

An econometric analysis to evaluate hazelnut price formation on the international hazelnut market

SONIA MARONGIU*

Jel classification: F140, F170, Q130

Introduction

Italy ranks second in the world after Turkey among the hazelnut producers. Although the Italian production is one third of the Turkish production, there are some areas in our country, concentrated in Piedmont, Lazio and Campania, where many farms and many processing industries are interested in having some indications about the market dynamics, in particular about the international market price.

This price, besides being influenced by Turkish competitiveness in terms of production, seems to be influenced by other economic and institutional factors. The former include the general situation of the Turkish economy, characterized by a high inflation and an exchange depreciation. The latter include political decisions took by the Turkish Government for the hazelnut sector (Marongiu).

These policies have been carried out in a different way over time, going through various phases that have deeply influenced the hazelnut exchange and quotations. At the beginning, they were concentrated mainly on the market: the most important instruments were the support price and the export fund. Then, to fulfill the European Union access requirements, the framework of Turkish agricultural policies

Abstract

This work illustrates the results obtained using a simultaneous equations econometric model, which describes the hazelnut market with special reference to the contribution of Turkish and Italian production. The model includes four equations. The first describes Turkish hazelnut supply, the second concerns Turkish exports, the third illustrates the influence of those exports on hazelnut international price. Finally, the last equation of the model explains the impact that the international hazelnut price changes can have on Italian quotations for this product. In particular, this last relationship has been modeled to investigate the variables affecting the price of Tonda Gentile Romana, the most widespread hazelnut cultivar in Viterbo production region. In defining the model, emphasis was laid on the role played by the public support system implemented in the last twenty years by the Turkish Government. The model was also used for forecasting purposes. In particular, it allowed to estimate the possible impact of different scenarios in case of variable changes (hazelnut prices, surfaces, supply).

Résumé

Dans ce travail, on passe en revue les résultats obtenus en appliquant un modèle économétrique d'équations simultanées qui décrit le marché du noisetier compte tenu, en particulier, de la contribution de la production turque et italienne. Le modèle inclut quatre équations. La première décrit l'offre de noisettes turques, la deuxième concerne les exportations turques, la troisième illustre l'influence de ces exportations sur le prix international des noisettes. Enfin, la dernière équation du modèle explique l'impact que les changements du prix international des noisettes peut avoir sur les cotations italiennes de ce produit. En particulier, cette dernière relation a été modélisée afin d'évaluer les variables affectant le prix du cultivar Tonda Gentile Romana, l'une des variétés de noisetier les plus cultivées dans la région de production de Viterbo. Dans la définition de ce modèle, l'accent a été mis sur le rôle du système de soutien public mis en place par le gouvernement turc ces vingt dernières années. Le modèle a également été utilisé à des fins de prévision. En effet, il a permis d'estimer l'impact possible des différents scénarios au cas où les variables (prix des noisettes, surfaces, offre) changeraient.

hazelnut cultivar in Viterbo (one of the most important producing regions in Italy) will be illustrated.

The econometric model is composed of four simultaneous equations, which will be illustrated, along with the main variables that compose them, in the first paragraph.

The second paragraph shows the structure of the model, while the third paragraph illustrates the results of the estimate and the model output.

In addition to its interpretative scope, this model can also be used for forecasting purposes. In particular, it allowed to estimate the possible impact of different scenarios on prices and exports. These scenarios are illustrated in the fourth paragraph.

Finally, conclusions are presented in the fifth paragraph.

has changed. Since 2000, Turkey has started an Agricultural Reform Implementation Program (ARIP), which aims at abandoning every form of support price in favour of structural interventions (for example, crop planning).

All these institutional and economic factors, and their simultaneous action, imply a high market instability and uncertainty as regards the course of the market and the price trend.

