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Full Length Research Paper

The impact of changes in Turkey's hazelnut policy on world markets

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The present study analyzes the manner in which changes in Turkey's hazelnut policies shall affect the world hazelnut markets via price impacts of these policy changes. For this aim, a multi-region partial equilibrium model for Turkey, Italy, Spain, USA and Germany, the main participants in the world hazelnut market, was developed. Since most of the world hazelnut production and export belongs to Turkey, export prices of Turkey were accepted as data for the world markets. In the model, the manner in which changes in Turkey's hazelnut policies reflects upon the international markets via prices was explained. Besides, scenarios with regard to Turkey's possible policy changes were given and with the help of the estimated model, future conditions of exports and imports of the countries participating in the international hazelnut market were estimated. According to the model results, it is expected that a decrease in Turkey's hazelnut production areas would lead to an increase of its effectiveness in international markets. The decrease in production areas shall raise the prices. However, it is expected that prices remaining stable shall increase the amount of hazelnut exports of Turkey. Therefore, this situation shall increase Turkey's hazelnut export income and decrease other exporter countries' exports and their impact on the market. In order to achieve these results, legal arrangements done by Turkey with respect to narrowing the production areas should be successfully implemented.

Key words: Hazelnut, partial equilibrium analysis, foreign trade, policy changes, Turkey.

INTRODUCTİON

Hazelnut is grown predominantly in some countries because of its ecological needs. Turkey's Black Sea Region is ecologically suitable for hazelnut production and the world's highest quality hazelnut is grown in this region. The region's ecological suitability for hazelnut production allowed Turkey to become dominant worldwide in hazelnut production. Among the total world production of almost one billion tons 68.79% was produced in Turkey, 14.79% in Italy, 4.27% in USA, 2.60% in Spain, 2.56% in Azerbaijan and 1.77% in Georgia. World hazelnut production area is around 600,000 ha of which 70.50% are located in Turkey (Table 1). With its dominance in hazelnut supply, Turkey is a dominant player in world markets. The impact on world hazelnut markets of Italy and USA, which are the most important hazelnut producers following Turkey is minor due to their domestic consumption levels (Sarimeseli and Aydogus, 2000). Therefore, world markets are extremely sensitive to fluctuations in Turkey's hazelnut production. In their studies, Bayramoglu and Gundogmus (2007) found that world hazelnut prices are affected by the fluctuations occurring in Turkey's hazelnut production and prices.

Hazelnut production in Turkey takes place in three different areas, each with different characteristics. The first region constitutes the natural hazelnut production areas and covers about 49.48% of the total hazelnut areas, consisting of Ordu, Giresun, Trabzon, Rize and Artvin provinces. At the same, the region has a very rough geographical structure and limited plantation areas. The second region covers 49.88% of the total hazelnut areas and consists of Sinop, Bolu, Duzce, Samsun, Kastamonu, Zonguldak, Kocaeli and Sakarya provinces. In this region, hazelnut gardens are mostly built on flat lands on which field agriculture can be carried out. The third region covers cities outside the Black Sea Region. This region accounts for 0.64% of the total hazelnut production area. With increasing governmental support

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Table 1. Hazelnut production area and production by country.

Countries		1970	1980	1990	2000	2003	2005	2006
Azerbaijan	Ha	0	0	0	16,720	17,812	18,228	17,379
	Ton	0	0	0	13,334	19,895	27,986	24,625
Georgia	Ha	0	0	0	8,000	8,000	8,689	9,000
	Ton	0	0	0	14,220	14,820	16,393	17,000
Italy	Ha	60,400	70,200	67,419	68,868	68,113	67,743	68,233
	Ton	78,877	100,600	109,344	98,540	83,292	87,879	142,109
Spain	Ha	24,900	35,541	32,013	23,570	21,973	20,343	20,000
	Ton	20,200	29,900	21,270	25,188	12,552	23,027	25,000
Turkey	Ha	223,318	299,394	320,788	342,987	368,357	387,879	400,000
	Ton	255,000	250,000	375,000	470,000	480,000	530,000	661,000
United	Ha	6,600	8,900	11,050	11,473	11,331	11,462	11,462
States	Ton	8,400	13,970	19,700	20,410	34,380	25,396	41,000
World	Ha	323,296	420,102	457,977	500,075	523,339	555,388	566,617
	Ton	384,251	421,136	560,761	679,099	686,577	763,938	960,907

