FEMISE RESEARCH PROGRAMME

# *Fiscal Challenges*
# *Of The Euro-Mediterranean Agreements*

*Ali H. BAYAR*
*Université Libre de Bruxelles, CESifo, ERF, EcoMod, Belgium*


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# FISCAL CHALLENGES OF THE EURO-MEDITERRANEAN AGREEMENTS

**Ali H. BAYAR**[1]

With contributions from

**Ghazi BEN-AHMED**[2], **Maria G. BOSCO**[3], **Paul de Boer**[4], **Ouafa CHABI**[2], **Mohamed CHATER**[5], **Rim CHATTI**[6], **Salma ELLOUMI**[6], **Joe FRANCOIS**[7], **Selçuk ONAY**[2], **Masudi OPESE**[2], **Sevgi RECBEROGLU**[8], **Dean SPINANGER**[9]

**DRAFT VERSION**

[1] Université Libre de Bruxelles, CESifo, ERF, EcoMod.
[2] Université Libre de Bruxelles,EcoMod
[3] Katholieke Universiteit, Leuven, and Bocconi University, Milan
[4] Erasmus University Rotterdam, EcoMod
[5] INSEA, Rabat
[6] University of Tunis
[7] Erasmus University Rotterdam
[8] Bilkent University, Ankara
[9] Kiel Institute of World Economics

*Correspondence to:*

Prof. Ali Bayar
Université Libre de Bruxelles
Avenue F. Roosevelt, 50 C.P. 140
B-1050 Brussels/Belgium

Email: Ali.Bayar@ulb.ac.be

## 1. Introduction

Since the Barcelona process was launched in November 1995, the pace of Euro-Mediterranean integration has been gaining momentum[1]. Negotiations for Euro-Mediterranean Agreements have been concluded between the Union and Tunisia, Israel, Morocco and Jordan; an interim Agreement has been concluded between the Union and the PLO for the benefit of the Palestinian Authority; negotiations are still under way with Egypt, Lebanon, Algeria and Syria. The Agreements with Tunisia and the PLO have already entered into force. The trade provisions of the agreement with Israel are equally in force. As far as Turkey, Cyprus and Malta are concerned, relations are governed by pre-existing Association Agreements providing inter alia for the progressive establishment of customs unions. Turkey moved into a full-fledged customs union with the EU as of January 1996.

**Table 1: Progress in the Euro-Mediterranean Agreements**

| Partner | Conclusion of the negotiations | Signature of the agreement | Entry into force |
|---|---|---|---|
| Tunisia | June 1995 | July 1995 | March 1998 |
| Israel | September 1995 | November 1995 | June 2000 |
| Morocco | November 1995 | February 1996 | March 2000 |
| Palestinian Auth. | December 1996 | February 1997 | July 1997 |
| Jordan | April 1997 | November 1997 | - |
| Egypt | Concluded in 1999 | - | - |
| Lebanon | In progress | - | - |
| Algeria | In progress | - | - |
| Syria | In progress | - | - |

Sources: European Commission

The entry into force of the Euro-Mediterranean agreements and the establishment of a free trade area by 2010 will have far reaching implications for the Mediterranean partners in terms

[1] Hoekman and Djankov, 1996; European Commission, 1997b and 1997c; Bensidoun and Chevalier, 1996; Institut de la Méditerranée, 1997.

of trade, intersectoral adjustment, tariff revenues, investment and employment, etc. In this paper we will mainly focus on the public finance issues.

Even if the creation of the free trade area involves a *gradual* abolition of external protection for the Mediterranean partners of the EU, competition may be damaging for some industries and tariff reductions may bring about considerable losses of government revenues in some countries. Bringing the tariff levels from an average of 30 to 40 percent in some countries in the region down to almost zero in a relatively short period of about ten to twelve years — as envisaged in the Euro-Med agreements — is a tremendous task. While some developing countries outside the region did well adapting to somewhat similar but not as extensive agreements, the Mediterranean countries face far-reaching agreements entailing significant adjustment costs.

**Table 2: Government debt and deficit as a percent of GDP**

| | Debt | | | Deficit | | |
|---|---|---|---|---|---|---|
| Country | 1996 | 1997 | 1998 | 1996 | 1997 | 1998 |
| Algeria | … | … | … | 3.0 | 2.4 | -3.9 |
| Morocco | 59.0 | … | 51.3 | - 3.0 | - 1.7 | - 4.3 |
| Tunisia | 52.4 | 54.9 | … | - 4.3 | - 3.8 | - 1.4 |
| Egypt | … | … | … | - 0.3 | … | … |
| Jordan | 128.8 | … | … | 1.5 | … | … |
| Lebanon | … | … | … | … | … | … |
| Syria | … | … | … | … | … | … |
| Israel | 90.3 | 89.3 | 89.6 | - 4.7 | - 2.8 | - 3.0 |
| Palestinian | 1.7 | … | … | … | … | … |
| Cyprus | 84.9 | 91.7 | 95.6 | - 3.4 | - 5.3 | - 5.5 |
| Malta | 42.8 | 51.3 | … | - 9.2 | - 9.9 | - 8.6 |
| Turkey | 21.3 | 21.6 | … | - 8.4 | - 7.6 | - 7.2 |

Sources: Eurostat (1999), *Euro-Mediterranean Statistics*

There is a widespread concern that tax revenue losses implied by the Euro-Mediterranean agreements are likely to be high. The fiscal dimension of the whole process is considered as being crucial (Diwan, 1997) given the importance of trade taxes in the government budget and fiscal imbalances (Tables 2 to 4) in the region. As Nabli (1997) puts it, the process of trade liberalization will increase public expenditures aimed at improving the country's competitive position, particularly in areas such as subsidies in support of the adjustment costs associated with the private sector's necessary restructuring as it faces increased competition; training and education to improve the quality of the labor force; and basic infrastructure supporting the private sector itself. The increased expenditures will usually be accompanied by reduced revenues resulting from a lowering of import tariffs.

**Table 3: Tariff revenue as a percent of imports**

| Country | 1975 | 1980 | 1985 | 1990 | 1995-6 |
|---|---|---|---|---|---|
| USA | 4.80 | 3.18 | 3.82 | 3.34 | 2.59 |
| Japan | 3.35 | 2.72 | 2.61 | 2.99 | 3.65 |
| France | 1.58 | 1.24 | 0.99 | 0.92 | 0.77 |
| UK | 2.38 | 2.46 | 1.76 | 1.52 | 1.49 |
| | | | | | |
| Turkey | 36.12 | 15.60 | 8.65 | 6.40 | 3.63 |
| Jordan | 11.94 | 16.47 | 14.05 | 9.51 | 12.31 |
| Syria | 16.40 | 11.56 | … | 8.43 | 9.93 |
| Israel | … | 4.43 | 4.96 | 1.58 | 0.63 |
| Egypt | 43.24 | 25.84 | 28.57 | 9.58 | 16.72 |
| Tunisia | 19.84 | 20.91 | 29.97 | 19.98 | 19.62 |
| Morocco | 25.38 | 26.32 | 15.37 | 19.08 | 14.92 |

Sources: IMF, *Government Finance Statistics*
OECD, *Revenue Statistics*

**Table 4: Tariff revenue as a percent of GDP**

| Country | 1975 | 1980 | 1985 | 1990 | 1995-6 |
|---|---|---|---|---|---|
| USA | 0.29 | 0.28 | 0.31 | 0.30 | 0.27 |
| Japan | 0.33 | 0.32 | 0.23 | 0.21 | 0.21 |
| France | 0.22 | 0.23 | 0.19 | 0.17 | 0.13 |
| UK | 0.51 | 0.49 | 0.40 | 0.33 | 0.35 |
| | | | | | |
| Turkey | 3.83 | 1.67 | 1.45 | 0.96 | 0.76 |
| Jordan | 6.47 | 8.79 | 7.01 | 6.47 | 7.74 |
| Syria | 4.24 | 3.55 | … | 1.37 | 2.48 |
| Israel | … | 1.88 | 1.89 | 0.46 | 0.19 |
| Egypt | 10.27 | 8.12 | 5.57 | 3.16 | 3.59 |
| Tunisia | 5.89 | 7.51 | 9.17 | 8.42 | 8.14 |
| Morocco | 3.63 | 5.27 | 4.20 | 4.64 | 4.27 |

Sources: IMF, *Government Finance Statistics*
OECD, *Revenue Statistics*

Abed (1998a) reports that if direct and indirect effects are taken into account, the losses in tax revenue that are connected with the EU agreement (by the end of the twelve year period as a ratio of GDP) range from 1.5 to 2.0 percent of GDP at the lower end to approximately 4 percent of GDP at the higher end. The most difficult case would be Lebanon where the revenue loss would be great and the capacity to compensate for it from domestic sources would be very limited. Revenue losses in Egypt and Morocco would be near the lower end, and somewhat higher in Algeria, Jordan and Tunisia. These however are the broad range estimates. Togan (1999) estimates that the customs union between the EU and Turkey would generate an annual loss of $ 2.454 billion in the import tax revenue, i.e. almost 10 percent of

the total tax revenue in 1994. As a result, this would aggravate the public finance deficits in Turkey by an additional 1.8 point with respect to GDP.

Current estimates show that the fiscal challenge is a very important issue, which will have to be addressed through relevant economic policies and tax reform. If there is no policy response, the revenues derived from the taxation of imports from the EU will continue to decline at the same time as imports from the EU increase and, in some cases, as imports from third countries decline as a result of trade diversion. But what should the size of the fiscal adjustment be? What determines the magnitude of the fiscal impact? How can it be minimized? Will the liberalization be self-financing? Answers to these questions require an elaborate tax model with very demanding data. As a result, policymakers rarely have the answers when they need them. Reforms are then undertaken with little knowledge of its fiscal consequences.

## 2. Fiscal Implications of Trade Reforms

Although policymakers generally recognize the long-term benefits of trade liberalization, some have argued for at least a slower pace, in part because they fear trade reform will lead to significant revenue losses in the short run. This is understandable, as for many developing countries taxes on international trade are still a significant source of revenue (Tanzi, 1990; Newbery and Stern, 1987). A number of authors (Branson et al., 1992, Mitra, 1992; and Greenaway and Miller, 1991) have therefore emphasized the importance of concomitant fiscal adjustment to make trade reform sustainable.

The revenue implications of trade liberalization are, in general, uncertain. Blejer and Cheasty (1990) and Tanzi (1989) conclude that ultimately the net impact of trade reform on revenue is an empirical matter. As Greenaway and Milner (1991), Ebrill et al. (1999), and Devarajan et al. (1999) point out, the fiscal impact of a tariff reduction will depend directly on the size of the tariff cut, the response of imports to the tax change, the components of the reform package, and the relative importance of import tariffs as a source of government revenue. It will also depend indirectly on what happens to the other tax bases and how they in turn will affect revenue. Rajaram (1994) observes that in many trade reforms, revenue effects are not anticipated and complemented by other tax measures. Papageorgiou et al. (1990), Thomas et al. (1991), Mitra (1992), and Datta-Mitra (1997) all underlines that in trade reform greater emphasis on revenue issues are called for. Abed (1998) also stresses the links between trade liberalization and domestic tax reform.

Trade liberalization can interact with the domestic tax system and the macroeconomic environment, with implications for economic growth, revenue, and the overall budget. It is therefore important to take all the major interactions and feedbacks into account. To estimate the direct and the indirect fiscal consequences economists often use general equilibrium tax models. General equilibrium tax models are usually very complicated and difficult to build, particularly in view of data constraints in the developing countries[2]. We should also point to the enormous difficulty of finding reliable data on the complex tariff structures and quantitative restrictions.

[2] For a discussion and review see Shoven and Whalley (1984), Ginsburg and Keyzer (1997).

Devarajan et al. (1999) find out that the magnitude of the Armington elasticities of substitution both for imports $\sigma$ and the Armington elasticities of transformation for exports $\Omega$ are essential for the fiscal consequences of trade reform. “Even if just one of the elasticities is low (close to zero), revenue will decline unequivocally from tariff reform, reaching close to maximum drop regardless whether the other elasticity is high. This is because for imports to grow and tariff collection to compensate for the tax cut, the import elasticity $\sigma$ has to be high. Because of the balance of trade constraint however, imports cannot substitute for domestic goods unless supply is able to switch towards exports. Hence, the export transformation elasticity $\Omega$ has to be high as well. (…) Both have to be greater than 20 before revenue growth becomes really positive. Hence as substitution possibilities between foreign and domestic goods increase, a tariff reform can theoretically be self-financing. Conversely, if the elasticities are less then ‘large’, tax revenue will fall with tariff reduction and further fiscal adjustments are necessary.” Their econometric estimates “indicate that the elasticities only range from 0 to 3 in most cases, nowhere near the point at which tariff reform can be self-financing.”

Ebrill et al. (1999) observe that “certain trade reform strategies can achieve considerable trade liberalization without overly adverse consequences for revenue mobilization. In principle, some strategies could even lead to increased revenue, especially in the initial stages of trade reform. Specifically, revenue will likely be least affected and could increase, when

- The initial position is highly restrictive
- Trade liberalization involves the tariffication of quantitative restrictions, the auctioning of licenses to imports, or both
- Trade Liberalization includes such reforms as a reduction in tariff dispersion, the introduction of a minimum tariff, or the elimination of exemptions
- Trade liberalization is accompanied by reforms in customs and tax administrations, which also reduce the incentives to evade taxes, and
- Trade liberalization is supported by sound macroeconomic policies that ensure that liberalization is consistent with external balance.” (pp. 7-8)

In the following sections we will focus on four countries: Turkey, Tunisia, Morocco, and Egypt.

## 3. EU-Turkey Customs Union

### 3.1. Background and Literature Survey

On January 1st 1996 the Customs Union between the European Union and Turkey came into effect, thereby creating the closest economic relationship between the EU and any non-member country. The Customs Union implies fundamental changes in the Turkish trade and competition legislation and policies, and creates new opportunities and challenges for the Turkish economy. The decision of Turkey-EU Association Council to establish a Customs Union between Turkey and the EU was the most important development affecting Turkish economy as a whole, since the liberalization measures in the 1980s.

The Customs Union is one of the cornerstones of Turkey's relationship of association with the European Community, which dates back to the 1960s. The framework of the Customs Union was drawn with the Ankara Agreement of 1963 and details were laid down by the additional Protocol, which entered into force in 1973. With the decision signed during the Turkey-EC Association Council meeting on March 6, 1995, Turkey completed the transitional phase in its integration with the EC as foreseen in the Ankara Agreement and additional protocols, and it entered into final phase. After a transitory stage of 22 years, during which essential measures were put into force towards trade liberalization and greater reliance on market forces, parties decided that conditions had been fulfilled for the establishment of the Customs Union and it started to function as of January 1, 1996.

The Customs Union covers only the industrial and (industrial content of) the processed agricultural products. Traditional agricultural goods are outside the scope of the Customs Union. Concerning processed agricultural products; the parties have agreed on the establishment of a system in which Turkey would differentiate between agricultural and industrial components of the duties applied on these products, similar to the model in the Community.

With the entry into force of the Customs Union, Turkey has eliminated all customs duties and charges having equivalent effect, as well as quantitative restrictions applied on imports of industrial products from the Community. For products imported into Turkey from third countries, Turkey started to apply the rates of protection specified in the common external

tariffs, except for those products classified as sensitive. Custom duties on sensitive products will be gradually eliminated over a period of 5 years.

As a consequence of the Customs Union, Turkey's weighted rates of protection for imports of industrial products originating from EU and EFTA member states have fallen from 5.9% to 0% and from 10.8% to 6% for similar goods originating from the third countries[3]. With the implementation of the Uruguay Round reductions, Turkey's average rates for third countries will be lowered to 3.5% (Table 5).

Turkey is now taking steps for adaptation to the EC's preferential trade agreements concluded with third countries. It has already signed free trade agreements with the all the candidate countries from Central and Eastern Europe as well as EFTA and Israel. Negotiations with Egypt, Tunisia, Morocco and the Palestinian Authority continue, while negotiations with Malta and Jordan should start soon.

Although five years have passed since the entry into force of the Customs Union, there are very few studies about the effects of the CU on the Turkish economy.

Mercenier and Yeldan (1997) analyze the effects of two different trade unions: Turkish commitment to enter a CU with the EU and Turkey's joining the European Single Market. The effects of these unions on the level and pattern – intertemporal and intersectoral – of welfare, production and employment are analyzed using a general equilibrium model. The model assumes a world economy of seven countries; Turkey, Great Britain, Germany, France, Italy, the rest of the EU, and the rest of the world. Each country has nine sectors of production, four of which are perfectly competitive, and the rest five industries are non-competitive. With this property, Mercenier and Yeldan (1997) differ from other studies in that assuming imperfect competition and increasing returns to scale, the model analyzes the dynamic impacts of the Customs Union. In each country, final demand decisions are made by a competitive, infinitely lived, utility maximizing single representative household.

Customs Union is incorporated into the model by setting most tariffs on European imports to zero and to harmonize most rates on imports from the rest of world with the European rates. Turkey's joining the European Single Market consists, in addition to tariff harmonization,

[3] Ministry of Foreign Affairs (1998), Relations between Turkey and the European Union.

both the Turkish and the European firms switch from their initial price-discriminating strategy to a single-pricing behavior within the Extended European Union (Extended EU= EU+TR)

Partial equilibrium results of the analysis on the Turkish chemical industry suggest that in the domestic market, foreign penetration erodes the monopoly power of the chemical industry previously enjoyed by local producers: more than a quarter of the firms will be forced out of market (28.7%) as a result of the Turkey's forming a CU with the EU, however, this percentage is only 0.9% (which is quite modest) if Turkey is to join the European Single Market.

General equilibrium results of the analysis suggest that the welfare cost of implementing the CU amounts to a sacrifice of real consumption on the whole time horizon of almost 1% (-0.832%). However, if Turkey were to join the European Single Market, the welfare gain would amount to almost 1% (+0.897%) over the whole time horizon.

Formulating a generic, static general equilibrium model of a small open economy by using the 1985 input-output table, Harrison, et al. (1993) experiments the Customs Union on the model as the policy of harmonization of Turkish tariff structure with the Common External Tariff (CET) of the EC. The general structure of the model employed is such that the production is characterized by competitively behaving 40 firms operating under constant returns to scale which use labor, capital and intermediate inputs in the production process. The trade-off between domestic goods and exports are presented in the constant elasticity of transformation frontier, and the assumption of product differentiation between imports and the domestic production are presented in the Armington function. The model allows imports and exports to bear different tariffs and subsidies, depending on their source and destination. This feature of the model allows studying the policy of harmonization of the tariff structure.

**Table 5: Nominal protection rates before and after the Customs Union with the EU**

| Sectors | NPR with EU in 1994 | NPR with third countries in 1994 | NPR with EU after CU in 2001 | Average MFN tariff rates after CU in 2001 | Average tariff rates for GSP beneficiaries in 2001 | Sectoral share of imports in total imports in % |
|---|---|---|---|---|---|---|
| 1 Agriculture | 41.27 | 41.65 | 41.26 | 41.26 | 41.26 | 2.78 |
| 2 Animal husbandry | 3.48 | 4.18 | 1.37 | 1.37 | 1.37 | 0.56 |
| 3 Forestry | 0.01 | 0.10 | 0.01 | 0.01 | 0.01 | 0.66 |
| 4 Fishery | 47.92 | 54.08 | 47.84 | 47.84 | 47.84 | 0.02 |
| 5 Coal mining | 3.33 | 3.33 | 0.00 | 4.00 | 0.00 | 1.24 |
| 6 Crude petroleum | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.27 |
| 7 Iron ore mining | 0.00 | 2.22 | 0.00 | 0.00 | 0.00 | 0.28 |
| 8 Other metallic ore mining | 0.13 | 1.21 | 0.00 | 0.00 | 0.00 | 0.10 |
| 9 Non-metallic mining | 9.09 | 11.02 | 0.00 | 0.95 | 0.95 | 0.08 |
| 10 Stone quarrying | 1.95 | 2.18 | 0.00 | 0.02 | 0.00 | 0.23 |
| 1 1Slaughtering and meat | 10.21 | 10.21 | 10.21 | 10.21 | 10.21 | 0.73 |
| 12 Fruits and vegetables | 72.49 | 72.62 | 68.01 | 68.01 | 68.01 | 0.07 |
| 13 Vegetable and animal oil | 16.31 | 16.38 | 16.31 | 16.29 | 16.29 | 1.11 |
| 14 Grain mill products | 41.33 | 41.33 | 41.02 | 41.02 | 41.02 | 0.26 |
| 15 Sugar refining | 28.79 | 28.79 | 28.79 | 28.79 | 28.79 | 1.23 |
| 16 Other food processing | 26.47 | 28.99 | 18.31 | 18.31 | 18.31 | 0.98 |
| 1 7Alcoholic beverages | 72.10 | 94.28 | 5.25 | 11.28 | 7.35 | 0.17 |
| 18 Non-alcoholic beverages | 56.92 | 69.81 | 0.00 | 14.83 | 0.00 | 0.05 |
| 19 Processed tobacco | 44.40 | 99.91 | 0.00 | 9.40 | 0.00 | 1.42 |
| 20 Ginning | 0.00 | 2.22 | 0.00 | 0.72 | 0.72 | 0.54 |
| 21 Textiles | 21.19 | 27.10 | 0.00 | 17.30 | 7.60 | 2.67 |
| 22 Clothing | 14.75 | 20.65 | 0.00 | 19.90 | 9.30 | 0.89 |
| 23 Lather and fur production | 7.85 | 12.57 | 0.00 | 10.20 | 2.80 | 0.74 |
| 24 Footwear | 24.40 | 35.70 | 0.00 | 22.50 | 9.10 | 0.06 |
| 25 Wood products | 15.25 | 18.97 | 0.00 | 2.00 | 0.05 | 0.19 |
| 26 Wood furniture | 26.22 | 32.64 | 0.00 | 5.50 | 0.00 | 0.06 |
| 27 Paper and paper products | 13.59 | 17.58 | 0.00 | 2.70 | 0.00 | 1.18 |
| 28 Printing and publishing | 8.23 | 10.79 | 0.00 | 4.52 | 0.00 | 0.17 |
| 29 Fertilisers | 8.22 | 16.38 | 0.00 | 8.10 | 0.00 | 1.01 |
| 30 Pharmaceutical production | 3.33 | 8.99 | 0.00 | 5.30 | 0.00 | 1.25 |
| 31Other chemical production | 10.79 | 17.62 | 0.00 | 8.71 | 0.04 | 10.56 |
| 32 Petroleum refining | 22.54 | 24.35 | 0.00 | 2.70 | 0.00 | 2.52 |
| 33 Petroleum and coal products | 5.62 | 7.52 | 0.00 | 2.15 | 0.00 | 0.31 |
| 34 Rubber products | 19.57 | 23.91 | 0.00 | 5.60 | 0.03 | 0.64 |
| 35 Plastic products | 24.61 | 31.68 | 0.00 | 9.90 | 0.00 | 0.40 |
| 36 Glass and glass production | 16.85 | 21.94 | 0.00 | 5.76 | 0.00 | 0.25 |
| 37 Cement | 30.45 | 32.88 | 0.00 | 3.14 | 0.00 | 0.18 |
| 38 Non-metallic mineral | 18.33 | 23.21 | 0.00 | 5.47 | 0.00 | 0.64 |
| 39 Iron and steel | 8.00 | 10.70 | 0.00 | 5.50 | 3.30 | 6.97 |
| 40 Non-ferrous metals | 4.52 | 8.43 | 0.00 | 3.20 | 0.50 | 8.18 |
| 41 Fabricated metal products | 18.36 | 25.29 | 0.00 | 6.00 | 0.11 | 1.60 |
| 42 Non-electrical machinery | 7.36 | 12.50 | 0.00 | 4.40 | 0.00 | 14.20 |
| 43 Agricultural machinery | 6.98 | 12.18 | 0.00 | 3.50 | 0.00 | 0.19 |
| 44 Electrical machinery | 9.69 | 16.64 | 0.00 | 8.30 | 0.00 | 6.74 |
| 45 Shipbuilding and repairing | 6.13 | 12.89 | 0.00 | 0.50 | 0.00 | 0.78 |
| 46 Railroad equipment | 0.00 | 4.61 | 0.00 | 4.04 | 0.00 | 0.09 |
| 47 Motor vehicles | 27.33 | 33.10 | 0.00 | 9.40 | 0.00 | 5.31 |
| 48 Other transport equipment | 0.01 | 1.76 | 0.00 | 1.60 | 0.00 | 1.30 |
| 49 Other manufacturing industries | 2.92 | 8.19 | 0.00 | 2.95 | 0.00 | 3.11 |
| Mean | 10.22 | 22.14 | 1.34 | 6.92 | 2.71 | |
| Standard deviation | 17.68 | 15.36 | 14.48 | 13.79 | 14.51 | |
| Total | | | | | | 100.00 |

Source: Togan (1997)

Turkey's interpretation of "harmonization" meant a zero customs duty and reduced import surcharges on imports from the EC. Instead, EC interpreted the term, as imports of the EC into Turkey are duty-free. With either interpretations, and with VAT as the replacement tax, harmonization of tariff structure had vitally no effect on welfare i.e. under Turkey's interpretation of the CET, Turkey's welfare would be increased by 0.007% of GDP whereas under EC's interpretation, its welfare would be reduced by –0.024% of GDP. Significant welfare gains were obtained only when the CET harmonization is combined with the removal of export subsidies.

Furthermore, Harrison, et al. (1996,1997) quantifies the impact of CU on Turkish welfare with a comparative static CGE model assuming equilibrium in 1993 and implementing different scenarios. The model differs from typical small open economy general equilibrium models since it quantifies the impact of the most important "deep integration" elements of the CU agreement such as harmonization of product standards and reduced costs of trading, in addition to the traditional tariff changes. Furthermore, CU is expected to influence the aggregate welfare through improved access to the EU and to the third markets by the reciprocity of the preferential access agreements. Each of the five elements above, result in an increase in Turkish welfare by 0.1%, 0.1%, 0.1%, 0.3%, and 0.5% of GDP, respectively. Improved access to the third markets results in the largest gain of all the components in Turkish welfare **[**De Santis (1998) argue that assuming Turkish exporters would obtain improved access in textiles and apparel, which consists of an exogenous increase in prices received by Turkish exporters to the EU on these goods over-estimate the welfare gains since the quota rents are not annulled**]**. The elimination of the remaining export subsidy incentives program for exports of non-agricultural products destined to the EU only causes a negligible reduction in welfare. Full CU impact produces an annual gain in Turkish welfare equal to 1.1% of GDP.

Moreover, in all the experiments, given the crucial importance in Turkey of reducing fiscal deficit and creating a stable macroeconomic regime, a constraint on government not to increase the budget deficit is imposed. Then, the complementary policies to confront the revenue replacement challenge might be using the VAT rates or export subsidy reduction for all destinations. Within the full CU framework, if the first option is applied, the VAT rates increase by 16.2% in each sector to compensate the revenue loss as a result of implementing the Full CU. Since increases in VAT rates stand as a risk for tax evasion problems, implementing the second policy, too, might be considered. In this case, there is an additional

0.1% of GDP gain in welfare and the VAT rates should only increase by 9.1% instead of 16.2%. Another scenario would be removing all tariffs, subsidies, and taxes other than the VAT, in addition to full CU, and using VAT as a replacement instrument (second best). Then, there exists an improvement of 1.4% of GDP, which amounts to 0.3% increase over the implementation of full CU only; but the existing VAT would increase by 74%. The last option is implementing a uniform VAT in the pervious scenario, which is equivalent to a lump sum tax with no distortions (first best). Here welfare increases by 0.1% over second best but the VAT rate has to increase by only 12.8%.

Another study that examines the economic implications of the CU between Turkey and the EU by applying a general equilibrium model is De Santis (1998). The trade model in the study is a static multi-sector, multi-household, multi-labor applied general equilibrium model. The production technology of 20 sectors is separable CES functions. Import demand and export supply functions are of Armington and CET specification, respectively, with small country assumption. The household sector consists of 20 urban and 19 rural household groups classified according to their income size. Preferences of each consumer group are described by Cobb-Douglas utility functions. Under the assumptions of perfect competition and constant returns to scale, the analysis is based on the input-output table of 1990 with the alternative hypothesis for the labor market: (i) full employment and flexible real wages; (ii) unemployment and fixed real wages; (iii) unemployment and flexible real wages. Different than other studies, it examines the issue with respect to the impact on employment and the distribution of income.

The results suggest that regardless of the assumption postulated for the labor market, textiles, wearing apparel, leather, and fur coats sectors in which Turkey has comparative advantage grow, whereas chemicals and transport equipment contract. Furthermore, the agreement leads to a re-allocation of resources in favor of manufacturing industries, expands trade volume in manufacturing and is not trade diverting. The indirect taxes have to increase by 41.7-46.7% for the budget deficit of the government to remain constant. [This is equivalent to VAT's increasing from the existing level of 15% in 1994 to 21.3%-22%. This rate is computed to increase to 24.6% in Harrison et al. (1996,1997) in the scenario, which is comparable to this analysis].

In aggregate, the welfare effect is modest (+0.5%, -0.2%, +0.6% increase in household income). However, urban (rural) groups are better (worse) off in (iii), while urban (rural)

groups are worse (better) off in the scenarios (i) and (ii). The impact on income inequality is ambiguous; it rises under (iii) whereas it declines under (i) and (ii). However, despite the relatively large fall in tariffs, the impact on overall income inequality is small. Regarding the employment patterns, the model predicts 68.000 new jobs in the (iii) scenario, but a loss of 100.000 jobs in (ii).

The analysis estimates a change in value added of agriculture varying from 3.5% to 5% depending on the scenario. Hence, agriculture is also effected from the CU, although the agreement deals only with the manufacturing sector. Measuring the strength of linkages among agricultural and non-agricultural sectors by using an input-output transaction matrix of Turkey for 1990, Sayan and Demir (1998) obtain a similar result. The idea behind the analysis is that based on the similarity of productive activities carried out by sectors, national input-output matrices may be divided into sub-matrices each representing a broader group of sectors called blocks. The strength of linkages among sectors that belong to different blocks would then show the degree of block interdependence. Their analysis based on a 32-sector aggregated version of the 64-sector IO transaction matrix of Turkey published by Turkish State Institute of Statistics suggest that the sensitivity analyzes conducted provide evidence generally supportive of the argument that agricultural sector in Turkey can not be taken in isolation from other sectors. This, in turn implies that although the agricultural trade is not covered by the CU agreement between Turkey and the EU, the agreement will have considerable impacts on the agricultural sectors as well as the non-agricultural sectors.

In Kose (1996), the model consists of 26 producing sectors, two categories of labor, the import demand, differentiated as the import from the EU and import from the rest of the world and a central government. The model shows a synthesis of the Walrasian and structuralist features of the traditional CGE literature. Inclusion of mark-up pricing enables to represent the monopolistic structures in the industry.

The results of the analysis indicate that changes in the public sector balances and changes in the market behavior of the industry would have definite effects on formation of the impacts of CU process on the national economy. Accordingly, the loss in the disposable public income caused by the CU is about 16%. The positive effect of this process on the national income is released only if the national economy were perfectly competitive and extremely small (0.1%). The changes in the foreign trade, induced by the CU process, are 2% increase in the exports and 1.6% increase in the total imports. Relatively small trade affect expectations, obtained

through the model runs, seem to support the expectations that the trade expansion after the Customs Union process shall be very limited. Under the case of perfect competition, the effect of this process is realized as a 0.01% decrease in the national income (Kose, 1996).

Krueger, et al. (1995) aims to provide an assessment of the probable impact of entry into CU with the EU on the Turkish Industry and the fiscal balances. In the study, nominal and effective protection rates are used in identification of the Most Impacted Industries (MII). Nominal protection rate is simply the officially determined level protection on the commodity, whereas the effective rate of protection is the rate of protection on value added. Effective protection rates are calculated using 1990 input-output tables. The idea behind analyzing protection rates is that the greater the amount of tariff reduction and the smaller the share of imported inputs subject to protection, the more the adjustment will be necessary and difficult.

The results suggest that TEKEL products (tobacco products, spirits and ethyl alcohol, and malt liquors and malt) are among the MII. The largest vulnerable sector both to trade diversion and trade creation outside TEKEL's products is motor vehicles. Non-electrical machinery and equipment, pulp and paper, electrical appliances and housewares, tires and tubes, some of the food processing industries would be vulnerable to competition from imports. The largest potential gainers, on the other hand, would be textile [This is in line with De Santis (1998)[4]] and garment industries. Processed food, glass and glass products, cement, food products, and structural clay products would also gain by experiencing significant cost reductions. The largest reductions in costs of intermediate goods are for petroleum refineries (28%), the chemical-based industries and food products (15%). Glass and glass products may experience 13%, and the producers of carpets and rugs may experience a reduction of 9% on average of cost reductions.

Similar to the technique above, Togan (1997) analyzes the resource allocation effects of CU based on the 1990 input-output table. Calculating the effective protection rates for the years of 1994 (as the period before the formation of the CU) and 2001 (as the period after the formation of the CU when Turkey is supposed to have adopted all of the preferential agreements of the EU), the difference between the two protection rates gives the affects of the

[4] Making comparisons among Krueger, et al. (1995), Togan (1997), and De Santis (1998) might be misleading since the classifications of the sectors and the methods employed are different from each other. However, whether the CU affects the sector positively or negatively is the comparison criteria.

CU on sectoral value added. Accordingly, processed tobacco, non-alcoholic beverages, alcoholic beverages [similar to the findings of Krueger, et al. (1995)], petroleum refining, wood furniture, footwear, plastic products, cement, motor vehicles and wood products might observe reductions in their value added; hence, are most sensitive ten sectors to the adjustment process of the Customs Union. On the other hand, grain mill products, clothing and agriculture [similar to the findings of De Santis (1998) and Krueger, et al. (1995)] might observe increases in their value added.