The aim of this work is to propose an econometric analysis that represents the mechanism of hazelnut price formation on the international market and its influence on the Italian hazelnut price. In particular, the influence on the production price of Tonda Gentile Romana, the most widespread

* Dipartimento di Economia Agro-forestale e dell'Ambiente Rurale-Facoltà di Agraria - Università della Tuscia (VT)

1. The model equations and the most important variables on the hazelnut market

The first step to define the market behaviour is the analysis of the most important variables and of their interrelations. To better understand the model, the four equations and their variables will be illustrated separately.

The equations are:

1. Turkish hazelnut supply: this equation explains the variables affecting the supply of Turkish hazelnuts. Aside from the surfaces and the yields, the role of support price is taken into account.
2. Turkish hazelnut exports: this equation underlines the relation between Turkish hazelnut supply (production and stocks of the previous year) and the total amount of exports. In this case too, the exports fund and other variables connected with Turkish general economy are taken into account.
3. International market price of hazelnuts: this equation shows the relations among international market price of hazelnut and Turkish exports, exchange rate, support price and cocoa price. The cocoa price is taken into account because it can be considered as a complementary good in industrial processing (Dono).
4. Italian Producers' price (Tonda Gentile Romana): the last equation shows how international quotations influence the Italian producers' price, in particular those of Tonda Gentile Romana, the most widespread hazelnut cultivar in Viterbo.

1.1. Turkish hazelnut supply

According to the FAO data, in 2003 the two biggest producers of hazelnuts in the world, Turkey and Italy, have produced 77% of the whole production, which equals 698.680 t. Besides these two countries, where the hazelnut cultivation is traditional and consolidated, other countries faced the hazelnut market: Spain (Catalonia), USA (Oregon) and recently, Azerbaijan and Georgia, whose commercial importance is increasing.

Table 1. Hazelnut production in the world 1992-2003 (FAO data, t unshelled)

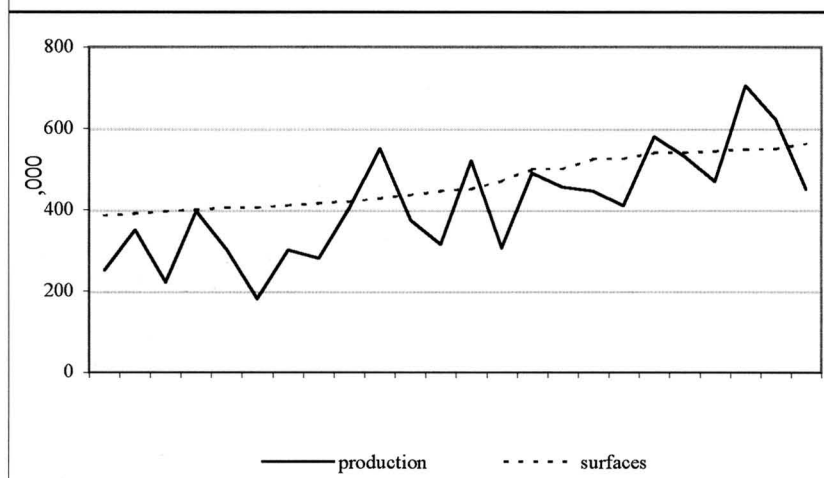
	Turkey	Italy	Spain	USA	Azerbaijan	Georgia	Others	Total
1992-1994	438,333	111,222	20,380	27,183	14,000	11,667	16,977	639,762
1995-1997	437,000	112,452	14,594	31,797	11,667	13,000	19,576	640,086
1998-2000	526,667	128,642	21,089	23,587	11,815	15,632	33,778	761,210
2001	630,000	120,000	26,200	43,540	15,945	11,375	28,315	875,375
2002	625,000	110,000	22,300	43,540	16,120	13,901	26,313	857,174
2003	450,000	86,828	14,343	31,720	19,895	14,000	80,894	697,680

Table 1 shows the production in these countries over the period 1992-2003 and underlines the positive trend of the new countries that faced the hazelnut market.

Although it is necessary to take into account the cyclic nature of hazelnut production, the Turkish production dynamics make the weight of this country in the definition of world supply progressively higher over time. Graph 1 shows the production trend and surfaces of the hazelnut sector from 1980 to 2003.

