

Macroeconomic implications of the European integration on the Turkish economy

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Abstract

The arguments about full membership in the EU has become a priority for Turkey in the last decade, because Turkey's joining the EU will have a strong impact on Turkey's and the EU's macroeconomic structure. In order to analyze the impacts of Turkish accession into the EU, a computable general equilibrium model has been developed and the results of various policy scenarios have been compared. The model considers the imperfect competition in the Turkish manufacturing sector. Simulation results showed that full membership appears to be the most beneficial scenario for the Turkish economy based on several macroeconomic variables.

1. Introduction

After major liberalization efforts by Turkish officials in the 1980s, full membership in the EU has become a priority for Turkey, because Turkey's joining the EU will have a strong impact on Turkey's and the EU's macroeconomic structure. Since the decisions are made politically, Turkish policy-makers need to know how to concentrate their efforts over the transition period, and produce policies accordingly. For that reason, this paper focuses on the impacts of different tax scenarios on macroeconomic performance.

As stated in Diao *et al.* (1998), not only the transition economies such as Bulgaria, Romania, and the Slovak Republic, but also most market economies

¹ The authors are Post-Doctoral Research Associate and Associate Professor, respectively. The authors gratefully acknowledge the suggestions by two unanimous referees. Dr. Bekmez also acknowledges financial support by Muğla University during the preparation of the manuscript. Sole responsibility of the study rests with the authors.

such as Greece, Turkey, Pakistan, and Egypt have very high fiscal deficits. Countries that are experiencing a current account balance deficit have difficulty attracting new foreign investment. Such countries must offer higher interest rates to attract foreign capital or tax breaks or a combination thereof.

The effects of financial deficits become even more important when economic integration is involved. Choosing economic integration with other countries affects the country's macroeconomic variables such as imports, exports, price and investment levels, wage rate, and population. Since all these issues are closely related to budgetary and fiscal independence of a country, pre-evaluation of such policy decisions should be carefully made. Appropriate forecasting of such policy results will improve the current and future policy making capabilities of the countries. These decisions are also important characteristics in terms of achieving a fair inter-generational resource allocation.

Harrison *et al.* (1993) defined three types of liberalization options for the Turkish government: across-the-board liberalization, sectoral liberalization, and tariff harmonization to the EU's common external tariff (CET) policy. Since Turkey and the EU were interpreting "harmonization" differently, their analyses gave different results regarding tariff harmonization. In Turkey's interpretation, harmonization reduces tariffs to zero but still puts some import surcharges on EU products. However, the EU's interpretation is to reduce the tariffs and import surcharges to zero. In this case, harmonization of tariffs is welfare enhancing for Turkey if its interpretation is followed, but welfare-reducing if the EU's interpretation is followed.

Joining to Customs Union created another discussion regarding tariff harmonization. By reducing tariff rates, Turkey will be losing its tariff revenues, but gaining trust of the EU countries. The question that must be asked is if this is really beneficial for Turkey? Yeldan (1997) used two types of analyses to capture the welfare implication of a customs union: (i) the implementation of a tariff harmonization program for a customs union, and (ii) the impact of joining the single European market. When Turkey joins the EU, non-tariff barriers will automatically be removed as well as tariff barriers. This will prevent import and export arbitrages, and the firms will be forced to use a single price. This price will be a mutual price for firms of both countries. In that case, the price will have a unique role to determine the welfare effects of integration. Harrison *et al.* (1993) claimed that the harmonization of tariffs will have very little beneficial effect on Turkey's economy. In order to be successful in liberalization policy, it is important for Turkey to use an export subsidy reduction policy combined with tariff harmonization policy. We might generalize this result and say that the success of the trade policy reforms depends crucially on reductions in both tariffs and export subsidies. The main conclusion that Harrison *et al.* (1993) pointed out was the fragility of the first-best rule. In other words, it is not the case that any partial movement toward the first-best trade policy for Turkey will result in some fraction of the welfare gains from that first-best package. This fact can be considered as a restatement of well-known rule of the "second-best".

A more comprehensive study which utilizes a multi-sector general equilibrium model of Turkey's fiscal harmonization process is conducted by Diao *et al.* (1998). The study focuses on the effects of fiscal debt and trade liberalization on foreign trade, capital accumulation, and the growth rate of Turkey. They use three different experiments. The first evaluates perfectly coordinated fiscal and trade policies, which means that all tariffs will be eliminated and income tax rates adjusted in order to compensate for tariff revenue losses. Thus, government revenue will be the same. Also, trade reform has no effect on government expenditure. The second experiment considers the reduction of tariff rates, and increased wage rates, but delays revenue enhancing policies, such as an increase in the income tax rate for 20 years. The third experiment is the same as the second except that the delay in the revenue enhancing policies is 40 years. The results indicate that the longer the delay in fiscal policy adjustment, the more harmful the tariff liberalization will be.