Togan (1997) estimates that the average annual loss in import tax revenue due to the Customs Union is about $ 2.454 billion. According to Togan, the declining employment sectors will in addition require substantial fiscal resources to ease the burden of adjustment, and thus the development of social safety nets for those who will loose their jobs under increased competition from rest of the world. On the other hand, the harmonization of commercial legislation regarding competition policy, state aids, intellectual and industrial property rights, technical barriers and customs procedures and the effective implementation of these rules will require substantial fiscal resources. If the loss in import taxes revenues is not compensated by an increase alternative tax revenues, public sector borrowing requirements will increase and push the interest and inflation rates upwards. But, as domestic prices increase, the price of importables relative to the prices of domestically produced goods will decrease as long as the rate of depreciation of the exchange rate falls short of the inflation differential between Turkey and rest of the world. This in turn will lead to an increase in imports. On the other hand, one of the main determinants of exports is the price of exportables relative to the prices of domestically produced goods. As long as the rate of depreciation of the exchange rate falls short of the inflation differential between Turkey and rest of the world the increase in domestic prices will lead to a decrease in relative prices and hence in exports. According to Togan (1997), this situation may lead to unsustainable deficits of the external balance.

Krueger, et al. (1995) also investigate the fiscal impact of such a trade union by a CGE analysis which assumes 1992 as the base year. The model is a static general equilibrium model with three regions: Turkey, the EU and the rest of the World. Both the demand side and the supply side of each commodity use the constant elasticity of substitution specification. The simulations suggest that tariff revenues would have been 0.48% of the GDP rather than 1.5% of GDP. [Togan (1997) calculates a reduction of $2.5 billion in total import tax revenues annually]. When VAT are used to compensate for the reductions in tariff revenues, the VAT revenues would increase from its 11.2% of GDP level to 12.6% of GDP. Hence,

overall, there would be an increase in government revenue equal to approximately 0.5% of GDP.

The common conclusion emerging from all the studies up to now are that the Customs Union will overall have a small impact on welfare in Turkey. However, if trade reform was pursued further and non-tariff barriers on European trade are removed, the policy leads to an improvement in the welfare. Since the Customs Union changes the effective protection rates and the terms of trade, sectors producing textiles and food products would be positively affected. On the other hand, chemicals, TEKEL products and motor vehicles sectors would be adversely affected by the Customs Union.

## 3.2. Model Simulations

This section provides some new simulation results with a multinational general equilibrium model of the world economy.

### *3.2.1. A Brief Description of the Model*[5]

The model used in this study is a multinational general equilibrium model with imperfect competition. This type of economic modelling is an important tool for analysing a great number of economic issues. It is extremely useful to policy makers dealing with issues of multilateral liberalisation of international trade, regional integration of economies and the consequent implications for energy and environmental standards. Applied general equilibrium models are now widely used in economic policy analyses by all the major international institutions such as the World Bank, the OECD, the European Commission, the World Trade Organisation, the UNCTAD, etc. This widespread use is explained by the capability of AGE models to provide an elaborate and realistic representation of the economy including the linkages between all agents, sectors and other economies. This complete coverage allows a unique insight into the effects of changes in the economic environment throughout the whole economy.

Global AGE models very often include an enormous number of variables, parameters and equations. The origin of the standard model used in this study lies in the Global Trade Analysis Project (GTAP) (Hertel et al., 1997). The standard GTAP model is a multiregion, computable general equilibrium model, with perfect competition and constant returns to scale. Bilateral trade is handled via the Armington assumption. Innovative aspects of this model include: the treatment of private household preferences using the non-homothetic CDE functional form, explicit treatment of international trade

[5] This section provides large excerpts from Francois (1998), Hertel (1997), and Swaminathan and Hertel (1996).

and transport margins, and a global banking sector which intermediates between global savings and consumption. Technical details of the standard model are documented in Hertel (1997).

The regional and sectoral disaggregations used in this study are provided in the Annex 2 of this study.

The standard implementation of the GTAP model assumes perfect competition in all industries. However, this specification is not relevant for many sectors especially in trade liberalisation analysis. It is therefore important to take into account imperfect competition and endogenous product differentiation. A casual look at a modern market economy is sufficient to conclude that consumption and production are complex phenomena. With millions of consumers, it is natural to expect preferences to be very diverse. Firms respond to this diversity by producing differentiated products of the same good. When viewed as an aggregate grouping, this is often termed a *love of variety*. Firms have an incentive to incur fixed costs related to R&D and marketing, in order to establish their product as differentiated - in the eyes of the consumer. The existence of this fixed cost makes the market for this product imperfectly competitive on two counts: firms cannot adopt marginal cost pricing, and they do not produce a homogeneous good: both deviations from the perfectly competitive behaviour. Assuming that production occurs at constant returns to scale, then firms experience-increasing returns to scale in sales. One of the important properties of this type of a market is that the share of total costs devoted to R&D and marketing activities will be directly related to the degree of preference heterogeneity. The more diverse are individual consumers, the greater the demand for variety, and the greater the scope for marking up the price of the differentiated product. It is this mark-up over marginal cost, which allows firms to recoup the fixed costs associated with their marketing and R&D activities.

The theoretical literature on imperfect competition is characterised by a myriad of models, ranging from monopoly, to oligopoly, and to monopolistic competition. Recent advances in industrial organisation theory have proliferated the number of oligopoly models. Theoretically elegant and mathematically complex, these models are difficult to operationalize and are largely unsuitable for multinational AGE models, as they require information on the nature of strategic interaction between firms in the imperfectly competitive industry, which is simply not available at the level of aggregation in most AGE models. Chamberlin's monopolistic competition has been widely used in AGE models. What makes this market structure appealing is the large group assumption, which permits us to abstract from inter-firm rivalry.
The monopolistically competitive industry is characterised by scale economies and firms producing differentiated products.

Products are said to be differentiated when they are imperfect substitutes in demand, although produced by firms within the same industry. A point to note here is that if an industry j is monopolistically competitive in a region r, then so it is in all other regions modelled. Again, due to the lack of data on firms' sales, we are forced to assume that firms producing differentiated products in any region are symmetric. This allows us to use industry level data, cost shares, quantities etc. to describe the behaviour of the representative firm. The representative firm is thus a scaled down version of the industry as a whole. The firm specific concepts include output per firm and fixed costs.

A firm producing in the monopolistically competitive industry incurs fixed costs to produce a differentiated product. It is appealing to treat the fixed component of costs as arising due to research and development expenditures incurred by the firm to produce a new product as well as marketing and advertisement costs incurred on artificially differentiating an otherwise homogeneous product. There is a one-to-one mapping between varieties and firms. Due to this simplifying assumption, the number of varieties produced is equal to the number of firms in the industry. This falls out of our assumptions that (a) each firm produces only one product (the complexity of the model and calibration procedures is vastly increased if we have firms producing multiple varieties necessitating a different pricing rule for each variety), and (b) any given product is produced by no more than one firm (a firm about to enter the industry would always do better by producing a new product rather than duplicating an existing one). The key thing to note here is that firms producing differentiated products are trying to capture a "niche" in the product space.

### *3.2.2. Firm-level Costs*[6]

In simulation models, the cost structure of firms, and hence of industry, follows from the choice of modelling technique and the observed data to which it is calibrated. One aspect, which has received intense scrutiny in recent years, is returns to scale. Beginning with a study by Harris (1984), a large literature on simulation modelling arose to evaluate trade liberalisation under various specifications of returns to scale. This numerically based research initiative was abetted by the intense parallel interest among trade theorists in applying concepts from industrial organisation to trade theory. Both strains of work on firm-level scale economies confirm a basic conclusion of the earlier literature on trade with industry-wide scale economies - the results of empirical and theoretical work grounded in classical trade theory can be contradicted, in magnitude and/or direction, when scale economies or diseconomies play a significant role in the adjustment process.

[6] From Francois (1998).

The most common departure from constant returns to scale (CRTS) incorporates unrealised economies of scale in production. Increasing returns to scale (IRTS) often takes the form of a monotonically decreasingly average cost function, calibrated to some simple notion of a fixed cost intercept. In other words, one assumes that marginal costs are governed by the preferred CRTS production function (usually CES), but that some subset of inputs are committed a priori to production and their costs must be covered regardless of the output level. The total cost function may be homothetic (i.e. fixed costs involve the same mix of inputs as marginal costs), or alternatively fixed costs may be assumed to involve a different set of inputs. In either case, average costs are given by a reciprocal function of the form

$$AC = \frac{FC}{X} + MC$$

As an alternative, scale economies can also be specified as deriving from costs that enter

$$AC = X^{\phi-1} f(w) \text{ where } 0 \prec \phi \prec 1$$

multiplicatively, with an average cost function like the following:

Where *f (w)* represents the cost function for a homogenous bundle of primary and intermediate inputs. This type of reduced form structure can be derived, for example, from scale economies due to returns from specialisation (i.e. an increased division of labour) inside firms. (See Francois, 1990). In reduced form, it can also represent returns to specialisation on an industry-wide basis of intermediate inputs, resulting in industry-wide scale effects. (See Markusen 1990).

With scale economies as in equation (1) (i.e. with fixed costs), the cost disadvantage ratio (CDR) as defined below will vary with the scale of output. Alternatively, with a cost function like (2), the CDR remains fixed. Under either approach, one "only" needs to calibrate the cost function from engineering estimates of the distance between average and marginal cost. With fixed costs, this also requires some idea about how to impute fixed costs to initial factor and/or intermediate use. In practice, it has become customary to appeal to the concept of a cost disadvantage ratio. This measure of unrealised scale economies is generally defined as

$$CDR = \frac{AC - MC}{AC}$$

For homothetic technologies, output elasticities at the margin with respect to inputs are equal to (1/(1-CDR)).

This specification is based on the observation that, for homothetic technologies, percentage changes in output of X with respect to percentage changes in inputs Z depend on the output elasticity, which equals (1/(1-CDR)).

$$\hat{X} = \left(\frac{1}{1-CDR}\right)\hat{Z}$$

Formally, within a region r, we assume that demand for differentiated intermediate products belonging to sector j can be derived from the following CES function, which is now indexed over firms or varieties instead of over regions. We have

$$q_{j,r} = \left(\sum_{i=1}^{n} \alpha_{j,i,r} X_{j,i,r}^{\rho_j}\right)^{1/\rho_j}$$

where $\alpha_{j,I,r}$ is the demand share preference parameter, $X_{j,i,r}$ is demand for variety i of product j in region r, and $\sigma j = 1/(1- \rho_j)$ is the elasticity of substitution between any two varieties of the good. Note that we can interpret q as the output of a constant returns assembly process, where the resulting composite product enters consumption and/or production. Equation (3) could therefore be interpreted as representing an assembly function embedded in the production technology of firms that use intermediates in production of final goods, and alternatively as representing a CES aggregator implicit in consumer utility functions. In the literature, both cases are specified with the same functional form. For this exercise, we assume both. While we have technically dropped the Armington assumption by allowing firms to differentiate products, the vector of $\alpha$ parameters still provides a partial geographic anchor for production.

In each region, industry j is assumed to be monopolistically competitive. This means that individual firms produce unique varieties of good j, and hence are monopolists within their chosen market niche. Given the demand for variety, reflected in equation (3), the demand for each variety is less than perfectly elastic. However, while firms are thus able to price as monopolists, free entry drives their economic profits to zero, so that pricing is at average cost. The joint assumptions of average cost pricing and monopoly pricing imply the following conditions for each firm fi in region i:

$$\frac{P_{f_i} - MC_{f_i}}{P_{f_i}} = \frac{1}{\varepsilon_{f_i}}$$

$$P_{f_i} = AC_{f_i}$$

The elasticity of demand for each firm fi will be defined by the following conditions.

$$\varepsilon_{j,f_i} = \sigma_j + (1-\sigma_j)\zeta_{j,f_i}$$

$$\zeta_{j,f_i} = \sum_{r=1}^{R} \frac{X_{j,f_i,r}}{X_{j,f_i}} \left[ \sum_{k=1}^{n} \alpha_{j,k,r} \left( \frac{P_{j,k,r}}{P_{j,f_i,r}} \right)^{1-\sigma_j} \right]^{-1}$$

In a fully symmetric equilibrium,

$$\zeta = n^{-1}$$

Under more general conditions, it is a quantity-weighted measure of market share. To close the system for regional production, we index total resource costs for sector j in region i by the resource index Z. Full employment of resources hired by firms in the sector j in region i then implies the following condition.

$$Z_{j,i} = \sum_{f=1}^{n-i} TC_{j,i,f}$$

In models with regionally symmetric firms (so that $Z_{j,i} = n_{j,i}$ x $TC_{j,i}$), together with the definition of AC=AC(x), define a subsystem that determines six sets of variables: x, ε, ζ, P, n, and the cost disadvantage ratio CDR= (1- MC/AC).

***3.2.3.***[7]

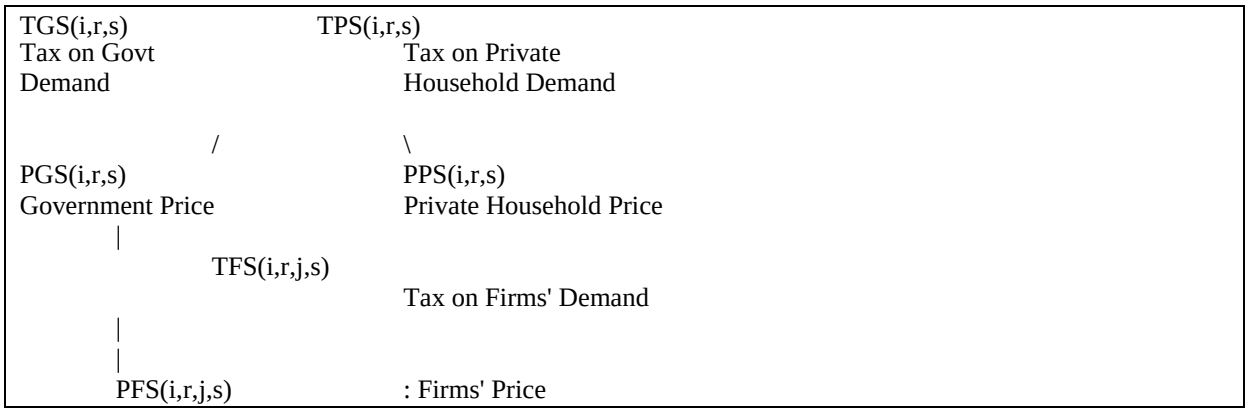
The model retains the Cobb-Douglas functional form for the regional household's utility function and the government's utility function as well as the Constant Difference Elasticity of substitution (CDE) utility structure of the private household. The sub-utility function for composite commodities is the most appropriate level in the utility tree to incorporate the differentiated products.

In the standard model with perfect competition and constant returns to scale, homogeneous commodities are produced by perfectly competitive industries in each region. Due to the Armington assumption, an ad hoc product differentiation scheme is made possible based on the geographical origin of the homogeneous commodity (national product differentiation). The same physical commodity produced in different regions is imperfect substitutes in the demand for a composite imported commodity. The quantity index resulting from the consumption/usage of imports from different sources is termed the composite import. In turn, the composite import, devoid of its geographical origins, imperfectly substitutes for the domestically produced commodity. Thus, sourced imports do not directly compete with the domestic commodity. Also, imports are not sourced directly to the agents. The composite import commodity, formed at the border, is demanded by all the agents in the economy. When firms within the same region produce differentiated products, the geographic origin of a product becomes an issue of lesser importance. Therefore, it makes little sense to leave the import-domestic distinction for monopolistically competitive industries producing differentiated products.

**Table 3.2. Price Linkages (i: sector, r and s: regions)**

PS(i,r) : Producer Price
|
|
TO(i,r) : Output Tax
||
PM(i,r) : Market Price
|
| TXS(i,r,s) : Export Tax
|
|PFOB(i,r,s) : World Price of Exports
||
PT : Transport Margin
||
PCIF(i,r,s) : World Price of Imports
||
TMS(i,r,s) : Import Tax
|
|
PMS(i,r,s) : Market Price of Imports
/ | \
/ | \

[7] From Swaminathan and Hertel (1996).




In the representative consumer approach, an aggregate utility function is used to represent the consumption of all varieties. To capture the effect of variety on utility, the average consumer's utility is defined over the quantities of the different varieties consumed and the total number of varieties consumed. The effect of additional variety on utility is positive. As the number of varieties of a differentiated commodity increases, the sub-utility derived from their consumption increases, even if the quantity consumed remains the same. Additional variety has a negative effect on unit expenditure. At constant prices, an increase in the number of varieties lowers the amount of expenditure necessary to attain a unit of utility.

### *3.4.2. Simulation Experiments*

Five simulation experiments have been carried out for this study:

***EXP1SR**: Customs union (tariff harmonisation), short-run effects*
In this experiment we investigate the short-run effects of tariff harmonisation and trade liberalisation between the EU and Turkey in the non-agricultural sectors. EFTA countries have also been taken into account. This experiment focuses on the short-run effects. This means that in this experiment we do not take into account any capital accumulation effects.

***EXP2LR**: Customs union (tariff harmonisation), long-run effects*
This experiment is similar to EXP1SR except that in this case we allow for capital accumulation effects in the long run.

***EXP3LR**: Customs union + risk reduction, long-run effects*
In addition to the long-run capital accumulation and trade liberalisation effects of the Customs Union, this experiments takes into account the effects of foreign capital inflows into Turkey due to a reduction in the risk premium.

Because of economic imbalances, large deficits and debt, as well as ongoing political instability, Turkey currently pays a very high risk premium (represented by a large spread) in the international financial markets. The current political and economic instability discourages foreign investment in Turkey.

In this experiment we assume that as a logical continuation of the customs union, Turkey will, in the long run, proceed with the necessary economic and institutional reforms. This progress will increase Turkey's credibility in the international financial markets and the risk premium will decline. A decline in the risk will increase the foreign capital inflow to Turkey and capital accumulation.

***EXP4LR**: Customs union + technological shock, long-run effects*
In this experiment we assume that following the Customs Union, the Turkish economy will, in the long run, benefit from a technical change that will improve labour and capital productivity in all sectors.

***EXP5LR**: Customs union + risk reduction + technological shock, long-run effects*
This simulation is the ideal long-run scenario that combines a reduction in the risk premium with the technical change in the Turkish economy.

### *3.4.3. Simulation Results*

Tables A1 through A32 in the appendix provide the detailed simulation results. Given many uncertainties regarding the parameters and available data, these results should be interpreted with care. The figures should not be taken for absolute numbers but should be considered in their relative magnitudes and as directions of change. The figures in the following tables do **not** provide what has actually happened in the Turkish economy since the entry into force of the Customs Union. The experiment results represent what would happen if everything else (except the entry into force of the Customs Union) remained constant in the world. Naturally, this is purely a theoretical abstraction. Model simulations do not represent real life as it is. In reality, things change all the time. In our case, many things have changed in Turkey and in the World since January 1, 1996. All these changes have had small or large effects on the economy. What has actually happened in the Turkish economy (at the micro and macro levels) since January 1, 1996 has been the result of these domestic and international developments. This is why the simulation results should not be crudely compared to the published macro or sectoral data. Observed economic data are the outcome of the combined effect of tens of thousands of dynamic events and of their feedback. Therefore, what we observe in the recent economic data is **not** the result of the Customs Union alone. For instance, the Table 4 below (EXP1SR) indicates that Turkey's GDP has increased by a rate of 0.04%. This shows that the 0.04% of the total increase in the GDP is linked to the Customs Union. In addition to this fact, we have to point out that many sectors of the economy had already taken measures **prior** to the entry into force of the Customs Union. They had adapted their production and investment to the Customs

Union even before January 1, 1996. The model simulations do not take these past changes into account.

These important qualifications been made, we will focus below on the simulation results for Turkey (Tables 3.3 through 3.10).

**Table 3.3: Effects on welfare (in millions of 1995 US$)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| TURKEY | 30.79 | 201.07 | 4350.60 | 3441.41 | 7715.81 |
| EU | -16.83 | -31.57 | -430.41 | -128.65 | -540.40 |
| EFTA | -0.47 | -0.21 | -11.57 | -2.98 | -14.65 |
| CEEC | -1.57 | -0.47 | -24.07 | -8.15 | -32.51 |
| FSU | 3.63 | -1.08 | -31.06 | -4.35 | -35.33 |
| MENA | -2.36 | -3.69 | -64.71 | -10.29 | -71.97 |
| USA | 28.33 | -0.64 | -408.76 | -77.18 | -495.33 |
| CHINA | -66.36 | -83.63 | 208.34 | 14.42 | 309.35 |
| ASIA | 7.05 | -10.24 | -553.12 | -134.50 | -689.92 |
| ROW | 55.42 | -9.42 | -373.68 | -85.08 | -457.75 |

The simulation results show that the overall short-run effects (EXP1SR) of the Customs Union are very small. Welfare improves by only $31 million and real GDP increases by 0.04 percent (Table 1 and 2).

**Table 3.4: Effects on real GDP (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| TURKEY | 0.04 | 0.12 | 3.11 | 2.37 | 5.45 |
| EU | 0.00 | 0.00 | -0.01 | 0.00 | -0.01 |
| EFTA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| CEEC | 0.00 | 0.00 | -0.01 | 0.00 | -0.01 |
| FSU | 0.00 | 0.00 | -0.01 | 0.00 | -0.01 |
| MENA | 0.00 | 0.00 | -0.02 | -0.01 | -0.03 |
| USA | 0.00 | 0.00 | -0.01 | 0.00 | -0.01 |
| CHINA | 0.00 | -0.01 | 0.03 | 0.00 | 0.04 |
| ASIA | 0.00 | 0.00 | -0.01 | 0.00 | -0.01 |
| ROW | 0.00 | 0.00 | -0.01 | 0.00 | -0.02 |

The sectoral output results of experiment EXP1SR (short-run effects) show that the impact is positive on the agricultural, textile, clothing, leather, and mineral products. The most important positive effect is on the textile sector. As a result of the reallocation of the resources of the economy, output declines in the other sectors. The most affected sectors are the machinery, motor vehicles, transport equipment and electronic products. In these sectors capital, skilled and unskilled labour inputs decline (Tables 6,

7, 8). Simulation results (Tables 4 and 5) also show that exports decline in these sectors, whereas they increase in the textile, clothing, leather, paper and plastic, mineral sectors.

**Table 3.5: Effects on output (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | 0.05 | 0.02 | 0.36 | 0.74 | 1.08 |
| Energy and minerals | -0.10 | -0.07 | 0.84 | 0.97 | 1.89 |
| Processed food | -0.02 | 0.05 | 2.18 | 1.82 | 4.00 |
| Textiles | 14.42 | 6.92 | 4.85 | 8.34 | 5.69 |
| Clothing | 3.01 | 1.03 | 1.55 | 2.33 | 2.72 |
| Leather | 3.56 | 1.65 | 5.18 | 4.90 | 8.34 |
| Wood products | -0.26 | -0.05 | 2.96 | 2.20 | 5.29 |
| Paper and plastic | -0.05 | 0.04 | 4.62 | 3.37 | 8.13 |
| Chemical products | -0.48 | -0.53 | 5.06 | 3.48 | 9.28 |
| Minerals | 1.17 | 1.31 | 4.50 | 3.67 | 6.95 |
| Metal products | -1.19 | -0.74 | 7.18 | 4.47 | 12.81 |
| Motor vehicles | -2.21 | -0.87 | 6.77 | 3.84 | 11.77 |
| Transport equipment | -2.30 | -1.61 | -2.48 | -1.53 | -2.46 |
| Electronic | -1.67 | -0.70 | 6.92 | 4.25 | 12.18 |
| Machinery | -4.73 | -3.12 | 13.64 | 7.05 | 25.12 |
| Other manufactures | 0.09 | 0.26 | 3.77 | 2.81 | 6.44 |
| Services | -0.18 | 0.07 | 2.89 | 2.14 | 5.05 |

In the long run, the negative and the positive effects are smaller. After the initial shock, the economy finds a new equilibrium with a better reallocation of resources. With increased capital stocks, and firms being able to adapt themselves to the new conditions in the long run, the short-run negative effects are dampened. In the long run, the positive effects on the textile, clothing and leather industries are also smaller. The economy prefers to invest in some other sectors and as a result the initial short-run positive effects on the agriculture, minerals, and other manufacturing products get stronger in the long run.

**Table 3.6: Effects on exports (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | -0.81 | -1.02 | -8.76 | -5.41 | -13.03 |
| Energy and minerals | -0.04 | -0.52 | -6.09 | -3.37 | -9.05 |
| Processed food | 0.35 | 0.13 | -1.94 | -0.79 | -2.92 |
| Textiles | 19.17 | 9.90 | 6.24 | 10.69 | 6.31 |
| Clothing | 3.99 | 1.28 | 0.76 | 2.12 | 1.39 |
| Leather | 5.98 | 3.19 | 7.29 | 6.98 | 10.91 |
| Wood products | -1.09 | -1.20 | 0.50 | 0.29 | 1.92 |
| Paper and plastic | 2.34 | 2.14 | 7.00 | 5.56 | 10.60 |
| Chemical products | -0.92 | -1.25 | 4.57 | 2.76 | 8.79 |
| Minerals | 8.60 | 8.38 | 11.37 | 10.63 | 13.68 |
| Metal products | -0.49 | -0.29 | 8.37 | 5.26 | 14.43 |
| Motor vehicles | -3.33 | -2.04 | 7.72 | 3.79 | 14.02 |
| Transport equipment | -1.57 | -1.45 | -5.25 | -3.10 | -6.97 |
| Electronic | -2.66 | -1.91 | 8.08 | 4.41 | 14.97 |
| Machinery | -5.25 | -3.90 | 13.42 | 6.48 | 25.26 |
| Other manufactures | 7.41 | 7.35 | 13.23 | 11.17 | 17.27 |
| Services | -0.29 | -0.49 | -0.79 | -0.42 | -0.72 |

**Table 3.7: Effects on imports (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | 1.03 | 0.91 | 6.22 | 4.49 | 10.03 |
| Energy and minerals | 0.02 | 0.21 | 3.93 | 2.87 | 6.73 |
| Processed food | 1.21 | 1.40 | 4.91 | 3.84 | 7.49 |
| Textiles | -4.35 | -1.99 | 0.20 | -1.15 | 1.27 |
| Clothing | -1.52 | -0.26 | 3.06 | 1.67 | 5.18 |
| Leather | -0.11 | 0.25 | -1.30 | -0.72 | -2.20 |
| Wood products | 0.75 | 1.05 | 2.29 | 1.83 | 3.18 |
| Paper and plastic | 0.36 | 0.58 | 1.36 | 1.28 | 2.06 |
| Chemical products | 0.49 | 0.67 | 0.89 | 1.04 | 1.26 |
| Minerals | -0.37 | 0.07 | 0.83 | 0.54 | 1.36 |
| Metal products | 0.29 | 0.57 | 1.19 | 1.16 | 1.72 |
| Motor vehicles | 1.34 | 1.18 | -0.34 | 0.54 | -1.00 |
| Transport equipment | -0.86 | 0.53 | 5.35 | 3.26 | 8.26 |
| Electronic | 0.91 | 1.22 | -0.69 | -0.05 | -1.99 |
| Machinery | 0.22 | 0.96 | 1.15 | 1.16 | 1.19 |
| Other manufactures | -0.07 | 0.51 | -0.14 | 0.18 | -0.44 |
| Services | 0.15 | 0.39 | 3.57 | 2.59 | 5.87 |

In the case of experiment 3 (risk reduction and foreign capital inflow, see Tables A15 through A20 for detailed simulation results) we see that the *long-run* effects of the foreign capital inflow are positive for almost all the sectors. Output expands in all the sectors, except in the transport equipment (Table 5). The increase in the manufacturing products is significant. Table 8 shows that capital formation increases dramatically in many sectors thanks to the availability of foreign capital inflows. As output

expands, exports and imports also increase in most of the sectors. The rise in the exports of many sectors is very important. This simulation shows how vital and urgent it is for Turkey to proceed with the economic and institutional reforms. Only these reforms can allow Turkey to get the huge benefits expected from the customs union. The simulation results show that with increased credibility Turkey can get significant benefits from the customs union. In the simulation experiment EXP3LR, real GDP increases by 3 percent and welfare improves by $4.4 billion, 2.6 percent of GDP in 1995.

**Table 3.8: Effects on capital use (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | 0.07 | 0.05 | 1.18 | 0.74 | 1.89 |
| Energy and minerals | -0.13 | -0.08 | 1.34 | 0.75 | 2.21 |
| Processed food | -0.03 | 0.07 | 3.02 | 1.81 | 4.83 |
| Textiles | 12.67 | 6.14 | 5.41 | 7.57 | 6.35 |
| Clothing | 3.08 | 1.09 | 2.64 | 2.50 | 3.93 |
| Leather | 3.15 | 1.49 | 5.36 | 4.34 | 8.15 |
| Wood products | -0.24 | -0.03 | 3.32 | 1.91 | 5.34 |
| Paper and plastic | -0.06 | 0.07 | 5.61 | 3.42 | 9.17 |
| Chemical products | -0.43 | -0.43 | 5.71 | 3.35 | 9.72 |
| Minerals | 1.02 | 1.20 | 5.23 | 3.53 | 7.67 |
| Metal products | -1.09 | -0.63 | 8.08 | 4.50 | 13.66 |
| Motor vehicles | -1.98 | -0.73 | 7.63 | 3.89 | 12.58 |
| Transport equipment | -2.16 | -1.40 | 0.69 | -0.09 | 2.00 |
| Electronic | -1.51 | -0.60 | 7.30 | 3.99 | 12.19 |
| Machinery | -4.21 | -2.72 | 13.48 | 6.60 | 23.97 |
| Other manufactures | 0.08 | 0.25 | 3.89 | 2.36 | 6.10 |
| Services | -0.22 | 0.11 | 4.60 | 2.63 | 7.27 |

**Table 3.9: Effects on skilled labour use (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | 0.10 | 0.03 | 0.38 | 0.27 | 0.63 |
| Energy and minerals | -0.10 | -0.09 | 0.65 | 0.35 | 1.11 |
| Processed food | 0.11 | -0.01 | -0.71 | -0.36 | -1.08 |
| Textiles | 11.36 | 5.36 | 0.93 | 4.40 | -0.44 |
| Clothing | 2.89 | 0.89 | -1.45 | 0.00 | -2.47 |
| Leather | 2.95 | 1.24 | 0.89 | 1.60 | 1.08 |
| Wood products | -0.06 | -0.10 | -0.86 | -0.51 | -1.28 |
| Paper and plastic | 0.09 | -0.02 | 1.10 | 0.80 | 1.93 |
| Chemical products | -0.24 | -0.46 | 1.19 | 0.74 | 2.39 |
| Minerals | 1.06 | 0.98 | 0.77 | 0.90 | 0.68 |
| Metal products | -0.82 | -0.64 | 3.21 | 1.74 | 5.69 |
| Motor vehicles | -1.61 | -0.73 | 2.82 | 1.21 | 4.78 |
| Transport equipment | -1.77 | -1.33 | -3.12 | -2.25 | -4.10 |
| Electronic | -1.19 | -0.61 | 2.54 | 1.30 | 4.46 |
| Machinery | -3.60 | -2.50 | 7.81 | 3.56 | 14.25 |
| Other manufactures | 0.22 | 0.14 | -0.38 | -0.12 | -0.64 |

| | | | | | |
|---|---|---|---|---|---|
| Services | -0.03 | 0.01 | -0.17 | -0.12 | -0.30 |

Tables A21 to A26 in the appendix (Experiment 4, EXP4LR), show the long-run impacts of a technical change following the Customs Union. In this experiment, we assume that the Customs Union will bring new technologies and know-how to the Turkish economy and will increase productivity. The simulation results confirm the lessons drawn from the experiment 3. The overall impact of a technological change is very positive for the Turkish economy: real GDP increases by 2.4 percent, welfare improves by $3.4 billion (1.9 percent of GDP), output expands, investment increases, etc.

**Table 3.10: Effects on unskilled labour use (in % changes)**

| | EXP1SR | EXP2LR | EXP3LR | EXP4LRr | EXP5LR |
|---|---|---|---|---|---|
| Agriculture | 0.08 | 0.02 | 0.32 | 0.23 | 0.53 |
| Energy and minerals | -0.12 | -0.10 | 0.60 | 0.31 | 1.02 |
| Processed food | 0.00 | -0.03 | -0.98 | -0.57 | -1.53 |
| Textiles | 11.22 | 5.33 | 0.63 | 4.16 | -0.94 |
| Clothing | 2.76 | 0.86 | -1.74 | -0.23 | -2.97 |
| Leather | 2.82 | 1.21 | 0.58 | 1.37 | 0.57 |
| Wood products | -0.18 | -0.13 | -1.16 | -0.74 | -1.79 |
| Paper and plastic | -0.03 | -0.05 | 0.79 | 0.57 | 1.41 |
| Chemical products | -0.36 | -0.49 | 0.88 | 0.50 | 1.87 |
| Minerals | 0.94 | 0.95 | 0.47 | 0.66 | 0.17 |
| Metal products | -0.94 | -0.67 | 2.90 | 1.50 | 5.15 |
| Motor vehicles | -1.73 | -0.76 | 2.52 | 0.98 | 4.25 |
| Transport equipment | -1.89 | -1.36 | -3.41 | -2.48 | -4.59 |
| Electronic | -1.31 | -0.64 | 2.23 | 1.06 | 3.93 |
| Machinery | -3.71 | -2.53 | 7.49 | 3.32 | 13.68 |
| Other manufactures | 0.10 | 0.11 | -0.68 | -0.35 | -1.14 |
| Services | -0.16 | -0.02 | -0.50 | -0.37 | -0.85 |

Experiment 5 combines scenarios 3 and 4. In this ideal scenario, we have the long-run effects of the increase in the credibility of Turkey in the financial markets, as well as an increase in the technical change following the customs union. This simulation exercise show the huge potential benefits of the Customs Union in the long run if Turkey achieves her economic and institutional reforms and if the economy succeeds in implementing new technologies. In this case, real GDP would increase by 5.5 percent in the long run and welfare would improve by $7.7 billion (4.5 percent of GDP). Investment and employment would increase dramatically and produce an important expansion of output and exports.

Experiment 5 provides the most desirable outcome. It clearly confirms the huge potential benefits of further economic integration with the EU. However, the potential benefits would not automatically come true! Only further foreign capital inflow and technological change are able to bring about the

desired results. But, we know that stable and favourable economic and political conditions are indispensable for increased capital inflow and innovation.

