A Comparative Analysis of the EU-Morocco FTA vs. Multilateral Liberalization

by

Aziz Elbehri*

And

Thomas W. Hertel

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*: Corresponding author; 1800 M Street NW, Room S5203, Washington DC 20036, USA; Tel: (202) 694-5291; Fax: (202) 694-5823; e-mail: aelbehri@ers.usda.gov

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Abstract

An applied general equilibrium model with oligopoly and scale economies, based on detailed plant-level data, is used to contrast the impacts of the Morocco-EU free trade area (FTA) to multilateral trade liberalization on Morocco's economy. Simulation results show that the FTA agreement is likely to have adverse effects on Morocco due to: (a) deteriorating terms of trade, (b) reductions in output per firm in industries dominated by scale economies, (c) diversion of imports away from non-EU suppliers, and (d) potentially adverse effects on the aggregate demand for labor. We contrast this FTA with a multilateral liberalization scenario along the lines of those proposed under the Doha Development Round and find this more beneficial to Morocco, with overall welfare gains due to: (a) lesser terms of trade losses, (b) positive scale effects, (c) non-preferential liberalization of imports into Morocco, and (d) a positive impact on aggregate labor demand. We conclude that Morocco would be better off pursuing trade liberalization in the multilateral arena.

JEL classification: F12, F14, F15

Keywords: Applied general equilibrium; Market Structure; Trade liberalization; Developing economies; Morocco

I. Introduction

Morocco and the European Union (EU) signed an association agreement (henceforth referred to as FTA) in 1996, which entered into effect in March 2000. This Agreement was part of a broader Euro-Mediterranean initiative, the 1996 Barcelona Protocol, in which the European Union negotiated free trade agreements with Southern Mediterranean countries. The association agreement with Morocco is a partial free trade agreement as it calls for free trade in industrial goods to be phased in over 12 years, but excludes selected agricultural goods. The latter continue to be regulated by existing preferential agreements that allow for low or no tariffs within pre-specified quantities[1]. The FTA effectively translates into a unilateral liberalization of domestic industries by Morocco as the latter already benefit from duty–free access for its exports to the EU due to previous preferential agreements[2]. In return, the EU promised financial assistance to help the Moroccan industries transition to open competition through investment and training.

FTAs between industrial and developing economies are expected to have much deeper economic effects on the latter (Panagariya, 2002). This is because developing countries typically rely more on trade and have smaller and more poorly functioning markets, and hence more sensitive to international competition than industrialized economies. In the case of Morocco, the FTA is expected to affect more than trade patterns, deeply altering its manufacturing structure as well. Since the 1960's, Morocco's industrial sectors have followed a narrow range of specializations, focusing mostly on goods exported to the European market. Moroccan manufacturing activities have also expanded via import substitution in those domestic industries shielded by high tariffs. In addition, lacking functioning competition rules, these industries have become dominated by just a few firms, with substantial market power.

The critical role of market structure in the Moroccan economy can be readily gleaned from Table 1 (last column), which shows data from the 1995 manufacturing census[3]. Ten out of 18 two-digit industries show a four-plant concentration (C4) ratio over 70 percent and four of them exceed 50 percent. The most concentrated sectors include beverages & tobacco and sugar processing, while textiles and clothing exhibit relatively low levels of concentration. Private industrial ownership (domestic and foreign) dominates (columns 2 and 3). It is important to note that these concentration ratios understate the potential market power exercised by domestic industries, due to the fact that a small number of holding companies own industrial firms accounting for about half of manufacturing value-added (World Bank, 1994). In light of these facts, it is hardly surprising that there is evidence of collusive pricing behavior as well as practices to restrict entry (Nasr et al., 1992).

Many analyses of FTAs have employed the assumptions of perfect competition and constant returns to scale. And advocates of FTAs often argue that the gains from such trade agreements will be larger if features of imperfect competition and increasing economies of scale are incorporated in the analysis. However, the theory of trade policy and imperfect competition is by no means conclusive on this point. In fact, it is equally possible that the gains will be smaller (or losses larger) when these features are taken into account.

A more general question is whether such FTAs are good for the developing country partner. Negotiating, implementing and monitoring such agreements is a costly process, and detracts from potential time and money spent on multilateral negotiations. A critical question is how the economic benefits from FTA compare to those from multilateral trade liberalization. The desirability of unilateral

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[1] A recent side agreement between the two sides expanded duty-free quantities for some agricultural products exported by Morocco to EU in exchange for preferential access by Morocco to selected food imported from the EU.

[2] Since 1977 there has been a Morocco-EU preferential agreement that allows Morocco's industrial goods to enter the EU duty-free.

[3] The 1995 census, collected by the Ministry of Commerce, included 6040 establishments covering 180 4-digit-level industrial activities.

versus regional preferential agreements continues to draw attention in the trade literature (Panagariya, 2002, 2003; Bandara and Yu, 2003). In the case of Morocco, a key question is whether FTA with the European Union will lock Morocco into a narrow band of industrial specialization in a few labor-intensive industries. Morocco has been successful in these sectors in the past, particularly textiles and apparel, but she may have more difficulty replicating this success in the future as EU's trade barriers against Asian competitors fall. In light of these tradeoffs, we also consider the alternative of incremental multilateral liberalization.

In this paper we apply a multi-sector, multi-region AGE model in which firms in imperfectly competitive industries, hold a Cournot conjecture vis-à-vis domestic rivals and Bertrand conjectures vis-à-vis foreign competitors. AGE models featuring imperfect competition have not been used as extensively in the developing country context. Where such work exists, the role of market structure often has a weak empirical basis (Devarajan and Rodrik, 1988; Brown et al., 1996). However, more commonly it is ignored altogether (Cogneau and Tapinos, 1995; Rutherford et al., 1997). This is problematic, given that imperfect competition and economies of scale are likely to be more important in trade policy analysis of developing than of developed countries (Rodrik, 1988). Undoubtedly, the lack of firm and industry level data has prevented modelers from constructing more empirically satisfying AGE models of developing countries. This study seeks to address these gaps, by using detailed firm level data from the Moroccan manufacturing census to calibrate markups and unrealized scale economies for Morocco.

Another issue we address is the potential impact of FTA as well as multilateral liberalization on the aggregate demand for labor. This is of the highest priority for Morocco, given the very high rate of unemployment among unskilled workers. Recent estimates place this between 15% and 20%. These high unemployment rates are due to various policy-induced rigidities. Unlike most developing countries, Morocco maintains two minimum wages, one for agriculture and a second for non-farm sectors. These are periodically increased in real terms, and typically at a rate higher than labor productivity, so that they continue to be binding (Azzam, 1997). Other labor market features that affect the cost of hiring include: national and sectoral wage bargaining for skilled workers, compulsory social-security coverage and restrictive hiring and firing regulations.

The remainder of the paper is organized as follows. Section 2 provides an overview of Morocco's foreign trade and its close ties to the European Union. Section 3 describes the theoretical underpinning of the numerical analysis drawing on the Baldwin-Venables welfare decomposition. Section 4 describes the empirical model and our approach to calibration. Section 5 presents the simulation results while section 6 concludes.

II. Morocco's Foreign Trade Patterns And European Union's Critical Role

The EU dominates Morocco's foreign trade. The share of total merchandise products exported to the EU rose from 63.5 percent in 1994, to 74.3 percent in 2000 (Table 2). In 1998, the EU market accounted for over 71 percent of fruits and vegetables exports from Morocco, and close to 95 percent of clothing (table 3). Manufactured goods are also exported predominantly to the EU. Only minerals (mostly phosphates) and derived chemical products are exported in a greater proportion to non-EU countries. Imports of manufactures to Morocco – mostly intermediate goods and capital equipment, originate primarily from the EU, with sectoral shares ranging from 56 to 90 percent, and an overall average of 73% (Table 3).

Morocco's close trade exchanges with the European Union date from colonial ties with France but have been reinforced by bilateral preferential trade agreements over the last few decades. The first preferential agreement between Morocco and the EU was concluded in 1969. This provided for duty free access in industrial goods from Morocco while imposing restrictions on Morocco's agricultural exports to the EU in line of with the EU's Common Agricultural Policy. This first preferential agreement stimulated investments in selective manufacturing activities, targeting import substitution products for domestic market and labor-intensive products for exports to the EU- particularly clothing. This contributed to a change in Morocco's trade structure. Between 1965 and 1995, the combined export shares of primary

agriculture and food products, declined from over 70 percent to less than 25 percent, while the export share of manufactures climbed from less than 10 percent to 70 percent of total exports, in the same period. This structural shift in trade patterns has been significantly affected by the selective preferential access offered by the EU; namely free access to industrial goods, but restrictive access to agriculture and processed food.