In addition to these CGE applications discussed above, there are numerous articles regarding regional economic integrations. Bean (1992), and Wyplosz (1997) focus on monetary union in Europe. The former justifies his arguments with the term "storm in a teacup", which means there is no need to make so much fuss out of the monetary union in Europe. The latter, however, points out the importance of monetary union in Europe. Fernandez and Portez (1998) conclude that countries can have several benefits from economic integration such as signaling, bargaining power, insurance, and coordination. Schiff and Winters (1998) also address the issues regarding the relations between openness of an economy and economic growth, and analyze the topics of dynamics, politics, and political economy in regional integration agreements. In contrast to these studies, however, Flam (1992) claims that removal of trade barriers among countries may not improve the gains from trade.

2. A general equilibrium model for the Turkish economy

This section explains the analytical framework and mathematical construction of a computable general equilibrium model for the Turkish economy (TRCGE). This model seeks to illustrate the impacts of Turkey's accession into the European Union and compares the results with customs union.

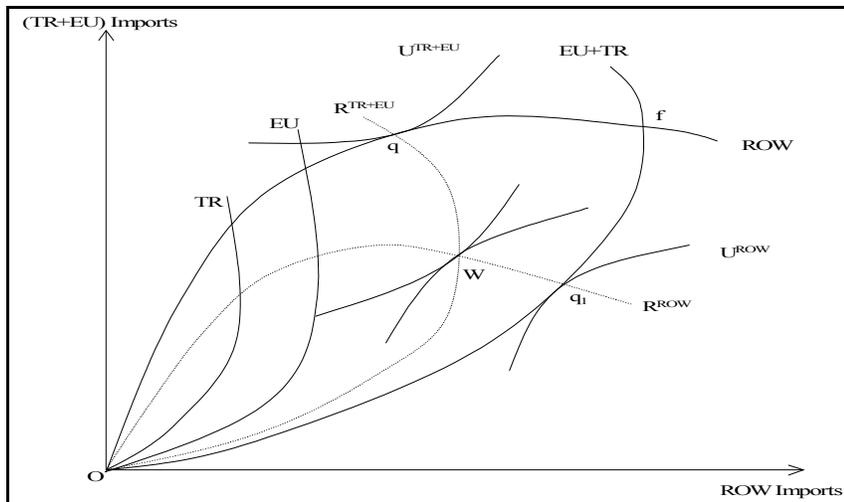
2.1. Theoretical framework

This part of the article aims to explain the analytical framework of a computable general equilibrium model for the Turkish economy (TRCGE). The model explains the impacts of Turkey's accession into the European Union within the neo-classical framework. Following the general rules of CGE modeling, economic implications of integration will be discussed.

We assume a two-stage cooperative game to capture the impacts of

integration. The first stage of the game determines the protection tools, and the second stage determines the level of the protection. The bargaining process starts in the second stage of the game. If anything fails in this stage, trade warfare occurs. Figure 1 shows the implications of Turkish-EU integration and explains the rationale behind this integration. The analysis begins with a three-country, two-commodity economy, which can be expanded to the n commodity case. The offer curves of the rest of the world, Turkey, and the EU are denoted as ROW, TR, and EU, respectively. The offer curve of the EU with inclusion of Turkey is denoted by TR+EU. The trade indifference curves are denoted by U^{ROW} , and $U^{\text{TR+EU}}$ for the rest of the world and the EU with Turkey, respectively. Since we are considering the implications of an integration between Turkey and the EU, individual trade indifference curves are ignored for the sake of simplicity, and thus, the trade indifference curves of these countries are analyzed jointly. The free trade will be point f . If ROW imposes its optimal tariff and the expanded EU (EEU) trades freely, q will be the equilibrium point; and if the EEU imposes its optimal tariff and ROW trades freely, the equilibrium point will be q_1 .

Figure 1
Partnership Game and Economic Integration



If bargaining between ROW and the EEU fails in the second stage of the game, we need to determine the tariff reaction curves of each country. These curves are R^{ROW} and R^{EEU} . The intersection of these curves, W , will be the equilibrium point for tariff warfare. The quota warfare equilibrium is no trade at all (point O). In international trade, if there is no free trade agreement and/or integration, a protection measure imposed by a country usually suffers retaliation in the form of an equivalent protection measure by other trading partners. As a result, the tariff warfare equilibrium point between ROW and the EEU will be point W .

