

TO CAP OR NOT TO CAP: THE ROLE OF AGRICULTURE IN THE TURKEY-EU CUSTOMS UNION

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Keywords: Regional Economic Integration, Customs Union, Turkey-EU, CGE

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ABSTRACT:

In this paper, I analyzed the implications of integrating Turkey's agriculture with the EU in the context of the Customs Union (CU), which has not been analyzed previously in a multi-country, multi-sector general equilibrium framework. The experiments included various integration scenarios from free trade area to the Customs Union with and without agriculture. I also looked at the affect of factor mobility on various aggregate variables, as well as the revenue replacement due to tariff revenue loss and the budgetary implications of absorbing Turkey's agriculture.

The simulation results indicate that integrating agriculture would be beneficial for Turkey in terms of welfare, per capita income, investments and real growth. When agriculture is not included in the integration, all primary agricultural sectors and all manufacturing sectors except for textiles and wearing apparels show negative output growth. On the other hand, when the CU is extended to include agriculture, 5 out of 7 expanding sectors in terms of output and exports will be primary agricultural and food processing sectors. Turkey's trade balance deteriorates in all manufacturing sectors except for textiles and wearing apparels. Welfare, income and terms of trade (TOT) gains will get higher, the higher the level of integration.

When agricultural integration is accomplished and trade negotiations with Central and Eastern European and EFTA countries are completed, Turkey's welfare gain measured by the equivalent variation is estimated to be around \$4.5 billion, real per capita income to go up by 2.6%, TOT by 8.7%, and investments by 9.3%. When agriculture is taken into account, real factor returns on land show the highest increase among all four primary factors. In this case real return on unskilled labor also goes up faster than skilled labor reflecting the unskilled labor-intensive character of the primary agricultural sectors. The results also indicate that labor mobility will be an important factor in determining the magnitude of the impacts on various aggregate variables. Mobile labor generates higher output, higher trade volume, higher income, faster GDP growth and higher welfare for Turkey. Turkey will have to increase value added taxes by 20% in order to compensate for the tariff revenue loss. Lastly, given the existing protection structure, absorbing Turkish agriculture will not impose an excessively high cost to the EU budget.

I. INTRODUCTION *

The objective of this paper is to analyze the implications of incorporating agricultural sectors into the economic integration process between Turkey and the EU in a multi-country, multi-sector general equilibrium framework. After a long period of negotiation, Turkey and the European Union (EU) signed a Customs Union (CU) agreement in 1995, which has been effective since 1996. The agreement basically proposed integration, over five-year time, in industrial sectors by eliminating all tariffs on industrial commodities. As typical for such regional integration arrangements, the 1995 CU agreements required Turkey to adopt Common External Tariffs (CET) of the EU for these sectors. In return, the EU is required to remove the existing non-tariff barriers (i.e. export quotas) on Turkish textiles and wearing apparels. The agreement excluded agricultural sectors, but confirmed the possibility of eventual agricultural integration in the course of time¹.

Currently available empirical evidence on the actual effects of a Turkey-EU Customs Union on the Turkish economy does not permit us to draw any firm conclusions about the current agreement, which is due to be fully implemented by the year 2001. There are two important factors, among others, which make it difficult to identify the CU's impact. The first is the macroeconomic turbulence that has been effective since early 1994. The second factor is the difficulties brought about by the spillovers of the so-called East Asian economic crisis.

Several studies have attempted *ex ante* assessments of the effects of CU with the EU on Turkish economy, among which are Akder, et al. (1990), Ertugrul (1992), Krueger, et al. (1996), Mercenier and Yeldan (1997) and Harrison et al. (1997). The findings of the two most recent analytical studies are mixed. Mercenier and Yeldan (1997) found that Turkish

* I would like to thank Dr. Thomas Hertel, Dr Erinc Yeldan and participants at the Second Annual Conference on Global Economic Analysis (Denmark, June 6-7, 1999) for their useful comments and feedback on an earlier version of this paper.

¹ Article 22 of the CU agreement reads: "The Association Council hereby reaffirms the Parties' common objective to move towards the free movement of agricultural products between themselves as provided for in articles 32-35 of the Additional Protocol" (Customs Union With EU, p.102).

economy is likely to suffer from welfare losses. Harrison et. al. (1997), on the other hand, reported positive welfare gains from such an integration.

One important dimension to the issue in question, which would help clarify this uncertainty, is that of agricultural integration. None of the studies so far looked at the implications of extending the CU to include the agricultural sectors in a general equilibrium context². Given the fact that Turkey is relatively more rural and much more reliant on agriculture than most EU countries³, the omission of agriculture obviously constitutes an important gap. This study aims to fill this gap by extending the earlier work in terms of including agricultural integration into the analysis in a multi-region, multi-sector setting. The paper aims to show that when agriculture is included, Turkey unambiguously benefits from the CU, that factor mobility plays an important role in sectoral reallocations, and that the cost of incorporating Turkey's agriculture into the EU does not impose a major cost on the EU budget.

The rest of the paper is organized as follows. In the following section Turkey-EU relations are discussed in a historical perspective where the key political and economic factors affecting Turkey-EU relations are highlighted and some details of 1995 CU agreement are provided. In section III the model, data and experimental design are presented. Then, the simulation results are analyzed, including a discussion of the general results of various experiments, the impacts of alternative integration scenarios on major aggregate variables, and the welfare implications. Concluding remarks follow.

II. TURKEY-EU RELATIONS AND THE CUSTOMS UNION AGREEMENT

1. Key Factors in Turkey-EU Relations

² Akder et al. (1990) has looked at the issue in a single sector partial equilibrium setting, based on a mathematical programming model called Turkish European Agricultural Model (TEAM). Ertugrul (1992) used the same model later in his study to get updated estimates. By far it is the most detailed study in this area; however, by its very nature, it did not look at the sectoral reallocations, the impact of this integration on the rest of the economy, nor did it consider how the other regions would be affected.

³ As of 1995 agriculture accounted for 15.7% of Turkey's GDP (as compared to 2.3% of the EU), and 47.4% of Turkish civilian labor force is employed in agriculture, compared to 5.3% of the EU (Economic Report 1995, Eurostat Yearbook 1997).

The factors that play a key role in Turkey-EU relations can be grouped into either political or economic factors. One has to take both groups of factors into account in order to understand the course of events and European reaction to Turkey's demands. In this context the objective of this section is to provide the reader with a historical perspective on the Turkey-EU political and economic relations.

Among the several factors that are political in nature and have a considerable effect on Turkey-EU relations, the relatively more important ones are the Ottoman legacy, civilization choice between East and West, democracy and human rights, disputes with Greece, and Turkish labor force in Europe.

The legacy, which Ottomans left behind after five centuries (14th -19th c.) of dominance in the Balkans and Central and Eastern Europe affected the minds of Europeans deeply. Among the several events that changed the course of history during this period maybe the most striking one is the collapse of the Eastern Roman (Byzantium) Empire when Ottoman Sultan Mehmet II conquered Istanbul, the center of Orthodox Christianity, in 1453. It took more than two hundred years for the Europeans to end Ottoman hegemony in Europe after the Empire started to lose power in late 17th century.