A close examination of Morocco trade patterns over this period reveals that a narrow manufacturing specialization dominated by labor-intensive activities, dictated by the type of preferential access offered by EU. This is illustrated by the pattern of textile and clothing trade between Morocco and the EU over the last 3 decades as shown in figure 1. This sector has shown the largest expansion of all manufacturing industries with export shares to the EU rising from 3.5% of total value of exports in the early 1970's to 38.7% in the late 1990's. Much of the growth in production and trade in textiles and clothing has developed along a close two-way expansion of trade with the EU with very little geographical diversification, as evidenced by the very modest growth in trade with ROW (Figure 1). The EU preferences, coupled with restrictive rules of origin, played a key role in the clothing sector expansion in Morocco at a time when many of its potential competitors were still under restricted market access. Economic reforms in the 1980's and the gradual opening of the Moroccan economy, have had limited effect on the diversification of production and trade. An exception is the light manufacturing sector (mostly electronic components) which has grown significantly in the latter part of the1990's and which saw its exports expanding both to the EU and third countries.

In summary, Morocco's over-reliance on trade with Europe makes her vulnerable to external shocks from the EU. Moreover, during the 1990's, Morocco has become increasingly sensitive to global competition and the erosion of preferences, as the EU has concluded similar FTA's with many other third countries. In addition, the Agreement on Textiles and Clothing has been expanding quotas on imports from Morocco's competitors since the advent of the Uruguay Round implementation period. These factors have had negative impact on Morocco's GDP which increased on average by a mere 2.7 percent in 1990's, compared to 3.9% in 1980's (IMF, 2001). In this context, it is important to ask whether further bilateral liberalization with the EU is the right direction for Morocco's international trade policy to go. As will be shown in the next section this is a complex issue, and the answer cannot be determined solely on the basis of theoretical arguments. Therefore, this paper will address this question empirically.

III. Economics of the FTA: A Small Country Perspective

To help identify the competing forces at work in determining the small country impacts of an FTA, and to facilitate the analysis of the numerical results, this section provides a brief exposition of the main channels of welfare changes under the FTA using the decomposition proposed by Baldwin and Venables (1995). They break down the welfare effects of an FTA in terms of the regional household's indirect utility function: V(p,E), in the following way:

$$dV/V_E = tdm - mdp + [p + t - a]dX - Xa_x dx + [(\tilde{r}/\rho) - 1]dI \qquad (1)$$

The first term in the RHS of (1) represents the trade volume effects whereby net imports (m) are subject to a price wedge created by trade barriers (t), so that changes in imports have first order effects on welfare. This volume of trade effect suggests that trade reform will increase welfare by spurring imports in sectors where domestic prices are kept above world prices. However, following a regional trade agreement, increased imports from the partner country may also accompany an import decline from third countries. Whether trade creation or trade diversion dominates, when tariffs or partner country imports are eliminated, will depend on the initial tariff levels, as well as the trade elasticities, used in the model.

The second term, mdp, represents the "terms-of-trade" effect whereby a decrease in the world price ($dp<0$) of net imports ($m>0$) is welfare increasing. The third and fourth terms represent the effects under an imperfectly competitive environment. The third term is the "profit-shifting" effect, which measures

the welfare impact of changes in output (*dX*) in industries where domestic price (*p* + *t*) differs from average cost (*a*). *Ceteris paribus*, resource reallocation to sectors in which such excess profits exist is desirable. This creates a potential conflict with the desired outcome from the first term ("trade volume" effect). In the Moroccan case, import-competing sectors are more oligopolistic than the export-oriented ones. Therefore the welfare-improving effects from the first term require that the former sectors contract to make room for cheaper imports, whereas the effect from the third term suggests just the opposite.

The fourth term ($Xa_{x}dx$) is the "scale" effect whereby increased output per firm ($dx>0$) lowers average cost (a_x), thereby reducing the cost of producing total output (X). This term captures the effect of unrealized economies of scale (average cost is higher than marginal cost so that $a_x < 0$). This too, leads to a potential conflict with the trade volume effect, since an expansion of average firm output is required for welfare to increase from this "scale" effect. However, when industry exit is possible, output per firm can increase, even as total industry output falls. This rationalization of industry output may allow for both higher imports (as desired from the volume of trade effects) and expanded output per firm (as desired by the scale effects). This cannot be predicted a *priori*, which is why a formal model is required.

The last term on the RHS of equation (1) represents the accumulation effect. A change in investment is instantaneously costly, but augments capital stock with social rate of return $\tilde{r}$, which is discounted back to the present at discount rate ρ , giving present value $\tilde{r} / \rho$. Change in investment has a first-order welfare effect if this ratio differs from one.

In examining the welfare implications for Morocco from implementing the FTA with the EU, we emphasize the static welfare effects, including the volume-of-trade, profit-shifting, and scale effects. In the absence of information on $\tilde{r} / \rho$, it is difficult to say much about the welfare effects of foreign capital inflows following the FTA. On the other hand, we *will* take account of some considerations not shown in (1). In particular, we will explore the interactions between the trade policy shock and domestic taxes and subsidies, including those adjustments required to maintain revenue neutrality. While these terms – which may be very numerous indeed -- have been omitted from the elegant theoretical decomposition offered in equation (1), they are readily captured in our empirical decomposition.

IV. The Applied General Equilibrium Model

Empirical analysis of the Morocco-EU FTA is carried out using a modified version of the multi-region applied general equilibrium model, GTAP v. 6.1 (Hertel, 1997)[4]. The model features imperfect competition and scale economies building on the work of Francois and Roland-Holst (1997) and Francois (1998). A distinguishing feature of this analysis is that the calibration of oligopoly behavior and scale economies for the Moroccan manufacturing sectors is based on detailed industrial census data. The empirical implementation distinguishes three regions, Morocco, the European Union (EU) and rest of world (ROW). Each economy has 28 sectors, of which 14 refer to manufacturing activity. The latter are characterized by economies of scale and oligopolistic market structures. The remaining sectors encompass agriculture, natural resources, and services activities, and are typified by constant returns to scale in production and perfectly competitive behavior[5]. We next turn to a detailed exposition of the imperfect competition and scale economies features of the model.

4.1. Scale Economies

[4] The GTAP model is implemented using the GEMPACK software (Harrison and Pearson, 1996). The current version of the model code may be downloaded from the GTAP web site: www.gtap.org.

[5] There are some sectors within the broad service aggregate that are also oligopolistic (e.g., communications). However, these are not taken into account due to problems of aggregation. Also note that the services sector is not directly affected by Morocco's FTA with the EU.

Scale economies for manufacturing sectors are modeled by combining fixed costs with an average variable cost function that is independent of scale. In this case, average total cost takes the following form:

$$AC = \frac{FC}{x} + AVC = \frac{FC}{x} + MC \qquad (2)$$

where: *AC, AVC, MC, FC* and *x* are average cost, average variable cost, marginal cost (also invariant to scale), fixed cost, and output per firm, respectively. It is common in the literature (Francois, 1998) to calibrate fixed costs via the cost disadvantage ratio (CDR), which measures the extent to which average total cost exceeds marginal cost:

$$CDR = \frac{AC(x) - MC(x)}{AC(x)} = \frac{FC}{TC(x)} \qquad (3)$$

With marginal costs that are invariant to scale, the CDR approaches zero asymptotically as output per firm increases[6].

In this analysis, scale economies are assumed to be internal to the firm and are modeled by linking percentage changes in output with percentage changes in an input composite assuming homothetic technologies (Francois, 1998):

$$\hat{x} = \left[\frac{1}{1-CDR}\right]\hat{Z} = \left[1 + \frac{CDR}{1-CDR}\right]\hat{Z} \qquad (4)$$

where $\hat{x}$ and $\hat{Z}$ are percentage changes in output per firm and composite input levels, respectively. The term 1/(1-CDR) is the output elasticity, which also equals the ratio of average to marginal cost (AC/MC).

4.2. Imperfect Competition

As noted above, most manufacturing sectors in Morocco are oligopolistic and highly concentrated. In this paper, these sectors are assumed to hold different perceptions about oligopolistic interdependence with respect to domestic rivals, which produce a homogenous good, and foreign rivals which produce a differentiated good (in the sense of Armington). Following Francois and Roland-Holst (1977), the elasticity of substitution among imports is assumed to be equal to that between domestic and imported goods (non-nested CES preferences). With respect to domestic rivals, including foreign-owned firms producing domestically, each oligopolist holds the Cournot conjecture (namely that rivals' outputs remain unchanged when the firm varies its own output). With respect to foreign rival firms, supplying differentiated imports, each oligopolist holds a Bertrand conjecture (that is foreign rivals' prices are assumed to remain unchanged in response to a change in their own price)[7]. The Cournot specification for oligopolistic behavior for domestic firms is a reasonable assumption given the high concentration industries in the Moroccan economy. The choice of the Bertrand conjecture *vis-à-vis* foreign imported

[6] An alternative method of calibrating scale economies uses the concept of minimum efficiency scale (MES). Besides the high correlation between MES and the Herfindhal index (de Melo and Urata, 1986), the MES measure is based on the assumption of U-shaped long run average cost (LRAC). This is unattractive since the empirical literature supports the L-shaped LRAC curve for which the CDR is more compatible (Johnson, 1960).