The integration between Turkey and the EU will allow us to combine their offer curves. Turkey and the EU will not use any trade protection tools against each other, but put restrictions for the other countries (ROW). As Gul (1989) mentioned, this situation can be called a partnership game. In other words, the EU and Turkey will act cooperatively regarding restrictions on others, but not on each other. The theoretical implication of this partnership game is an expectation of an increase in welfare of both countries.

2.2. The Empirical Model

The empirical model is an extended version of Köse (1996) and Yeldan (1997). The model has two important specifications. First of all, it considers imperfect competition in the Turkish manufacturing sector. With this important specification, we can differentiate the commodity market as perfect and imperfect competition, and highlight the policy implications in terms of these two criteria. The Beverage, Tobacco, Petroleum, Glass, Iron/Steel/Metal, Non-electrical Machinery, and Transport Equipment sectors are considered as monopolistic sectors. The second important specification of the model is to consider differentiated factors in the production process. As we know, capital and labor are used in the production process as primal factors. Labor is differentiated as “formal labor” and “marginal/informal labor” (Köse, 1996). With this specification we can analyze the basic characteristics of two different labor markets, and show the linkages between them.

The decision processes of the model are differentiated as public and private, and Armington assumption, and small country assumptions are recognized throughout the model. The import demand for each sector is determined in two stages. In the first stage, domestic production and sectoral import demands are solved in terms of relative prices and exchange rates. In the second stage, the import demand found in the first stage is differentiated into two origins: EU and non-EU imports. This differentiation in the imports in terms of origin makes the analysis of full excess of Turkey into the EU much easier. Since Turkey has to remove all import duties levied on the EU commodities and not on non-EU commodities, the custom taxes collected from the EU countries and non-EU countries will be put into different categories in order to capture the impacts of the accession to the EU. However, our model is a static formulation of the general equilibrium modeling so that it may not capture medium term dynamics.

The production technology is assumed to have multi-level constant elasticity of substitution (MLCES), and the intermediate input demand is defined as Leontieff technology, where inputs should be used in a constant proportional way to produce a certain amount of output. This technology can be formulated as:

$$Q_i = A_i (\alpha_i V_i^{-\beta} + (1 - \alpha_i) N_i^{\beta_i})^{1/\beta_i} \quad (1)$$

where A_i represents the scale parameter showing the returns to scale, V_i represents value added factors (capital and labor), N_i represents composite

intermediate commodities, α_i represents the distribution parameter, β_i represents the substitution parameter, and $\zeta_i = 1/(1 + \beta_i)$ represents the elasticity of substitution between factors and intermediates.

The value added factors in equation (1) can be expressed as follow:

$$V_i = AV_i \left\{ \sum_s \delta_{i,s} L_{i,s}^{-\rho_i} + (1 - \sum_s \delta_{i,s}) K_i^{-\rho_i} \right\}^{-1/\beta_i}$$

(2)

where AV_i represents the scale parameter, $L_{i,s}$ represents labor categories, K_i represents capital, $\delta_{i,s}$ represents a share parameter, and $\rho_i = 1/(1 + \rho_i)$ represents the elasticity of substitution between primal production factors (capital and labor).

The producers try to choose the optimal level of physical and intermediate inputs in order to minimize their production cost. In this regard, the optimum level of input choice can be formulated as:

$$\text{Min } PQ_i QS_i (1 - tax) = PV_i V_i + PN_i N_i$$

(3)

subject to Equation 1 and 2. In equation 3, PQ_i represents the price of good i , PV_i represents price of primary inputs, and PN_i represents price of intermediate inputs, and tax is the rate of tax that government imposes on firms.

The subsequent step of the model is to determine the optimal factor use. The model considers four types of inputs: non-mobile capital, Leontieff technology intermediate input, marginal labor, and organized (formal) labor. Labor supply is assumed constant for both labor categories. Wages in the organized labor market are elastic. If the wage rate in this sector is sufficiently high with respect to the equilibrium level, the remaining excess supply of labor enters the marginal labor market and creates unemployment in this sector. As a result, the wage rate in the marginal labor market decreases (Köse, 1996).