After the collapse of the Ottoman Empire following WWI, founders of the Turkish Republic made radical reforms in the political, judicial and social structure of the country. One aspect of this process had to do with switching the choice of civilization as a point of reference from East to West. The rhetoric of East vs. West, or in a slightly different context, Islam vs. Secularism is still a hot debate today. It is still a point of controversy in the political, military, academic and intellectual circles in the country as to which direction the country should be headed. For some, Western civilization should be the point of reference and the country should do its best to join the European civilization. Joining the EU has been viewed as an effective means to achieve this goal. This is not an easy task, however, as the course of events has shown in recent decades.

Human rights have long been a factor that created frictions in Turkey-EU relations. Turkey frequently receives strong criticism from Europe with respect to democratic standards and human rights. A closely related issue that goes hand in hand with the human rights is the Kurdish problem. This problem has several dimensions including political, economic and international balance of powers in the Middle East, which cannot be fully addressed here. The methods used by the Turkish governments to topple down the terrorist activities conducted by the Kurdish militants in South Eastern part of the country have received severe criticism from the EU on numerous occasions. Besides these, Turkey and Greece have disputes over the status of Cyprus, territorial boundaries in the Aegean Sea, and the civil rights of Turkish minority living in the northern part of Greece (Western Thrace). The EU has consistently emphasized the resolution of these issues as prerequisites before the integration between Turkey and the EU can be taken to further stages (Agenda 2000).

Among the economic factors that affect Turkey-EU relations are the remarkable share of the EU in Turkey's foreign trade, potential welfare gains from the CU, and existence of Turkish labor force in Western Europe. In addition to the potential welfare gains that would be expected from a CU, Turkey hopes to accelerate the process of technology transfer and encourage foreign direct investments by joining the EU. This process would stimulate technological improvements, increase the product quality, diversity and the competitiveness of domestic industries. This, in turn, would contribute positively to economic growth.

The existence of a considerable Turkish population in Western Europe is another factor that should not be neglected. The first generation of Turkish workers migrated to Europe upon demand by Germany in the early 1960s. Migration continued in the following decades. Currently more than 3 million Turkish people live in different parts of Europe. It is estimated that the Turkish population constitutes the largest minority in Germany⁴. France, Holland, Austria and Belgium are also important destinations for Turkish workers. The share of the EU in total Turkish workers abroad is 81.5%.

⁴ As of 1995, 28.1% of 7.1 million foreigners in Germany was counted for by Turks (Sanay, 1997).

The importance of these overseas workers for foreign exchange for developing countries for financing imports, debt servicing and coping with the balance of payments difficulties cannot be overemphasized. Workers' remittances sent from Europe have always been of crucial importance in this regard. For instance, workers' remittances from Germany alone, between 1992 and 1996, amounted to DM 2.6-3.0 billion annually⁵. Combined with the contributions of workers from the other countries, every year Turkey receives around \$ 3-3.5 billion from migrant workers.

Chronically high inflation in Turkey⁶, unemployment, huge public deficits and resulting high rates of PSBR, potential budgetary cost of absorbing Turkey into the EU, and fear from a new wave of labor migration from Turkey in the case of free movement of persons are other sources of concern.

2. Turkey-EU Economic Relations

Since WWII, economic relations between Turkey and Western Europe have been quite strong. Germany, Italy and France have always been among the major trading partners of Turkey. As of 1995, eight out of eleven top trading partners of Turkey were the EU members. The other three countries were the US, Former Soviet Union (FSU) and Saudi Arabia. The following table shows the share of the EU, Organization of Islamic Conference (OIC) and FSU in Turkish foreign trade in recent years.

Table 2.1: Share of the EU, OIC and FSU in Turkish foreign Trade (% of total)

	Exports			Imports		
	EU	OIC	FSU	EU	OIC	FSU
1990	53.2	12.5	4.1	41.8	6.0	5.6
1991	51.8	12.9	4.5	43.9	9.6	5.2

⁵ Ministry of Labor and Social Security, 1996 Yearbook, p.13.

⁶ Average annual inflation rate in the 1980s and 1990s have been in the range of 60%-100%.

1992	51.7	17.7	4.6	42.9	14.1	5.4
1993	47.5	18.2	6.2	44	12	5.8
1994	47.7	17.5	7.8	46.9	15.1	7.8
1995	51.2	16	9.7	47.2	12.7	9.4
1996	49.7	17.7	11.5	53	12.8	7
1997	46.6	15.3	13.4	51	10.8	7.4

Source: SIS Statistical Indicators (1923-1995), SPO Main Economic Indicators.

As the table shows, about half of the Turkish foreign trade is accounted for by the EU. The share of the OIC in this period ranged between 12.5% and 18.2% for exports, between 6.0% and 15.1% for imports. It is also noticeable that the share of FSU in Turkish foreign trade has been increasing.

In addition to the above figures, it should be noted that about 50% of the foreign tourists visiting Turkey each year come from the EU countries, which generates a considerable portion of Turkish annual tourism revenues of around \$6-7 billion. According to the figures released by the Ministry of Tourism, for instance, out of 9.7 million tourists who visited Turkey in 1998, 22.9% came from Germany alone, 10.2% from England, 62.8% from OECD countries, and 25.5% from Eastern European Countries (Economic Report, 1998).

Turkey's interest in integration with Europe goes back to late 1950s. Only two years after the formation of the European Economic Community in 1957, Turkey applied for membership in 1959. Following a period of negotiations, Turkey-EU relations were put into a formal framework with the Ankara Agreement signed in 1963.

The Ankara Agreement proposed a twenty-five-year transition period during which both sides agreed to reduce the tariffs and other trade barriers on manufacturing products on a reciprocal basis. At the end of the transition process, all barriers would be eliminated, with the exception of agricultural products (Turkey-EC Relations, 1993). After a long period of

ups and downs, Turkey and the EU signed CU agreement in 1995. Currently Turkey is the only country who formed a CU with the EU, but not a full member yet.

3. The Customs Union Agreement:

The CU agreement became effective at the beginning of 1996. It proposed elimination of tariffs and levies on imports of manufacturing products originating from the EU, and adoption of Common External Tariff (CET) of the EU on imports from the third regions. Practically this implies a substantial reduction of tariffs imposed by Turkey on its imports from the non-EU countries. The most favored nation tariff rate of the EU is around 6-8 % on average.

Also, Turkey is obligated to provide preferential access to its markets to all countries to which the EU grants preferential access. These countries include Central and Eastern European countries with whom EU has *association agreement*, EFTA countries, Mediterranean countries that are covered by the Mediterranean Policy of the EU, and African and Pacific countries included in the Lome convention.

According to the agreement, by 2001 Turkey is supposed to establish preferential trade arrangements with all countries with which the EU has a preferential agreement. In this context, by the year 2001, based on Turkey's current import shares, the average tariff on non-agricultural imports will be less than 2% (zero for imports from the EU and around 3% on average for other countries) (Harrison et al., 1997). Coupled with liberalization attempts since early 1980s Turkey will become a rather open economy in the post-CU era. There will be no restrictions on tariffs imposed by Turkey on imports of agricultural products. As a result, agriculture will become highly protected relative to manufacturing unless Turkey takes unilateral action to reduce protection on agriculture. The agreement proposes no restrictions on export subsidies to third countries or export subsidies in agricultural products to any country (Customs Union With EU, 1995).

