

**AN INTER-TEMPORAL, MULTI-REGION GENERAL  
EQUILIBRIUM MODEL OF AGRICULTURAL TRADE  
LIBERALIZATION IN THE SOUTH MEDITERRANEAN NIC's,  
TURKEY, AND THE EUROPEAN UNION**

Ali Bayar  
Universite Libre de Bruxelles, Belgium

Xinshen Diao  
International Food Policy Research Institute, Washington D.C.

and

A. Erinc Yeldan  
Bilkent University, Ankara

*With the aid of an intertemporal, multi-region general equilibrium model, we study issues of agricultural trade liberalization, growth and capital accumulation in the context of a world economy moving towards a multi-polar structure. We specifically focus on Turkey, the European Union, the Middle East, and the Economies in Transition; and study alternative scenarios of formation of customs unions and increased trade orientation.*

*The model is based on intertemporal general equilibrium theory with Ramsey-type dynamics. The world economy is fully endogenized within a 9-region specification, with Turkey, EU, Middle East and the Transition Economies constituting as one of the indigenous regions. A key feature of the model is its explicit recognition of both the commodity and foreign capital flows across regions in an endogenous setting, and its explicit portrayal of the out-of-steady state dynamics under an intertemporal optimization framework. We explore the short- versus the long-run economic impacts of alternative trade and investment policies on agricultural production, foreign trade, resource allocation, accumulation, consumer welfare, and income distribution in the regions of analysis. Our results reveal significant gains from increased bilateral trade between the identified regions, and further underscore the crucial importance of financing commodity trade deficits in sustaining the accumulation patterns.*

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## I. Introduction

Currently, the post-Uruguay world economy is widely viewed as moving towards a multi-polar structure based on regional trade agreements (RTAs). Indeed, now almost every country in the world is either a direct member or an associate of an RTA, and it is reported that nearly 60 percent of world trade is transacted now within such blocs (Schiff and Winters, 1998). The emphasis of the world trading regime seems to have shifted from one in which trade relations between nations were almost entirely multilateral to one in which the existing –and quite open- multilateral system co-habits with various preferential trading blocs and RTAs.

Thus, as such, there is now a growing interest on the economics of formation of customs unions and free trade blocs. At face value, it is not clear that the current trends on RTAs will constitute a welfare-improving outcome, or not. The theoretical debate on the welfare effects of a customs union dates far back to Viner (1950), who had pointed out that the net effects could be ambiguous. Accordingly, a customs union could result in both beneficial *trade creation* among its members, as trade barriers within the group were reduced, and also *trade diversion*, in which the increased trade between the member countries might occur at the expense of trade formerly with (probably lower cost) third countries. Thus, existing economic studies tackling the issue have faced an inadequate theoretical framework; and in the absence of a well-developed theory of regional trade zoning and formation, most analysts relied on simulation-based, applied general equilibrium modeling techniques to assess the impact of free trade blocs on output, accumulation, trade, and consumer welfare.<sup>1</sup>

The motivation of the current study derives from this growing body of modeling paradigm to analyze the nexus of these issues. In this preliminary version, we exclusively focus on the effects of extending the trade policy reform initiatives over Turkey, EU, Middle East and the so-called Economies in Transition. We investigate the likely effects on fiscal balances, capital accumulation, and on growth in an intertemporal equilibrium framework. The prevalence and nature of the linkages between globalization of the financial markets and regional capital accumulation patterns, and their effects on production and trade balance are extensively analyzed. Account is also given on issues of bilateral trade and capital flows among the identified regions and other large trading blocks of the global economy.

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<sup>1</sup> See, for instance, Smith and Venables (1988), and Mercenier (1995) on Europe; Behar (1995) and Diao and Somwaru (1996) on MERCOSUR; Kehoe and Kehoe (1994) on NAFTA. For a recent review of the political economy issues surrounding the RTAs, see the symposium on “Regionalism and Development” held in the *World Bank Economic Review*, 12(20), May, 1998.

The model is based on intertemporal general equilibrium theory with Ramsey-type dynamics. The world economy is fully endogenized within a 9-region specification, with Turkey, EU, Middle East and the Transition Economies constituting as one of the indigenous regions. A key feature of the model is its explicit recognition of both the commodity and foreign capital flows across regions in an endogenous setting, and its explicit portrayal of the out-of-steady state dynamics under an intertemporal optimization framework. The rest of the paper is organized as follows: In section II we introduce our modeling approach and discuss the main attributes of our economic structures, and study various issues of trade liberalization under alternative policy scenarios in section III. We provide summary conclusions in Section IV.

## **II. The model**

### *II-1. Overview*

The model is based on dynamic macroeconomic theory with a multi-region and multi sector specification, and draws in many ways upon the recent contributions of dynamic applied general equilibrium modeling by McKibbin (1993), Mercenier and Sampaio de Souza (1994), Mercenier and Yeldan (1997), Diao, Roe and Yeldan (1999), and Diao and Somwaru (1997). The world economy is aggregated into nine regions.<sup>2</sup> In each region, there are nine production sectors each of which produces a single commodity. All the regions are fully endogenous in terms of their producers and consumers' economic behavior. Furthermore, in a multi-region and multi-sector global model, commodity trade flows are kept track by their geographical and sectoral origin and destination. Countries are further linked by an Armington system so that sectoral commodities are differentiated in demand and supply by their geographical origin.

Firms in each region produce goods and conduct capital investment so as to maximize firm's valuation. Infinitely-lived households consume home produced and imported goods to maximize an intertemporal utility function. Household income is consumed or saved in the form of equity in domestic firms or foreign bonds. Home firm equities and foreign bonds are assumed to be perfect substitutes. Through equity purchases by households, the world "pool" of savings is channeled to profitable investment projects without regard to the national origin of savings. Technological change and population growth are exogenous and hence are assumed to be zero in the model.<sup>3</sup> The detailed description of the model is as follows:

### *II-2. Firms and investment*

We assume that firms within each sector of every region can be aggregated into a representative firm. The representative firm operates with constant returns to scale technology. The value added production function for labor and capital is of Cobb-Douglas, while the intensities of intermediate goods are fixed. The representative firm chooses, at each time period, the input levels of labor and intermediate goods and makes investment decision to maximize the value of the firm. With constant returns to scale technology, the number of firms does not matter.