In this development process, an important role is played

Graph 1. Trend of Turkish hazelnut surfaces and hazelnut production (t unshelled, ha, FAO)



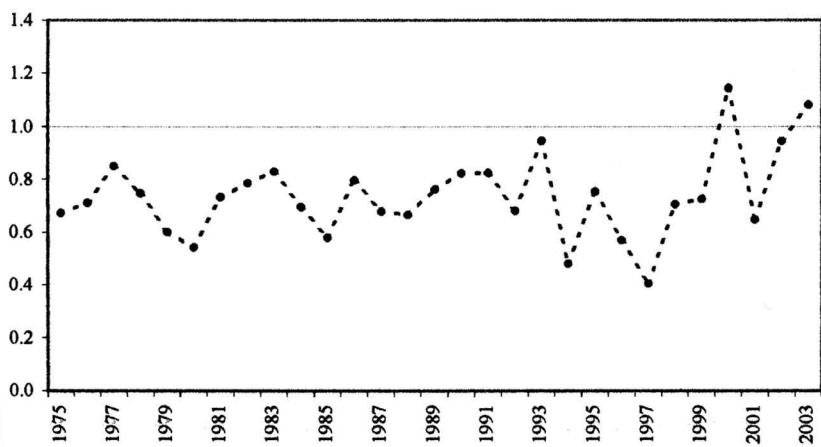
by the support public system implemented by the Turkish Government. The first intervention took place in 1964, with the establishment of Fiskobirlik, a Cooperative Union operating in the hazelnut sector. Fiskobirlik received financial support from the State to buy hazelnuts: quantity and purchase prices were decided by the Government. The primary aim was to encourage the hazelnut cultivation in the most important areas (Trabzon, Giresun and Ordu), then to improve the farmers' standard of living and to regulate the national and international hazelnut market.

These first goals were reached. As mentioned before, the result was both a general production increase and a positive effect on agricultural incomes because the support prices were higher than the production costs (Bozoglu). The trend of this relation is showed in Graph 2: until 2000, the support price was higher than the costs. Afterwards, things changed: these years coincide with the start of the new agricultural reform program.

1.2. Turkish hazelnut exports

The development of the hazel-

Graph 2. Proportion between the production costs and the support price in Turkey (TL/kg, base 1990)



of “tax” was used later as an instrument to regulate the hazelnut trade: its dramatic decrease at the beginning of the 90s allowed the increase in exports which became cheaper (graph 3). At present, this instrument is no longer used.

The equation considers also variables connected with the general economy of Turkey, in particular, the exchange rate between Turkish lira and dollar (the transaction on the market are made using dollars) and the inflation rate (Consumer Price Index). These variables make the international hazelnut market more uncertain and unstable.

1.3. International market price of hazelnuts

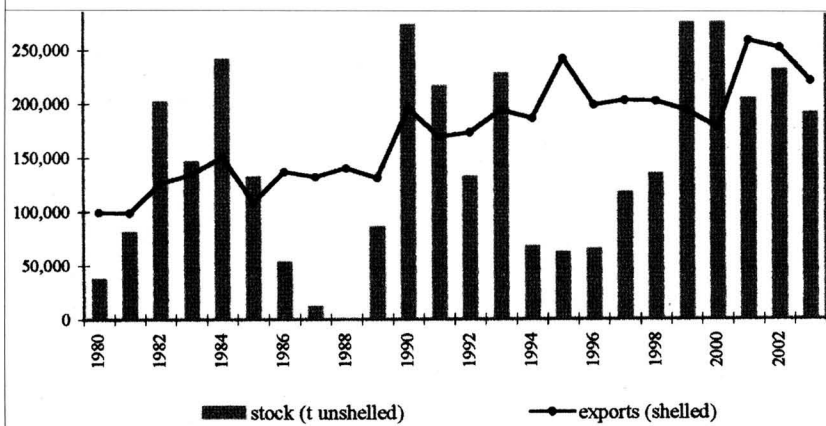
The quantity of Turkish exports is one of the most important variables that influenced hazelnut quotations on the international market. Some more important variables are connected with the exchange rate between Turkish lira and dollar, the cocoa price and the support price applied by Fiskobirlik.

