

# Quantifying the Impact of Services Liberalization in a Developing Country

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## **ABSTRACT**

We compare goods versus services liberalization in terms of welfare, outputs, and factor prices in Tunisia using a CGE model with multiple products, services and trading partners. Restraints on services trade involve both cross-border supply (tariff-equivalent price wedges) and on foreign ownership (monopoly-rent distortions and inefficiency costs). Goods-trade liberalization yields a modest gain in aggregate welfare. Reducing services barriers generates relatively large welfare gains and low adjustment costs. Services liberalization increases economic activity in all sectors and raise the real returns to both capital and labor. The results point to the potential importance of deregulating services provision for economic development.

## 1. Introduction

Many developing countries sharply lowered manufacturing tariffs and other impediments to goods trade in the 1990s, both through unilateral trade liberalization and agreements reached in the World Trade Organization (WTO) and regional trade accords. Nevertheless, as Rodrik (2001) has pointed out, traditional trade liberalization seems not to have fully delivered on its promise for prosperity. In this paper we suggest that part of the explanation rests in the continued insulation, and resulting poor condition, of the domestic services sectors in many developing countries. These service sectors tend to deliver high-cost and unproductive input services, thereby limiting economic efficiency gains from trade reform. We explore this claim in a computational general equilibrium model of the Tunisian economy.

The mechanisms by which services trade liberalization might improve welfare differ from those of goods trade. Producers respond to a lowering of border barriers in products by reorienting production towards goods in which an economy possesses a comparative advantage. Tariff cuts thus involve a restructuring of the economy. Liberalization of merchandise trade also tends to redistribute income, with abundant factors benefiting disproportionately in the long run.

In contrast, trade in services is not solely a cross-border phenomenon. As the paper by Markusen, Rutherford and Tarr (2005) points out, many foreign services are best transferred through foreign direct investment (FDI) due to the personal contact required between the service provider and client. Restrictions on FDI or the movement of professional personnel may reduce services trade far more than tariffs or other border barriers limit trade in goods. Indeed, in many developing countries, Tunisia included, laws and regulatory agencies erect entry barriers that essentially rule out FDI in key service sectors.

Foreign direct investment involves inflows of capital and personnel, but more importantly for developing countries it also tends to embody transfers of technology that can upgrade productivity in the domestic economy. Because financial, communications, and professional

services are key intermediate inputs into production in all sectors, cost reductions in these sectors could have the effect of upgrading overall productivity (Lipsey, 2001; Markusen, 1989). Thus, whereas liberalizing goods trade moves an economy toward specialization, liberalizing services trade through permitting foreign establishments could lead to more balanced output expansion.<sup>1</sup>

In Tunisia there is a large state presence in many key service sectors. Regulatory agencies limit competition by restricting markets available to producers. Foreign participation is highly restricted and often limited to the services of non-resident Tunisian suppliers. As we discuss below, anecdotal evidence indicates that Tunisia's communication, financial, insurance, distribution, and professional services are expensive, of poor quality, and often inaccessible. Thus, the economy might particularly gain from more openness in the service sector.

In some respects, Tunisia has pursued a strategy of liberalization and alignment with the global economy (World Bank, 2004). For example, Tunisia concluded an Association Agreement with the European Union in 1995. Under this Agreement, border restrictions on industrial-goods imports from the EU were to be phased out over 12 years and the participants agreed to work toward greater financial and technical cooperation. However, the trade opening was confined largely to merchandise, excluding services.

Indeed, Tunisia's 1995 commitments under the General Agreement on Trade in Services (GATS) were few and generally represented a preservation of status quo policies.<sup>2</sup> Reluctance to open services markets to foreign suppliers, which would also involve privatization and deregulation, reflects concerns of policymakers about whether the economic benefits would justify the adjustment costs involved. Moreover, Tunisian services are supplied by important domestic interests and this fact makes liberalization difficult to undertake without some indication

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<sup>1</sup> Similar comments pertain to trade in intermediate and capital goods. One interesting difference, which we find in our simulations, is that liberalization of goods trade may have sharply stronger impacts on relative factor prices than liberalization of services, because the former generates stronger production reallocation effects favoring the abundant factor.

<sup>2</sup> Of the twelve service sectors defined under the GATS classification scheme Tunisia made commitments in only three: financial services, tourism, and telecommunications. These commitments reflected little

of the potential for gains and their likely distribution. Hoekman and Djankov (1996) in particular note the potentially large gains in well-being for Tunisian citizens of liberalization in services.

Unfortunately, as discussed in Section 2, empirical studies of the effects through FDI of services liberalization are scarce, in part due to a variety of measurement problems. It is against this backdrop that we conduct the present study. We develop a computable general equilibrium (CGE) model to compare the impacts of services liberalization to that of trade liberalization. A significant innovation is to implement GATS definitions and consider, separately, liberalization of both cross-border services trade and the establishment of domestic presence by FDI. For this purpose we develop estimates of the distortions that the present, relatively closed, environment in Tunisia imposes on the price of services. By simulating the removal of these distortions, we are able to quantify the impacts of liberalization. The potential efficiency gains would be large, on the order of four to five percent of initial consumption, while output in all merchandise sectors would rise. Furthermore, the real prices of both capital and labor would increase.

## **2. Conceptual Issues**

Trade in services is distinguished from trade in goods by the intangible nature of many transactions. Unlike physical goods, which must cross borders and thus are subject to customs procedures and tariffs, services often involve direct transactions between the consumer and producer. This fact complicates measurement of both service flows and their corresponding impediments. The founders of GATS recognized the importance of the various channels by which services are transacted. GATS identifies four modes of supply: cross-border supply (mode 1), consumption abroad (mode 2), commercial presence (mode 3), and the presence of natural persons (mode 4). Thus GATS extends traditional trade law to include both foreign direct investment (mode 3) and movements of labor (mode 4).

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more than a codification of Tunisia's existing legal system and have not been expanded.

Unfortunately, these legal definitions do not accord well with present international balance of payments accounting practices, as discussed in detail by Karsenty (2000), making difficult the measurement of services trade and its components. Equally problematic is the measurement of impediments to services trade.<sup>3</sup> For example, Hoekman (1995) developed a frequency indicator as an initial attempt to quantify the presence of barriers based on the GATS schedule of commitments by country. While this index provides some indication of the extent of commitments, it is not designed to measure the level of service barriers. Francois (1999) estimated a gravity model of services trade, adopting Singapore and Hong Kong as free-trade benchmarks. Discrepancies in predicted trade patterns were used to indicate the severity of policy barriers. Warren and Findlay (2000) described an ongoing Australian services research project attempting to measure the wedge between price and marginal cost in service sectors in order to get an indication of the impact that impediments might have on prices. The project also seeks to develop quantity impact measures by comparing domestic output to international standards. Unfortunately, the study is incomplete and may not provide information that could be applied to developing economies.

Given severe data limitations, econometric studies on services trade and their barriers are rare. In contrast, a CGE model can provide quantifiable insights with relatively sparse datasets.<sup>4</sup> An early model by Brown, et al (1996) converted Hoekman's frequency indices into an approximation of cross-border barriers to services trade and simulated liberalization in the multi-country Michigan model. Several studies of services barriers exist using the multi-country database established in the Global Trade Analysis Project (GTAP).<sup>5</sup> Hertel (2000) approximated cross-border barriers with the gravity-equation estimates of Francois and treated liberalization as an elimination of resource-using barriers. Robinson, Wang, and Martin (2002) focused on

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<sup>3</sup> Warren and Findlay (2000) and Hoekman (2000) provide excellent surveys of these measurement issues. See also Brown and Stern (2001) and Stern (2002) for discussion of measurement and modeling in services.

<sup>4</sup> Whalley (2003) and Dee, et al (2000) survey the computational literature in services.

<sup>5</sup> GTAP is explained in Hertel (1997).

enhancements in total factor productivity arising from imported producer services in a ten-region, eleven-sector CGE model.

A significant limitation of these models is that they do not capture the potential benefit of FDI liberalization in services. Recently, however, FDI has been incorporated into multi-country CGE models. Two examples are Dee and Hanslow (2001) and Brown and Stern (2001). Their approaches to measuring services were somewhat different, with the latter authors using price-cost margins for a number of countries. Both studies assumed imperfect competition in manufactures and services. Typically, FDI was treated as a capital flow and barriers to the right of establishment were modeled as a tax on both the existing investment flow and local sales. Liberalization (removal of the tax) resulted in a global reallocation of capital as sector-level rates of return adjust to a new equilibrium. This approach represents a significant improvement over earlier work, which focused only on cross-border services trade (mode 1). These models are informative about the potential global impacts of the GATS approach.