As a whole, the simulation results show that the Customs Union has not induced any significant disruptions in the Turkish economy. The short-run effects on output, foreign trade, capital and labour use are rather small. There is no significant trade diversion. The welfare effect is positive. The results show that large gains from the Customs Union are only available in the long run if Turkey provides the favourable framework for capital inflow and technological change, i.e. macroeconomic stabilisation, political stability, and structural reforms. Only these fundamental changes can create the long awaited credibility and stability for a sustainable development.

### 3.5. Conclusion

Before its formal adoption, the Customs Union project gave rise to two major economic concerns in the public debate:

- the possibility of a large trade diversion away from the third countries,
- the danger of an important negative shock to the Turkish economy and the ability of the Turkish companies to stand the challenge.

Four years after the entry into force of the agreement, we fortunately observe that non of these worries have been justified. On the contrary, recent developments have confirmed the large potential positive effects of the Customs Union.

First, the entry into force of the Customs Union between Turkey and the European Union has given a renewed impetus to the liberalisation process in the Turkish trading system and led to far-reaching and comprehensive changes. To implement the Customs Union, Turkey enacted a wide range of reforms in trade policy and related areas such as competition policy and intellectual property rights. As stressed by Hartler and Laird (1999), these reforms locked in the Turkish trade policy with that of the EU thus creating more secure trading conditions not only with the EU but also for the third countries.

In addition to this positive effect, the Customs Union did not generate any important trade diversion away from the third countries. Data for the first four years give no indication of any trade diversion. Before the Customs Union, Turkey's foreign trade was already strongly oriented towards the EU and there has not been any fundamental increase in Turkey's trade with the EU. There has not been any dramatic change in Turkey's trade with the third countries either. Imports from most partners continued to grow. As a result of Turkey aligning its tariff with the EU Common Customs Tariffs (CCT), its simple average applied MFN tariff rate declined from some 26.7 percent in 1993 to 12.7

percent in 1998. Hartler and Laird (1999) find that trade creation has been the dominant feature of the Customs Union. We know that trade creation improves welfare. If we also take into account the dynamic effects, welfare gains can be substantial.

As for the second concern, the Turkish economy in the last four years has not shown any dramatic negative changes due to the Customs Union. The effects of the Customs Union seem to be quite small in the short run. However, this does not mean that the Turkish economy is not and will not be affected by the Customs Union. From the simulation results, it is clear that there will inevitably be some reallocation of resources among the productive sectors and therefore some sectors will expand whereas some others will contract. But the overall changes are small. There are no dramatic negative sectoral or macroeconomic disturbances due to the Customs Union. But, there are inevitably some adjustment costs due to the:

- The loss in tariff revenue,
- The costs related with the development of social safety nets for those who will loose their jobs due to increased competition, and
- The costs associated with the harmonisation of legislation and effective implementation of these rules regarding competition policy, state aids, intellectual and industrial property rights, and technical barriers and customs procedures.

The Customs Union will bring fundamental institutional changes in the Turkish economy given that it involves the harmonisation of Turkey's commercial and competition policies with those of the European Union and it extends most of the EU's trade and competition rules to the Turkish economy. The upgrading of the economic legislation especially in areas of competition regulations and protection of intellectual property rights will create a legislative framework favourable to the development of economic activity. The simulation results show how vital and urgent it is for Turkey to proceed with the economic and institutional reforms that can nourish her credibility in the global economy.

In order to draw all the potential benefits of the Customs Union and of a deeper integration with the EU, Turkey needs urgently to proceed with the long-time awaiting macroeconomic stabilisation. In the past decades, Turkey has achieved a remarkable growth. But the endemic high inflation, high budget deficits, and erratic policy measures prevent the Turkish economy from fulfilling its large growth potential. High real interest rates and explosive interest payments undermine the economy and exacerbate the country’s vulnerability to shocks. The lack of credible commitment to structural reform, political and economic instability prevents foreign investment to flow into Turkey. However, we should point out that macroeconomic adjustment is not enough. Macroeconomic stabilisation can only

be successful and lasting if it is accompanied by a broad range of structural long-term reforms (strengthening of the banking sector, improving the policy-making process, improving the income distribution, restructuring the state-owned enterprises, accelerating privatisation, implementing the acquis communautaires, etc.). Only a long-term fundamental structural reform and political stability can provide a secure and credible framework for a sustainable development, a strong integration with the world economy and a significant inflow of foreign capital and new technology.

## Annex 3.1: Sectoral and Regional Aggregations Used in This Study

### Sectoral Aggregation used in this study

| | |
|---|---|
| Paddy rice | Agriculture |
| Wheat | Agriculture |
| Cereal grains nec | Agriculture |
| Vegetables, fruit, nuts | Agriculture |
| Oil seeds | Agriculture |
| Sugar cane, sugar beet | Agriculture |
| Plant-based fibers | Agriculture |
| Crops nec | Agriculture |
| Bovine cattle, sheep and goats, horses | Agriculture |
| Animal products nec | Agriculture |
| Raw milk | Agriculture |
| Wool silk-worm cocoons | Agriculture |
| Forestry | Agriculture |
| Fishing | Agriculture |
| Coal | Energy & minerals |
| Oil | Energy & minerals |
| Gas | Energy & minerals |
| Minerals nec | Energy & minerals |
| Bovine cattle, sheep and goat, horse meat | Processed food |
| Meat products nec | Processed food |
| Vegetable oils and fats | Processed food |
| Dairy products | Processed food |
| Processed rice | Processed food |
| Sugar | Processed food |
| Food products nec | Processed food |
| Beverages and tobacco products | Processed food |
| Textiles | Textiles |
| Wearing apparel | Clothing |
| Leather products | Leather |
| Wood products | Wood |
| Paper products, publishing | Paper |
| Petroleum, coal products | Other Manufacture |
| Chemical, rubber, plastic products | Chemical |
| Mineral products nec | Mineral |
| Ferrous metals | Metal Products |
| Metals nec | Metal Products |
| Metal products | Metal Products |
| Motor vehicles and parts | Motor vehicles |
| Transport equipment nec | Transport Equipment |
| Electronic equipment | Electronic |
| Machinery and equipment nec | Machinery |
| Manufactures nec | Other Manufacture |
| Electricity | Services |
| Gas manufacture, distribution | Services |
| Water | Services |
| Construction | Services |
| Trade, transport | Services |
| Financial, business, recreational services | Services |
| Public admin and defence, education, health | Services |
| Dwellings | Services |

**Regional Aggregation used in this Study**

| | |
|---|---|
| Australia | Rest of the World |
| New Zealand | Rest of the World |
| Japan | Asia |
| Republic of Korea | Asia |
| Indonesia | Asia |
| Malaysia | Asia |
| Philippines | Asia |
| Singapore | Asia |
| Thailand | Asia |
| Vietnam | Asia |
| China | China |
| Hong Kong | China |
| Taiwan | Asia |
| India | Asia |
| Sri Lanka | Asia |
| Rest of South Asia | Asia |
| Canada | Rest of the World |
| United States of America | United States |
| Mexico | Rest of the World |
| Central America and Caribbean | Rest of the World |
| Venezuela | Rest of the World |
| Colombia | Rest of the World |
| Rest of Andean Pact | Rest of the World |
| Argentina | Rest of the World |
| Brazil | Rest of the World |
| Chile | Rest of the World |
| Uruguay | Rest of the World |
| Rest of South America | Rest of the World |
| United Kingdom | European Union |
| Germany | European Union |
| Denmark | European Union |
| Sweden | European Union |
| Finland | European Union |
| Rest of European Union | European Union |
| European Free Trade Area | European Free Trade Area |
| Central European Associates | Central & East Europe |
| Former Soviet Union | Former Soviet Union |
| Turkey | Turkey |
| Rest of Middle East | Middle East & North Africa |
| Morocco | Middle East & North Africa |
| Rest of North Africa | Middle East & North Africa |
| South African Customs Union | Rest of the World |
| Rest of Southern Africa | Rest of the World |
| Rest of Sub Saharan Africa | Rest of the World |
| Rest of World | Rest of the World |

# 4. Tunisia

## 4.1. Introduction

During the first half of the 1980s, Tunisia registered large current account deficits, induced by the deterioration of world oil prices, the decline of petroleum production and exports, poor agricultural harvest and a fall of tourism receipts. The balance of payments difficulties culminated in 1986 and constrained the country to introduce a far-reaching stabilization and structural adjustment program, under the auspices of the IMF and the World Bank.

The program aimed to initiate a wide range of reforms to reduce government intervention in the economy and strengthen market forces. The inward-oriented import substitution strategy has been replaced by an outward-oriented export-promotion strategy. Accordingly, trade liberalization has been a kingpin of the program. Quantitative import restrictions have been widely replaced by tariffs and the levels of the latter have been lowered and their number reduced.

As taxes on international trade represent a relative important share of government fiscal revenue, the tax system has had to be reformed too, in order to compensate potential government revenue losses resulting from the trade liberalization.[8]

The progress achieved towards trade liberalization allowed Tunisia to join the GATT in 1990, participate, and sign the Uruguay Round agreement in 1993, become a member of the WTO in 1994 and sign a FTA with the European Union in mid-1995.

In addition to the removal of tariff and non-tariff barriers on industrial EU goods, over a period of twelve years, the agreement covers trade rules harmonization of standards and financial and technical assistance to upgrade Tunisian industries and services [The World Bank (1995)]. The aim of the agreement would be to promote growth and employment as a result of an efficient reallocation of primary factors of production between sectors, according to the comparative advantage, and the exploitation of economies of scale permitted by the access to a larger market [Jbili and Enders (1996)].

[8] The program also called other major reforms. See GATT (1994) and the World-Bank (1995) for details.

The FTA requires to eliminate immediately protection on import capital goods from EU, which have not import-competing locally produced goods and which represent 12 percent of imports from EU. Then during the first five years, tariffs should be removed on EU raw materials, which represent 28 percent of Tunisian imports from the same region. During the same period, however import-competing domestic goods are not concerned by the tariff break up. Protection of these latter products will begin to be gradually removed over the 8 remaining years.

As the EU is the most important trading partner of Tunisia, since 70 percent of Tunisian imports come from this region, and given the level of protection on EU imports, the immediate government fiscal revenue losses resulting from customs duties elimination could exacerbate the public deficit, despite the reform and the strengthening of the domestic tax system pursued since the end of the 1980s in order to intensify the role of income and value added taxes as principal sources of government revenue.

The immediate fiscal impact of the agreement will depend, directly on the level of tariffs, the share of imports from EU in total imports, the ratio of tariff receipts from EU imports to total government revenue and on the response of imports to tariff reductions. It will also depend indirectly on the extent of trade diversion, or the degree of substitution between imports from EU and other trading partner, on the degree of substitution between composite imports and import-competing goods locally produced, an on the other tax base. Devarajan et al. (1997) and Devarajan et al. (1999) analyze the direct and indirect government revenue effects of FTA and trade reform.

In the absence of offsetting measures, Abed (1998) estimates that the revenue losses for Tunisia will range from 0.3 percent of 1995 GGP in the first year of the agreement implementation, that is 1996, to 2.6 percent of 1995 GDP in 2008, the twelfth year of the transition period.

The aim of this work is twofold. First, relying on computable general equilibrium (CGE) models, it evaluates the (direct and indirect) impact of the FTA on welfare, government revenue and sectoral adjustments, either by removing protection on manufacturing or all imported goods from EU, while maintaining protection on imported goods from other trading partner not involved in the agreement. Second, it investigates the best tax reform needed to

compensate government revenue losses, without exacerbating internal distortions and deteriorating welfare.

The work is structured as follows. Section 2 gives an overview of the Tunisian tax system. While the analytical framework and the corresponding data base used to evaluate the effects of the FTA between Tunisia and the EU are described respectively in sections 3 and 4. The empirical results are both presented and discussed in sections 5 and 6. Finally, conclusions follow in section 7.

**4.2. An Overview of the Tunisian fiscal system**

Since 1986, in the context of stabilization and structural adjustment program, Tunisia has undertaken a wide range of tariff and tax reforms in order to reduce government intervention and budget imbalances.

Quantitative import restrictions have been gradually removed, as they represent currently only 8 percent of the value of imports and tariffs become the principal instrument of protection. The maximum tariff was reduced from a high rate of 236 percent in 1986 to a rate of 43 percent in 1995. Also, tariff dispersion was narrowed substantially, and the number of rates was lowered to 26. As a result, the average tariff fell from 36 percent in 1986 to 19.6 percent in 1995. In addition, the Tunisian authorities plan to lower the maximum tariff rate to 25 percent by 2001 [La Banque Mondiale (1999)]. The tariffs are expected to fall even more with FTA with EU, as they should be eliminated on industrial imports from EU over a period of 12 years. Numerous exemptions are still granted, leading to revenue losses.

Since tariffs represent a large share of government revenue, trade liberalization and the FTA put pressures on government budget. Hence, a simultaneous deep reform of the tax system was undertaken, especially that until the mid-1980s, Tunisia's tax system was economically distortionary, complicated and difficult to administer, as it was containing a large number of taxes whose scope and rates differed by type of income or sector activity.[9]

**Table 1 : Summary of the Tunisian tax system**

| Tax | Nature of Tax | Exemptions and Deductions | Rates |
|---|---|---|---|
| 1. Rates on individuals income and profits corporations | | | |
| 1-1. Individuals | Levied on individuals income of each taxpayer domiciled in Tunisia.<br>Types of income include wages and salaries; professional income; business profits; profit shares; capital income; and royalty income. | 11 exemptions, mainly: social security and welfare payments; life annuities paid to work-related accident victims; special allowances to cover work-related expenses: interest income from deposits at the national savings fund of Tunisia, from saving deposits for housing, and from bank deposits in foreign currency or convertible Dinars; remuneration of foreign diplomats. | Up to 1500 Dinars 0%<br>[1500 Dinars, 5000 Dinars [ 15%<br>[5000 Dinars, 10000 Dinars[ 20%<br>[10000 Dinars, 20000 Dinars[ 25%<br>[20000 Dinars, 50000 Dinars[ 30%<br>Over 50000 Dinars 35% |
| 1-2. Corporations | Levied on all resident corporations, cooperatives, and non-financial public firms | 7 exemptions, mainly:<br>nonprofit public entities; nonprofit professional associations; mutual funds; service cooperatives in agricultural and fishing activities. | Normal rate 35%<br>Reduced rate 10%<br>(applicable to agricultural and fishing activities, and some service activities.)<br>Reduced rate 20%<br>(applicable to 1st time issuing shares firms on the Tunisian stock market) |
| 2. Social security contributions | | None | Employer 17.50%<br>Employees 7.25% |

**Summary of the Tunisian Tax system (cont.)**

| Tax | Nature of Tax | Exemptions and Deductions | Rates |
|---|---|---|---|
| 2. Tax on payroll and work force | | | |
| 3-1. Vocational training tax | Levied on wages and salaries to enhance vocational training | None | Normal rate: 2%<br>Reduced rate: 1%<br>(for industrial manufacturing jobs) |
| 3-2. Contribution to the " Promotion Fund for Social Housing: FOPRLOS " | Levied on wages and salaries | None. | Unique rate: 1% |
| 4. Indirect Taxes | | | |
| 4-1. Value added tax | Levied on services, imports and wholesale trade, and production activities. | Exports and selected domestic and import goods, such as books, newspapers, milk, olive oil production | Normal rate: 18%<br>Reduced rate: 6%<br>(for services, handcrafts, etc.)<br>Intermediate rates: 10%<br>(for hardware, transport service,..)<br>High rate: 29%<br>(for luxury goods) |
| 4-2. Consumption duties | Levied on selected luxury imported and domestic goods | None | From 10 to 355% |
| 4-3. Tax on insurance contracts | Levied on premiums | Reinsurance, agricultural risk, life insurance, etc. | 5% for navigation and air risk.<br>10% for others risks. |
| 4-4. Motor vehicle tax | Annual levy on motorcycles and cars. | None. | Motorcycles: from 30 to 450 Dinars depending on the engine size.<br>Cars: from 60 to 1800 Dinars depending on their taxable horsepower. |
| 5. Tax on International trade | | | |
| 5-1. Taxes on imports | Levied on wide range on finished and intermediate goods. | Numerous. | From 10 to 43% of the (CIF) import value. |
| 5-2. Export duties | Flat fiscal duty on selected exports | Numerous | 1.5% of the (FOB) export value. |

**Sources: Nsouli (1993), Banque Mondiale (1999), and Thabet (1999).**

The Tunisian tax system was reformed progressively so as to compensate the government revenue losses resulting from trade liberalization during the period 1986-1995 and the FTA with the EU since 1995. As a result, the different indirect taxes on production, consumption and services and other series of excise taxes, were replaced in 1988 by a value-added tax (VAT). The VAT had three rates in 1988 and four rates since 1998: (1) 6 percent on basic consumer goods and services; (2) 10 percent on transport services and hardware; (3) a general rate of 18 percent on most goods and services; (4) 29 percent on luxury goods. [10]The introduction of VATs improved revenue performance, but it still could do better if only minimal exemptions are granted.

Also, since 1994, it still exists 26 consumption *ad valorem* tax rates varying from 10 percent to 355 percent, in addition to high specific consumption tax on petroleum products. Consumption duties are levied, with no exemptions and deductions, on selected luxury imported and locally produced goods, like tobacco, alcohol, beauty, jewellery products and private automobiles.

In 1990, a single personal tax and a new corporate tax have been settled. Under the single personal tax, the number of income brackets was reduced from 18 to 6 and tax rates are ranging from 15 percent to 35 percent.[11] Under the new corporate tax, the six prevailing rates before the reform, differentiated according to economic sector, with a top rate of 44 percent, were replaced by a standard rate of 35 percent and a special rate of 10 percent. In 1999 a second special corporate tax rate of 20 percent has been introduced for firms issuing shares for the first time on the Tunisian stock market.

Since 1988, exemptions and deductions were reduced and the tax administration was strengthened through improvements of collection procedures and tax auditing.

Figures 1 and 2 show the evolution of the fiscal income components and their shares in total fiscal income during 1982-1998.[12] Although the fiscal income increased steadily from 1982 to 1998, its ratio to GDP declined from an average of 30 percent during the first half of 1980s to an average of 25 percent, during the last half of 1995 (figure 2). This is because government reduced its absorption of resources, while improved fiscal performance.

[10] Thabet (1999) provides a list of goods and services submitted to each VAT rate.
[11] See table 1 for the income brackets bounds and a summary of the Tunisian tax system.
[12] Figures 1 and 2 rely on tables A1.1and A1.2 reported in appendix 1.

**Figure 1. Trends in Tax Category Receipt From 1982 to 1998**

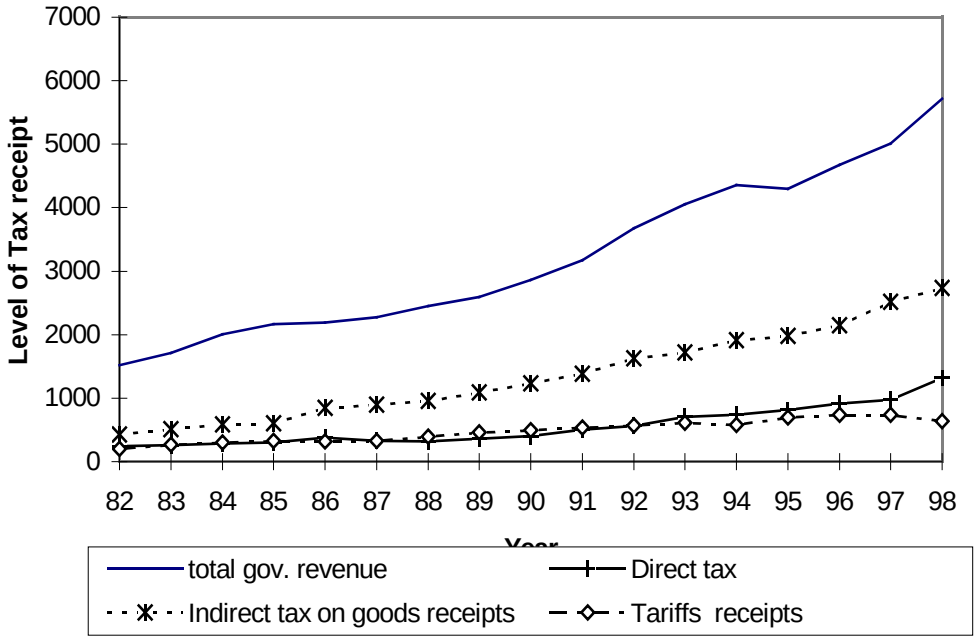
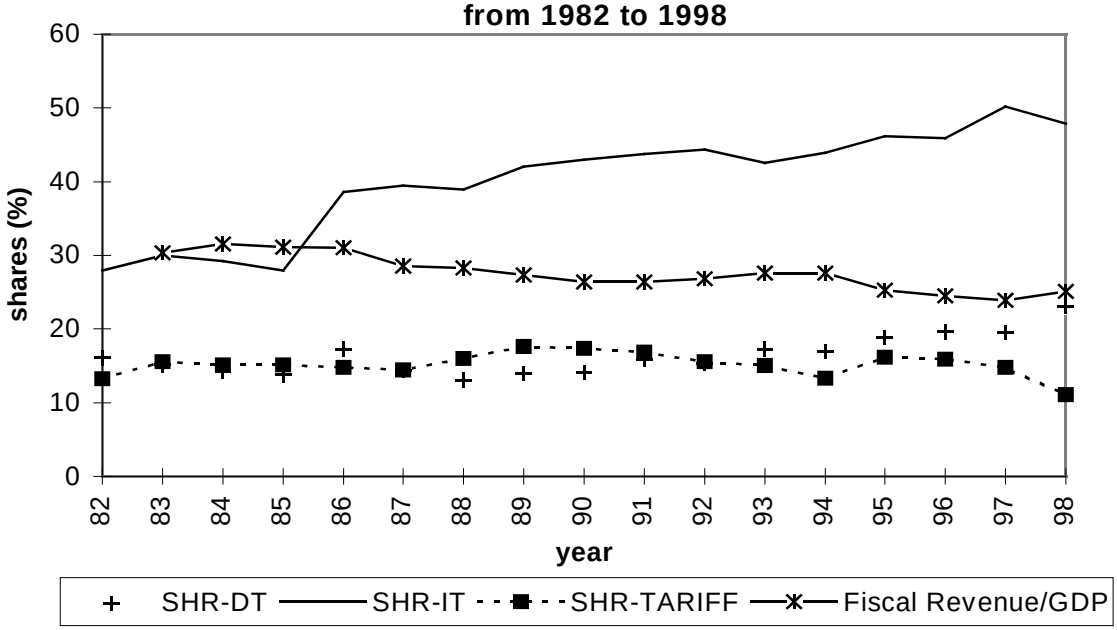



**Figure 2. Trends in Tax Contribution to Government Fiscal Revenue and Share of Fiscal Revenue to GDP from 1982 to 1998**



The fiscal income increase during the period, is explained by an important expansion of indirect taxes on goods and services receipts, these receipts include consumption duties levied on both import and domestic goods and only on imports for which there are no domestic produced substitutes such as private automobiles. Also, the tariff collection continued to increase although at a slow rhythm, since tariffs reductions were self-financing as the volume of imports increased with trade liberalization. In addition, the direct taxes on income receipts begun to increase since 1992 due to better collection and reduction of exemptions and their level exceeded that of customs receipts.

In terms of fiscal revenue composition, the share of indirect taxes on goods and services increased significantly from 27 percent in 1982 to 42 percent in 1989, when the VAT became operational and reached 47 percent during the period 1995-1998. The share of taxes on foreign trade remained however stable around 15-16 percent, despite the lowering of average tariffs and decreased to 14 percent in 1997 then to 11 percent in 1998 when the FTA with EU became operational.

As for the share of direct taxes, it was fluctuating between 13 percent and 15 percent during 1983-1992, and then it increased to reach an average greater than 19 percent during 1995-1997.

In 1996, tariffs on 12 percent of imports from EU have been removed. This reform has concerned capital goods for which there are no produced substitutes in Tunisia. The FTA requires also to remove over a period of 5 years all tariffs on imported raw materials and other inputs. The latter goods represent 28 percent of imports from EU. Tariffs levied on final consumption goods, except for textiles, and which represent 30 percent of imported goods from EU, should also be eliminated progressively over a period of 12 years, while the remaining import, which are substitutes of import-competing locally produced goods should be liberalized progressively after 4 years of the beginning of the agreement, until 2008 the end of the transition period. As for services they are given five years grace, before complete liberalization, whereas agricultural goods are excluded from the FTA.

### 4.3. Description of the small open economy CGE model

In this section we describe Rutherford et al. (1997) standard and widely used single country static CGE model of regional FTA.[13] The model is implemented to quantify the potential fiscal impact of the FTA between Tunisia and EU and investigate the best level of replacement tax to keep government income constant.

A representative household who receives income from wages and capital revenues is considered. Given this income, the representative household decides how to allocate its budget between final consumption and saving according to a Cobb-Douglas utility function. Hence, the shares of final consumption and saving in income are assumed fixed. In a second step, the final consumption budget is divided across the different composite consumption goods so as to minimize total final consumption expenditures subject to a CES aggregation function. The demands for each composite consumption good are then dependent.

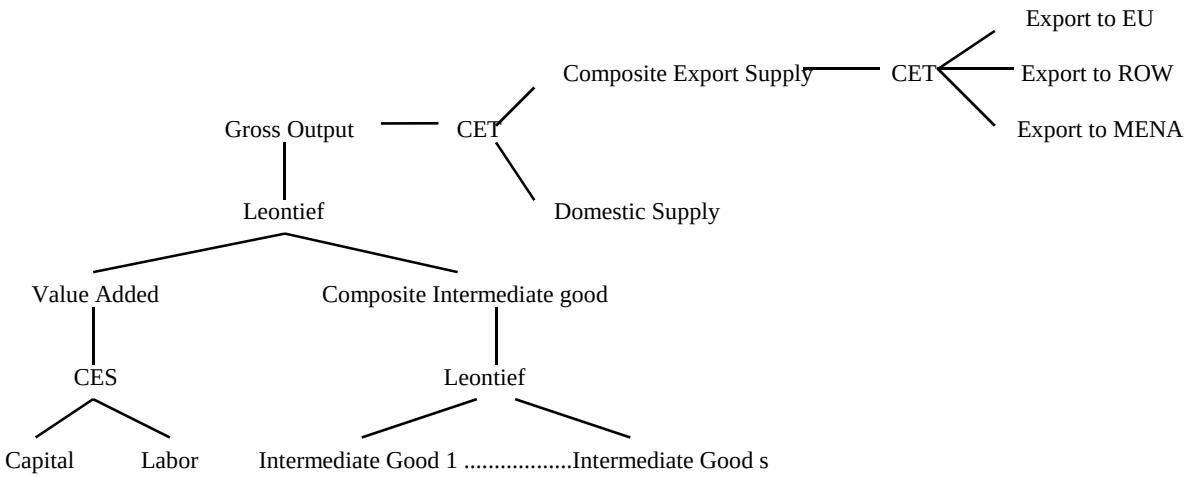
Producers also demand composite consumption goods for intermediate use, according to a Leontief input-output technology; that is, the coefficients of intermediate goods in production are fixed.

The model in addition explicitly features the expenditure flows arising from government behavior and the activities of investors. Indeed, the government maximizes a Cobb-Douglas utility function over saving and final composite consumption goods subject to its given income. Hence both government saving and final consumption demand are fixed proportions of its income. The latter derives from direct and indirect taxes collection. In the Tunisian model the government has three indirect tax instruments: import tariffs, value-added taxes and consumption taxes. As for the investors, the investment demands for the different composite consumption goods are also assumed to be in fixed shares of total investment demand, which is equal to total saving.

Although government and investors' behavior is modeled in a rudimentary fashion, their inclusion is needed to capture their activities in the economy.

[13] The model has also been implemented by Maskus and Konan (1997) and Hoekman and Konan (1999).

**(a) The Production Structure**




**(b) Composite Demand Structure**

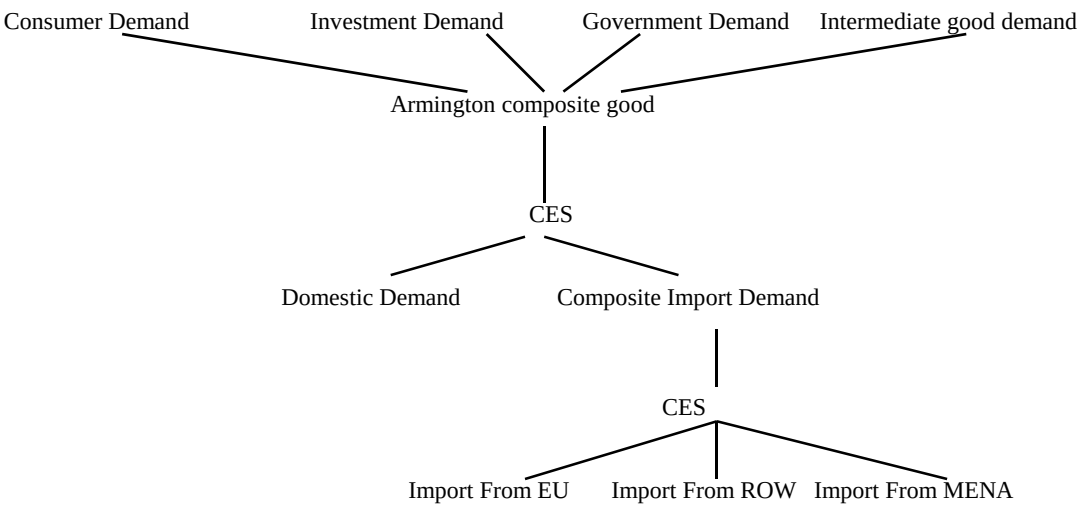



**Figure 1. Model Structure. (a) Production Structure ; (b) Composite Good Demand Structure**

Each composite consumption good is thus a sum of consumer, government and investors final consumption demand and all producers intermediate composite good demands, all derived from an optimizing decision subject to constraints. Following the Armington (1969) assumption, each composite good is a CES aggregation function of domestically produced good and composite imported good. Therefore, domestic and composite imported goods are imperfect substitutes in use, and there is product differentiation at the sectoral level.

Demanders moreover choose the level of imports from different countries of origin. The composite imported good is then supposed to be a CES aggregation function of imported goods from these trading partners. Import supplies of each trading partner are, in addition, assumed to be infinitely elastic, so that the world prices of imported goods are exogenous.

Producers take a multiple-step supply decision. First, they decide on the optimal level of primary factors services to hire and intermediate goods to purchase, so as to minimize production costs, given the technology of production constraints. The production technology is described by a Leontief aggregation function of two composites: a composite of primary factors of production and a composite of intermediate goods. The composite of intermediate goods is also a Leontief aggregation function, whereas the primary factors of production composite is a CES function of capital and labor; the latter factors are hence imperfect substitutes and are also assumed to be mobile between sectors and supplied inelastically.

In a second step, producers choose the optimal amount of output to produce. In the case of constant returns to scale (CRTS) and perfect competition, the optimal production level is determined by equating marginal costs to marginal revenue, where the marginal revenue is the dual to the constant-elasticity-of-transformation (CET) aggregation or equally the composite producer price.

In a final step, producers allocate their output between domestic and composite export sales according to a CET aggregation function. They also decide on how to sell the composite export between different destinations, according to a CET aggregation function. The implementation of the latter specification allows us to incorporate product differentiation at the national level, since exported and locally produced goods and exported goods to different destinations are imperfect substitutes, while keeping the small country assumption for Tunisia on foreign markets. Indeed, analogously with import supplies, export demands of each region

are infinitely elastic and the foreign prices of exports are fixed; terms of trade are thus exogenous. All the functional forms used in the model to describe individuals behavior are summarized in figure 1.

To close the model description, all demand and supply functions are homogenous of degree zero in prices. Hence, only relative prices matter and a numéraire should be chosen to evaluate prices. The labor wage is chosen as numéraire and fixed to one.

In equilibrium, all prices adjust such that excess demands equal zero for all goods and factors, household income is equal to total expenditures and total imports net of total exports are equal to the exogenous value of net foreign capital inflow. Also, by Walras' law, all the equilibrium conditions are not independent. Thus we must omit one redundant equilibrium condition to close the simultaneous equations system, which set of equations and variables is contained in appendix 2.

The above models of competitive market structures have been implemented to replicate the observed data for Tunisia in the base year 1995 and then analyze the impact of the removal by Tunisia of tariffs on imported goods from EU on welfare, government budget and sectoral adjustments.[14]

### 4.4. The Tunisian pattern of production and trade in the reference year

The Tunisian economy in 1995 is desegregated into 22 sectors of which 3 are non-tradable, 18 are tradable and the electricity activity which registers import demand but not export supply. Also, 18 manufacturing sectors are distinguished. The sectoral features of the economy in the reference year are described in table 1.[15]

The first two columns of table 1 indicate the production characteristics of each sector. As can be seen, the sectoral share in GDP [column (1)] reveals that agriculture and (private and public) services provide respectively 14.4 percent and 43.1 percent of 1995 GDP, whereas the contribution of manufacturing activities to total value added represents 34.4 percent and it is dominated by textiles, apparel and leather activities which provide 10 percent of GDP.

[14] The CGE models have been written and run using the MPSGE interface of GAMS software, which implementation is described in Brooke et al. (1992).

[15] The Tunisian production and trade features rely on 1995 social accounting matrix (SAM), that has been constructed using an unpublished input-output table built by the Institut National de la Statistique (INS). Whereas the decomposition of imports by country of origin and exports by country of destination relies on Eby Konan and Maskus (1999).

The weight of primary factors vs. intermediate goods for each sector production is indicated in column (2) by the share of value-added in gross output. Except for agriculture and (private and public) services where the shares of primary factors in production are greater than 69 percent, and water, where primary factors share in output is equal to 56 percent, the remaining sectors show strong inter-industry linkages, with intermediate goods shares in total production exceeding 50 percent. The resource reallocation of primary factors is hence expected in the latter sectors to play relatively a weak role in explaining the output levels resulting from the FTA with EU.

The remaining columns of table 1 give information about the trade orientation of each sector. It can be seen that agriculture, food processing, beverages and tobacco, ceramics, electricity and private services are not the most trade oriented, since both the shares of composite imports in internal demand and composite exports in sectoral output are low.

Most of the manufacturing sectors show, however, high trade shares. These shares increased over time starting in 1986 and following the trade liberalization reform that has been undertaken progressively within the structural adjustment program.

