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SOME ECONOMIC EFFECTS OF THE FREE TRADE AGREEMENT BEWEEN TUNISIA AND THE EUROPEAN UNION

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Abstract

We use a specially constructed version of the Michigan Brown-Deardorff-Stern (BDS) Computational General Equilibrium (CGE) Model of World Production and Trade to estimate the potential economic effects on the Tunisian economy that may result from the free trade agreement (FTA) between Tunisia and the European Union (EU) that was concluded in July 1995. We find that the static welfare benefits for Tunisia of the FTA range from slightly negative to somewhat positive, depending on what is assumed about intersectoral capital mobility in Tunisia. Further, depending on the length of time allowed for the phasing in of the FTA, Tunisia could experience significant adjustment problems in connection with the intersectoral movements of labor and capital that the FTA would induce. Finally, while our computational scenarios are subject to the difficulties of integrating foreign direct investment (FDI) into a CGE trade modeling framework, we find that the FDI inflows into Tunisia that might result from the FTA would not materially increase Tunisian economic welfare. Our results suggest therefore that Tunisia may not have much to gain economically from the FTA. Reducing its trade barriers multilaterally and reinforcing these actions with further liberalization of its foreign investment policies and maintenance of macroeconomic and political stability might in the end be the best path for Tunisia to follow.

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I. Introduction

In this paper, we use a specially constructed version of the Michigan Brown-Deardorff-Stern (BDS) Computational General Equilibrium (CGE) Model of World Production and Trade to estimate some potential economic effects on the Tunisian economy that may result from the free trade agreement (FTA) between Tunisia and the European Union (EU) that was concluded in July 1995. The BDS CGE model provides measures of the effects that the FTA may have on the trade, output, and employment in the goods and services sectors for Tunisia and its major trading partners. The model also permits calculations of the effects of the FTA on economic welfare and returns to labor and capital in the individual countries/regions. A key issue in evaluating the Tunisian-EU FTA is how foreign direct investment (FDI) inflows may be affected. While changes in FDI inflows are not determined within the BDS CGE model, we can use the model nonetheless to investigate both how the incentives for FDI may be altered by the FTA and the ways in which potential changes in FDI associated with the FTA may impact on the Tunisian economy.

Our analysis focuses exclusively on the static effects of reductions in tariffs and NTBs in the Tunisian-EU FTA and on several possible changes in FDI. Our model is a static model and it therefore does not include various possible dynamic effects on longer run growth that may arise in response to the static changes. We also have not attempted to model other aspects of the effects of the FTA that some investigators have suggested may be more important than the changes in tariffs and NTBs themselves. Page and Underwood (1995) have discussed a number of such effects in connection with a survey of certain World Bank CGE studies of FTAs between the EU and both Tunisia and Morocco. These effects include the possible further benefits that may arise from harmonization of standards, product quality improvements, and increased trading efficiency. Such effects, especially because they would reduce the costs of trade not only with the EU but with other countries as well, are found in those studies to be

more important than the reductions in tariffs and NTBs for the effects on welfare of the respective countries. We hope that these assessments are correct, but we did not include such changes in our own analysis because of the considerable uncertainties over how large they may really turn out to be.

The paper proceeds as follows. In Section II, we outline some essential features of our CGE model and the data used to analyze the effects of the Tunisia-EU FTA. Since, as mentioned, our model-based approach is not altogether well suited to analyzing issues relating to FDI, we devote Section III to a brief summary of selected recent literature on the determinants of FDI, including especially the experiences of developing countries. This may be helpful in assessing how FDI may respond to the FTA, especially when investment incentives are offered. Thereafter, in Section IV, we discuss the details of the FDI incentives in Tunisia's 1994 Investment Code. The various model scenarios that we have run using our CGE model are described in Section V, and the aggregate and sectoral computational results of these scenarios are presented in Sections VI and VII. Finally, in Section VIII, we summarize our conclusions and consider the implications for Tunisia's trade and foreign investment policies.

I. The Michigan BDS CGE Trade Model[1]

Some Essential Model Features

The CGE model used in this paper is an extension of the model first constructed by Brown and Stern (1989) to analyze the economic effects of the Canada-U.S. Trade Agreement (CUSTA), and later expanded by Brown, Deardorff, and Stern (BDS) (1992a,b, 1996a,b) to analyze the NAFTA, the extension of the NAFTA to some major trading countries in South America, and the formation of an East Asian trading bloc. The potential effects of integrating Czechoslovakia, Hungary, and Poland into the EU are also analyzed in Brown, Deardorff, Djankov, and

[1] Readers who are not concerned with the technical details of the model may wish to proceed to the results of the analysis reported in the sections below.

Stern (1996). For our purposes here, we model the following eight countries/regions: Tunisia; Greece/Portugal/Spain (MEU); France/Italy (FR-IT); Other 7-EU countries (OEU); Other Europe (OEUR); Asia/Pacific (APAC); NAFTA; and South America (SAM).[2] All remaining countries of the world are consigned to a residual rest-of-world to close the model. The sectoral coverage in each country/region includes one agricultural sector, 21 product categories covering manufacturing, one mining sector, and six categories covering services, including government. All sectors are modeled as tradable.[3] The individual sectors and corresponding International Standard Industrial Classification (ISIC) categories are listed below in Tables 1 and 2.

The agricultural sector in the model is characterized as being perfectly competitive and the nonagricultural sectors are taken to be monopolistically competitive with free entry.[4] Agricultural products are differentiated by country of production. The products of the manufacturing, mining, and services sectors are assumed to be differentiated by firm to correspond to the imperfectly competitive market structure. Domestic demands by sector reflect the overall demands in the economies, and we do not distinguish among different categories of demand such as consumption, investment, and government purchases. The level of total demand is determined by income.[5] The

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[2] Other Europe includes: Austria; Finland; Norway; Sweden; Switzerland; Turkey; and Israel. Asia/Pacific includes: Hong Kong; Japan; Singapore; South Korea; Taiwan; India; Australia; and New Zealand. NAFTA includes Canada, Mexico, and the United States. South America includes: Argentina; Brazil; Chile; and Colombia. In 1995, the EU was expanded to include Austria, Finland, and Sweden, but as noted, we treat the EU as consisting of only 12 member countries.

[3] As will be noted below, treating all 29 model sectors as tradable enables us to analyze the effects and interaction of liberalization of both merchandise trade and services.

[4] Issues of the modeling of market structure are discussed in Brown and Stern (1989), where a variety of different imperfectly competitive market structures are used in analyzing the economic effects of the CUSTA. As noted, for the current model, we use a structure of monopolistic competition, following Helpman and Krugman (1985), for all of the nonagricultural sectors. There is free entry of firms, each producing a different variety of a good/service and producing it with a fixed cost and constant marginal cost in terms of primary and intermediate inputs.

[5] Thus we also do not allow an independent role for the government budget.

reference year for the data base of the model is 1990. The input-output relations used in the model refer to different years, depending on the availability of national input-output tables.[6] The data base and documentation as well as a full statement and description of the equations and parameters of the model are available from the authors on request.[7]

There are several important assumptions that either are built into the model or are implemented by the model for the present analysis. It is important that these be understood in interpreting the results to be reported below.

Full Employment -- The analysis assumes throughout that the aggregate, or economy-wide, level of employment is held constant in each country. The effects of trade liberalization are therefore not permitted to change any country's overall rates of employment or unemployment. This assumption is made because overall employment is determined by macroeconomic forces and policies that are not contained in the model and would not themselves be included in a negotiated free trade agreement. The focus instead is on the composition of employment across sectors as determined by the microeconomic interactions of supply and demand resulting from the liberalization of trade.

Balanced Trade -- It is assumed that trade remains balanced for each country, or more accurately that any initial trade imbalance remains constant, as trade barriers are changed. Thus implicitly the exchange rate (which as

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[6] It is always a problem to obtain completely up-to-date input-output tables because of ongoing changes in technology and productivity that would alter the input-output coefficients for particular sectors. However, our CGE model relies mainly on the intermediate input-value shares and the shares of primary factors as data. These shares tend to be more stable over time than physical input requirements. Indeed, to the extent that techniques change in response to price changes, a price increase will lead to an opposite change in quantity, leaving only a smaller change, if any, in input share. And to the extent that techniques change due to technological progress, input shares will again remain constant if that progress is neutral with respect to inputs in an appropriate sense. Therefore the fact that prices and technologies undoubtedly do change over time does not necessarily mean that input-output tables lose their validity for our purposes. Nonetheless, it would of course be preferable to use newer data if those were available. For more discussion of this point, see Deardorff and Stern (1990, pp. 61-79).

[7] The sectoral data for merchandise trade, production, and employment come primarily from United Nations sources and to a lesser extent from national sources. The model parameters are constructed from the trade and input-output data for the countries included in the model and from published studies of trade and capital/labor substitution elasticities. More details on the data are provided below. See also Deardorff and Stern (1990, pp. 37-45).

a nominal variable plays no role in the largely real analysis of the model) can be thought of as flexible. This reflects the reality of mostly flexible exchange rates, or at least adjustable exchange rates, among the countries involved. It also, like the full employment assumption, is appropriate as a way of abstracting from the macroeconomic forces and policies that are the main determinants of trade balances.[8]

Rents and Revenues -- Revenues from tariffs are assumed to be redistributed to consumers in the tariff-levying country and spent like any other income. Similarly, the rents from NTBs are also assumed to remain within the importing country and to be spent like other income. When tariffs and tariff equivalents are reduced, this means that income available to purchase imports falls along with their prices, and there is no overall bias towards expanding or contracting aggregate demand.

Fixed Relative Wages -- While the economy-wide wage in each country is permitted to adjust so as to maintain full employment, the wages across sectors are held fixed relative to one another. This permits the analysis to focus on the labor-market adjustments that might be required, independently of any relative wage changes that may facilitate those adjustments.[9]

Fixed Labor Supply -- The total labor supply in each country is assumed to be held fixed in the analysis. This is not to say that changes in labor supply will not occur in the course of the phase-in of trade liberalization, but only that such changes are assumed not to be the result of the negotiated agreement.

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[8] The results reported below for changes in total exports and imports may appear to contradict this assumption of balanced trade. This is because what are reported are measures of the changes in *quantities* traded, which are relevant for output and employment changes. They are not the *values* of trade, which undergo additional change due to changing relative prices. It is the values of exports relative to imports that are held fixed by the balanced trade assumption.

[9] We also do not distinguish workers according to their skill characteristics, and we therefore cannot determine how the wages and employment of different skill groups may be affected by the Tunisia-EU FTA.