4. Turkish Economy in the 1990s:

The Turkish economic experience in recent years can be described as a typical *boom-and-bust cycles* (Yeldan and Diao, 1998). Looking at the real GDP growth rates after 1990 reveals this fact clearly, fluctuating between 10% and - 5%.⁷ These fluctuations are closely related to the availability of foreign resources to finance the domestic deficits. In general, the economy showed a high positive growth performance in the years when external resources were sufficient to finance current account deficit. Real output growth slowed down or even declined when foreign resources were not available. Economic and political stability was the primary factor affecting the accessibility of foreign resources.

Another important phenomenon that characterized the economy in this period was the rapid deterioration in the fiscal position of the government (Boratav, Turel and Yeldan, 1996). Substantial increases in real wages due to political pressures brought about by the 1989 and 1990 elections led to this deterioration. Real wage costs in private manufacturing sector went up by 105.2% from 1989 to 1991. The rapid increase in transfer payments outweighed the modest improvements in government tax revenues. Transfer payments climbed from 6.1% in 1991 to 13.4% of GDP in 1996. In the meantime public sector savings declined sharply and turned into negative after 1992 (Yeldan and Diao, 1998).

As is the case in most developing countries, the Turkish government had to rely on indirect taxation as the main source of government revenues due to the political difficulties associated with direct taxation. A comprehensive tax reform which would involve increasing tax rates and imposing extra measures for efficient tax collection is one of the politically most risky, hence unfeasible tasks for the governments. As a result, indirect tax revenues remarkably exceeded direct tax revenues in the 1990s.

⁷ Real growth was 9.3% in 1990, 0.9% in 1991, 8.0% in 1993, -5.5% in 1994, 7.2% in 1995 and 1996.

On the other hand, CU agreement with the EU required Turkey to harmonize its tariffs with the EU. This practically meant a huge revenue loss for Turkish government from foreign trade taxes, which imposed further difficulties on the fiscal balances.

As a result of these constraints on government's fiscal position, Public Sector Borrowing Requirement (PSBR) rose sharply, reaching 12.1% of GNP in 1993. The 1994 economic crisis broke out in such an environment. Given the limited external sources, the government had to use internal borrowing means extensively for public finance. In order to attract funds from the private sector, real interest rates offered on government bonds climbed to 30% in 1994 and 1996, an incomparably higher return than the real return on time deposits. Heavy domestic borrowing led to the rapid growth of domestic debt stock, which reached 22% of GNP by the end of 1997. Interest payments on domestic debt increased from 2.4% in 1990 to 9.0% of GNP in 1996.

Under these circumstances, short-term capital inflows could be the only way to finance fiscal deficits and foreign trade deficits. Indicating this fact, the current account, which showed a slight positive balance until 1990, turned into a sharp deficit in that year 1990. The current account deficit increased even further in the following years, reaching \$6.4 billion before the 1994 economic crisis. Export performance of the economy in 1980s could not be sustained in the 1990s. One of the major factors contributing to this cause was real appreciation of TL in the first half of 1990s. Imports increased relatively faster, as would be expected in a time of currency overvaluation. Between 1988 and 1993 exports increased only by \$4 billion whereas imports were doubled, from \$14.3 to \$29.5 billion.

A more realistic exchange rate adjustment later on helped reverse the appreciation of the TL and keep exports competitive in the world markets. However, with the annual inflation rate of around 90% real depreciation policy carried high risks of *currency substitution*. Coupled with the difficulties brought about by the Asian crisis, the Turkish economy today suffers from severe financial pressures and uncertainty, which in turn puts its stability and sustainable growth at risk.

The following table summarizes the macro indicators of the Turkish economy in 1990s.

Table 2.2: Main Indicators of Turkish Economy: 1990-1997

	1990	1991	1992	1993	1994	1995	1996	1997
<i>Annual % Change</i>								
GDP	7.9	1.1	5.9	8.0	-5.5	7.2	7.0	6.7
Private Consumption	13.1	1.9	3.3	8.4	-5.3	4.8	8.5	8.0
Public Consumption	7.9	4.5	3.8	2.3	-3.5	6.8	8.6	4.1
Fixed Capital Formation	19.4	0.9	4.3	35.0	-9.1	16.9	12.1	11.7
Private								
Public	8.9	1.8	4.3	3.4	-34.8	-18.8	24.4	28.4
Exports (\$ m.) ^a	13026	13667	14891	15611	18390	21637	23225	26245
Imports (\$ m.) ^a	22302	21047	22871	29428	23270	35709	43626	48585
Current Acc. (\$ m.) ^a	-2625	250	-974	-6433	2631	-2339	-5380	-4739
<i>As % of GNP</i>								
Budget Balance	-3.1	-5.3	-4.3	-6.7	-3.9	-4.0	-8.2	-7.3
PSBR	7.4	10.3	10.6	12.1	7.9	5.4	9.6	8.2
Domestic debt stock	7.0	8.1	11.7	12.8	14.0	14.6	18.8	21.4
Interest payments on domestic debt	2.4	2.7	2.8	4.6	6.0	6.2	9.0	7.7
Inflation (CPI, %)	60.4	71.1	66.1	71.1	106.3	88.0	80.4	85.7
Real exchange rate ^b	82.6	84.7	88.5	88.5	114.9	102.9	104.2	104.0
Real interest rate ^c	-0.6	1.2	6.1	2.3	-4.4	2.7	7.2	5.2
Real return on Gov. bonds ^d	-4.0	5.3	13.9	9.9	28.6	18.1	31.1	22.1
Employment index in priv. mnfcs.	95.2	79.5	78.1	80.3	75.5	82.9	89.1	94.4
Real wage index in priv. mnfcs. ^e	152.0	205.2	210.0	208.0	147.2	156.3	172.5	160.5

Source: SPO Main Economic Indicators, SPO Economic and Social Indicators (1950-1997).

(a) Excluding luggage trade. (b) Index, 1987=100. Derived from the basket with weights, 0.75\$+0.25DM; deflated by the wholesale price index. An increase means depreciation of the Lira. (c) Rate of return on 1-year time deposits, deflated by the CPI. (d) Annual average of Compounded Interest Rate on Government Debt Instruments deflated by the CPI. (e) Index (1988=100) based on index of production workers' hourly wages in Private Manufacturing industry, deflated by the CPI (seasonally adjusted).

III. THE MODEL, DATA AND EXPERIMENTAL DESIGN

Since its inception in the early 1950s, the research in the area of CU has passed through several phases. The first phase concentrated on the welfare effects from forming a CU on member countries. The second phase attempted to determine the reasons why customs unions are formed. Lastly, the third phase focused on specific topics (scale economies, imperfect competition, CU and developing economies, etc.) with some interest in general equilibrium models (Gunter, 1989). One of the findings many researches in this field agree is the empirical character of the question. In other words, there is no *a priori* theoretical assertion whether CU will be beneficial or not; the benefits or losses will depend on the details of the CU agreement in question, macro economic balances of the integrating regions and other environmental conditions. That leaves room for empirical studies in this area.