Source: FAO 2008.

support after 1970, hazelnut cultivation in Turkey spread more in natural hazelnut production areas, which belong to the first and partly to the second region. The areas falling outside the scope of the natural hazelnut production areas are some parts of the second region and all parts of the third region. In 1970, 77.94% of the total hazelnut production area was located in the first region, 21.76% in the second region and 0.30% in the third region. Continuous support given to hazelnut production with respect to socio-economic aspects caused hazelnut production areas to spread. In spite of increasing hazelnut production, Turkey could not increase its domestic demand and was unable to develop marketing strategies aimed at world markets. The fact that the food industry intended for hazelnut production did not develop also contributed to an increase in hazelnut stocks in Turkey. This situation brought about important burdens for the Turkish economy in terms of stock keeping costs and support payments. In addition, stock formation prevents Turkey using its rivalry advantage in the foreign market (Bozoglu, 1999). It could not take advantage of its market dominance parallel to the supply dominance.

Turkey made legal arrangements for narrowing the hazelnut areas in order both to keep its dominancy in world hazelnut markets and to decrease the cost brought to the country's economy by hazelnut stocks and supports.

These precautions were first legislated with a law in 1983. However, since the income obtained from hazelnut production together with the supports given is greater than the income obtained from other agricultural products per unit area, hazelnut production areas continued to increase until 2001.

In 2001, Turkey made legal arrangements once again in order to plan hazelnut production and determine the hazelnut planting areas. However, these arrangements again could not help reducing the hazelnut production areas to the desired level. Since the desired result could be obtained from this legal arrangement, a third legal arrangement was made. With this arrangement, hazelnut production was planned again. With this arrangement, establishment of hazelnut gardens was limited through requiring an official permission for such establishment. Also, rooting up of hazelnut gardens in determined areas was encouraged. It was decided that producers which cut their hazelnut gardens and grew alternative products would be paid 146 $ per ha (Bozoglu, 2005). 1st and 2nd class agricultural fields below 750 m altitude in the first and second hazelnut production regions and third class agricultural fields with slopes less than 6% were covered by the scope of this support payment for alternative product growers (Anonymous, 2004; Reis and Yomralioglu, 2006). With these arrangements, it is expected that Turkey's hazelnut production areas shall decline by 100,000 ha (Gunaydin and Suicmez, 2004).

In this study it is examined how world hazelnut markets would be affected as a result of a reduction of Turkey's hazelnut production areas. Also, import and export predictions of other countries having word in hazelnuts market were determined by means of partial equilibrium model. This study is quite important for determining the impact of changes in Turkey's hazelnut policies on world hazelnut markets.

METHOD

As a result of the legal reforms, Turkey expects a reduction in its hazelnut production area by 100,000 ha (Gunaydin and Suicmez, 2004). However, as adoption by producers takes a certain time, it is not possible that such reduction shall takes place within one year. Therefore, within the context of this study it is assumed that the reduction in Turkey's hazelnut production areas is going to occur