Role of Variety -- The Dixit-Stiglitz aggregation function in its usual form uses a single parameter, the elasticity of substitution, to determine both the degree of substitution among varieties of a good and the extent to which an increased number of varieties adds to welfare of consumers and reduces costs of intermediate inputs. This effect on welfare and cost could be quite important in an analysis of trade liberalization, since reduced trade barriers provide greater access to varieties produced abroad and could increase welfare on that account alone.[10]

The policy inputs into the model, which we discuss more fully below, are the pre-Uruguay Round tariffs and tariff equivalents applied to the bilateral trade of the countries/regions being modeled explicitly with respect to each other. Because our model is static, we will assume that the reduction or removal of tariffs and NTB tariff equivalents takes place all at one time rather than being phased in over a period of several years as in fact will be the case. Therefore our analysis refers to the effects of the FTA that will occur in total, from before the reductions are initiated to the equilibrium that arises after all are completed. When the policy changes are introduced into the model, the method of solution yields percentage changes in sectoral employment and other variables of interest for each country/region. Multiplying the percentage changes by the actual (1990) levels given in the data base yields the absolute changes, positive or negative, that might result from the FTA.

We should further mention that we do not take account in our model of changes in the cross-border movement of workers that might occur as the result of changes in real wages, and we also do not make any allowance for dynamic efficiency changes and economic growth. We will, however, make allowance for changes in inward foreign direct investment into Tunisia. We are aware that the Agreement between Tunisia and the EU involves much more than negotiated reductions and/or removal of tariffs and NTBs. That is, besides trade and related policies, the Agreement deals with the movement of capital, support for sectors experiencing adjustment problems and for structural reform, and a variety

[10] In earlier work we have noticed that the effect of variety in lowering costs can introduce an instability into the model, because an increase in demand for an industry can lead to entry, additional variety, lower costs to users, and hence additional demand. To avoid this happening in our model we therefore depart slightly from the Dixit-Stiglitz formulation, using an additional parameter to control these variety effects. In the results reported here, the effect of variety on welfare has been set to one half of what would occur in the Dixit-Stiglitz model.

of labor and social issues.[11] While these other facets of the Agreement may be important, it is difficult to quantify the roles they will play. Our treatment of only the effects of liberalizing trade in goods, taking FDI into consideration, means therefore that our calculations of the consequences of the Tunisia-EU Agreement will be incomplete.

Policy Input Data

An indication of the basic data for Tunisia is provided in Tables 1 and 2. These data provide a sectoral breakdown, with 1990 as the reference year, of gross output, employment, capital stock, imports, exports, and bilateral tariffs.

The tariff data refer to the official tariff rates on Tunisian imports.[12] To obtain the sectoral tariff rates, we first aggregated the import data to the 6-digit Harmonized System (HS) classification and then matched the import and tariff data at this level. We then concorded the 6-digit HS import and tariff data to the 3-digit ISIC categories that we use in our CGE modeling framework. Tunisia's bilateral tariff rates against the seven regions included in the model were calculated using bilateral imports as weights.[13] Since we disaggregated the EU-12 into Greece/Portugal/Spain, France/Italy, and the Other EU-7, we list separate weighted average sectoral tariffs for these disaggregated EU

[11] For details on the Agreement, see IMF (1996, pp. 77-79) and Hoekman and Djankov (1995, esp. pp. 14-25).

[12] There is an issue here as to whether the official tariff rates are representative of the rates actually applied on imports. That is, there may be a difference between the official rates and the actual collection rates which will reflect the various tariff exemptions that may be applied to particular categories of imports. Since data on collection rates were not available, we use the official rates. While the official rates may thus overstate Tunisia's import protection policies, a case can be made for using them insofar as the tariff exemptions may vary from year to year as government policies and the composition of imports are subject to change. The official rates are also representative of the rates that are bound by Tunisia's membership in the GATT/WTO. Further details on Tunisia's official rates are given in GATT (1994, esp. pp. 61-72).

[13] Also included in Table 2 are "guesstimates" of the global ad valorem equivalents of Tunisian services barriers which have been calculated in Hoekman (1995). Given the tentative nature of these guesstimates, they will not enter into our FTA scenarios to be reported below.

groupings. The differences among them reflect the different import compositions used in constructing the weighted averages. It is evident that Tunisia's weighted average official tariff rates show considerable dispersion, with some instances of rates below 10% and others in excess of 40%.

Besides tariffs, data on NTBs were needed. According to Nsouli et al. (1993, p. 69), 85% of Tunisia's imports in 1992 were effectively unrestricted. The remaining 15% were apparently subject to import licensing and annual import authorization.[14] We assumed for our purposes that these restrictions applied only to imports of agricultural products. Estimates based on Stanton (1994) suggest that the ad valorem equivalents of these agricultural NTBs were 5.5% on imports from the EU and 12.3% from all other regions. We have added these NTB ad valorem equivalents to the tariff rates for Sector 1 reported in Table 2.[15],[16]

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[14] For information on Tunisia's existing nontariff restrictions, see GATT (1994, pp. 58-89). Tunisia also maintains export processing zones. We have no data on these zones, however, and have not included them in our analysis. For a brief description of the zones, see GATT (1994, Vol. II, pp. 40-41).

[15] In the absence of tariff equivalents, we typically model NTBs in terms of the percentage of trade subject to NTBs, using available or specially constructed NTB inventory data. These NTB measures are calculated by first making an inventory of existing NTBs classified by disaggregated import groupings, then determining the value of imports that are subject to any NTBs, and thereafter aggregating up to the sectors used in the model. Thus, a sector with a zero percent NTB trade coverage is taken to be completely exempt from NTBs, while, say, an NTB coverage of 25% is taken to mean that 25% of the imports in that sector are subject to one or more NTBs. The NTB coverage ratios are then used in the model to dampen the effects of tariff reductions undertaken when the NTBs are assumed to remain in place. It is important to emphasize that these measures of NTB trade coverage are *not* the same as the tariff equivalents of the NTBs. For further discussion, see Deardorff and Stern (1990, pp. 23-25). The most comprehensive available estimates of the NTB trade coverage by sectors for Tunisia are given in GATT (1994, esp. pp. 64, 66-68, and 167-172). These sectoral estimates are weighted apparently by total imports and cannot in themselves be used to calculate bilateral coverage ratios which we would ordinarily need for modeling purposes. In any case, as indicated below, we assume that the estimated tariff equivalents that we have already reflect the most significant existing NTBs, and that these NTBs will be eliminated in establishing the Tunisia-EU FTA. So long as this is the case, there is no need to use the NTB coverage ratios to dampen the effects of Tunisian tariff reductions.

[16] Tunisia's domestic tax system includes a value-added tax and a consumption tax. We chose not to represent these taxes in our modeling framework on the assumption that they would remain unchanged in the context of the Tunisia-EU FTA. For a brief overview of Tunisia's tax system, see Nsouli et al. (1993, esp. pp. 5-9 and 70-72).

The EU maintains some quantitative restrictions on imports from Tunisia. These apply to such agricultural products as olive oil, oranges, potatoes, wine, apricot pulp, and sardines. In the absence of measures of the tariff equivalents of these restrictions, we decided to use a figure of 8% for the EU barriers on Sector 1 agricultural imports from Tunisia, based on the estimate in Harrison, Rutherford, and Wooton (1989). The EU also maintains certain seasonal restrictions on agricultural imports from Tunisia, which we assume to be included in the 8% tariff equivalent. With respect to manufactured goods, the EU has annual quotas limiting imports of cotton cloth and trousers from Tunisia. Since our textile and clothing sectoral aggregates cover a large variety of products and we do not have any information on the tariff equivalents involved, we have assumed that the EU quota restrictions here are not binding.[17]

III. The Determinants of Foreign Direct Investment

An important reason why many developing countries are anxious to enter into FTAs with advanced industrialized industries is the belief that the FTA will stimulate inward foreign direct investment (FDI). Tunisia is no exception. In order to shed some light on this question, we reviewed some selected studies in an effort to identify what appear to be the main factors influencing FDI inflows into developing countries especially. These studies included UNCTAD (1993), UNCTC (1992), Bajo-Rubio and Sosvilla-Rivero (1994), Lucas (1993), and Haddad and Harrison (1993). Our reading of this literature suggested that macroeconomic factors appear to play a dominant role in influencing aggregate FDI inflows. It was especially striking in the studies we examined that FDI has not been shown to be responsive to the main microeconomic factor that one might have expected to influence capital flows: the return to capital. This may be because returns to capital do not in fact influence FDI, but there are alternative explanations as

[17] According to GATT (1994, pp. 89-96), the Tunisian Government has a variety of measures designed to restrain or promote exports in certain specified circumstances. Since information is not available that would permit assessment of the quantitative importance of these export-related measures and how they might be changed with implementation of the FTA, we have not taken them into account in our various modeling scenarios that will be noted below.

well. For example, FDI may respond so elastically to small variations in returns that the observed variations become too small to be picked up econometrically. Or, FDI may respond to variations in returns to capital separately by sector, so that measures of total FDI and average returns to capital hide the relationship. Finally, there was some evidence in the studies noted, although it was not overwhelming, that openness and trade barriers also affect aggregate FDI inflows.

As a general matter, the literature further suggested that incentives designed to encourage FDI inflows do not appear to matter very much, although once it is decided to engage in FDI, the presence of incentives may affect the magnitude and geographic location of the FDI.[18] As indicated earlier, Tunisia introduced a number of investment incentives in 1994, hoping that this would result in an increase in inward FDI. While it is not possible to determine what effects these incentives will have, it may be interesting nevertheless to examine their potential impact within our CGE modeling framework, which we shall do below. But let us first consider some of the main features of Tunisia's Investment Code.

IV. Tunisia's 1994 Investment Code[19]

A new Investment Code was introduced in January 1994. It is global in character and covers all sectors except domestic trade and investments in mining, energy, and finance. Foreign investors are permitted 100% ownership, with some exceptions in industries that are not wholly exporting, and in agriculture where long-term leasing is permitted. Off-shore status can be granted to wholly exporting companies in the form of bonded factories or within a free trade zone. Common incentives are offered in all sectors, and there are additional incentives designed to promote exports, regional

[18] Effects may appear to be greater when FDI incentives are linked directly to exports, as in maquiladora-type export processing zones. These have been used extensively by East European countries in their arrangements with the EU, but is not clear that Tunisia is moving very far in that direction. By the same token, there is reason to believe that such arrangements have little spillover to the domestic economy.

[19] Details on the 1994 Investment Code can be found in Ministry of International Cooperation and Foreign Investment (1994).

development, agricultural development, environmental protection, technology transfer and promotion, and development support activities and services (e.g., education, etc.). The incentives can be either fiscal in the form of tax reductions or waivers, or financial in the form of grants or subsidies.

The tax incentives offered are: 35% for all activities covered by the Investment Code; 50% for activities related to environmental protection and investments in development support activities and services; and 100% for wholly exporting activities, companies located in regional development areas, and agricultural development projects. All activities covered by the Code are eligible for suspension of the Value Added Tax (VAT) and consumption tax on locally manufactured capital goods and for reduction of tariffs to 10% and suspension of the VAT and consumption tax on imported equipment when no similar equipment is made locally. There are a variety of specific incentives for the priorities mentioned earlier for environmental protection, etc.