Within this framework, a considerable portion of the literature on CU issue focuses on the impacts of the formation of a CU or expansion of an existing one, on the welfare of the member countries. The major drawback of the early studies is that they tended to use partial equilibrium analysis, or general equilibrium analysis with only two goods. An analysis of the issue within a general-equilibrium framework is apparently more preferable for it takes the linkages between various sectors of the economy into account, hence provides a more comprehensive explanation. In the last two decades, attempts have been made for developing n-good general equilibrium models. Among these are Berglas (1979), Wooton (1986), Harrison, Rutherford and Wooton (1988), and Harrison, Rutherford and Tarr (1997).

One of the shortcomings of the majority of the studies is that they investigate the formation of a CU by considering the effects of marginal changes in trade barriers. Given the fact that the formation of a CU or expansion of an existing one is often subject to large, discrete changes in tariffs and other trade barriers, marginal analysis does not seem to be the best way of analyzing the effects of CU. Implementing marginal techniques was basically due to its analytical tractability. This was not without cost, however, as stated by Harrison,

Rutherford and Wooton (1988). They showed that marginal and discrete tariff changes do not always have the same implications: they may differ not only quantitatively, but also qualitatively.

Following this line of argument, this study is an attempt to quantify the impact of the CU between Turkey and the EU in a general equilibrium framework. The major contribution of the study is the inclusion of agricultural and food processing sectors.

1. The Model: Extended GTAP Model

The Global Trade Analysis Project (GTAP) modeling framework is employed to analyze the issue in question. The main assumptions of the GTAP model are perfect competition, utility maximizing regional household with a Cobb-Douglas utility function in which private household preferences are explained by Constant Difference of Elasticities (CDE) functional form. Production is governed by CRTS technology with a nested CES production structure.

On the demand side, the standard GTAP model allows for differences in both the price and income responsiveness of demand in different regions depending on the consumption patterns of the region. According to the model, the representative *Regional Household* receives all income generated in a given economy: payments to the primary factors of production including quota rents and net taxes. Final demand is explained by an aggregate utility function, which consists of private consumption, government consumption and savings. Aggregate utility and government consumption behavior is modeled by a CES utility function with Cobb-Douglas functional form, whereas private household consumption behavior is explained by CDE (Constant Difference of Elasticities) expenditure function.⁸

⁸ CDE functional form is based on the assumption of implicit additivity, which, in the case of N commodities, constrains the symmetric NxN matrix of elasticities of substitution to depend on only N parameters. It is less restrictive than CES but more restrictive than fully flexible functional forms, for example, the translog. The term flexible functional form is usually used for those forms that provide a second-order approximation at a point to the true function (Fuss et al., 1978). See Huff, Karen M. et. al (1997) for more details on CDE expenditure function.

On the supply side, differences in relative rates of factor accumulation interact with varying sectoral factor intensities. This interaction affects the sectoral composition of output. Different sectors are distinguished by the factor intensities. In this context, if labor accumulates in a particular region relative to other factors, then labor intensive sectors are expected to expand at the expense of capital intensive sectors. Supply is modeled by a weakly separable, CRTS, nested CES production function⁹.

The model utilizes the Armington assumption where products are differentiated by the origin of production, and it is exogenous. This assumption permits the researcher to track bilateral trade flows. Separability allows firms to determine sourcing of inputs independently of the price of domestic goods. The GTAP modeling framework also enables one to analyze the possible effects of regional economic integration in a multi-country, multi-sector setting through generating comparative static results for a variety of trade policy reform scenarios. Technology shocks can be used to assess the implications of a variety of possible technical changes. Furthermore, the model is quite handy for a detailed welfare analysis. The concept of *regional household* is instrumental to generate a single welfare indicator for a given region to estimate whether the region as a whole is better or worse off due to trade policy reforms. It is also possible to treat primary factors of production differently in terms of factor mobility across sectors.

The standard GTAP model has been extended in two dimensions to account for the tariff revenue replacement due to the CU and the budgetary implications of integrating Turkish agriculture. First, a new exogenous variable *tva* (tax on value added) is added to the model, which is defined as tax imposed on the components of value-added (land, unskilled labor, skilled labor and capital). As the counterpart of *tva*, the endogenous variable added is *nt* (net taxes), which is defined to be the sum of all taxes from different sources net of subsidies. During the simulations, *nt* is fixed, whereas *tva* is allowed to vary to keep the total net taxes unchanged.

⁹ See Hertel (1997) for more details on GTAP modeling framework.

The second extension to the standard model is modeling the EU budget to account for the budgetary costs of EU enlargement.¹⁰ For this purpose, a sector called "Brussels" is added to the model as primarily an accounting entity, which collects revenues from the member countries and then disburses back to them, resulting in the possibility of net transfers between member countries. The two main sources of revenues are import tax and GDP tax contributions of member countries. Revenues collected are spent to finance the output and export subsidies for agricultural and food processing sectors of the members.

2. Data: GTAP 4 Data Base

The GTAP 4 data base is utilized as the source data, which contains very large and detailed bilateral trade data, transport data, and protection data characterizing economic linkages between regions, and individual country input-output tables accounting for inter-sectoral linkages within each region. The database is built on a complete set of economic accounts for each of the 45 regional economies. Some of these regions are individual countries, whereas some others include a group of countries¹¹.

The GTAP4 data is based on the year 1995 and incorporates an exhaustive description of inter-industry linkages among 50 sectors within each region. Both intermediate input and import compositions are allowed to change across different uses¹².

Regional and sectoral aggregations are shown in tables 2.3 and 2.4 respectively.

¹⁰ Modeling the EU budget is adapted from Swaminathan (1997).

¹¹ The original data source is The Input-Output Structure of The Turkish Economy 1990 published by SIS. This I/O table is incorporated into GTAP 4 data base in order to separate out Turkey for the analysis. Agricultural sectors and labor categories are disaggregated by following a series of procedures explained in McDougall et al. (1998). Also, labor and capital shares are modified in accordance with the data received from Dr. Yeldan. In addition to the data received from OECD, WTO and World Bank for the data base, Togan (1993) and Krueger (1996) are utilized for modifications in the protection data.

¹² See McDougall et al. (1998) for further details.

Table 2.3: Regional aggregation

	Code	Region
1	TUR	Turkey
2	EU	European Union of 15
3	CEE	Central and Eastern Europe
4	EFTA	European Free Trade Area
5	MNA	Middle East and North Africa
6	ROW	Rest of the World

Table 2.4: Sectoral aggregation

	Code	Sector
1	GOS	Grains and oilseeds
2	LVS	Livestock
3	VAF	Fruits and vegetables
4	OCR	Other crops
5	FAF	Forestry and fishing
6	MTP	Meat products
7	DAP	Dairy products
8	BTP	Beverages and tobacco products
9	OFP	Other food products
10	TEX	Textiles
11	WAP	Wearing apparels
12	PCM	Petro-chemicals and metal products
13	MVH	Motor vehicles
14	MEE	Machinery and electronic equipment
15	OMP	Other manufacturing products
16	SVC	Services

As can be seen from the above tables, the 45 regions in the database are aggregated to 6 regions with which Turkey has strategic trade relations¹³. On the commodity side, the 50 sectors are aggregated into 16 sectors: 5 primary agricultural (sectors 1-5 in table 2.4), 4 processed food (sectors 6-9), 6 manufacturing (sectors 10-15) and 1 services (sector 16).