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<sup>2</sup> Appendix Table 1 provides the aggregation scheme of the geographical regions.

<sup>3</sup> This specification has no real effects on the model, since, alternatively, we could normalize all variables in per capita terms.

Hence, we assume that the firm finances all its investment outlays by retaining profits so that the number of firm equities within each sector of a region remains unchanged.

A starting point for specifying the firm's optimizing behavior is the condition of asset market equilibrium, i.e., the expected returns from holding the equity in the firms must be in line with those from holding a 'safe' asset, such as foreign bonds, at any time period:

$$r = \frac{div_i}{V_i} + \frac{\Delta V_i}{V_i}$$

where  $r$  is the world interest rate,  $V_i$  is the market value of firm  $i$ ,  $div_i$  is the current dividend payments, and  $\Delta V_{i,t+1} - V_{i,t}$  is the expected annual gain on firm equity. Assuming an efficient financial capital market, each region faces the same world interest rate.

Firms' intertemporal decision problem can be restated more rigorously as follows: in each region's sector  $i$ , ( $i=1,2,\dots,6$ ), the representative firm chooses the optimal investment and labor employment strategies,  $\{I_{i,t}, L_{i,t}\}_{t=1,\dots,\infty}$ , to maximize the present value of all future dividend payments, taking into account expected future price of output, unit value of sector specific capital equipment, and labor wage,  $\{P_{i,t}, PI_{i,t}, w_t\}_{t=1,\dots,\infty}$ , and the capital accumulation constraint. Formally,

$$Max V_i = \sum_{t=1}^{\infty} R_t div_{i,t} \equiv \sum_{t=1}^{\infty} R_t \left[ P_{i,t} (f_i(K_{i,t}, L_{i,t}) - a_{i,t}) - w_t L_{i,t} - PI_{i,t} I_{i,t} \right]$$

subject to

$$K_{i,t+1} = (1 - d)K_{i,t} + I_{i,t}$$

where  $R_t = \prod_{s=1}^t 1/(1+r_s)$  represents the discount factor;  $I_{i,t}$  is quantity of new capital equipment built through investments at time  $t$ ;  $d_i$  is a positive capital depreciation rate; and  $a_t$  represents the capital adjustment costs and  $\gamma$ s assumed to be of the following form:

$$a_{i,t} = f_i P_{i,t} \frac{I_{i,t}^2}{K_{i,t}}$$

Because of the presence of adjustment costs on capital, marginal products of capital differ across sectors, resulting in unequal, although optimal rates of investments. We assume that labor is perfectly mobile across sectors (but immobile internationally), and firms never face any quantity constraints. Also, the structure of newly produced capital equipment in terms of foregone sectoral goods is of Cobb-Douglas form. The foregone sectoral output used for investment purposes can be produced domestically or imported. Hence,  $PI_i$  can be written as a function of the (Armingtonian) composite prices:

$$PI_i = \prod_j PC_j^{d_j}$$

where  $PC_j$  is the price of the composite good,  $I$ ,  $0 < d_j < I$ , and  $\sum_j d_j = 1$ .

### II-3 The Household and Consumption/Savings.

In each region, the representative household owns labor and all private financial assets, namely, equity in domestic firms and foreign bonds. The household allocates income to consumption and savings to maximize an intertemporal utility function over an infinite horizon:

$$\text{Max} \sum_{t=1}^{\infty} \left( \frac{1}{1+r} \right)^t U(TC_t)$$

subject to the following current budget constraint:

$$SAV_t = w_t L_t + TI_t + div_t + r_t B_{t-1} - P_t^{TC} TC_t$$

where  $\rho$  is the positive rate of time preference;  $TC_t$  is aggregate consumption at time  $t$ ;  $SAV_t$  is household savings,  $B_{t-1}$  is the stock of foreign assets, and  $r_t B_{t-1}$  is interest earned from ownership of foreign bonds.  $P_t^{TC}$  is the consumer price index, and  $TI_t$  is lump sum transfer of government revenues from excise taxes and tariffs. We assume no government saving-investment behavior. "Government" spends all its tax revenues on consumption or as transfers to the households, and hence, public sector borrowing requirement is not explicitly modeled.  $TC_t$ , the instantaneous consumption, is generated from the consumption of final goods by maximizing a Cobb-Douglas function:

$$TC_t = \prod_i C_{i,t}^{b_i}$$

subject to

$$\sum_i PC_{i,t} C_{i,t} = P_t^{TC} TC_t$$

where  $C_{i,t}$  is the final consumption for good  $i$ , and the consumer shares,  $b_i$  satisfy  $0 < b_i < 1$ , and  $\sum b_i = 1$ .

The flow of savings,  $SAV_t$ , is the demand for new foreign bonds issued by other regions, which, under equilibrium, reflects current account balances of the region:

$$SAV_t = B_t - B_{t-1} = r_t B_{t-1} + FBOR_t$$

where a positive  $FBOR_t$  implies a surplus in the region's foreign trade.

*II-4. Equilibrium.* Intra-temporal equilibrium requires that at each time period, (i) demand for production factors equal their supply; (ii) in the world, total demand for each sectoral good equal to its supply; (iii) in the world, the aggregate household savings equals zero. The inter-temporal equilibria are further constrained by the following steady state conditions:

$$r_{ss} = \frac{div_{ss}}{V_{ss}}$$

$$I_{i,ss} = \delta_i K_{i,ss}$$

$$FBOR_{ss} + r_{ss} B_{ss} = 0$$

The first equation above implies that at the steady state, the value of the firm,  $V_{ss}$ , becomes constant and hence the profits,  $div_{i,ss}$ , is simply equal to the interest earnings from a comparable amount of riskless assets. The second equation implies that in each sector- $i$ , investment expenditures just cover the depreciation of sectoral capital; hence in each sector the stock of capital remains constant. Finally, the last one states that under the steady state foreign bond accumulation must be zero, i.e., that future trade deficits must be covered by interest earnings on foreign assets held.

This completes our overview of the model. Full algebraic equations can be obtained from the authors upon request.