Consumers strive to minimize their cost, and this minimization process can be formulated as:

$$\text{Min } PC_i CC_i = PD_i DC_i + PM_i M_i \quad (4)$$

subject to:

$$CC_i = C_i \left[\varphi_i M_i^{-\phi_i} + (1 - \varphi_i) DC_i^{-\phi_i} \right]^{-1/\phi_i} \quad (5)$$

where CC_i , M_i and DC_i represent the domestic composite commodity, the imported commodity, and the domestically produced commodity, respectively; C_i represents a shift parameter, N_i represents a share parameter and $1/(1 + N_i) = F_i$ represents elasticity of substitution between domestic and imported goods. PD and PM represent domestic and imported good prices, respectively.

As mentioned earlier, exports and imports are distinguished in terms of their source, and it is assumed that they are limited substitutes for each other. The formulation of this process for imported goods is:

$$M_i = \Omega_i \left[\gamma_i MEU_i^{-\tau_i} + (1 - \gamma_i) MRW_i^{-\tau_i} \right]^{-1/\tau_i} \quad (6)$$

where MEU and MRW represents imports from the EU and imports from ROW, respectively; and γ_i represents a share parameter, Ω_i represents a shift parameter, and $\varepsilon_i = 1/(1 + \tau_i)$ represents elasticity of substitution between imported goods of different origin imported goods.

Given prices of imported goods of different origin and the degree of elasticity of substitution, the optimization problem of the consumers is:

$$\text{Min } PM_i M_i = PMEU_i MEU_i + PMRW_i MRW_i \quad (7)$$

subject to Equation 6. In Equation 7, PMRW and PMEU represent the import price of rest of the world and the import price of the EU, respectively.

On the import side of the economy, a small country assumption and perfectly elastic EU and non-EU import supply assumptions are made. If the exchange rate (ER) and foreign trade taxes are known, the domestic market price of the commodities can be determined as follows:

$$PMEU_i = PW_{MEU_i} (1 + tmeu_i + tfeu_i) ER \quad (8)$$

$$PMRW_i = PW_{MRW_i} (1 + tmrw_i + tfrw_i) ER \quad (9)$$

where PMEU, PMRW and PW stand for domestic price of EU imports, domestic price of ROW imports, and world price, respectively. The terms tmeu, tfeu, tmrw, and tfrw represent the EU and non-EU custom taxes and funds, respectively. Fund rates in the model indicate non –tariff barriers on imports. These rates are considered as exogenous and used as policy parameters in the model.

The export supply side of the model can be formulated similar to the import supply function:

$$QS_i = D_i \left[\mu_i \cdot E_i^{-\nu_i} + (1 - \mu_i) DC_i^{-\nu_i} \right]^{-1/\nu_i} \quad (10)$$

where D_i represents a shift parameter, E_i represents commodity exported, μ_i represents a share parameter, and $\zeta_i = 1/(1 + \nu_i)$ represents the transformation elasticity. The maximization problem becomes:

$$\text{Max } PQ_i \cdot QS_i = PD_i \cdot DC_i + PE_i \cdot E_i \quad (11)$$

subject to equation 10.

Following the specification of the maximization problem, the origin of the exports must be determined. Since we have specified two different origins as exports to the EU and exports to the ROW, the Armington function for this problem can be formulated as:

$$E_i = \psi_i \left[a_i EEU_i^{-\eta_i} + (1 - a_i) ERW_i^{-\eta_i} \right]^{-1/\eta_i} \quad (12)$$

where EEU_i and ERW_i represent exports to the EU and ROW, respectively; a_i represents the share parameter; ψ_i represents the shift parameter, and

$\omega_i = 1/(1 + \eta_i)$ represents the elasticity of substitution between exported good.

The private income (YH) consists of gains from value added production of private sector, transfers from government and the rest of the world, and factor incomes. The private sector value added can be obtained by subtracting government factor income and corporation tax.

$$YH = [(PVA \cdot V) - FI_G - TAX_{CAP}] + T + (FI_P - PT_{ROW}) ER \quad (13)$$

where FI_G , and FI_P represents factor income of the government and private sector, respectively, TAX_{CAP} represents corporation tax ratio, T represents transfers to the private sector, PT_{ROW} represents private income transfers to the ROW.

The public sector is another independent component of the economy. That is why the public sector should be considered carefully in order to make a model complete. Misspecification of the public sector income creates serious drawbacks in the model. Public income is shown as:

$$GREV = TARIFF + TAX_{IND} + TAX_{HH} + TAX_{CAP} + FI_G + GFI_{ROW} \cdot ER \quad (14)$$

where GREV represents government revenue; TAX_{IND} and TAX_{HH} represent indirect tax and income tax, respectively. Here TAX_{IND} is the total tax in the amount of $PQ \cdot Q \cdot tax$, and TAX_{HH} is directly proportional to YH. GFI_{ROW} represents government's factor income from the rest of the world. TARIFF is an ad valorem type tax imposed on all goods and services imported into the country and it is an exogenous variable for our modeling purposes since they are determined by international agreements.