3. Experimental Design

There are several different scenarios as far as the integration possibilities are concerned. We are going to look at free trade area, customs union without agriculture, and customs union with agriculture in a variety of complications. The base case scenario is *maintaining pre-1996 policies*, i.e. no CU case. In this case there is no need for preliminary adjustment of the data, since GTAP 4 data base provides all the data in terms of 1995 US dollars. We will depart from the base case and evaluate the implications of different scenarios by the following 8 experiments.

Experiment 1: *FTA*, which involves free trade area between Turkey and the EU, where all the import tariffs between the integrating regions are eliminated, all food sectors are excluded.

Experiment 2: *CU*, which involves customs union between Turkey and the EU, where all the import tariffs and export subsidies between the integrating regions are eliminated, CET of the EU is adopted by Turkey, and tariffs for processed food commodities are adjusted such that the protection on agricultural component is preserved. Primary agricultural sectors are excluded.

Experiment 3: *CU+*, which involves experiment 2 plus free trade area between Turkey-CEE and Turkey-EFTA by eliminating tariffs on nonfood commodities.

¹³ The 1995 CU agreement proposed that Turkey should complete trade negotiations with those countries who have preferential access to the European markets, that's where CEE and EFTA come into the picture.

Experiment 4: *CUCAP*¹⁴, which extends CU to include agriculture. This is an extension of experiment 2 such that liberalization includes all traded commodities, primary agricultural products, processed food and nonfood products alike.

Experiment 5: *CUCAP+*, which involves experiment 4, plus liberalization of Turkey's trade with CEE and EFTA on nonfood commodities. This experiment describes the ideal case where Turkey can reach along the lines of CU agreement.

IV. RESULTS

1. Summary results with respect to some variables of interest:

The following table summarizes changes in some variables of interest in response to various experiments conducted.

Table 4.1: Summary results (Turkey):

	FTA	CU	CU+	CUCAP	CUCAP+
Welfare gain (\$ m)	3577	4072	4226	4361	4526
Trade bal. (\$ m)	-2589	-2752	-2842	-2361	-2451
Utility (%)	2.29	2.60	2.70	2.79	2.89
TOT (%)	8.16	7.67	7.97	8.42	8.77
Real income (%)	2.32	2.65	2.76	2.5	2.63
CPI (%)	7.96	7.33	7.62	9.53	9.88
Real growth (%)	0.17	0.51	0.53	0.52	0.53
Investments (%)	8.38	9.19	9.46	9.05	9.32
VAT adjustment(%)	7.4	18.1	18.0	19.7	19.9
Factor returns (%)	10.58	10.18	10.60	12.20	12.69
Cost on EUB (\$ m)	0	0	0	-2845	-2825

MNA is also important for Turkey because of the historical-social ties between the two regions, as well as its considerable share in Turkish foreign trade (around 15% of exports and 12% of imports, as of 1995).

¹⁴ CAP stands for Common Agricultural Policy of the EU.

The figures in the above table indicate that integration with the EU will be beneficial for Turkey in terms of welfare gains, per capita utility and real income, terms of trade, real growth and investments. In general the gains increase as we move from FTA to higher levels of integration. For example welfare gains (measured by the equivalent variation) rises gradually from \$3.5 billion in FTA to \$4.5 billion in CUCAP+. Per capita utility follows the same trend, too. In the highest level of integration (CUCAP+), which involves customs union, agriculture included, and free trade area with CEE and EFTA, Turkey's welfare gain is estimated to be \$4526 million. Utility per capita will go up by 2.89%, per capita real income by 2.63%, TOT by 8.77%, real GDP by 0.53%, and real investments by 9.32%.

Trade balance will deteriorate, as expected, in all scenarios, with the lowest magnitude in FTA, \$2.5 billion and highest in CU+, \$2.8 billion. It is lowest in FTA since only the nonfood sectors are liberalized. In CU, food processing sectors are partially liberalized and Turkey adopts CET of the EU, which leads to a higher trade deficit. Trade deficit reaches its highest level in CU+ scenario because the positive contribution of agricultural sectors is not utilized yet, while the liberalization in industrial sectors is extended to CEE and EFTA. Agricultural integration in the last two experiments narrows the trade deficit as Turkish agricultural products reach the EU market without barriers. As will be elaborated later on, trade balance will improve for four of the food sectors when agriculture is included, which help reduce the overall trade deficit. In parallel to this, inclusion of agricultural sectors positively contributes to the factor returns.

Among other variables of interest are adjustment to value added tax for tariff revenue replacement and the cost of incorporating Turkish agriculture on the EU budget. The simulation results indicate that Turkey will have to increase value-added taxes in order to compensate for the tariff revenue loss brought about by the tariff cuts due to the CU. The difference that CET adoption by Turkey will bring in this regard reflects itself in the big jump of the tax rates from 7.4% in FTA to 18.1% in CU scenario.¹⁵

¹⁵ This finding is quite similar to what Harrison et al. (1997) reported in their study: 16.2%.

The other interesting finding is that contrary to what many would think, the cost of absorbing Turkish agriculture into the EU will not be big. In fact, the results indicate that the net transfer from the EU budget in the case of agricultural integration will be negative, i.e. Turkey will be contributing more than it receives from the EU budget. One thing to note is that one needs to be careful in interpreting the above numbers. These results do not reflect any “politically determined” fund transfers from the EU budget, which is typically decided by the policymakers during the accession negotiations. What my results tell us is that, given the existing protection structure, the contribution Turkey will make to the EU budget through its tariff revenues and GDP-based deductions will exceed the transfers it will receive to cover output and export subsidies. The results do not qualitatively change, even though quantitatively they get smaller, when Turkey increases its output subsidy rates to the EU levels. Net transfers from the EU budget become positive only when Turkey adopts both output and export subsidy levels of the EU against third regions.

2. Impact on sectoral output:

Table 4.2 reports the impact on sectoral output in Turkey of the 5 scenarios described earlier.