The share of imports in aggregate composite expenditures is greater than 55 percent in non-ferrous metals, agricultural and households materials, transport equipment, electrical machinery, textiles and miscellaneous manufactures. The latter are the most import-oriented sectors in the economy and demand 50.4 percent of total imports.

Four of the 18 manufacturing sectors are the most export-oriented in the economy. Indeed, the composite export share in sectoral output is greater than 40 percent in electrical machinery, electronic materials, textiles apparel and leather and miscellaneous manufactures Together these sectors account for 49.6 percent of total exports, with textiles apparel and leather providing 41.8 of total exports.

**Table 2: Tunisia's pattern of production and trade in 1995 (%)**

| Sectors | $VA_i/GDP$ (1) | $VA_i/X_i$ (2) | $M_i/Q_i$ (3) | $EX_i/X_i$ (4) | $M_{EU}$ (5) | $M_{MENA}$ (6) | $M_{ROW}$ (7) | $EX_{EU}$ (8) | $EX_{MENA}$ (9) | $EX_{ROW}$ (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. AGR** | 14.4 | 78.6 | 20.2 | 4.3 | 39.0 | 06.4 | 54.6 | 68.7 | 22.4 | 08.9 |
| **2. FOO** | 3.2 | 17.5 | 15.8 | 12.5 | 55.1 | 00.3 | 44.6 | 71.9 | 12.5 | 15.6 |
| **3. BET** | 2.3 | 43.4 | 14.5 | 06.0 | 54.8 | 00.2 | 45.1 | 71.9 | 12.5 | 15.6 |
| **4. CCC** | 2.2 | 32.1 | 13.7 | 11.0 | 44.2 | 03.9 | 52.0 | 24.0 | 44.7 | 31.3 |
| **5. NFM** | 0.3 | 13.5 | 61.5 | 19.6 | 62.2 | 31.2 | 06.6 | 70.4 | 25.7 | 03.9 |
| **6. MTP** | 1.3 | 37.8 | 35.8 | 21.6 | 67.8 | 03.4 | 28.8 | 58.8 | 28 .9 | 12.3 |
| **7. AHM** | 1.1 | 46.6 | 78.3 | 20.7 | 75.8 | 00.3 | 23.9 | 80.6 | 09.7 | 09.7 |
| **8. TRE** | 1.2 | 42.8 | 73.2 | 21.0 | 81.4 | 01.1 | 17.5 | 46.5 | 50.3 | 03.2 |
| **9. ELM** | 1.3 | 43.6 | 69.4 | 65.5 | 64.4 | 00.0 | 35.6 | 50.4 | 10.7 | 38.9 |
| **10. ELC** | 0.1 | 10.0 | 75.3 | 41.3 | 63.7 | 00.0 | 36.3 | 50.4 | 10.7 | 38.9 |
| **11. CHM** | 2.7 | 21.4 | 45.6 | 34.3 | 75.5 | 02.8 | 21.7 | 39.2 | 18.3 | 42.5 |
| **12. TEX** | 10.0 | 36.2 | 56.2 | 63.1 | 92.4 | 00.8 | 06.8 | 95.0 | 00.9 | 04.1 |
| **13. WOP** | 2.7 | 40.4 | 29.5 | 05.8 | 63.4 | 07.4 | 29.1 | 31.2 | 52.8 | 16.0 |
| **14. PLS** | 0.5 | 36.3 | 42.5 | 10.6 | 74.2 | 11.4 | 14.4 | 28.0 | 57.9 | 14.1 |
| **15. MIS** | 0.7 | 44.6 | 55.2 | 43.4 | 72.4 | 00.0 | 27.6 | 76.2 | 09.5 | 14.3 |
| **16. MIN** | 0.5 | 43.5 | 16.8 | 33.7 | 36.9 | 29.7 | 33.4 | 86.0 | 02.1 | 11.9 |
| **17. GAS** | 4.3 | 49.2 | 41.0 | 35.3 | 62.2 | 00.3 | 37.5 | 38.7 | 59.1 | 02.2 |
| **18. ELE** | 0.9 | 32.2 | 00.4 | 00.0 | 71.3 | 05.2 | 23.5 | 00.0 | 00.0 | 00.0 |
| **19. WAT** | 0.4 | 56.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 |
| **20. CON** | 6.7 | 37.8 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 |
| **21. PRS** | 26.6 | 61.7 | 08.5 | 14.2 | 71.3 | 05.2 | 23.5 | 78.9 | 09.3 | 11.8 |
| **22.PUB** | 16.5 | 69.5 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 |

**Notes:** AGR = Agriculture and fishing; FOO = food processing; BET = beverages and tobacco ; CCC= cement, ceramics and carrying ; NFM= non-ferrous metals ; MTP= metals products ; AHM= agricultural and households machinery ; TRE= transport equipment ; ELM= electrical machinery ; ELC= electronic materials ; CHM= chemical ; TEX = textile, apparel and leather; WOP = wood and paper; PLS = plastics; MIS = Miscellaneous manufacturing; MIN = mining; GAS= natural gas and petroleum ; ELE= electricity ; WAT= water ; CON= construction ; PRS= private services ; PUB= public services.
Column (1) gives the sector contribution to GDP and column (2) reports the contribution of primary factors to sectoral gross output, while columns (3) and (4) indicate respectively the share of composite imports in composite demand of each good and the share of composite export in composite production of each good. Columns (5)-(7) list respectively the shares of imports from EU, MENA and ROW while columns (9)-(11) give the shares of exports from the latter regions.
**Source** : Author's calculations from 1995 SAM.

The columns (5)-(10) reveal that the EU is a privileged trading partner of Tunisia. As it is shown, an important trade share takes place with the EU and the latter trading partner provides 71.8 percent of Tunisian imports, which contribute through tariffs to 20.5 percent of government revenue, and absorbs 73.8 percent of Tunisian exports. Except for agricultural and cement, ceramics and carrying products, more than 50 percent of the remaining 17 imported composite goods come from EU rather than from the MENA region or the rest of the world (ROW). On the export side, 12 of the 18 exporting sectors sell the most important share of their exports to the EU market. The MENA market receives more than 45 percent of Tunisian exports of cement, ceramics and carrying, transport equipment, wood and paper, plastics and natural gas and petroleum, whereas the ROW represents the most important Tunisian importing partner for chemical products.

**Table 3: Tax rates and receipts composition in 1995**

| | **Tax receipts composition (Millions of Tunisian Dinars)** | | | | **Average Tax rates (%)** | | | |
|---|---|---|---|---|---|---|---|---|
| **Sectors** | TRM_EU | TRM_MENA | TRM_ROW | VAT_R | TR_EU | TR_MENA | TR_ROW | VAT_R |
| **1. AGR** | 35.272 | 2.925 | 47.832 | -6.635 | 15.8 | 7.5 | 15.2 | -0.3 |
| **2. FOO** | 57.042 | -- | 48.008 | 176.283 | 29.8 | -- | 31.3 | 7.9 |
| **3. BET** | 36.728 | -- | 30.911 | 196.772 | 115.7 | -- | 21.5 | 36.3 |
| **4. CCC** | 19.400 | 1.363 | 24.671 | 38.939 | 42.7 | 31.3 | 47.8 | 4.4 |
| **5. NFM** | 62.004 | 3.570 | 7.286 | 9.962 | 28.8 | 2.6 | 33.1 | 3.7 |
| **6. MTP** | 34.524 | 0.204 | 16.267 | 37.840 | 28.7 | 2.7 | 32.9 | 10.2 |
| **7. AHM** | 92.163 | 0.528 | 39.347 | 17.840 | 14.4 | 21.2 | 20.6 | 7.1 |
| **8. TRE** | 174.497 | 3.035 | 39.235 | 15.481 | 32.6 | 46.3 | 34.6 | 5.1 |
| **9. ELM** | 26.653 | -- | 24.505 | 24.765 | 13.0 | -- | 23.6 | 18.5 |
| **10. ELC** | 34.215 | -- | 31.457 | 4.557 | 17.9 | -- | 32.5 | 4.1 |
| **11. CHM** | 139.526 | 2.428 | 44.827 | 41.170 | 21.8 | 9.3 | 25 | 3.5 |
| **12. TEX** | 56.909 | 0.249 | 5.038 | 72.763 | 3.3 | 1.7 | 3.9 | 5.1 |
| **13. WOP** | 53.364 | 1.283 | 20.832 | 10.999 | 27.3 | 4.6 | 22.3 | 1.2 |
| **14. PLS** | 23.717 | 0.598 | 5.593 | 8.952 | 27.5 | 3.7 | 35.6 | 4.7 |
| **15. MIS** | 3.632 | 0.006 | 2.624 | 14.465 | 3.3 | -- | 6.5 | 12.8 |
| **16. MIN** | 2.422 | 0.017 | 0.407 | 5.254 | 36.6 | 0.2 | 5.2 | 4.5 |
| **17. GAS** | 26.620 | 0.104 | 25.370 | 187.783 | 7.8 | 6.5 | 13.0 | 28.5 |
| **18. ELE** | | | | 13.430 | | | | 3.2 |
| **19. WAT** | | | | 9.889 | | | | 9.8 |
| **20. CON** | | | | 92.038 | | | | 3.6 |
| **21. PRS** | | | | 196.091 | | | | 3.7 |
| **22.PUB** | | | | 194.105 | | | | 5.8 |
| **Total receipts** | 878.688 | 16.310 | 414.210 | 1362.743 | | | | |
| **share of tax receipts on government revenue (%)** | 20.5 | 0.4 | 9.7 | 31.8 | | | | |

**Source: Author's calculations from 1995 SAM**

### 4.5. Simulations results of the FTA between Tunisia and EU

Two scenarios are considered. First, tariffs on manufacturing EU imports are eliminated (LIB_MAN_EU). Second, the preferential tariffs removal is extended to all imported goods from EU (LIB_ALL_EU). Both aggregate and sectoral results of each scenario are reported.

The removal of tariffs on manufacturing imports from EU produces welfare gains equal to 6 percent of 1995 GDP, whereas the welfare gains resulting from the removal of tariffs on all imports from EU reaches 6.5 percent of 1995 GDP, as can be seen from table 4.

**Table 4: Aggregate Effects of Tunisia's FTA with EU under the Alternative Scenarios (%) (all elasticities of substitution and transformation are set equal to 2)**

| | LIB_MAN_EU | LIB_ALL_EU |
|---|---|---|
| Welfare change | 6.026 | 6.533 |
| Government revenue (GR) change | -20.169 | -21.876 |
| GR variation/1995 GDP | -5.803 | -6.294 |
| VAT receipts change | -3.948 | -4.84 |
| Tariffs receipts on imports from other regions than EU | -6.062 | -6.502 |
| Income tax receipts change | 14.579 | 14.687 |
| Real exchange rate change | 1.779 | 2.113 |
| Nominal exchange rate | -0.54 | -0.56 |
| Capital price change | 3.237 | 3.44 |

**Notes**: Author's calculations.

The welfare change is measured by the equivalent variation (EV), as a share of the reference year GDP. The change of import prices resulting from the FTA affects the level of welfare reached by the representative consumer and the EV measures the income change, evaluated at the reference year price system, which allows the consumer to reach the same level of welfare as that obtained with the new price system.

To understand the sources of welfare gains, it is useful to have recourse to the following analytical expression of the EV, resulting from a Cobb-Douglas utility function and the multiple-steps consumption behavior, as described in figure 1:

$$EV = \left[ \sum_{i=1}^{s} \beta_i \left( \frac{PQ_{0i}}{PQ_{1i}} \right)^{\rho_i - 1} \right]^{\frac{shrc}{p_i - 1}} YM_1 - YM_0, \qquad (1)$$

where $\beta_i = \frac{PQ_{0i}C_{0i}}{YM_0}$ represents the share of good *i* to total expenditure in the benchmark equilibrium, $\rho_i \geq 0$ is the elasticity of substitution between the different composite consumption goods, $PQ_{0i}$ and $PQ_{1i}$ are respectively the cost of living indexes before and after the FTA, whereas $YM_0$ and $YM_1$ represent respectively the representative consumer's nominal income before and after the chock.

As we can see, any income increase and/or composite consumption price $PQ_i$ decrease, so that $\frac{PQ_{0i}}{PQ_{1i}} > 1$, lead to an increase of the real income and thus of welfare.

It is easy to show by differentiating the composite consumption price $PQ_i$, which analytical expression is given by equation A1.19 in appendix 2, that its change is equal to:

$$\frac{PQ_{1i}}{PQ_{0i}} = \left[\theta_i \left(\frac{PD_{1i}}{PD_{0i}}\right)^{1-\sigma_i} + (1-\theta_i)\left(\frac{PM_{1i}}{PM_{0i}}\right)^{1-\sigma_i}\right]^{\frac{1}{1-\sigma_i}} \qquad (2)$$

where $\theta_i = \frac{PD_{0i}DD_{0i}}{PQ_{0i}Q_{0i}}$ represents the share of domestic good to the internal demand of the composite good in the reference year, whereas $PM_i$ and $PD_i$ are respectively the prices of the composite imported good (from EU, MENA and ROW) and of the domestic good. Any decrease of the domestic and composite import prices leads to a fall of the composite consumption price index and hence to welfare gains.

From expressions (1) and (2), it is clear that the aggregate effect of the FTA on welfare depends on the adjustments at the sectoral level.

As can be seen from tables 5 and 6, the removal of tariffs on (manufacturing or all) imports from EU reduces their prices (column 1) and increases their level (column 2). As a result consumer's welfare improves.

The prices of imports from MENA and ROW decrease too by 0.54 (0.56) percent in the first (second) scenario, as the nominal exchange rate appreciates and shifts downward the perfectly elastic import supplies of the latter trading partners, and contribute to improve welfare. However, as it is shown in columns (3) and (4) of tables 5 and 6, except for few imported

goods, the general tendency is towards a fall of the levels of imports from ROW and MENA. As the diminution of import prices from EU is more important, the representative consumer and the other demanders in the economy (investors and firms) substitute EU imports for MENA and ROW imports; these are the trade diversion effects. The more substitutes are import goods from different sources, the larger are the trade diversion effects.

The welfare change also depends on the evolution of import competing domestic goods prices. As the price of EU imports decreases, the consumer and the other demanders of the economy substitutes in addition EU goods for the locally produced goods. This results into an excess supply of domestic goods, which is eliminated by a reduction of the domestic goods price. However, further to this substitution effect, the domestic goods price reacts to a change of the production costs.

Except for agriculture and services, the remaining sectors of the economy as it has been said above are intensive intermediate goods users. When the prices of imports and domestic goods decrease, the cost of intermediate goods reduces. As the weight of intermediate goods in production are greater than 55 percent, the overall production costs diminish resulting into a more important fall of domestic goods price (column 6 of tables 5 and 6) but also into a decrease of export goods price. Whereas the substitution effect in consumption leads to a reduction of the domestic goods production, the production cost effect results, in intensive intermediate goods users sectors, into an expansion of domestic goods production but also of exports.

**Table 5: Sectoral effects of the preferential removal of tariffs on manufacturing imports from the EU (%)**

| sectors | $PMR_{EU}$ 1 | $MR_{EU}$ 2 | $MR_{MENA}$ 3 | $MR_{ROW}$ 4 | $M_i$ 5 | $PD_i$ 6 | $DD_i$ 7 | $PQ_i$ 8 | $Q_i$ 9 | $EX_i$ 10 | $LD_i$ 11 | $KD_i$ 12 | $XS_i$ 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. AGR** | -0.54 | 0.14 | 0.14 | 0.14 | 0.14 | 1.91 | -4.62 | 1.4 | -99.97 | -9.16 | 0.66 | -5.55 | -4.81 |
| **2. FOO** | -23.38 | 62.81 | -3.38 | -3.38 | 30.94 | -0.11 | -4.23 | -2.71 | -99.96 | -5.06 | -0.42 | -6.57 | -4.34 |
| **3. BET** | -53.89 | 342.68 | -4.84 | -4.84 | 153.91 | -1.62 | -2.75 | -9.66 | -99.87 | -0.62 | -1.5 | -7.58 | -2.58 |
| **4. CCC** | -30.31 | 86.88 | -8.25 | -8.25 | 29.62 | -1.91 | -5.67 | -4.18 | -99.91 | -3.02 | -1.57 | -7.65 | -5.37 |
| **5. NFM** | -22.80 | 34.6 | -18.9 | -18.9 | 12.78 | -11.17 | 1.65 | -13.99 | -99.85 | 27.43 | 8.62 | 1.91 | 7.09 |
| **6. MTP** | -22.72 | 41.02 | -14.86 | -14.86 | 21.48 | -7.92 | -0.68 | -11.28 | -99.83 | 15.87 | 6.99 | 0.39 | 3.28 |
| **7. AHM** | -13.1 | 13.42 | -13.41 | -13.41 | 6.58 | -6.63 | -1.76 | -9.57 | -99.91 | 11.46 | 2.29 | -4.02 | 1.21 |
| **8. TRE** | -24.98 | 50.63 | -14.29 | -14.29 | 37.18 | -10.09 | 4.87 | -18.65 | -99.89 | 28.33 | 13.64 | 6.63 | 10.20 |
| **9. ELM** | -11.98 | 41.05 | -- | 10.47 | 29.73 | -15.47 | 52.92 | -10.56 | -99.74 | 111.69 | 102.65 | 90.14 | 94.57 |
| **10. ELC** | -15.64 | 41.79 | -- | 2.01 | 26.62 | -19.40 | 55.32 | -13.04 | -99.72 | 136.49 | 92.97 | 81.06 | 91.71 |
| **11. CHM** | -18.36 | 34.81 | -9.17 | -9.17 | 23.24 | -10.13 | 11.25 | -12.23 | -99.95 | 36.26 | 24.42 | 16.74 | 20.32 |
| **12. TEX** | -3.69 | 18.44 | 11.06 | 11.06 | 17.87 | -4.94 | 21.57 | -4.11 | -99.96 | 33.08 | 33.11 | 24.89 | 29.02 |
| **13. WOP** | -21.89 | 45.89 | -10.03 | -10.03 | 23.88 | -3.47 | -4.50 | -7.27 | -99.92 | 1.37 | -0.04 | -6.21 | -4.15 |
| **14. PLS** | -22 | 48.58 | -8.62 | -8.62 | 32.49 | -6.45 | 3.29 | -11.44 | -99.67 | 16.76 | 9.48 | 2.72 | 4.82 |
| **15. MIS** | -3.73 | 9.76 | -- | 2.85 | 7.83 | -4.83 | 12.32 | -3.76 | -99.61 | 22.67 | 22.34 | 14.79 | 17.18 |
| **16. MIN** | -0.54 | 19.5 | 19.5 | 19.5 | 19.5 | -0.62 | 19.67 | -0.6 | -99.18 | 19.85 | 23.39 | 15.77 | 19.73 |
| **17. GAS** | -0.54 | 1.38 | 1.38 | 1.38 | 1.38 | 2.49 | -4.53 | 1.22 | -99.93 | -10.10 | -1 | -7.11 | -6.81 |
| **18. ELE** | -0.54 | 1.31 | 1.31 | 1.31 | 1.31 | -0.31 | 0.84 | -0.31 | -99.77 | -- | 5.28 | -1.22 | 0.84 |
| **19. WAT** | -- | -- | -- | -- | -- | -0.07 | -1.48 | -0.07 | -99.11 | -- | 1.98 | -4.31 | -1.48 |
| **20. CON** | -- | -- | -- | -- | -- | -3.31 | -1.11 | -3.31 | -99.96 | -- | 1.61 | -4.66 | -1.11 |
| **21. PRS** | -0.54 | 0.32 | -0.32 | -0.32 | 0.32 | 0.88 | -2.94 | 0.76 | -99.98 | -5.23 | 1.38 | -4.88 | -2.89 |
| **22.PUB** | -- | -- | -- | -- | -- | -1.1 | -18.45 | -1.1 | -99.98 | -- | -18.45 | -- | -18.45 |

***Notes :*** $PMR_{EU}$ is the local price of imports from EU, $MR_{EU}$ is the quantity of import from EU ; $MR_{MENA}$ is the quantity of imports from MENA ; $MR_{ROW}$ is the quantity of imports from ROW, ***M*** is the quantity of composite import ; ***PD*** is the local price of the domestic produced good ; ***DD*** is the quantity of the produced domestic good ; ***PQ*** is the price of composite consumption good ; ***Q*** is the local absorption ; ***EX*** is the level of composite export ; ***LD*** is the level of labor demand ; ***KD*** is level of capital demand ; ***Q*** is the level of total sectoral production.

***Source : Author's calculations***

**Table6 : Sectoral effects of the preferential removal of tariffs on all imports from EU (%)**

| Sectors | $PMR_{EU}$ 1 | $MR_{EU}$ 2 | $MR_{MENA}$ 3 | $MR_{ROW}$ 4 | $M_i$ 5 | $PD_i$ 6 | $DD_i$ 7 | $PQ_i$ 8 | $Q_i$ 9 | $EX_i$ 10 | $LD_i$ 11 | $KD_i$ 12 | $XS_i$ 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. AGR** | -14.137 | 32.937 | -0.885 | -0.885 | 11.715 | 1.810 | -5.447 | 0.051 | -99.97 | -9.799 | 0.145 | -6.406 | -5.63 |
| **2. FOO** | -23.40 | 61.806 | -3.987 | -3.987 | 30.131 | -1.122 | -2.897 | -3.523 | -99.96 | -1.788 | 1.49 | -5.149 | -2.74 |
| **3. BET** | -53.897 | 341.140 | -5.176 | -5.176 | 153.022 | -1.918 | -2.532 | -9.886 | -99.87 | 0.186 | -1.16 | -7.626 | -2.313 |
| **4. CCC** | -30.323 | 85.391 | -8.979 | -8.979 | 28.590 | -2.517 | -5.289 | -4.681 | -99.91 | -1.449 | -0.789 | -7.278 | -4.846 |
| **5. NFM** | -22.814 | 34.918 | -18.712 | -18.712 | 13.046 | -11.871 | 3.491 | -14.252 | -99.85 | 31.760 | 11.129 | 3.858 | 9.475 |
| **6. MTP** | -22.734 | 41.365 | -14.651 | -14.651 | 21.780 | -8.087 | -0.101 | -11.389 | -99.83 | 16.929 | 7.948 | 0.886 | 3.979 |
| **7. AHM** | -13.115 | 13.107 | -13.65 | -13.65 | 6.289 | -6.704 | -1.903 | -9.598 | -99.92 | 11.441 | 2.243 | -4.445 | 1.092 |
| **8. TRE** | -24.993 | 50.223 | -14.529 | -14.529 | 36.807 | -10.121 | 4.621 | -18.664 | -99.89 | 28.063 | 13.596 | 6.165 | 9.947 |
| **9. ELM** | -11.997 | 41.501 | -- | -- | 30.141 | -15.623 | 53.924 | -10.629 | -99.74 | 113.787 | 105.028 | 91.616 | 96.356 |
| **10. ELC** | -15.657 | 41.721 | -- | -- | 26.549 | -19.539 | 55.725 | -13.087 | -99.72 | 137.851 | 93.903 | 81.219 | 92.555 |
| **11. CHM** | -18.375 | 36.027 | -8.347 | -8.347 | 24.356 | -11.081 | 14.624 | -12.736 | -99.95 | 43.352 | 29.607 | 21.129 | 25.075 |
| **12. TEX** | -3.710 | 19.085 | 11.66 | 11.66 | 18.510 | -5.158 | 22.747 | -4.220 | -99.96 | 34.936 | 35.042 | 26.208 | 39.638 |
| **13. WOP** | -21.912 | 45.795 | -10.094 | -10.094 | 23.800 | -3.556 | -4.421 | -7.333 | -99.92 | 1.609 | 0.307 | -6.254 | -4.060 |
| **14. PLS** | -22.016 | 48.690 | -8.552 | -8.552 | 32.591 | -6.699 | 3.877 | -11.577 | -99.69 | 17.996 | 10.467 | 3.241 | 5.484 |
| **15. MIS** | -3.744 | 9.809 | -- | -- | 7.877 | -4.959 | 12.625 | -3.829 | -99.61 | 23.292 | 23.144 | 15.088 | 17.630 |
| **16. MIN** | -27.196 | 118.992 | 17.386 | 17.386 | 51.256 | -1.192 | 18.893 | -3.270 | -99.15 | 20.420 | 23.301 | 15.235 | 19.423 |
| **17. GAS** | -7.792 | 13.032 | -2.812 | -2.812 | 6.906 | 1.447 | -6.619 | -1.384 | -99.93 | -10.278 | -2.026 | -8.435 | -8.117 |
| **18. ELE** | -0.56 | 0.025 | 0.025 | 0.025 | 0.025 | -1.524 | 1.993 | -1.520 | -99.77 | -- | 1.697 | -0.215 | 1.993 |
| **19. WAT** | -- | -- | -- | -- | -- | -0.259 | -1.433 | -0.259 | -99.11 | -- | 6.769 | -4.439 | -1.433 |
| **20. CON** | -- | -- | -- | -- | -- | -3.481 | -1.111 | -3.481 | -99.96 | -- | 2.250 | -4.882 | -1.111 |
| **21. PRS** | -0.56 | 0.091 | 0.091 | 0.091 | 0.091 | 0.742 | -2.480 | 0.630 | -99.98 | -4.985 | 1.776 | -4.956 | -2.845 |
| **22.PUB** | -- | -- | -- | -- | -- | -1.235 | -19.997 | -1.235 | -99.98 | -- | -19.997 | -- | -19.997 |

***Notes :*** $PMR_{EU}$ is the local price of imports from EU, $MR_{EU}$ is the quantity of import from EU ; $MR_{MENA}$ is the quantity of imports from MENA ; $MR_{ROW}$ is the quantity of imports from ROW, ***M*** is the quantity of composite import ; ***PD*** is the local price of the domestic produced good ; ***DD*** is the quantity of the produced domestic good ; ***PQ*** is the price of composite consumption good ; ***Q*** is the local absorption ; ***EX*** is the level of composite export ; ***LD*** is the level of labor demand ; ***KD*** is level of capital demand ; ***Q*** is the level of total sectoral production.

***Source : Author's calculations***

As can be seen from columns (7), (10) and (13) of tables (5) and (6), the production cost effect of the FTA, that reduces domestic and export prices while allows for an expansion of production destined for local sale and export, is dominant for 8 manufacturing sectors. especially textiles, electrical machinery and electronic materials. The FTA is harmful for agriculture and services, as they are primary factors intensive and the cost of the latter expands. The consumption substitution effect adds to the negative production costs effect to lessen both prices and level of domestic and export goods. As for food processing and beverage and tobacco, their evolution is closely related to the fate of agriculture.

It goes without saying that the fall of domestic goods price intensifies the positive effect on welfare.

While the FTA with the EU has a positive effect on welfare, it has a negative effect on government revenue. In a model with public goods provision, the government revenue losses could result into welfare losses, as the supply of public goods diminishes.

As it is shown in table 4, the government revenue losses are equal to 20.2 percent in the first scenario and 21.9 percent in the second scenario, which is equivalent to 5.8 percent and 6.3 percent of 1995 GDP. The difference between the two results is not important as the contribution of tariffs on agriculture, mining and petroleum and gas imports, which are not concerned by the FTA in the first scenario, represents only 4.2 percent of 1995 government revenue. These results are greater than those obtained by Abed (1998), who does not consider indirect effects on fiscal revenue captured through a CGE model, and Devarajan et al. (1997), who consider a high aggregate model.

The government revenue losses are explained in grand part by the disappearance of tariff receipts on imports EU which ratio to total revenue is equal to 20.5 percent in 1995. However, as the prices and quantities of imports from other trading partners shrink, by substitution effect or trade diversion effect, the value of tariffs receipts on these imports decreases by 6 and 6.5 percent. Since, in Tunisia the VAT applies only on domestic sales and exports are exempt from this indirect tax, and as the domestic goods price decrease is accompanied by a contraction of domestic sales in 9-10 sectors, through a dominant substitution effect in consumption, whereas the domestic goods price decrease is accompanied by an expansion of domestic sales, through a dominant production cost effect in 10 sectors, the VAT receipts reduction is moderate and equal to 3.9 percent (4.8 percent) in the first (second) scenario.

The receipts from direct taxes on consumer's revenue expand however by 14.6 percent, as the nominal representative consumer's income increases following an improvement of the capital unit price by 3 percent and given an average revenue tax equal to 10 percent in the reference year,.

Both the effects of the FTA with the EU on welfare and government revenue have been obtained using elasticities of substitution and transformation equal to 2. However, the level of changes depends as explained above on the degree of substitution between goods.

In order to evaluate the robustness of these results to the degree of substitution, sensitivity analysis have been performed by varying the level of elasticity of substitution from 0 (no substitution) to 5 (high substitution) in order to see the impact on welfare and government revenue changes.

Figure 3 illustrates the sensitivity of welfare and government revenue to the level of the elasticity of substitution between imports from different countries of origin. It shows that the welfare gains vary from 6 percent (with an elasticity of substitution equal to 0) to 7.2 (with an elasticity of substitution), and thus increase with the ease of substitution of other imports into EU imports. However, as the replacement of other imports by EU goods grows up, the tariff receipts decrease leading to government revenue losses expansion from 18.8 percent (with an elasticity of substitution equal to 0) to 25.3 percent (with an elasticity of substitution equal to 5).

The government revenue change and to a less extent the welfare change also are sensitive to the level of substitution between labor and capital, as is shown by figure 5. Indeed, while the welfare gains vary from 5.47 to 6.69 for an elasticity of substitution between labor and capital ranging from 0 to 5, the government revenue losses vary from 15.9 percent to 22.7 percent. The latter result is explained by the positive correlation between the elasticity of substitution between labor and capital and production cost effect. When the elasticity of substitution between primary factors is weak, the weight of intermediate goods costs reduction resulting from the FTA is intensified and the impact on domestic supply is increased, improving thus the VAT receipts and reducing the government revenue losses.

Figures 4, 6 and 7 show that neither welfare nor government revenue is sensitive to the elasticities of substitution between composite consumption goods, the domestic and composite import goods and to the elasticity of transformation between domestic and

composite export goods. The welfare gains vary slowly from 6 to 7, while the government revenue losses vary slowly from 21 to 22 percent.

**Figure 3. Sensitivity analysis of welfare and GR changes to elasticity of substitution between imports from different sources**

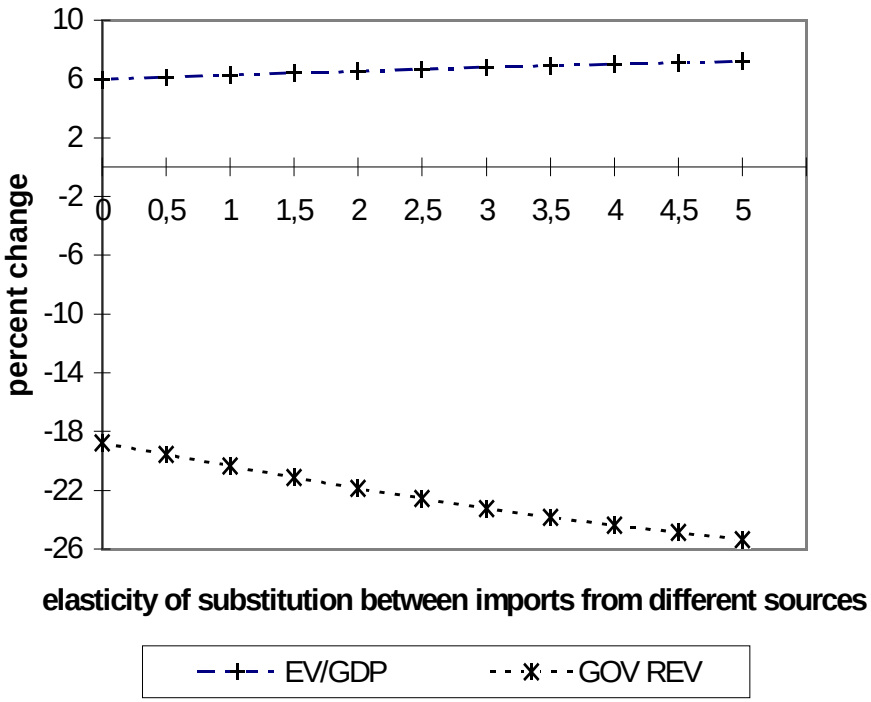



**Figure 4. Sensitivity analysis of welfare and GR changes to the elasticity of substitution between local and composite imported goods**

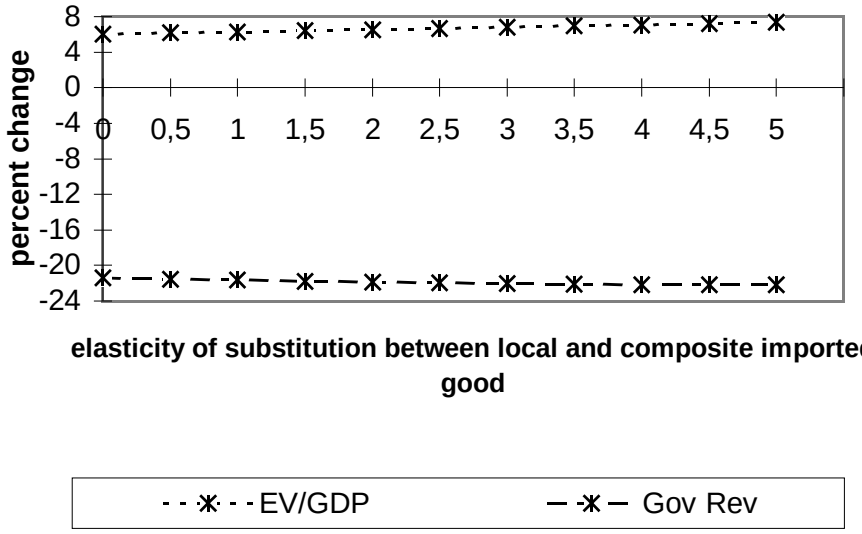


**Figure 5. Sensitivity analysis of welfare and GR changes to the elasticiy of substitution between labor and capital**

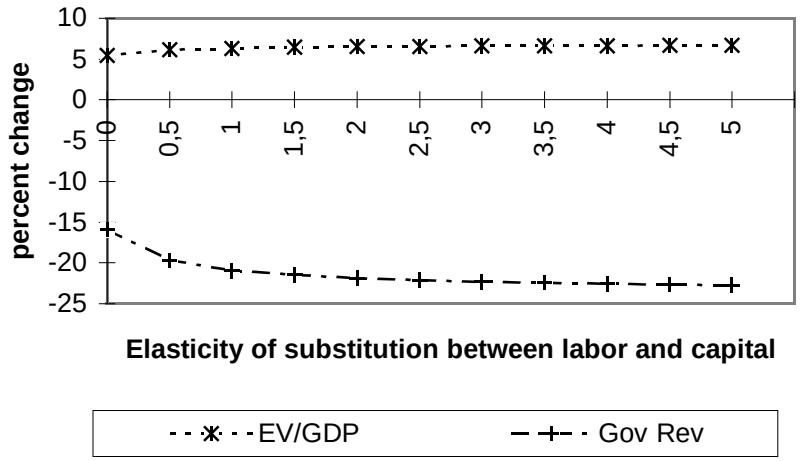



**Figure 6. Sensitivity analysis of welfare and GR changes to the elasticity of substitution between composite consumption goods**

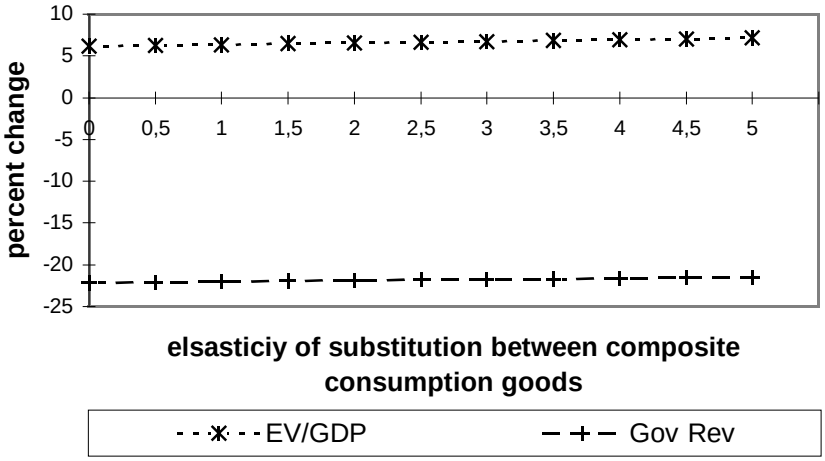
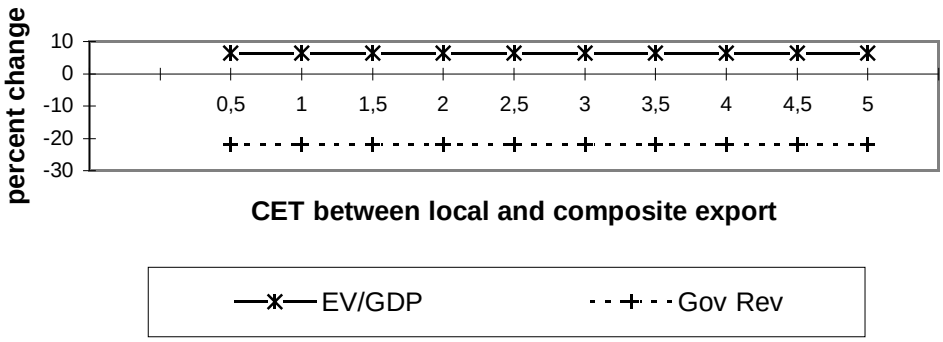



**Figure 7. Sensitivity analysis of welfare and GR changes to the CET between local and composite export goods**



### 4.6. Replacement tax and welfare change

As the FTA with EU results into fiscal revenue losses equal to 22 percent on average, the Tunisian government should respond by raising other domestic indirect taxes so as to maintain the same level of budget deficit.