3. Policy scenarios

The model is simulated under the following four scenarios through which macroeconomic variables in the Turkish economy change.

1) *Customs Union with the EU*: This scenario considers the obligations that Turkey and the EU have made, and assumes both sides fulfill their obligations. These obligations are determined by the European Council and Common External Tariff rules.

2) *Full Membership to the EU*: This scenario considers Turkey's full accession into the EU. According to the agreement between Turkey and the EU, Turkey will lower tariff rates for EU imports, but continue to impose higher tariff rate for the non-EU countries. This reduction in tariff rates causes the Turkish government to lose tariff revenues arising from imports from the EU. However, the EU will compensate the Turkish government for a portion of these losses.

3) *Full Membership plus Replacement Tax*: This scenario analyzes the impacts of full membership with the assumption of an increase in the domestic indirect tax rate. Under this scenario, government loss due to tariff reduction is compensated with an increase in the rate of indirect tax. By increasing the indirect tax rate, government can finance the budget deficit.

4) *Free Trade*: This scenario analyzes the option of free trade. Under this scenario, Turkey will reduce tariff rates for all countries. This reduction in

tariff rates does not necessarily mean that tariff rates for all countries should be zero. Tariff rates on average should asymptotically converge to zero. The reductions are made not only in the tariff rates but also non-tariff barriers such as funds should be eliminated completely under this scenario.

The customs union scenario assumes that import tariff rates on EU manufacturing goods are reduced completely, but the manufacturing and services sectors remain the same. However, import tariffs on non-EU goods are reduced by 30% in the agricultural sector and 40% in the manufacturing and services sectors. The full membership scenario requires complete elimination of tariffs on EU goods for all sectors. However, only 50% of tariffs will be reduced on non-EU goods. As can be expected, all tariffs are removed under the free trade scenario.

4. Calibration and data

De Santis and Ozhan's (1995) social accounting matrix has been used to calibrate the model. This is the benchmark equilibrium of the model. When calibrating the scale and share parameters, we make use of Rutherford's (1999) method implemented with GAMS/MINOS5 non-linear solver package. The model starts with the balanced equilibrium for the social accounting matrix as the reference equilibrium, with a set of elasticities taken from available empirical studies such as Harrison *et al.*, (1996, 1993) and de Santis (1997).

Since the data used for the base year do not include quantities, only data in value terms are used in the process. For that reason the most common method used is to assume that all prices are equal to one. In other words, physical quantities in the base solution are obtained by assuming the price level for each category is equal to unity. After determining the functional forms to be used in the model, the calibration process begins. Although there are different techniques to determine parameter values, the calibration method is the most appropriate technique, because it is much simpler and does not require econometric estimations.

In the first step of the calibration the matrix collects the quantities appearing in the equations. In the second step, relative prices in that year fix the slope of the isoquant in that point. The elasticities, which show the curvature of the isoquant are used in the last step of the calibration.

5. Results and discussion

The Turkish economy continuously suffered from the beginning of the 1990s from macroeconomic problems. One of the main reasons for this problem was the government sector deficit, which was increasing every year. The ratio of government deficit to GDP was 3.5% in 1987. However, this ratio increased to 5.3% in 1991, 6.7% in 1994, and continued to increase in the following years. During these years, the Turkish economy experienced a decrease in government revenue and import duties became a major component

of government revenue. In 1990, for example, 15% of the total budget revenue was from these taxes. Although this rate continued to decrease in the following years, it is still high compared to European countries. After the customs union, this ratio showed a dramatic decrease due to the Common External Tariff of the EU, and the Turkish economy experienced problems concerning finance of government expenditures (Köse, 1996).