Graph 4 shows the trend of the international market price and support price and highlights the similar variations of these prices. The initial gap is probably due to the presence of the “export fund” which made export price very high until the 90s. After that, this gap decreases, but the support price still influences international quotations of the product.

1.4. Italian producers' price (Tonda Gentile Romana)

This analysis tries to understand how these events could affect the producers' price paid for Italian hazelnut, in particular for Tonda Gentile Romana, considering the difference between Turkey and Italy in terms of production, and taking into account the most important vari-

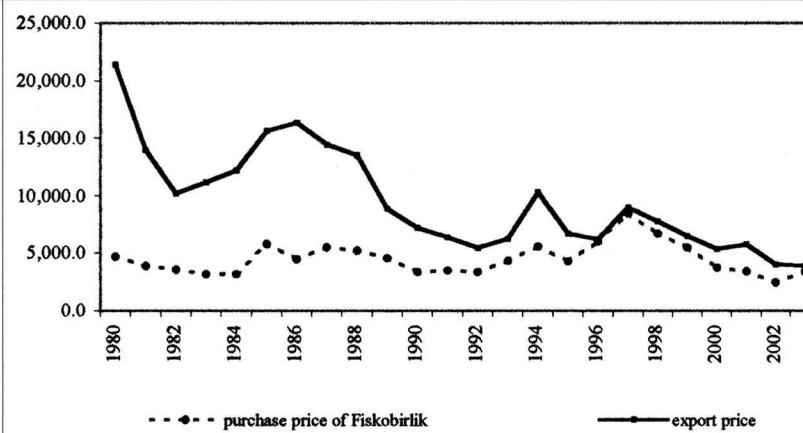
Graph 3. Trend of Turkish hazelnut exports and stocks (t, Fiskobirlik)



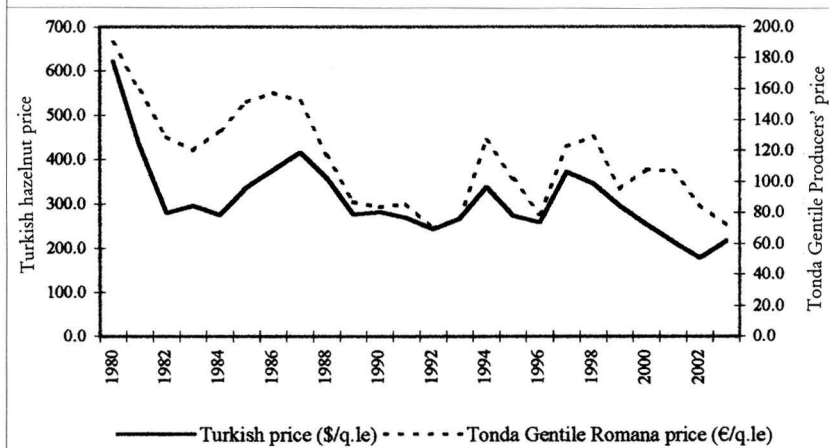
nut sector in Turkey had two important consequences. First of all, the supply increase induced an increase in hazelnut exports. Secondly, there were serious problems with the formation of considerable stocks. Consequently, every year Turkey faces the market with the new production and the stocks of the previous year.