A contribution of particular note is Brown, Deardorff, and Stern (1997), who analyzed the potential impacts of the Tunisia-EU Association Agreement in a model with monopolistic competition in non-agricultural sectors. They permitted an exogenous increase in FDI equal to 10 percent of the initial Tunisian capital stock in response to the Agreement, with the incoming capital allocated according to sectoral returns with industry-specific capital. They do not contemplate liberalization of services, however. Their findings suggest that the EU Agreement would have a modest impact on Tunisian GDP, ranging from -0.1 percent to +3.3 percent depending on the scenario.

Unfortunately, the models available to date fall short of capturing domestic effects of services liberalization in such highly regulated developing economies as Tunisia for two reasons. First, service sectors that experienced no FDI in the benchmark economy were assumed to be non-tradable and could not, therefore, be recipients of FDI in counterfactual scenarios. Yet in Tunisia, we might reasonably expect that FDI would occur in several important sectors (such as

telecommunications or insurance) in which, under current policy, foreign suppliers are simply not permitted to serve Tunisian residents. Prior methodologies do not offer a reasonable way to predict how responsive FDI flows would be in such sectors in a liberalized environment. Second, the market structure in most service sectors in Tunisia is highly regulated and imperfectly competitive, perhaps best characterized as cartels. As Francois and Wooten (2001) discussed, shallow liberalization without deregulation could essentially be an invitation to foreign firms to join the cartel. Deeper liberalization, involving also deregulation permitting new entry, should bring about a more competitive market structure.

An additional point of departure for our work is to consider the impact of services liberalization on the structure of Tunisia's economy relative to that of commodities trade liberalization. The Tunisian input-output table allows us to disaggregate services into 15 sectors. We consider the regulatory environment at a disaggregated level and are able to compare the relative impact of liberalization in individual service sectors. With data on services as intermediate inputs, our simulations indicate how service liberalization may restructure the domestic economy.

As discussed in the following section, our model is designed to capture several static effects of services and goods trade liberalization, including efficiencies from production reallocation, pro-competitive gains from reducing cartel power, and efficiencies from adopting best-practice technologies. Analysis of pro-competitive impacts in the CGE context stems from the pioneering work of Harris (1984). However, we do not compute gains from increasing returns to scale, as emphasized by Harris (1984), Brown, Deardorff, and Stern (1997), and others. Nor do we consider the potential for product variety gains from liberalizing services trade, an element introduced by Romer (1994) and introduced into dynamic CGE models by Rutherford and Tarr (2002).

### 3. Tunisia: Services and Impediments

Services play a significant role in the Tunisian economy, as is evident from Table 1. Nearly half of all output (excluding tourism) was comprised of services in 1995, according to the input-output table for that year (Institute National de la Statistique, 1998). Services made up one-third of household consumption and eighteen percent of intermediate demand. Tourism was the largest of the tradable services, representing over fifteen percent of imports and more than 19 percent of all exports. Tourism export services are considered to be rather open.<sup>6</sup>

There is no statistical information on the importance of FDI in Tunisian services trade, as the earnings and sales of foreign-owned subsidiaries are not reported separately from those of domestic firms. However, foreign participation clearly is minimal in the main service activities due to a variety of investment measures, exchange controls and limits on movement of foreign personnel. The most important restriction is the Foreign Commercial Activities Law of 1961 (Decree Law Number 61-14), by which non-Tunisians are required to obtain a trader's permit, *carte de commercant*, to engage in any form of commercial activity. This permit, granted on a discretionary basis, has effectively precluded foreign participation in most wholesale and retail markets. The Investment Code of 1993 is also an important barrier to majority foreign equity projects, with foreign entry requiring approval by regulatory councils. Such approvals are rare and FDI is strictly controlled.<sup>7</sup>

Domestically, the level of competition varies across services sectors. Certain sectors, including computer services, real estate, construction, restaurants, and some distribution activities, are characterized by many participants, even though licensing requirements and other regulations impose burdensome costs on domestic entry and production. In several important

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<sup>6</sup> Tourism may be exported without being produced because tourists are treated as "foreign consumers" in the input-output table and enter as a component of final demand. The production of tourism services exists in the other service sectors, such as transportation, hotels, and restaurants.

<sup>7</sup> Despite some movements toward liberalization of FDI in 2001, foreign equity participation in Tunisian services other than hotels remains "negligible" according to the World Bank (2004). The essential reasons include reservations from FDI of 225 activities, prior approval requirements in other activities, and cumbersome entry requirements. It is evident that the market was not more open to FDI in 1995, our

sectors, such as automobiles and electronics, exclusive-distributor laws require that foreign suppliers appoint only Tunisian citizens as local agents and also ban parallel imports (Maskus and Lahouel 2000). This situation grants effective monopoly power to local agents and substantially raises consumer prices.

In other areas, such as financial and banking services, insurance, and many professional services, entry is tightly controlled by regulatory boards that limit the ability of providers to offer a full range of services and also limit market access. That such restrictions increase costs and limit market size is particularly evident in the insurance industry. Tunisia's 1997 expenditures on insurance premiums were only 1.58 percent of GDP, a penetration rate far behind those of nearly all middle-income countries and even behind that of several African nations, with an average rate of 5.7 percent (Swiss Re 1999). The insurance market is highly concentrated and dominated by state-owned enterprises, which accounted for roughly half of total insurance premiums (Vittas 1995). Foreign involvement remains strictly limited. According to the Insurance Code (Article 44) Tunisian residents, and risks situated solely in Tunisia, may only be insured directly by policies from Tunisian-owned companies. Foreign subsidiaries are permitted as a public limited or mutual company and may only serve non-residents.

As Bahlous and Nabli (2000) discussed, the government is also heavily involved in the banking system. Five of the twelve commercial banks in the mid-1990s were public.<sup>8</sup> They initiated 68 percent of loans and tended to favor state-owned enterprises, which are heavily indebted. Many small and medium-sized enterprises reported difficulties in gaining access to credit (World Bank 2000, 2004). The ratio of non-performing loans to total assets was 36 percent and 72 percent in 1993 for the two largest public banks. Goaid (1999) estimated the cost frontier of Tunisian deposit commercial banks with panel data for 1980 to 1995 and found that the mean cost-inefficiency of private banks was 28.5 percent and of public banks was 50.5 percent.

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benchmark year.

<sup>8</sup> This situation is still evident in that in the year 2000 there were only 14 commercial banks and these held

By standard measures the Tunisian banking system also seems to engage in less monetary intermediation than would be anticipated for a country of its development level. In general, the ratio of domestic credit to GDP rises as countries become richer. The ratio in Tunisia in 1995 was 0.57, which was markedly lower than those in Egypt (0.77) and Jordan (0.88), Arab League countries with even lower income levels.<sup>9</sup> Thus, as a rough indication, monetary intermediation through the Tunisian banking sector is perhaps thirty percent less than might be expected.

Finally, several service sectors have traditionally been provided by the government and are only now being slowly liberalized to allow limited private participation. These industries include telecommunications, postal services, air transport, health, and education. For example, Tunisie Telecom remains the sole provider of nearly all telecommunications services and regulation is the domain of the Ministry of Telecommunications. As shown in Table 1, communications services comprise only one percent of production in the economy, whereas they make up four percent of GDP in Morocco (Varoudakis and Rossotto, 2001). Tunisian prices are likewise four times those of Morocco (World Bank 2001). Recent investments in infrastructure have reduced the waiting time for fixed-line installation and the rate of service disruption. The telephone network is fully digitized. Yet Tunisian teledensity falls short of that of other middle-income countries, particularly in rural areas. Internet service accounts are expanding rapidly in response to the granting of two licenses to provide residential and commercial internet services but monthly access rates are double those in Morocco and much higher than those observed in most liberalized markets.<sup>10</sup>

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2/3 of the economy's financial assets (World Bank 2004). The government controls the three largest banks.

<sup>9</sup> The source for these data is International Monetary Fund, *International Financial Statistics Yearbook 1997*.

<sup>10</sup> Modernization of this sector seems to have improved technical efficiency considerably by 2003 (World Bank 2004), though entry remains tightly controlled.

#### 4. The Model and Benchmark Data

In this section we present the model structure and describe the database used, the details of which are in a technical appendix. We employ what is, in most respects, a standard CGE model of a small open economy. Our contribution is in the explicit treatment of services production and investment. In the benchmark, production decisions in the services sector are distorted by regulations that raise entry costs and limit the rights of foreign enterprises to establish facilities in Tunisia. Counterfactual experiments involve the removal of regulatory investment barriers. As new firms are now permitted to enter, the market structure becomes competitive (eliminating rents) and more efficient (introducing lower cost firms).