Table 4.2. Impact on output, by sector (% change)

Sectors	FTA	CU	CU+	CUCAP	CUCAP+
GOS	-2.41	-2.22	-2.32	-0.60	-0.64
LVS	-0.01	-0.10	-0.16	0.97	1.06
VAF	-1.44	-1.41	-1.44	3.95	3.89
OCR	-1.43	-1.40	-1.51	3.00	2.86
FAF	-1.84	-3.25	-3.32	-3.57	-3.58
MTP	15.10	15.16	15.17	28.86	34.17
DAP	-0.17	-0.03	-0.01	0.52	0.75
BTP	-1.82	-1.72	-1.76	-2.29	-2.71
OFF	-3.82	-2.26	-2.38	0.29	0.46
TEX	44.79	45.78	45.94	36.67	36.42
WAP	105.66	117.85	118.44	106.18	106.06
PCM	-6.93	-5.26	-5.22	-5.76	-5.78
MVH	-42.66	-43.31	-40.95	-45.06	-43.04
MEE	-19.63	-21.02	-20.86	-22.28	-22.24
OMP	-5.73	-11.02	-11.31	-11.66	-11.68
SVC	-0.56	-0.35	-0.35	-0.82	-0.85

Apparently the most striking result that comes out of Turkey-EU integration with respect to output is the huge expansion of the textiles and wearing apparels sectors. These results are hardly surprising given the higher protection and the high export shares of these sectors. Textiles and wearing apparels exports account for 5.9% and 21.3% of total Turkish exports to the EU, respectively. It is also worth noting the high share of the EU in Turkish textiles and wearing apparels exports: 50.3% and 67.1%, respectively. Given these considerably high shares, as the EU removes barriers, demand for Turkish textiles and wearing apparels goes

up, which leads to higher exports to Europe. This will, in turn, promote output growth because exports constitute 36.3% of the disposition of textiles and 59.2% of the disposition of wearing apparels. Output expansion in these sectors slow down when the agricultural sectors start growing when agriculture is included.

Another general result is that all other manufacturing sectors contract in all of the integration scenarios. This is also not surprising since integration in nonfood commodities is the common denominator across all experiments and import tariffs of the EU are lower than Turkish counterparts in nonfood sectors, except for textiles and wearing apparels.

As far as the agricultural and food processing sectors are concerned, output response will depend on the nature of the integration. All the primary agricultural and processed food sectors, with the exception of MTP, contract when they are excluded from the integration (first three experiments). Two factors can be identified in generating this result. First, as trade barriers are removed from nonfood sectors, protection levels in food sectors become relatively even higher, which affect the trade flows in these sectors negatively. Second, due to the sharp expansion in textiles and wearing apparels, resources are pulled away from agricultural sectors, which will also force output to shrink in these sectors. When protection levels are adjusted for the CU (experiment 2), all processed food sectors response positively, though not significantly: contraction slows down in DAP, BTP and OFP, while MTP grows slightly faster than FTA case. Competition from the CEE and EFTA negatively affects these sectors.

More important for the focus of this study is that, when primary agricultural sectors are included in the CU (CUCAP scenario), then output contraction in LVS, VAF and OCR sectors turns into output expansion. In parallel to this, two of four processed food sectors (DAP and OFP) switch from contraction to expansion, while output growth accelerates sharply in MTP. In other words, when agriculture is included in the integration process, 6 out of 8 growing sectors will be food industries. As the tariffs and export subsidies are eliminated from agriculture, EU demand for Turkish agricultural products goes up

substantially, as will be shown later. Increased foreign demand, hence increasing export prices will promote higher production in these sectors. Not surprisingly, among the five primary agricultural sectors LVS, VAF and OCR have larger export shares in disposition of output (4.7%, 6.5% and 11.1% compared to 2.5% and 1.1% of GOS and FAF sectors, respectively). Even more so, the share of the EU in Turkish VAF and OCR sectors are seemingly higher: 58.3% and 33.9%, compared to 13.3% of GOS sector. This answers the question why GOS sector contract when CUCAP is implemented. Along the same lines, FAF contracts because there is not much difference between Turkey and the EU in terms of import tariffs (3.12% and 7.66%, respectively), but there is a big difference in terms of export subsidies. Turkey subsidizes FAF by 64.54, whereas the EU taxes it by 0.48%. Elimination of the subsidies obviously works to the benefit of the EU.

Note that output growth in the primary agricultural sectors discussed above is realized when the existing output subsidies are left intact. The EU output subsidy levels are higher than Turkey in all primary agricultural sectors, except for OCR. This implies that if Turkey increases its output subsidy levels to the EU levels, expansion in the agricultural sectors will be even higher. For instance, when Turkey subsidize GOS sector as the EU, negative growth (-0.6) in this sector turns into an expansion of 7.21%. Other sectors follow the same trend as well.

3. Impact on Factor Markets

The following table shows the factor market response in Turkey in response to the 5 experiments conducted.

Table 4.3: Real factor returns (% change)

Factors	FTA	CU	CU+	CUCAP	CUCAP+
Land	-5.84	-6.1	-6.33	14.07	13.92
UnSkLab	2.91	3.21	3.33	2.38	2.52
SkLab	2.62	2.94	3.07	1.33	1.47
Capital	3.01	3.21	3.35	1.44	1.59

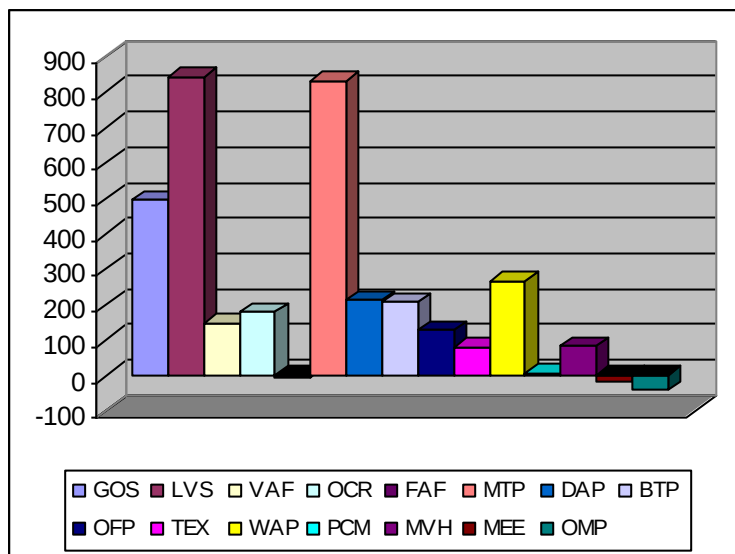
The contribution of agriculture and processed food sectors is clearly reflected in real factor returns. For instance, real return on land, which is a sector-specific factor employed only in the primary agricultural sectors, is negative in all three experiments in which agriculture is excluded from the integration. Once agriculture comes into the picture, return on land not only switches to positive, but increases faster than any other factor. Another interesting point to note is that for the first three experiments that exclude agriculture, the wedge between real return on skilled and unskilled labor is very low. Once the agriculture is included, however, the wedge increases considerably.

When agriculture is included, those agricultural sectors with relatively high output and export shares expand, which requires more primary factors to accommodate increased demand. Since primary agricultural sectors are unskilled labor intensive, return on unskilled labor increases faster than that of skilled labor.