Graph 3 shows the export trend for the period 1980-2003 and the amount of stocks that, apart from some years of low production, are quite high. Turkish productions and stocks have been influenced, over time, by two important institutional factors connected with national agricultural policies. The first one is the purchase price of Fiskobirlik, higher than the market price: this price could sustain high quotations on the international market which became very tempting for Turkish traders. The second one is represented by the “export fund”, introduced in the 80s by the Turkish Government in view of realigning the national prices with the international market price, and, at the same time, to obtain some funds for farm aids. This type

Graph 4. Trend of the export prices and the support price in Turkey L/kg, 1990=100, Fiskobirlik)



Graph 5. Trend of the Turkish hazelnut price and of the Italian producers' price



- pol = dummy connected with agricultural reform policies in Turkey
- export = Turkish hazelnut export, t shelled, Fiskobirlik
- stock = Turkish stock at the beginning of the year, t unshelled, Fiskobirlik
- intrpr = international market price of hazelnuts, \$/q shelled, base 90, Fiskobirlik
- intrate = interest rate on Turkish deposit, IFM
- expfund = export fund on the shelled hazelnut, TL/kg, base 90, USDA
- exctrltd = exchange rate between Turkish lira and dollar, IFM
- export = Turkish export of shelled hazelnuts (t, Fiskobirlik)
- fisko = purchase price of Fiskobirlik, TL/kg, base 90, Fiskobirlik

- cocoa = cocoa price, \$/kg base 90, quotation on New York exchange
- tgr = producers' price of Tonda Gentile Romana, \$/kg, base 90, ISMEA
- exctrltd = exchange rate between Italian lira and dollar, IFM
- ass = dummy connected with the development of Producers' Association in Viterbo

The method used in the estimation is the Three Stage Least Square, a simultaneous equation system. The idea is that strong interdependence exists between the different variables and that their values are determined simultaneously. The behaviour of one variable influenced the behaviour of the others. The econometric software used in the analysis is E-Views.

Table 2 shows the model output.

3. Analysis of the output and valuation of the model

The diagnosis to test the significance and the explicative capacity of the model is made observing some outputs of E-Views, in particular the t-Statistic, the p-value, the R2, and the correlation index of Durbin-Watson.

Generally speaking, all the equations are well-explained and, except for some cases, t-Student values for the variables are significant at more than 95%, and therefore, statistically reliable. There is no correlation among the residuals. The elasticity values are calculated separately.

The different model equations and their coherence with the economic theory are explained in the following paragraphs.

Eq. 1: $turksup = f(ha5, rappcp, yield, pol)$

The dependent variable in the first equation is represented by Turkish hazelnut supply. The variable of the surfaces is delayed by 5 years.

In this equation, it is possible to underline the effect of the Fiskobirlik purchase price on the quantity of hazelnuts put on the market. The negative coefficient of the variable rap-

ables influencing the international price of hazelnuts.

In Italy, the measures for hazelnuts result from the application of the European regulations for the nuts sector issued in the 90s. These regulations aimed to improve the hazelnut trade and price stabilization. Furthermore, they tried to improve technical assistance to farms and cultural practices.

Notwithstanding these interventions, the price trend of Italian hazelnuts has been strictly dependent on the price of Turkish hazelnuts (Dono). The high correlation degree between these two prices is clearly showed in graph 5.

2. Specification of the econometric model

The data available to study the Turkish market and the variables outlined in the previous paragraphs have been used to produce an econometric model. Starting with different variables, the aim is to understand the factors which influence hazelnut production in Turkey and the amount of product put on the international market. As mentioned before, the hypothesis is that the international market price depends on Turkish supply and that this price influences the Italian producers' price

The data used in the model were collected from different sources: Fiskobirlik, FAO, ISMEA, Chamber of Commerce. The period considered is 1980-2003. Some data are used without being particularly worked out while some others, as price and exchange rate, are indexed. 1990 is the reference year.

The equations system and the variables are the following:

1. $turksup = f(ha5, rappcp, yield, pol)$
2. $export = f(turksup, stock, intrpr, intrate, expfund, exctrltd)$
3. $intrpr = f(resport, fisko, cocoa, exctrltd)$
4. $tgr = f(intrpr, export, exctrltd, ass)$
 - turksup = Turkish hazelnut supply, t unshelled, FAO
 - ha5 = surfaces (5 years ago)
 - rappcp = proportion between production costs and purchase price of Fiskobirlik
 - yield = t of unshelled hazelnuts per hectare, FAO