Benchmark regulation distorts prices and quantities through two primary channels. One is the *cartel effect* whereby barriers to FDI and excessive regulation limit both domestic and foreign participants in certain service sectors, thus hampering competition and supporting market power on behalf of local firms. This market power creates the opportunity in sector  $i$  to charge price markups  $v_i$  over marginal cost  $c_i$ .

$$(1) \quad c_i (1 + v_i) = p_i$$

The markup depends on the number of firms, price elasticity of demand, and conjectures about reactions of rival firms. We assume that the rents generated by markups accrue to the representative agent.

Second is a *cost inefficiency effect*. Marginal costs in a regulated environment may be excessively high as low-cost foreign suppliers are excluded from the market. Additionally, domestic suppliers may be forced to absorb into their costs various regulations on provision and bureaucratic procedures. These activities do not contribute to output and generate pure economic waste (Hoekman and Konan 2000). Thus, resource-using service barriers  $\lambda_i$  raise marginal costs above ‘best practice’ marginal costs  $c_i^*$  that would prevail in a liberalized environment.

$$(2) \quad c_i^* (1 + \lambda_i) = c_i$$

Combining equations (1) and (2) shows that the wedge between price and true marginal costs depends on the product of an ad valorem markup and a proportionate waste factor.

Ultimately it would be preferable and interesting to locate empirical information on these two wedges in each sector in order to simulate the effects of their separate and joint removal. Unfortunately, we only have estimates of the entire price-cost wedge and cannot perform this decomposition except on assumed shares. Thus, our counterfactual scenarios make two assumptions. First, we assume that barriers to FDI generate wedges consisting of half rents and half waste. Second, based on the discussion in the prior section we distinguish three types of service sectors: (i) competitive with inefficient technologies, or "low rent, high cost" (construction, distribution, hotels, restaurants, real estate, and repair); (ii) monopolized with efficient technologies, or "high rent, low cost" (communication); and (iii) monopolized with inefficient technologies, or "high rent, high cost" (transport, finance, insurance, and business services).

Services liberalization involves confronting a domestic cartel with the possibility of competitive markets with foreign entry. It is important to note that liberalization does not, in our model, generate endogenous changes in FDI flows. Rather, the scenarios involve changes in ownership and market structure in ways that improve efficiency and alter the distribution of rents. This assumption reflects the fact that in several service sectors there is no foreign participation (that is, FDI) in the benchmark equilibrium. In that context it is impossible to determine what the impact of liberalization would be on "marginal" FDI flows, which would not be meaningful. It also permits us to retain a fixed aggregate capital stock in the model, rather than engaging in dynamic simulations of endogenous investment and capital allocation. In this context, the estimates of welfare changes from liberalization of establishment rules are likely to be understated relative to full long-run gains.

Model equations are presented in the Appendix and the model is depicted in Figure 1. We assume that production of agricultural, mineral, and manufacturing goods is characterized by

constant returns to scale and perfect competition, implying that prices equal marginal costs of output.<sup>11</sup> Services production is subject to constant returns as well, though in the initial benchmark it is monopolized as discussed above. It should be stressed that a number of services, such as telecommunications, transport, and finance, likely are subject to increasing returns and, to the extent that trade liberalization expands output in those sectors, additional gains would accrue to the economy that we do not capture here. Note also that we engage solely in static simulations, without permitting endogenous increases in product differentiation and variety. For these reasons, in addition to our conservative estimates of price-cost wedges, computed welfare gains are liable to be underestimated.

In all sectors, production functions are approximated with Leontief technologies using composite intermediate inputs and real value added. A constant elasticity of substitution (CES) production function describes the substitutability between labor and capital inputs in producing real value added. Intermediate inputs and final goods are differentiated by country of origin according to the Armington assumption, so that export and import prices differ across regions.<sup>12</sup> The three trading regions are the European Union (EU), the Arab League countries,<sup>13</sup> and the rest of the world (ROW).

In each sector, demand for domestically produced and imported goods is represented by a CES function, and intermediate imports are also differentiated across regional sources of supply in a CES structure. Similarly, Tunisian industries supply regionally differentiated goods to both domestic and foreign markets (exports). Production follows a nested two-stage constant elasticity of transformation (CET) function. Total output is first calculated as the sum of domestic supply

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<sup>11</sup> See, for example, Konan and Maskus (2000).

<sup>12</sup> In some contexts the Armington assumption can be problematic for it may generate large terms-of-trade effects that dominate welfare calculations. However, De Melo and Robinson (1989) showed that models allowing product differentiation are well behaved under a small open economy assumption; in effect the economy is a price taker at the level of aggregate trade flows and each region's aggregation is sufficiently distinctive to support the Armington assumption. In any event, we consider here only Tunisian import (FDI) liberalization, which would be expected to worsen the country's terms of trade. The fact that we find large welfare increases suggests that the issue is not important.

and total exports, with the latter then being allocated across the same destination regions according to a sub-CET function. Capital and labor are assumed to be freely mobile across sectors, whereas the stock of factor endowments are exogenous, implying that our simulations pertain to long-run outcomes of liberalization.

A representative consumer maximizes a nested CES utility function with a corresponding multi-staged budget constraint. In the first stage, the consumer decides how much to spend on goods from each sector, given the budget constraint. Income elasticities across sectors are set at unity as given by a Cobb-Douglas (CD) utility nest. In the second nest, the consumer determines domestic and aggregate import expenditures in each sector according to a CES function. Then given a budget for imports, the consumer selects purchases of imports from each region. These latter functions also characterize the split between government consumption and investment spending on domestic and imported goods and services. The representative consumer receives income from primary factors (labor and capital), net transfers from the government, the current-account deficit, and any net economic rents from the operation of restrictions on services trade.

Two standard closure rules are imposed: the savings-investment balance and a fixed current-account balance. The savings-investment balance is based on the assumption that the capital stock is exogenously fixed at the benchmark level. This stock is financed through forced consumer savings that act as a direct (lump-sum) tax. The interest rate (an index price of the composite capital stock) is endogenous and determined by factor-demand conditions. The current-account balance is the sum of the merchandise trade balance, the services balance, net foreign worker remittances, and (negative) net payments on foreign capital.<sup>14</sup> We assume that foreign reserves will be held constant so that the current account will be just offset by (the negative of) the capital account. The current-account balance itself is held constant in real terms

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<sup>13</sup> These countries are designated MENA, for Middle-East North-African nations.

<sup>14</sup> In the 1995 benchmark year, foreign remittances were approximately 650 million Dinars while net capital income totaled negative 680 million Dinars according to the IMF *Balance of Payments Statistics*

throughout the simulations. Income from foreign remittances less foreign capital payments enters as an exogenous addition to the representative agent's income. To hold the current-account balance fixed while international prices are constant requires a balancing item. This is accomplished by means of a change in the home "real exchange rate," which refers implicitly to a change in the home price index (generated by changes in price of home-produced goods) sufficient to sustain a constant current-account balance as import and export volumes change.<sup>15</sup>

The government budget deficit is a deduction in available income for the representative agent, constituting a transfer to government consumption. The deficit is held fixed during our simulations. Thus, if a policy reform causes prices to fall, thereby reducing the tax revenues required to finance government expenditures, this tax saving is transferred to the representative agent. At the same time, if trade liberalization results in lost tariff revenues, the revenues are recouped by means of allowing household lump-sum taxes to vary endogenously.

The data for the model consist of a Social Accounting Matrix (SAM) and other parameters, such as import and export trade flows by region, sectoral tax and tariff rates, and elasticities of substitution and transformation. Because there is little empirical evidence on relevant elasticities for the Tunisian market, we make standard assumptions about their values. In particular, labor-capital substitution is set at unity in a Cobb-Douglas value-added production function. Benchmark trade elasticities are drawn from Rutherford, Rutstrom and Tarr (1995) and Konan and Maskus (2000). The various trade elasticities are 2.0 for substitution between domestic and imported goods, 5.0 for substitution among regional imports and for transformation between domestic output and exports, and 8.0 for transformation among regional export destinations. These data are assembled into a consistent set of relationships between intermediate demand, final demand, and value-added transactions using the 1995 input-output table for Tunisia on a diskette

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*Yearbook.*

<sup>15</sup> Tunisia has maintained a managed floating exchange rate system. The system has become more flexible, and the real exchange rate has depreciated somewhat leading up to implementation of the EU free trade agreement, World Bank (2004).

provided by the Institut National De La Statistique (INS) along with the 1998 INS *Les Comptes de la Nation* report.