### III. Policy Analysis

We now utilize our analytical model to study alternatives of preferential trade agreement blocs among the countries of the MENA region, given their exiting trade patterns with the EU. As a first step we study the CU path between Turkey and the EU as was formulated in 1995. Since Turkey has already signed a CU with EU, we regard this manouver as a historically given fact and trace the new policy environments starting from the Turkish-EU trade integration. The CU agreement between Turkey and the EU which is currently in effect covers mainly industrial commodity trade, with agriculture and services being subject to a grace period. In our next step, we take this issue and expand the initial agreement to full trade liberalization between the two partners, covering all sectors. In what follows, we broaden the geographical coverage to include the Economies in Transition, and the Middle East.

We study two sets of issues: *first*, we look into the country experiences in response to bilateral trade integration with the EU, *given that Turkey had already signed a customs union with the EU*. Here we implement four alternative policy environments each corresponding a bilateral trade agreement with the EU for the following four regions: (i) Turkey; (ii) Morocco; (iii) Other Middle East Countries (OME); and (iv) Other North African Countries (ONA). With the aid of this first set of policy simulations, we try to capture the individual regional macroeconomic responses and welfare changes of each individual region, in response to their bilateral trade liberalization with the EU in the form of a customs union. More formally, under EXP-1A, we first implement a CU between Turkey and the EU by eliminating all bilateral tariffs between the two regions. Furthermore, Turkey accepts the EU tariffication structure with respect to its trade with the third party countries. Thus, Turkey and the EU acts as a unified bloc among each other, as well as with their commodity trade vis-à-vis the rest of the world. In what-follows, we regard this experiment as a historical given fact, and implement, respectively, the same

experiment for Morocco (EXP-1B), Rest of the Middle East (EXP-1C), and the North Africa (EXP-1D).

Under the *second set* of experiments, we study issues of trade integration within the MENA region itself. Here, first we look into the intertemporal macro consequences of a customs union between Turkey, Morocco, The Rest of the Middle East, and North Africa under EXP-2A. Continuing from this environment, we extend the customs union to include the Transitional Economies and the Former Soviet Union under the simulation EXP-2B. Finally, in simulation EXP-3, we look into the ultimate exercise of full trade liberalization across the globe, and eliminate all existing tariffs and subsidies in the world commodity trade. This last experiment, EXP-3, notwithstanding the political difficulties and certain country specific exceptions, nevertheless tries to capture the post-Uruguay Round trade liberalization as studied for instance in Blake, Rayner and Reed (1999), and Meilke et. al. (1996).

Our starting point is the macro general equilibrium of the global commodity and finance markets as of 1995. Our data come from a direct aggregation of the database of the *Global Trade Analysis Project (GTAP)*, version 4, in McDougall. We give a broad outline of the characteristics of this data set in the Appendix Tables. We implement our policy simulation experiments via parametric changes of the relevant policy parameters and trace out the out-of-steady state transitional dynamic adjustments towards a new steady state equilibrium. Thus, we rely on the laboratory characteristics of our analytical apparatus and implement these strategic policy options as discrete simulation experiments sequentially. Since our focus is mostly on the short- to medium-run, we choose to limit our analysis exclusively on the first twenty periods of the dynamic adjustment; yet, in principle, one can extend this time horizon and portray the whole time path of the intertemporal equilibrium towards the steady state. The results of simulation experiments are reported in set of Tables 1 and 2.

We first perturb the initial equilibrium configuration by implementing, *ceteris paribus*, the CU agreement between Turkey (TUR) and the EU, and eliminate all tariffs and the non-tariff barriers between EU and TUR. Furthermore, TUR accepts the common trade policy of the EU in all its exports. The new commercial environment mainly results in complete liberalization of the Turkish agriculture vis-à-vis Europe and achieves in attaining a major step towards releasing resources out of agriculture. Sectoral output responses clearly underscore this point, as primary agriculture and processed food manufacturing contract to release resources to export-oriented textiles and services.

The initial impact of the EXP-1A environment through elimination of tariffs is a cheapening of import costs and an overall deflation of the domestic price level in TUR. Thus, vis-à-vis EU the real exchange depreciates.<sup>4</sup> The decline of the domestic price level leads to an intertemporal substitution of today's consumption in favor of current investment. Thus, current consumption declines and savings and investment expand.

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<sup>4</sup> We utilize the concept of the real exchange rate as the ratio of the domestic versus the EU consumer baskets. For a further analytical exposition of this point, see Obstfeld and Rogoff, 1996, Chp.4.

We observe that, *ceteris paribus*, the completion of CU causes a slight deflation of the real gross domestic product in TUR. This short impact is expected to be overcome by period 3, and the Turkish GDP rises over its initial value by 0.5% by period 10, and by 1.4% by the end of period 20. Part of this expansion is due to efficiency gains in resource allocation after lowering the average tariff protection, and part of it originates from the *level effects* of increased investment expenditures which lead to expansion of the capital stock (by as much as 3.0% by the end of period 20). Both exports and imports expand in TUR; yet the rate of expansion in the latter outweighs that of the former, and the trade deficit is expected to widen. Counterpart of this deficit is the rise in the investment-saving gap in the domestic economy. Domestic investment increases by 3.6% upon impact, and by 7.0% over a time horizon of 20 periods.

The output responses of the experiment are diverse and it is hard to make generalizations given the complexity of intertemporal general equilibrium effects. Yet, the surge in TUR textiles in an attempt to exploit its leading role in exports is clearly visible. By period 20, other manufacturing industries along with services join the textiles sectors in the post-CU environment. Thus, the output responses to the CU seem to be a diversion of resources away from agriculture, food processing and investment towards industries with a higher value added content.

Next, we envisage a direct expansion of the CU to encompass Morocco (EXP-1B) by removing its tariffs vis-à-vis EU and Turkey. Morocco, as well faces similar adjustments along with Turkey. Its response in terms of its GDP, however, is slightly stronger (a gain of 1.4% is recorded by period 20) to reflect mostly the initially more distorted trade regime of Morocco. Investment expansion of Morocco, likewise, records a gain of 7.6% upon first period impact, to be followed by 8% over the base run path by the end of period 20. The other side of this strong investment is, however, the decline in consumption expenditures. Unlike Turkey, the Moroccan consumption path cannot recover to its base run by the end of period 20, suggesting that the welfare of consumers as of period 20 still lags behind recovery of the pre-liberalization level. The individual sectoral responses also vary. In comparison to Turkey, Moroccan agricultural sectors expand their output levels in response to trade liberalization. While in Turkey, agricultural sectors dwindle under its round of trade liberalization (EXP-1A), Moroccan agriculture stands to gain during the trade liberalization episode EXP1-B. The expansion of the sugar products is especially pronounced. Fisheries and livestock products, likewise is a very important sector of debate in the Moroccan-EU trade, and is observed to expand its output level by 0.6% upon first period impact, and by 3.3% by period 20. The overall response of agricultural trade to the experiment is that the imports of agricultural contract by 11% in period 20, and the sector's exports rise by 15.6% by period 20. These results contrast with the Turkish agricultural imports rising by 39%, while its exports of agriculture rose by only 9.8% during its round of trade liberalization. This suggests that the Turkish agriculture have a heavier distortion relative to the rest of the economy.