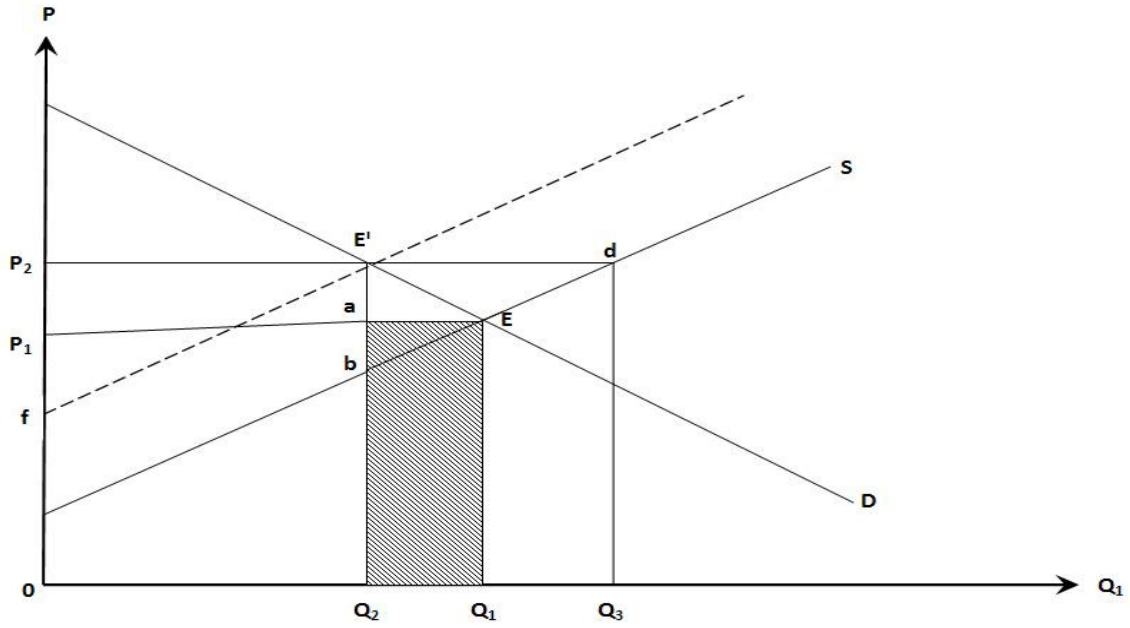

Figure 1. Turkey's hazelnut market equilibrium.

gradually. Under this assumption, it is thought that out of the planned reduction of 100,000 ha, a reduction of 75,000 ha can be achieved. In the model, this reduction of 75,000 ha was thought to take place arithmetically over a period of 5 years. According to this scenario, the reduction in hazelnut production area shall happen to be 5,000 ha in the 1st year, 10,000 ha in the 2nd year, 15,000 ha in the 3rd year, 20,000 ha in the 4th year and 25,000 ha in the 5th year.

The impacts of the reduction in Turkey's hazelnut production areas on the market are theoretically explained in Figure 1.

Point E is the market equilibrium under current circumstances. At this equilibrium point, hazelnut amount Q1 is produced at price P1. As a result of the government's intervention in hazelnut production areas, production will decrease by Q1-Q2 and an amount of Q2 shall be produced at Price P2. At the new price level and under the former supply conditions, production is expected to be Q3. However, as whole competition conditions removed and the government intervened in the production areas, production is limited to Q2. The market equilibrium to be newly formed shall necessarily be at point E1. So, A(P1, E, Q1, O) < A(P2, E1, Q2, O) and hazelnut foreign sale incomes shall rise. With this application, Turkey wishes to decrease the existing hazelnut stocks. Therefore, the cost (stock + support) incurred by the government shall decrease as hazelnut production is going to decrease. Furthermore, Turkey is going to strengthen its market control mechanism established via production and price existing for it (Bayramoglu and Gundogmus, 2007). This application is important with respect to establishing a sustainable development in Turkey's hazelnut production areas, regulating the domestic market, reducing the stocks and increasing effectiveness in foreign market.

Fluctuations occurring in Turkey's hazelnut prices affect the foreign market. Turkey's hazelnut policy affects world hazelnut market along with hazelnut importing countries. 70% of world hazelnut consumption is used in industry and for the industry, price stability is important (Karagulmez and Usul, 2004). Hazelnut importer countries, notably the European Union countries, support countries like Azerbaijan and Georgia, ecological conditions of which are suitable for hazelnut production, in order to provide a stable price policy, to guarantee their access to raw materials and to establish hazelnut producers which are alternative to Turkey (Anonymous, 2001; Bozoglu, 2004). Faced with such developments occurring in world markets, Turkey decided to reduce its hazelnut production areas. It is expected that when Turkey establishes supply control by means of reducing its hazelnut production areas, this is going to affect the foreign market together with the domestic market. As a matter of fact, the studies carried out show that the supports given to hazelnut have an impact on export prices (Yavuz, 2005).

Many quantitative studies have been carried out about Turkey's hazelnut production and export. Gonenc et al. (2006) made a projection with respect to hazelnut production areas and concluded that unless the hazelnut production areas are reduced, Turkey is going to face bigger problems in hazelnut trade. Uzunoz et al. (2006) determined that despite the support given to hazelnut production, income of hazelnut producer decreases in real terms and declared that reduction of hazelnut areas is a useful policy change. Using a three level model for hazelnut production, Yavuz et al. (2005) showed that hazelnut prices are affected by production areas increasing as a result of supports and that this was reflected in export prices. In a partial equilibrium analysis study prepared for Turkey, scenarios of removing obstacles arising out of instructions by placing Turkish agricultural products under the scope of Customs Union was applied (Grethe, 2004). As result of this study, it was found that in case of Turkey's full membership its hazelnut export may increase by approximately 52,000 tons and that in case obstacles arising from the instructions are removed, it is going to increase by 26,000 tons. In this study, a partial equilibrium model is used to analyze how the supply control efforts of Turkey shall affect the world markets.