In this section of the paper, the comparison of the scenarios is discussed. The reason for this is because seeing the resemblance and differences between the scenarios is more appropriate. Value of the macroeconomic indicators of an economy under different scenarios should be compared to see the impacts of the various policies. The impact of the customs union and full EU membership on the Turkish economy with different policy assumptions are presented in Tables 1 and 2. The Turkish economy experiences a 2% decrease in GDP under the customs union scenario. This decrease becomes nearly 2.7% under the full access scenario, and 3.4% under the free trade scenario. However, the loss in GDP will disappear in the replacement tax scenario. Government revenues also decrease under all scenarios due to the elimination of tariffs and tariff related taxes on imports. The losses in import taxes by origin are shown in Table 2. Under the customs union scenario, almost 98% of tariff revenues from imports from the EU and 62% of fund revenue from the EU will be lost. Also, 25% of tariff revenues from the ROW and 60% of the fund revenues from the ROW will be lost. As explained earlier, however, tariff and fund rate on imports from EU will be completely eliminated under the other scenarios, and 40% of tariff revenue, and 43% of fund revenue from the ROW will be lost under the second and third scenarios. All revenues due to tariff and fund, of course, will be lost under the free trade scenario. Public consumption also decreases under all the scenarios. This decrease reaches a high level under the free trade scenario (34%). Government savings also decrease under all scenario assumptions between 2.7% and 3.4% of the base year value.

Private income increases 0.5% under the customs union scenario, 1.5% under the full membership scenario, and 0.7% under the free trade scenario. However, it decreases by 0.8% of the base value under the third scenario in which a replacement tax is levied. Private consumption also increases in the range of 1.6 % to 2.6% of its base value under the customs union, full membership, and free trade scenarios. However, it decreases by 1.2% of the base value under the replacement tax scenario. Private savings increase under all the scenarios. This increase is 2.1% under the customs union scenario, 2.6% under the full membership scenario, 1.2% under the replacement tax scenario, and 3.4% under the free trade scenario.

Table 1
Macroeconomic Balances (Billion TL)

Base Value	CU	%	EU	%	EU + Tax	%	FT	%
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GDP	390,796.6	382,818.3	0.979	380,302.91	0.973	389,819.5	0.997	377,536.9	0.966
Public Consumption	43,127.6	34,227.36	0.793	31,758.36	0.736	36,032.47	0.835	28,698.45	0.665
Private Consumption	262,140.5	266,366.7	1.016	267,112.16	1.019	259,045.4	0.988	268,872.4	1.025
Public Savings	13,692.7	13,413.2	0.979	13,325.14	0.973	13,315.14	0.972	13,228.14	0.966
Private Savings	76,141.1	76,520.6	1.005	76,556.43	1.005	69,163.79	0.908	76,683.66	1.007
Public Investment	34,228.8	34,228.8	1.000	34,228.78	1.000	34,228.78	1.000	34,228.78	1.000
Private Investment	68,458.6	70,055.0	1.023	70,368.85	1.027	69,163.79	1.010	70,942.94	1.036
Exports to the EU	24,706.6	27,448.3	1.110	27,851.62	1.137	25,606.32	1.036	28,466.64	1.152
Exports to the ROW	27,457.4	28,060.0	1.022	28,436.53	1.035	26,306.42	0.958	29,002.23	1.056
Imports from the EU	34,392.8	36,421.6	1.059	39,439.12	1.146	35,013.79	1.018	37,656.72	1.094
Imports from the ROW	48,095.3	49,196.8	1.022	47,419.99	0.985	46,122.28	0.959	50,031.31	1.040
Exchange Rate (TL/\$)	2630.0	2936.8	1.116	3010.65	1.144	2978.10	1.13	3122.00	1.187

CU: Customs Union

EU: European Union

EU+Tax: Revenue Replacement Tax in the EU

FT: Free Trade

%: Percentage Change with respect to the Base Value

Table 2
Changes in Government Balance

	Base	CU	%	EU	%	EU+Tax	%	FT	%
Incomes:									
Indirect taxes	20,525.805	20,350.938	0.9915	20,314.473	0.9897	25,205.970	1.2280	20,229.970	0.9856
Corporate taxes	5,093.022	5,120.939	1.0055	5,122.600	1.0057	5,035.946	0.9886	5,133.584	1.0080
Income taxes	26,486.100	26,617.778	1.0050	26,630.225	1.0054	26,270.000	0.9918	26,674.482	1.0071
Tariff income:									
From EU	582.002	5.163	0.0089	0.000	-	-	-	-	-
From ROW	515.501	386.798	0.7503	308.875	0.5992	306.593	0.5947	-	-
Funds:									
From EU	5,673.611	2,114.256	0.3726	0.000	-	-	-	-	-
From ROW	6,630.828	2,608.226	0.3934	2,504.716	0.3778	2,496.481	0.3756	-	-
Factor incomes	13,462.894	13,188.044	0.9796	13,101.386	0.9731	13,091.641	0.9724	13,006.100	0.9660
Expenses:									
Consumption	43,127.656	34,227.365	0.7364	31,758.359	0.7364	36,932.471	0.8563	28,698.448	0.6645
Transfers	16,980.748	16,980.748	1.0000	16,980.748	1.0000	16,980.748	1.0000	16,980.748	1.0000
Interest payments	9,023.531	10,105.529	1.1199	10,279.15	1.1391	10,250.276	1.1359	10,742.82	1.1904
Savings	13,692.731	13,413.189	0.9796	13,325.052	0.9732	13,315.140	0.9725	13,228.139	0.9661
Investment	34,228.780	34,228.780	1.0000	34,228.780	1.0000	34,228.780	1.0000	34,228.780	1.0000