In this section we investigate the optimal level of indirect taxes, necessary to compensate the foregone government revenue, and their impact on welfare.

The Tunisian data distinguish 3 types of taxes : import duties, indirect taxes on production and direct taxes. As shown in table 1, the indirect taxes on production apply only on domestic sales and exports are exempt from the VAT. Also, there are disperse consumption taxes levied on both imports and local goods. However, the available data do not give the share of consumption taxes receipts. So the level of consumption tax is assumed equal to zero in the reference year.

Eight scenarios are considered, which results are displayed in table 7. Each result corresponds to a removal of protection on EU imports and a replacement of the lost fiscal revenue by an endogenous increase of an indirect domestic tax.

In the first scenario, ENDO_VAT, a non-uniform VAT is considered as a response to the fiscal shortfall caused by the agreement. The new levels of VAT are now equal to 1.9 times the VATs applied in the reference year, and reported in table 3, and the average VAT is equal to 15.9 percent. The share of new VAT receipts in government revenue increases hence from 31.8 percent before the agreement to 48.2 percent after the agreement. As the VAT levels are now greater, consumers face higher prices of domestic goods. The welfare gains are hence reduced from 6 percent to 0.5 percent.

In the second scenario, UNIFORM_VAT, a uniform VAT on domestic goods is considered. To replace government revenue losses, a uniform VAT equal to 10.16 percent is required. The VAT is now lower, hence the domestic goods price increase is lower too. This results into welfare gains equal to 1.6 percent of 1995 GDP.

**Table 7: Various effects of the different replacement taxes**

| | ENDO_VAT | UNIFORM_VAT | UNIFORM_VAT +0TM | UNIFORM_CT + 0 VAT | UNIFORM_CT +0 VAT+0 TM | UNIFORM_TLK + 0VAT | UNIFORM_TLK +0VAT +0TM |
|---|---|---|---|---|---|---|---|
| Welfare change | 0.484 | 1.6 | 2.347 | 1.011 | 1.992 | 2.054 | 3.265 |
| TAU | 1.901 | 10.16 | 12.778 | 7.132 | 8.407 | 15.179 | 18.41 |
| VAT receipts change | 66.47 | 65.1 | 97.19 | -100 | -100 | -100 | -100 |
| Income Tax receipts change | 12.455 | 1.85 | 11.561 | 13.61 | 13.425 | 0 | 0 |
| Tariff receipts change | -5.863 | -2.28 | -100 | -14.519 | -100 | -5.328 | -100 |
| VAT receipts /GR | 48.245 | 47.721 | 58.043 | 0 | 0 | 0 | 0 |
| Income tax /GR | 42.291 | 42.439 | 41.957 | 42.72 | 42.655 | 42.63 | 41.863 |
| Tariff receipts /YG | 9.464 | 9.84 | 0 | 8.594 | 0 | 9.517 | 0 |
| CT receipts /YG | -- | -- | -- | 48.686 | 57.345 | -- | -- |
| TLK receipts/YG | -- | -- | -- | -- | -- | 47.853 | 58.137 |

**Source : Author's calculations**

In addition to the removal of tariffs on EU imports, the trade liberalization is extended to non-EU imports and an endogenous uniform VAT is sought-after, in the third scenario, in order to compensate the now more important fiscal losses. The VAT becomes equal to 12.8 percent and allows for welfare gains equal to 2.3 percent. The removal of protection on both EU and non-EU imports eliminated the discrimination between the two goods and reduced their prices.

As it is applied in the latter scenario, the VAT discriminates between domestic and import goods and it is unfavorable to the domestic industries. That is why we looked for other indirect uniform domestic taxes, such as consumption taxes on both import and domestic goods, and VAT on both domestic and export sales, which do not discriminate between two substitutes goods. For this purpose, the existing value added taxes have been removed and replaced by other indirect domestic taxes in the remaining scenarios.

We begin by introducing a uniform consumption tax, UNIFORM_CT, in the fourth scenario. As the uniform domestic consumption tax, which optimal level is equal to 7.1 percent, does not discriminate anymore between the local and composite import goods, the welfare gains are now equal to 1 percent. When the trade liberalization is extended to non-EU imports, the uniform consumption tax becomes equal to 8.4 percent and allows for 2 percent welfare gains. Although, there is no more discrimination between domestic and all imports, the welfare gains are lower than those reached with the uniform VAT, as the consumption tax increases the cost of both domestic and import goods.

In the case of Tunisia, as only few sectors are primary factors intensive, a uniform tax on labor and capital, which is equivalent to a VAT on both domestic and export goods, would increase the cost of production. However, as the share of intermediate goods in total cost is more important, the agreement will allow for substantial intermediate goods costs saving, which could over compensate the incremental cost generated by the primary factors tax and reduce hence the production cost while permit an expansion of domestic and export sales which prices have fallen. In the last two scenarios the existing VAT is removed and endogenous uniform tax on both labor and capital, UNIFORM_TLK, is introduced.

When protection on non-EU imports is maintained, the level of the endogenous tax is 15.2 percent, while the welfare gains are 2 percent of 1995 GDP. However, the welfare gains are

the highest when all protection is removed and the revenue losses are compensated by a uniform tax on labor and capital equivalent to 18.4 percent.

### 4.7. Conclusion

In this paper a computable general equilibrium model of a small open economy has been used to quantify the direct and indirect impact of the FTA on the Tunisian government fiscal revenue, welfare and sectoral adjustments. As tariffs receipts on EU imports represent 20 percent of the 1995 fiscal revenue, and the ratio of EU imports to total imports is 70 percent, the government revenue losses are found to be equal to 20 percent when tariffs on EU imports are removed. These results are greater than those obtained by Abed (1998), who does not consider indirect effects on fiscal revenue captured through a CGE model, and Devarajan et al. (1997), who consider a high aggregate CGE model.

As for the welfare gains resulting from the agreement, they represent 6 percent of 1995 GDP.

Sensitivity analysis shows that the extent of revenue losses depends on the elasticity of substitution between EU and non-EU imports and the elasticity of substitution between labor and capital. The revenue losses vary from 18.8 to 25.3 percent, when the elasticity of substitution between EU and non-EU imports ranges from 0 to 5, and from 15.9 to 22.7 percent when the elasticity of substitution between labor and capital ranges from 0 to 5.

As the fiscal revenue implications of the agreement could be substantial, the welfare consequences of different fiscal policy responses to the FTA have been investigated. The investigation showed that the welfare changes resulting from the endogenous indirect taxes are positive though smaller than those reached without any fiscal compensation. Also, it has been found that the best indirect replacement tax should be a VAT on both domestic and export goods or equally a uniform tax on sectoral labor and capital demands. As few sectors are primary factors intensive, a uniform primary factors tax would increase the cost of the latter factors by an amount less important than intermediate goods cost reduction resulting from the agreement. Despite the indirect tax, the domestic and export prices will decrease and the industries output will increase.

## Appendix 1: Tax structure and Fiscal Performance

**Table A1.1: Tunisian Government Fiscal Revenue Structure (in millions of current Dinars)**

| Year | Government Fiscal Revenue | Direct Tax Receipts | Indirect Tax on goods and services receipts | Tariffs on imports receipts |
|---|---|---|---|---|
| 1982 | 1521 | 244 | 425 | 209 |
| 1983 | 1716 | 260 | 515 | 267 |
| 1984 | 2007 | 288 | 587 | 303 |
| 1985 | 2162 | 298 | 604 | 328 |
| 1986 | 2190 | 378 | 845 | 323 |
| 1987 | 2273 | 326 | 897 | 328 |
| 1988 | 2452 | 320 | 954 | 393 |
| 1989 | 2593 | 362 | 1090 | 458 |
| 1990 | 2859 | 403 | 1230 | 496 |
| 1991 | 3173 | 504 | 1388 | 534 |
| 1992 | 3675 | 563 | 1630 | 572 |
| 1993 | 4050 | 701 | 1723 | 610 |
| 1994 | 4360 | 738 | 1914 | 580 |
| 1995 | 4255 | 811 | 1984 | 696 |
| 1996 | 4630 | 915 | 2146 | 741 |
| 1997 | 4946 | 976 | 2515 | 740 |
| 1998 | 5643 | 1315 | 2736 | 634 |

**Sources : La Banque Mondiale (1999) and The World Bank (1995a)**

**Table A1.2:Trends in Each Tax Category Contribution to Government Fiscal Revenue (%)**

| Year | Share of Direct Tax | Share of Indirect Tax on goods and services | Share of Tariffs on imports |
|---|---|---|---|
| 1982 | 16,04 | 27,94 | 13,21 |
| 1983 | 15,15 | 30,01 | 15,56 |
| 1984 | 14, 30 | 29,25 | 15,10 |
| 1985 | 13,78 | 27,94 | 15,17 |
| 1986 | 17,26 | 38,58 | 14,75 |
| 1987 | 14,34 | 39,46 | 14,43 |
| 1988 | 13,05 | 38,91 | 16,03 |
| 1989 | 13,96 | 42,04 | 17,66 |
| 1990 | 14,10 | 43,02 | 17,35 |
| 1991 | 15,88 | 43,74 | 16,83 |
| 1992 | 15,32 | 44,35 | 15,56 |
| 1993 | 17,31 | 42,54 | 15,06 |
| 1994 | 16,93 | 43,90 | 13,30 |
| 1995 | 18,86 | 46,14 | 16,19 |
| 1996 | 19,58 | 45,93 | 15,86 |
| 1997 | 19,47 | 50,18 | 14,76 |
| 1998 | 23, 00 | 47,85 | 11,10 |

**Sources : Author's calculations**

## Appendix 2: Models equations, variables and parameters

### *List of equations*

There are i,j = 1,.....,s sectors (and goods), of which T = 1,.....,c are tradable and N = c+1,....,s are non tradable. k trading partners denoted r = 1,k are also distinguished.

Leontief Input-Output Coefficients $$a_{ij} = \frac{CI_{ij}}{X_j} \quad \text{(A2.1)}$$

Labor Demand $$LD_i = \left(\frac{1}{\overline{AX_i}}\right)^{1-\eta_i} \left(\frac{\alpha_i MC_i}{W}\right)^{\eta_i} \quad \text{(A2.2)}$$

Capital Demand $$KD_i = \left(\frac{1}{\overline{AX_i}}\right)^{1-\eta_i} \left(\frac{(1-\alpha_i) MC_i}{R}\right)^{\eta_i} \quad \text{(A2.3)}$$

Marginal Cost $$MC_i = \frac{(1+tlk_i)}{\overline{AX_i}} \left[\alpha_i^{\eta_i} W^{1-\eta_i} + (1-\alpha_i)^{\eta_i} R^{1-\eta_i}\right]^{\frac{1}{1-\eta_i}} + \sum_j PQ_j a_{ji} \quad \text{(A2.4)}$$

Marginal cost pricing $$PX_i = MC_i \quad \text{(A2.5)}$$

Government Revenue $$YG = \sum_i \sum_r tm_{i,r} \overline{PWM_{i,r}} MR_{i,r} ER + \sum_i tlk_i (W LD_i + R KD_i)$$

$$+ ct_i (PD_i DD_i + PM_i M_i) + dt(W\overline{LS} + R\overline{KS}) + \sum_i vat_i PD_i DD_i \quad \text{(A2.6)}$$

Government saving $$SG = \left(1 - \sum_i shrcg_i\right) YG \quad \text{(A2.7)}$$

Government demand of composite consumption good *i* $$GC_i = shrcg_i YG \quad \text{(A2.8)}$$

Investors demand of composite consumption good *i* $$I_i = shrci_i \ \ S \quad \text{(A2.9)}$$

Household disposable Income $$YM = (1-dt)\ (W\overline{LS} + R\overline{KS}) \quad \text{(A2.10)}$$

Household saving $$SH = (1-shrc) YM \quad \text{(A2.11)}$$

Household demand of composite consumption good i $$C_i = \frac{PQ_i^{-\rho_i} \lambda_i^{\ \rho_i} shrc\, YM}{\left[\sum_{i=1}^{s} \lambda_i^{\rho_i} PQ_i^{1-\rho_i}\right]} \quad \text{(A2.12)}$$

Composite Demand of Imports $$M_i = AQ_i^{\sigma_i - 1} \left(\frac{PQ_i \delta_i}{PM_i}\right)^{\sigma_i} Q_i \quad \text{(A2.13)}$$

Demand of Domestically Produced Goods $$DD_i = AQ_i^{\sigma_i - 1}\left(\frac{PQ_i(1-\delta_i)}{PD_i(1+vat_i)}\right)^{\sigma_i} Q_i \quad \text{(A2.14)}$$

Demand of Imports by Country of Origin $$MR_{i,r} = AMR_i^{\sigma r_i - 1}\left(\frac{\delta r_{i,r} PM_i}{PMR_{i,r}}\right)^{\sigma r_{i,r}} M_i \quad \text{(A2.15)}$$

Domestic Sales of Locally Produced Goods $$DS_i = AE_i^{-\omega_i - 1}\left(\frac{PD_i}{PX_i(1-\gamma_i)}\right)^{\omega_i} X_i \quad \text{(A2.16)}$$

Composite Export Sales $$EX_i = AE_i^{-\omega_i - 1}\left(\frac{PE_i}{PX_i\gamma_i}\right)^{\omega_i} X_i \quad \text{(A2.17)}$$

Export Sales by Country of Destination $$EXR_{i,r} = AER^{-\omega r_i - 1}\left(\frac{PER_{i,r}}{\gamma r_{i,r} PE_i}\right)^{\varpi r_i} EX_i \quad \text{(A2.18)}$$

Composite Consumption Price $$PQ_i = \frac{(1+ct_i)}{AQ_i}\left[\delta_i^{\sigma i} PM_i^{1-\sigma i} + (1-\delta_i)^{\sigma i} PD_i^{1-\sigma i}\right]^{\frac{1}{1-\sigma i}} \quad \text{(A2.19)}$$

Composite Production Price $$PX_i = \frac{1}{AE_i}\left[\gamma_i^{-\varpi_i} PE_i^{1+\varpi_i} + (1-\gamma_i)^{-\varpi_i} PD_i^{1+\varpi_i}\right]^{\frac{1}{1+\varpi_i}} \quad \text{(A2.20)}$$

Composite Price of Imports $$PM_i = \frac{1}{AMR_i}\left[\sum_r \delta r_{i,r}^{\sigma r_i} PMR_{i,r}^{1-\sigma r_i}\right]^{\frac{1}{1-\sigma r_i}} \quad \text{(A2.21)}$$

Composite Price of Exports $$PE_i = \frac{1}{AER_i}\left[\sum_r \gamma r_{i,r}^{-\varpi r_i} PER_{i,r}^{1+\varpi r_i}\right]^{\frac{1}{1+\varpi r_i}} \quad \text{(A2.22)}$$

Domestic Currency Price of Imports from country r $$PMR_{i,r} = \overline{PWM_{i,r}}(1+tm_{i,r})ER \quad \text{(A2.23)}$$

Domestic Currency Price of Exports to country r $$PER_{i,r} = \overline{PWE_{i,r}}ER \quad \text{(A2.24)}$$

Labor Market Clearing Condition $$\sum_i LD_i = \overline{LS} \quad \text{(A2.25)}$$

Capital Market Clearing Condition $$\sum_i KD_i = \overline{KS} \quad \text{(A2.26)}$$

Domestic good market clearing condition $$DS_i = DD_i \quad \text{(A2.27)}$$

Composite Consumption Demand $$Q_i = C_i + CG_i + I_i + \sum_i CI_{ji} \quad \text{(A2.28)}$$

Total saving $$S = SG + (1-shrc)YM + ER\overline{B} \quad \text{(A2.29)}$$

Trade Balance Constraint $$\sum_i \sum_r \overline{PWM_{i,r}}\, MR_{i,r} - \sum_i \sum_r \overline{PWE_{i,r}} EXR_{i,r} = \overline{B} \quad \text{(A2.30)}$$

Numéraire $$W = 1 \quad \text{(A2.31)}$$

***List of endogenous variables***

| | |
|---|---|
| $X_i$ | Sectoral composite production |
| $PX_i$ | Sectoral composite production price |
| $LD_i$ , $KD_i$ | Sectoral labor and capital demands |
| $MC_i$ | Sectoral marginal costs |
| $DD_i$ , $DS_i$ | Demand and supply of locally produced good |
| $M_i$ , $EX_i$ | Composite Import and export Levels |
| $MR_{i,r}$ , $EXR_{i,r}$ | Levels of imports and exports of good *i* from and to country *r* |
| $PD_i$ , $PM_i$ , $PE_i$ | Prices of locally produced goods, composite imports and composite exports |
| $PMR_{i,r}$ , $PER_{i,r}$ | Domestic Currency Price of Imports and exports of good i from country r |
| $Q_i$ | Composite consumption good |
| $PQ_i$ | Price of Composite consumption good |
| $C_i$ , $CG_i$ , $I_i$ | Household, government and investors final consumption of composite good *i* |
| $CI_{ij}$ | Intermediate goods consumption by sector i for goods from sectors j |
| $W$ , $R$ | Labor and capital unit prices |
| $YM$ , $YG$ | Household and Government incomes |
| $ER$ | Nominal exchange rate |
| $SH$, $SG$, $S$ | Household, government and total savings |

***List of parameters and exogenous variables***

| | |
|---|---|
| $a_{ij}$ | Leontief input-output coefficients |
| $\overline{LS}$ , $\overline{KS}$ | Total labor and capital supplies |
| $\overline{PWM_{i,r}}$ , $\overline{PWE_{i,r}}$ | Exogenous world prices of imports and exports of good i from country r |
| $tm_{i,r}$ , $vat_i$ , $ct$, $dt$, $tlk$ | Tariff rate on imports from country *r*, value added tax on domestic goods , consumption tax on import and domestic good, direct tax and value added tax on domestic and export goods, or equally on sectoral labor and capital. |
| $\overline{B}$ | Net foreign capital inflow |
| $W$ | Numéraire |

| | |
|---|---|
| $shrc, shrcg_i, shrci_i$ | Fixed shares of household consumption to its income, of government consumption to its income, of investment demand of good i to total saving |
| $\sigma_i$ | Armington elasticity of substitution between imported and domestic goods |
| $\sigma_{r_i}$ | Elasticity of substitution between imported good i from country r |
| $\omega_i$ | Constant elasticity of transformation between exported and domestic goods |
| $\omega_{r_i}$ | Constant elasticity of transformation between exported good i from country r |
| $\eta_i$ | Elasticity of substitution between labor and capital |
| $\beta_i$ | Constant expenditure share |
| $\alpha_i$, $\delta_i$, $\gamma_i$, $\delta_{r,r}$, $\gamma_{r,r}$ | Share parameters in the CES value added, Armington and constant elasticity of transformation aggregator |
| $AX_i$, $AQ_i$, $AE_i$, $AMR_i$, $AER_i$ | Shift parameters in the CES value added, Armington and constant elasticity of transformation aggregators |

## 5. Morocco

Le Maroc a signé 1996 un "accord d'association" avec l'Union européenne (U.E) dont la pièce maîtresse est l'établissement progressif - durant une période de transition de 12 ans - d'une zone de libre-échange . Cet accord fait partie d'un projet européen plus vaste visant à créer une zone de libre-échange euro-méditerranéenne à l'horizon 2010.

L'établissement d'une zone de libre-échange, à travers le démantèlement tarifaire en faveur des produits de l'Union Européenne, a des retombées fiscales certaines sur l'économie marocaine.

Le travail consiste d'abord à décrire les modalités du désarmement douanier, son calendrier et ses échéances et analyser les variations induites de la protection.

Ensuite, une projection de la perte fiscale est proposée sur base d'un scénario de croissance de l'économie marocaine.

Enfin, l'utilisation d'un modèle d'équilibre général donne une évaluation de l'impact de l'instauration d'une zone de libre-échange sur l'économie marocaine, en particulier en qui concerne l'aspect fiscal. Des simulations de politique économique, en relation avec la réforme fiscale, nécessaire et obligatoire , complètent l'analyse de l'impact.

### 5.1. L'ACCORD D'ASSOCIATION

L'accord d'association a été signé le 26 février 1996 et est entré en vigueur le premier mars 2000. Les caractéristiques essentielles concernent l'instauration d'une zone de libre-échange pour les produits manufacturés, la redéfinition de la coopération financière, la relance de la coopération économique et technique et l'établissement d'un dialogue politique, social et culturel…

#### La zone de libre-échange

Sa mise en place est progressive et s'étale sur une période de douze ans, avec cependant, une différence de traitement entre les produits industriels et les produits agricoles (auxquels on ajoute les biens agro-alimentaires et produits de la pêche).

*Les produits industriels*

Du côté européen, il y a confirmation de la liberté d'accès qui existe déjà depuis l'accord de coopération de 1976 des produits marocains en exonération de droits de douane et de taxes d'effet équivalent.

Du côté marocain, dès l'entrée en vigueur de l'Accord, le Maroc n'appliquera plus de restrictions quantitatives (ou de mesures d'effet équivalent) aux produits originaires de l'U.E. Le démantèlement des barrières tarifaires se fera à des rythmes différents et décroissants selon le degré de sensibilité des produits. Six listes de produits son prévues à cet effet (et sont annexées à l'accord), les trois premières sont générales, les trois suivantes portent sur des produits particuliers :

- Un démantèlement total dès l'entrée en vigueur de l'Accord pour les biens d'équipement (liste 1). Il faut dire qu'il s'agit de biens non fabriqués par le Maroc et dont les droits d'importation étaient déjà très faibles (souvent de 2,5%).

- Un démantèlement rapide, en quatre ans, à raison de 25% par an, dès l'entrée en vigueur de l'Accord, pour les matières premières, les pièces de rechange et les produits non fabriqués localement (liste 2).

- Un démantèlement lent, en dix ans, à raison de 10% par an, après délai de grâce de trois, pour les produits industriels fabriqués au Maroc (liste 3).

Le tableau suivant présente le calendrier de démantèlement tarifaire prévu dans les trois listes.

Les listes particulières portent sur les voitures automobiles ou l'élément industriel des produits agricoles transformés :

- Le démantèlement pour les voitures automobiles (liste 4) est d'abord lent : de 3% par an de la quatrième à la sixième année de l'entrée en vigueur de l'Accord; puis plus rapide : de 15% par an pour les années suivantes, jusqu'à l'élimination des droits d'importation.

- Le démantèlement de l'élément industriel des produits agricoles transformés suit deux rythmes : quatre ans dès l'entrée en vigueur de l'Accord (liste 6-1) ou dix ans à partir de la quatrième année (liste 6-2).

**Tableau 5.1: Calendrier des rythmes de désarmement tarifaire**.

| Année de démantèlement | Biens d'équipement (Liste 1) | Matières premières et produits non fabriqués localement (Liste 2) | Produits fabriqués localement (Liste 3) |
|---|---|---|---|
| 2000 | 100% | 25% | Délai |
| 2001 | | 25% | De |
| 2002 | | 25% | Grâce |
| 2003 | | 25% | 10% |
| 2004 | | | 10% |
| 2005 | | | 10% |
| 2006 | | | 10% |
| 2007 | | | 10% |
| 2008 | | | 10% |
| 2009 | | | 10% |
| 2010 | | | 10% |
| 2011 | | | 10% |
| 2012 | | | 10% |

Source : Administration des douanes et des impôts indirects (ADII)

Le démantèlement tarifaire concerne en moyenne 60% des importations marocaines qui sont en provenance de l'UE. Mais la proportion varie selon la catégorie de produits ( tableau 1.2).

**Tableau 5.2. Part des importations en provenance de l'U.E. en 1999**

| Secteur d'activité | % |
|---|---|
| 1.Alimentation | 33.88 |
| 2.Matières premières agricoles | 51.14 |
| 3.Produits minéraux | 25.77 |
| 4.Fer et acier | 52.28 |
| 5.Produits chimiques | 71.67 |
| 6.Autres produits manufacturiers | 78.38 |
| 7.Textile | 88.40 |
| 8.Habillement | 90.03 |
| 9.Machines génératrices | 61.30 |
| 10. Autres machines non électriques | 82.31 |
| 11. Machines de bureau et équipement de de télécommunication (M.A.B.E.T.) | 47.05 |
| 12.Appareils. et machines électriques | 88.00 |
| 13.Véhicules routiers | 76.24 |
| 14.Autres équipements de transport | 47.08 |
| 15. Autres produits | 77.45 |
| Total | 62.66 |

Source : calculs d'après les données de l'ADII

*Les produits agricoles et assimilés*

Une libéralisation progressive et réciproque des échanges "agricoles" est prévue, à partir de 2001, mais elle doit encore faire l'objet de négociations. Les secteurs de l'industrie agro-alimentaire et les produits de la pêche sont assimilés aux produits agricoles.

Dans une première phase de cinq ans, l'accord conserve les avantages déjà accordés par l'U.E. - dans le cadre des accords précédents - avec quelques aménagements et améliorations mineurs, notamment : augmentation limitée des contingents en franchise douanière (3% par an entre 1997 et 2000) pour certains fruits et légumes (agrumes, tomates, pommes de terre, jus d'orange, fleurs), extension - partielle - au marché communautaire, qui est devenu un marché unique sans frontières intérieures, des avantages du protocole Maroc - France (Protocole 1/7), exonération de droits de douane dans le cadre de contingents pour quelques produits qui n'en bénéficiaient pas dans le régime actuel (tels que les légumes en conserve et congelés).

## 5.2. LA PROTECTION SECTORIELLE DE L'ECONOMIE MAROCAINE

### 5.2.1. Le taux de protection nominale

La méthode utilisée s'inspire de la définition du taux de protection nominale par Olgun et Togan[16] selon laquelle ce taux réunit l'ensemble des tarifs, des impôts et autres dépenses exigées pour importer un bien quelconque. Dans le cas marocain les biens importés supportent les droits de douane, auxquels il faut joindre le prélèvement fiscal obligatoire (PFI), et les prix de référence comme suit :

- *Biens soumis aux prix de référence*

$$\mathbf{TPN_i = ( DI_i + PFI_i ) * Pr_j / P_j} \qquad (1)$$

où $DI_i$ : tarifs douaniers appliqués au produit i
$Pr_i$ : prix de référence appliqué au bien i

[16] [16] H. Olgun et S. Togan (1991) « Trde Liberalisation and the Structure of Protection in Turkey in the 1980's : A quantitative analysis », Weltwirtschaftliches Archiv, pp152-170.

$P_i$ : prix du bien i

- *Biens non soumis aux prix de référence*

$$\mathbf{TPN_i = DI_i + PFI_i} \qquad (2)$$

Le TPN sectoriel s'obtient par agrégation pondérée comme suit :

$$\mathbf{TPN^s = \sum_i TPN_i * V_i^s / V^s} \qquad (3)$$

Où $TPN^s$ : le taux de protection nominale du secteur s

$V_i^s$ : la valeur du produit importé i

$V^s$ : la valeur des importations du secteur s

### 5.2.2. L'analyse sectorielle

L'état de la protection nominale sectorielle est présenté au tableau 2.1 où les taux ont été calculés grâce aux données de l'année 1999.

**Tableau 5.2.1 : taux de protection nominale avec et hors prix de référence (%)**

| Secteur d'activité | TPN avec PR | TPN hors PR | Différence |
|---|---|---|---|
| 1.Alimentation | 36.30 | 36.30 | 0 |
| 2.Matières premières agric | 16.83 | 16.74 | 0.09 |
| 3.Produits minéraux | 20.29 | 20.22 | 0.07 |
| 4.Fer et acier | 18.57 | 18.57 | 0 |
| 5.Produits chimiques | 24.38 | 23.99 | 0.39 |
| 6.Autres produits manufact | 35.66 | 33.02 | 2.64 |
| 7.Textile | 27.56 | 23.52 | 4.04 |
| 8.Habillement | 46.42 | 41.67 | 4.75 |
| 9.Machines génératrices | 22.32 | 16.57 | 5.75 |
| 10. Aut machines non éléc. | 6.74 | 6.40 | 0.34 |
| 11. M.a.b.e.t | 3.51 | 3.49 | 0.02 |
| 12.App. et mach éléctriq | 23.20 | 19.38 | 3.82 |
| 13.Véhicules routiers | 7.37 | 6.95 | 0.42 |
| 14.Aut équipem. de transp. | 26.64 | 24.00 | 2.64 |
| 15. Autres produits | 21.59 | 20.20 | 0.39 |

Source : calculs d'après les données de l'ADII

Les conclusions qu'on peut tirer des chiffres ci-dessus sont :

- Il n'y a pas d'uniformité sectorielle de protection. Des secteurs, tels que l'alimentation ou l'habillement, sont fortement protégés alors que ceux qui concernent les produits d'investissement le sont nettement moins.

- Que les prix de référence exercent une protection moindre que les droits d'importation.

La protection sectorielle a une logique qui consiste à consentir des barrières douanières faibles pour les matières premières, les biens d'équipement et aussi les biens non produits par l'industrie marocaine, ceci, bien sûr, pour stimuler la production locale et la rendre compétitive. En contrepartie, elles pénalisent les importations des secteurs alimentaire et textile habillement. D'ailleurs, c'est pour ce dernier secteur que les prix de référence sont réellement utilisés.

## 5.3. IMPLICATIONS FISCALES DE L'ACCORD D'ASSOCIATION

Le démantèlement douanier en faveur de l' Union européenne concerne plus de 60% des importations marocaines. Autant dire que les retombées sur l'appareil productif et sur les finances publiques risquent d'être important.

### 5.3.1 Conséquences directes sur l'industrie

En ce qui concerne les secteurs productifs, le démantèlement a des effets sectoriels spécifiques, dépendant de l'importance des échanges avec l'U.E., du rythme du désarmement et du différentiel de protection vis-à-vis des produits U.E. et du Reste du Monde.

La projection des taux de protection nominale suivant le rythme de démantèlement nous donne, par secteur de production, l'évolution de l'ouverture.

On y voit, qu'à terme, il y 'a convergence du processus de libéralisation pour tous les secteurs, à l'exception notable du secteur agro-alimentaire( Alimentation). Celui-ci se voit maintenir un niveau de protection élevé, conséquence directe de son assimilation aux produits agricoles.

Les autres secteurs voient fondre leur taux de protection vis-à-vis des produits européens, à un rythme variable (cf. tableau 3.1). Les secteurs, initialement les mieux protégés, connaissent

des évolutions rapides (cf. l'habillement), alors que les moins protégés glissent en douceur vers la zone de libre-échange.

Par rapport au différentiel de protection (cf. dernière colonne du tableau 3.1), il y' a, à terme, une nette discrimination en défaveur des importations en provenance du R.d.M, à l'exception de celles du secteur de l'agro-alimentaire. Ceci doit, cependant, être émis avec réserve car il faut tenir compte des résultats que ne manqueront pas d'avoir les futures négociations de l' O.M.C. sur la protection globale de l'économie marocaine.