Additional tax incentives are available besides those mentioned above. They involve taking accelerated depreciation on capital goods and income tax exemptions for revenues derived from export activities. Companies with off-shore status have duty-free imports and can sell part of their production domestically subject to some restrictions. Partially exporting companies are allowed tax exemption and refunds of customs duties. There are special tax incentives for regional development projects, etc.

Besides the various incentives noted, foreign investors can employ foreign nationals up to 4% of their total employment, have certain personal tax advantages, are permitted free repatriation of profits, receive investment protection under treaty, are not subject to double taxation, are covered by foreign arbitration processes, are covered for non-commercial risks, and are given protection of industrial property rights.

This is evidently a broad and generous Code. The question then is how it will be implemented and whether it will lead to a significant increase in inward FDI. We have no way to determine how successful the Code may be in attracting FDI. But we can attempt to calculate, using our CGE model, how the common tax incentive of 35% might affect inward FDI and the consequences that this could have for the economy. We shall have more to say on this below.

Having set out the essential features of our CGE model and reviewed some considerations relating to the determinants of inward FDI and Tunisia's 1994 Investment Code, we turn now to a description of the model scenarios we have run and to our computational results.

V. Model Scenarios

It is possible to use our CGE model to analyze a variety of features of the Tunisia-EU FTA. These features can be analyzed individually as well as in combination. As discussed above, we have data on pre-Uruguay Round nominal tariff rates in agriculture, manufactures, and mining, as well as estimated ad valorem tariff equivalents of the agricultural NTBs. One question that immediately arises is what to assume about the reduction or elimination of the NTBs that may be negotiated as part of a FTA. Given that the NTBs are confined to the agricultural sector in our framework, we modeled the elimination of both bilateral tariffs and NTBs in agriculture.

A further issue is what to assume about services liberalization. Since it remains to be seen whether the FTA will involve the liberalization of both goods and services and since we do not have altogether reliable estimates of bilateral services barriers, we confined our attention to goods liberalization.

One other issue we should mention concerns whether or not to assume that labor and capital are mobile between sectors. It is common in the international trade literature for some purposes to treat labor as perfectly mobile and capital as completely immobile, that is, sector specific. This may capture some of the short- and medium-run effects of trade liberalization as compared to the long run when all factors of production are mobile. In what follows, we will implement scenarios of both types since this will help especially in determining how inward FDI may respond to the FTA.

In light of the foregoing considerations, we constructed the following five model scenarios:

Scenario A. Free Trade with Sectorally Specific Capital: Trade Only

A Free Trade Agreement (FTA), involving bilateral removal of tariffs and NTBs on goods only, between Tunisia and the 12-member EU, assuming perfect labor mobility and sector-specific capital.

Scenario B. Free Trade with Sectorally Mobile Capital: Trade Only

Same as A but with sectorally mobile capital.

Scenario C. Free Trade with Sectorally Mobile Capital: Trade and FDI

Same as B but including also a flow of capital into Tunisia equal to 10% of the Tunisian capital stock, taken proportionally from the capital stocks of the 12-member EU nations.

Scenario D. Free Trade with Sectorally Specific Capital: Trade and FDI

Same as A but also with an increase in the sectoral capital stocks of each sector in Tunisia that recorded a positive change in the nominal return to capital, r, in scenario A. The elasticity of foreign direct investment with respect to this return to capital is assumed to be 5.0. Thus

$$FDI(j) = \max \{ 5\Delta r(j)/r(j) , 0 \}$$

where FDI(j) is foreign direct investment into sector j as a fraction of sector j's (specific) capital stock.

Scenario E. Free Trade with Sectorally Specific Capital and Capital Tax: Trade and FDI

Same as D, but incorporating the Tunisian Investment Code as follows:

$$FDI(j) = \max \{ 5\alpha(j)\Delta r(j)/r(j) , 0 \}$$

where $\alpha(j)$ incorporates features of the Investment Code as follows:

i) To reflect excluded industries (page 1 of Code):

$$\alpha(j) = 0 \quad , \quad j = \text{ISIC } 2, 4, 6, 8$$

since the Code excludes the domestic trade, mining, energy, and finance sectors.

ii) To reflect tax exemptions on page 3 of Code for all other sectors:

$$\alpha(j) = \gamma(j)(1 + \tau) + (1 - \gamma(j))\,(1 + .35\tau) \quad , \qquad j \neq \text{ISIC } 2, 4, 6, 8$$

where $\gamma(j)$ is the export share of production and τ is the tax rate for Tunisian capital income, which we have taken to be 35%.

The final scenario, Scenario E, is our attempt to incorporate features of the Tunisian Investment Code. To do this we augment the incentive to invest in each sector ($\Delta r(j)/r(j)$) by a factor $\alpha(j)$ representing the tax incentive. The latter appears in the last equation as the .35 multiplying the tax rate τ. Coincidentally, this tax incentive of .35 happens to be equal to the value of the tax rate τ, which is also 35%. The above formulation also includes adjustments to reflect the exclusion of certain industries from the Investment Code and the fact that wholly exporting firms get a tax break of 100%.

There is much more to the Investment Code than this, of course, but it appears to us that most other features of the Code either are likely to be quantitatively insignificant (e.g., provisions that apply only to capital goods manufactured locally), or are related to activities that we are unable to isolate in our model (e.g., environmental protection, regional development areas).

VI. Computational Results: Aggregate Effects

An overview of results on trade, terms of trade, welfare, and factor payments for each of the foregoing scenarios is reported in Table 3. Of considerable interest in evaluating the scenarios is the impact on economic welfare, that is, the "equivalent variation" measure of the change in real gross domestic product (GDP).

Scenario A

We begin with Scenario A, in which Tunisia becomes part of a free trade area (FTA) with the European Union. Since, as a consequence of the 1976 cooperation agreement between Tunisia and the European Communities

(EC), EU trade restrictions against imports from Tunisia are already zero in all sectors except for agriculture and textiles/clothing, the Tunisian-EU FTA practically amounts to a unilateral removal of tariffs by Tunisia. However, because tariffs are eliminated only *vis-a-vis* the EU, these tariff reductions are discriminatory and need not necessarily lead to welfare improvement.

Indeed, in Scenario A, in which we assume that capital is unable to move among sectors, our results in Table 3 indicate that economic welfare in Tunisia declines by 0.2% of GDP due to this change.[20] This result is best understood in terms of the traditional concept of trade diversion. When Tunisia eliminates its relatively high tariffs against all EU-members but keeps its tariffs in place against other ("third") countries, a first effect is to cause substitution away from the imports from third countries. The reason is that imports from the EU now appear cheaper to buyers within Tunisia, who no longer have to pay the tariff. But these imports are not cheaper to the country as a whole, since, if they had been cheaper, they would have been purchased before when all imports faced the same tariffs. Therefore, the country as a whole loses from this substitution.

The way that this loss manifests itself within Tunisia is through the loss of tariff revenue. Initially, buyers were paying high prices for imports from the third countries, but a part of these high prices was staying within the country in the form of tariff revenues collected by the government. This tariff revenue was available to be used by the government and therefore contributed to economic welfare. In our model, government revenues are formally assumed to be redistributed to consumers in some non-distorting way, so that consumer incomes include both earned factor incomes plus this transfer from the government, both of which are spent on goods and services. When tariffs against the EU fall, consumers pay less for the imports that they now buy from the EU instead of from third countries, but they lose even more as the transfer of tariff revenue is reduced as well.

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[20] This is in contrast to the positive welfare effect cited by Page and Underwood (1995) in a World Bank study of a Tunisian-EU FTA. That study reported an increase in welfare (equivalent variation) of 1.7% due to trade liberalization alone, rising to 4.7% when effects of trade efficiency were included.

Now trade diversion is only one of two effects of a discriminatory tariff reduction such as this. To the extent that trade is also created, welfare can rise. Trade creation occurs, in this case, when buyers substitute imports from the EU for purchases of domestically produced goods. Since these two sources both now face zero tariffs, imports from the EU must be cheaper than their domestic alternatives in order to be bought, and the country therefore gains from switching to the more efficient source. Formally, there is no loss of tariff revenue to offset the gain experienced by the purchasers.

A limited amount of trade creation can occur to the extent that imports overall are made cheaper by the tariff reduction relative to domestic goods. But a greater scope for trade creation exists if the country is also able to increase exports, for then the revenues from increased exports can be spent on imports. Tariff reductions abroad (here only in agriculture), and a more general reallocation of factors toward export sectors, can therefore contribute to trade creation and cause the overall welfare effect of an FTA to become positive. In Scenario A, however, the sector-specificity of capital limits this reallocation, and it is perhaps not surprising that overall welfare falls in this short-to-medium run setting.

It is also evident in Table 3 that Tunisia's terms of trade -- the relative price of its exports compared to its imports, or what it gets in return for its exports -- fall by even more than welfare in Scenario A, and that is the case in all of the subsequent scenarios as well. This is a normal effect of a discriminatory and largely unilateral tariff reduction, especially for a country with relatively high tariffs like Tunisia. Tunisia is of course quite a small country, and it is customary to argue that small countries are unable to influence their terms of trade.[21] But this is not the case for a discriminatory tariff reduction. To the extent that trade diversion occurs as discussed above, Tunisia substitutes toward higher cost imports, and this is a direct worsening of its terms of trade. In other words, while it is largely true that a small country cannot influence world prices, it can nonetheless influence its terms of trade by changing the composition of its import

[21] This is not entirely the case in our model, however, even for a nondiscriminatory liberalization, because of product differentiation. In the agricultural sector, where we assume perfect competition, the Armington assumption of product differentiation by country of origin gives even small countries some leverage over their terms of trade. In other sectors, where product differentiation is at the level of the firm, that leverage is considerably reduced but it still exists to some extent. The effects on the terms of trade that appear in our scenarios, however, are better understood as a byproduct of trade diversion.

bundle. Thus Tunisia's terms of trade worsen, not because the prices of its exports fall or of its imports rise, but because it switches to higher priced imports from the EU. That is, it gets less in return for its exports because it switches to more costly imports. In quantitative terms, the terms of trade worsen by considerably more than overall welfare, however, because the country also benefits from the efficiency improvements that arise from trade creation.

The results in Scenario A also indicate that the real wage and the real return to capital both rise, by 2.5% and 6.6% respectively. This may at first appear to be inconsistent with the overall decline in welfare. However, recalling our discussion above that economic welfare derives both from earned incomes and from redistributed tariff revenue, this should not be so surprising. Furthermore, these changes in real factor returns, defined as the amount of goods that the wage and rent will buy, also include the effects of price changes and therefore contrast with the changes in nominal (money) factor returns which in this case, though not reported in Table 3, are both negative. By substantially reducing tariffs, Tunisia lowers the nominal domestic prices of both imports and import-competing goods, and this feeds through the economy to reduce other goods prices and factor prices as well. However, the falling prices of imports and other goods also mean that these lower nominal factor prices can be used to buy an increased amount of goods, and real factor prices therefore can rise.