Trade and tariff data, provided in Table 2, were aggregated to the input-output sectoral basis using import weights consistent with the concordance between the input-output table and the tariff classification. Tariff rates were determined by collections data for 1995 and vary across regions due to duty drawback provisions as well as preferential treatment of the EU and the Arab League. There are no data on tariff collections on services, reflecting the absence of formal trade taxes, and we take their tariff rates to be zero. This treatment is the same as that in Chatti (2000), while Brown, Deardorff and Stern (1997) assume there are no barriers to trade in Tunisian services.

Table 3 lists our estimated price wedges due to service barriers, which are the key parameters to be altered in the simulations. Mode 1 restrictions on cross-border trade are treated as ad valorem tariff-equivalent non-tariff barriers. These are simply set to zero in the liberalization exercises. Sectors listed as non-traded (indicated by *nt*) remain non-traded post-liberalization. In terms of mode 3, we would ideally like to estimate the impact that services barriers have on both price markups and on resource costs to distinguish between the pro-competitive effects and the cost-reduction effects. Warren and Findlay (2000) suggested computing the pro-competitive impacts using price-cost margins (or “net interest margins”). We would also like to capture the cost-reduction effects by comparing actual costs to a constructed estimate of costs if services were provided according to a ‘world’s best-practice’ cost function. Unfortunately, none of these measurements are attainable for Tunisia, as is the case for most countries.

The services barriers given in Table 3 are based on industry studies in Tunisia, extensive discussions with Tunisian industry experts, country economists and government officials, and Zarrouk (2000). The financial services barriers estimates are taken from our observation that the level of monetary intermediation in the banking system is about 30 percent lower than in

comparable countries (Bahlous and Nabli 2000) and on Goaid's (1999) estimation of the cost inefficiencies in the financial sector. This is in line with the estimates of Kalirajan, et al (2000) for the banking sectors in Chile, Singapore, South Korea, and Thailand. The price wedges in insurance, communications, and transportation reflect the high level of benchmark regulation in those sectors and comparisons with markets in similar countries (Vittas 1995, World Bank 2000). The distribution and retail sectors show large inefficiencies and are very fragmented, making our five-percent inefficiency measure conservative. Many professional services are subject to a nationality requirement, thus restricting foreign participation, and it is likely that our ten-percent estimated price wedge is low. While the construction, hotel, and restaurant sectors are viewed here as already substantially liberalized and subject to a small price-cost wedge, foreign participation remains subject to the investment code and projects are granted upon approval of a *Cahier des Charges*. Remaining sectors (health and education, public services, and other services) are taken to be exempt from potential liberalization.

It is important to note that these price wedges, while not constituting formal tariffs, do serve to restrict cross-border trade (mode 1) in services. Further, they increase costs of producing and trading other goods through the input-output structure. Thus, for example, the high costs in telecommunications make it relatively difficult for Tunisian exporters to sell textiles and carpets abroad through internet services and telephone contacts. In this regard, our approach captures the cost impacts that would arise from modeling service tariffs.

## **5. Results**

The liberalization scenarios considered can be broken down in several ways. First, liberalization of investment barriers in services is considered. Sensitivity analysis demonstrates the importance of the decomposition of the price wedge into resource-using versus rent-generating barriers. The second step is to distinguish between liberalization of border barriers and investment barriers, broadly. Next, the impacts of liberalization are broken down on a

sectoral basis. The final set of scenarios compares the impact of services liberalization to that of traditional liberalization of trade in goods.

Note that we do not consider any reciprocal liberalization in exporting regions. It is possible that Tunisia will experience efficiency gains from the EU Association Agreement, its membership in the WTO, and any FDI preferences that may exist in the Arab League. In particular, we could expect large benefits from a decision by the European Union to permit greater temporary movement of service providers (mode 4), given that in 1995 approximately 480,000 Tunisian migrant workers lived there and contributed remittances constituting 34 percent of Tunisian GDP (Jbili and Enders, 1996). However, our focus is to isolate the potential gains from unilateral services liberalization associated with competition and efficiency.

Thus, Table 4 presents potential impacts of lifting barriers to foreign investment in services (mode 3 delivery). As discussed in the previous section, investment barriers are assumed to drive an observable wedge between price and marginal cost. Unobserved is the decomposition of the wedge into two sources of distortion: rent-generating (cartel effect) and resource-using (inefficiency effect). Four benchmark possibilities are considered in Table 4. First (column one), assume that barriers to foreign investment solely preserve a domestic cartel and generate pure economic rents for Tunisian interests. That is, Tunisian service producers use world-class technologies and face costs equivalent to those of the low-cost world producer. Upon liberalization, foreign entry is assumed to eliminate the price-wedge as markets become competitive. Domestic rents are completely dissipated to the benefit of Tunisian services consumers. The result is a modest gain in welfare of the representative household of one-third of one percent, measured as equivalent variation in the representative agent's real income.

At the other extreme (column four), assume services markets are perfectly competitive in the benchmark, but that Tunisian firms do not employ world-class production techniques and are thus inefficient. Entry by foreign firms introduces cost-saving innovations and services prices fall. Welfare increases dramatically, by nearly eight percent. This large difference from the

initial benchmark case reflects the fact that elimination of a pure rent wedge generates a small net gain in efficiency from resource reallocation, but most of the gross gains are transfers from the prior rent stream earned by the representative agent.<sup>16</sup> In both cases consumer prices fall about seven percent. Note that while both scenarios increase returns to both labor and capital (non-labor value added), labor gains relatively more in the pure rent-wedge case. This suggests that one effect of the protected cartel is to restrain wages in relation to what they would be under full efficiency. Capital gains are relatively larger when the pure cost wedge is removed.

Two additional scenarios involve combinations of rent generating distortions and benchmark inefficiencies within services sectors. In the “baseline scenario,” it is assumed that the price-wedge is an equal combination of the rent-generating and resource-using distortions (column 2 of Table 4). Welfare impacts mix efficiency gains with rent losses for the representative agent. The result is a four-percent increase in welfare and a seven-percent fall in the consumer price index. Gains from liberalization are skewed toward capital, the price of which increases seven percent. Five percent of the capital stock changes sector of employment. Real returns to labor increase by three percent and three percent of the labor force changes sector of employment.

The ‘mixed’ scenario, considers an environment where the composition of the price – cost wedge varies across sectors (column 3 of Table 4). The margin attributed to rents is assumed to be 33 percent in relatively competitive sectors, including construction, distribution, hotels, restaurants, real estate, and repair services. The remaining 67 percent is consumed in cost inefficiencies. Rents account for 67 percent of the wedge in communications. The margin in remaining sectors, transportation, finance, insurance and business, is assumed to be evenly distributed between rents and inefficiency costs. Foreign ownership liberalization improves welfare by 4.3 percent increase in equivalent variation and lowers the CPI by 7.11 percent. Real

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<sup>16</sup> As discussed in Anderson and van Wincoop (2001), liberalization of trade costs that generate rents for home agents have smaller welfare impacts than liberalization of “real” trade costs that absorb resources.

returns to labor and capital improve by 3.24 percent and 6.99 percent, respectively. Interestingly, the macroeconomic outcome closely resembles that of the ‘baseline scenario,’ which provides support for taking baseline conditions as a reasonable approximation for further analysis.

The bottom part of Table 4 indicates impacts on major sectoral production shares. The figures in parentheses in the left-most part indicate benchmark output shares before any liberalization. Liberalization itself tends to favor relative output expansion in agriculture and services, while restraining the manufacturing and mining shares. Thus, the initial structure of protection for services actually restrains domestic output in that sector. The remaining columns compare these shares across FDI-liberalization cases. While these shares are essentially stable across benchmark assumptions, moving from the rent-wedge case to the efficiency-wedge case slightly favors agriculture and manufacturing, while reducing the share of services.

Table 5 provides liberalization scenarios by the two modes of service delivery considered, assuming an equal split of price markups between rents and costs (baseline scenario) in the benchmark. Assume that Tunisia eliminates all border barriers (mode 1 barriers) on tradable services, and does so on a non-discriminatory or most-favored-nation (MFN) basis. This would raise welfare, as measured by equivalent variation in the representative agent’s real income, by about 1.2 percent. While both factors would gain in terms of real returns, the benefits would be larger for capital (a 1.32 percent increase in price), with the real wage increasing by less than one percent. In terms of factor adjustment, 0.8 percent of the labor force and one percent of capital would turn over industry of employment.