Now we turn our attention to the Rest of the Middle East (OME) bloc of countries. Under experiment EXP1-C, we start from the Turkish-EU integration of EXP-1A, and leaving Morocco aside, study the individual regional response of OME by bilateral trade liberalization with the EU, followed by adoption of the EU tariff



rates against the third party regions. The liberalization of trade vis-à-vis European Union leads to an expansion of investment demand by 6.4%, capital stock by 3.4%, and the aggregate GDP by 0.9% over a period of twenty periods. The expansion of agricultural exports, in particular is very strong, with a cumulative rise of 22.4% by period 20. Imports of agriculture contracts by 5.1%, and thus the agricultural economy moves into a trade surplus. The behavior of individual sectors varies. Except for vegetables and processed agricultural products, all sectors do expand, with the strongest resource pulls occurring in grains.

Similar sets of macro adjustments are observed for the North African Countries (ONA) under its round of respective bilateral trade agreements with the EU. The expansion of investment demand leads to an expansion of the capital stock and of GDP. Aggregate consumption recovery lags behind the base run as of period 20. Sector-wise, grains, processed food industries and (other) primary agriculture contract to release resources for rapidly expanding sectors –sugar products, grains and textiles.

In the next set of experiments (EXP-2A to EXP-3) we turn our attention to alternatives of RTA formation in the region. Under EXP-2A, we study the behavior of individual country blocs under a Middle Eastern RTA. Under this arrangement, Turkey, Morocco, the Rest of the Middle East and North Africa are all brought together in a customs union agreement and liberalize their trade with respect to each other. We find that individual country responses vary when contrasted with the results obtained under the EXP-1 policy environments. Turkey, in particular, is observed to lose GDP when comparison is made with its bilateral trade liberalization with European Union. Turkish investment expansion is observed to be weaker and consumption path is almost unchanged. So the difference across the two policy experiments lie on trade performance. Here, the Turkish agriculture turns into a trade surplus sector, while under the European customs union, imports of the sector have surpassed its exports severely.

The adjustment patterns of the other three regions in the new RTA bloc do not differ significantly. One minor, yet important, development from the view-point of consumer welfare is that aggregate consumption succeeds in recovering by period 20 in response to the Middle Eastern RTA. Furthermore, in the case of Morocco, agriculture ends up as a trade deficit sector, as grains and vegetables contract, and fisheries and livestock products expand.

In the following experiment, we add the economies in transition and the former Soviet Union economies to the Middle Eastern RTA. The expansion of the RTA brings forth further gains over the previous EXP-2A for all parties concerned. However, Turkey still remains behind its performance vis-à-vis the European CU of EXP-1A. In Morocco fisheries and livestock products continue their expansion, and its agricultural imports contract over its base run path. The GDP in the other Middle East countries (OMA) is not effected differently than its European CU of EXP-1C. The ONA region, on the other hand, increases its gains in investment and output production, with a significant surplus in its agricultural trade.

Finally, we implement a global trade liberalization scenario under EXP-3. From a regional and global viewpoint this policy maneuver is a culmination of the

trade liberalization efforts. Trade preferences, thus far, are observed to be granted on a non-reciprocal basis, and clearly, much of the elements of this policy scenario are topics of the current political agenda, and we have to finesse much of the detail given the context of our aggregate schemes.

The EXP-3 environment brings very strong adjustments on the TUR economy especially with respect to its agriculture. Turkish real exchange rate depreciates by 3.1% upon impact. This adjustment is necessary to bring forth the expansion in exports (by 12.7% over period 20). The new trade environment leads to a further impetus to the TUR gross domestic product, bringing the overall gains to 2.1% over the base run in period 20. All sectors get a further slight boost over their EXP-1A level. Agricultural imports rise by almost 50% and exports by 21.1% in period 20. Grains contract by 5.4%, livestock products by 10%, and processed food industries by 1.6% upon impact. Textiles rise by 16.7%.

In Morocco, GDP expansion is also very rapid and outpaces its experience with the EU integration under EXP-1B. Textiles is also the most visible gainer with an expansion of 9.8% in period 20. The other primary agriculture is the only sector in Morocco to contract. The overall rapid expansion of investments in Morocco leads to a substitution of current consumption with the future consumption, and the stagnation of aggregate consumption, in that respect, continues well into period 20. This result is qualified for the OMA region, where consumption is observed to recover by 0.2%. Aggregate GDP rise by 1.8% by period 20. Sugar and other primary agriculture reveal themselves as the most rapid gainers for the OMA region countries under global trade liberalization.

As for the Other North African countries, we see that the rapid expansion in investment demand generate a similar set of adjustments as in Morocco, where aggregate consumption is substituted out as of period 20. The rise in aggregate GDP by 0.7% in period 20, however, falls short of its CU experiment of 0.9% under the environment EXP-1D. We observe that non-agricultural sectors gain more relative to the agricultural sectors in North Africa under global trade liberalization. Vegetables and other primary agriculture, in fact, contract as of period 20 to release resources for the observed expansion in textiles (by 3.9%), other manufacturing (by 4.1%), and services (by 4.0%).

#### **IV. Concluding Comments and Directions for Future Research**

Some caveats are in order on the limitations of the study before we go on with the summary of our main findings. First, it has to be clear that, with this type of a methodology, no distinctive conclusions can be inferred about the characterization of the future path of the economy based on "calendar" dates. The policy experiments performed are basically of *comparative* nature and are meaningful only in relation to each other, rather than revealing forecasts of the future.