[7] The approach adopted in this analysis is that proposed by Francois and Roland-Holst (1997). It differs from other formulations of Cournot behavior (e.g., Smith and Venables 1988; Willenbockel, 1994) in which firms are assumed to hold Cournot conjectures about both domestic and foreign rivals.

goods in the Morocco case is justified since these products are highly differentiated from those supplied by domestic firms.

A natural alternative to the Armington-type national-level product differentiation specification would be the firm-level product differentiation approach of Dixit and Stiglitz (1977). However, the associated "variety effects", stemming from the entry or exit of domestic firms, are likely to be misleading here, since the domestic manufacturing industries produce relatively undifferentiated products.

Calibration of the Cournot markups is based on the following relationship:

$$\frac{P - MC}{P} = (1 - M^{-1}) = \frac{1}{n\varepsilon} \qquad (5)$$

where P = price, MC = (constant) marginal cost, $M = P/MC$ = the power of the markup over marginal cost, ε = the perceived market demand elasticity, and n is the Cournot equivalent number of firms. In this equation, the price-markup over marginal costs varies endogenously, decreasing with the number of firms and decreasing with a higher market elasticity of demand. Francois and Roland-Holst show that the industry elasticity of demand is larger, the larger the elasticity of product substitution, and the smaller the sales-weighted market share of firms.[8] For industries where the bulk of the sales are to the domestic market (e.g., beverages and tobacco) – where domestic sales are dominant - the industry demand elasticity will be relatively small. On the other hand, industries such as wearing apparel (84% of output is exported -- see Table 1) will have a larger industry demand elasticity, *ceteris paribus.*

From the point of view of the welfare decomposition outlined in (1), it is also of interest to consider the power of the markup over *Average* Cost:

$$M_A = \frac{P}{AC} = (1 - CDR)M \qquad (6)$$

When this value exceeds one, firms in the sector earn positive profits, as the power of the markup over marginal cost *(M)* exceeds the output elasticity, 1/(1-CDR). On the other hand, in sectors where the markup is relatively small and the scale effects are strong, it is possible that firms will be incurring losses. When the product of the power of the markup over marginal cost is precisely equal to the inverse of the output elasticity, we observe zero profits.

The potential for excess profits or losses raises the question of entry and exit. In this paper, we consider two alternative entry and exit assumptions. In the first case, there is no entry or exit, so non-zero excess profits may arise. These profits accrue to the regional household and are spent in the same way as other household income. In order to ensure comparability of results between the entry and no entry cases, we avoid implementing a zero pure profits scenario. This would confound the consequences of removing barriers to entry/exit – an issue of industrial policy -- with the direct impacts of trade policy. Therefore, we instead assume *no change* in the profit margin (defined as profits share in total revenue) under the entry/exit assumption. Thus if profitability in the beverages and tobacco industry falls as a result of the FTA, we expect that firms will leave the sector until the initial profit margin in the industry is restored. The appendix offers an algebraic exposition of the implications of entry and exit). The most important consequence of a constant profit margin in the presence of homothetic costs is the following equation linking changes in markups to changes in output per firm:

$$\hat{x} = -(1/\{\Omega_F/[1-\Omega_\Pi]\})\hat{M} \qquad (7)$$

[8] For derivation of the expression for the perceived market demand elasticity see the Appendix.

This means that, if trade liberalization raises the firms' perceived demand elasticity, and optimal markups fall, then output per firm will increase and there will be positive scale effects on welfare via equation (1).

4.3. Data and Model Calibration

The underlying data structure for the model is the global GTAP data base, version 5.3 (Dimaranan and McDougall, 2002). For purposes of this analysis, a Moroccan Social Accounting Matrix for 1990 (Bussolo and Roland-Holst, 1993) was adapted and incorporated into the GTAP data base (Elbehri, 1998).

The 57-sector GTAP database is aggregated into 28 sectors for purposes of this paper (Appendix Table A.3). The commodity aggregation is designed to cover the major sectors of importance to Morocco's production and trade. There are 15 manufacturing sectors including six in food processing, with the other 13 covering the agriculture, extractive, and service activities. Manufacturing sectors are disaggregated following the two-digit Moroccan nomenclature of economic activities. The last of the six processed food sectors, "other processed food", includes Morocco's traditional exports of canned vegetables, fruits, and fish. Of the eight non-food manufacturing sectors, four are export-oriented industries (clothing, textiles, chemical products, wood products) while the remaining sectors are import substitution industries serving the domestic market (medium and heavy manufacturing, as well as electronics). All 15 manufacturing sectors are treated as oligopolistic with scale economies, while agricultural and service sectors are assumed to be perfectly competitive for purposes of this study.[9]

Calibration of the oligopoly model and scale economies for the manufacturing sectors was based on detailed industrial census[10] data for 1995. To calibrate the Cournot model, Herfindhal indices and the model-conformable benchmark number of symmetric firms[11] were combined with the perceived demand elasticity for each sector to obtain optimal markups via application of equation (5). Table 4 reports the Herfindahl index for each industry, along with the resulting power of the markup over marginal cost. Note the very high markups for processed sugar and beverages and tobacco, with ratios of price to marginal cost of more than two. The smallest markups are for products with a large export share and relatively low concentration indexes: wearing apparel, other food products, and textiles.

Estimation of the cost disadvantage ratio by sector is more problematic. The most common approach to CDR estimates is to compute minimum efficient scale estimates based on engineering cost studies, dating mostly from the 60's and 70's and compiled by Pratten (1988)[12]. However, in addition to being very old, these studies were not conducted in the Moroccan context and are likely to bear little relation to the economic costs and organizational faced there. Therefore, we take a different approach, inspired by de Melo and Urata, (1986). We order the plants in the manufacturing survey according to gross total plant-level sales. We then divide the survey data into two parts, each accounting for one-half of total industry sales. We then compute the ratio of gross output per worker in the smaller firms divided by the corresponding values in the larger firms. This gives us some idea of the potential cost savings due to greater scale of production in each industry. For very large firms, the fixed cost component will be less

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[9] As noted previously, there is evidence of market power in some of the non-manufacturing sectors – most notably services. However, we do not have data to support an oligopoly specification in these sectors. Furthermore, the FTA under analysis here does directly affect these other sectors.

[10] This is a comprehensive annual census covering 6040 firms for 1995 covering all formal sector firms with 10 or more employees or with 100,000 Dirhams (around $11,000) gross annual revenues. Herfindhal indices for the other regions of the model (EU, ROW) were taken from Haaland and Tellefsen (1994).

[11] This is the number of symmetric firms, which generates the same Herfindhal-Hirschman concentration index as the actual observed asymmetric size distribution in the industry. This approach has been used by Smith and Venables (1988), Willenbockel (1994), and Mercenier (1995).

[12] Examples of analyses include Gasiorek, Smith and Venables (1988); Harrison, Rutherford and Tarr (1994); Roland-Holst, Reniert and Shiells (1994); and Willenbockel (1994).

important and average costs will approach the (assumed constant) marginal cost of output. We use this information to obtain an estimate of the *dispersion of CDRs* across industries.[13] To derive a set of CDRs consistent with the rest of the model, this industry cost ratio is taken as a first estimate of the ratio, *AC/MC*, which is also the output elasticity. This initial estimate is subsequently scaled such that overall profits in manufacturing are equal to zero to obtain the value used in the model. The associated CDRs are also reported in Table 4. They range from 0.06 in sugar refining, other food products and beverages and tobacco to 0.27 in motor vehicles.

Combining the estimated CDR with the optimal markup over marginal cost, we obtain the markup over average cost using equation (6). This is an estimate of the relative profitability of each sector in our initial data base. Note that the most profitable sector appears to be the highly concentrated beverages and tobacco industry, which faces relatively inelastic market demand and which evidences a relatively low CDR. This is followed by sugar refining and dairy processing. Due to our CDR calibration procedure, which ensures that excess profits in the manufacturing sector as a whole are zero, some industries also show evidence of losses. Meat processing, textiles and motor vehicles, all have relatively small markups while the survey evidence shows rather sizable output elasticities. As a result, there is insufficient revenue to cover fixed costs and estimated per unit profits are negative. [14] Based on the decomposition in equation (1), expansion of any of the loss-making sectors will contribute to a national overall welfare loss.