Partial equilibrium analysis accepts that some economical events do not change. Thus current market is examined with a restricted number of variables (Dinler, 1997). In this study, a partial equilibrium model was developed for Turkey, Spain, Italy and USA, which are important hazelnut importers and for Germany; which is an important exporter. Using the results of the partial equilibrium models obtained, data were derived in order to get information about the future world hazelnut market. It was assumed that the foreign trade regimes of countries, which are hazelnut importers

Table 2. Shares of important hazelnut importer countries within total hazelnut imports (%).

	1970	1980	1990	1999	2000	2001	2002	2003	2004	2005
Austria	3.65	4.69	8.55	2.32	3.65	2.25	1.67	1.76	2.27	1.95
Belgium	2.74	2.83	4.43	5.82	7.31	5.85	6.59	7.66	8.34	9.54
France	8.49	10.63	9.14	9.13	7.06	8.26	8.94	11.14	6.14	3.92
Germany	44.85	39.10	39.03	39.43	37.20	37.25	30.21	26.86	27.55	21.47
Italy	2.06	3.30	5.04	10.57	14.36	13.00	18.72	17.48	14.30	20.16
Poland	0.00	0.00	0.00	2.24	1.86	2.35	2.42	2.10	3.03	3.39
Russia	0.00	0.00	0.00	1.23	1.54	2.26	1.78	2.46	5.17	3.98
Spain	0.00	0.00	0.89	2.18	2.21	2.29	2.56	2.97	3.37	2.30
Switzerland	10.61	9.05	7.29	6.71	6.19	6.09	5.07	5.37	6.56	6.10
USA	3.24	1.72	2.11	3.09	2.38	2.40	2.81	2.91	2.48	2.47
Total	75.64	71.32	76.48	82.72	83.76	82.00	80.77	80.71	79.21	75.27

Source: FAO 2008.

and exporters, are going to remain fixed and no changes are going to be made. In addition, it was assumed that no hazelnut stocks exist in producer countries other than Turkey. Under these assumptions, the partial equilibrium model developed for Turkey is as follows:

1. STR = f (ARTR, YLTR).
2. PTR = f (STR, PRTR).
3. DTR = f (PTR, INTR, PRTR).
4. SCTR = f (DTRt-1, STR).
5. EXQTR = f (STR, SCTR).
6. EXPTR = f (PTR, EXQTR, PRTR).

Because of Turkey's impact upon world hazelnut markets, Turkey's export price is accepted as datum for world hazelnut market price. Therefore, Turkey hazelnut export price (EXPTR) which represents world hazelnut market price is explained by the Turkish market price (PTR), Turkey's hazelnut export quantity (EXQTR) and the YTL/USD parity (PRTR) (TCMB, 2008). Turkey's hazelnut supply (STR) is explained by area (ARTR) and yield (YLTR). Turkey's domestic demand (DTR) (Anonymous, 2008) was explained with market prices (PTR), income (INTR; Gross Domestic Product/ Population) (Anonymous, 2007) and the YTL/USD parity (PRTR) which explains Turkey's economical situation. Turkey's hazelnut stock (SCTR) (Anonymous, 2008) was explained with the demand at period t-1 and Turkey's hazelnut export quantity (EXQTR). On the other hand the partial equilibrium model developed for other countries is as follows:

a. EXQIT = f (EXPTR, DIT, SIT).
b. EXQSP = f (EXPTR, DSP, SSP).
c. EXQUS = f (EXPTR, DUS, SUS).
d. IMQGR = f (EXPTR, ALEXPWR).

Export quantities of hazelnut producer countries other than Turkey were explained by their own domestic demand (D) and supply (S) and by Turkey's export price (EXPTR). It was assumed that the instabilities in Turkey's export price are going to increase other exporter countries' export thus make such countries play a dominant role in the market. Besides, an import model was predicted for Germany as the most important hazelnut importer. Germany import model (IMQGR) was explained with world almond import prices (ALEXPWR) and Turkey's hazelnut import prices (EXPTR). Since hazelnut and almond are substitutes, they were used for explaining Germany's hazelnut import quantity. Countries' import and export quantities were written as decorticated hazelnut with 50% efficiency. The models developed under the scope of this study were estimated using Ordinary Least Squares Method. Subsequently, using the estimated equations, the manner in which changes in Turkey's demand-supply equilibrium shall affect the world markets was examined.