As already noted, the return to capital rises in Scenario A relative to the wage. Evidently, according to these results, the structure of tariffs in Tunisia has been such as to protect labor more than capital, and the liberalization therefore causes a relative shift in favor of capital. However, both factors lose in nominal terms, which means in terms of the numeraire of world prices that are here essentially unchanged, capital simply losing less than labor. The reason is that domestic prices of goods and factors have been kept artificially high by the tariffs relative to world prices, and the liberalization therefore reduces them across the board. This will be important below when we look at capital flows.

Since Tunisia is small compared to its major trading partners, especially the EU member countries, the effects of the FTA with the EU would not be expected to have a signficant impact on the EU countries. This is evident in Table 3 where it can be seen that EU total imports and exports rise by less than $1 billion and that there are negligible changes in the terms of trade, welfare as a percent of GDP, and real returns to labor and capital. Nonetheless, in terms of absolute changes in economic welfare, the gain for the EU 12-member countries amounts to $2.4 billion compared to the $26.8 million

reduction in Tunisian welfare. France/Italy combined gain $1.5 billion. As noted, this asymmetry results from the fact that Tunisia is in effect cutting its tariffs unilaterally against the EU, given that Tunisia already has tariff-free access to the EU for most of its exports.

Scenario B

Scenario B is distinguished from Scenario A insofar as capital is no longer assumed to be sector-specific but is permitted instead to move among sectors. We still, however, keep capital internationally immobile. Capital therefore exits from those sectors where its return has fallen the most and migrates to sectors where the relative return, inside Tunisia, has increased. The movement of capital permits labor also to move among sectors by larger amounts, as we will note below in our discussion of sectoral effects.

The main effect of capital mobility is to cause greater changes in sectoral output, and therefore trade. This can be seen by comparing the export and import columns of Scenarios A and B in Table 3. Also, because trade creation is enhanced, the overall welfare effect of the FTA in Scenario B is now positive. Finally, the reallocation of capital in favor of the less protected capital-intensive sectors causes the ratio of the return to capital relative to labor to increase and actually leads to a fall in the real wage. That is, as capital migrates from previously protected labor-intensive sectors to capital-intensive sectors, labor is left with less capital to work with and its marginal product and real wage are reduced. This is apparently a reflection of the Stolper-Samuelson effect, even though in our model we have found on other occasions that the Stolper-Samuelson Theorem does not necessarily hold, due to the effects of scale and variety.[22]

The asymmetry of the effects of the FTA is further evident here. While Tunisian welfare rises in absolute terms by $430.3 millon, the absolute increase in welfare for the 12-member EU together amounts to $3.4 billion. These effects

[22] See Brown, Deardorff, and Stern (1993).

are larger than in Scenario A because of the more complete adjustments represented with full mobility of both labor and capital.

Scenario C

In Scenario C we introduce an arbitrary international capital movement into the model, equal to 10 percent of the Tunisian capital stock.[23] The assumption is that it flows into Tunisia from the EU countries, in proportion to their own capital stocks.

Our original intent was to select the capital flow as approximating that which would undo the effect of the FTA on the nominal return to capital in Tunisia. The rationale for choosing this was two-fold. First, it is the relative nominal return in Tunisia compared to the rest of the world that would motivate capital to move, and, second, we expected the FTA to raise the return to capital in Tunisia and to leave it essentially unchanged elsewhere. The latter expectation was borne out in the results of our model, as already noted in Scenarios A and B, but the former expectation was not. Instead the removal of tariffs in Tunisia *vis-a-vis* the EU caused a small reduction, not an increase, in the nominal return to capital in Tunisia in those scenarios. Thus, if we were to rely on market signals to determine capital flows, our model would suggest that capital would flow out of Tunisia, rather than in.

Of course the model does not include certain considerations that might be expected to overcome these market signals and to draw capital into Tunisia in spite of them. Most frequently mentioned is the hope that an FTA between a small developing country and a larger, more advanced country or group of countries will lock into place certain market reforms in the developing country that accompany or precede liberalization. This in turn may reduce the risk

[23] This assumed capital inflow was $2,144 million in 1990 value. If, say, this was spread over a period of 10 years, it would amount to $214 million annually. This can be compared to the actual inflow of FDI in 1991, which according to GATT (1994, p. 52), was $133 million. Some 90 percent of this actual inflow went into energy-related sectors.

that is associated with investment in the country and thus attract capital.[24] Our model does not include such effects, and therefore we thought it appropriate simply to impose an exogenous capital flow into Tunisia as a crude way of representing them. This is what is done in Scenario C. We have modeled the earnings on imported capital as being retained and reinvested in Tunisia, so that there is no effect on the balance of payments after the inflow itself is completed.

The results for Scenario C in Table 3 show a further worsening of the terms of trade, an increase in the expansion of exports and a decrease in the expansion of imports (needed to keep the trade balance unchanged when the prices of imports rise relative to exports), a rise (relative to Scenario B) in the wage-rental ratio, and a decline in overall welfare. All of these effects except the last are what one would expect from any capital inflow. The surprise may be the loss of welfare, which occurs because capital is flowing here in a direction opposite to market signals. That is, as noted above, the FTA drives the nominal return to capital in Tunisia down because it lowers prices in most sectors. Without evidence to the contrary, the model assumes that nominal returns on capital (adjusted for risk) were initially the same in Tunisia as elsewhere. Therefore the natural market response to the FTA would have been for capital to flow out of Tunisia to other countries where it would be more productive. By instead forcing capital to flow into Tunisia in Scenario C, we are moving capital to a location where its productivity has been reduced by the FTA, and it is now therefore below the return that is paid on it. The country is therefore paying more for this capital than it receives in increased output. This reduces welfare of the country as a whole.

Of course if the risk premium story above were valid, so that a lower nominal return could be paid to foreign capital, then this result for welfare would be altered. The reduction in the risk premium could be much greater than any reduction in the marginal product of capital due to the FTA, and in that case the same capital flow would be welfare

[24] This argument was prominent in the discussions leading up to the NAFTA. Events starting in December 1994 unfortunately suggest that it may have been overly optimistic, at least for Mexico, and that perception may now stop it from working in other countries whether or not it would be justified.

increasing. But we have no way of knowing how the risk premium might change, and therefore we are unable to quantify this possibility.

We again see the asymmetry vis-a-vis the EU in this Scenario. Tunisia has a welfare decline of $15.0 million, while the 12-member EU gains $5.9 billion in welfare. Compared to Scenario B, the capital flow from the EU to Tunisia has increased welfare somewhat in the EU. This is because Tunisia is assumed to pay a market return on the capital even though its productivity within Tunisia is less than that. The real return to capital in all three EU groupings falls by 0.1 percent.

Scenario D

We were reluctant to give up entirely on market-driven capital flows, however, and we therefore turned in Scenario D to an alternative formulation with sector-specific capital. With capital unable to move among sectors, perhaps because it has already been installed and is not easily converted to other uses, returns to capital rise in some sectors and fall in others. This was already mentioned in Scenario A. Our assumption in Scenario D is that capital flows into the sectors where the return has risen, but does not flow out of the sectors where returns have fallen.

Unfortunately we do not have any acceptable way to predict how much capital will respond to such signals. What we did therefore was simply to assume an arbitrary elasticity of capital with respect to its return, equal to 5.0. That is, an increase in the nominal return to capital in a sector is assumed to cause a capital flow into Tunisia that is five times as large relative to the Tunisian sectoral capital stock. We have no way to establish whether this elasticity of 5.0 is plausible, and we therefore offer these results primarily for illustrative purposes.

What is shown in Table 3 is that the sector-specific capital flows cause largely very similar results to those of Scenario C, although the effects in this case are quite a bit smaller because the capital flow itself is smaller. Responding only to the sectors where the return to capital has increased, even with an elasticity of five, causes a capital flow of only 1.9 percent of the Tunisian capital stock, compared to the 10 percent in Scenario C.

The one effect that is noticeably different, however, is on economic welfare. Here the small decline in welfare that we saw in Scenario A without the capital flow is turned into an also small but positive change in welfare by the sector-specific flow. The reason is simply that capital, in contrast to Scenario C, is now flowing only into sectors where it does earn a high enough return to pay for itself, and it thus creates a surplus for the economy.

Scenario E

Our final Scenario is intended to take account of the major features of the Tunisian Investment Code. The endogenous capital flows introduced in Scenario D are here expanded or contracted in response to various constraints and/or subsidies that are included in the Code. It is evident in Table 3 that the results differ hardly at all from those of Scenario D, although the fact that there is a slight increase in the welfare improvement from the FTA in the presence of the Code suggests that its features may have a small positive benefit. Apparently the Code is to some extent succeeding in directing capital to sectors where it can be most productive.

VII. Computational Results: Sectoral Effects

Sectoral results for Scenarios A, B, and D are given for Tunisia in Tables 4-6. The sectoral results for Scenarios C and E are available from the authors on request. The percent changes in total exports and imports are shown in columns (2) and (3) of each table. The percent changes in imports are decomposed bilaterally in columns (4) through (10). The percent changes in sectoral output and number of firms are listed in columns (11) and (12). The change in output per firm, and thus the extent to which economies of scale have been realized, can be determined by subtracting column (12) from (11). Columns (13) and (14) record the percentage and absolute changes in employment of labor, and column (15) records changes in the return to capital or in the employment of capital, depending on the

individual scenario.[25] The sectoral results for the three EU regions and the other regions are in general very small and are therefore not reported here.

Scenario A

This Scenario refers to the bilateral removal of tariffs and NTBs between Tunisia and the EU, with labor assumed to be perfectly mobile, and with capital sector-specific and thus immobile. The results might best be interpreted as referring to the short-to-medium run effects of the Tunisia-EU FTA. As noted in column (2) of Table 4, there are sizable percentage increases in total Tunisian exports across all sectors. According to column (3), imports increase in all the goods sectors except wood products and mining and quarrying, and there are reductions in imports in all of the services sectors. These increases in goods imports reflect the unilateral reduction in Tunisian tariffs, whereas Tunisian services imports decline because the barriers in these sectors are assumed to remain intact. Since Tunisian goods imports will increase with the tariff removal, Tunisian exports will also increase in order for trade to balance.

There are substantial percentage increases in Tunisia's bilateral imports from the three EU groupings in all of the goods sectors and reductions in the services sectors, all of which reflect the relative price changes noted due to the assumed removal of Tunisian tariffs on goods imports. There are sizable negative percentage changes in Tunisia's imports from all of the non-EU regions noted in columns (7)-(10), which are indicative of the trade diversion that we have already mentioned in discussing the aggregate results reported in Table 3.[26]

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[25] In interpreting the results for the changes in employment of labor and for the allocation of capital, we should note that the model was solved under the assumption that total employment of both labor and capital is constant, as indicated in the bottom line of the pertinent tables. However, because our solution algorithm solves a log-linear approximation to the true model, when the changes in logs of variables (which do average to zero) are converted to true percentages, they do not quite average to zero. This in turn means that the absolute changes in employment that are calculated from these percentages also fail to add exactly to zero.