The investment liberalization (mode 3) scenario shown in column 2 of Table 5 is the same as that discussed above (column 2 of Table 4). Finally, the aggregate impact of liberalizing both investment barriers and border barriers (modes one and three) is slightly more than additive as shown in column 3, raising welfare by 5.3 percent. Note that roughly 75.5 percent of estimated welfare gains may be attributed to investment liberalization, while 23.0 percent are due to border liberalization. This leaves a small positive residual gain of 1.5 percent reflecting the

fact that both types of barriers together interact to generate a larger income loss than they would separately. It is interesting that this interaction process affects labor and capital differently. The individual liberalization impacts on the real wage sum to less than the joint impact of full liberalization, suggesting that the barriers interact to restrain wages. The opposite is true for the real price of capital. Finally, note in the bottom panel that any policy reform expands the share of services compared to the initial benchmark. However, mode-1 liberalization favors manufacturing and mining over full liberalization in mode 1 and mode 3, which favors agriculture and services. Indeed, full services liberalization would increase the services share of GDP from 40.7 percent to 43.6 percent, a large shift in relative output.

It is possible also to consider the gains from liberalizing individual service sectors, as reported in Table 6.<sup>17</sup> For this purpose we compute the impacts of liberalizing both mode 1 and mode 3 delivery options in six of the 11 tradable service sectors. About 41 percent of the welfare gains of full liberalization may be attributed to reforms in financial and transportation sectors. The impact of liberalization in business services, distribution, and communications are also substantial. Note that these individual trade reforms are not neutral with respect to factor prices. Opening up the construction sector would actually reduce the real wage moderately. Capital income would gain significantly from liberalization of transportation, business services, and finance.

The final set of scenarios compares liberalization of goods and services. Goods-trade liberalization is modeled as a non-discriminatory and unilateral elimination of the commodity tariffs given in Table 2. Results are shown in Table 7. Household welfare is estimated to increase by 1.5 percent, in contrast to the 5.3 percent gain from full services liberalization. As Stolper—Samuelson theory would predict, the gains are largely experienced by the abundant factor, labor, while there is relatively little change in the real returns to other value added. The

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<sup>17</sup> Note that sector-level reforms are assumed to occur in isolation while full liberalization entails the simultaneous liberalization of all modeled service sectors. The aggregate impact does not equal the sum of

real wage increases nearly 19 percent while returns to capital increase 3.5 percent. Goods trade involves a shift of production to sectors in which Tunisia demonstrates a comparative advantage. Thus, factor turnover is relatively high at 10 percent for both workers and capital. There is a significant increase in the manufacturing share of total output from 32.8 percent in the benchmark to 42.8 percent in the free goods-trade environment. Agriculture declines substantially as a relative component of output, as do services.

Liberalizing services barriers and goods tariffs simultaneously yield a potential gain in welfare of 6.7 percent. These gains are less than the sum available under the isolated liberalization packages, indicating that there is a slightly offsetting interaction between the two commitments. Gains from joint liberalization, however, are more evenly distributed across labor and capital than they are in either individual reform. Thus, removal of goods tariffs strongly favors labor while removal of services barriers favors capital. Both factors experience significant real price increases with joint liberalization.

That the blended goods and services liberalization package does not generate gains for the abundant factor (labor) at the expense of the scarce factor (capital), as Stolper-Samuelson trade theory would predict, is remarkable. It is also notable that the structure of output is closer to that with an isolated service liberalization than to one with solely goods tariff elimination, as noted in the bottom panel. The productivity gains associated with lower service costs raise real returns for both factors and make service-intensive sectors relatively more globally competitive. Thus, in an important sense, removing commodity tariffs without services liberalization tends to “over-adjust” the economy toward manufacturing and away from agriculture and services. Freeing up services moves the structure back toward the fully efficient outcome in the final column. Indeed, a pure goods-trade liberalization results in a much greater movement of labor and more dramatic changes in the composition of production.

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the sectoral impacts due to interactions between sectors with joint liberalization.

## 6. CONCLUSIONS

This paper considers how services liberalization differs from that of goods liberalization using an applied general equilibrium model of the Tunisian economy. Not surprisingly, goods-trade liberalization reorients production towards manufacturing (especially in textile and electronics) in line with Tunisia's benchmark comparative advantage. In contrast, the overall composition of production with service liberalization remains fairly stable, with only slight increases in manufacturing and service provision and a small decrease in agriculture and mining. The gains under service liberalization are more evenly distributed across factors than are those under goods liberalization, where gains are strongly concentrated in the hands of workers (the abundant factor). Fewer workers are required to change positions to accommodate service liberalization, implying less impact on frictional unemployment. Thus, we might expect less political resistance to services liberalization relative to goods liberalization.

Interestingly, combining goods and services liberalization appears to offer the best of both worlds. The gains from jointly freeing up goods and services are nearly additive in the two independent reforms. Yet the overall structure of the economy remains similar to that of the benchmark, with relatively small changes in the employment location of workers. Services liberalization therefore eases the adjustment costs involved in the liberalization of goods trade as the expansion of economic activity would no longer be restrained by the lagging competitiveness of Tunisia's service sector.

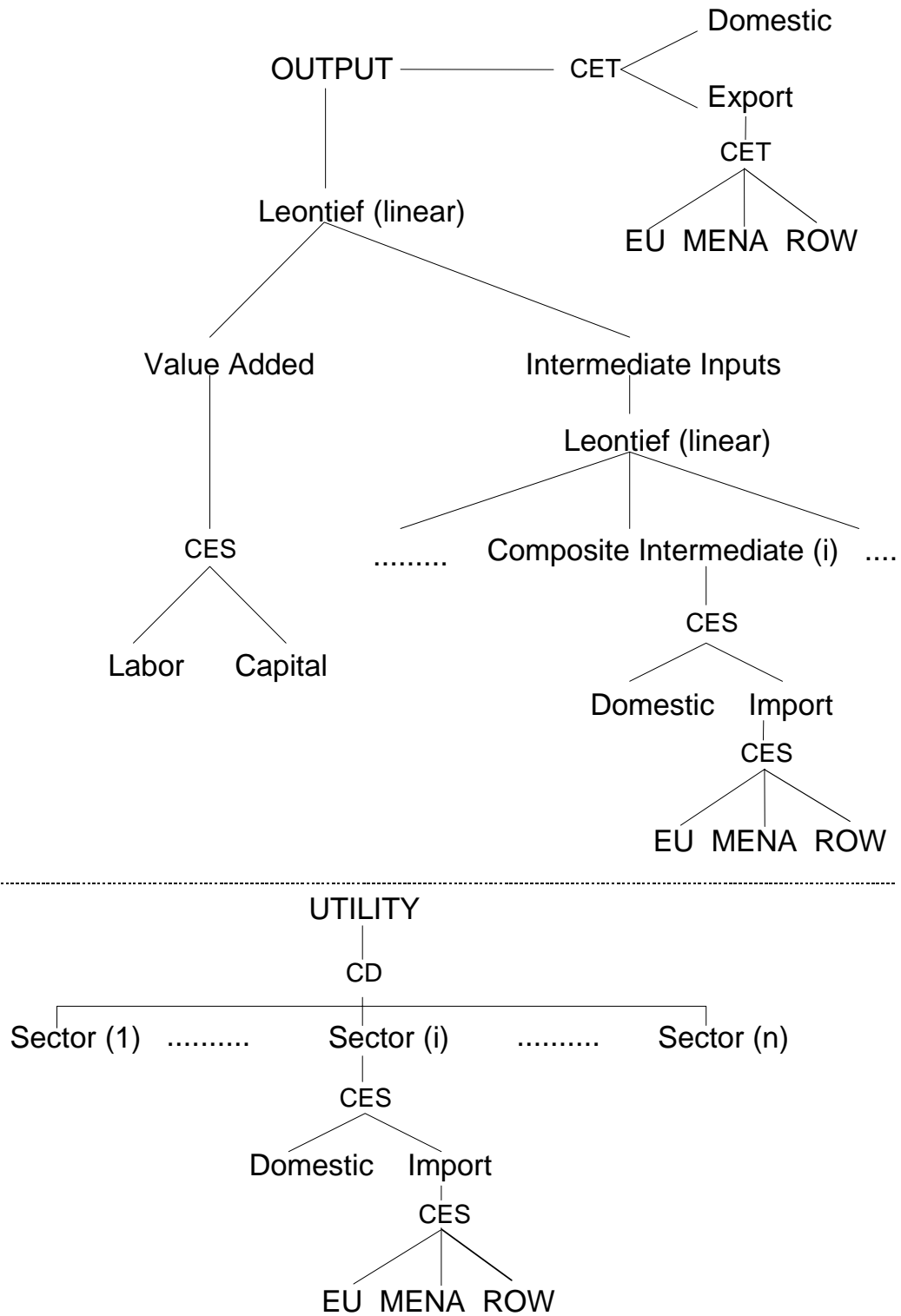
The potential welfare implications of services liberalization are clearly positive and substantial. Even given modest assumptions about the current environment for trade in services, welfare (measured as equivalent variation) and GDP are both estimated to increase more than seven percent. These gains are more than three times the magnitude of the estimated gains from goods-trade liberalization alone. Further, perhaps 75 percent of services liberalization gains may be achieved from the liberalization of foreign investment barriers that impede mode-3 delivery of services. Granting the right of establishment to foreign firms stands to increase real household

income by four percent. In contrast, liberalization of cross-border trade in services (mode 1) results in a roughly one-percent gain in household income.