Linear Trend Analysis was applied in determining the future values of the variables which are determined outside the model. Turkey's hazelnut efficiency was accepted to be constant and the average figure of the last 20 years was used for the years 2007 - 2018. The implementations in foreign trade and economy policies of Turkey and other countries were assumed to be constant. Therefore, YTL/USD parity was assumed to be constant, taking the year 2006 as basis. Turkey's income per capita was predicted for the future using a Quadratic Trend Model. For Spain's hazelnut supply (SSP), Spain's hazelnut demand (DSP), Italy's hazelnut supply (SIT), Italy's hazelnut demand (DIT), United States of America's hazelnut supply (SUS), United States of America's hazelnut demand (DUS) and United States of America's almond export quantity (ALEXQUS), for which the values are determined outside the model, 2007 - 2018 data were predicted with Linear Trend Analysis.

World hazelnut imports

The most important hazelnut importer is Germany. Despite slight annual fluctuations, it accounted for 30% (average of 2000 - 2005) of world hazelnut imports. The fact that important hazelnut importer are mainly based in Hamburg and that large chocolate producers are in this country increased Germany's hazelnut and almond imports. Important hazelnut importing countries are at the same time important chocolate producers. The second largest importer country, Italy, is also an important hazelnut producer and exporter. Because of the increase in domestic consumption of Italy in years, significant increases occurred in its imports (Sarimeseli and Aydogmus, 2000). Other important importer countries are Belgium and Switzerland. Switzerland is an important chocolate producer and Belgium is another re-exporter country re-exporting the hazelnut it imports by re-packaging. Other important importer countries are listed in Table 2.

World hazelnut exports

The most important world hazelnut producer and exporter country is Turkey. Despite yearly changes, it accounts for 70% of world haze-

Table 3. Shares of ımportant hazelnut exporter countries within total hazelnut exports (%).

	1970	1980	1990	1999	2000	2001	2002	2003	2004	2005
Azerbaijan	0.00	0.00	0.00	3.27	4.08	2.00	3.38	4.50	1.75	5.26
Georgia	0.00	0.00	0.00	3.34	4.60	1.80	1.67	2.57	2.09	4.71
Italy	13.94	12.09	13.71	11.11	9.19	5.22	10.88	13.16	11.07	7.62
Spain	5.14	7.28	1.90	2.68	3.33	1.78	1.91	2.43	1.87	2.77
Turkey	79.27	75.25	78.57	73.08	70.11	83.32	74.77	67.38	76.31	63.87
USA	0.16	1.35	0.75	0.98	1.27	0.73	0.38	2.01	1.59	7.28
Austria*	0.00	0.06	0.06	0.19	2.14	0.75	0.23	0.13	0.19	0.20
Germany*	1.12	2.18	2.46	2.46	2.04	1.30	1.52	2.40	1.68	1.35
Netherlands*	0.00	0.54	1.28	0.56	0.62	0.99	1.36	1.45	0.88	1.05
Belgium*	0.01	0.04	0.06	0.35	0.45	0.31	0.82	0.62	0.63	0.23
Total	99.64	98.79	98.79	98.02	97.83	98.20	96.92	96.65	98.06	94.33

Source: FAO 2008, *only re-exportation.

Table 4. Turkey hazelnut market model.

Independent variables	Dependent variables					
	STR	PTR	DTR	SCTR	EXQTR	EXPTR
C	- 343258.70*	535644.7****	7456.95*	-85506.90*	4057.21****	1.20****
ARTR	1.12*					
YLTR	312.50*					
STR		- 1.69***		0.42*	0.48*	
PRTR		2.48*	0.02*			- 0.0000019*
PTR			0.01*			0.0000014*
INTR			7.29*			
DTR t-1				- 0.62***		
SCTR					- 0.99*	
EXQTR						0.0000011**
R2	0.99	0.77	0.70	0.82	0.93	0.68
Prob (F-statistic)	0.000	0.000	0.000	0.000	0.000	0.000
Dw	1.39	1.69	1.70	1.80	2.03	1.66

* 1%, **5%, *** 10%, **** 15% significant and dw statistics are significant at% 1.

nut exports. Due to this fact, Turkey has a monopoly position in the hazelnut market. It has rivalry dominance over Spain and Italy, which are other important hazelnut producers and exporters, because of its low production costs. At the same time, Italy's domestic consumption increased and Spain reduced its production areas during the past years. As another important producer and exporter country, the USA can compete with Turkey in prices as a result of its high efficiency achieved in hazelnut production. However US production quantities are comparatively small. Azerbaijan and Georgia took their places in the hazelnut market as important exporter countries, after they gained their independency (Table 3). These countries are supported by hazelnut exporter countries like Germany in order to become supplier countries alternative to Turkey. In the long term, this situation might negatively affect the market share of Turkey (Anonymous, 2001).