[26] Because Tunisia does not change tariffs on service imports or on goods imports from non-EU countries, all of these trade flows are effected symmetrically from within Tunisia. At first glance it appears that each of these levels

As noted in column (11), there are increases in output in 14 of the 29 sectors, with the largest increases in leather products, footwear, wood products, miscellaneous manufactures, and mining and quarrying. The largest declines in output occur in rubber products, furniture and fixtures, paper products, and transport equipment. If we subtract the percent changes in number of firms in column (12) from the percent changes in output in column (11) to get changes in output per firm, there is evidence of positive scale effects in 20 sectors and negative scale effects in 8 sectors.

The changes in employment listed in columns (13) and (14) show expansion in 12 sectors and contraction in 17 sectors. The sectors with the largest absolute employment increases in number of workers are wholesale and retail trade and transportation services. The sectors with the largest absolute employment declines are agriculture, textiles, and community, social, and personal services.

Changes in the nominal return to capital are listed in column (15). There are positive changes in returns in 16 sectors, with the largest increases in mining and quarrying, wood products, miscellaneous manufactures, leather products and footwear, and clothing. The largest negative changes in returns to capital are in transportation equipment, rubber products, furniture and fixtures, and paper products.[27]

Scenario B

In Scenario B, capital is now permitted to move among sectors rather than being sector-specific, that is, immobile among sectors as in Scenario A. The results of Scenario B might then be interpreted as the longer-run effects of the Tunisia-EU FTA when both labor and capital can move among sectors. Looking first at the percent changes in total exports in column (2) of Table 5 in comparison to Scenario A in Table 4, there are evidently now relatively larger

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of imports falls by the same percentage across trading partners. This is not quite the case, however, as a closer inspection of the results will reveal. Changes within the separate EU and other countries are very small here, but they sometimes lead to slight differences in these effects.

[27] As already mentioned, the sectoral effects on the EU regions are negligible in this scenario and those that follow. The effects on sectoral imports, output, employment, and the return to capital are mostly zeros, with the exception of some positive/negative effects of 0.1 or 0.2 for a few sectors. It was decided accordingly not to report these EU sectoral tables since they contain very little extra information beyond what is shown in the sectoral results for Tunisia.

increases especially in exports of clothing and mining and quarrying, which are two of Tunisia's most important export industries. There are four sectors that now show reductions in exports: textiles; leather products; paper products; and rubber products. As for total sectoral imports in column (3), the percentage increases are larger as compared to Scenario A since it is now possible for both capital and labor to be reallocated among sectors. Services sector imports also fall by sizable percentages in Scenario B. Bilateral imports from the three regions of the EU increase more in Scenario B than in Scenario A as indicated in columns (4)-(6). As for the regions outside the Tunisia-EU FTA, noted in columns (7)-(10), there appears to be somewhat less trade diversion when full mobility of capital and labor is permitted.

Allowing for full mobility of capital and labor has more pronounced effects on changes in sectoral output as compared to Scenario A. The sizable positive and negative changes in sectoral outputs suggest accordingly that there would be considerable intersectoral reallocation of capital and labor in response to the Tunisia-EU FTA, given Tunisia's relatively high manufacturing sector tariffs. This is evident from the results reported in columns (13)-(15).

Comparing columns (11) and (12), there are indications of positive scale economies in 23 sectors and negative scale economies in 5 sectors.

Scenario C

The results of this scenario, which are not reported here, suggest that the assumed infusion of FDI from the EU results in larger percentage expansions of exports and smaller percentage reductions as compared to Scenario B. Total imports show smaller percentage increases as compared to Scenario B, since there is a worsening in the terms of trade that limits the imports that can be financed with an unchanged balance of trade.[28]

The percentage changes in Tunisia's bilateral imports vis-a-vis the three EU regions are now also smaller as compared to Scenario B, which also reflects the change in terms of trade, and there is now more evidence of trade diversion with respect to the regions outside the EU. The percent changes in sectoral output tend to be larger with the assumed inflow of FDI, but this is not altogether uniform. The reallocation of labor and capital in this scenario is also substantial as was the case in Scenario B, even with the potential for proportional expansion in the sectoral capital stocks associated with an increased inflow of FDI.

[28] Recall that earnings on FDI are not repatriated, and therefore the trade balance remains unchanged.

Scenario D

This Scenario also considers an inflow of FDI but within the context of the sector-specific capital framework. That is, in Scenario A, we calculated the changes in the nominal returns to capital as the result of the removal of trade barriers in the Tunisia-EU FTA. Having identified sectors in which there was an increase in the nominal return to capital (see the final column of Table 4), we then assumed that there would be an increase of FDI in these sectors only.[29] For this purpose, we assumed an elasticity of 5.0 for FDI inflows with respect to the return to capital.

If we compare the percentage changes in total sectoral exports and imports in columns (2) and (3) of Table 6 with those in Table 4, the results are not greatly different especially because the calculated FDI inflows turn out to be not substantial. That is, these FDI inflows constitute 1.9% of Tunisia's base-level total capital stock. Of course, some of the individual sectors are affected differentially because the FDI inflows are directed only at the sectors that show increases in the nominal return to capital. It is also difficult to see many important changes in the bilateral import results between Scenarios A and D.

While the investment inflows that occur in this scenario have only relatively small effects on the various magnitudes calculated by the model, it is of some interest to note which sectors of the Tunisian economy attract these inflows. This can be read from column 15 of Table 6, where increases in returns to capital correspond to sectors into which FDI is flowing. This includes more than half of the sectors, with the largest increases in returns to capital (and therefore the largest FDI inflows under our assumptions) in manufacturing sectors occurring in leather products, clothing, petroleum products, nonferrous metals, miscellaneous manufactures, and footwear. There are also increases in returns to capital and hence capital inflows into all of the services sectors, including especially wholesale trade, transportation, and financial services, some of which includes components of tourism.

[29] Actually, the capital flows are based upon endogenous changes in returns to capital, which do not always increase in the same sectors as Scenario A. See Table 7.

Scenario E

This scenario is the same as Scenario D, but it incorporates some features of Tunisia's 1994 Investment Code. The results, which are not reported here, indicate that the inflow of FDI in this case is only slightly larger than in Scenario D, amounting to an increase of 2.1% in the base level of Tunisia's total capital stock. The detailed sectoral results are very close to the Scenario D results in Table 6.

Policies for Adjustment

The foregoing disaggregated results all indicate the need for substantial intersectoral adjustment by the Tunisian economy in response to implementation of the Tunisia-EU FTA. The question then arises what policies, if any, should be used to facilitate that adjustment. Since this is inherently a dynamic issue, our model does not say anything about it directly. However, the world has considerable experience in adjusting to the dislocations that are occasioned by trade liberalization, and that experience warns of the pitfalls of programs to facilitate adjustment, even if it does not tell us clearly how to avoid those pitfalls.

The greatest danger is that policies that are intended to reduce the burden of adjustment for industries whose output and employment must contract will instead permit them to avoid that adjustment entirely or delay it so that in fact the burden on the economy will be extended unnecessarily over time.[30] To avoid this, it is important that adjustment assistance policies be designed primarily to help workers accomplish the relocation and retraining that may be necessary to shift to expanding industries rather than merely to compensate them for the losses they incur in the contracting industries. Similar conditions apply to any assistance provided to owners of capital, although here the

[30] According to Hoekman and Djankov (1995, p. 16), the tariff reductions for the least competitive Tunisian industries will be backloaded towards the end of the 12-year phase-in period. Since the effective protection for these industries will be increased due to cheaper imports as tariffs on inputs are reduced in the early phase-in period, they point out that this could lead to inefficient investment and resistance to market opening down the road.

assistance might take the form of accelerated depreciation allowances and credits for investment in expanding sectors.[31]

VIII. Conclusions and Implications for Policy

The objective of our paper has been to investigate the potential economic effects on the Tunisian economy of the FTA between Tunisia and the EU as the result of bilateral removal of existing trade barriers coupled with possible changes in FDI inflows into Tunisia. For this purpose, we have carried out a number of trade and FDI scenarios using a specially constructed version of the Michigan Brown-Deardorff-Stern CGE Trade Model. Because the model is static, it has been assumed that all the changes in trade barriers and FDI occur at a single point in time rather than over a period of time as will be the case in actuality. Our computational results are therefore to be interpreted in a context of comparative static analysis, that is, moving from a pre-FTA starting point to a post-FTA equilibrium.

Our chief findings are as follows.

1. The static welfare benefits for Tunisia of the FTA with the EU involving the bilateral removal of existing trade barriers between Tunisia and the EU range from slightly negative to somewhat positive, depending on what is assumed about intersectoral capital mobility in Tunisia. Identifying capital mobility with the time horizon of the analysis, we expect the FTA to reduce Tunisia's aggregate welfare somewhat in the short run but raise welfare in the longer run.

2. Depending on the length of time allowed for phasing in of the FTA, Tunisia could experience significant adjustment problems in connection with the intersectoral movements of labor and capital that the FTA would induce.

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[31] According to the IMF (1996, p. 79), the Agreement provides for an industrial restructuring program that will cost an estimated $2.4 billion over five years and will be financed jointly by the Tunisian Government and contributions from the EU and the World Bank. It is interesting, though probably fortuitous, that the $2.4 billion corresponds to the estimated total welfare gain for the EU reported for our Scenario A in Table 3.

3. Our FDI-related scenarios are intended to be primarily illustrative since there is no straightforward way to integrate FDI inflows into our CGE trade modeling framework. In any event, our results suggest that even an approximate doubling of the recent annual level of the FDI inflow into Tunisia in conjunction with the FTA would be unlikely to make a significant difference for Tunisian welfare. This applies as well when we make allowance for FDI inflows in response to changes in sectoral rates of return and to features of Tunisia's 1994 Investment Code.

4. A question of concern is whether the success of the FTA between Tunisia and the EU depends on whether there is a substantial flow of FDI into Tunisia. Our results say that such FDI is not necessary for the FTA to become beneficial to Tunisia once enough time for adjustment has elapsed. Also, unless an FDI inflow is considerably larger than the flows that have been observed to date, and unless it is also systematically targeted primarily to sectors where it can yield a higher return than its cost, we would not expect the presence of FDI to make a noticeable difference to the economic success of the FTA. On the other hand, given the difficulty of observing the types of gain that the FTA is likely to yield, it may well be that a large visible flow of FDI is necessary for the FTA to be *viewed* as a success.

As noted earlier, we should reiterate that our CGE model does not make any allowance for dynamic efficiency changes and economic growth. Recent research suggests that static gains from trade, such as we have calculated here, may well be augmented by their effects over time on economic growth, so that the static changes, to the extent that they are positive, are really only lower bounds on what the economic benefits to an economy may turn out to be. On the other hand, the very few estimates of such effects that are available only suggest that the static gains will be increased by a small integer multiple, and this would not materially affect the conclusions we have reached here based on the estimates of the static model.[32]

There are other theoretical models that explore the possibility that trade liberalization may have a permanent positive effect on a country's rate of growth, by stimulating technological progress or by taking advantage of various

[32] See Baldwin (1992).