4.4. Protection, Trade, and Cost Structure Data for Morocco

The benchmark tariff structure used in the analysis is reported in table 4. The tariff rates in the version 5.3 GTAP database were updated for Morocco based on the 1996 Moroccan legislation on tariff rates for agricultural goods[15] and other sources (IMF, 1997; Tangermann, 1997). The database was also adjusted to account for zero tariffs on Moroccan industrial goods exported to the EU. Tariffs for processed food products were proportionately adjusted for the content of primary agricultural inputs, since only the non-agricultural components of processed products are imported duty-free into the EU. Table 4 shows that Morocco's tariffs are relatively high compared to the EU and the rest of the world[16]. With few exceptions, all duties on Moroccan manufacturing imports are higher than ROW and they are much higher than the EU. The exceptions are in food processing industries such as beverage and tobacco products.

In the subsequent sections of this paper, we will examine the impact of the trade agreement between Morocco and the EU and was negotiated in 1996 and began its 12-year implementation period in 2000. This entails removing all tariffs on Morocco's non-food manufacturing imports. In keeping with the EU's approach to trade in processed food products, in the case of manufactured food products, Morocco will eliminate only that portion of the tariffs that protect non-agricultural inputs. Since the EU already offered duty free access to Moroccan imports of manufactured goods, there are no tariff cuts on the EU side, making this tantamount to a unilateral liberalization on Morocco's part.

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[13] This measure of scale economies also has limitations in that we assume that differences in output per worker between smaller and larger establishments are due solely to scale economies. A more precise measure would have sorted out the effect of the differences in capital investments between the smaller and larger establishments. However, data limitations precluded such a refinement.

[14] Based on this approach, we also estimate substantial losses in Morocco's highly competitive export-oriented apparel sector. This does not seem plausible and the CDR in this sector is revised to give zero profits.

[15] Bulletin Officiel Number 4375 bis; Royaume du Maroc; 6 May 1996.

[16] Despite trade liberalization reforms since the mid-1980's, Morocco's trade policies remain restrictive. The un-weighted average MFN tariff rate is 33.9 percent giving Morocco a scale of 8 out of 10 in the IMF's index of trade restrictiveness (IMF, 2001).

V. Analysis of the EU-Morocco FTA

Aggregate Welfare Effects of the EU-FTA: The aggregate welfare impacts of the FTA on Morocco are reported in Table 5. The first point to note is that Morocco loses welfare following this FTA, regardless of the closure assumed. The aggregate welfare decomposition in Table 5 explains why this is the case. Begin by considering the no-entry, full employment closure (column 1). When firms do not exit the industry, output per firm falls in almost all of the manufacturing sectors, and this contributes $US -305.7 million to the aggregate welfare loss. The other argument in the welfare decomposition that relates explicitly to the imperfectly competitive sectors is the profit shifting effect, which is positive ($US 149.0 million).

Overall, the loss to the Moroccan economy is heavily influenced by the adverse terms of trade (TOT) effect ($US -683.2 million), which results from the effectively unilateral liberalization being undertaken by Morocco. In order to offset the surge in imports following the tariff cuts in manufacturing, Morocco must increases her exports. This tends to drive down export prices, provided the EU and ROW do not cut their tariffs. As a consequence, Morocco's TOT deteriorated significantly.

Of course, Morocco could still gain from the FTA if the first term in the welfare decomposition shown in equation (1) – the trade volume effect – were large enough. However, preferential liberalization (EU only) tends to lessen the size of the efficiency gains associated with the import surge. Cheaper imports from the EU are substituted for lower cost products from the ROW, thereby dampening the gains from displacement of high cost domestic products. Furthermore, the consumption tax increase required to offset the forgone tariff revenue has an adverse impact on efficiency. As a consequence, the efficiency gains are not large enough to offset the TOT and scale economy losses, and Moroccan welfare falls under the no entry/full employment scenario.

When entry/exit is permitted, industry rationalization occurs and output per firm rises. This gives rise to a positive aggregate scale effect in the welfare decomposition reported in Table 5 (column 2). This is a marked turn-around from the no-entry case, where the scale effect represented a substantial negative contribution to aggregate welfare. On the other hand, the larger increases in exports under the entry/exit case also give rise to larger adverse TOT effects. Taken together, these continue to offset the positive effects of increased scale economies and increased import volumes, and Morocco loses aggregate welfare, although the losses are negligible when compared to the no-entry case.

The other question of interest is how the EU-FTA interacts with aggregate labor demand. For this reason, we introduce real wage rigidity into our model closure. Specifically, we postulate a perfectly elastic supply of unskilled labor at the prevailing, fixed real wage rate. We implement this along with the no entry case, since real wage rigidity is generally viewed as a short run phenomenon. As can be seen from the aggregate results reported in Table 5, aggregate employment contracts (-8.4%) as a result of the EU-FTA, under the unemployment closure. The third column in Table 5 reports the welfare decomposition for the no-entry/unemployment closure. Clearly allowing for a variable supply of unskilled labor in the presence of a fixed real wage has very adverse consequences for the Moroccan economy. The welfare loss is now nearly 5 times as large compared to no entry, full employment case. Most of this additional loss is due to the diminished aggregate demand for labor (-8.4%), although the adverse scale effects are quite substantial as well.

Sectoral Effects of the EU-FTA: The impacts of the EU-Morocco FTA on the imperfectly competitive sectors in Morocco are reported in Table 6. The first column of this table reports the change in average market share facing a representative firm in each sector. As noted previously, this is a sales share-weighted average of the individual market shares for the Moroccan firms in the domestic, EU, and ROW markets. Obviously their market share is largest in the domestic market. By cutting tariffs, imports erode firms' sales to this domestic market. This is evident from the last column of Table 6. At the same time, the real devaluation that ensues makes Moroccan firms more competitive overseas and export sales increase (see the second to last column of this table). So the average market share for domestic firms falls in every case but one (sugar). With average market share falling, and a constant number of firms (no

entry case), the perceived demand elasticity rises, and optimal markups fall. This is evident in the third column of the no entry results reported in the top panel of Table 6.

Overall, output (as well as output per firm) falls in most of the manufacturing sectors of Morocco as a result of the EU-FTA under the no-entry scenario. The exceptions are vegetable oils, beverages and tobacco, apparel and light manufacturing. In beverages and tobacco, the decline in markup largely offsets the tariff reduction and leads to a substantial increase in exports. Wearing apparel and light manufactures are export-oriented (Table 1) and the increase in exports following the real depreciation in Morocco dominates the loss in domestic sales.

The next block of results in Table 6 reports the impact of the EU-FTA in the presence of entry/exit. With the possibility of firms leaving the industry, supply response is greater, as are the changes in average market share, which declines as before in all but two cases. The resulting change in perceived demand elasticity depends, however, on the change in number of firms. It is possible that the exit of domestic firms could raise markups despite a lower industry average market share. However, this reversal only occurs in the cases of meat and dairy products, paper and motor vehicles. In general, markups fall by less than in the no-entry case.

In the presence of entry/exit, there is an inverse relationship between markups and output per firm (Equation 7). In the ten sectors where markups decline, output per firm increases. This gives rise to increased scale economies in the manufacturing sector as a whole. Sector output increases in six sectors in the entry/exit case (compared to four under no entry).

VI. Comparison with Multilateral Trade Liberalization

Given the close trade ties between Morocco and the EU, and the dependence of Morocco exports on a few key labor-intensive industries (apart from the restricted market access in agriculture), the Morocco-EU FTA doesn't appear to help Morocco diversify its industrial productive and export base. Also, the projected efficiency gains from industry rationalization and resource adjustments are not big enough to overcome the substantial losses through TOT, that arise in the wake of this essentially unilateral liberalization of Morocco's manufacturing trade with the EU. This raises the question: Can Morocco do better under a multi-lateral liberalization option? We explore this option with a simple multi-lateral liberalization scenario that involves a 30% across the board cut in all tariffs for Morocco, the EU and ROW. This is roughly the magnitude of cuts achieved under the previous multilateral negotiations (the Uruguay Round). It is somewhat more modest than the cuts proposed in the context of recent efforts to restart the Doha Round negotiations (Josling and Hathaway, 2003). Finally, in the analytical framework used here, the 30% cut in tariffs generates roughly the same efficiency gain from increased trade volume as under the EU-FTA. So we can consider these two experiments to be placed on comparable footing in terms of their ability to increase trade volume.

Aggregate Welfare Effects: Under Multilateral Trade Liberalization (MTL) aggregate welfare is positive for Morocco under all closure assumptions (table 5, last three columns). The aggregate welfare decomposition reveals additional insights into this general finding. Under the no-entry closure, the combination of output expansion in some sectors and smaller output per firm losses in others, result in negligible scale economy losses overall. This is partially offset by smaller profit shifting gains ($8 million vs. $149 million under the FTA), but when combined, the sum of the scale and profit-shifting effects are now roughly zero, as opposed to -$157 million in the case of the FTA. Therefore, we conclude that multilateral trade liberalization interacts more favorably with Morocco's oligopolistic industry structure than does the EU-FTA.