Other exporter countries are Austria, Germany, Netherlands and Belgium which make exports although they do not perform production. They re-export the hazelnuts purchased mainly imported from Turkey by packaging them.

MODEL RESULTS

Six equations were predicted for Turkey's hazelnut market (Table 4). The first is Turkey's supply model. The signs of the productivity and area variables in the supply model are positive and they are theoretically accuracy. The explanatory power of productivity and area variable with respect to supply (R2) was calculated to be 99%. Also, the variables in the first equation are statistically significant at a 1% level of significance. The second equation explains Turkey's hazelnut prices. The sign of the supply variable in the equation is negative and the sign of the YTL/USD parity variable was determined to be positive, both being theoretically consistent accuracy. The explanatory power of supply and the parity with respect to price were calculated to be 77%. The third

Table 5. World hazelnut market model.

Independent variables	Dependent variables			
	IMQGR	EXQIT	EXQUS	EXQSP
C	40304.25*	10743.35 **	1843.07 **	2791.68 *
EXPTR	- 3537.56 ***	461.53***	241.04***	272.86**
ALEXPWR	10425.23 *			
DIT		- 0.39 (- 7.06)		
DSP				- 0.50*
DUS			- 0.75*	
SIT		0.27 *		
SSP				0.25*
SUS			0.45*	
R2	0.66	0.68	0.88	0.74
Prob (F-statistic)	0.000	0.000	0.000	0.000
Dw	1.49	1.41	1.46	.1.79

* 5%, ** 10% significant and others are significant at 1%, dw statistics are significant at 1%.

equation explains the domestic demand of Turkey. Signs of the variables in this model were determined in accordance with the theory and the explanatory power was calculated to be 70%. The fourth equation explains Turkey's hazelnut stocks. While the increase in Turkey's supply quantity increases the stock, the increases in domestic demand decline the stock. This is also confirmed by the signs of the variables. The corresponding R^2 was calculated to be 82%. The fifth equation explains Turkey's export quantity by supply and stock amounts. Signs of the variables were determined in accordance with the theory. The explanatory power of supply and stock with respect to export quantity were calculated to be 93%. The sixth equation explains Turkey's export price. In this equation Turkey's hazelnut supply, YTL/USD parity and Turkey's export quantity were used. In Turkey, increase in hazelnut prices and increase in export quantity increases export prices and an appreciation of YTL against the USD negatively affects export prices. This is confirmed by the signs of the variables in the model. In addition, with the F-test, all equations were found to be statistically significant at a level of 1% significance.

The equations predicted for countries active in the hazelnut market other than Turkey are given in Table 5. The first of these models explains the imports of Germany. In the model predicted for Germany, Turkey's export price and almond prices are used. Increase in Turkey's export prices decreases the amount of hazelnut purchased by Germany from Turkey. Besides, Germany imports almond as a substitute for hazelnut. The results obtained from the model verify this theory. 66% of the changes occurring in Germany's imports are explained by the variables on the model. The second equation was estimated to explain Italy's export quantities. Italian exports increase with an increase in export prices of Turkey and with an increase in its own production. Italian exports decline with an increase in domestic demand. He results obtained from the equation are in line with these. The explanatory power of the equation was determined to be 68%. The third and fourth equations were estimated for the export quantities of USA and Spain, respectively. The variables used in these equations are the export price of Turkey, the domestic demands and the own supply quantities of the respective countries. The signs of the variables are in accordance with theory. In addition, the F-test found all equations to be statistically significant at a level of 1% significance.