Second, one has to note that the adjustment path as characterized by the simulation exercises reflect *equilibrium* relationships on a *smooth* time horizon, mainly in the absence of rigidities and/or structural bottlenecks. Thus, the speed of transitional adjustment of many variables to their respective equilibrium paths should

not be taken as a measure of the global stability properties of the modeled economies, but rather as a direct outcome of the laboratory characteristics of a macroeconomic model with continuous, well-behaved functional forms. For these reasons, our results should be at best regarded as crude approximations of the long-run equilibrium effects of foreign trade policies on current account, output, capital accumulation and the real exchange rate.

The model results reveal that the expected positive outcomes from the current CU agreement between the EU and Turkey very much depend on whether the non-tariff barriers could be eliminated and a move towards a more competitive environment be sustained. The simulation results suggest that Turkish gains from bilateral trade liberalizations with the Middle East or expansion of the CU with the inclusion of the Transition Economies may be equally comparable from a pure resource efficiency viewpoint.

The adjoining of TRN to a Middle Eastern RTA especially leads to a sizable increase in the regional agricultural trade and brings forth additional gains to Morocco's and Middle Eastern gross domestic product and capital investments. Turkey, on the other hand, is observed to gain more strongly with respect to its bilateral trade liberalization with the EU.

In comparison, textiles and clothing reveal itself as the leading exporting sector in Turkey that stands to have significant gains from the trade liberalization episodes. Experiment results suggest that primary agriculture and intermediates utilize excessive resources in comparison to the first best open trade arrangements. According to our results, under the analyzed patterns of macroeconomic adjustments in response to the elimination of tariff protection, there would likely be sizable increases in trade deficits of the region's economies. This would naturally call for the feasibility of access to foreign funds to finance the import-export gap. A key concern here is the fragility of the current external position of Turkey, given the international standards.

Clearly, much of these outcomes will depend upon a host of political factors to which we cannot address in a theoretically satisfying fashion. There is a greater degree of uncertainty on the factors that will determine the impact of the enlargement of the CU, or extension of the RTAs over the Middle East and the Transition Economies. Moreover, these outcomes will as well depend on many exogenous factors, and given the complexity of issues surrounding the trade liberalization initiatives, we need a coherent framework that can take all the fundamental macro-dynamic and micro-sectoral effects into account. We believe that the multi-region, multi-sector framework based intertemporal dynamic methodology presented here provides such an initial step in understanding these fundamentals.

## References

Bagwell, K. and R. Staiger (1998) "Will Preferential Arrangements Undermine the Multilateral Trading System?" *Economic Journal*, July, 108(409): 1162-1182.

- Behar, J. (1995) "Measuring the Effects of Economic Integration for the Southern Cone Countries: Industry Simulations of Trade Liberalization" *The Developing Economies*, 33(1):4-31.
- Bhagwati, J., D. Greenaway and A. Panagariya (1998) "Trading Preferentially: Theory and Policy" *Economic Journal*, July, 108(409): 1128-1148.
- Blake, A.T., A.J. Rayner and G.V. Reed (1999) "A Computable General Equilibrium Analysis of Agricultural Liberalisation: The Uruguay Round and Common Agricultural Policy Reform" *Journal of Agricultural Economics* 50(3): 400-424.
- Diao, X. and A. Somwaru (1997) "An Inquiry on General Equilibrium Effects of MERCOSUR: An Intertemporal World Model" *Journal of Policy Modeling*, forthcoming.
- Fernandez, R. and J. Portes (1998) "Returns to Regionalism: An Analysis of Nontraditional Gains from Regional trade Agreements" *The World Bank Economic Review*, 12(2): 197-220, May.
- Krueger, A. (1999) "Are Preferential Trade Arrangements Trade Liberalizing or Trade Protectionist?" *Journal of Economic Perspectives*, Fall, 13(4): 105-124.
- McKibbin W.J. (1993) "Integrating Macroeconomic and Multisector Computable General Equilibrium Models" *Brooking Discussion Papers in International Economics*, No. 100.
- Meilke, K., D. McCarthy, and H. de Gorter (1996) "Challenges in Quantitative Economic Analysis in Support of Multilateral Trade Negotiations" *Agricultural Economics* 14(3): 185-200.
- Mercenier J. and M. da C.S. de Souza (1994) *Structural Adjustment and Growth in a Highly Indebted Market Economy: Brazil*, In J. Mercenier and T. Srinivasan (eds.) *Applied General Equilibrium Analysis and Economic Development*, Ann Arbor: University of Michigan Press.
- Obstfeld, M. and K. Rogoff (1996) *Foundations of International Macroeconomics* Cambridge, Mass. And London: The MIT Press.
- Schiff, M. and A. Winters (1998) "Dynamics and Politics in Regional Intyegration Arrangements: An Introduction" *The World Bank Economic Review*, 12(2): 177-195, May.
- Smith, A. and A.J. Venables (1988) "Completing the Internal Market in the European Community: Some Industry Simulations" *European Economic Review*, 32: 1501-1525.
- Viner, J. (1950) *The Customs Union Issue*, Carnegie Endowment for International Peace, New York. (Cited in Krueger, 1999).

**Appendix Table 1. Aggregation Structure**

<b>Regions of the CGE Model</b>	<b>GTAP Data Base</b>
Asia	Japan, Korea, Indonesia, Malaysia, Phillipines, Singapore, Thailand, Vietnam, China, Taiwan, Hong Kong, India, Sri Lanka, Rest of South Asia
European Union	United Kingdom, Germany, Denmark, Sweden, Finland, Rest of EU
EFTA and Economies In Transition	European Free Trade Area, Central European Associates
Former Soviet Union	The former Soviet Union
Turkey	Turkey
Morocco	Morocco
Rest of Middle East	Rest of the Middle East Countries
Rest of North Africa	Rest of North Africa
Rest of the World	Australia, New Zeland, Canada, USA, Mexico, Centrl America and the Caribbean, Venezuela, Colombia, Rest of Andean Pact, Argentina, Brazil, Chile, Uruguay, Rest of South America, Soyuth African Customs Union, Rest of Southern Africa, Rest of Sub-Saharan Africa, Rest of the World