Turning next to the trade volume effect, when export and import tax effects are summed, they are quite comparable between the FTA and MTL experiments. While most of Morocco's trade is with the EU and these tariffs are completely eliminated, the FTA-driven efficiency gains are no larger than when all of Morocco's tariffs are cut by just 30% (MTL). This is due to the costly diversion of imports away from

lower cost ROW suppliers, and towards the EU, as well as the inclusion of agriculture in the MTL experiment.

The most significant contributing factor to the positive aggregate welfare gain under MTL is the much smaller TOT losses. In this case the increase in exports to required to offset the rise in imports does not lead to lower export prices since the EU and ROW also lower their tariffs, thereby stimulating demand. The net effect is much smaller TOT losses for Morocco compared to the unilateral liberalization under FTA. The overall aggregate welfare gains for Morocco range from $414 million to $666million, depending on closures. Note from the consumption tax entry in Table 5 that, even though the consumption tax must still be increased to offset the loss of tariff revenue under MTL, overall efficiency related to consumption in Morocco rises, due to the increase in aggregate consumption under this scenario.

In contrast, to the EU-FTA, MTL interacts positively with aggregate labor demand, leading to a 1.4% increase in aggregate employment. This leads to a further boost in aggregate welfare ($666 million vs. $414 million – see Table 5), beyond that obtained in the no-entry, fixed employment case. As with the EU-FTA, permitting entry/exit increases the welfare gains to Morocco from MTL, primarily through the rationalization effect, as firms exit the industry, permitting the remaining domestic firms to expand their scale of production.

In summary, not only does MTL give more of the traditional welfare gains than a comparably-sized EU-FTA, it also interacts positively with two of the major structural features of the Moroccan economy, namely: the high degree of concentration and market power in some of the manufacturing sectors, and the high rate of unemployment amongst unskilled workers.

Sectoral Effects: Under the fixed entry, full employment scenario (third panel of table 5) output (and output per firm) increase in six manufacturing sectors out of 15. More significantly, many sectors that expand are export-oriented sectors for which Morocco has a comparative advantage. These are food processing, beverages & tobacco, chemical products and light manufacturing. Under this scenario, wearing apparel shows a slight contraction, as the ROW region displaces Morocco in the EU market. Imports into Morocco now come from both the EU (although at much lower rates of increase than under the FTA), as well as from ROW, which increases sales to Morocco in 10 out of 15 manufacturing sectors (see Table 6).

In the presence of entry and exit, the main difference compared to no-entry case is the wearing apparel that now expands moderately (1.9%). The other export-oriented sectors also grow, except for beverages and tobacco (b_t) and dairy products (drp) that contract under the entry/exit case. In these highly concentrated sectors, markup reductions are among the highest, and as a result of industry rationalization, the degree of firm exit exceeds the rise of output per firm, resulting in a net decline in sectoral output. In the case of wearing apparel- a comparatively low concentration industry, the extent of firm exit is smaller than the increase in output per firm, resulting in a net rise in sector output under free entry scenario.

VII. Conclusions

This paper has compared the potential impacts on Morocco's welfare, production and trade, from implementing the Morocco-EU FTA – currently being phased in -- and incremental multilateral liberalization of comparable magnitude. The analysis pays special attention to two key structural features of the Moroccan economy: the highly concentrated industrial sector, and the rigid real wage for unskilled labor that has contributed to high levels of unemployment. Calibration of the analytical framework's market structure features was based on detailed firm level industrial data using 1995 Moroccan industrial census. The analysis examined the FTA and multilateral scenarios under a tax replacement closure whereby the value-added tax is raised to compensate lost tariff revenues. Different assumptions regarding

firm entry and exit in the imperfectly competitive sectors, as well as the functioning of the labor market were tested.

Results show that the FTA with the EU generates a welfare loss for Morocco. Much of the loss arises from substantial TOT losses that outweigh the modest gains in resource allocation efficiency. The latter are dampened due to the discriminatory nature of tariff removal under the FTA, as well as the added distortions from the consumption tax for revenue replacement. Many manufacturing sectors contract under FTA and only few export oriented sectors, such as clothing, expand production. Hence it appears that the main effect of FTA with the EU is to lock the Moroccan manufacturing sector even more firmly into its current pattern of specialization, favoring a few labor-intensive sectors such as wearing and apparel, for which preferential access to the EU market is significant. While this may have been attractive in the past, it seems like a far less satisfactory strategy today, with international trade barriers continuing to fall, and with Morocco facing the inevitable erosion of its trade preferences in the EU. This is particularly striking in the case of textiles and apparel, where the existing quotas are scheduled for removal at the end of 2004. In this environment, multilateral trade liberalization appears to be much more favorable to Morocco. Not only do the traditional efficiency gains dominate the TOT losses, but this liberalization strategy also interacts in a more positive way with Morocco's highly concentrated industry structure, as well as increasing (as opposed to diminishing) the demand for unskilled labor in Morocco. In summary, Morocco would be well advised to invest more of its energy in helping to obtain a positive outcome in the multilateral trade negotiations.

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Figure 1. Morocco's Textiles and Clothing trade patterns (1970-1998). Source: GTAP Data Base version 4.

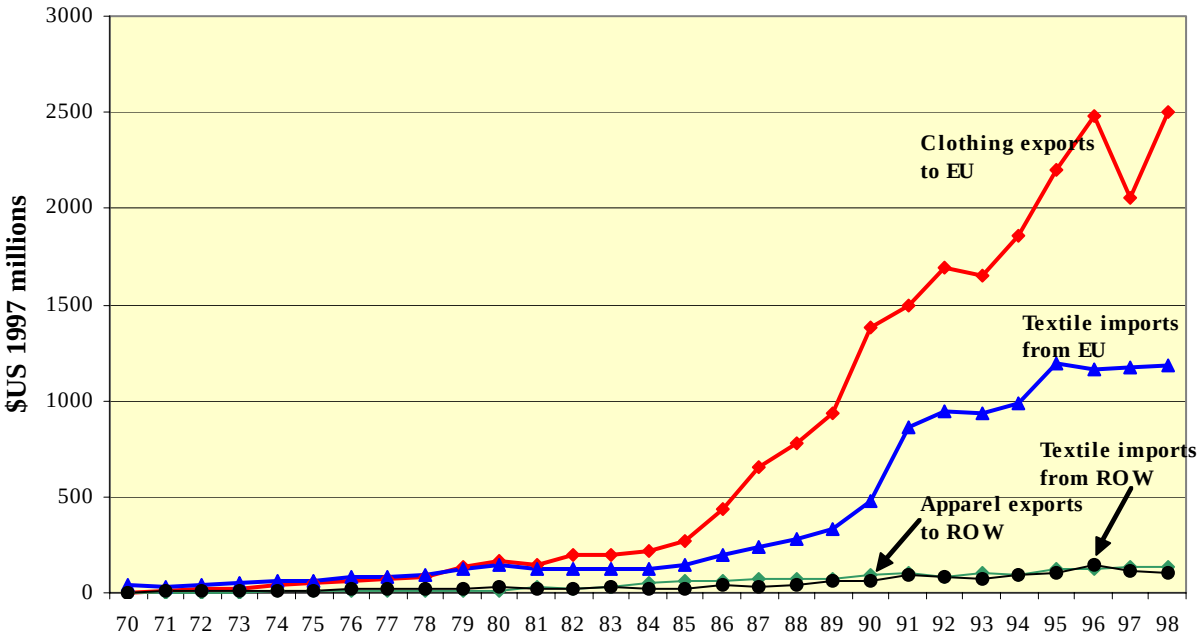

Table 2. Morocco's shares of total exports and imports by partner (percent)

	1994	1995	1997	1998	1999	2000
EXPORTS						
Eureopean Union	**63.5**	**61.6**	**60.2**	**58.7**	**72.8**	**74.3**
Other Europe	1.6	1.9	2	2.2	1.2	1.1
Middle East/Mediter	8.1	8	5.7	4.7	3.6	3.2
Japan	6.6	7.7	5.6	5.7	3.6	3.8
India	6.4	6.6	8.3	6.9	4.8	4.2
USA	3.5	3.4	3.5	3.6	3.4	3.4
Other	10.3	10.8	14.7	17.8	10.6	10.1
IMPORTS						
European Union	**55.9**	**55**	**51.2**	**55**	**60.1**	**57.4**
OPEC Countries	12.1	11	12	7.4	7.4	10.5
USA	8.6	6.6	6.5	7.3	6.5	5.6
Other	20.6	22.7	25.2	25.8	21.5	22.6

Source: Banque Marocaine du Commerce Exterieur (various issues)

Table 3. Share of Morocco's exports and imports by partner (1998; percent total)