The finding that Tunisia would gain from unilateral services liberalization, with balanced gains to factors, but has failed to do so clearly suggests that political-economy constraints are important. It is likely that significant rents accrue to incumbent service providers, which are able to block market deregulation. In this context, the government may be faced with the prospect of compensating these incumbents in some fashion to effect true change. One means might be to pursue reciprocal services liberalization in major export markets while supporting efficiency-enhancing investments in Tunisian services. The GATS approach has yet to effect significant opening of important services in the EU or the Arab League countries that would benefit Tunisian exporters. One obvious approach would be to encourage the EU to provide greater opportunities for temporary workers from Tunisia through mode 4 negotiations. While this change would benefit Tunisian laborers it would not directly compensate existing domestic service providers. Thus, some of the income gains to workers might need to be transferred to service incumbents to buy out their resistance to reforms.

We stress that the uncertainties surrounding estimated price wedges and the allocation of those wedges between rent and production inefficiency deserve further exploration. Improved estimates of services barriers are critical for a more accurate determination of the magnitude of the potential impacts of liberalization. Still, recall that conservative assumptions were made here about the existing distortions and the potential competitive effects and efficiency improvements with liberalization. It is likely that a liberalizing reform would bring even greater gains than those reported here.

**Figure 1. Model Structure**



## APPENDIX: MODEL EQUATIONS AND NOTATION

### A. Production

1. Value Added Function  $V_i = [a_{Li}L_i^{(\sigma_i-1)/\sigma_i} + a_{Ki}K_i^{(\sigma_i-1)/\sigma_i}]^{\sigma_i/(\sigma_i-1)}$
2. Imported Intermediates  $M_{iN} = [\sum_r \delta_{ri} m_{riN}^{(\eta_i-1)/\eta_i}]^{\eta_i/(\eta_i-1)}$
3. Composite Intermediate  $Z_{ji} = [\gamma_{di} d_{ji}^{(\eta_j-1)/\eta_j} + \gamma_{mi} m_{ji}^{(\eta_j-1)/\eta_j}]^{\eta_j/(\eta_j-1)}$
4. Final Goods Technology  $Y_i = \min[z_{1i}/a_{1i}, \dots, z_{ni}/a_{ni}, V_i/a_{VA}]$
5. Domestic & Foreign Sales  $Y_i = [\alpha_{Di} D_i^{(\epsilon_i-1)/\epsilon_i} + \alpha_{Xi} X_i^{(\epsilon_i-1)/\epsilon_i}]^{\epsilon_i/(\epsilon_i-1)}$
6. Export Allocation  $X_i = [\sum_r \beta_{ri} X_{ri}^{(\epsilon_i-1)/\epsilon_i}]^{\epsilon_i/(\epsilon_i-1)}$
7. Marginal Cost Condition  $(1+\lambda_i)c_i Y_i = \sum_j (1+v_j)p_j d_{ji} + \sum_r \sum_t (1+u_j+t_{rt})p_{rt}^m m_{rjt} + (w_K K_i + w_L L_i)$

### B. Utility

8. Utility Function  $U = \Pi_i C_i^{b_i} ; \sum_i b_i = 1$
9. Domestic & Import Consumption (applies also to  $G_i$  and  $I_i^F$ )  $C_i = [\phi_{Di} D_i^{(\psi_i-1)/\psi_i} + \phi_{MiC} M_{iC}^{(\psi_i-1)/\psi_i}]^{\psi_i/(\psi_i-1)}$
10. Import Allocation (applies also to  $M_{iG}$  and  $M_{iI}^F$ )  $M_{iC} = [\sum_r \delta_{ri} M_{ric}^{(\eta_i-1)/\eta_i}]^{\eta_i/(\eta_i-1)}$

### C. Constraints and Balancing Items

11. Agent's Budget Constraint  $\sum_i \tilde{p}_i^C C_i = w_K \bar{E}_K + w_L \sum_i L_i + - \sum_i \tilde{p}_i^{IF} I_i^F - \sum_i \tilde{p}_i^I I_i^I - r^F K^F - D + \sum_i v_i Y_i$
12. Government Budget Constraint  $\sum_i \tilde{p}_i^G G_i = D + \sum_i \tau_{vi} \tilde{p}_i^C V_i + \sum_i \sum_r t_{ri} p_{ri}^m (M_{riC} + M_{riI}^F)$
13. Current Account Balance  $0 = \sum_r \sum_i (1/e)(p_{ri}^m M_{ri} - p_{ri}^x X_{ri} - w_L^F L^F + r^F K^F)$
14. Product Market Clearance  $S_i = \sum_j a_{ij} Y_j + G_i + I_i^F + I_i^I + C_i$
15. Factor Market Clearance  $\sum_i K_i = \bar{E}_K ; \sum_i L_i = \bar{E}_{L}$
16. Zero Profits  $p_i D_i + \sum_r p_{ri}^x X_{ri} = c_i Y_i$
17. Supply Value Balance  $\tilde{p}_i S_i = \tilde{p}_i^Z \sum_j a_{ij} (1+v_i) Y_j + \tilde{p}_i^C D_{iC} + \tilde{p}_i^{IF} D_{iI}^F + \tilde{p}_i^G D_{iG} + \tilde{p}_i^{IF} I_i^I + \sum_r (1+u_i+t_{ri}) p_{ri}^m (M_{riC} + M_{riG} + M_{riI}^F)$

### ***D. Price Relationships and Identities***

18. Components of Domestic Sales	$D_i = D_{iC} + D_{iI}^F + I_i^I + D_{iG}$
19. Components of Import Sales	$M_i = M_{iN} + M_{iC} + M_{iI}^F + M_{iG}$
20. Domestic Price of Intermediate Imports (holds also for imports for G)	$p_{ri}^N = (1 + u_i + t_{ri})p_{ri}^m$
21. Domestic Price of Imports for C (holds also for imports for $I^F$ )	$p_{ri}^C = (1 + u_i + t_{ri})p_{ri}^m$
22. Consumer Price of Domestic Goods (holds also for purchases for $I^F$ )	$p_i^C = (1 + v_i)p_i$
23. Capital-Market Equilibrium	$\tau_{K1} + w_{K1} = \dots = \tau_{Kn} + w_{Kn}$ (mobile capital sectors)

### ***LIST OF VARIABLES***

$L_i$	Domestic labor inputs, sector $i$ ( $i=1,\dots,34$ )
$K_i$	Capital (other value added) inputs, both mobile and immobile
$V_i$	Value added
$M_i$	Total imports
$M_{ri}$	Imports from region $r$ ( $r = \text{EU, MENA, ROW}$ )
$M_{iN}$	Imports of commodity $i$ for intermediate use
$m_{riN}$	Imports for intermediate use from region $r$ ( $r = \text{EU, MENA, ROW}$ )
$z_{ji}$	Composite intermediate input of $j$ into $i$ ( $j=1,\dots,34$ )
$d_{ji}, m_{ji}$	Intermediate usages of domestic and imported goods
$Y_i$	Output of good $i$
$D_i, X_i$	Output for domestic sales and exports
$D_{iC}, D_{iG}, D_{iI}^F$	Domestic sales: private and public consumption, capital formation
$X_{ri}$	Exports of good $i$ to region $r$
$c_i$	Index of marginal cost of production
$p_i$	Domestic producer price index
$\tilde{p}_i^Z, \tilde{p}_i^C, \tilde{p}_i^{IF}, \tilde{p}_i^G$	Domestic price indexes (home and imported prices)
$w_K, w_L$	Factor price indexes
$U$	Utility
$\tilde{p}_i$	Composite price index for total domestic supply
$C_i, G_i$	Private and public consumption
$I_i^F, I_i^I$	Fixed capital formation and inventory investment
$M_{iC}, M_{iG}$	Imports for private and public consumption