<b>Regions of the CGE Model</b>	<b>GTAP Data Base</b>
Grain crop agriculture	Paddy rice, Wheat, Cereal grains
Vegetables, fruits and oil	Vegetables, Fruits, Nuts, Oil seeds,
Sugar	Sugar cane, Sugar beet
Other Agriculture	Plant-based fibers, Crops nec,
Animal Products	Bovine cattle, Sheep and Goats, Horses, Animal products nec, Raw milk, Wool silk-worm cocoons, Fishing
Processed Food	Meat products nec, Vegetable oils and fats, Dairy products, Processed rice, Sugar Processing, Food Products nec, Beverages and Tobacco Products
Textiles and Clothing	Textiles, Wearing apparel, Leather products
Producer Manufacturing	Wood products, Paper products and publishing, Petroleum and coal products, Chemical, rubber and plastic products, Mineral products nec, Ferrous metals, Metals nec, Metal products, Motor vehicles and parts, Transport equipment nec, Electronic equipment, Machinery and equipment nec, Manufactures nec
Other	Coal, Oil, Gas, Minerals nec, Electricity, Gas manufacture and distribution, Water, Construction, Trade and transport, Financial business and recreational services, Public admin and defense, education and health, Dwellings

**Table 1. Experiment Results: Country Case Studies**  
(Ratios to Base Run Equilibrium)

	Turkey											
	Exp1A			Exp1B			Exp1C			Exp1D		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	0.9982	1.0052	1.0137	0.9982	1.0052	1.0136	0.9989	1.0067	1.0161	0.9957	1.0012	1.0078
Consumption	0.9943	0.9962	1.0041	0.9899	0.9927	1.0042	0.9899	0.9930	1.0060	0.9892	0.9915	1.0008
Investment	1.0365	1.0538	1.0705	1.0363	1.0537	1.0704	1.0393	1.0591	1.0779	1.0281	1.0423	1.0555
Capital Stock <sup>2</sup>	1.0015	1.0134	1.0302	1.0015	1.0134	1.0301	1.0016	1.0146	1.0332	1.0011	1.0105	1.0237
Exports	1.0724	1.0788	1.0958	1.0722	1.0783	1.0952	1.0798	1.0862	1.1043	1.0377	1.0417	1.0542
Agricultural exports	1.0833	1.0853	1.0985	1.0858	1.0876	1.1007	1.1063	1.1077	1.1216	1.0471	1.0476	1.0575
Imports	1.0771	1.0800	1.0682	1.0767	1.0796	1.0678	1.0840	1.0875	1.0746	1.0425	1.0448	1.0356
Agricultural Imports	1.3989	1.4003	1.3929	1.3982	1.3996	1.3922	1.4163	1.4183	1.4105	1.3420	1.3433	1.3375
Real Exchange Rate <sup>1</sup>	0.9810	0.9790	0.9718	0.9808	0.9788	0.9716	0.9818	0.9800	0.9724	0.9706	0.9693	0.9636
Output Supply												
Grains	0.9828	0.9849	0.9945	0.9829	0.9849	0.9946	0.9851	0.9872	0.9980	0.9906	0.9919	0.9997
Vegetables	0.9900	0.9902	0.9968	0.9903	0.9906	0.9971	0.9901	0.9904	0.9977	0.9886	0.9889	0.9941
Sugar prod.	0.9790	0.9822	0.9938	0.9790	0.9822	0.9937	0.9788	0.9823	0.9951	0.9755	0.9780	0.9870
Livestock prod.	0.8759	0.8778	0.8850	0.8760	0.8778	0.8851	0.8784	0.8801	0.8879	0.8847	0.8861	0.8919
Other primary agri.	1.0265	1.0303	1.0469	1.0262	1.0299	1.0465	1.0228	1.0267	1.0451	1.0179	1.0206	1.0333
Processed agri.	0.9816	0.9861	1.0000	0.9816	0.9861	1.0000	0.9829	0.9878	1.0033	0.9828	0.9864	0.9975
Textiles	1.1689	1.1826	1.2271	1.1658	1.1789	1.2229	1.1682	1.1829	1.2322	1.0724	1.0814	1.1132
Other manuf.	0.9944	1.0059	1.0203	0.9948	1.0063	1.0207	0.9961	1.0087	1.0245	1.0062	1.0152	1.0268
Services	0.9992	1.0082	1.0158	0.9992	1.0082	1.0158	0.9988	1.0086	1.0169	1.0013	1.0084	1.0145

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.

**Table 1. Experiment Results: Country Case Studies**  
(Ratios to Base Run Equilibrium)

	Morocco											
	Exp1A			Exp1B			Exp1C			Exp1D		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	0.9995	0.9994	0.9993	0.9929	1.0080	1.0142	0.9995	0.9996	1.0000	1.0001	1.0005	1.0007
Consumption	0.9996	0.9995	0.9996	0.9842	0.9959	0.9985	0.9993	0.9995	0.9996	0.9998	1.0002	1.0004
Investment	0.9993	0.9994	0.9994	1.0763	1.0752	1.0800	0.9992	1.0001	1.0006	1.0002	1.0010	1.0014
Capital Stock <sup>2</sup>	0.9999	0.9996	0.9995	1.0084	1.0487	1.0693	0.9999	0.9998	1.0003	1.0000	1.0005	1.0011
Exports	0.9979	0.9976	0.9969	1.1114	1.1329	1.1418	0.9991	0.9985	0.9975	1.0012	1.0005	1.0000
Agricultural exports	1.0016	1.0014	1.0014	1.1192	1.1444	1.1560	1.0029	1.0027	1.0027	1.0037	1.0038	1.0041
Imports	0.9981	0.9981	0.9980	1.1025	1.0976	1.0941	0.9985	0.9987	0.9986	1.0003	1.0004	1.0002
Agricultural Imports	0.9965	0.9965	0.9965	0.9029	0.8936	0.8891	0.9962	0.9964	0.9962	0.9997	0.9995	0.9993
Real Exchange Rate <sup>1</sup>	0.9993	0.9995	0.9996	0.9645	0.9555	0.9514	0.9993	0.9996	0.9999	0.9999	1.0002	1.0002
Output Supply												
Grains	1.0005	1.0004	1.0005	1.0011	1.0199	1.0287	1.0004	1.0004	1.0010	0.9998	1.0002	1.0007
Vegetables	1.0007	1.0006	1.0007	0.9860	1.0064	1.0160	1.0016	1.0016	1.0021	0.9999	1.0003	1.0007
Sugar prod.	1.0005	1.0004	1.0006	1.1874	1.2107	1.2215	1.0000	1.0001	1.0009	0.9993	0.9998	1.0003
Livestock prod.	1.0000	0.9998	0.9997	1.0065	1.0242	1.0320	0.9999	0.9998	1.0001	1.0003	1.0004	1.0007
Other primary agri.	1.0017	1.0015	1.0017	0.9548	0.9817	0.9940	1.0020	1.0016	1.0019	1.0005	1.0009	1.0014
Processed agri.	1.0004	1.0002	1.0003	0.9912	1.0100	1.0189	1.0003	1.0004	1.0010	1.0009	1.0013	1.0017
Textiles	0.9959	0.9953	0.9943	1.0948	1.1270	1.1408	0.9960	0.9954	0.9947	0.9980	0.9976	0.9973
Other manuf.	1.0010	1.0008	1.0007	0.9561	0.9825	0.9932	1.0018	1.0019	1.0023	1.0016	1.0017	1.0019
Services	1.0003	1.0002	1.0003	0.9916	1.0081	1.0145	1.0000	1.0000	1.0003	0.9999	1.0002	1.0005