Par conséquent, le désarmement douanier en faveur des produits européens doit clairement entraîner :

- Une augmentation de la concurrence sur le marché intérieur.
- Créer un climat propice au développement des échanges euro-méditerranéens.
- Modifier profondément la protection effective des secteurs productifs et, donc leur compétitivité.

**Tableau 5. 3.1 : taux de protection nominale suivant le rythme de démantèlement**

| Secteurs | 2000 | 2005 | 2010 | 2013 | TRdM* |
|---|---|---|---|---|---|
| Alimentation | 35.89 | 34.01 | 32.94 | 32.51 | 30.92 |
| M. p. agricoles | 15.33 | 09.45 | 03.14 | 0.62 | 15.79 |
| Prod. Miniers | 15.71 | 07.59 | 02.17 | 0.00 | 17.60 |
| Fer et acier | 14.84 | 02.59 | 00.74 | 0.00 | 17.63 |
| Prod chimiques | 21.17 | 8.52 | 02.47 | 0.05 | 23.45 |
| Aut prod manuf | 34.67 | 22.57 | 06.45 | 0.00 | 36.55 |
| Textiles | 26.43 | 16.13 | 04.61 | 0.00 | 30.65 |
| Habillement | 45.55 | 30.06 | 08.59 | 0.00 | 39.37 |
| Mach génératrices | 20.32 | 16.66 | 06.79 | 0.00 | 12.62 |
| Aut mach non élec | 3.25 | 01.75 | 00.50 | 0.00 | 06.45 |
| M.A.B.E.T | 0.80 | 00.69 | 00.69 | 0.00 | 05.45 |
| Mach et appar élec | 20.28 | 12.69 | 03.63 | 0.00 | 24.95 |
| Véhicules | 5.25 | 02.53 | 00.77 | 0.00 | 32.21 |
| Aut équip transport | 17.16 | 12.01 | 03.43 | 0.00 | 27.96 |
| Autres produits | 18.94 | 12.16 | 03.69 | 0.31 | 18.71 |

*****tRdM : taux de protection vis-à-vis des produits en provenance du RdM.

### 5.3.2. Implications budgétaires

La libéralisation des échanges, amorcée avec le programme d'ajustement structurel dans les années 80, a généré des réformes tarifaires visant à rationaliser et alléger la pression fiscale sur le commerce extérieur. Néanmoins, celle-ci est toujours élevée, restant une composante majeure des recettes financières. En 1988, les recettes au titre des droits de douane se sont élevées à 12 873 millions de dirhams dont 52% proviennent des droits levés sur les importations européennes. Ces recettes tarifaires représentent 17.15 % des rentrées fiscales et 3.7% du PIB.

Le démantèlement a donc des répercussions directes sur le budget de l'Etat. Dès lors, l'évaluation des retombées du désarmement, et leur gestion devient une priorité de la politique économique.

L'évaluation de la moins value fiscale est faite, selon une optique comptable, à l'aide des projections du taux de croissance du PIB selon le plan quinquennal 2000-2004, de l'estimation des élasticités de la demande à l'import et du rythme du démantèlement.

Les résultats de cette simulation sont présentés au tableau 3.2 qui présente les projections de la perte tarifaire engendrée par le démantèlement. On y remarque :

- que la perte s'accroît avec l'avancement du désarmement douanier
- que l'accroissement du commerce entre le Maroc et l'U.E. génère des gains en matière de droits de douane, particulièrement en ce qui concerne le secteur de l'alimentaire qui n'est affecté que partiellement par le démantèlement

Cependant, il ne faut pas perdre de vue que ces résultats dépendent des hypothèses croissance ainsi que des projections de la demande à l'importation. Pour illustrer ceci, en se référant à la simulation statique où l'on considère que les importations se maintiennent à leur niveau initial de 1988, la perte fiscale est nettement plus accentuée( arrivant en 2013 à 1.57% du PIB et 6.4% des recettes ordinaires de l'Etat).

Les résultats sont aussi partiels, car ils reflètent les modalités initiales de l'Accord d'Association, excluant dans un premier temps les produits agricoles, une grande partie de l'industrie agro-alimentaire ainsi que les produits frais et transformés de la pêche. IL est aisé de voir que l'intégration du secteur alimentaire dans son entièreté modifie sensiblement la

configuration et l'intensité de la protection.. Pour s'en convaincre, il suffit d'observer les résultats relatifs au secteur agro-alimentaire, on y perçoit nettement le poids dans la perte fiscale.

Dans tous les cas le Maroc doit subir des pertes fiscales certaines dues, à l'application de l'accord.

**Tableau 5.3.2 : Moins value fiscale générée par le démantèlement (Simulation à prix constants)**

| **Secteurs** | Recettes* douane98 | **Moins value** | | | |
|---|---|---|---|---|---|
| | | **2000** | **2005** | **2010** | **2013** |
| **Alimentation** | 1426.87 | -47.32 | -447.5 | -1071.7 | -1550.1 |
| **M. p. agricoles** | 213.72 | 10.45 | 67.89 | 137.89 | 195.72 |
| **Prod. Miniers** | 419.04 | 81.55 | 248.7 | 349.76 | 419.04 |
| **Fer et acier** | 354.78 | 58.27 | 294.6 | 327.06 | 354.78 |
| **Prod chimiques** | 1328.28 | 91.51 | 642.0 | 940.24 | 1318.1 |
| **Aut prod manuf** | 1030.95 | -47.57 | 41.10 | 477.26 | 1030.9 |
| **Textiles** | 106.76 | -2.59 | 16.18 | 40.17 | 106.76 |
| **Habillement** | 22.04 | -3.09 | -17.10 | -15.02 | 22.04 |
| **Mach génératrices** | 514.14 | -38.65 | -554.1 | -633.65 | 514.14 |
| **Aut mach non élec** | 394.16 | 193.8 | 259.9 | 286.12 | 394.16 |
| **M.A.B.E.T** | 49.26 | 37.38 | 34.47 | 13.62 | 4.43 |
| **Mach et appar élec** | 250.68 | 19.47 | 70.66 | 105.75 | 250.68 |
| **Véhicules** | 65.74 | 16.29 | 35.57 | 40.42 | 65.74 |
| **Aut équip transp.** | 98.76 | 31.67 | 40.31 | 51.71 | 98.76 |
| **Autres produits** | 395.17 | 15.52 | 14.06 | 139.78 | 364.11 |
| **Total** | **6670.35** | **416.7** | **747.4** | **1189.4** | **3589.1** |
| **Perte/PIB** | | 0.12% | 0.14% | 0.16% | 0.38% |

*****Il s'agit exclusivement des recettes perçues sur le importations en provenance de l'U.E.

## 5.4. L'IMPACT FISCAL DE L'ETABLISSEMENT D'UNE ZONE DE LIBRE-ECHANGE

L'impact fiscal du démantèlement tarifaire ne peut être valablement évalué sans la prise en compte des paramètres conditionnant les comportements des agents économiques face aux changements de la structure d'offre, des prix relatifs, de la concurrence, de la politique économique d'accompagnement, des évolutions du pouvoir d'achat…..Pour ce faire, on a recours à une approche de modélisation en équilibre général calculable qui nous paraît opportune pour une étude d'impact.

### 5.4.1 La méthodologie

Le modèle d'équilibre général calculable utilisé est constitué d'un ensemble de relations qui, portant sur les balances matérielles, décrivent les comportements des agents économiques.

Pour mieux tenir compte des caractéristiques de l'économie marocaine, ce modèle se distingue en optant pour un comportement de concurrence imparfaite dans le cas d'une majorité de secteurs et pour un environnement de rendements d'échelle croissants.

Il est basé sur la multiplicité sectorielle, l'économie y est subdivisée en treize secteurs de production dont sept en concurrence imparfaite. Il s'agit de tous les secteurs de l'industrie manufacturière, du secteur de l'énergie ainsi que celui des mines dont principalement l'activité phosphatée et, enfin, le secteur particulier de l'intermédiation financière et de l'assurance.

Tous les secteurs combinent deux facteurs de production, le capital et le travail, selon une technologie Cobb-Douglas ; le facteur travail est mobile à travers les secteurs tandis que le facteur capital est fixé pour chaque secteur dans la simulation de référence. Les firmes s'y trouvant ont pour objectif de maximiser les profits compte tenu des prix du marché. Les secteurs sont en relation les uns avec les autres via un système d'échange d'inputs intermédiaires du type Léontief (à coefficients fixes).

Le travail considéré au niveau de la fonction de production est composite. Il s'exprime comme étant la résultante d'une agrégation CES portant sur trois catégories de travail, différenciées par leur degré respectif de qualification. Chaque catégorie est mobile à travers les secteurs et bénéficie d'un salaire approprié qui varie cependant entre les secteurs.

La production de tous ces secteurs engendre les revenus d'un consommateur représentatif. Ses préférences sont représentées par un système emboîté où on trouve au sommet une fonction d'utilité Cobb-Douglas (ce qui se traduit par des décisions de consommation et d'épargne prises dans le cadre d'un système linéaire des dépenses) portant sur un bien composite qui, à son tour, se définit comme une fonction CES portant sur le bien importé et celui produit localement, pour lesquels la substitution est imparfaite.

### 5.4.2 Le choix sectoriel

On a considéré treize secteurs de productions. L'agriculture a été répartie en trois compartiments spécifiques selon leurs caractéristiques en termes de commerce extérieur, particulièrement en ce qui concerne les échanges avec l 'Union Européenne.

Le secteur minier est naturellement assimilé à celui des phosphates qui en constitue le compartiment, de loin, le plus important.

Tous les processus relatifs à la production énergétique et à la production de l'eau sont assemblés en un seul secteur.

L'industrie manufacturière est ventilée conformément au classement de la comptabilité nationale marocaine en quatre groupes de branches :

1. les biens alimentaires ( IAA : l'industrie agro-alimentaire)

2. les biens finis (ITC : l'industrie du textile et du cuir)

3. les biens intermédiaires (ICP : l'industrie de la chimie et de la parachimie)

4. la production de biens d'équipement (IMME + AIM : l'industrie métallique, métallurgique et électrique à laquelle s'ajoutent les autres industries métalliques).

En vertu des mêmes dispositions, au groupe «bâtiment et travaux publics» est assigné un seul secteur de production. C'est le cas, aussi, des services non marchands.

Les services marchands, intégrant, entre autres, l'industrie du tourisme, forment un seul secteur qui est en relation avec l'extérieur. Cependant, pour des raisons liées au degré de concurrence, on extrait de ce groupe les activités concernant la banque et assurance qui forment un secteur distinct.

### 5.4.3 La sélection concurrentielle

On procède ensuite à une seconde ventilation selon la nature et le degré de la concurrence qui prévaut sur les marchés respectifs. On aboutit alors à la répartition suivante :

- en concurrence imparfaite et avec des rendements croissants tous les secteurs manufacturiers auxquels on ajoute les secteurs minier et énergétique ainsi que celui des "banques et assurances".

- en concurrence parfaite, avec des rendements constants : les trois secteurs agricoles, les deux secteurs abrités restants (construction et services non marchands) et les services marchands.

### 5.4.4. Les données

La structure du modèle a été calibrée avec les données relatives à l'année 1996. . Une première base de données a été construite à partir des statistiques officielles marocaines dont la structure s'est révélée hétérogène, insuffisante et inapte à établir une matrice des comptes sociaux pour l'année 1996

La masse des données a été travaillée et organisée de façon à la rendre compatible avec l'existence implicite d'un équilibre comptable dans le cadre élargi des matrices des comptes sociaux. A cette fin, il a fallu rencontrer les conditions d'équilibre entre offre et demande sur chaque marché considéré et vérifier que les institutions concernées équilibrent effectivement leur compte respectif par la confrontation ressources-emplois. On calcule, de ce fait, les éléments comptables de l'équilibre référentiel.

Par ailleurs, pour toute une série de paramètres présents dans le modèle, leur valeur a été importée directement à partir de sources variées, quant à leur nature et origine, et incorporée à la base de données. Afin d'assurer la compatibilité des valeurs paramétriques et des éléments comptables inhérents à la situation économique en 1996, on fait appel à la procédure de calibrage pour compléter les conditions d'équilibre de la base de données ainsi élargie.

La base de données ainsi obtenue, est injectée dans la structure du modèle pour en vérifier la cohérence et produire l'équilibre de base (simulation de référence).

### 5.4.5. Impact de l'instauration d'une Zone de Libre Echange (ZLE)

L'impact présenté ci dessous au tableau 4-1 a été calculé à partir d'une annulation des droits de douane appliqués aux biens et services originaires de la Communauté européenne. Aucune autre modalité ou mesure n'a été incorporée.

Globalement à travers l'analyse des chiffres ci-dessus, il apparaît que :

- Les importations augmentent légèrement, de 1.3%.

- Il y a redistribution du flux des importations marocaines en faveur de l ’Union européenne.

**Tableau 5.4.1 : Effets globaux de l’annulation des droits de douane au profit des produits U.E**

| Grands agrégats | Evolution (%) | Données Budgétaires | Evolution (%) | Marché du travail | Evolution (%) |
|---|---|---|---|---|---|
| Production | -1.6 | Droits de douane | -54.7 | Deman. De | |
| Revenu disponible | -3.4 | Impôts directs | -4.2 | travail : | -2.3 |
| Consom. Privée | 0.7 | Impôts indirects | -5.6 | Main d’œuvre** | -1.1 |
| F.B.C.F. | -10.1 | Recouvrements | -12 | Qualifiés | -3.2 |
| Importations | 1.3 | globaux | | Cadres | |
| Importations E.U. | 7.25 | | | | |
| Imports R.d.M.* | -6.2 | | | | |
| Exportations | 1.1 | | | | |

** Main d’œuvre : travail non qualifié

- Les exportations progressent (1.1%) presque dans les mêmes proportions que les importations (1.3%) ; le solde de la balance commerciale est en statu quo.

- La production diminue légèrement (1.6%) tirant vers le bas le produit national, le revenu disponible et par conséquent l’épargne privée.

- La consommation privée ne s’apprécie que très légèrement ; la baisse des prix à l’importation compense juste la faiblesse des revenus.

- Les recouvrements du Trésor Public subissent une forte diminution (-12%) due aux fléchissements des impôts directs et indirects ainsi qu’à l’effondrement des recettes douanières. Le déficit public s’en trouve affecté sérieusement. La restructuration de la fiscalité devient nécessaire, ici, dans le cadre de l’équilibre budgétaire.

- Le cumul des contre-performances des épargnes privée et publique provoque la chute de l’investissement(-10%).

- Le marché du travail est négativement perturbé dans ses trois composantes, de manière différenciée.

Cet état économique reflète les réactions de l’économie marocaine dans son ensemble. A l’exception de l’investissement, les résultats globaux concernant les variables macro-

économiques agrégées apparaissent comme étant relativement faibles et ceci est du essentiellement au phénomène de substitution entre zones d'importation.

Les effets sur l'économie locale sont amortis par la baisse sensible des importations en provenance du reste du monde. Celles-ci deviennent moins compétitives. Ce qui a comme conséquences directes de limiter le déficit de la balance commerciale et d'atténuer l'effet sur la production locale.

En ce qui concerne l'investissement, sa régression est provoquée par la baisse des revenus du travail et, surtout, par le creusement sensible du déficit budgétaire. Ce dernier point montre l'importance et la nécessité d'une politique d'accompagnement efficace au moins, dans un premier temps, en termes de finances publiques. Une réforme fiscale s'avère être une contrainte majeure pour entrer dans la zone de libre échange. Assurément les pouvoirs publics se doivent de préserver un certain «train de vie» sans aggraver le déficit budgétaire. Ce qui leur permet de :

- réduire le recours au marché financier pour combler le déficit public au détriment de l'investissement ;
- engager des programmes sociaux pour pallier les perturbations du marché de l'emploi qui pourraient apparaître avec l'instauration de la zone de libre-échange ;
- trouver des fonds qui participent à la mise à niveau des entreprises marocaines.

### 5.4.6. Recommandations de politique économique

Le descriptif global et sectoriel de l'impact montre clairement qu'il faut remédier à la chute de l'investissement par le renforcement de l'épargne nationale, particulièrement sa composante publique. Les ressources fiscales doivent compenser les pertes douanières. Pour ce faire une restructuration de ces ressources est nécessaire et passe inévitablement par :

- Un meilleur recouvrement de l'impôt.
- Une intégration fiscale de tous les secteurs productifs.
- Une réforme fiscale adéquate pour lutter contre toute aggravation du déficit public.

L'épargne nationale doit donc être renforcée, et ce dans ses deux composantes publique et privée.

L'épargne publique consiste d 'abord à éviter l'augmentation du déficit budgétaire pour ne pas amplifier la ponction sur les ressources de l'épargne privée destinée à financer l'investissement. Ensuite, dans la mesure des possibilités budgétaires, participer significativement à la formation brute de capital fixe. La perte des ressources douanières doit donc être compensée. La réforme fiscale s'impose.

La réforme de la fiscalité s'avère être une nécessité impérieuse ; elle doit :

- offrir une solution financière aux contraintes budgétaires,
- viser l'équité et l'efficacité fiscales,
- réussir l'élargissement de l'assiette d'imposition.

Combler les pertes douanières est l'objectif premier. La dépense publique a des contraintes de gestion économique qui la rendent peu flexible à la baisse. Certes une rationalisation de certaines dépenses, mais surtout une lutte contre les gaspillages des deniers publics peut seulement produire quelques économies. Il faut surtout chercher parmi des solutions du côté des recettes. Par exemple, l'administration de l'impôt, en pensant aux moyens qui peuvent maintenir l'équilibre fiscal, pense à l'élargissement de la taxe intérieure de consommation (TIC). Cette taxe est un impôt indirect sur les quantités, neutre quant à l'origine du bien taxé et ne concerne que certains produits.

De par sa spécificité, la TIC ne pourra remplacer intégralement les droits de douane. Elle constitue, en outre une forme d'impôt relativement ancienne dont le mérite principal réside dans sa facilité de calcul et de collecte (ce qui peut paraître attrayant pour l'administration des finances). La réforme doit porter plus loin sa réflexion sur les autres outils d'imposition selon la capacité de compensation et aussi en fonction des critères d'équité. C'est à travers l'équité qu'on peut atteindre l'efficacité.

Une fiscalité équitablement répartie est aussi le garant d'une acceptation par le plus grand nombre d'agents économiques, ceux du secteur de production moderne comme ceux qui se positionnent le mieux dans le secteur informel. L'élargissement de l'assiette dépend dans une large mesure de l'intégration des activités informelles et de la refiscalisation de l'agriculture.

Dans cet ordre d'idées, supposons que, parmi les diverses stratégies fiscales qui peuvent être adoptées, les autorités publiques choisissent de privilégier l'imposition directe et réussissent à améliorer le rendement de l'imposition directe de 10%.

La simulation correspondante nous apprend que la production progresse très légèrement (1%), les importations et les exportations ne connaissent guère de mouvements significatifs. Il y a effectivement une amélioration des recettes fiscales, mais qui ne se répercute pas sur l'épargne nationale. L'investissement n'augmente pas, au contraire il fléchit de près de 1%. Cette mesure est donc inefficace car elle constitue une ponction additionnelle sur le revenu.

Mais il ne faut pas oublier que cette simulation ne peut faire ressortir ni l'intégration du secteur informel, ni l'élargissement de l'assiette d'imposition. Ce sont ces derniers éléments qui devraient être à la base d'une amélioration réelle du rendement de l'impôt direct.

La réforme fiscale, dans l'objectif de maintien du train de vie de l'état, doit porter aussi sur la taxation indirecte par l'aménagement adéquat de la taxes intérieure de consommation et de la taxe sur la valeur ajoutée.

Intéressons-nous au volet «charges »du Trésor public en émettant l'hypothèse que le budget public a pu connaître une rationalisation des dépenses via une réduction de la consommation publique de 10%.

Il en ressort que la situation d'ensemble s'améliore. Il y 'a appréciation de la production de près 1% qui génère, à travers une élévation des revenus de l'ordre de 2%, une hausse de l'épargne privée de 1.5%, et par conséquent une augmentation de l'investissement, à peu près du même ordre. Comme dans le cas précédent, il n'y a pas de réelle modification des flux d'exportation et d'importation.

**Tableau 5.4.2 : L'épargne publique**[17]

| Grands agrégats | Elévation de l'impôt direct (évolution en %) | Diminution de la consommation publique (évolution en %) |
|---|---|---|
| Production | 1.0 | 1.1 |

[17] Toutes les évolutions reproduites dans les tableaux du chapitre 7 se rapportent non à la simulation de référence mais à la nouvelle base constituée par la situation de l'économie après le démantèlement douanier vis-à-vis des produits de l'U.E.

| | | |
|---|---|---|
| Revenu disponible | 1.0 | 1.5 |
| Consom. Privée | 1.9 | 3.6 |
| F.B.C.F. | -1.2 | 1.2 |
| Imports | 0.6 | 1.3 |
| Exports | 1.2 | 2.6 |

La restructuration fiscale doit donc nécessairement veiller au maintien des équilibres budgétaires sans détérioration des revenus. Elle doit montrer une certaine neutralité positive vis-à-vis de la production, encourager l'épargne et l'orienter vers l'investissement productif.

### 5.4.5 Conclusion

La réforme fiscale s'impose comme condition nécessaire de toute politique d'accompagnement dans le cadre de la libéralisation des échanges. La politique d'accompagnement s'avère être indispensable, non seulement pour amortir le choc de l'ouverture, mais pour aussi le dépasser en termes de compétitivité et de croissance. Celle-ci ne peut être assurée que par un bon niveau d'investissement. Dans le cadre de la libéralisation, encourager l'investissement productif constitue l'objectif premier de la politique économique.

# 6. Egypt

## 6.1. Introduction

The global economy has seen rapid integration over the last two decades. In particular, increasing trade and investment flows have deepened the links between national economies. Because of its mix of domestic and foreign economic policies, the Egyptian economy has effectively insulated itself from this process. Over the same period, the Egyptian economy has seen its links with the world economy weaken in important ways, even as the global economy (manifested in trade and investment flows) has marched toward deeper integration.

The establishment of a Free Trade Agreement (FTA) with the EU offers an important opportunity to (at least partially) rationalize Egyptian trade policy. This is because the EU accounts for over 40% of Egyptian trade. This paper uses a global general equilibrium model (built around a modified version of the GTAP database) to evaluate the likely effects of such an FTA on Egypt. This involves comparing the Egyptian economy in a projected 2005 baseline (based on IMF macro projections) to an alternative set of projected 2005 scenarios involving alternative FTA scenarios. This paper also explores the important issue of revenue replacement, as a significant share of Egyptian tax revenue comes from trade taxes.

The economy-wide implications of trade policy (and trade liberalization) depend critically on patterns of protection, trade and production. Therefore, before we discuss estimation of likely effects of a prospective FTA, we examine the economy-wide patterns of economic activity and economic policy. This is followed by discussion of the various model scenarios.

## 6.2. Patterns of Protection and Trade

Egypt's participation in the process of globalization has been weak. During the 1990s, foreign direct investment (FDI) inflows into Egypt increased by less than 8 percent a year on average, nearly one-half the 15 percent annual growth in the rest of the world. More strikingly, the US dollar value of Egypt's exports contracted by an average of 5.4 percent in the 1990's compared with a 7 percent average annual growth of world trade, with the result that Egypt's share is now half of what it was at the beginning of the 1990s. This reflects Egyptian trade policy. In a study released earlier this year in the United States, 26 counties were examined with respect to measures aimed at keeping markets closed. Out of these 26

countries, no country exhibited a higher number of import barriers than Egypt (Table 1). Egypt also has one of the highest average tariff rates in the world, placing Egypt in a group that includes Brazil, India, Sri Lanka, Tunisia, and Zimbabwe. (Table 2). Due to the well-established link between import restrictions and poor export performance, there is an economy-wide link between Egyptian import protection levels and Egypt's export performance.

Egypt's poor export performance is not a strictly recent phenomenon, but can be spotted in data for the 1980s. At the beginning of the 1980's, Egyptian exports reached levels not reached again until recently (1997/98). Perhaps most indicative of the demise of the Egyptian export industry is what has happened to its textile industry. In the mid 1960's, Egypt was the 16th largest exporter of textiles, just behind Portugal and the 4th out of only five developing countries in the top 20 (India [7]; China [10]; Pakistan [12]; Taiwan [20]. Just 8 years later it had fallen to #22 and was

Table 1: Trying to Keep Markets Closed -- Some Examples

| | ARG | AUS | BGL | BRA | CHL | COL | EGY | IDA | IDO | JAP | MAL | MAR | MOR | PAK | PHI | PRC | ROC | ROK | ROM | RSA | RUS | SRI | THA | UKR | URU | VNM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Creating difficult, expensive customs procedures | x | | x | x | | | x | x | x | | | | | x | | x | | x | | | x | | | x | | |
| Allowing/tolerating corruption | x | | | x | | x | x | x | x | | | x | x | x | x | x | | | x | x | x | | x | x | x | x |
| Intellectual property rights (designs, etc.) infringement | x | | x | x | | x | x | x | x | | | | | x | | x | x | x | x | x | x | | x | x | x | x |
| Lowering tariffs but adding new taxes | x | | | x | | | x | x | x | | | | x | x | | | | x | | | | x | | | | x |
| Keeping tariffs prohibitively high | x | x | x | x | | | x | x | x | | | | x | x | | x | | | x | | | | x | x | | x |
| Difficult marking rules | x | | | | | | x | x | | | | | | | | | | x | | | x | | | | | |
| Avoiding applying VAT to domestic goods | x | | | | | | | x | x | | | | | x | | x | | | | | | | | x | | |
| Lower tariffs but imposing (specific) duties | x | | x | | x | | x | x | | | | | x | | | x | | | x | x | x | x | x | x | | x |
| Subsidizing domestic industry | x | | x | x | x | x | x | x | x | | x | x | | x | | x | x | | | x | | x | x | | | |
| Changing customs rules without notification | x | | x | x | | x | | | | | | x | | x | | x | | | | | x | | x | | | |
| Changing applied rates frequently | x | | x | x | | | x | | | | | | | | | x | | | x | | x | | | x | | x |
| Not binding tariffs | x | x | x | x | | x | x | x | x | | | | x | x | | x | | x | x | x | | | x | | | |
| Restricting imports for unusual reasons | | | x | | | | x | x | | | | | | x | | | | | | | | | x | | | x |
| Making LCs unacceptable, demanding cash | | | | x | | | | | | | | | | | | | | x | | | | | | | | |
| Valuating imports by ad hoc means | | | x | x | | x | x | x | x | | x | | | x | | x | | x | | x | | | x | | | |
| Faking "automatic" licensing systems | | | | x | | x | x | | | | | | | | | | | | | | | | | | | |
| Pre-inspection of imports for high fees | x | | | | | x | | | | | | | | | | x | | | | | | | | | | |
| Adherence to strange rules of origin | x | | | | | x | x | | | | | | | | | | | | | | | | | | | |
| Imposition of arcane technical/quality standards | | | | | | | x | | | x | | | | | | x | | x | | | x | | | x | | |
| Keeping distribution system hard to breach | | | | | | | x | | | x | | | | | | x | | | | | | | | | | |
| Forming domestic cartels | | | | | | | | | x | x | x | | | | | x | | x | | | | | | | | |
| Buy-domestic policies by government | | | | | | | | | | | | | | | | x | | | | | | | | | | |
| total (average = 7.3) | 14 | 2 | 10 | 12 | 2 | 9 | 16 | 12 | 10 | 3 | 3 | 3 | 5 | 11 | 1 | 16 | 2 | 9 | 6 | 6 | 8 | 3 | 9 | 8 | 2 | 7 |

ARG = Argentina; AUS = Australia; BGL = Bangladesh; BRA = Brazil; CHL = Chile; COL = Colombia; EGY = Egypt; IDA = India; IDO = Indonesia; JAP = Japan; MAL = Malaysia; MAR = Mauritius; MOR = Morocco; PAK = Pakistan; PHI = Philippines; PRC = China; ROC = Taiwan; ROK = South Korea; ROM = Romania; RSA = Rep. South Africa; RUS = Russia; SRI = Sri Lanka; THA = Thailand; UKR = Ukraine; URU = Uruguay; VNM = Vietnam.

Source: Adapted from ATMI (2000: 27).

Table 6.2: A Comparison of Applied Manufacturing Tariffs

| Country | Weight average applied tariff 1997/98 |
|---|---|
| Argentina | 14.1 |
| Australia | 4.4 |
| Brazil | 18.3 |
| Canada | 3.2 |
| Chile | 10.9 |
| Colombia | 10.5 |
| Egypt | 19.8 |
| El Salvador | 3.8 |
| European Union | 3.5 |
| Hungary | 9.4 |
| India | 29.5 |
| Indonesia | 14.9 |
| Japan | 1.5 |
| Korea | 7.8 |
| Malaysia | 9.4 |
| Mexico | 12.0 |
| New Zealand | 4.0 |
| Norway | 2.4 |
| Peru | 12.5 |
| Philippies | 9.1 |
| Poland | 14.2 |
| Sri Lanka | 19.8 |
| Sweden | 3.5 |
| Tunisia | 23.5 |
| Turkey | 5.7 |
| United States | 2.7 |
| Uruguay | 10.7 |
| Venezuela | 10.9 |
| Zimbabwe | 20.5 |

Source: World Bank, *World Development Indicators*, 1999; and Egyptian customs data.

exporting only one third as much as Taiwan, which had moved up to the 12th rank. In a wider sense, Egypt has been unable to tap its location advantages across the entire spectrum of industrial exports. An examination of all two-digit SITC categories from #51 to #89 (i.e. basically manufactured products) in the years 1965, 1973, 1978, 1983 and 1985 revealed that among the entire set of developing countries, Egypt was able to place itself among the top five exporters to the world in just one product group for only one year, namely SITC 64 (paper, paperboard, etc) in the year 1965. In the years since then, this picture has not really changed.

As of 1997, Egypt's exports were strongly concentrated on the EU, with almost 45% on average being shipped there (see Figure 1). In terms of product structure, the big foreign exchange earnings are services (reflecting the unique role of the canal) and petroleum-related activities (including refining and chemicals). Beyond services and petroleum-related production, the textile and garment industries stand out. On the import side, trade is relatively low in sectors afforded the most protection. This includes beverages and tobacco, textiles, garments, leather, and wood and furniture products. (Figure 2).

Tables 3-4 portray the composition of Egypt's trade for the benchmark CGE model data year (1997), while Tables 5-8 provide a more dynamic picture, portraying the product structure of Egypt's trade with the Quad countries (the EU, USA, Canada and Japan) over the period 1990-1998. There has been a discernible shift across all four countries towards manufactured products and away from fuels, etc. This could imply that the reform program initiated at the beginning of the nineties is beginning to bear fruit. However, knowing how trade has fared over the past decade, these can be viewed as merely shifts within the given amount of exports, without demonstrating a noticeable increase in the shares in total imports. As a matter of fact, in some cases there was actually a noticeable decline in the actual amount of the individual products being exported (see the final column in the tables). This reflects the poor overall export performance, with some sectors simply doing less badly than others.

## 6.4. The Model

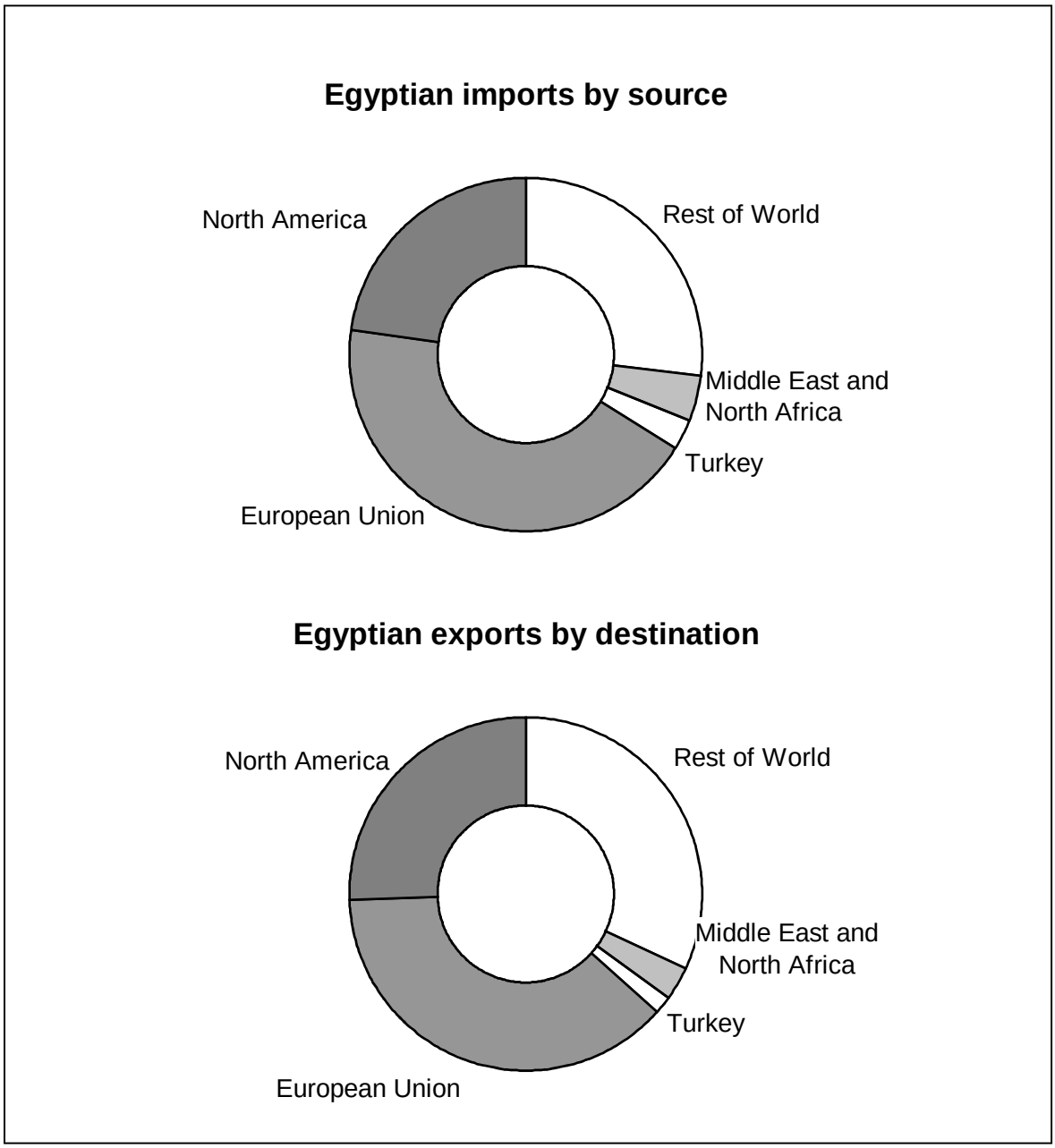
### 6.4.1 Overview

In recent years, the use of computable general equilibrium (CGE) models to estimate the impact of trade liberalization has made the move from academic research organizations to those policy institutions dealing specifically with trade policies. (See for example Francois

and Shiells 1994 and Francois et al 1996). While the results of these exercises are hampered both by the assumptions and the quality of the data available, their relevance in estimating the possible overall pattern of impact from trade policy – i.e. both of direct and indirect nature – has proved to be helpful in policy formulation and the assessment of existing economic policies.