$M_{il}^F$	Imports for fixed capital formation
$M_{riC}, M_{riG}$	Imports for private and public consumption from region r
$M_{riI}^F$	Imports for fixed capital formation from region r
$K^F$	Net payments on foreign capital holdings
e	Real exchange rate (price index for foreign exchange)
B	Current-account balance
D	Government budget deficit (held fixed)
$S_i$	Supply on domestic market ( $D_i + M_i$ )
$p_{ri}^N$	Domestic price index for intermediate imports
$p_{ri}^C, p_{ri}^G$	Domestic price indexes for imports of private and public consumption
$p_{riI}^F$	Domestic price index for imports for gross capital formation
$p_i^C, p_{iI}^F$	Price index for private consumption/fixed capital of domestic goods
$p_{ri}$	Producer price index for goods exported to region r

### *LIST OF PARAMETERS*

$\sigma_i$	Substitution elasticity between capital and labor
$\eta_a$	Substitution elasticity between intermediates and value added
$\eta_i$	Armington elasticity on imports between regions
$\eta_j$	Substitution elasticity between domestic and imported intermediates
$\varepsilon_i$	Transformation elasticity between domestic and exported output
$e_i$	Transformation elasticity on exports between regions
$\psi_i$	Substitution elasticity between domestic and imported consumption
$t_{ri}$	Tariff rate on imports from region r ( $t_{ri}=0$ for service sectors)
$u_i$	Resource-using services border barriers ( $u_i=0$ for non-service sectors)
$v_i$	Service rents on output ( $v_i=0$ for non-service sectors)
$\lambda_i$	Service resource-using barriers on output ( $\lambda_i=0$ for non-service sectors)
$\bar{E}_K, \bar{E}_{iL}$	Endowment of capital and labor
$p_{ri}^m$	Price of imports from region r
$p_{ri}^x$	Price of exports in region r
$r^F$	Price of foreign capital payments

## References

- Anderson, James E. and Eric van Wincoop, 2001, "Borders, Trade, and Welfare," in Susan Collins and Dani Rodrik, editors, *Brookings Trade Forum 2001*, 207-243.
- Bahlous, Mejda and Mustapha K. Nabli, 2000, "Financial Liberalization and Financing Constraints on the Corporate Sector in Tunisia," Working Paper No 2005, Economic Research Forum for the Arab Countries.
- Brown, Drusilla K., Alan V, Deardorff, and Robert M. Stern, 1997, "Some Economic Effects of the Free Trade Agreement between Tunisia and the European Union," in Ahmed Galal and Bernard Hoekman, editors, *Regional Partners in Global Markets: Limits and Possibilities of the Euro-Med Agreements*, London: Centre for Economic Policy Research.
- Brown, Drusilla K., and Robert M. Stern, 2001, "Measurement and Modeling of the Economic Effects of Trade and Investment Barriers in Services," *Review of International Economics*, 9: 262-86.
- Chatti, Rim, 2000, "General Equilibrium Assessment of Trade Liberalization Effects under Cournot Oligopoly Market Structures: The Case of Tunisia," Economic Research Forum for the Arab Countries, Iran, and Turkey, Working Paper 2009,
- Dee, Philippa and Kevin Hanslow, 2001, "Multilateral Liberalization of Services Trade," in Robert M. Stern, editor, *Services in the International Economy*, Ann Arbor: University of Michigan Press.
- Dee, Philippa, Alexis Hardin and Leanne Holmes, 2000, "Issues in the Application of CGE Models to Services Trade Liberalization," in Christopher Findlay and Tony Warren, editors, *Impediments to Trade in Services: Measurement and Policy Implications*, London and New York: Routledge.
- De Melo, Jaime and Sherman Robinson, 1989, "Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies," *Journal of International Economics*, 27: 47-67.
- Francois, Joseph, 1999, "A Gravity Approach to Measuring Services Protection," Manuscript, Erasmus University.
- Francois, Joseph and Ian Wooton, 2001, "Market Structure, Trade Liberalization, and the GATS," *European Journal of Political Economics* 17: 389-402.
- Goaied, Mohamed, 1999, "Cost-Frontier Analysis of Tunisian Commercial Banking Sectors," manuscript.
- Harris, Richard G., 1984, "Applied General Equilibrium Analysis of Small Open Economies with Scale Economies and Imperfect Competition," *American Economic Review* 74: 1016-1032.
- Hertel, Thomas W., 1997, *Global Trade Analysis: Modeling and Applications*, New York: Cambridge University Press.

- Hertel, Thomas W., 2000, "Potential Gains from Reducing Trade Barriers in Manufacturing, Services and Agriculture," in *Multilateral Trade Negotiations: Issues for the Millenium Round*, St. Louis: Federal Reserve Bank of St. Louis.
- Hoekman, Bernard, 1995, "Tentative First Steps: An Assessment of the Uruguay Round Agreement on Services," World Bank Policy Research Working Paper 1455. Washington DC.
- Hoekman, Bernard, 2000, "The Next Round of Services Negotiations: Identifying Priorities and Options," in *Multilateral Trade Negotiations: Issues for the Millenium Round*, St. Louis: Federal Reserve Bank of St. Louis.
- Hoekman, Bernard and Simeon Djankov, 1996, "Catching Up with Eastern Europe? The European Union's Mediterranean Free Trade Initiative," World Bank, Policy Research Working Paper 1562, Washington DC.
- Hoekman, Bernard and Denise Eby Konan, 2000, "Rents, Red Tape, and Regionalism: Economic Effects of Deeper Integration," in Bernard Hoekman and Jamel Zarrouk, editors, *Catching Up with the Competition: Trade Policy Challenges and Options for the Middle East and North Africa*, Ann Arbor: University of Michigan Press.
- Institute National De La Statistique (INS), 1998, *Les Comptes de la Nation, agregats et tableaux d'ensemble 1993-1997*, Tunis: INS Press.
- Jbili, Abdelali and Klaus Enders, 1996, "The Association Agreement between Tunisia and the European Union," available at [www.worldbank.org/fandd/english/0996/articles/040996.htm](http://www.worldbank.org/fandd/english/0996/articles/040996.htm).
- Kalirajan, Kaleeswaran, Greg McGuire, Duc Nguyen-Hong, and Michael Schuele, 2000, "The Price Impact of Restrictions on Banking Services," in Christopher Findlay and Tony Warren, editors, *Impediments to Trade in Services: Measurement and Policy Implications*, London and New York: Routledge.
- Karsenty, Guy, 2000, "Assessing Trade in Services by Mode of Supply," in Pierre Sauve and Robert M. Stern, editors, *GATS 2000: New Directions in Services Trade Liberalization*, Washington DC: Brookings Institution Press.
- Konan, Denise Eby and Keith E. Maskus, 2000, "Joint Trade Liberalization and Tax Reform in a Small Open Economy: The Case of Egypt," *Journal of Development Economics* 61: 365-92.
- Lipsey, Robert, 2001, "The New Economy: Theory and Measurement," paper for 27<sup>th</sup> Annual PAFTAD Conference: The New Economy: Challenges for East Asia and the Pacific, Canberra, Australia.
- Markusen, James R., 1989, "Trade in Producer Services and in Other Specialized Intermediate Inputs," *American Economic Review* 79: 85-95.
- Markusen, James R., Thomas F. Rutherford and David Tarr. 2005, "Trade and Direct Investment in Producer Services and the Domestic Market for Expertise," *Canadian Journal of Economics*, forthcoming.