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.

**Table 1. Experiment Results: Country Case Studies**  
(Ratios to Base Run Equilibrium)

**Other Middle East Economies**

	Exp1A			Exp1B			Exp1C			Exp1D		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	1.0003	1.0005	1.0007	1.0003	1.0005	1.0006	0.9941	1.0023	1.0089	1.0003	1.0005	1.0007
Consumption	0.9999	0.9999	1.0000	1.0001	1.0003	1.0007	0.9818	0.9889	0.9978	1.0001	1.0003	1.0007
Investment	1.0009	1.0011	1.0013	1.0008	1.0011	1.0013	1.0569	1.0557	1.0639	1.0006	1.0011	1.0015
Capital Stock <sup>2</sup>	1.0000	1.0003	1.0007	1.0000	1.0003	1.0693	1.0026	1.0186	1.0338	1.0000	1.0003	1.0007
Exports	1.0014	1.0015	1.0014	1.0016	1.0016	1.0014	1.0222	1.0295	1.0363	1.0016	1.0014	1.0012
Agricultural exports	1.0093	1.0096	1.0097	1.0069	1.0069	1.0068	1.1954	1.2083	1.2237	1.0117	1.0112	1.0111
Imports	1.0016	1.0016	1.0014	1.0016	1.0016	1.0014	1.0376	1.0347	1.0263	1.0014	1.0015	1.0013
Agricultural Imports	1.0012	1.0012	1.0011	1.0013	1.0013	1.0013	0.9592	0.9549	0.9490	1.0015	1.0016	1.0016
Real Exchange Rate <sup>1</sup>	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	0.9738	0.9694	0.9640	1.0002	1.0003	1.0003
Output Supply												
Grains	0.9994	0.9995	0.9999	0.9991	0.9993	0.9997	1.1229	1.1340	1.1473	0.9985	0.9985	0.9989
Vegetables	0.9996	0.9998	1.0000	0.9998	0.9999	1.0001	0.9821	0.9897	0.9986	1.0003	1.0002	1.0004
Sugar prod.	0.9997	0.9999	1.0003	0.9997	0.9999	1.0003	1.0232	1.0345	1.0474	0.9986	0.9987	0.9991
Livestock prod.	1.0023	1.0025	1.0026	1.0023	1.0024	1.0026	0.9882	0.9974	1.0072	1.0023	1.0025	1.0027
Other primary agri.	0.9967	0.9969	0.9973	0.9946	0.9947	0.9951	1.0286	1.0412	1.0564	0.9952	0.9952	0.9956
Processed agri.	1.0000	1.0001	1.0004	1.0000	1.0001	1.0004	0.9731	0.9822	0.9927	1.0004	1.0006	1.0009
Textiles	0.9970	0.9971	0.9971	0.9965	0.9965	0.9965	1.0092	1.0235	1.0394	0.9986	0.9986	0.9987
Other manuf.	0.9995	0.9997	0.9999	0.9995	0.9998	0.9999	0.9931	1.0065	1.0162	0.9998	1.0000	1.0002
Services	1.0001	1.0003	1.0005	1.0001	1.0003	1.0005	1.0005	1.0101	1.0176	1.0000	1.0002	1.0004

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.



**Table 1. Experiment Results: Country Case Studies**  
(*Ratios to Base Run Equilibrium*)

**North African Economies**

	Exp1A			Exp1B			Exp1C			Exp1D		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	1.0001	1.0003	1.0004	1.0001	1.0003	1.0004	1.0000	1.0002	1.0004	0.9886	1.0053	1.0093
Consumption	0.9998	0.9998	0.9999	0.9999	1.0001	1.0004	0.9997	0.9999	1.0005	0.9729	0.9896	0.9940
Investment	1.0007	1.0006	1.0007	1.0004	1.0006	1.0008	1.0003	1.0007	1.0009	1.1096	1.0770	1.0748
Capital Stock <sup>2</sup>	1.0001	1.0004	1.0006	1.0000	1.0003	1.0006	1.0000	1.0003	1.0007	1.0110	1.0540	1.0673
Exports	1.0008	1.0009	1.0004	1.0008	1.0008	1.0003	1.0020	1.0017	1.0007	1.0576	1.0781	1.0827
Agricultural exports	0.9964	0.9966	0.9966	1.0014	1.0013	1.0012	0.9831	0.9828	0.9821	1.1598	1.1955	1.2045
Imports	1.0007	1.0006	1.0005	1.0006	1.0006	1.0005	1.0013	1.0013	1.0011	1.0827	1.0679	1.0639
Agricultural Imports	1.0000	1.0000	0.9999	0.9999	0.9998	0.9998	1.0008	1.0008	1.0007	0.9198	0.9076	0.9045
Real Exchange Rate <sup>1</sup>	1.0000	1.0000	1.0001	0.9999	1.0000	1.0001	0.9997	0.9998	1.0001	0.9498	0.9382	0.9354
Output Supply												
Grains	0.9996	0.9998	1.0001	0.9997	0.9999	1.0002	0.9964	0.9966	0.9971	1.0511	1.0782	1.0852
Vegetables	0.9999	1.0000	1.0002	1.0001	1.0003	1.0005	1.0005	1.0007	1.0010	0.9578	0.9798	0.9854
Sugar prod.	0.9995	0.9997	1.0000	0.9995	0.9997	1.0001	0.9988	0.9990	0.9995	1.0739	1.1020	1.1093
Livestock prod.	1.0006	1.0008	1.0009	1.0006	1.0006	1.0008	1.0007	1.0008	1.0011	0.9750	0.9950	1.0000
Other primary agri.	0.9980	0.9982	0.9985	0.9978	0.9980	0.9984	0.9974	0.9975	0.9978	0.9247	0.9558	0.9637
Processed agri.	1.0000	1.0001	1.0003	1.0004	1.0005	1.0008	1.0006	1.0007	1.0011	0.9425	0.9649	0.9707
Textiles	0.9962	0.9963	0.9960	0.9953	0.9950	0.9947	0.9962	0.9960	0.9958	1.0125	1.0460	1.0541
Other manuf.	1.0000	1.0002	1.0003	1.0000	1.0002	1.0003	1.0005	1.0006	1.0006	0.9798	1.0097	1.0168
Services	1.0004	1.0006	1.0007	1.0005	1.0007	1.0008	1.0006	1.0007	1.0009	1.0066	1.0250	1.0293

