Turk J Agric For
24 (2000) 453–456

Impacts of Turkey's Integration into the European Union on Agriculture in the Post-Uruguay Round Environment

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Received: 05.02.1998

Abstract: Agricultural trade policies between Turkey and the European Union are modeled using a political preference function (PPF). The PPF is used to estimate the producer and consumer weights perceived by policy makers. The agricultural effects of Turkey's integration into the European Union (EU) and optimal strategies for Turkey and the EU are analyzed Results show that Turkey' s PPF values will be lower, with respect to agriculture, when it joins the EU; however, EU trade liberalization benefits Turkey.

Uruguay Round Sonrası Türkiye'nin Avrupa Topluluğu'na Üyeliğinin Tarım Sektörüne Etkileri

Özet: Türkiye ve Avrupa Birliği (AB) arasındaki tarım politikaları Politik Tercih Fonksiyonu (PTF) kullanılarak incelenmiştir. Politika yapıcıları tarafından algılanan üretici ve tüketicilerin sektördeki ağırlıklı oranları PTF kullanılarak hesaplanmış ve Türkiye'nin AB'ne üyeliğinin tarımsal etkileri ve optimal stratejiler incelenmiştir. Sonuçlar Türkiye'nin birleşme olmadan izleyeceği çeşitli koruma politikaları arasından statusko politikasını uygulmasanının tarım açısından birleşmeye göre daha iyi olacağını göstermektedir. Türkiye'nin AB'ye katılımı durumundaki PTF değerleri birleşme öncesine göre daha düşük çıkmıştır, ancak birleşme durumunda AB'nin ticaret politikasında liberalleşmeye gitmesi Türkiye'ye yarar sağlayacaktır.

Introduction

International trade negotiations in agriculture, such as the General Agreement on Tariffs and Trade (GATT) have shown that agricultural trade policies carried out at the international level are a consequence of domestic farm policies. Because the Common Agricultural Policy (CAP) of the European Union (EU) has encouraged agricultural production, surpluses have developed in recent years and the EU has become a major exporter of several commodities (1). EU exports have steadily taken a greater share of world agricultural trade, while for other major agricultural exporters such as the United States (US), agricultural exports to the EU have begun to decline as well (2).

This situation has resulted in trade disputes in negotiations between the countries concerned. The US adopted an extreme position in GATT, demanding complete elimination of all aid that had any impact on trade in agricultural products (3). Another important factor to consider is that the European economic region will include additional countries. Applying in 1987 for full membership, Turkey stated its eagerness to be part of this union (4).

The goal of this research is to examine agricultural trade relations between Turkey and the EU. More specifically, the possible entrance of Turkey into the EU and trade relations between the EU are examined. This study aims to obtain empirical evidence concerning the changes in consumer and producer welfare due to the effects of various policy actions of Turkey and the EU.

To accomplish these objectives, this study employs the Modele International Simplifie de Simulation (MISS), a partial equilibrium trade simulation model that simulates in a comparative static framework the effects of various policy decisions (5). Once the model is initialized, simulations that mirror the effects of the Uruguay Round agricultural agreement arearried out. In addition, consumer, producer, and government budget weights are estimated to reflect the net gains or losses to the economies as viewed by policy-makers.

Theoretical Framework

The framework underlying this analysis is similar to that used by Johnson et al. (6) and Kennedy et al. (7). In this model, two countries and the rest of the world produce, consume and trade N commodities. Aggregate production, consumption, and trade in country i is described by vectors of supply, demand, and excess demand. Farms

in country i produce some subset of the N traded commodities, taking prices, technology, and endowments as given in order to maximize profit.

Governments intervene in their domestic markets through price instruments and supply/demand shift instruments. Price instruments, denoted as A^p_{fn} for producers and A^p_{cn} for consumers of commodity n, affect the farm and consumer prices of the N commodities. Domestic producer and consumer prices are functions of world prices (P_w), price instruments (A^p_{fi}), and supply/demand shift instruments (A^s_{ci}).

In the selection of agricultural policies, governments consider the effects of their policies on the welfare of various groups, namely, producers, consumers and taxpayers. Since agricultural policies often improve the welfare of certain groups at other's expense, governments must weigh the welfare gains of one group against the welfare losses of others. These trade-offs are represented by a political payoff function (PPF), a weighted, additive function of producer quasi-rents, indirect utility of consumers, and the budget costs of agricultural policies. In order to simplify these expressions, let -i represent the other main countries, and let $A_i=(A_{fi}, A_{ci})=(A^p_{fi}, A^s_{fi}, A^p_{ci}, A^s_{ci})$. Producers are aggregated by commodity group. The welfare of each producer group is the profit obtained from the production and sale of the commodity.

Let the vector of producer quasi-rents be shown as a function of government policies by

1. $\prod_i (A_i, A_{-i})=\prod_i (P_{fi} (A^p_{fi}, P_w (A_i, A_{-i})), A^s_{fi})$.

The utility of the aggregate consumer group is denoted as a function of government policies by

2. $U_i (A_i, A_{-i})= U_i (P_{ci}, (A^p_{ci}, P_w (A_i, A_{-i})), A^s_{ci})$.

Similarly, the budget of government i is shown as a function of the governments' agricultural policies:

3. $B (A_i, A_{-i}) = B_i (P_{fi} (A^p_{fi}, P_w(A_i, A_{-i})), P_{ci} (A^p_{ci}, P_w (A_i, A_{-i})), P_w (A_i, A_{-i}), A^s_{fi}, A_{ci})$.