- Maskus Keith E. and Mohamed Lahouel, 2000, "Competition Policy and Intellectual Property Rights in Developing Countries," *The World Economy* 23: 595-611.
- Robinson, Sherman, Zhi Wang, and Will Martin. 2002. "Capturing the Implications of Services Trade Liberalization," *Economic Systems Research*, 14: 3-33.
- Rodrik, Dani, 2001, "Trading in Illusions," *Foreign Policy*, March/April, 54-62.
- Romer, Paul M., 2004, "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions," *Journal of Development Economics* 43: 5-38.
- Rutherford, Thomas, E.E. Rutstrom, and David Tarr, 1995, "The Free Trade Agreement Between Tunisia and the European Union," World Bank, manuscript.
- Rutherford, Thomas and David Tarr, 2002, "Trade Liberalization, Product Variety and Growth in a Small Open Economy: A Quantitative Assessment," *Journal of International Economics* 56: 247-272.
- Stern, Robert M., 2002, "Quantifying Barriers to Trade in Services," in Bernard Hoekman, Aaditya Mattoo, and Philip English, editors, *Development, Trade and the WTO: A Handbook*, Washington DC: World Bank.
- Swiss Re, 1999, *World Insurance in 1997: Booming Life Business, but Stagnant Non-Life Business*, Sigma No. 3/99.
- Varoudakis, Aristomene, and Carlo Maria Rossotto, 2001, "Regulatory Reform and Performance in Telecommunications: Unrealized Potential in the MENA Countries," World Bank manuscript.
- Vittas, Dimitri, 1995, "The Insurance Sector in Tunisia," Financial Sector Development Department, World Bank Working Paper, March 1995.
- Warren, Tony and Christopher Findlay, 2000, "Measuring Impediments to Trade in Services," in Pierre Sauve and Robert M. Stern, editors, *GATS 2000: New Directions in Services Trade Liberalization*, Washington DC: Brookings Institution Press.
- Whalley, John, 2003, "Liberalization of China's Key Service Sectors Following WTO Accession: Some Scenarios and Issues of Measurement," Industry Canada, manuscript.
- World Bank, 2000, *Tunisia: Social and Structural Review 2000: Integrating into the World Economy and Sustaining Economic and Social Progress*, World Bank, Washington, DC.
- World Bank, 2001. *Republic of Tunisia: Information and Communications Technology Strategy Report*, Washington D.C.
- World Bank, 2004, *Republic of Tunisia: Development Policy Review: Making Deeper Trade Integration Work for Growth and Jobs*, Washington DC.
- Zarrouk, Jamel, 2000, "Regulatory Regimes and Trade Costs," in Bernard Hoekman and Jamel Zarrouk, editors, *Catching Up with the Competition: Trade Opportunities and Challenges for Arab Countries*, Ann Arbor: University of Michigan Press.

**TABLE 1: SECTORAL OUTPUT AND FACTOR SHARES (%)**

	Production	Imports	Household Consumption	Intermediate Consumption	Exports
<b>AGGREGATE SECTORS (% of total)</b>					
Agriculture and Fishing	17.5	10.2	32.4	20.1	6.6
Manufacturing	30.0	63.2	29.7	51.3	55.3
Utilities, Mining, Petroleum	5.8	5.8	4.0	10.9	6.8
Services	46.7	20.8	33.8	17.7	31.2
<b>SERVICE SECTORS (% of total)</b>					
Construction	8.2	0.0	0.3	0.4	0.0
Distribution/Commerce	6.9	0.0	0.0	0.0	0.0
Transportation	5.6	2.7	5.7	4.3	8.7
Communication	1.0	0.1	0.3	1.7	0.4
Hotel	1.5	0.0	3.9	0.1	0.0
Restaurant	4.1	0.0	10.9	0.0	0.0
Finance	2.5	0.2	0.1	4.8	0.3
Insurance	0.3	0.2	0.3	0.6	0.0
Business	1.4	2.1	0.1	2.5	2.5
Real Estate	2.6	0.0	5.0	1.3	0.0
Repair	1.3	0.0	1.1	1.8	0.0
Health and Education	2.0	0.0	4.9	0.2	0.0
Public	9.0	0.0	0.6	0.0	0.0
Other Services	0.2	0.0	0.6	0.0	0.0
Tourism	--	15.4	--	--	19.3

Institute National de la Statistique, 1998, *Les Comptes de la Nation Base 1983, agregats et tableaux d'ensemble 1993-1997*.

**Table 2: Benchmark Trade Shares and Tariffs**

Sectors	EU Trade Share (%)		Trade-Weighted Import Tariff	
	Imports	Exports	EU	Rest of World
Agriculture	38.7	68.7	13.5	13.0
Process Foods	55.3	71.9	17.6	18.5
Chemicals and Glass	48.8	24.0	21.1	23.6
Non-Ferrous Metals	57.7	70.4	15.3	21.2
Metalwork	67.8	58.8	15.3	17.5
Machinery	77.0	86.0	6.5	8.5
Automobiles & Trucks	87.6	40.8	6.3	10.8
Automobile parts	57.1	71.0	0.1	1.7
Electrical Parts	66.4	50.4	4.3	7.8
Electronics	66.4	50.4	4.3	7.8
Household Appliances	66.4	50.4	4.3	7.8
Chemicals	75.7	39.2	9.0	10.3
Clothing & Textiles	92.3	94.8	17.7	21.6
Leather	93.3	96.6	25.1	28.3
Wood	41.1	66.7	16.4	16.6
Paper	74.4	20.6	11.1	5.3
Plastics	72.9	28.0	14.5	18.7
Other Manufacturing	72.9	76.2	8.1	15.8
Mining	30.6	86.0	17.4	2.5
Petroleum	63.3	38.7	12.2	20.2
Services	70.0	76.0		

**Table 3: Barriers to Trade in Services (NTB ad valorem price equivalent %)**

	Mode 1	Mode 3
	Cross-border trade	Foreign Presence
Construction	<i>nt</i>	3
Distribution	<i>nt</i>	5
Transportation	50	3
Communications	200	30
Hotel	<i>nt</i>	3
Restaurant	<i>nt</i>	3
Finance	30	30
Insurance	50	50
Business, Insurance & Leasing	10	10
Real Estate	10	10
Repair	<i>nt</i>	3
Health and Education	<i>nt</i>	<i>nt</i>
Public	<i>nt</i>	<i>nt</i>
Other Services	<i>nt</i>	<i>nt</i>

*nt* non-traded modes of supply

**Table 4: Liberalization of Foreign Direct Investment in Services under Alternative Assumptions on Benchmark Investment Barriers**

	Rent Scenario (1)	Baseline Scenario (2)	Mixed Scenario (3)	Inefficiency Scenario (4)
<i>Macroeconomic Variables (% change)</i>				
Welfare, Household Income (EV)	0.33	4.00	4.31	7.68
Consumer price index (CPI)	-7.09	-7.11	-7.11	-7.13
Real returns to labor	4.39	3.20	3.24	2.04
Real returns to capital	6.55	6.99	6.97	7.43
Labor turnover	3.44	3.42	3.40	3.79
Capital Turnover	4.87	4.90	4.92	5.06
<i>Production (share of GDP)</i>				
Agriculture (bench = 19.5 percent)	21.1	21.2	21.2	21.3
Manufacturing (32.8 percent)	28.5	28.7	28.7	28.9
Mining and Utilities (7.0 percent)	6.8	6.8	6.8	6.7
Services (40.7 percent)	43.6	43.3	43.3	43.1

**Table 5: Baseline Services Liberalization Scenarios**

	Border Liberalization (Mode 1)	Investment Liberalization (Mode 3)	Full Service Liberalization (Mode 1 & 3)
<i>Macroeconomic Variables (% change)</i>			
Welfare, Household income (EV)	1.22	4.00	5.30
Consumer price index	-1.02	-7.11	-8.04
Real returns to labor	0.57	3.19	4.23
Real returns to capital	1.32	6.99	8.23
Labor turnover	0.78	3.42	3.73
Capital turnover	0.98	4.90	5.35
<i>Production (share of GDP)</i>			
Agriculture (bench = 19.5 percent)	19.9	21.2	21.4
Manufacturing (32.8 percent)	31.7	28.7	28.2
Mining and utilities (7.0 percent)	7.1	6.8	6.8
Services (40.7 percent)	41.3	43.3	43.6

**Table 6: Baseline Service liberalization (Mode 1 and Mode 3), by sector**

	Commun- ications	Construc- tion	Transport- ation	Business, Insurance, & Leasing	Distrib- ution	Finance	All Service Sectors
Welfare (EV)	0.46	0.32	1.09	0.60	0.44	1.08	5.30
Real returns to labor	0.90	-0.13	0.62	0.66	1.23	0.60	4.23
Real returns to capital	0.46	0.10	1.44	1.69	0.54	2.29	8.23
Labor turnover	0.35	0.15	1.03	1.34	0.68	1.84	3.73
Capital turnover	0.40	0.11	1.23	1.89	0.89	2.62	5.35

**Table 7: Comparing Goods and Services Liberalization (Baseline Case)**

	Goods Liberalization (Eliminate tariffs)	Services Liberalization (Mode 1 & 3)	Goods and Services Liberalization
<i>Macroeconomic Variables (% change)</i>			
Welfare, Household income (EV)	1.52	5.30	6.67
Consumer price index	-1.07	-8.04	-9.07
Real returns to labor	18.93	4.23	17.67
Real returns to capital	3.46	8.23	13.61
Labor turnover	9.83	3.73	3.40
Capital turnover	10.38	5.35	5.89
<i>Production (share of GDP)</i>			
Agriculture (bench = 19.5 percent)	15.3	21.4	19.1
Manufacturing (32.8 percent)	42.8	28.2	33.6
Mining and utilities (7.0 percent)	5.2	6.8	5.6
Services (40.7 percent)	36.7	43.6	41.7