0.007	0.01	0.038	0.005	0.003
China	0.019	0.017	0.009	0.032	0.01
US	0.115	0.099	0.066	0.174	0.151
CEEC	0.046	0.013	0.012	0.006	0.014
Japan	0.031	0.037	0.021	0.159	0.023
EFTA	0.038	0.015	0.01	0.006	0.012
Total	1	1	1	1	1

**Table A3: Direction of Imports (as share of total imports)**

VALIMPORTS	EU	MOR	TUN	ROMIDE	RONAF
RONAM	0.025	0.021	0.011	0.012	0.021
EU	0.534	0.59	0.698	0.205	0.581
ROW	0.099	0.123	0.077	0.12	0.107
MOR	0.003	0	0.006	0.005	0.005
TUN	0.003	0.005	0	0.001	0.009
EA	0.047	0.047	0.021	0.192	0.034
ROMIDE	0.03	0.027	0.032	0.088	0.036
RONAF	0.007	0.01	0.042	0.006	0.003
China	0.021	0.017	0.009	0.033	0.01
US	0.114	0.094	0.063	0.169	0.147
CEEC	0.048	0.014	0.012	0.006	0.014
Japan	0.031	0.037	0.02	0.157	0.022
EFTA	0.038	0.017	0.009	0.006	0.012
Total	1	1	1	1	1

Source: GTAP database 6

## Appendix 4