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.

**Table 2. Experiment Results: Regional Trade Agreements and Global Liberalization**  
*(Ratios to Base Run Equilibrium)*

	Turkey								
	Exp2A			Exp2B			Exp3		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	1.0016	1.0041	1.0070	0.9996	1.0085	1.0192	0.9984	1.0087	1.0215
Consumption	0.9988	0.9998	1.0040	0.9893	0.9930	1.0080	0.9856	0.9906	1.0092
Investment	1.0126	1.0186	1.0244	1.0436	1.0670	1.0885	1.0472	1.0773	1.1034
Capital Stock <sup>2</sup>	1.0005	1.0046	1.0104	1.0017	1.0165	1.0376	1.0019	1.0185	1.0434
Exports	1.0243	1.0263	1.0318	1.0891	1.0951	1.1156	1.1044	1.1061	1.1269
Agricultural exports	1.0454	1.0460	1.0505	1.1163	1.1168	1.1327	1.1998	1.1960	1.2121
Imports	1.0258	1.0267	1.0226	1.0928	1.0971	1.0823	1.1028	1.1087	1.0914
Agricultural Imports	1.0508	1.0512	1.0491	1.4463	1.4491	1.4403	1.4979	1.5038	1.4956
Real Exchange Rate <sup>1</sup>	0.9998	0.9991	0.9965	0.9817	0.9801	0.9716	0.9699	0.9698	0.9609
Output Supply									
Grains	0.9974	0.9981	1.0016	0.9782	0.9804	0.9926	0.9462	0.9484	0.9622
Vegetables	0.9992	0.9993	1.0016	0.9903	0.9906	0.9989	0.9936	0.9941	1.0042
Sugar prod.	0.9955	0.9967	1.0007	0.9778	0.9817	0.9964	1.0193	1.0236	1.0408
Livestock prod.	0.9918	0.9925	0.9953	0.8798	0.8817	0.8905	0.9002	0.9024	0.9124
Other primary agri.	0.9946	0.9958	1.0013	1.0035	1.0074	1.0280	1.0303	1.0331	1.0571
Processed agri.	1.0008	1.0024	1.0073	0.9856	0.9913	1.0090	0.9837	0.9900	1.0112
Textiles	1.0079	1.0119	1.0249	1.1742	1.1891	1.2451	1.1675	1.1774	1.2406
Other manuf.	1.0070	1.0111	1.0162	0.9978	1.0119	1.0300	1.0028	1.0179	1.0388
Services	0.9988	1.0019	1.0046	0.9987	1.0098	1.0193	0.9969	1.0099	1.0212

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.

**Table 2. Experiment Results: Regional Trade Agreements and Global Liberalization**  
(Ratios to Base Run Equilibrium)

	Morocco								
	Exp2A			Exp2B			Exp3		
	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20	Period 1	Period 10	Period 20
Gross Domestic Product	1.0016	1.0033	1.0041	0.9929	1.0086	1.0155	0.9916	1.0119	1.0215
Consumption	0.9999	1.0013	1.0021	0.9842	0.9961	0.9989	0.9788	0.9955	0.9994
Investment	1.0088	1.0086	1.0092	1.0763	1.0771	1.0829	1.0937	1.0983	1.1072
Capital Stock <sup>2</sup>	1.0010	1.0056	1.0079	1.0084	1.0495	1.0715	1.0103	1.0621	1.0918
Exports	1.0176	1.0197	1.0205	1.1114	1.1351	1.1436	1.1475	1.1689	1.1777
Agricultural exports	1.0095	1.0122	1.0134	1.1192	1.1484	1.1606	1.1520	1.1800	1.1926
Imports	1.0150	1.0144	1.0140	1.1025	1.0993	1.0956	1.1300	1.1243	1.1192
Agricultural Imports	1.0224	1.0211	1.0205	0.9029	0.8976	0.8930	1.0759	1.0637	1.0582
Real Exchange Rate <sup>1</sup>	0.9989	0.9979	0.9974	0.9645	0.9552	0.9513	0.9451	0.9358	0.9315
Output Supply									
Grains	0.9954	0.9977	0.9989	1.0011	1.0173	1.0270	0.9639	0.9878	1.0004
Vegetables	0.9919	0.9943	0.9955	0.9860	1.0107	1.0212	0.9979	1.0249	1.0392
Sugar prod.	0.9970	0.9996	1.0008	1.1874	1.2101	1.2221	0.9872	1.0157	1.0295
Livestock prod.	0.9999	1.0020	1.0029	1.0065	1.0242	1.0327	0.9947	1.0166	1.0280
Other primary agri.	0.9927	0.9959	0.9974	0.9548	0.9742	0.9870	0.9407	0.9731	0.9889
Processed agri.	1.0003	1.0025	1.0036	0.9912	1.0117	1.0214	1.0047	1.0289	1.0418
Textiles	1.0058	1.0091	1.0104	1.0948	1.1261	1.1403	1.0462	1.0804	1.0979
Other manuf.	1.0043	1.0074	1.0088	0.9561	0.9856	0.9970	1.0069	1.0424	1.0584
Services	0.9995	1.0015	1.0023	0.9916	1.0082	1.0150	0.9968	1.0188	1.0283

1) Ratio of The Domestic Price Index to the Import Price Index.

2) Period 2.