CONCLUSİON AND DİSCUSSİON

In order to get rid of the economical burdens (cost of stock keeping + supports) created by the excessive hazelnut supply, Turkey decided to reduce the area of hazelnut production. As a matter of fact, excess supply production has always been a problem. In order to reduce the production of products with excess supply, various systems have been applied by governments worldwide. The problem of excess production is generally solved with implementations like decreasing importation, purchase of excess products by the government, restriction of production areas, giving financial supports for reducing the production and application of production quotas (Brandow, 1960; Van Kooten and Taylor, 1989; USDA, 1999; Levy, 2000). In Canada, United States of America and European Union countries, different supply control systems are applied. The mostly known excess production control method is restriction of importation (Gonenc et al., 2006). However, Turkey's hazelnut imports are so low that they can not affect supply. For this reason, this system is of little use for Turkey. In order to ensure supply control, Turkey made legal arrangements and supported growing alternative products in order to reduce production areas. In this study, the manner in

Table 6. Predictions based on model results.

Years	2006	2007	2008	2009	2010	2011	2015	2018
ARTR (ha)	400000	395000	385000	370000	350000	325000	325000	325000
YLTR (kg/ha)	1328	1328	1328	1328	1328	1328	1328	1328
STR (Ton)	520405	514805	503605	486805	464405	436405	436405	436405
PRTR	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
PTR (USD)	3.09	3.10	3.12	3.15	3.19	3.24	3.24	3.24
INTR (USD)	4042	4181	4323	4468	4615	4765	5390	5887
DTR (Ton)	38796	39745	40647	41503	42311	43073	47633	51255
SCTR (Ton)	112066	104333	99100	91572	81748	69628	67074	64882
EXQTR (Ton)	140071	145056	144915	144388	143473	142172	144694	146860
EXPRTR (USD)	3.12	3.14	3.17	3.21	3.26	3.33	3.33	3.33
DIT (Ton)	71706	73354	75001	76649	78296	79944	86534	91476
SIT (Ton)	120881	121602	122324	123045	123767	124488	127374	129539
DSP (Ton)	12305	12559	12813	13068	13322	13576	14593	15356
SSP (Ton)	21493	21482	21471	21460	21449	21438	21394	21362
DUS (Ton)	10690	10782	10873	10964	11056	11147	11513	11787
SUS (Ton)	33248	34006	34764	35522	36280	37038	40070	42343
ALEXVLWR (USD)	4.28	4.33	4.38	4.44	4.49	4.54	4.76	4.92
EXQIT (Ton)	16736	16291	15849	15413	14984	14560	12746	11386
EXQSP (Ton)	2838	2713	2590	2471	2355	2242	1723	1333
EXQUS (Ton)	9589	9868	10148	10432	10719	11009	12106	12929
IMQGR (Ton)	67876	68163	68430	68662	68860	69023	70367	71374

in which reduction in Turkey's hazelnut areas shall be reflected upon international markets was examined.

Using models predicted for Turkey, Germany, Italy, USA and Spain, future values (2007 - 2018) of these countries' variables were predicted (Table 6). It was assumed that as a result of the changes taking place in Turkey's hazelnut production policies, in 5 years time, its production areas are going to decline by 75,000 ha. It was estimated that declines in Turkey's hazelnut production shall be positive for Turkey's effectiveness in hazelnut markets. Reduction in hazelnut areas have also decreased hazelnut supplies. For this reason, hazelnut prices and thus hazelnut export prices are going to increase. However, a stable export policy is a desired situation for the importers. Despite the increase in hazelnut prices, the stability in prices and export quantities shall continue to increase the demand for Turkey's hazelnut. As a matter of fact, when there is instability in hazelnut markets, hazelnut can be substituted by almond (Cicek et al., 1996, Ulusoy, 2004).

Supplying hazelnut at the desired price level and with stability in Turkey shall prevent importer countries to look for alternative producer countries. This situation is important for Turkey with regard to its effectiveness in world hazelnut markets. In addition, the stable hazelnut export price policy to be ensured by Turkey shall decline Turkey's hazelnut exports in the short term; because hazelnut prices shall rise with decreasing supply. But it is predicted that Turkey's hazelnut export is going to increase in the long term. Therefore, hazelnut exports of other exporter countries shall decline.

Hazelnut exports of other producer countries display asymmetrical behavior with respect to the quantity of Turkey's hazelnut exports. This situation can clearly be seen in Figure 2. During the years when Turkey's hazelnut exports increase, other countries' hazelnut exports declined. The opposite situations are also valid. Despite this, Germany's hazelnut imports displayed symmetrical behavior with Turkey's export quantity.