	EXPORTS TO:				IMPORTS FROM:		
	European Union	Third countries	Total		European Union	Third countries	Total
EXPORTS				**IMPORTS**			
Fruit & Veg	70.8	29.2	100	Grains	44.3	55.7	100
Minerals	46.9	**53.1**	100	Sugar	1.8	98.2	100
Proc Food	56	**44**	100	Food products	73.3	26.7	100
Textile	88.1	11.9	100	Textiles	92.2	7.8	100
Clothing	94.9	5.1	100	Clothing	93.4	6.6	100
Wood products	91.5	8.5	100	Wood products	79.4	20.6	100
Paper paste	66.7	**33.3**	100	Paper products	86.1	13.9	100
Chemical products	30.5	**69.5**	100	Chemical products	71.7	28.3	100
metal industry	86.6	13.4	100	metal industry	66.1	33.9	100
Motor & vehicles	100	0	100	Motor & vehicles	56.5	43.5	100
Light manufacturing	80.5	19.5	100	Light manufacturing	83.4	16.6	100
Other manufacturing	66.1	**33.9**	100	other manufacturing	73.1	26.9	100
Total	73.3	26.7	100	Total	72.5	27.5	100

Source: GTAP database version 5.3

Table 4. Tariff rates and Market Structure Data for Morocco (1995)

Table 4. Tariff rates and Market Structure Data for Morocco

(percent)	*Tariff rates*				*Market structure data(b)*				
	Morocco	*E_U*		*ROW*					
		From MOR [(a)]	*From ROW*		*Herfindhal Index [(c)]*	*Perceived demand elasticity*	*Price-marginal cost Markup [(d)]*	*Price-average cost Markup [(d)]*	*Economies of scale (CDR) [(e)]*
Primary Agriculture									
Grains crops	124.00*	8.59	8.59	96.95					
Vegetables-fruits	18.26	0.00/3.00	1.95	12.48					
Oil seeds	90.97*	0.00	0.00	6.61					
Sugar crops	4.11	35.07	35.07	36.03					
Other agriculture	14.25	4.25	4.25	10.74					
Livestock	4.00	5.91	5.91	11.24					
Other Primary									
Fishing	22.88	2.55	2.55	6.07					
Forestry	11.58	0.00	0.00	1.44					
Energy products	5.45	0.12	0.12	3.54					
Minerals	3.41	0.00	0.00	2.44					
Manufacturing									
Meat products	24.00*	0.00	13.12	31.22	0.2173	4.31	1.11	1.25	0.24
Vegetable oils & fat	13.80	50.60	64.20	21.75	0.4250	3.56	1.33	1.05	0.16
Dair products	23.03	0.00	5.58	62.07	0.4254	2.04	1.49	0.91	0.13
Sugar	148.00*	5.58	5.58	62.07	0.4893	1.70	2.39	0.80	0.11
Other food products	25.30	0.00/1.50	3.29	10.32	0.0790	1.81	1.06	1.06	0.10
Beverages & Tobacco	18.91	0.00/2.30	1.84	31.23	0.7907	1.85	2.45	0.64	0.10
Textiles	27.79	0.00	1.73	20.92	0.1214	3.77	1.07	1.20	0.19
Wearing apparel[f]	34.04	0.00	4.90	12.16	0.0434	3.99	1.02	1.00	0.19
Wood products	12.91	0.00	0.73	4.97	0.3236	2.22	1.26	0.96	0.11
Paper & Publishing	20.59	0.00	0.52	5.55	0.2218	1.56	1.21	1.07	0.20
Chemical products	17.41	0.00	0.83	8.49	0.3892	2.37	1.35	1.00	0.16
Metal products	12.64	0.00	0.78	7.80	0.2315	1.98	1.19	0.97	0.09
Motor vehicles	21.75	0.00	1.10	9.29	0.2867	5.31	1.10	1.27	0.25
Light manufacturing	18.82	0.00	1.37	6.28	0.4138	4.19	1.21	1.06	0.15
Other maunfacturing	34.03	0.00	2.47	8.12	0.5141	2.39	1.49	0.91	0.14

Sources: GTAP data base version 4; tariff values with "" were compiled from various sources.*

(a) Tariff rates from Morocco into EU reflect trade agreements in force between the two partners prior to the FTA.

(b) All manufacturing and market structure data are authors' calculations from annual manufacturing survey (Moroccan Ministry of Commerce and Industry)

(c) Herfindhal indices for the other model regions, EU and ROW (proxied by USA) were taken from Haaland and Tellefsen (1994)

(d) Benchmark price-cost markups were calibrated from a Cournot oligopoly model using Herfindhal indices and perceived demand elasticity.

(e) Cost disadvantage ratios (CDR) were derived from the Moroccan manufacturing census data
CDR values for EU were taken from Harrison, Rutherford and Tarr (1994) and for ROW (proxied by USA) from Roland-Holst, Reinert and shiells (1994).

(f) For wearing apparel we scaled down the power of markup to remove profit losses in the sector which also resulted in zero profits in aggregate for all manufacturing sectors

Table 5. Static Welfare Effects of FTA and Multi-lateral liberalization on Morocco (US 1997 millions)

	FTA scenarios			Multilateral liberalization scenario		
	No entry	Entry	No entry and Unempl.	No entry	Entry	No entry and Unempl.
Total welfare	**-392.0**	**-16.0**	**-1935.9**	**414.6**	**528.0**	**666.4**
Allocative Efficiency	596.8	659.3	445.3	622.1	656.7	645.8
Labor Endowment	0.0	0.0	-1327.2	0.0	0.0	213.8
Scale Economies	-305.7	68.8	-404.7	-18.7	83.1	-1.7
Terms of trade	-683.2	-744.1	-649.3	-188.7	-211.8	-191.5
Allocative Efficiency	**596.8**	**659.3**	**445.3**	**622.1**	**656.7**	**645.8**
Profit shifting	149.0	126.3	173.7	8.1	-8.7	5.5
Input tax	-28.0	-40.8	-35.3	-1.5	-4.8	-0.2
Consumption tax	-86.1	-35.4	-198.8	9.6	17.8	21.1
Export tax	122.6	138.8	115.9	44.8	49.4	45.5
Import tax	439.2	470.4	389.9	561.1	603.1	573.9
Aggregate Labor (percent change)			-8.4			1.4