CU: Customs Union

EU: European Union

EU+Tax: Revenue Replacement Tax in the EU

FT: Free Trade

%: Percentage Change with respect to the Base Value

The comparison of revenue, consumption, savings, and investment changes in government and private sectors indicates that the economic crisis in the Turkish economy is the result of unbalanced structure of the government sector. For that reason, cutting government expenditures will be a good policy to eliminate the negative impact of the public sector on the economy.

Turkey's accession to the EU will have a trade creating impact between the EU and Turkey under all scenarios. Although there is a slight increase in

the wage rate, elimination of tariff and tariff-related taxes will decrease the domestic price level. The decreases in the price level and changes in the exchange rate in favor of the EU cause an increase in exports between the EU and Turkey. Since there will be a reciprocal decrease in tariff rates, Turkish imports from the EU will also increase. This result can be seen from Table 1. Turkish exports to the EU increase by 11% under the customs union scenario, 13.7% under the full membership scenario, 15.2% under the free trade scenario, and 3.6% under the replacement tax scenario. Turkish imports from the EU also increase by 5.9% under the customs union scenario, 14.7% under the full membership scenario, 9.5% under the free trade scenario, and 1.8% under the replacement tax scenario.

Exports to the ROW increase due to reciprocal elimination of tariffs and changes in the exchange rate in favor of the ROW. Under the Common External Tariff, Turkey is required to decrease import taxes on third countries as well. This preferential agreement results in an increase in the trade volume between Turkey and the ROW. Exports to the ROW increase by 2.2% under the customs union scenario, 3.5% under the full membership scenario and 5.6% under the free trade scenario. However, ROW exports decrease by 4.2% of the base value under the replacement tax scenario. Imports from the ROW increase by 2.3% under the customs union scenario, and 4% under the free trade scenario. However, there will be a trade diverting impact of full membership and replacement scenarios. Thus, Turkish imports from the ROW decrease by 1.4% under the full membership, and 4.1% under the replacement tax scenario.

Table 2 shows the changes in government balance under the proposed policy scenarios. Total indirect tax collected is 20,525 billion TL in the base year. There are no significant changes in indirect taxes under the customs union, full membership or free trade scenarios. However, a 22.8% increase will be experienced under the replacement tax scenario. This shows that indirect taxes should be increased by 22.8% to compensate for the losses due to tariff reduction. This can be called a "compensation tax rate". The changes in corporate and income taxes, however, are too small to be considered. Government factor income will show a decrease by 3% of the base value, and experiences almost equal changes under all policy scenarios.

Government interest payments are the major problem for the Turkish economy because, almost 10% of total government revenue went to interest payments in 1990, and this rate is increasing every year. This is a real burden for an already in-debt Turkish budget. The increases in interest payments will be 12% under the customs union scenario, 14% under the full membership scenario, 13% under the replacement tax scenario, and 19% under the free trade scenario. This also shows that government debts should be reduced to cut down interest payments.

The comparison of our findings with regards to customs union with other studies as well as actual numbers justified our results in most cases. The vast majority of the findings of the paper, however, pertain to such cases that are not realized yet such as actual membership of Turkey in the European Union.

6. Sensitivity analysis

Sensitivity analyses for different variables are performed to test the reliability of the results. Since elasticity estimates includes a margin of error, the remedy for this problem is to perform a sensitivity analysis. The elasticity values are obtained from Köse (1996), de Santis (1997) and Harrison *et al.* (1996), and adjusted according to sectoral aggregation of this study.

The sensitivity analysis results show that overall conclusions obtained are not fragile to the assumptions made regarding elasticities, and the variations are in an acceptable range. For example, GDP variations are in the range of -1% and 2.8%, government revenue variations are in the range of -2.3% and 1.9%, and replacement tax rate variations are in the range of -2.4% to 3.2%. The highest variations have been seen in the domestic sales and EU imports. However, these are not large variations considering the scope of the study.