Finally, normalizing on the budget and using equations 1, 2, and 3, the PPF is:

4. $V_i (A_i, A_{-i}) =\prod (A_i, A_{-i}) * \lambda_{fi} + U (A_i, A_{-i})*\lambda_{ci} +B (A_i, A_{-i})$,

where λ_{fi} is an N by one strictly positive vector and λ_{ci} is a positive scalar. (λ_{fi}, λ_{ci}) are the political weights of the respective commodity groups and the aggregate consumer group in country i.

Equation 4 explicitly links the policies of the governments with their objectives. What is lacking is a means for the governments to select agricultural policies. In other words, subsequent determination of the production, consumption, and prices should be found. The following describes an equilibrium in which a government, with the policies of the other countries given, selects a policy to maximize its PPF. Formally, a best response correspondence is defined for each government. Then, the equilibrium is defined using the best response correspondence. For a given A_{-i}, government i chooses A_i*, a best response to A_{-i}, such that

5. $V_i (A_i *, A_{-i}) \geq Vi (A_i, A_{-i}) \forall \mathbf{A_i} \in \mathbf{A_i}$

where $\mathbf{A_i}$ is the set of actions (policies) available to government i. Thus, every A_i, in A_{-i} has a set of actions in $\mathbf{A_i}$ that satisfy equation 5. The set defines the best response correspondence of A-i. A pair of actions (Ai*, A-i*) is an equilibrium if it satisfies equation 5 for all i, that is, Ai* is a best response to A_{-i} * for all i. Differentiating equation 4 with respect to Afi and Aci, the first order necessary conditions for a maximum can be determined.

Empirical Analysis

1992 is the base year for the empirical analysis. Ten commodity groups are distinguished; beef and veal, dairy milk, corn, wheat, rice, soybeans, cotton, sugar, tobacco, and pork and poultry. To initialize the model, protection ratios are calculated for producers and consumers in Turkey and the EU for the base year 1992. These protection ratios, combined with production and consumption levels, are used as a base from which all simulations will be conducted. Nominal protection ratios were calculated by the ratio of domestic price to border price. Prices were calculated in term s of commodity values for all products. The necessary data to initialize the model were obtained from various publications, such as the European Commission (8) and FAO (9).

The PPF weights for Turkey and the EU are estimated through the evaluation of incremental changes in the observed policies from their base levels. These changes are then used as approximations of the partial derivatives in first order conditions. Solving the first order conditions of equation 4 with respect to λ_{fi} and λ_{ci}, the PPF weights are obtained. These weights, normalized such that the budget weight is one, are presented in Table 1. According to these weights, in Turkey, rice, corn, dairy milk and soybeans are high while in the EU, dairy milk, wheat, soybeans, and beef and veal have a high level of weights. The Turkish weights are all greater than one. This indicates that the budgetary pressures experienced by the EU have not been felt in Turkey to the same degree. In addition, Turkish consumers rank higher than

Table 1. 1992 Political Payoff Function Weights.

Products	Turkey		EU	
	Rank	Weight	Rank	Weight
Beef and veal	7	1.10	4	1.21
Dairy milk	4	1.18	1	1.32
Corn	3	1.22	5	1.17
Wheat	10	1.02	2	1.25
Rice	1	1.77	6	1.07
Soybeans	4	1.18	3	1.22
Cotton	5	1.14	11	0.84
Sugar	6	1.13	8	1.02
Tobacco	9	1.07	10	0.91
Pork and poultry	8	1.09	7	1.06
Consumers	2	1.24	9	1.00

Source: Calculated.

all the sectors with the exception of rice. This implies that Turkish policy makers place more importance on consumers, probably due to the level of per capita income.

In order to obtain Turkey's PPF values, two scenarios are considered. The first one considers that Turkey is outside the EU and has four actions; the status quo, GATT protection reductions, a fifty-percent reduction from base level protections, and free trade. When Turkey is considered within the EU, its protection rates in chosen agricultural products are adjusted with the EU such that they are same as those of the EU. The EU has two actions; the status quo and GATT commitments. Based on the calculated weights, Turkey's PPF values without and with integration can be seen in Table 2.

As can be seen from Table 2, Turkey's highest PPF value is 15.01 when Turkey and the EU keep the status quo. With the GATT reductions, Turkey's PPF (6.23) is positive although lower than the status quo option. When the EU fulfils its GATT commitments, Turkey's PPF values are all negative with the highest negative value for free

Table 2. Turkey's PPF Values for Alternative Protection Ratios without and with Integration ($ Million).

	EU	
	Status Quo	GATT
Turkey		
Without Integration		
Status Quo	15.01	-19.25
GATT Reductions	6.23	-27.01
Fifty Percent Reduction	-14.52	-47.85
Free Trade	-47.37	-85.56
With Integration		
	-835.17	-562.09

Source: Calculated.

trade. When Turkey joins the EU, Turkey's PPF values are considerably lower. With integration, when the EU keeps its status quo, Turkey's PPF value (-835.17) is negative. When the EU fulfils its GATT commitments, Turkey's PPF value (-562.09) is again negative but less than the EU status quo scenario.

Conclusions

The results of this analysis suggest that it is better for Turkey, from an agricultural standpoint, to keep the current protection ratios when it is separate from the EU. When Turkey is in the EU, its PPF values decrease. Joining the EU will bring Turkey an increased financial burden in agriculture due to the higher producer prices and budget cost. However, EU trade liberalization decreases Turkey's loss in agriculture with integration. The results have several implications for Turkey. Turkey's loss in agriculture from joining the EU may be compensated for by the potential gains in the manufacturing and service sectors as well as the EU' s funding for various sectors. Turkish policy-makers can evaluate these gains and losses as they seek economic integration. Comparisons of this type can be made in a similar framework to include the manufacturing and service sectors.

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