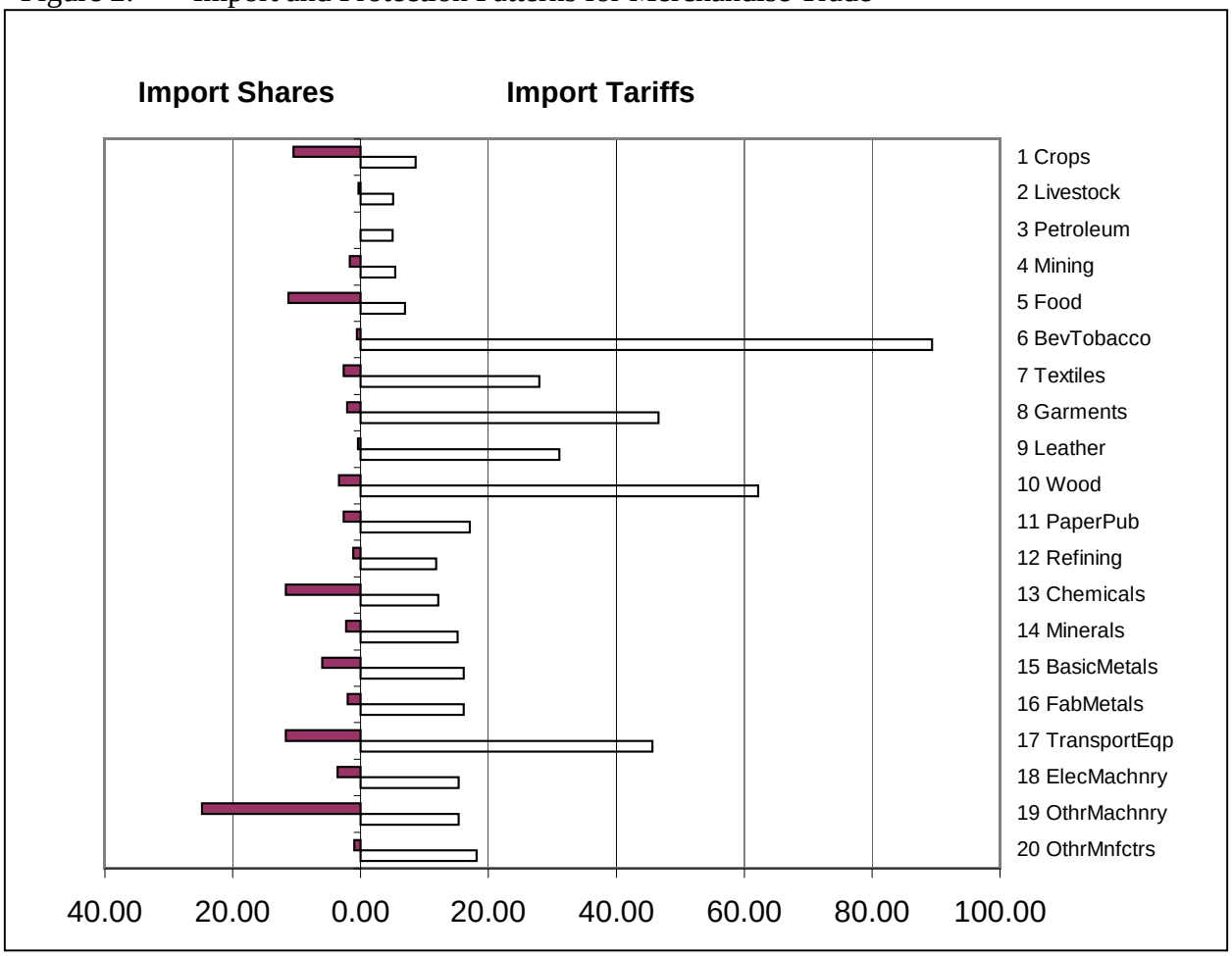
In this section we turn to an overview of the basic structure (data and theory) of the global CGE model employed for assessment of an EU-Egypt FTA. The model is a standard multi-region computable general equilibrium (CGE) model. We work with a modified version of the GTAP model, and the reader is referred to Hertel (1996) for a detailed discussion of the basic

Figure 1: Egyptian trade shares by partner




Source: GTAP consortium supplied trade data, based on UNCTAD COMTRADE data for 1997.

Figure 2: Import and Protection Patterns for Merchandise Trade




Source: Trade data are based on GTAP consortium supplied trade data, based on UNCTAD

COMTRADE data for 1997. Tariff data are from this report, based on Egyptian customs data.

Table 6.3: Regional Structure (%) of Egyptian Imports and Exports by Sectors, 1997

| | Imports | | | | | | Exports | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North America | European Union | Turkey | Middle East and North Africa | Rest of world | Total (mill. US$) | North America | European Union | Turkey | Middle East and North Africa | Rest of world | Total (mill. US$) |
| Crops | 44.87 | 13.36 | 2.62 | 0.72 | 38.43 | 2016.20 | 11.82 | 48.21 | 0.75 | 9.23 | 30.02 | 332.50 |
| Livestock | 6.37 | 28.64 | 0.17 | 1.34 | 63.48 | 59.70 | 12.88 | 70.39 | 0.00 | 2.15 | 15.02 | 23.30 |
| Petroleum | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.40 | 2.17 | 62.31 | 14.54 | 0.00 | 20.92 | 1972.70 |
| Mining | 25.83 | 11.54 | 0.63 | 4.79 | 57.21 | 333.70 | 2.31 | 48.84 | 7.80 | 9.25 | 31.79 | 34.60 |
| Food | 22.21 | 24.61 | 0.54 | 0.20 | 52.44 | 2184.90 | 14.61 | 30.42 | 2.82 | 8.71 | 43.44 | 390.20 |
| Beverages & Tobacco | 53.59 | 33.10 | 0.62 | 1.77 | 10.91 | 112.70 | 20.58 | 37.74 | 0.53 | 2.56 | 38.59 | 93.80 |
| Textiles | 7.37 | 25.62 | 5.02 | 4.61 | 57.37 | 518.00 | 21.14 | 65.84 | 2.22 | 2.83 | 7.97 | 792.50 |
| Garments | 3.71 | 15.27 | 8.22 | 0.51 | 72.29 | 412.50 | 52.89 | 36.76 | 0.08 | 1.80 | 8.46 | 478.50 |
| Leather | 3.67 | 31.88 | 0.80 | 0.11 | 63.53 | 87.20 | 9.54 | 39.45 | 2.94 | 19.45 | 28.62 | 54.50 |
| Wood | 4.16 | 53.57 | 0.35 | 0.03 | 41.89 | 658.90 | 32.99 | 32.79 | 0.20 | 13.44 | 20.57 | 49.10 |
| Paper and Publishing | 22.72 | 43.49 | 0.72 | 1.70 | 31.37 | 513.20 | 13.45 | 40.35 | 0.47 | 12.03 | 33.86 | 63.20 |
| Refining | 3.69 | 45.23 | 0.23 | 39.02 | 11.84 | 222.20 | 7.65 | 44.44 | 1.49 | 7.63 | 38.81 | 847.20 |
| Chemicals | 8.40 | 50.83 | 1.50 | 10.41 | 28.86 | 2248.20 | 6.33 | 38.36 | 1.17 | 15.96 | 38.19 | 342.80 |
| Minerals | 4.63 | 53.19 | 6.16 | 1.16 | 34.86 | 431.50 | 5.73 | 40.12 | 0.85 | 16.34 | 36.83 | 82.00 |
| Basic Metals | 3.16 | 32.51 | 1.71 | 13.16 | 49.46 | 1160.70 | 13.20 | 54.82 | 5.19 | 6.11 | 20.65 | 283.30 |
| Fabricated Metals | 14.71 | 46.47 | 5.17 | 6.65 | 27.00 | 390.80 | 11.04 | 26.96 | 0.11 | 16.61 | 45.28 | 87.90 |
| Transport Equipment | 43.78 | 37.80 | 2.28 | 1.22 | 14.93 | 2249.20 | 14.34 | 49.04 | 0.40 | 2.48 | 33.73 | 124.80 |
| Electrical Machinery | 20.99 | 42.03 | 0.49 | 0.59 | 35.90 | 694.70 | 16.80 | 46.09 | 0.39 | 1.69 | 35.16 | 76.80 |
| Other Machinery | 26.92 | 50.69 | 0.66 | 0.59 | 21.14 | 4782.30 | 13.74 | 49.87 | 2.68 | 4.25 | 29.38 | 152.80 |
| Other Manufactures | 13.14 | 44.98 | 0.36 | 1.38 | 40.14 | 196.30 | 13.72 | 46.46 | 0.11 | 2.99 | 36.73 | 90.40 |
| Electric Utilities | 28.21 | 40.17 | 1.71 | 0.85 | 29.06 | 11.70 | 21.05 | 39.47 | 0.33 | 1.64 | 37.50 | 30.40 |
| Construction | 16.88 | 27.27 | 1.30 | 7.79 | 46.75 | 7.70 | 3.17 | 55.88 | 0.53 | 1.06 | 39.37 | 75.70 |
| Other Utilities | 32.14 | 41.07 | 1.79 | 0.00 | 25.00 | 5.60 | 20.69 | 40.23 | 0.57 | 1.15 | 36.78 | 17.40 |
| Transport & Comm. | 26.07 | 39.07 | 1.30 | 1.66 | 31.89 | 824.60 | 39.69 | 34.47 | 0.22 | 1.38 | 24.23 | 3638.30 |
| Trade, Finance, and Ins. | 22.12 | 45.09 | 0.93 | 1.31 | 30.55 | 374.80 | 21.05 | 38.11 | 0.48 | 2.11 | 38.25 | 583.30 |
| Other Services | 38.64 | 34.81 | 1.46 | 2.12 | 22.98 | 3172.50 | 24.16 | 38.71 | 0.49 | 6.04 | 30.59 | 3199.30 |
| Total | 25.46 | 37.98 | 1.62 | 3.07 | 31.87 | 23670.20 | 22.76 | 43.46 | 2.79 | 4.04 | 26.95 | 13917.30 |

Note: Bold numbers indicate most important region in each sector.

Source: Own calculations from GTAP consortium supplied trade data, based on UNCTAD COMTRADE data for 1997.

Table 6.4: Sectoral Structure (%) of Egyptian Imports and Exports by Regions, 1997

| | Imports | | | | | | Exports | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North America | European Union | Turkey | Middle East and North Africa | Rest of world | Total | North America | European Union | Turkey | Middle East and North Africa | Rest of world | Total |
| Crops | 15.01 | 3.00 | 13.80 | 2.00 | 10.27 | 8.52 | 1.24 | 2.65 | 0.64 | 5.46 | 2.66 | 2.39 |
| Livestock | 0.06 | 0.19 | 0.03 | 0.11 | 0.50 | 0.25 | 0.09 | 0.27 | 0.00 | 0.09 | 0.09 | 0.17 |
| Petroleum | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 1.35 | 20.32 | 73.98 | 0.00 | 11.01 | 14.17 |
| Mining | 1.43 | 0.43 | 0.55 | 2.20 | 2.53 | 1.41 | 0.03 | 0.28 | 0.70 | 0.57 | 0.29 | 0.25 |
| Food | 8.05 | 5.98 | 3.10 | 0.61 | 15.19 | 9.23 | 1.80 | 1.96 | 2.84 | 6.05 | 4.52 | 2.80 |
| Beverages & Tobacco | 1.00 | 0.41 | 0.18 | 0.28 | 0.16 | 0.48 | 0.61 | 0.59 | 0.13 | 0.43 | 0.97 | 0.67 |
| Textiles | 0.63 | 1.48 | 6.78 | 3.29 | 3.94 | 2.19 | 5.29 | 8.63 | 4.54 | 3.99 | 1.69 | 5.69 |
| Garments | 0.25 | 0.70 | 8.84 | 0.29 | 3.95 | 1.74 | 7.99 | 2.91 | 0.10 | 1.53 | 1.08 | 3.44 |
| Leather | 0.05 | 0.31 | 0.18 | 0.01 | 0.73 | 0.37 | 0.16 | 0.36 | 0.41 | 1.89 | 0.42 | 0.39 |
| Wood | 0.45 | 3.93 | 0.60 | 0.03 | 3.66 | 2.78 | 0.51 | 0.27 | 0.03 | 1.17 | 0.27 | 0.35 |
| Paper and Publishing | 1.94 | 2.48 | 0.97 | 1.20 | 2.13 | 2.17 | 0.27 | 0.42 | 0.08 | 1.35 | 0.57 | 0.45 |
| Refining | 0.14 | 1.12 | 0.13 | 11.94 | 0.35 | 0.94 | 2.05 | 6.22 | 3.25 | 11.49 | 8.77 | 6.09 |
| Chemicals | 3.13 | 12.71 | 8.82 | 32.24 | 8.60 | 9.50 | 0.69 | 2.17 | 1.03 | 9.73 | 3.49 | 2.46 |
| Minerals | 0.33 | 2.55 | 6.94 | 0.69 | 1.99 | 1.82 | 0.15 | 0.54 | 0.18 | 2.38 | 0.81 | 0.59 |
| Basic Metals | 0.61 | 4.20 | 5.16 | 21.03 | 7.61 | 4.90 | 1.18 | 2.57 | 3.79 | 3.08 | 1.56 | 2.04 |
| Fabricated Metals | 0.95 | 2.02 | 5.27 | 3.58 | 1.40 | 1.65 | 0.31 | 0.39 | 0.03 | 2.60 | 1.06 | 0.63 |
| Transport Equipment | 16.34 | 9.46 | 13.38 | 3.77 | 4.45 | 9.50 | 0.57 | 1.01 | 0.13 | 0.55 | 1.12 | 0.90 |
| Electrical Machinery | 2.42 | 3.25 | 0.89 | 0.56 | 3.31 | 2.93 | 0.41 | 0.59 | 0.08 | 0.23 | 0.72 | 0.55 |
| Other Machinery | 21.36 | 26.96 | 8.29 | 3.88 | 13.40 | 20.20 | 0.66 | 1.26 | 1.06 | 1.16 | 1.20 | 1.10 |
| Other Manufactures | 0.43 | 0.98 | 0.18 | 0.37 | 1.04 | 0.83 | 0.39 | 0.69 | 0.03 | 0.48 | 0.89 | 0.65 |
| Electric Utilities | 0.05 | 0.05 | 0.05 | 0.01 | 0.05 | 0.05 | 0.20 | 0.20 | 0.03 | 0.09 | 0.30 | 0.22 |
| Construction | 0.02 | 0.02 | 0.03 | 0.08 | 0.05 | 0.03 | 0.08 | 0.70 | 0.10 | 0.14 | 0.79 | 0.54 |
| Other Utilities | 0.03 | 0.03 | 0.03 | 0.00 | 0.02 | 0.02 | 0.11 | 0.12 | 0.03 | 0.04 | 0.17 | 0.13 |
| Transport & Comm. | 3.57 | 3.58 | 2.79 | 1.89 | 3.49 | 3.48 | 45.59 | 20.74 | 2.06 | 8.93 | 23.51 | 26.14 |
| Trade, Finance, and Ins. | 1.38 | 1.88 | 0.91 | 0.67 | 1.52 | 1.58 | 3.88 | 3.68 | 0.72 | 2.19 | 5.95 | 4.19 |
| Other Services | 20.34 | 12.28 | 12.10 | 9.25 | 9.66 | 13.40 | 24.40 | 20.47 | 4.05 | 34.39 | 26.10 | 22.99 |
| Total (millions of dollars) | 6025.80 | 8990.40 | 383.40 | 726.10 | 7544.50 | 23670.20 | 3167.50 | 6048.70 | 387.80 | 562.10 | 3750.10 | 13917.30 |

Note: Bold numbers indicate most important sector in each region.

Source: Own calculations from GTAP consortium supplied trade data, based on UNCTAD COMTRADE data for 1997.

Table 6.5: Product Structure (%) of EU15 Trade with Egypt, 1990–1998

| Product | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Imports from Egypt | | | | | | | | |
| Total trade (1000 US$) | 2951.81 | 2706.98 | 3177.20 | 2810.02 | 3275.56 | 3054.84 | 3585.98 | 3043.08 | 2520.04 |
| 0 Food and live animals | 3.61 | 5.54 | 4.47 | 4.48 | 3.53 | 8.83 | 5.60 | 4.65 | 6.87 |
| 1 Beverages and tobacco | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.05 |
| 2 Crude mats., except fuels, etc. | 2.77 | 2.54 | 2.29 | 2.29 | 3.52 | 4.23 | 2.88 | 4.40 | 5.76 |
| 3 Mineral fuels, lubricants, related mats. | **65.14** | **65.65** | **63.76** | **65.87** | **57.75** | **51.95** | **65.63** | **53.84** | **44.87** |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.10 | 0.03 | 0.00 |
| 5 Chemicals/related prods., n.e.s. | 1.11 | 1.36 | 2.39 | 1.62 | 2.53 | 2.83 | 1.39 | 2.39 | 2.83 |
| 6 Manufactured goods | 17.69 | 14.94 | 14.68 | 12.95 | 18.36 | 20.67 | 14.02 | 21.38 | 21.12 |
| 7 Machinery/transport equip. | 5.87 | 5.36 | 7.82 | 6.03 | 8.18 | 3.34 | 2.46 | 2.55 | 4.81 |
| 8 Misc. manufactured articles | 3.46 | 4.55 | 4.52 | 6.68 | 6.05 | 8.04 | 7.87 | 10.67 | 13.64 |
| 9 Commodities/transactions, n.e.s. | 0.34 | 0.04 | 0.06 | 0.06 | 0.06 | 0.07 | 0.03 | 0.01 | 0.05 |
| | Exports to Egypt | | | | | | | | |
| Total trade (1000 US$) | 5520.66 | 5268.35 | 4796.96 | 5605.40 | 5664.22 | 6318.34 | 6969.17 | 7407.57 | 8044.47 |
| 0 Food and live animals | 14.09 | 8.49 | 9.61 | 13.02 | 11.41 | 10.86 | 9.59 | 9.27 | 9.47 |
| 1 Beverages and tobacco | 0.54 | 0.57 | 1.60 | 0.65 | 1.33 | 0.51 | 0.46 | 0.46 | 0.77 |
| 2 Crude mats., except fuels, etc. | 4.41 | 4.70 | 5.22 | 4.97 | 4.66 | 6.40 | 4.64 | 4.75 | 4.33 |
| 3 Mineral fuels, lubricants, related mats. | 1.65 | 1.57 | 0.71 | 1.38 | 0.64 | 0.64 | 1.24 | 1.48 | 1.40 |
| 4 Animal/vegetable oils, fats/waxes | 0.47 | 0.42 | 0.44 | 0.55 | 0.51 | 0.75 | 0.46 | 0.51 | 0.48 |
| 5 Chemicals/related prods., n.e.s. | 10.99 | 12.36 | 12.94 | 12.08 | 12.92 | 14.78 | 13.43 | 12.94 | 13.38 |
| 6 Manufactured goods | 13.88 | 14.87 | 13.82 | 12.86 | 12.64 | 14.70 | 13.59 | 14.15 | 14.86 |
| 7 Machinery/transport equip. | **46.26** | **48.65** | **48.24** | **47.51** | **48.45** | **44.39** | **48.71** | **47.92** | **47.24** |
| 8 Misc. manufactured articles | 5.05 | 5.65 | 6.32 | 5.97 | 6.31 | 6.16 | 6.57 | 6.80 | 6.64 |
| 9 Commodities/transactions, n.e.s. | 2.66 | 2.71 | 1.10 | 1.02 | 1.13 | 0.81 | 1.32 | 1.60 | 1.44 |

Note: **Bold** numbers indicate most important import/export sector relative to total EU15 imports/exports from Egypt.

Source: Own calculations from ITCS.

Table 6.6: Product Structure (%) of USA Trade with Egypt, 1990–1998

| Product | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Imports from Egypt | | | | | | | | |
| Total trade (1000 US$) | 435.26 | 223.54 | 465.60 | 663.22 | 592.83 | 653.88 | 713.47 | 657.42 | 698.61 |
| 0 Food and live animals | 1.19 | 2.83 | 1.31 | 0.96 | 1.81 | 1.44 | 1.65 | 1.25 | 1.39 |
| 1 Beverages and tobacco | 0.04 | 0.10 | 0.06 | 0.04 | 0.09 | 0.08 | 0.12 | 0.14 | 0.14 |
| 2 Crude mats., except fuels, etc. | 1.02 | 2.35 | 1.40 | 0.79 | 1.05 | 1.28 | 2.15 | 0.93 | 2.07 |
| 3 Mineral fuels, lubricants, related mats. | **66.24** | 21.70 | **52.06** | **59.76** | **38.49** | 30.00 | 35.44 | 14.84 | 8.20 |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 5 Chemicals/related prods., n.e.s. | 0.49 | 1.20 | 0.46 | 0.51 | 1.94 | 1.71 | 0.44 | 0.36 | 0.43 |
| 6 Manufactured goods | 8.94 | 25.92 | 10.63 | 8.10 | 15.16 | 17.37 | 12.30 | 18.74 | 21.84 |
| 7 Machinery/transport equip. | 0.08 | 0.26 | 0.36 | 0.24 | 0.21 | 0.26 | 0.17 | 0.38 | 0.55 |
| 8 Misc. manufactured articles | 16.79 | **39.36** | 27.95 | 26.81 | 38.39 | **41.36** | **42.07** | **50.97** | **59.66** |
| 9 Commodities/transactions, n.e.s. | 5.21 | 6.29 | 5.76 | 2.79 | 2.87 | 6.49 | 5.66 | 12.40 | 5.71 |
| | Exports to Egypt | | | | | | | | |
| Total trade (1000 US$) | 2220.43 | 2687.50 | 3063.81 | 2756.06 | 2828.88 | 2976.98 | 3135.53 | 3816.97 | 3059.79 |
| 0 Food and live animals | 24.62 | 19.28 | 19.82 | 20.47 | 28.00 | **37.97** | **36.78** | 23.21 | 27.03 |
| 1 Beverages and tobacco | 0.78 | 1.06 | 0.88 | 1.83 | 1.04 | 1.75 | 1.48 | 1.34 | 2.43 |
| 2 Crude mats., except fuels, etc. | 8.44 | 6.89 | 5.17 | 2.60 | 2.13 | 5.45 | 3.47 | 1.90 | 2.21 |
| 3 Mineral fuels, lubricants, related mats. | 1.50 | 1.58 | 1.59 | 1.55 | 1.74 | 2.33 | 2.25 | 1.65 | 1.56 |
| 4 Animal/vegetable oils, fats/waxes | 0.63 | 1.15 | 1.09 | 0.79 | 1.08 | 1.59 | 1.39 | 1.46 | 1.82 |
| 5 Chemicals/related prods., n.e.s. | 5.28 | 5.35 | 3.07 | 3.89 | 3.02 | 3.46 | 3.58 | 3.85 | 5.39 |
| 6 Manufactured goods | 6.10 | 5.51 | 3.73 | 3.09 | 3.34 | 4.45 | 4.85 | 3.13 | 3.13 |
| 7 Machinery/transport equip. | **38.86** | **43.39** | **47.82** | **43.73** | **36.01** | 28.51 | 29.91 | **42.88** | **39.74** |
| 8 Misc. manufactured articles | 12.23 | 14.58 | 16.06 | 21.01 | 22.68 | 13.56 | 15.41 | 19.32 | 14.65 |
| 9 Commodities/transactions, n.e.s. | 1.56 | 1.23 | 0.77 | 1.03 | 0.96 | 0.93 | 0.89 | 1.25 | 2.05 |

Note: **Bold** numbers indicate most important import/export sector relative to USA imports/exports from Egypt.

Source: Own calculations from ITCS.

Table 6.7: Product Structure (%) of Canada's Trade with Egypt, 1990–1998

| Product | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Imports from Egypt | | | | | | | | |
| Total trade (1000 US$) | 8.05 | 10.39 | 34.82 | 72.74 | 10.99 | 13.73 | 14.15 | 20.97 | 23.44 |
| 0 Food and live animals | 8.31 | 14.38 | 1.67 | 0.93 | 6.92 | 4.29 | 8.08 | 3.91 | 4.82 |
| 1 Beverages and tobacco | 0.19 | 0.67 | 0.38 | 0.22 | 1.86 | 1.95 | 1.20 | 0.66 | 0.42 |
| 2 Crude mats., except fuels, etc. | 1.68 | 0.74 | 0.38 | 0.18 | 1.88 | 1.37 | 1.89 | 1.40 | 1.54 |
| 3 Mineral fuels, lubricants, related mats. | 0.39 | 27.00 | **81.60** | **90.14** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 5 Chemicals/related prods., n.e.s. | 1.15 | 0.00 | 0.05 | 0.00 | 0.33 | 0.26 | 0.20 | 0.09 | 1.04 |
| 6 Manufactured goods | 29.85 | **28.59** | 6.60 | 3.36 | 29.73 | 45.12 | 38.47 | **53.83** | **46.23** |
| 7 Machinery/transport equip. | 11.45 | 0.18 | 0.55 | 0.18 | 0.87 | 1.22 | 2.39 | 3.33 | 3.00 |
| 8 Misc. manufactured articles | **46.43** | 27.94 | 8.66 | 4.85 | **41.91** | **45.28** | **46.20** | 36.52 | 42.51 |
| 9 Commodities/transactions, n.e.s. | 0.55 | 0.48 | 0.10 | 0.15 | 16.49 | 0.51 | 1.56 | 0.25 | 0.43 |
| | Exports to Egypt | | | | | | | | |
| Total trade (1000 US$) | 63.71 | 98.72 | 83.49 | 56.77 | 70.23 | 95.41 | 92.34 | 126.97 | 106.29 |
| 0 Food and live animals | 7.96 | 14.98 | **30.19** | **19.84** | 18.77 | 4.33 | 15.38 | 7.81 | 10.06 |
| 1 Beverages and tobacco | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.03 | 0.00 | 0.00 | 0.82 |
| 2 Crude mats., except fuels, etc. | 19.35 | 12.26 | 6.22 | 9.03 | 5.92 | 3.76 | 16.49 | 15.57 | 9.40 |
| 3 Mineral fuels, lubricants, related mats. | 0.13 | 22.17 | 6.94 | 10.51 | 16.03 | 2.75 | 11.98 | 6.87 | 5.04 |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 4.83 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.03 |
| 5 Chemicals/related prods., n.e.s. | 4.36 | 2.80 | 8.84 | 12.32 | 4.16 | 4.29 | 5.23 | 5.99 | 8.69 |
| 6 Manufactured goods | **40.23** | **26.52** | 27.94 | 10.66 | **28.68** | **61.34** | **24.11** | **30.47** | **34.52** |
| 7 Machinery/transport equip. | 22.47 | 17.58 | 9.54 | 18.92 | 20.13 | 17.64 | 19.64 | 26.32 | 23.56 |
| 8 Misc. manufactured articles | 2.31 | 1.86 | 1.75 | 6.33 | 4.33 | 4.78 | 4.95 | 5.71 | 6.33 |
| 9 Commodities/transactions, n.e.s. | 3.20 | 1.84 | 3.75 | 12.25 | 1.97 | 1.07 | 2.21 | 1.24 | 1.55 |

Note: **Bold** numbers indicate most important import/export sector relative to Canadian imports/exports from Egypt.

Source: Own calculations from ITCS.

Table 6.8: Product Structure (%) of Japan's Trade with Egypt, 1990–1998

| Product | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Imports from Egypt | | | | | | | | |
| Total trade (1000 US$) | 115.92 | 89.05 | 91.17 | 101.66 | 80.29 | 93.05 | 69.88 | 153.31 | 83.20 |
| 0 Food and live animals | 0.38 | 0.82 | 0.50 | 0.44 | 2.59 | 4.09 | 2.39 | 1.60 | 2.92 |
| 1 Beverages and tobacco | 0.04 | 0.01 | 0.03 | 0.01 | 0.02 | 0.01 | 0.05 | 0.01 | 0.02 |
| 2 Crude mats., except fuels, etc. | 39.33 | 41.61 | 25.26 | 14.96 | 25.16 | 28.49 | **40.00** | 17.52 | 29.76 |
| 3 Mineral fuels, lubricants, related mats. | **49.62** | **47.90** | **62.71** | **40.79** | **45.24** | **49.34** | 0.42 | **55.94** | **51.53** |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 5 Chemicals/related prods., n.e.s. | 0.20 | 0.28 | 0.10 | 0.23 | 0.24 | 0.45 | 0.32 | 0.16 | 0.15 |
| 6 Manufactured goods | 6.69 | 7.49 | 10.17 | 20.19 | 19.45 | 12.24 | 21.22 | 10.20 | 9.26 |
| 7 Machinery/transport equip. | 0.01 | 0.01 | 0.03 | 0.02 | 0.04 | 0.38 | 0.78 | 0.15 | 0.32 |
| 8 Misc. manufactured articles | 0.79 | 0.81 | 0.70 | 21.32 | 5.27 | 1.23 | 30.79 | 13.52 | 5.20 |
| 9 Commodities /transactions, n.e.s. | 2.94 | 1.08 | 0.51 | 2.03 | 1.99 | 3.77 | 4.05 | 0.90 | 0.84 |
| | Exports to Egypt | | | | | | | | |
| Total trade (1000 US$) | 526.04 | 545.30 | 584.67 | 748.46 | 712.81 | 818.09 | 793.95 | 910.88 | 1071.04 |
| 0 Food and live animals | 0.03 | 0.05 | 0.04 | 0.01 | 0.02 | 0.22 | 0.00 | 0.02 | 0.01 |
| 1 Beverages and tobacco | 0.10 | 0.00 | 0.00 | 0.05 | 0.02 | 0.03 | 0.03 | 0.53 | 0.00 |
| 2 Crude mats., except fuels, etc. | 0.54 | 0.39 | 0.39 | 0.30 | 0.39 | 0.52 | 0.30 | 0.36 | 0.31 |
| 3 Mineral fuels, lubricants, related mats. | 0.01 | 0.00 | 0.02 | 0.12 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 |
| 4 Animal/vegetable oils, fats/waxes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 Chemicals/related prods., n.e.s. | 2.68 | 2.63 | 2.71 | 2.80 | 3.12 | 2.92 | 3.64 | 4.31 | 4.48 |
| 6 Manufactured goods | 20.58 | 20.83 | 14.21 | 12.40 | 11.53 | 11.36 | 13.78 | 15.66 | 17.58 |
| 7 Machinery/transport equip. | **68.57** | **68.72** | **76.02** | **79.20** | **79.59** | **79.01** | **73.67** | **71.64** | **71.16** |
| 8 Misc. manufactured articles | 7.09 | 7.16 | 6.09 | 4.94 | 5.10 | 4.49 | 6.19 | 3.88 | 4.22 |
| 9 Commodities/transactions, n.e.s. | 0.41 | 0.23 | 0.52 | 0.18 | 0.23 | 1.45 | 2.39 | 3.58 | 2.23 |

Note: **Bold** numbers indicate most important import/export sector relative to Japanese imports/exports from Egypt.

Source: Own calculations from ITCS.

algebraic model structure. We focus here on a general overview rather than a detailed discussion. The model is implemented in GEMPACK -- a software package designed for solving large applied general equilibrium models. The model is solved as an explicit non-linear system of equations. Social accounting data are based on the GTAP data set (McDougall, R.A., A. Elbehri, and T.P. Truong 1998). This data set has been updated and modified to reflect Egyptian production and trade. Egypt is not included in the GTAP database, and so this addition is based on data from CAPMAS and related sources.