7. Concluding remarks

The results discussed above concern four different scenarios and a base year value. By the nature of CGE models, base year values give the same results with the calibration process. These analogous results assure the validity of the calibration procedure and SAM constructed. Thus, instead of giving full magnitudes of the results, only percentage changes in each variable are given so that policy makers have much clearer vision about the policies adopted.

It is well a known issue that the Turkish economy suffered losses from the customs union agreement due to a decrease in tariff and tariff related taxes on EU products. The losses that the Turkish economy experienced were supposed to be compensated by the EU in a timely manner, but for some political reasons the EU did not fulfill its obligation on this matter. The EU officials promise the same thing for the full membership process and according to the agreement, a total of \$1.8 billion will be given to Turkey in the transition period to compensate the tariff revenue losses. Assuming this promise is kept, full membership will send a signal of positive movements in the domestic markets as well as exports and imports.

A 2% decrease in GDP and an 8% decrease in government revenue will be experienced under the customs union scenario. As a result of this revenue loss, government consumption also decreases by 20%. However, private income, consumption, and savings show increases. Although this result seems to lead the policy-makers of Turkey in a direction that allow them to know what the best policy is, in reality it is very hard to have such strong conclusions, because there is no “best” policy in political decisions like this. There are “better” policies, however, in certain cases, and these “better” policies are subject to change depending on the perspective of policy-makers, current conditions of the country, and the power of lobbyists in each sector.

These facts show that realistic decisions in policy implementations are very rare, especially in developing countries like Turkey.

The phenomenon of free trade always attracts international trade theorists. In some cases, however, it may not be an easy task to implement due to social and political reasons. The analysis of free trade scenario is done here is because we wanted to show the policy-maker what the ideal thing is, and give them opportunity to decide accordingly. The losses in GDP under the free trade assumption are the highest among other scenarios, but it increases the trade volume and initiates private entrepreneurship. As a result, total welfare gains will be more under this scenario. However, free trade is a difficult scenario to reach for real life international trade applications, because every country has to protect some sector or politicians have tendency to protect powerful lobbyist groups for reelection purpose. The public sector, for sure, will be worse off under this policy assumption.

The revenue replacement tax scenario results indicated that tax rates should be increased by 22.8% to compensate revenue losses due to tariff reductions. This rate is higher than that of Harrison *et al.* (1996); however their results indicate a customs union revenue replacement tax rate, not a full membership rate. Therefore, a higher revenue replacement tax rate is necessary for full membership, because revenue loss due to tariff reduction is more under the full membership scenario. Decreases in GDP will be very small under this scenario, and can be ignored, but with the revenue compensation assistance given by the EU, the Turkish economy will be better off if it is used properly. This revenue compensation assistance might be used to increase the domestic production level or distributed among consumers and producers to ease the burden of taxes levied, and increase the welfare of the whole economy.

The full membership scenario, however, seems more logical in many cases. For example, domestic production, domestic sales, trade volume, and profit rate increase. Government intervention in the whole economy tends to decrease, and economic relations with the EU and the ROW get better. Under this scenario, also, the Turkish government will get revenue compensation assistance from the EU, and the decreases in GDP will be compensated with this assistance. No replacement tax in the domestic economy will encourage domestic producers to create new and higher quality products for EU markets, and the government will not have the responsibility of redistributing assistance from the EU. Turkish consumers, will also enjoy buying various new and higher quality products at cheaper prices. The government compensates itself by getting revenue assistance from the EU. Thus, the Turkish economy as a whole will be better off with full membership, even though some sectors individually lose a portion of their profits.

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Özet

Avrupa ile bütünleşmenin Türkiye ekonomisi üzerinde makroiktisadî etkileri

Türkiye'nin Avrupa Topluluğuna tam üyeliği gerek Türkiye ekonomisi, gerekse Avrupa Topluluğu ekonomisi üzerinde büyük etkiler yapacağı için birçok tartışmaları da beraberinde getirmiştir. Makalemiz bu tartışmaları analiz eden bir "Hesaplanabilir Genel Denge" modelinden faydalanmış ve değişik senaryo varsayımları üzerinde durmuştur. Modelimiz ayrıca, Türk üretim sektöründe büyük ölçüde etkin olan tam rekabetçi sistemden sapmaları ve emek piyasasındaki ücret farklarını gözönüne almış ve simülasyon tekniğinden faydalanmıştır. Çeşitli makroekonomik büyüklüklerdeki değişmelerden yola çıkarak, Türkiye için en faydalı senaryonun tam üyelik olduğu sonucuna varılmıştır.