"dynamic scale economies."[33] There is some empirical evidence for such an effect, but it is unclear whether the effects of trade on growth rates that have been found empirically are transitory or permanent.[34] We therefore would hesitate to claim that the welfare effects found here will be significantly augmented by such considerations.

As noted above, we have also omitted from our analysis the possible reductions in trading costs with all countries that may be achieved through harmonization and other sources of increased trading efficiency discussed by Page and Underwood (1995) among others. This does not deny the potential importance of these other sources of benefit, but it remains to be seen whether and how effectively Tunisian policies and the Tunisian economic structure can be adapted to the realities and opportunities of the FTA.

Acting in the other direction, there may be some concern that the gains from the FTA with the EU could be reversed later by the EU backing out of the agreement. We see no reason to expect that to happen, based upon the history of the EU's other preferential trading arrangements. But we should also point out that Tunisia has benefited since the mid-1970's from preferentially low tariffs on most exports to the EU. The benefits to Tunisia from these preferences — which are not included in our analysis here since they are already present independently of the FTA — will be eroded if the EU continues to lower trade barriers multilaterally as a result of the Uruguay Round and future negotiations under the auspices of the World Trade Organization.

We have also left out a host of other considerations that have figured importantly in the negotiation of the Tunisia-EU FTA. Perhaps most importantly, we have not addressed any of the political considerations that may have served as major driving forces in the formation of the Tunisia-EU FTA. These forces include issues of democratization, as well as trying to diminish the potential influence of radical Islamic fundamentalism, as is evident in Algeria and Egypt.

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[33] See Grossman and Helpman (1991).

[34] Levine and Renelt (1992), in a critical analysis of the empirical literature relating growth rates across countries to various determinants, find that the only robust conclusions are that growth responds to investment and that investment in turn responds to trade.

Overall, what the foregoing conclusions suggest to us is that Tunisia may not have a great deal to gain in economic terms from entering into the FTA with the EU. The reason is that the FTA amounts essentially to Tunisia eliminating its bilateral tariffs vis-a-vis the EU, since Tunisia already has had duty free access to the EU except for some agricultural products and certain types of clothing exports. The trade diverting effects of such a disciminatory tariff reduction are likely to be harmful, especially in the short run. Further, the FTA does not in itself appear likely to generate an inflow of capital into Tunisia that would materially increase Tunisian welfare. The question thus arises as to whether Tunisia might pursue liberalization of its trade restrictions on a multilateral basis as well as preferentially with respect to the EU. This would avoid the trade diversion that our CGE model suggests might otherwise occur. Reducing its trade barriers multilaterally and reinforcing these actions with a liberalization of its foreign investment policies and maintenance of macroeconomic and political stability might in the end be the best path for Tunisia to follow.[35]

[35] A similar conclusion is reached by Hoekman and Djankov (1995, p. 31).

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Table 1
Tunisia: Basic Data, 1990

Sector	ISIC	(1) Output (Mill. $)	(2) Labor (000)	(3) Capital (Mill. $)	(4) Imports (Mill. $)	(5) Exports (Mill. $)
Agriculture, Forestry, & Fisheries	*(1)*	*2,668.6*	*542.4*	*3,343.5*	*317.9*	*176.9*
Manufactures						
Food, Beverages, & Tobacco	*(310)*	*2,487.6*	*35.3*	*579.4*	*286.2*	*234.3*
Textiles	*(321)*	*525.6*	*76.9*	*734.4*	*818.0*	*121.0*
Wearing Apparel	*(322)*	*1,501.0*	*19.4*	*50.5*	*200.1*	*1,138.7*
Leather Products	*(323)*	*88.2*	*2.6*	*22.2*	*55.7*	*30.4*
Footwear	*(324)*	*139.1*	*12.1*	*50.5*	*12.0*	*48.3*
Wood Products	*(331)*	*141.9*	*6.6*	*13.5*	*104.0*	*5.1*
Furniture & Fixtures	*(332)*	*33.6*	*1.7*	*12.7*	*28.0*	*9.3*
Paper & Paper Products	*(341)*	*176.6*	*4.6*	*177.2*	*101.1*	*23.7*
Printing & Publishing	*(342)*	*82.9*	*5.0*	*29.5*	*24.5*	*2.2*
Chemicals	*(35A)*	*696.6*	*25.2*	*469.6*	*40.8*	*15.0*
Petroleum & Related Products	*(35B)*	*1,431.3*	*1.7*	*1,743.6*	*468.7*	*503.6*
Rubber Products	*(355)*	*163.1*	*5.0*	*23.5*	*298.3*	*65.6*
Nonmetallic Mineral Products	*(36A)*	*110.7*	*7.0*	*268.2*	*26.4*	*5.8*
Glass & Glass Products	*(362)*	*735.7*	*33.1*	*698.8*	*25.6*	*95.6*
Iron & Steel	*(371)*	*136.2*	*3.4*	*48.6*	*236.3*	*35.3*
Nonferrous Metals	*(372)*	*23.5*	*0.5*	*11.1*	*69.1*	*16.8*
Metal Products	*(381)*	*232.3*	*6.6*	*49.4*	*108.3*	*43.8*
Nonelectric Machinery	*(382)*	*459.0*	*19.3*	*152.7*	*751.2*	*30.7*
Electric Machinery	*(383)*	*1,024.6*	*38.5*	*496.2*	*402.2*	*194.8*
Transportation Equipment	*(384)*	*196.8*	*5.8*	*111.9*	*442.4*	*43.7*
Miscellaneous Manufactures	*(38A)*	*148.2*	*5.3*	*39.4*	*273.7*	*90.0*
Mining & Quarrying	*(2)*	*682.7*	*1.6*	*69.1*	*251.6*	*529.9*
Services						
Electricity, Gas, & Water	*(4)*	*549.1*	*12.5*	*1,349.9*	*133.1*	*6.9*
Construction	*(5)*	*1,573.0*	*63.6*	*317.9*	*4.1*	*12.4*
Wholesale & Retail Trade	*(6)*	*1,057.5*	*267.6*	*3,918.7*	*140.3*	*803.3*
Transportation, Storage & Communications	*(7)*	*1,275.9*	*52.3*	*3,470.8*	*432.5*	*536.2*
Finance, Insurance, & Real Estate	*(8)*	*568.4*	*16.3*	*326.2*	*63.9*	*134.9*
Community, Social, & Personal Services	*(9)*	*5,247.1*	*721.0*	*2,863.8*	*70.8*	*106.4*
Total		*24,166.8*	*1,992.9*	*21,442.8*	*6,186.8*	*5,060.6*

Notes: Column (1) refers to gross output; Columns (1) and (2) are partly estimated for some sectors; Column (3) is based on cumulative annual sectoral investment, measured in constant prices, less depreciation; Columns (4) and (5) have been concorded from the Harmonized System to the ISIC sectoral categories.

Table 2
Tunisia: Tariff Rates and Services-Sector Tariff Equivalents, Pre-Uruguay Round
(Percentage)

Sector	ISIC	(1) Greece Portugal Spain	(2) France Italy	(3) Other EU-7	(4) Other Eur.	(5) NAFTA	(6) Asia/ Pac.	(7) South Amer.	(8) Rest of World
Agriculture, Forestry, & Fisheries	(1)	21.9	19.7	22.1	28.1	20.2	13.8	19.9	18.0
Manufactures									
Food, Bevages,& Tobacco	***(310)***	17.2	28.6	27.6	32.0	20.8	29.9	20.4	20.2
Textiles	***(321)***	38.2	37.3	37.9	31.1	32.2	30.2	29.5	34.2
Wearing Apparel	***(322)***	40.0	40.7	40.4	38.4	40.9	41.1	43.0	38.8
Leather Products	***(323)***	27.7	31.1	29.1	34.5	38.3	25.0	34.7	27.5
Footwear	***(324)***	39.0	39.6	42.4	42.7	43.0	42.1	0.0	41.9
Wood Products	***(331)***	27.9	23.4	30.4	22.1	21.8	38.9	22.0	21.5
Furniture & Fixtures	***(332)***	41.1	38.7	37.9	28.8	42.6	38.4	10.0	40.5
Paper & Paper Products	***(341)***	40.5	36.2	36.3	26.5	32.7	40.3	26.2	20.8
Printing & Publ.	***(342)***	19.7	25.0	26.6	26.8	12.1	40.7	0.0	25.5
Chemicals	***(35A)***	17.4	18.9	19.9	18.5	19.4	20.4	16.2	17.8
Petrololeum & Related Products	***(35B)***	10.3	10.3	20.3	28.5	18.0	31.0	0.0	10.2
Rubber Products	***(355)***	33.3	30.9	33.4	33.8	36.4	32.2	28.7	24.9
Nonmetallic Mineral Products	***(36A)***	34.9	33.3	35.9	37.5	31.2	24.6	42.0	39.0
Glass & Glass Products	***(362)***	23.3	15.1	25.3	20.9	5.9	22.4	20.0	27.4
Iron & Steel	***(371)***	25.1	21.0	19.8	24.0	12.0	15.2	26.2	25.7
Nonferrous Metals	***(372)***	18.7	20.7	20.7	25.2	20.3	31.9	20.0	22.2
Metal Products	***(381)***	32.9	32.4	32.5	32.6	28.5	31.8	36.3	31.7
Nonelectric Machinery	***(382)***	16.8	18.0	15.8	15.5	18.1	13.1	13.4	16.9
Electric Machinery	***(383)***	26.7	28.6	22.7	36.8	18.8	19.4	27.8	27.3
Transportation Equipment	***(384)***	24.1	25.9	24.8	34.3	22.3	27.0	27.7	32.9
Miscellaneous Manufactures	***(38A)***	26.3	27.9	27.5	23.1	19.7	20.4	22.8	31.7
Mining & Quarrying	***(2)***	16.2	20.1	38.9	20.1	17.2	17.0	20.0	10.2
Services									
Electricity, Gas, & Water	***(4)***	--	--	--	--	--	--	--	--
Construction	***(5)***	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Wholesale & Retail Trade	***(6)***	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
Transportation, Storage, & Commun.	***(7)***	193.9	193.9	193.9	193.9	193.9	193.9	193.9	193.9
Finance, Insurance, & Real Estate	***(8)***	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6
Community, Social, & Personal Services	***(9)***	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5

Note: The tariff rates on Sectors (1), (2), and (310)-(38A) are based on official Tunisian data and do not reflect exemptions and other duty-free allowances. They are weighted by bilateral imports. The ad valorem tariff equivalents in the services sectors (5-9) are "guesstimates" based on Hoekman (1995) and are not bilaterally weighted.