4. Impact on Bilateral Exports of Turkey to the EU

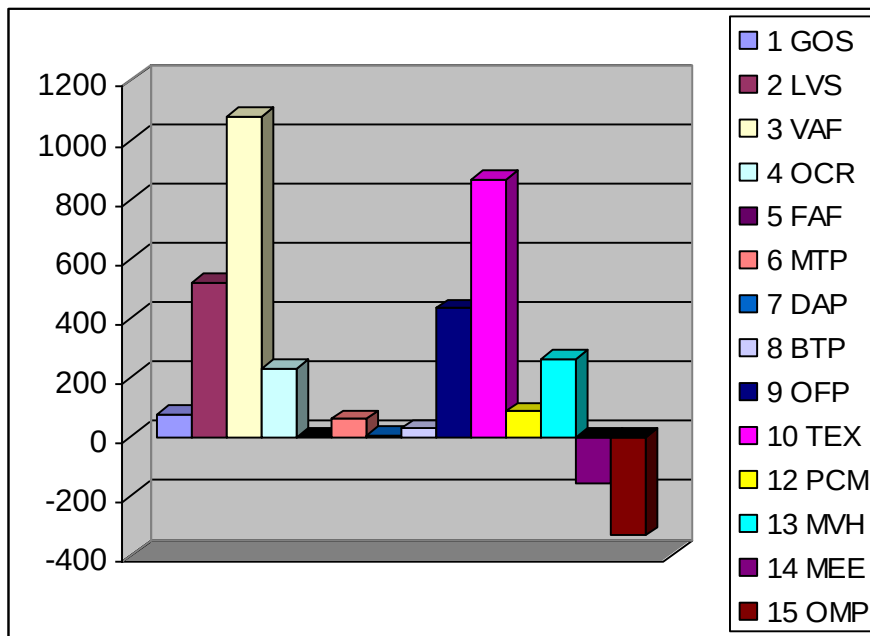
The tables below show the response of Turkish exports to the EU in CUCAP+ scenario.

Graph 4.1: Impact on Turkish exports to the EU (% change)



The graph indicates that all primary agriculture and processed food exports will increase, with the exception of FAF sectors. Export growth rates are so high partly because the protection levels before the liberalization were high, partly because the initial trade flows were low so that small level changes convert to big % changes. Wearing apparels exports will follow GOS, LVS and MTP in terms of the growth in exports to the EU.

Graph 4.2: Impact on Turkish exports to the EU (volume change, \$million)



The graph does not show wearing apparels and services because their values are out of chart (\$10557 and -2923). Growth in export volume for VAF, OFP and TEX are more visible, as the graph shows.

A few words on trade creation and trade diversion are in order. As expected, Turkey rotates its trade pattern towards the EU, and CEE and EFTA as they come into the integration scenario, at the expense of the other regions. When agriculture is included and trade negotiations are completed with CEE and EFTA (CUCAP+ scenario), Turkish primary agricultural exports change their destination more towards the EU, processed food exports towards the EU, CEE and EFTA at the expense of MNA and ROW. Overall trade creation

will dominate. Volume of aggregate exports of Turkey to the EU, CEE and EFTA is estimated to go up by \$10788, 143 and 75 million respectively, whereas exports to MNA and ROW go down by \$ 1011 and 2864 million.

Table 4.4: Aggregate exports, by region (volume change, \$m.)

	TUR	EU	CEE	EFTA	MNA	ROW	Total
TUR	0	10788	143	75	-1011	-2864	7131
EU	3482	-3421	-22	224	836	3079	4177
CEE	713	-725	-2	1	24	143	153
EFTA	482	-334	-10	-4	30	19	183
MNA	1502	-1197	-14	-15	-4	-674	-403
ROW	5686	-5819	-117	-111	249	-674	-788
Total	11865	-708	-23	169	123	-971	10455

5. Impact on Regional Trade Balance

Looking at trade balance by commodity and by region is also informative.

Table 4.5: trade balance by commodity and by region (\$ m.)

	TUR	EU	CEE	EFTA	MNA	ROW
GOS	-51.42	0.79	-10.75	0.47	-1.16	52.08
LVS	-473.06	-525.75	-24.31	7.09	174.28	817.53
VAF	1212.72	-917.32	-8.38	-0.96	-39.44	-208.76
OCR	-29.96	11.22	3.3	1.19	-13.87	11.42
FAF	-12.07	26.27	-1.35	-0.52	-2.08	-12.38
MTP	41.48	75.73	17.88	-55.06	-0.59	-82.1
DAP	0.22	28.75	16.5	-16.72	-5.25	-30.31
BTP	-137.18	159.46	-0.34	16.61	-4.11	-46.43
OFP	95.95	-240.33	65.56	-27.87	-8.06	81.32
TEX	-1666.55	385.88	111.64	-18.65	28.79	1038.69
WAP	10394.39	-5898.89	-734.77	-95.4	-637.38	-3259.52
PCM	-1304.56	586.47	169.41	61.53	-101.33	389.78
MVH	-1565.41	1268.84	205.97	-11.09	-33.92	60.41
MEE	-2387.45	2731.94	50.25	78.51	-156.79	-479.84
OMP	-2181.56	824.75	36.98	-9.94	505.46	685.03
SVC	-4152.97	3536.7	165.71	106.55	-49.98	1392.39

As the table 4.5 shows, 4 out of 5 sectors in Turkey for which trade balance improves are food sectors. The only nonfood sector that shows a positive trade balance will be, not

surprisingly, wearing apparels. Trade balance in textiles deteriorates because in order to accommodate the huge expansion in wearing apparels, imports of textiles also go up since textiles are used as inputs in wearing apparels sector.

6. Impact on Regional Welfare

The following table shows the welfare gain or loss for the regions from different integration scenarios, as measured by the change in regional equivalent variation. All scenarios generate positive welfare gain for Turkey, more remarkably so when agriculture is included. The welfare loss will be shared mainly by the EU and the ROW due to terms of trade deterioration.

Table 4.6: Impact on regional welfare (\$ million)

EV	FTA	CU	CU+	CUCAP	CUCAP+
TUR	3577	4072	4227	4361	4526
EU	-1214	-2489	-2605	-1788	-1904
CEE	-238	-171	-166	-174	-156
EFTA	-65	69	59	55	-18
MNA	-536	86	84	83	83
ROW	-1372	-741	-780	-842	-885

Table 4.7: Welfare summary table (CUCAP+)

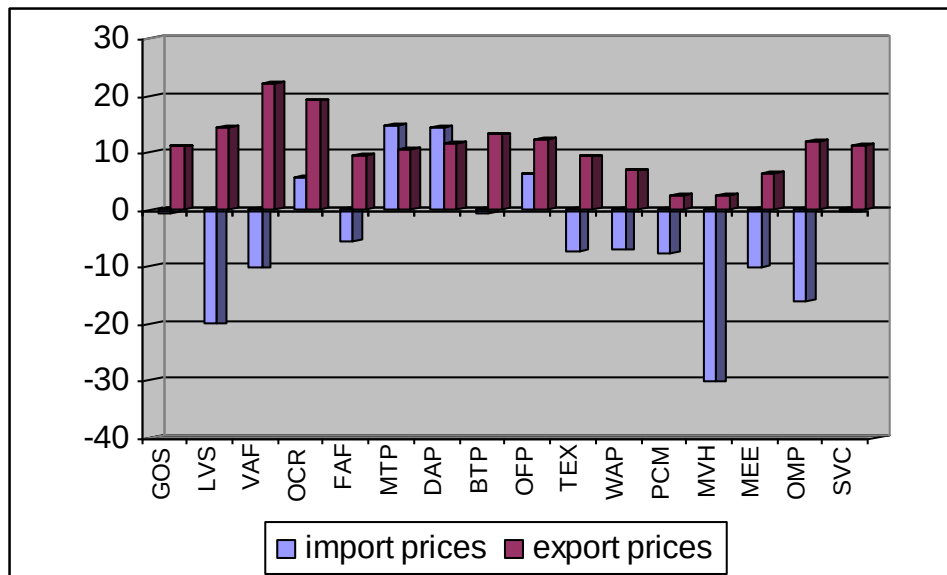
	alloc eff.	tot	cgds	total
TUR	921	3493	104	4526
EU	1335	-3253	14	-1904
CEE	-6	-142	-8	-156
EFTA	-51	26	7	-18
MNA	-27	107	3	83
ROW	-360	-399	-126	-885
Total	1813	-169	-6	1645