According to the data obtained from model results, the fluctuations occurring in Turkey's domestic hazelnut market increase the effectiveness in international markets. With the latest legal arrangements, it is desired to prevent these instabilities. Thus, Turkey wants to maintain and increase its effectiveness in world hazelnut markets. Future predictions done with the model results obtained show that Turkey's hazelnut exports shall increase. With the reduction that shall be observed in Turkey's hazelnut areas, production is going to decline and domestic market prices are going to rise. However, decline in production shall decrease costs of supports and stock keeping. This is confirmed by the model results. Turkish domestic market prices first raised and then remained constant. Parallel to increasing domestic market prices, Turkish hazelnut export prices also increased. Domestic market prices and export prices of hazelnut remained steady after the year 2011. But Turkey's hazelnut export quantities have been continous-

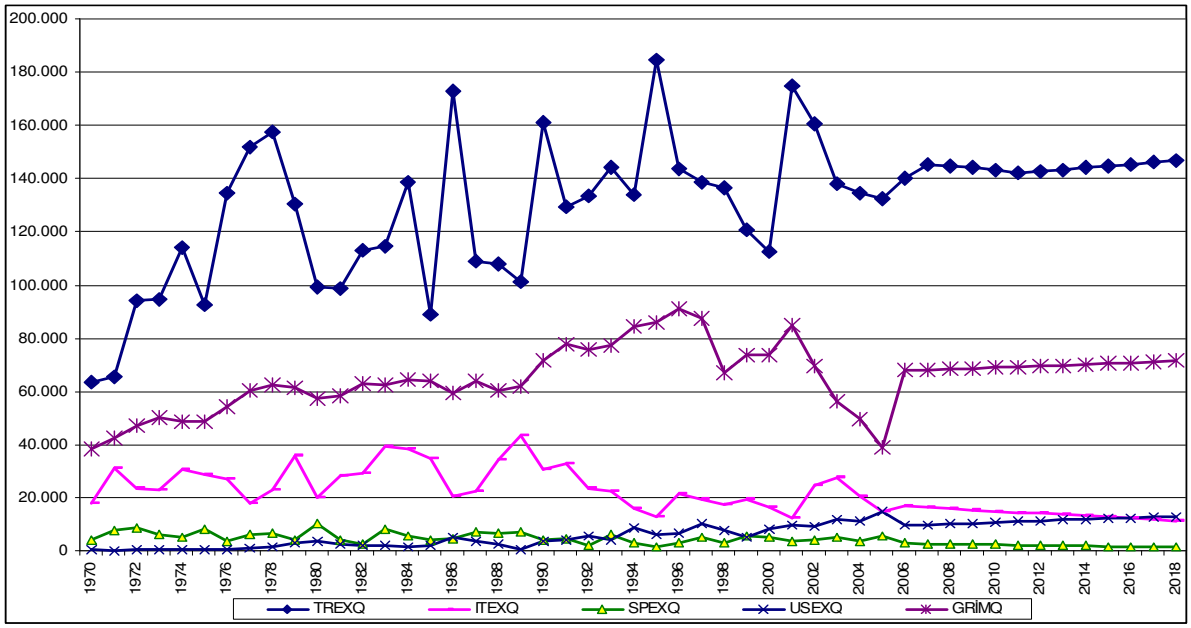

Figure 2. Yearly distribution of hazelnut exports with respect to countries.

ly increasing. Between the years 2007 and 2018, a 5% export increase against an approximately 7% rise in prices is expected. It is predicted that such a change in Turkey's hazelnut foreign trade is going to decrease the hazelnut export amount of Spain by 53% and of Italy by 32%. Besides, the expected increase for Germany's hazelnut import amount was calculated to be 5%. However, 34% increase was calculated for the hazelnut export quantity of USA. Thus, in hazelnut exports, USA has a competitive advantage with regard to quality.

Policy changes done according to the model results predicted show that Turkey can achieve the results it expects.

When another partial equilibrium study (Grethe, 2004) carried out for the full integration of Turkey into the Customs Union and for the foreign trade liberation in agriculture is examined together with the partial equilibrium model of supply control policy, it can be said that integration or even canceling out the customs taxes of agricultural products in the world are inadequate policies for reducing stock amounts. So, in order to reduce its stocks and increase its effectiveness in the world markets, Turkey should increase domestic demand and provide better support for branches of the food industry performing production using hazelnut raw material and encourage investments in this area.

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