TABLE 3
SUMMARY RESULTS OF TUNISIA-EU FREE TRADE:
CHANGES IN COUNTRY IMPORTS, EXPORTS, TERMS OF TRADE, WELFARE
AND RETURN TO LABOR AND CAPITAL

Country	Imports*	Exports*	Terms of Trade Percent Change	Equivalent Variation		Percent Change Real Wage	Real Return to Capital
				Percent of GDP	Millions $		
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Free Trade with Sector Specific Capital: Trade Only							
Tunisia	483.2	735.1	-5.0	-0.2	-26.8	2.5	6.6
Mediteranean EU	46.7	47.2	0.0	0.0	136.4	0.0	0.0
France-Italy	589.6	401.9	0.0	0.1	1542.0	0.0	0.0
Other EU	351.9	208.0	0.0	0.0	741.8	0.0	0.0
Other Europe	-31.4	-18.6	0.0	0.0	13.7	0.0	0.0
NAFTA	-28.2	2.1	0.0	0.0	54.3	0.0	0.0
Asia-Pacific	47.8	14.5	0.0	0.0	136.0	0.0	0.0
South America	0.0	-4.0	0.0	0.0	-0.6	0.0	0.0
B. Free Trade with Sectorally Mobile Capital: Trade Only							
Tunisia	911.6	1158.6	-4.9	3.3	430.3	-1.7	6.5
Mediteranean EU	52.8	58.7	0.0	0.0	172.3	0.0	-0.1
France-Italy	829.1	623.9	0.0	0.1	2186.3	0.0	-0.1
Other EU	481.3	317.8	0.0	0.0	1045.5	0.0	0.0
Other Europe	-8.5	-0.2	0.0	0.0	51.9	0.0	0.0
NAFTA	-15.5	13.9	0.0	0.0	-36.5	0.0	0.0
Asia-Pacific	71.4	26.1	0.0	0.0	147.6	0.0	0.0
South America	7.7	-1.7	0.0	0.0	17.0	0.0	0.0
C. Free Trade with Sectorally Mobile Capital: Trade & FDI							
Tunisia	533.3	1734.6	-7.0	-0.1	-15.0	4.6	7.1
Mediteranean EU	82.8	-9.4	0.0	0.0	284.3	0.0	-0.1
France-Italy	1,037.0	493.8	0.1	0.2	3972.4	0.0	-0.1
Other EU	657.9	-1.9	0.0	0.1	1662.4	0.0	-0.1
Other Europe	-17.2	-11.0	0.0	0.0	189.2	0.0	0.0
NAFTA	-34.5	-3.6	0.0	0.0	115.8	0.0	0.0
Asia-Pacific	68.3	24.8	0.0	0.0	336.5	0.0	0.0
South America	4.5	-2.9	0.0	0.0	43.5	0.0	0.0

*Exports and imports in millions of U.S. dollars, valued in U.S. dollar base period prices.

TABLE 3, CONTINUED
SUMMARY RESULTS OF TUNISIA-EU FREE TRADE:
CHANGES IN COUNTRY IMPORTS, EXPORTS, TERMS OF TRADE, WELFARE
AND RETURN TO LABOR AND CAPITAL

Country	Imports*	Exports*	Terms of Trade Percent Change	Equivalent Variation		Percent Change Real Wage	Real Return to Capital
				Percent of GDP	Millions $		
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D. Free Trade with Sector Specific Capital: Trade & FDI							
Tunisia	501.5	917.7	-5.1	0.9	122.4	3.5	6.6
Mediteranean EU	54.4	41.0	0.0	0.0	123.8	0.0	0.0
France-Italy	659.9	424.5	0.0	0.1	1597.8	0.0	0.0
Other EU	394.9	136.0	0.0	0.0	642.6	0.0	0.0
Other Europe	-34.2	-23.7	0.0	0.0	21.4	0.0	0.0
NAFTA	-34.5	-1.9	0.0	0.0	55.6	0.0	0.0
Asia-Pacific	45.2	11.0	0.0	0.0	144.3	0.0	0.0
South America	1.0	-3.8	0.0	0.0	4.1	0.0	0.0
E. Free Trade with Sector Specific Capital and Capital Tax: Trade & FDI							
Tunisia	498.0	931.4	-5.1	1.0	130.8	3.6	6.6
Mediteranean EU	55.1	39.4	0.0	0.0	124.1	0.0	0.0
France-Italy	664.8	423.5	0.0	0.1	1600.9	0.0	0.0
Other EU	398.0	130.9	0.0	0.0	646.6	0.0	0.0
Other Europe	-34.7	-24.3	0.0	0.0	22.5	0.0	0.0
NAFTA	-34.7	-2.3	0.0	0.0	60.1	0.0	0.0
Asia-Pacific	44.3	10.5	0.0	0.0	143.9	0.0	0.0
South America	0.9	-3.8	0.0	0.0	4.5	0.0	0.0

*Exports and imports in millions of U.S. dollars, valued in U.S. dollar base period prices.

TABLE 4

SCENARIO A: TRADE ONLY WITH SECTORALLY SPECIFIC CAPITAL

SECTORAL EFFECTS ON TUNISIA OF TUNISIA-EU FREE TRADE

(Percent Change unless Otherwise Noted)

Sector	Exports	Imports	Bilateral Imports							Output	No. Firms	Employment		Return to Capital
			MEU	FR-IT	OEU	OEUR	NAFTA	APAC	SAM			Percent	1000's	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 Agriculture	43.5	5.4	51.9	45.7	52.4	-20.3	-20.3	-20.3	-20.3	0.0	0.0	-0.9	-4.8	1.5
310 Food	18.2	17.4	22.0	53.0	50.1	-21.5	-21.5	-21.5	-21.5	-1.4	-1.3	-4.6	-1.6	0.0
321 Textiles	53.7	20.2	26.9	25.2	26.6	-44.6	-44.6	-44.6	-44.6	6.3	-4.7	-5.4	-4.2	-2.8
322 Clothing	14.8	66.5	66.0	67.9	67.1	-29.6	-29.5	-29.5	-29.5	3.7	3.6	6.5	1.3	7.7
323 Leather Products	58.3	23.7	21.0	28.5	24.0	-36.9	-36.9	-36.9	-36.9	18.2	2.4	9.4	0.2	9.7
324 Footwear	45.2	54.6	56.8	58.2	65.2	-32.4	-32.4	-32.4	-32.4	13.7	0.6	11.0	1.3	9.7
331 Wood Products	13.8	-6.7	62.5	49.2	70.0	-15.5	-15.4	-15.5	-15.5	12.5	1.9	7.9	0.5	11.4
332 Furniture, Fixtures	4.9	34.8	65.5	59.6	57.5	-30.9	-30.9	-30.9	-30.9	-7.6	-5.7	-12.8	-0.2	-8.3
341 Paper Products	17.6	19.9	61.4	51.0	51.1	-32.0	-32.0	-32.0	-32.0	-6.1	-2.0	-16.0	-0.7	-7.1
342 Printing, Publishing	14.4	13.3	18.5	31.5	35.7	-27.7	-27.7	-27.7	-27.7	-2.2	-0.9	-6.0	-0.3	-4.5
35A Chemicals	8.0	18.2	27.3	31.4	34.3	-18.3	-18.3	-18.3	-18.3	-3.5	-1.8	-4.8	-1.2	-1.6
35B Petroleum Products	8.8	8.4	10.4	10.2	38.4	-16.6	-16.6	-16.6	-16.7	1.7	-0.6	2.1	0.0	4.5
355 Rubber Products	7.6	30.1	42.2	36.3	42.2	-32.9	-32.9	-32.9	-32.9	-15.2	-13.5	-20.2	-1.0	-9.6
36A Nonmetal Min. Prod.	1.2	56.4	76.9	72.0	79.6	-18.6	-18.6	-18.6	-18.6	-6.8	-5.9	-8.0	-0.6	-3.6
362 Glass Products	6.0	22.2	42.6	20.0	48.4	-19.0	-19.0	-19.0	-19.0	-0.4	-0.8	-1.9	-0.6	1.1
371 Iron, Steel	6.9	5.8	33.8	23.2	20.1	-26.8	-26.8	-26.8	-26.8	-5.1	-6.5	-8.5	-0.3	-3.4
372 Nonferrous Metals	13.9	4.0	10.5	15.3	15.2	-31.0	-31.0	-31.0	-31.0	4.7	0.6	5.0	0.0	6.0
381 Metal Products	15.7	29.7	44.7	43.6	43.9	-31.1	-31.1	-31.1	-31.1	-5.2	-3.1	-9.3	-0.6	-6.8
382 Nonelec. Machinery	14.6	5.5	12.8	15.8	10.3	-26.7	-26.7	-26.7	-26.7	-2.2	-2.9	-5.4	-1.0	-4.9
383 Electrical Machinery	38.4	19.4	29.3	33.9	19.7	-31.2	-31.2	-31.2	-31.2	4.0	-1.3	-1.0	-0.4	0.7
384 Transport Equipment	18.0	12.8	15.7	19.7	17.2	-35.4	-35.4	-35.4	-35.4	-6.1	-6.8	-8.5	-0.5	-18.9
38A Misc. Mfrs.	33.5	11.9	18.4	22.1	21.0	-36.6	-36.5	-36.5	-36.5	13.5	2.0	11.6	0.6	11.0
2 Mining, Quarrying	21.0	-5.1	21.4	32.2	85.0	-20.1	-20.0	-20.1	-20.0	13.5	12.7	20.0	0.3	14.4
4 Utilities	22.1	-16.6	-16.8	-16.8	-16.8	-16.7	-16.7	-16.7	-16.8	1.8	0.3	2.4	0.3	3.5
5 Construction	22.9	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-0.5	-2.8	-4.1	-2.6	-1.0
6 Wholesale Trade	3.6	-7.5	-7.5	-7.6	-7.5	-7.5	-7.5	-7.5	-7.5	1.3	0.4	14.1	37.8	8.2
7 Transportation	12.6	-10.5	-10.6	-10.6	-10.6	-10.5	-10.5	-10.5	-10.5	5.5	3.2	12.1	6.4	10.3
8 Financial Services	11.8	-11.5	-11.5	-11.5	-11.5	-11.5	-11.5	-11.5	-11.4	2.8	1.9	7.5	1.2	6.7
9 Personal Services	21.3	-19.6	-19.6	-19.6	-19.6	-19.5	-19.5	-19.5	-19.5	-2.0	-2.5	-3.5	-25.3	-0.5
Total	16.5	11.5	19.7	22.2	26.4	-24.9	-22.8	-29.6	-20.9	0.7	-1.8	0.0	0.0	3.5

TABLE 5

SCENARIO B: TRADE ONLY WITH SECTORALLY MOBILE CAPITAL

SECTORAL EFFECTS ON TUNISIA OF TUNISIA-EU FREE TRADE

(Percent Change unless Otherwise Noted)