Source: Authors' simulation results

Table 6. Static FTA effects on Morocco's output, markups and trade

Sector	*Average Mkt Share for Industry (%)*	*Number of firms (%)*	*Markups (%)*	*Output per firm (%)*	*Sectoral Output (%)*	*Imports from EU (%)*	*Imports from ROW (%)*	*Exports (%)*	*Domestic sales (%)*
				FTA, NO ENTRY					
Meat products	-55.55	0	-0.06	-15.27	-15.27	324.61	-50.96	16.99	-42.45
Vegetable oils & fat	-6.52	0	-0.20	0.24	0.24	18.74	-18.98	17.08	-4.62
Dairy products	-22.19	0	-5.09	-19.55	-19.55	204.00	-47.15	39.84	-23.52
Sugar	0.42	0	0.28	-1.52	-1.52	3736.05	-10.05	8.77	-1.64
Other food products	-5.75	0	-0.35	-0.57	-0.57	125.07	-17.29	14.29	-4.53
Beverages & Tobacco	-2.77	0	-4.37	2.19	2.19	158.36	-52.2	102.08	0.28
Textiles	-51.81	0	-0.26	-0.44	-0.44	26.72	-60.32	63.83	-33.57
Wearing apparel	-44.84	0	-0.38	8.62	8.62	305.06	-67.31	77.88	-23.33
Wood products	-30.83	0	-5.17	-23.32	-23.32	225.6	-64.89	88.5	-29.44
Paper & Publishing	-13.66	0	-2.44	-14.76	-14.76	93.1	-42.37	40.16	-17.29
Chemical products	-23.19	0	-2.35	-4.80	-4.80	68.61	-38.34	28.25	-17.00
Metal products	-14.88	0	-2.74	-13.06	-13.06	134.06	-47.85	53.51	-16.02
Motor vehicles	-47.51	0	-1.76	-38.47	-38.47	106.16	-82.69	204.54	-46.42
Light manufacturing	-18.75	0	-0.65	10.90	10.90	26.55	-32.4	44.1	-3.24
Other maunfacturing	-31.81	0	-7.57	-12.54	-12.54	162.68	-63.36	99.19	-24.68
				FTA, WITH ENTRY					
Meat products	-55.75	-13.33	0.75	-3.03	-15.95	330.27	-50.3	15.59	-42.53
Vegetable oils & fat	-4.96	1.30	-0.33	2.11	3.43	19.12	-18.72	20.41	-1.47
Dairy products	-26.60	-24.68	0.41	-3.01	-26.95	247.67	-39.56	14.7	-29.73
Sugar	1.05	1.48	0.09	-0.88	0.58	3645.26	-12.18	13.4	0.43
Other food products	-5.95	-1.76	-0.28	2.89	1.08	121.65	-18.54	17.39	-3.27
Beverages & Tobacco	-4.83	-9.09	-0.90	9.86	-0.12	208.05	-43	68.71	-1.44
Textiles	-50.50	1.25	-0.29	1.55	2.83	29.68	-59.4	67.41	-30.47
Wearing apparel	-44.63	-12.27	-0.28	31.39	15.26	296.44	-68.01	91.56	-19.93
Wood products	-36.11	-34.71	-0.20	1.75	-33.57	268.44	-60.27	48.82	-38.08
Paper & Publishing	-15.38	-18.75	0.42	-2.03	-20.40	102.76	-39.49	26.05	-22.53
Chemical products	-24.31	-11.13	-0.37	2.32	-9.07	70.91	-37.49	22.07	-20.56
Metal products	-16.83	-21.62	-0.32	3.77	-18.67	147.16	-44.93	36.64	-21.12
Motor vehicles	-64.38	-60.74	3.40	-11.79	-65.37	108.72	-82.48	74.2	-69.94
Light manufacturing	-18.51	4.79	-1.10	8.00	13.17	22.74	-34.43	50.32	-2.65
Other maunfacturing	-37.58	-32.19	-0.53	4.08	-29.43	220.3	-55.33	37.42	-36.69
				MULTI-LATERAL, NO ENTRY					
Meat products	-84.00	0.00	-0.09	47.79	47.79	0.11	8.30	170.20	-55.37
Vegetable oils & fat	-35.11	0.00	-1.02	-3.40	-3.40	-21.66	48.25	63.42	-22.71
Dairy products	-11.40	0.00	-2.97	1.54	1.54	22.59	18.45	103.10	-5.26
Sugar	-9.98	0.00	-5.27	-9.14	-9.14	50.81	54.26	62.26	-9.96
Other food products	-6.34	0.00	-0.38	5.67	5.67	32.35	30.39	27.76	-0.22
Beverages & Tobacco	-3.78	0.00	-5.76	5.30	5.30	14.24	-6.62	222.19	1.15
Textiles	-15.98	0.00	-0.09	-1.58	-1.58	4.30	-0.75	15.37	-10.33
Wearing apparel	-8.40	0.00	-0.10	-0.35	-0.35	48.37	45.27	8.61	-4.46
Wood products	-6.22	0.00	-1.46	-3.32	-3.32	38.77	-7.03	22.11	-4.71
Paper & Publishing	-3.33	0.00	-0.68	-2.59	-2.59	20.05	4.68	11.68	-3.25
Chemical products	-8.75	0.00	-0.97	3.03	3.03	15.31	2.42	19.21	-2.94
Metal products	-3.73	0.00	-0.83	-2.13	-2.13	26.28	-0.53	17.39	-3.00
Motor vehicles	-14.38	0.00	-0.69	-9.47	-9.47	23.82	-7.19	95.03	-12.88
Light manufacturing	-6.16	0.00	-0.22	2.08	2.08	5.21	3.98	10.28	-1.41
Other maunfacturing	-7.33	0.00	-2.39	-1.68	-1.68	29.29	6.33	21.80	-4.23
				MULTI-LATERAL, WITH ENTRY					
Meat products	-82.87	49.02	-1.77	7.93	60.84	0.09	8.48	193.90	-51.28
Vegetable oils & fat	-35.79	-6.30	-0.21	1.35	-5.04	-20.99	49.72	59.83	-23.79
Dairy products	-12.41	-8.90	-1.04	8.59	-1.08	29.06	24.79	90.25	-7.19
Sugar	-14.05	-17.70	-0.29	2.88	-15.33	74.92	79.70	32.28	-15.88
Other food products	-6.53	1.44	-0.45	4.66	6.16	31.08	29.34	29.25	0.01
Beverages & Tobacco	-6.43	-11.81	-1.12	12.47	-0.81	46.09	19.40	143.40	-3.57
Textiles	-15.80	-1.45	-0.04	0.20	-1.25	4.67	-0.38	15.50	-9.89
Wearing apparel	-8.65	-4.06	-0.06	5.47	1.19	46.04	43.09	11.58	-3.58
Wood products	-7.08	-7.90	-0.34	3.04	-5.10	43.56	-3.84	16.53	-6.29
Paper & Publishing	-3.58	-4.02	-0.08	0.38	-3.65	21.20	5.68	9.62	-4.26
Chemical products	-8.86	-1.62	-0.69	4.42	2.72	15.15	2.33	19.02	-3.29
Metal products	-4.08	-5.53	-0.20	2.28	-3.37	28.09	0.90	14.36	-4.16
Motor vehicles	-17.64	-15.97	0.10	-0.40	-16.30	24.49	-6.95	80.51	-19.46
Light manufacturing	-5.98	0.64	-0.28	1.95	2.61	4.10	2.94	11.68	-1.26
Other maunfacturing	-8.50	-8.54	-0.50	3.85	-5.02	37.84	13.35	11.20	-6.78

Source: Authors' simulation results

Appendices

Appendix A: GTAP Model Description

A.1. Intermediate and Final Demand

Demand for intermediate inputs is modeled via a two-stage CES function. In the lower stage, a CES function is used to aggregate each imported good, differentiated by region of origin into a single import composite (Hertel, 1997; chapter 2). A second CES function aggregates imports and domestically produced goods into a single composite good (Armington assumption). Firms first decide on the sourcing of their imports and then based on the resulting price of the import composite, determine the optimal mix of imported and domestic goods. Although the same value of Armington substitution elasticity is used across uses (final versus intermediate demand) firms or consumers' composite import demand are distinguished by their different import shares.

Final demand is treated via a regional household, which receives all income that is generated in the economy including factor income, quota rents, and net taxes adjusted for the value of depreciation. Regional income is allocated to private consumption, government and savings according to a Cobb Douglas utility function. Consumers' utility takes the form of a Constant Difference Elasticity (CDE) minimum expenditure function (Hanoch 1975). This functional form allows for non-homothetic preferences, which are important when per capita income changes significantly. The CDE form also lends itself to calibration based on existing data on income and own-price elasticities (Hertel et al., 1992).

There are five factors of production (land, unskilled labor, skilled labor, capital and natural resources) in fixed supply with labor and capital mobile across sectors while land and natural resources are sector-specific. Perfect mobility of labor and capital across sectors means that wage and rental rates are equalized across sectors. In this analysis, the aggregate economy-wide level of unemployment implicit in the benchmark data base is assumed to be unaffected in the long run by the FTA[17]. In the formation of a value added composite, firms substitute among the five primary factors using a common elasticity of factor substitution (farmland is exclusively employed in agriculture and extractive natural resources are also sector-specific).

Welfare is derived at the regional level as an equivalent variation computed from regional income and prices, based on the regional household's utility function. Moreover, it can be decomposed into component parts using an approach developed by Huff and Hertel (1996). This decomposition approach may be viewed as a generalization of Baldwin and Venables' analytical decomposition, which accommodates domestic distortions and handles non-marginal changes via numerical integration.

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[17] The analysis assumes that wages are market-determined such that the base-year unemployment rate is unaffected by the FTA. This assumption, however, could be relaxed by fixing wages and allowing aggregate labor demand to adjust, thereby altering the aggregate rate of unemployment.

A.2. Derivation Of Perceived Demand Elasticity

The derivation of the perceived demand elasticity for a given industry starts from the demand function of the form:

$$X_{i,r} = \alpha_{i,r}^{\sigma} P_{i,r}^{-\sigma} \theta_r^{\sigma-1} E_r \qquad (6)$$

where $X_{i,r}$ is demand by region *r* for goods of origin *i*, $P_{i,r}$ is price of commodity in region *r* of origin *i*, θ_r is price index in region *r* dual to the Armington aggregator, E_r is total expenditure value of region *r* on the commodity group, and σ is elasticity of substitution between goods of different origin – assumed to be identical across all regions.

By assumption, both domestic and export markets are integrated – that is domestic firms are not able to engage in regional price discrimination, but face a single, world-wide market demand curve for their product, and thus have only one decision variable (namely their total quantity to the integrated world market). We write the total demand function faced by oligopolists in region *i* as:

$$X_i(.) = \sum_r X_{i,r}(.) \qquad (7)$$

Assuming total constant expenditure for the composite commodity, a general form of the perceived market demand elasticity can be written as (Francois and Roland Holst, 1997):

$$\varepsilon_i = -\hat{X}_i / \hat{P}_i = \sigma + (1-\sigma) \sum_r \frac{X_{i,r}}{X_r} \frac{\hat{\theta}_r}{\hat{P}_i} \qquad (8)$$

where the hat notation is used to indicate proportional changes.