## 4.2 General Structure of the CGE Model

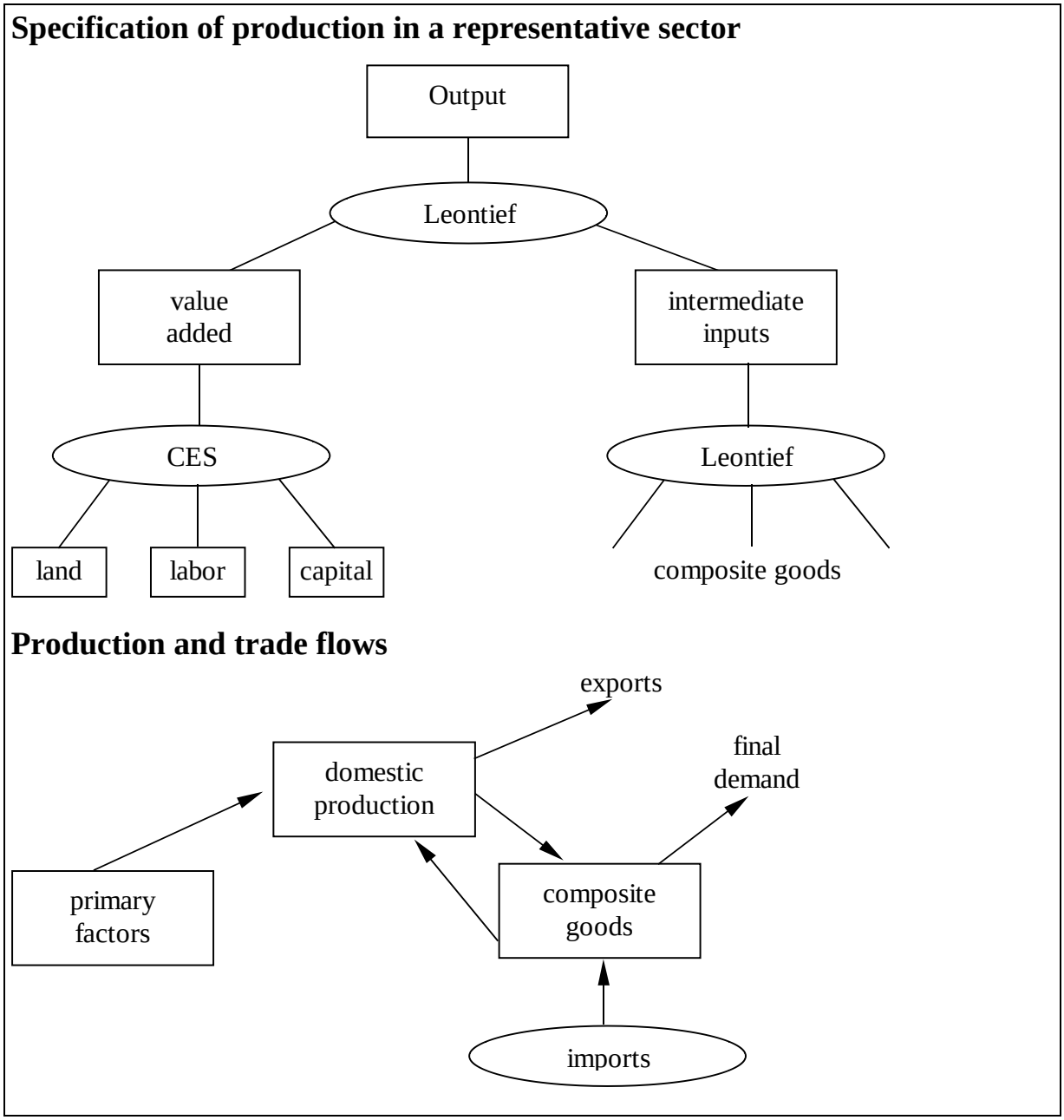
The general conceptual structure of a regional economy in the model is represented in Figure 3. The model is characterized by an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value added chain from primary goods, over continuously higher stages of intermediate processing, to the final assembling of goods and services for consumption. Inter-sectoral linkages are direct, like the input of steel in the production of transport equipment, and indirect, via intermediate use in other sectors. The model captures these linkages by modeling firms' use of factors and intermediate inputs. Within each region, firms produce output, employing land, labor, and capital, and combining these with intermediate inputs. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labor (both skilled and unskilled) are mobile between all production sectors. Capital is fully mobile within regions. However, capital movements between regions are not modeled, but rather are held fixed in all simulations. Labor mobility is discussed below. All demand sources combine imports with domestic goods to produce a composite good, as indicated in the figure. These are called Armington composites.

Mathematically, economic operations are represented in the model by constant elasticity of substitution (CES) technologies. Hence, value added is a CES composite of primary factors, and the combination of valued added with intermediates involves a Leontief technology (i.e. fixed input coefficients), which is also a special case of the CES functional form. The composite import goods (referred to as Armington composites) are also the outcome of a CES technology in the model. In all regions there is a single representative, composite household in each region, with expenditures allocated over personal consumption and savings (future consumption). The composite household owns endowments of the factors of production and

receives income by selling them to firms. It also receives income from tariff revenue and rents accruing from import/export quota licenses (when applicable). Part of the income is distributed as subsidy payments to some sectors, primarily in agriculture. The upper-tier demand structure for this household is Cobb-Douglas, another special case of the CES technology.

On the production side, in all sectors, firms employ domestic production factors (capital, skilled labor, unskilled labor, natural resources, and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allow. Products from different regions are assumed to be imperfect substitutes in accordance with the so-called "Armington" assumption.

Figure 6.3: Basic CGE Model Structure



Prices on goods and factors adjust until all markets are simultaneously in (general) equilibrium. This means that we solve for equilibria in which all markets ultimately have cleared. While we model changes in gross trade flows, we do not model changes in net international capital flows. Rather our capital market closure involves fixed net capital inflows and outflows. (This does not preclude changes in gross capital flows). To summarize, factor markets are competitive, and labor and capital are mobile between sectors but not between regions.

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modeled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

International trade is modeled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the composite "international trade services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data.

## 4.3 Data Structure of the CGE Model

The data come from a number of sources. Data on production and trade are based on national social accounting data linked through trade flows (see Reinert and Roland-Holst 1997). With the exception of Egypt, these social accounting data are drawn directly from the Global Trade Analysis Project (GTAP). (GTAP 1999). Egyptian data are based on value added and input-output data from Egyptian agency CAPMAS, along with more detailed Moroccan input-output coefficients, and along with trade data and macro data from the World Bank and the GTAP consortium. The resulting global data set is benchmarked to 1997, and includes

detailed national input-output, trade, and final demand structures. The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers.

The baseline scenario we work with involves a post-Uruguay Round world, including relevant tariff cuts and liberalization of textile and clothing trade. In this regard, the data on post-Uruguay Round tariffs are taken from recent estimates reported by Francois and Strutt (1999). These in turn are taken primarily from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules. All of this tariff information has been concorded to GTAP model sectors. This is not so important for Egypt, but rather for the trade policy of Egypt's trading partners as represented in the model.

While the our basic data set is benchmarked to 1997, and reflects applied tariffs actually in place in 1997, we want to work with a baseline representation of a post-Uruguay Round world. To accomplish this, before conducting any policy experiments we first run a "pre-experiment" in which we implement the rest of the Uruguay Round. As such, the dataset we work with for actual experiments is a representation of a notional world economy (with values in 1997 dollars) wherein we have full Uruguay Round implementation. This global economy is moved forward to 2005 based on World Bank medium-term growth projections. All policy experiments are with respect to this notional 2005 post-Uruguay Round world.

The social accounting data have been aggregated to 26 sectors and 6 regions. The sectors and regions are detailed in Tables 9-10, along with 1997 value-added shares. Tax rates in the model are summarized in Table 11. For comparison, Egypt's import taxes are compared to taxes on Egypt's exports, in the same sectors, imposed by trading partners. This comparison is made in Table 12.

Table 6.9: Regional Structure of the General Equilibrium Model

| Label | Regional Description |
|---|---|
| EGY | Egypt |
| NAM | North America |
| EUN | European Union |
| TUR | Turkey |
| MNA | Rest of Middle East and North Africa |
| ROW | Rest of World |

Table 6.10: General Equilibrium Model Sectors

| Model sectors and label | GTAP version 5 sectors | Value-added share of GDP (from CAPMAS) |
|---|---|---|
| 1. CROPS | paddy rice<br>wheat and meslin<br>other grains<br>vegatables and fruit<br>oil seeds and oleaginous fruits<br>plants used for sugar manufacturing<br>raw vegetable material used in textiles<br>other crops<br>fishery products | 0.155 |
| 2. LIVESTOCK | bovine cattle<br>other agriculture products<br>raw milk<br>raw animal products for textiles | 0.033 |
| 3. PETROLEUM | crude petroleum extraction | 0.057 |
| 4. MINING | coal mining<br>crude gas extraction<br>other mining | 0.002 |
| 5. FOOD | bovine meat products<br>other meat products<br>vegetable oils<br>dairy products<br>processed rice products<br>processed sugar<br>other food products | 0.023 |
| 6. BEVTOBACCO | beverages and tobacco | 0.017 |
| 7. TEXTILES | textile, man-made fibres | 0.030 |
| 8. GARMENTS | wearing apparel | 0.034 |
| 9. LEATHER | leather products | 0.003 |
| 10. WOOD | lumber products and furniture<br>forestry, logging, and related services | 0.007 |
| 11. PAPERPUB | paper and paper products | 0.008 |
| 12. REFINING | refined petroleum and coke products | 0.021 |
| 13. CHEMICALS | chemicals, rubber and plastics | 0.016 |
| 14. MINERALS | other non-metallic mineral products | 0.025 |
| 15. BASICMETALS | basic iron and steel<br>basic non-ferrous metals | 0.018 |
| 16. FABMETALS | fabricated metal products | 0.005 |
| 17. TRANSPORTEQP | motor vehicles and parts<br>other transport equipment | 0.011 |
| 18. ELECMACHNRY | electrical machinery | 0.007 |
| 19. OTHRMACHNRY | other machinery | 0.001 |
| 20. OTHRMNFCTRS | other manufactures | 0.004 |
| 21. ELECUTILS | electricity utilities | 0.019 |
| 22. CONSTRUCTION | Constuction, Building Maint | 0.057 |
| 23. OTHER UTILS | gas utilities<br>water utilities<br>Dwellings | 0.023 |
| 24. TRANSCOMM | land transport and travel agencies<br>water transport<br>air transport<br>communications | 0.100 |
| 25. TFI | wholesale & resale trade<br>financial services<br>insurance | 0.226 |
| 26. OTHERSERVICES | other business services<br>other private services<br>other government services | 0.099 |

Table 6.11: Tax Rates for Aggregate Sectors in the CGE Model

| | Total 1997 imports[a] | Import tariffs | Domestic sales tax | Imported sales tax | Capital income tax | Stamp duty |
|---|---|---|---|---|---|---|
| 1 Crops | 2016.2 | 8.6 | 0.0 | 0.0 | 0.0 | -- |
| 2 Livestock | 59.7 | 5.1 | 10.0 | 10.0 | 0.0 | -- |
| 3 Petroleum | 0.4 | 5.0 | 0.0 | 0.0 | 18.0 | -- |
| 4 Mining | 333.7 | 5.4 | 10.0 | 10.0 | 18.0 | -- |
| 5 Food | 2184.9 | 6.9 | 0.0 | 5.0 | 18.0 | -- |
| 6 BevTobacco | 112.7 | 89.4 | 60.0 | 45.0 | 18.0 | -- |
| 7 Textiles | 518.0 | 28.0 | 10.0 | 10.0 | 18.0 | -- |
| 8 Garments | 412.5 | 46.6 | 0.0 | 0.0 | 18.0 | -- |
| 9 Leather | 87.2 | 31.1 | 10.0 | 10.0 | 18.0 | -- |
| 10 Wood | 658.9 | 62.2 | 5.0 | 5.0 | 18.0 | -- |
| 11 PaperPub | 513.2 | 17.1 | 0.0 | 0.0 | 18.0 | -- |
| 12 Refining | 222.2 | 11.8 | 10.0 | 5.0 | 18.0 | -- |
| 13 Chemicals | 2248.2 | 12.1 | 5.0 | 5.0 | 18.0 | -- |
| 14 Minerals | 431.5 | 15.2 | 5.0 | 5.0 | 18.0 | -- |
| 15 BasicMetals | 1160.7 | 16.1 | 10.0 | 10.0 | 18.0 | -- |
| 16 FabMetals | 390.8 | 16.1 | 10.0 | 10.0 | 18.0 | -- |
| 17 TransportEqp | 2249.2 | 45.6 | 25.0 | 25.0 | 18.0 | -- |
| 18 ElecMachnry | 694.7 | 15.3 | 25.0 | 25.0 | 18.0 | -- |
| 19 OthrMachnry | 4782.3 | 15.3 | 25.0 | 25.0 | 18.0 | -- |
| 20 OthrMnfctrs | 196.3 | 18.1 | 10.0 | 10.0 | 18.0 | -- |
| 21 ElecUtils | 11.7 | -- | 2.5 | 2.5 | 23.0 | -- |
| 22 Construction[b] | 7.7 | 19.0 | 10.0 | 10.0 | 23.0 | -- |
| 23 OtherUtils | 5.6 | -- | 5.0 | 5.0 | 23.0 | -- |
| 24 TransComm[b] | 824.6 | 10.0 | 10.0 | 10.0 | 23.0 | 2.0 |
| 25 TFI[b] | 374.8 | 10.0 | 10.0 | 10.0 | 23.0 | 4.0 |
| 26 OthrServices | 3172.5 | 10.0 | 5.0 | 5.0 | 23.0 | 2.0 |

[A]Imports are in millions of US-Dollars. – [b]Service sector tariffs are actually estimated tariff equivalents for non-tariff barriers.

Table 6.12: A Comparison of Import Tariffs

| | Egyptian tariffs | Tariffs on Imports from Egypt | | | | |
|---|---|---|---|---|---|---|
| | | North America | European Union | Turkey | Middle East and North Africa | Rest of World |
| Crops | 8.6 | 0.2 | 4.0 | 26.8 | 14.0 | 15.9 |
| Livestock | 5.1 | 1.7 | 5.4 | 18.7 | 7.6 | 20.9 |
| Petroleum | 5.0 | 0.5 | 0.0 | 0.2 | 7.1 | 8.7 |
| Mining | 5.4 | 0.1 | 0.0 | 3.0 | 12.7 | 1.6 |
| Food | 6.9 | 4.0 | 9.9 | 18.4 | 14.1 | 9.1 |
| BevTobacco | 89.4 | 15.1 | 5.3 | 94.8 | 3.0 | 13.0 |
| Textiles | 28.0 | 10.6 | 10.0 | 7.4 | 18.8 | 10.5 |
| Garments | 46.6 | 11.0 | 10.9 | 9.6 | 31.9 | 14.1 |
| Leather | 31.1 | 4.1 | 3.8 | 7.3 | 30.3 | 17.3 |
| Wood | 62.2 | 0.5 | 2.0 | 5.4 | 21.4 | 8.3 |
| PaperPub | 17.1 | 1.3 | 0.1 | 4.7 | 13.0 | 13.1 |
| Refining | 11.8 | 0.9 | 0.0 | 101.4 | 30.7 | 14.8 |
| Chemicals | 12.1 | 1.7 | 1.9 | 4.1 | 10.7 | 48.0 |
| Minerals | 15.2 | 1.0 | 2.9 | 8.0 | 22.1 | 10.9 |
| BasicMetals | 16.1 | 1.5 | 0.9 | 3.5 | 17.8 | 3.5 |
| FabMetals | 16.1 | 0.8 | 1.7 | 13.7 | 21.9 | 13.3 |
| TransportEqp | 45.6 | 1.1 | 2.6 | 7.9 | 24.5 | 10.1 |
| ElecMachnry | 15.3 | 0.0 | 3.0 | 5.0 | 19.5 | 9.8 |
| OthrMachnry | 15.3 | 0.2 | 2.4 | 6.0 | 15.2 | 10.0 |
| OthrMnfctrs | 18.1 | 0.0 | 0.1 | 12.4 | 31.3 | 1.0 |

Source: CGE model database.

## 6.5. The Scenarios

Our baseline scenario involves projecting the global economy from 1997 through 2005. This allows us to identify economic adjustment with the Egyptian economy, as a result of the evolution of and interaction with the global economy. The resulting projected 2005 economy serves as our baseline for the assessment of alternative changes in trade policy related to a prospective EU-Egypt FTA.

Our alternative scenarios reflect four versions of a free-trade agreement between the EU and Egypt. These scenarios are summarized in Table 13 below. They involve narrow and broad free trade, under reciprocal and non-reciprocal settings.

Table 6.13: Experiments

| Experiment | Description |
|---|---|
| Baseline projection | This involves the projection of the global economy, based on scheduled Uruguay Round liberalizations and World Bank macroeconomic forecasts, through the year 2005. |
| Experiment 1: Full FTA | This scenario involves full free trade between the EU and Egypt, across all sectors. |
| Experiment 2: Duty-free treatment for Egypt | This scenario involves full duty-free access for Egyptian exports to the EU. |
| Experiment 3: Partial FTA | This scenario involves partial free trade between the EU and Egypt, excluding agriculture and food products. |
| Experiment 4: Partial duty-free treatment for Egypt | This scenario involves partial duty-free access for Egyptian exports to the EU, excluding agriculture and food products. |

## 6.6. Results, Interpretation and Summary

We turn next to the projected impact of an FTA. It is useful, when viewing these results, to also consider the projected adjustment in the Egyptian economy that will occur anyway through the 2005 baseline projection. For this reason, each of the scenario tables (Tables 14-18) includes a baseline column.

Consider first the impact of the various scenarios on the pattern of production in the Egyptian economy. It is clear, from the first column of Table 14, that dramatic changes in output can be expected in the Egyptian economy, even without an FTA. This follows from growth within the Egyptian economy itself, but more importantly from growth in the economies of its trading partners. In addition, the trade policy regime of Egypt's trading partners also changes as a result of Uruguay Round commitments. The net impact of these changes is a rather dramatic increase in both light and heavy manufactures. The model sectors involved include other machinery (annual growth of 14.5 percent), other manufactures (annual growth

of 7.2 percent), fabricated metals (annual growth of 7.0 percent), and leather products (annual growth of 6.0 percent).

The impact of the FTA (or of duty-free access) depends on the structure of the agreement. For example, under a full FTA, Egyptian agricultural and food production grows relative to the baseline. This is based on the assumption that an FTA includes these sectors. If these sectors are excluded under a partial offer of duty-free access, the pull of resources into other sectors reduces food and crop production. Overall, under a full FTA, the greatest impact on relative output growth is realized in garment production (1997 value added share: 3.4 %, extra annual growth: 1.28%), other machinery (1997 value added share: 0.1%, extra annual output growth: 2.6), other manufactures (1997 value added share: 0.4%, extra annual output growth: 1.04%), and other services (1997 value added share: 9.9%, extra annual output growth: 1.81%).

Table 6.14: Projected Changes in Output by Sector in the Egyptian Economy (Annual Percent Change through 2005)

| | Baseline | Full FTA | Full duty free acess | Partial FTA | Partial duty free access |
|---|---|---|---|---|---|
| Crops | 2.34 | 2.61 | 2.30 | 2.63 | 2.29 |
| Livestock | 2.56 | 2.73 | 2.62 | 2.67 | 2.56 |
| Petroleum | 2.20 | 2.25 | 2.19 | 2.25 | 2.20 |
| Mining | -0.53 | 0.80 | -0.72 | 0.83 | -0.62 |
| Food | 3.84 | 4.58 | 4.12 | 4.23 | 3.78 |
| BevTobacco | 1.60 | -4.85 | 1.54 | -4.80 | 1.60 |
| Textiles | -1.40 | 0.52 | -0.46 | 0.59 | -0.24 |
| Garments | 4.09 | 5.38 | 4.70 | 5.41 | 4.75 |
| Leather | 5.99 | 6.96 | 6.06 | 7.05 | 6.17 |
| Wood | 4.44 | 2.71 | 4.45 | 2.72 | 4.45 |
| PaperPub | 2.45 | 2.70 | 2.37 | 2.72 | 2.40 |
| Refining | 4.93 | 5.03 | 4.97 | 5.02 | 4.97 |
| Chemicals | 3.77 | 4.40 | 3.75 | 4.41 | 3.77 |
| Minerals | 0.57 | 0.73 | 0.36 | 0.76 | 0.47 |
| BasicMetals | -5.74 | -6.36 | -6.36 | -6.28 | -6.08 |
| FabMetals | 6.96 | 7.85 | 7.06 | 7.84 | 7.02 |
| TransportEqp | -6.27 | -16.70 | -7.03 | -16.58 | -6.64 |
| ElecMachnry | 4.16 | 4.99 | 4.12 | 5.01 | 4.18 |
| OthrMachnry | 14.50 | 17.10 | 14.81 | 17.11 | 14.85 |
| OthrMnfctrs | 7.16 | 8.20 | 7.18 | 8.20 | 7.16 |
| ElecUtils | 2.17 | 2.51 | 2.16 | 2.52 | 2.17 |
| Construction | 1.66 | 2.28 | 1.67 | 2.29 | 1.70 |
| OtherUtils | 2.24 | 2.77 | 2.23 | 2.78 | 2.26 |
| TransComm | 2.00 | 2.47 | 1.89 | 2.48 | 1.93 |
| TFI | 2.24 | 2.54 | 2.21 | 2.55 | 2.23 |
| OthrServices | 4.83 | 5.64 | 4.75 | 5.65 | 4.78 |

Table 6.15: Projected Changes in Total Exports by Sector in the Egyptian Economy (Annual Percent Change through 2005)

| | Baseline | Full FTA | Full duty free acess | Partial FTA | Partial duty free access |
|---|---|---|---|---|---|
| Crops | 2.31 | 4.83 | 2.80 | 3.79 | 2.01 |
| Livestock | 0.06 | 5.02 | 1.98 | 2.39 | -0.33 |
| Petroleum | 1.90 | 1.86 | 1.87 | 1.86 | 1.89 |
| Mining | -7.00 | -3.89 | -7.61 | -3.81 | -7.31 |
| Food | 4.21 | 7.89 | 5.62 | 5.95 | 3.91 |
| BevTobacco | -0.44 | 4.07 | 0.43 | 4.18 | 0.77 |
| Textiles | -2.68 | 3.52 | 0.49 | 3.59 | 0.75 |
| Garments | 4.56 | 17.24 | 9.71 | 17.36 | 10.11 |
| Leather | 21.56 | 30.13 | 22.21 | 30.59 | 23.07 |
| Wood | 6.92 | 11.55 | 6.96 | 11.61 | 7.18 |
| PaperPub | 0.04 | 1.87 | -0.39 | 1.93 | -0.19 |
| Refining | 3.71 | 4.90 | 3.53 | 4.93 | 3.65 |
| Chemicals | 2.58 | 5.23 | 2.52 | 5.29 | 2.71 |
| Minerals | -3.67 | 0.53 | -3.55 | 0.63 | -3.20 |
| BasicMetals | -9.25 | -6.97 | -9.62 | -6.88 | -9.35 |
| FabMetals | 16.87 | 22.17 | 17.18 | 22.18 | 17.21 |
| TransportEqp | -7.83 | -0.34 | -7.28 | -0.17 | -6.75 |
| ElecMachnry | 5.31 | 9.70 | 5.88 | 9.77 | 6.09 |
| OthrMachnry | 15.69 | 21.41 | 16.51 | 21.43 | 16.58 |
| OthrMnfctrs | 15.51 | 19.97 | 15.29 | 20.01 | 15.41 |
| ElecUtils | -3.00 | 0.54 | -3.68 | 0.64 | -3.31 |
| Construction | 2.73 | 4.48 | 2.31 | 4.53 | 2.47 |
| OtherUtils | 2.95 | 8.19 | 2.23 | 8.31 | 2.71 |
| TransComm | 1.47 | 2.13 | 1.29 | 2.16 | 1.36 |
| TFI | 1.34 | 3.33 | 0.83 | 3.40 | 1.06 |
| OthrServices | 7.73 | 10.09 | 7.34 | 10.14 | 7.51 |

Table 6.16: Projected Changes in Egyptian Exports to the EU by Sector (Annual Percent Change through 2005)

| | Baseline | Full FTA | Full duty free acess | Partial FTA | Partial duty free access |
|---|---|---|---|---|---|
| Crops | 1.43 | 5.16 | 3.10 | 2.91 | 1.13 |
| Livestock | -0.02 | 5.99 | 2.91 | 2.33 | -0.41 |
| Petroleum | 1.99 | 1.94 | 1.96 | 1.95 | 1.97 |
| Mining | -6.79 | -3.66 | -7.39 | -3.58 | -7.10 |
| Food | 4.46 | 11.83 | 9.45 | 6.24 | 4.16 |
| BevTobacco | -0.13 | 6.86 | 3.08 | 6.97 | 3.43 |
| Textiles | -2.32 | 5.44 | 2.35 | 5.52 | 2.61 |
| Garments | 5.27 | 24.94 | 16.90 | 25.07 | 17.33 |
| Leather | 20.17 | 31.91 | 23.84 | 32.37 | 24.71 |
| Wood | 7.73 | 13.47 | 8.73 | 13.54 | 8.96 |
| PaperPub | 0.11 | 2.00 | -0.28 | 2.06 | -0.08 |
| Refining | 3.58 | 4.78 | 3.40 | 4.80 | 3.51 |
| Chemicals | 2.45 | 5.70 | 2.96 | 5.76 | 3.15 |
| Minerals | -3.78 | 1.61 | -2.55 | 1.71 | -2.19 |
| BasicMetals | -9.32 | -6.75 | -9.42 | -6.66 | -9.15 |
| FabMetals | 16.79 | 23.20 | 18.12 | 23.21 | 18.16 |
| TransportEqp | -6.86 | 2.23 | -4.92 | 2.40 | -4.38 |
| ElecMachnry | 5.44 | 11.04 | 7.16 | 11.10 | 7.37 |
| OthrMachnry | 15.47 | 22.18 | 17.23 | 22.20 | 17.30 |
| OthrMnfctrs | 15.26 | 19.79 | 15.09 | 19.82 | 15.21 |
| ElecUtils | -2.69 | 0.90 | -3.38 | 1.00 | -3.00 |
| Construction | 2.50 | 4.27 | 2.09 | 4.32 | 2.24 |
| OtherUtils | 2.66 | 7.94 | 1.93 | 8.06 | 2.42 |
| TransComm | -0.05 | 0.05 | -0.08 | 0.05 | -0.06 |
| TFI | 0.09 | 2.09 | -0.41 | 2.15 | -0.18 |
| OthrServices | 7.42 | 9.80 | 7.03 | 9.85 | 7.20 |

Table 6.17: Projected Changes in EU exports to Egypt by Sector
(Annual Percent Change through 2005)

| | | | | | |
|---|---|---|---|---|---|
| Crops | 2.70 | 5.81 | 4.49 | -0.15 | 3.05 |
| Livestock | 3.84 | -12.02 | -10.96 | -0.15 | 4.38 |
| Petroleum | 1.29 | 4.83 | 1.34 | 4.81 | 1.32 |
| Mining | 4.89 | 7.01 | 5.22 | 6.97 | 5.08 |
| Food | 1.70 | -6.52 | -8.00 | 0.16 | 2.03 |
| BevTobacco | 3.81 | 49.73 | 4.55 | 49.68 | 4.36 |
| Textiles | 2.93 | 13.84 | 3.37 | 13.85 | 3.33 |
| Garments | 0.26 | 36.34 | 1.04 | 36.29 | 0.90 |
| Leather | -9.16 | 10.99 | -8.22 | 10.70 | -8.60 |
| Wood | -2.07 | 26.55 | -1.60 | 26.52 | -1.68 |
| PaperPub | 2.73 | 6.93 | 3.15 | 6.89 | 3.04 |
| Refining | 2.85 | 5.26 | 3.10 | 5.25 | 3.06 |
| Chemicals | 1.70 | 3.55 | 2.10 | 3.53 | 2.01 |
| Minerals | 4.29 | 9.70 | 4.80 | 9.65 | 4.62 |
| BasicMetals | 3.26 | 10.84 | 3.34 | 10.84 | 3.34 |
| FabMetals | -9.23 | -4.57 | -9.09 | -4.57 | -9.06 |
| TransportEqp | 0.25 | 21.10 | 0.46 | 21.10 | 0.43 |
| ElecMachnry | -1.32 | 4.34 | -0.95 | 4.31 | -1.01 |
| OthrMachnry | 0.53 | 5.51 | 0.58 | 5.52 | 0.61 |
| OthrMnfctrs | -6.47 | -0.83 | -6.20 | -0.83 | -6.20 |
| ElecUtils | 4.93 | 2.60 | 5.50 | 2.58 | 5.31 |
| Construction | 0.41 | 0.38 | 0.58 | 0.40 | 0.59 |
| OtherUtils | 1.66 | 0.64 | 1.91 | 0.65 | 1.85 |
| TransComm | 3.24 | 0.03 | 3.71 | 0.00 | 3.60 |
| TFI | 2.77 | -0.63 | 3.27 | -0.67 | 3.13 |
| OthrServices | -2.95 | -5.99 | -2.59 | -6.01 | -2.66 |

Table 6.18: Projected Changes in Egyptian Macro Indicators
(Annual rates of change through 2005)

| | Baseline | Full FTA | Full duty free acess | Partial FTA | Partial duty free access |
|---|---|---|---|---|---|
| | annual rates of change | | | | |
| investment levels | 3.55 | 4.35 | 3.57 | 4.36 | 3.62 |
| gross domestic product | 3.99 | 4.33 | 4.02 | 4.32 | 4.02 |
| imports | 1.32 | 2.74 | 1.51 | 2.75 | 1.57 |
| exports | 3.65 | 6.25 | 3.90 | 6.22 | 3.97 |
| | total effective change | | | | |
| terms of trade | -3.14 | -4.02 | 0.42 | -3.78 | 0.41 |
| revenue loss (share of GDP) | n.a. | 3.91 | -0.25 | 3.86 | -0.22 |

It is important to remember that these changes take place in the context of projected 36.8 percent growth in overall GDP between 1997 and 2005. A number of sectors, like minerals and the agriculture sector, lag behind as the economy shifts more towards manufacturing production. At the same time, some manufacturing sectors, especially transportation equipment (annual growth of -6.3 percent), are hit hard by expansion in growing supply from trading partners. The impact of the FTA scenarios must be viewed while keeping these underlying changes in mind. The Egyptian economy will be undergoing substantial shifts in the pattern of production anyway, even without an FTA. The full FTA scenarios hit the transportation sector especially hard, on top of the general baseline projections. This is driven by a surge in transport equipment imports from the EU. (See Table 17.) Then again, this sector is relatively small (from Table 9 it represented 1.1 percent of economy-wide value added in 1997.)

We turn next to the impact of the FTA scenarios on the pattern of Egyptian exports. These projected changes are reported in Tables 15 and 16. Recall that the EU is Egypt's major trading partner. For this reason, the FTA scenarios have a strong impact on the Egyptian economy. Growth in exports of low-end manufactures is particularly dramatic relative to the baseline. This includes products like textiles, clothing, leather products, tobacco and beverages, and wood products. If the FTA is broadly defined to include agriculture and food products, then there is also a dramatic export of these products to the EU (Table 16). These are sectors that one would view as natural export sectors for the Egyptian economy, given its resource base. In this sense, the shift in Egyptian export patterns, under an FTA, moves closer to its natural pattern, in that the EU is a natural trading partner (45% of total exports). In this sense, a full opening to Europe is a dramatic step towards full opening to the world, with a consequent correction of some dramatic underlying distortions within the current Egyptian economic policy structure.

At a macroeconomic level, the impact on the Egyptian economy depends critically on the scope of any agreement with the EU. To highlight this point, aset of macroeconomic indicators is reported in Table 18. These indicators include a quantity-based GDP index, a quantity-based investment index, quantity-based

import and export indexes, and a terms of trade index. They also include an indication of the revenue shortfall (scaled to total GDP) that follows from tariff reductions. This revenue indicator is also a crude measure of the necessary value-added tax rate needed to make up for lost trade taxes. This is an important issue. Like most developing countries, the Egyptian government relies heavily on import taxes to finance government expenditures. Revenue replacement measures will be required if a full FTA is to be implemented. Table 18 indicates that this requires an additional tax on internal economic activity (a tax on value-added or comparable measures) of roughly 4 percent.[18]

The results in the table illustrate an important point. Almost all of the gains to Egypt under the various scenarios follow from own-liberalization. These gains follow from the simple facts that (1) Egypt is one of the most protectionist regimes in the world, and (2) the EU is one of Egypt's two major trading partners. Hence, an EU-Egypt FTA represents a significant step toward full free trade. Given that Egypt is relatively small on world markets, the resulting efficiency gains domestically far outweigh any adverse terms of trade gains. Current Egyptian trade policy only serves to hamper the performance of the Egyptian economy. At the same time, these same two facts mean that duty-free access to the EU's markets makes very little difference to economic performance. GDP growth, annually, is less than one-tenth of one percent faster with preferential access. In contrast, with a reciprocal FTA, the Egyptian economy adds over 0.3 percent to its GDP growth rate over the projected period. This is enough of a difference in growth to add over 2 percent to annual GDP levels over a 5-year period. Over the same period, a non-reciprocal offer from the EU would add less than 0.2 percent to annual GDP levels over the same period. (Note that these growth estimates even include revenue-replacement by the government as trade taxes are reduced). In summary, a reciprocal FTA-agreement, with or without the inclusion of food and agriculture, would make a significant contribution toward the rationalization of Egyptian trade policy, with

[18] This rate is actually calculated by solving the policy scenarios with a revenue-replacing domestic tax scheme in place for each of the four scenarios. When the EU offers non-reciprocal duty-free access, there is actually an estimated increase in government tariff revenue amounting to 0.2 percent of GDP.

consequent gains for export performance, investment, and GDP. A non-reciprocal offer from the EU offers none of these gains.

### 6.7. Concluding Remarks

The recent experience of the developing countries and the preliminary estimates for the South Mediterranean countries show that the fiscal challenge is a very important issue, which will have to be addressed through relevant economic policies and tax reform. It should, nevertheless, be clear that while the agreements with the EU clearly carry some risk — loss of revenue, exposure to a more competitive environment, a decline in inefficient industries — they also provide the MENA countries with great opportunities for improved competitiveness, higher investment and growth.

History is on the side of liberalization. Nearly all countries, with very rare exceptions, benefit when their economies are joined to a larger, richer market. In fact, the poorer the country, the more striking the effect on its rate of growth and its rate of export growth. Exactly what kind of effect there will be on growth and investment, however, is hard to estimate, but evidence suggests that the largest benefits accrue to countries with reasonable macroeconomic stability and flexible domestic markets. The benefits will be realized only to the extent that the countries in the region reform their economies. Implementing a comprehensive reform of the domestic tax system from the outset of the liberalization process is a priority. An additional reason for stressing the urgency of reforms to bolster domestic taxes is that such reforms have long gestation periods. Tax reforms require several years and cannot be done overnight, particularly administrative reforms and the building of administrative capacity for the new system.

Economic theory and international experience suggest that it is best to move away from international trade taxation whether there is an agreement with Europe or not. In looking at all countries in the world, international trade taxation as a source of revenues declines over time. To compensate for this, the tax system must be reformed. The tax base should be enlarged to cover more extensively domestic consumption, profits and personal income. At the same

time, tax systems should be designed for easier and more efficient administration and tax collection.

We should also emphasize that in most of the South Mediterranean countries, tax reforms have merit on their own as they are essential for fiscal consolidation and macroeconomic stability, regardless of whether they need revenue or not to compensate for import tariff losses. Tax reforms can reduce distortions in the allocation of resources, contribute to national savings, release resources from the public to the private sector, and provide an improved environment for investment and growth.

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