Sector	Exports	Imports	Bilateral Imports							Output	No. Firms	Employment		Allocation of Capital
			MEU	FR-IT	OEU	OEUR	NAFTA	APAC	SAM			Percent	1000's	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 Agriculture	25.1	18.6	71.0	64.0	71.5	-10.3	-10.3	-10.3	-10.3	-4.1	0.0	1.8	9.7	-4.4
310 Food	5.3	34.1	39.6	75.0	71.8	-10.1	-10.1	-10.1	-10.1	-3.3	-3.8	6.6	2.3	-7.4
321 Textiles	-61.9	64.3	73.7	72.4	74.9	-24.4	-24.0	-24.1	-24.0	-85.9	-85.7	-85.1	-65.4	-86.2
322 Clothing	49.3	38.1	37.2	39.0	38.8	-41.7	-41.5	-41.5	-41.5	27.9	27.8	33.2	6.4	21.1
323 Leather Products	-3.3	39.8	36.8	45.4	40.6	-28.7	-28.6	-28.6	-28.6	-22.5	-27.0	-21.8	-0.6	-29.2
324 Footwear	31.7	69.3	71.5	73.1	81.0	-26.0	-26.0	-26.0	-26.0	9.1	3.5	13.3	1.6	1.0
331 Wood Products	10.0	-4.7	65.4	51.8	73.1	-14.0	-13.9	-13.9	-14.0	6.8	3.4	8.8	0.6	1.6
332 Furniture, Fixtures	0.1	57.7	94.1	87.1	84.7	-19.0	-19.0	-18.9	-19.0	-13.8	-14.7	-10.2	-0.2	-18.0
341 Paper Products	-6.8	50.2	104.4	91.2	91.3	-13.9	-13.9	-13.9	-13.9	-22.9	-25.0	-15.9	-0.7	-26.2
342 Printing, Publishing	1.5	39.4	46.4	62.4	67.6	-10.7	-10.7	-10.7	-10.7	-7.2	-8.9	-3.5	-0.2	-9.6
35A Chemicals	2.8	25.4	35.2	39.5	42.5	-13.3	-13.3	-13.3	-13.3	-7.6	-7.5	-3.4	-0.9	-11.5
35B Petroleum Products	6.2	15.6	17.9	17.7	47.5	-11.0	-11.0	-11.0	-11.1	2.1	-1.7	7.5	0.1	-0.8
355 Rubber Products	-19.9	53.1	67.5	61.2	67.1	-21.2	-21.1	-21.1	-21.1	-30.4	-28.8	-27.4	-1.4	-36.4
36A Nonmetal Min. Prod.	1.0	59.2	80.1	75.1	82.8	-17.1	-17.1	-17.1	-17.2	-7.2	-6.5	-4.1	-0.3	-13.2
362 Glass Products	5.2	28.6	50.0	26.2	56.1	-14.8	-14.8	-14.8	-14.8	1.9	-0.2	6.3	2.1	-4.0
371 Iron, Steel	4.3	7.2	36.2	25.3	22.1	-25.6	-25.6	-25.6	-25.6	-9.6	-11.5	-7.1	-0.2	-16.9
372 Nonferrous Metals	11.8	0.1	6.6	11.1	11.0	-33.5	-33.5	-33.5	-33.5	1.4	-1.9	5.9	0.0	-5.0
381 Metal Products	6.7	46.3	63.8	62.4	62.7	-22.0	-22.0	-22.0	-22.1	-8.4	-13.4	-8.6	-0.6	-15.3
382 Nonelec. Machinery	10.2	12.3	20.2	23.3	17.4	-21.9	-21.9	-21.9	-21.9	-3.7	-8.0	-5.2	-1.0	-10.2
383 Electrical Machinery	32.9	26.6	37.1	42.0	26.8	-27.1	-27.1	-27.1	-27.1	4.5	-2.8	0.9	0.4	-3.2
384 Transport Equipment	4.4	28.4	31.9	36.5	33.5	-26.3	-26.3	-26.3	-26.3	-14.9	-16.9	-15.3	-0.9	-17.6
38A Misc. Mfrs.	10.8	17.7	24.7	28.5	27.4	-33.2	-33.2	-33.2	-33.2	-4.7	-7.7	-0.9	0.0	-10.5
2 Mining, Quarrying	94.4	-27.4	-17.1	-10.5	26.2	-45.3	-45.4	-45.4	-45.4	63.1	63.2	69.8	1.2	50.0
4 Utilities	17.6	-14.0	-13.8	-13.9	-13.9	-13.8	-13.8	-13.8	-13.8	1.5	-0.7	13.1	1.6	-5.7
5 Construction	24.1	-20.9	-20.9	-20.9	-20.9	-20.8	-20.8	-20.8	-20.9	3.1	0.4	3.5	2.2	-5.3
6 Wholesale Trade	22.4	-17.2	-17.2	-17.2	-17.1	-17.1	-17.1	-17.1	-17.1	15.9	14.8	36.8	98.5	14.0
7 Transportation	34.4	-20.0	-20.2	-20.4	-20.3	-20.2	-20.2	-20.2	-20.2	17.9	16.5	26.1	13.7	12.2
8 Financial Services	11.9	-13.3	-13.3	-13.3	-13.3	-13.2	-13.2	-13.2	-13.2	1.3	0.8	10.5	1.7	-3.3
9 Personal Services	21.6	-17.1	-17.1	-17.2	-17.1	-17.1	-17.1	-17.1	-17.1	1.2	0.8	4.1	29.9	-4.6
Total	31.1	21.8	30.5	34.3	42.2	-20.6	-19.8	-23.7	-12.6	2.7	-20.1	0.0	0.0	1.4

TABLE 6

SCENARIO D: TRADE & FDI WITH SECTORALLY SPECIFIC CAPITAL

SECTORAL EFFECTS ON TUNISIA OF TUNISIA-EU FREE TRADE

(Percent Change unless Otherwise Noted)

Sector	Exports	Imports	Bilateral Imports							Output	No. Firms	Employment		Return to Capital
			MEU	FR-IT	OEU	OEUR	NAFTA	APAC	SAM			Percent	1000's	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 Agriculture	40.0	8.5	56.3	50.0	56.8	-18.0	-18.0	-18.0	-18.0	-0.1	0.0	-1.1	-6.1	2.1
310 Food	16.3	20.4	25.2	56.9	54.0	-19.5	-19.4	-19.4	-19.4	-1.1	-1.5	-5.0	-1.8	0.7
321 Textiles	53.0	22.1	29.0	27.3	28.6	-43.7	-43.7	-43.7	-43.7	7.1	-5.1	-5.7	-4.4	-2.2
322 Clothing	11.9	71.8	71.3	73.3	72.5	-27.3	-27.2	-27.2	-27.2	2.1	1.9	3.6	0.7	6.4
323 Leather Products	75.4	20.1	17.4	24.6	20.2	-38.8	-38.8	-38.8	-38.8	28.5	10.4	15.9	0.4	8.4
324 Footwear	60.0	44.5	46.5	47.8	54.3	-36.8	-36.8	-36.8	-36.8	20.1	7.2	12.4	1.5	5.6
331 Wood Products	23.9	-13.0	46.1	34.1	52.9	-24.0	-23.9	-24.0	-24.0	19.5	17.2	13.8	0.9	-1.0
332 Furniture, Fixtures	5.0	36.5	67.5	61.5	59.4	-30.0	-30.0	-30.0	-30.0	-6.2	-6.0	-12.6	-0.2	-7.3
341 Paper Products	17.6	21.2	63.3	52.7	52.8	-31.2	-31.2	-31.2	-31.2	-5.1	-2.2	-16.2	-0.7	-6.4
342 Printing, Publishing	13.6	15.7	21.0	34.3	38.6	-26.2	-26.2	-26.2	-26.2	-1.6	-1.2	-6.0	-0.3	-3.6
35A Chemicals	8.8	19.1	28.2	32.3	35.2	-17.8	-17.7	-17.7	-17.7	-1.3	-2.0	-3.5	-0.9	0.4
35B Petroleum Products	7.6	12.9	14.9	14.9	44.0	-13.2	-13.2	-13.2	-13.2	2.6	-0.9	2.5	0.0	5.9
355 Rubber Products	8.8	32.1	44.5	38.5	44.5	-31.8	-31.8	-31.8	-31.8	-13.4	-13.5	-18.3	-0.9	-7.6
36A Nonmetal Min. Prod.	1.2	58.0	78.6	73.7	81.3	-17.8	-17.8	-17.8	-17.8	-5.7	-6.1	-8.2	-0.6	-2.9
362 Glass Products	5.9	24.3	45.0	22.0	50.9	-17.6	-17.6	-17.6	-17.6	0.7	-0.8	-2.0	-0.6	2.0
371 Iron, Steel	6.7	7.6	36.1	25.4	22.2	-25.6	-25.5	-25.5	-25.5	-4.3	-7.0	-8.3	-0.3	-2.3
372 Nonferrous Metals	13.1	5.9	12.7	17.5	17.4	-29.7	-29.7	-29.7	-29.7	4.5	-0.2	3.5	0.0	5.9
381 Metal Products	15.6	31.5	46.7	45.6	45.9	-30.1	-30.1	-30.1	-30.1	-4.3	-3.2	-9.5	-0.6	-6.2
382 Nonelec. Machinery	14.5	7.0	14.4	17.4	11.8	-25.7	-25.7	-25.7	-25.7	-1.2	-3.1	-5.5	-1.1	-4.2
383 Electrical Machinery	37.9	21.2	31.2	35.9	21.5	-30.2	-30.2	-30.2	-30.2	4.9	-1.5	-1.2	-0.5	1.3
384 Transport Equipment	16.6	14.9	17.9	22.0	19.5	-34.1	-34.1	-34.1	-34.1	-6.5	-7.4	-9.1	-0.5	-19.8
38A Misc. Mfrs.	50.9	6.1	12.2	15.7	14.7	-39.9	-39.9	-39.9	-39.9	25.9	15.6	19.7	1.0	5.7
2 Mining, Quarrying	56.3	-15.2	1.6	10.8	54.9	-32.9	-32.9	-32.9	-32.9	39.4	38.8	40.1	0.7	4.9
4 Utilities	20.0	-14.3	-14.4	-14.5	-14.5	-14.4	-14.4	-14.4	-14.4	2.8	0.3	3.4	0.4	4.9
5 Construction	22.7	-21.6	-21.5	-21.6	-21.6	-21.5	-21.5	-21.5	-21.5	0.8	-2.8	-4.0	-2.5	0.0
6 Wholesale Trade	4.8	-7.1	-7.1	-7.2	-7.1	-7.1	-7.1	-7.1	-7.1	2.6	1.6	12.5	33.5	7.9
7 Transportation	27.9	-17.3	-17.5	-17.6	-17.5	-17.5	-17.5	-17.5	-17.5	14.4	12.8	16.0	8.4	5.7
8 Financial Services	8.8	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	2.9	1.6	7.3	1.2	7.6
9 Personal Services	18.6	-17.2	-17.2	-17.2	-17.2	-17.2	-17.2	-17.2	-17.2	-1.5	-2.6	-3.2	-22.8	0.7
Total	21.4	12.1	20.6	23.0	27.6	-25.5	-23.6	-29.3	-20.7	2.6	-0.6	0.0	0.0	3.4