Now the elasticity of the share θ_r with respect to P_i depends on domestic *i* firms' conjectures about foreign rivals' responses to a change in their own price. In general form:

$$\frac{\hat{\theta}_r}{\hat{P}_i} = \sum_k S_{k,r} \frac{\hat{P}_{k,r}}{\hat{P}_i} \qquad (9)$$

where

$$S_{k,r} = \alpha_{k,r}^{\sigma} \left[\frac{P_{k,r}}{\theta_r} \right]^{1-\sigma} \qquad (10)$$

denotes the market share of goods from region *k* in region *r* within the commodity group under consideration. Now we assume that the firms take foreign rival' prices as given, so that: $d \ln P_k / d \ln P_i = 0$ for $k \neq i$ (the Bertrand assumption). The perceived market demand elasticity from equation (8) becomes

$$\varepsilon_i = -\hat{X}_i / \hat{P}_i = \sigma + (1-\sigma)\sum_r \frac{X_{i,r}}{X_i} S_{i,r} \qquad (11)$$

A.3. Entry and Exit Model Specification

To explore the implications of this, begin with the following equation which determines profits per unit of output:

$$P = AVC + \frac{FC}{x} + \Pi \qquad (7)$$

The combination of the optimal markup and zero profit conditions, (5) and (7), has strong implications for the relationship between the markup and the scale of production in the entry-exit equilibrium. This may be seen most readily by totally differentiating (7), and subtracting $\Omega_\Pi \hat{P}$ from both sides, yielding:

$$\hat{P} - \Omega_\Pi \hat{P} = \Omega_v \hat{AVC} + \Omega_F (\hat{FC} - \hat{x}) + \Omega_\Pi \hat{\Pi} - \Omega_\Pi \hat{P} \qquad (8)$$

where Ω_v, Ω_F *and* Ω_Π are the shares of variable costs, fixed costs, and profits in total revenue and "^" denotes proportional change. This may be rearranged as follows:

$$\hat{P} = [\Omega_v \hat{AVC} + \Omega_F (\hat{FC} - \hat{x}) + \Omega_\Pi (\hat{\Pi} - \hat{P})] / [1 - \Omega_\Pi] \qquad (9)$$

But the change in price is also linked to the optimal power of the markup (M) and marginal costs via (5), so that:

$$\hat{P} = \hat{M} + \hat{C} \qquad (10)$$

Equating (9) and (10), and recognizing that $AVC = MC$ under the assumed variable cost function, then:

$$\hat{M} + \hat{AVC} = [\Omega_v \hat{AVC} + \Omega_F (\hat{FC} - \hat{x}) + \Omega_\Pi (\hat{\Pi} - \hat{P})] / [1 - \Omega_\Pi] \qquad (11)$$

But we have also assumed a homothetic cost structure, such that the input composition of fixed and variable costs is the same. Therefore, these costs change at the same rate, as factor prices change. Thus, $\hat{FC} = \hat{AVC}$ and (11) simplifies, using the fact that the revenue shares sum to one:

$$\hat{M} + \hat{AVC} = [(1 - \Omega_\Pi) \hat{AVC} - \Omega_F \hat{x} + \Omega_\Pi (\hat{\Pi} - \hat{P})] / [1 - \Omega_\Pi] \qquad (12)$$

Canceling the $\hat{AVC}$ terms from both sides and setting the change in the unit profit rate equal to zero, we have the following relationship between markups and output per firm:

$$\hat{M} = -\{\Omega_F / [1 - \Omega_\Pi]\} \hat{x} \qquad (13)$$

This relationship appears in the text as equation (7).

Appendix Table A1. Composition of Morocco's exports to EU and third countries (1970-98; % of total exports by destination)

	1970-74	1975-79	1980-84	1985-89	1990-94	1995-98
EXPORTS TO EU						
AgProd	75.0	59.6	40.6	32.1	21.6	13.0
Clothing	3.5	9.7	16.5	31.3	45.1	38.7
ChemIndus	1.1	3.6	7.1	6.7	7.3	6.7
LightMnfct	0.4	1.4	2.6	4.5	6.5	8.7
OthMnfct	2.6	4.3	6.3	5.7	4.9	3.9
Other	17.4	21.4	26.8	19.7	14.6	29.0
EXPORTS TO ROW						
AgProd	55.0	41.7	20.9	17.9	23.5	21.4
Clothing	2.1	4.9	5.1	7.9	6.5	5.5
ChemIndus	4.1	14.5	39.6	36.5	34.0	26.1
LightMnfct	1.6	0.4	0.4	1.8	5.0	5.5
OthMnfct	14.6	9.9	4.9	6.9	8.0	4.7
Other	22.7	28.5	29.2	29.1	23.0	36.9

Source: GTAP database version 5.3

Appendix Table A2. Scale and markup effects for oligopolistc manufacturing sectors under FTA and Multilateral liberalization for Morocco

	NO ENTRY		WITH ENTRY	
	Scale effects	Markup effects	Scale effects	Markup effects
FTA				
Meat products	-0.38	0.32	-0.07	0.31
Vegetable oils & fat	0.08	-0.02	0.72	-0.32
Dairy products	-9.97	-3.57	-1.10	-9.28
Sugar	-1.37	-3.37	-0.82	1.32
Other food products	-2.34	1.43	11.69	-2.64
Beverages & Tobacco	0.68	3.70	2.88	-0.18
Textiles	-1.76	1.47	3.78	-5.63
Wearing apparel	7.31	-1.83	22.81	-1.08
Wood products	-24.04	1.52	1.91	-10.18
Paper & Publishing	-48.30	21.60	-5.57	21.68
Chemical products	-30.59	2.38	13.54	-0.87
Metal products	-56.69	-7.28	13.76	-28.99
Motor vehicles	-167.08	148.81	-25.74	193.62
Light manufacturing	37.10	-13.63	28.54	-17.76
Other maunfacturing	-8.32	-2.51	2.44	-13.69
Total	**-305.67**	**149.02**	**68.77**	**126.31**
MULTI-LATERAL				
Meat products	0.90	-0.72	0.21	-1.16
Vegetable oils & fat	-1.18	0.36	0.43	0.48
Dairy products	0.70	0.39	3.65	-0.37
Sugar	-8.68	-17.12	2.42	-34.14
Other food products	22.69	-13.55	18.93	-14.98
Beverages & Tobacco	1.68	8.89	3.61	-1.52
Textiles	-4.18	3.61	0.51	2.84
Wearing apparel	-0.32	0.04	4.79	-0.09
Wood products	-3.17	-0.76	2.71	-1.59
Paper & Publishing	-8.22	3.03	1.17	3.96
Chemical products	18.99	-0.04	27.33	0.27
Metal products	-8.95	-2.82	9.16	-5.33
Motor vehicles	-35.56	30.30	-1.36	48.93
Light manufacturing	7.64	-2.86	7.21	-3.62
Other maunfacturing	-1.08	-0.68	2.32	-2.38
Total	**-18.74**	**8.08**	**83.09**	**-8.71**

Source: Authors' simulation results

Appendix Table A3. Commodity Aggregation and Mapping with the GTAP V4 Sectoral Classification

Model sectors:		*GTAP sectoral classification:*
Agriculture & Other Primary sectors:		
1	Grains crops	Paddy rice (pdr); Wheat (wht); Cereal grains nec (gro)
2	Vegetables-fruits	Vegetables, fruit, nuts (v_f)
3	Oil seeds	Oil seeds (osd)
4	Sugar crops	Sugar cane, sugar beet (c_b)
5	Plant-based fibers	Plant-based fibers (pfb)
6	Other agriculture	Crops nec (ocr); Wool silk-worm cocoons (wol)
7	Livestock	Bovine cattle, sheep and gots, horses (ctl); Animal products nec (oap); Raw milk (rmk)
8	Fishing	Fishing (fsh)
9	Forestry	Forestry (for)
10	Energy products	Coal (col); Oil (oil); Gas (gas); petroleum coal products (p_c)
11	Minerals	Minerals nec (omn)
Manufacturing:		
12	Meat products	Bovine cattle, sheep, goat, horse meat products (cmt); Meat products nec (omt)
13	Vegetable oils & fat	Vegetable oils and fats (vol)
14	Dairy products	Dairy products (mil)
15	Sugar	Sugar (sgr)
16	Other food products	Processed rice pcr); Food products nec (ofd)
17	Beverages & Tobacco	Beverages and tobacco products (b_t)
18	Textiles	Textiles (tex)
19	Wearing apparel	Wearing apparel (wap); Leather products (lea)
20	Wood products	Wood products (lum)
21	Paper & Publishing	Paper products, publishing (ppp)
22	Chemical products	Chemical, rubber, plastic products (crp)
23	Metal products	Mineral products nec (nmm); Ferrous metals (i_s); Metals nec (nfm); Metal products (fmp)
24	Motor vehicles	Motor vehicles and parts (mvh); Transport equipment nec (otn)
25	Light manufacturing	Electronic equipment (ele); Machinery and equipment nec (ome)
26	Other maunfacturing	Manufactures nec (omf)
Services:		
27	Utilities	Electricity (ely); Gas manufacture distribution (gdt); water (wtr)
28	Other services	Construction (cns); Trade, transport (t_t); Financial, business, recreational services (osp); Public admin and defence, education, health (osg); Dwellings (dwe)