Welfare decomposition indicates that Turkey's gain will largely be generated by TOT improvements, which accounts for about $\frac{3}{4}$ of the overall welfare gains. Decomposition of

allocative efficiency gains shows that import taxes are the dominating factor in generating efficiency gains. Removing the distortions will promote reallocation of resources where the marginal productivity is higher, which will generate allocative efficiency gains.

The details of TOT decomposition, on the other hand, reveals that the results are driven by export price contributions. The following graphs show the estimated change in export prices, import prices and the contribution of different components (world prices, export and import prices) to total TOT gain. This finding makes sense given the elimination of tariffs by the EU and high shares of Turkey's exports to the EU. As import demand by the EU goes up prices of Turkish exports will increase. Combined with falling import prices in Turkey due to import liberalization, TOT will improve.

Graph 4.3: % change in import and export prices (Turkey, CUCAP+)

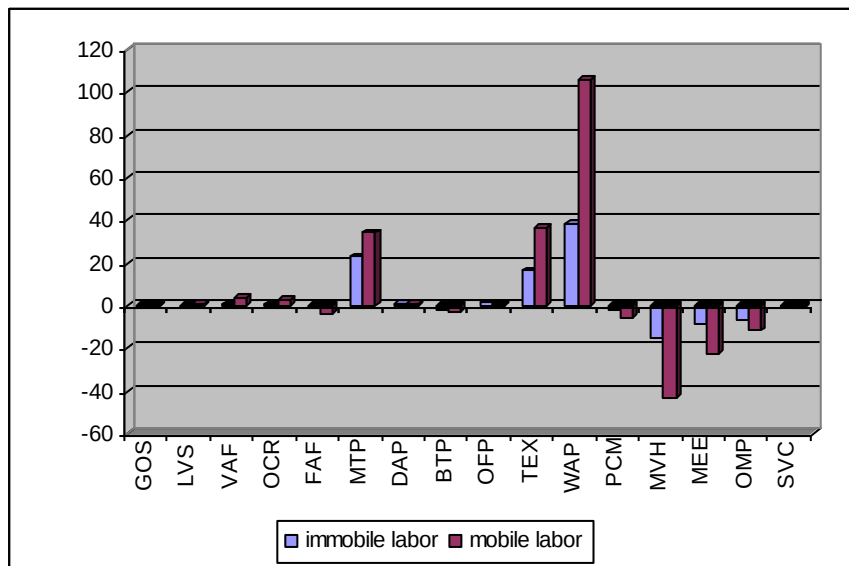


Notice that prices of Turkish primary agricultural exports increase faster relative to processed food and manufacturing sectors due to increased foreign demand. As far the changes in import prices are concerned, LVS, VAF, MTP, BTP and MVH and OMP have more visible price falls, due to relatively higher protection levels prior to the integration.

7. Effect of Factor Mobility:

Factor mobility has always been an important issue in theoretical and empirical economic analysis. It becomes more critical when a developing economy is engaged in trade policy reforms that would affect sectoral reallocations, where unskilled labor intensive agriculture has a considerable share in GDP and unemployment is a major concern. As the following table shows, labor mobility is an important factor to influence the response of aggregate variables.

Graph 4.4: Contribution of mobile labor to output response (CUCAP+):



When labor is not allowed to move across sectors freely, supply response becomes limited, generating lower output changes. It is also interesting to note that output response switches

sign (from -1 to 1.06) in LVS sector depending on whether labor is mobile or not. In all other sectors output response is smaller in immobile labor case than mobile labor. Positive contribution of mobile labor to output expansion is more visible in MTP, TEX, WAP, MVH, MEE and OMP. Similarly, other variables of interest such as EV, per capita utility, TOT and per capita income also give lower responses to immobile labor (not shown here).

V. CONCLUSION

In this paper, I analyzed the implications of integrating Turkey's agriculture with the EU in the context of the CU, which has not been analyzed previously in a multi-sector, multi-region general equilibrium context. The experiments included various integration scenarios from free trade area to the Customs Union with and without agriculture. I also looked at the affect of factor mobility on various aggregate variables.

The results showed that integrating agriculture will be beneficial for Turkey in terms of equivalent variation, per capita utility, per capita income, investments and real growth. When agriculture is excluded from the integration all primary agricultural sectors and all manufacturing sectors except textiles and wearing apparels contract. On the other hand, when the CU is extended to include agriculture, 6 out of 8 expanding sectors will be primary agricultural and food processing sectors. Similarly, 4 out of 5 sectors for which trade balance improves will be food sectors. Turkey's trade balance will deteriorate in all manufacturing sectors except for wearing apparels, which will show a remarkable expansion in both output and exports.

Welfare, income and TOT gains will get higher the higher the level of integration. When agricultural integration is accomplished and trade negotiations with CEE and EFTA countries are completed, Turkey's welfare as measured by the equivalent variation is estimated to be around \$4.5 billion, real income is estimated to go up by 2.63%, TOT by 8.77%, and investments by 9.32%. Contribution of this integration scenario to real economic growth is expected to be 0.53%.

When agriculture is taken into account, real factor returns on land, sector-specific factor in agriculture, turn into positive and show the highest increase among all four primary factors.

In this case real return on unskilled labor also goes up faster than skilled labor, reflecting the unskilled labor-intensive character of the primary agricultural sectors.

The results also indicated that labor mobility will be an important factor in determining the impact of Turkey-EU integration on various aggregate variables. Mobile labor will generate higher output, higher trade volume, higher income, faster GDP growth and higher welfare for Turkey. Turkey's welfare gains will largely follow from the TOT improvements brought about by export price increases.

Lastly, there are two other major concerns about Turkey-EU integration including agricultural sectors. First, its implications on government finance. Second, the cost it will impose on the EU budget. As far as the revenue replacement is concerned, the simulation results indicate that Turkey has to increase value-added taxes by 20% in order to compensate for the tariff revenue loss due to the CU. As regards to the budgetary implications of Turkey-EU integration on the EU budget, my findings are such that the contribution Turkey will make to the EU budget through import tariff revenue and GDP taxes will outweigh the transfers from the EU budget to finance export and output subsidies. In other words, as mentioned by Akder et al.(1990), it seems reasonable that the fears that the cost of getting Turkish agriculture into the CAP will be tremendously high are unfounded.

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