Table 2. Output of the econometric model

System: Hazelnut market and international prices					
	Coefficient	Std. Error	t-Statistic	Prob.	Elasticity
C(1)	0.157906	0.064562	2.445807	0.0167	0.16
C(2)	-101352.5	29710.59	-3.411326	0.0010	-0.19
C(3)	320989.3	12108.13	26.51023	0.0000	1.01
C(4)	18285.66	4857.648	3.764303	0.0003	0.02
C(5)	0.100017	0.042247	2.367438	0.0204	0.24
C(6)	0.126295	0.055900	2.259295	0.0267	0.11
C(7)	111.9466	51.44741	2.175943	0.0326	0.20
C(8)	1717.690	589.7614	2.912517	0.0047	0.33
C(9)	-20.08923	5.761683	-3.486694	0.0008	-0.17
C(10)	16.79991	10.39545	1.616084	0.1102	0.28
C(11)	19945748	9094711.	2.193115	0.0313	0.40
C(11)	-0.041174	0.014494	-2.840866	0.0058	-0.38
C(13)	0.440664	0.188042	2.343440	0.0217	0.24
C(14)	0.054030	0.008512	6.347765	0.0000	0.73
C(15)	4.713785	0.602665	7.821565	0.0000	0.67
C(16)	-0.003474	0.001465	-2.371854	0.0202	-0.27
C(17)	0.809668	0.154440	5.242616	0.0000	0.55
C(18)	24.23647	18.95595	1.278568	0.2049	0.05
<i>Equation 1: turksup = c(1)*ha5+c(2)*rappcp +c(3)*yield+c(4)*pol</i>					
R-squared	0.983924	Mean dependent var		410804.3	
Adjusted R-squared	0.981385	S.D. dependent var		134888.4	
S.E. of regression	18403.63	Sum squared resid		6.44E+09	
Durbin-Watson stat	1.965936				
<i>Equation2: export=c(5)*turksup+c(6)*stock+c(7)*intpr+c(8)*intrate+c(9)*expfund+c(10)*excrtld</i>					
R-squared	0.811454	Mean dependent var		171663.8	
Adjusted R-squared	0.731303	S.D. dependent var		46263.40	
S.E. of regression	28091.35	Sum squared resid		1.42E+10	
Durbin-Watson stat	1.177717				
<i>Equation 3: intpr =c(11)*rexpport+c(12)*excrtld+c(13)*cocoa+c(14)*fisko</i>					
R-squared	0.792268	Mean dependent var		311.0367	
Adjusted R-squared	0.761108	S.D. dependent var		91.35140	
S.E. of regression	44.64944	Sum squared resid		39871.45	
Durbin-Watson stat	1.974113				
<i>Equation 4: tgr=c(15)*intpr+c(16)*export+c(17)*excrtld+c(18)*ass</i>					
R-squared	0.784510	Mean dependent var		2202.152	
Adjusted R-squared	0.752186	S.D. dependent var		623.2827	
S.E. of regression	310.2756	Sum squared resid		1925420.	
Durbin-Watson stat	1.514274				

pcp (proportion between production costs and Fiskobirlik purchase price) means that the lower the capacity of purchase price to cover the costs, the lower the supply of hazelnuts. This result supports the hypothesis that support price system is an incentive for production.

Although in 2000 Turkey has started a reform program of its agricultural policies which includes the elimination of all previous supports, it seems as the hazelnuts sector did not respond to new policies implementation. The positive sign of the dummy pol connected with implementation of new policies could mean that in the three-year period 2000-2003, the Turkish production did not perceive the scenario changes.

Eq.2: export = f (turksup, stock, intpr, intrate, expfund, excrtld)

The second equation estimates the amount of Turkish exports.

Generally speaking, from an economic point of view, the signs of all the variables are coherent with the theory. The influence of hazelnut supply (given by new production and

stocks of the previous year) on exports is direct and clear. A positive effect is played by the international market price. The same result was obtained in other market studies conducted in Turkey: they underline the fact that an increase in international price does not determine a decrease in hazelnut demand because the industry does not substitute hazelnuts with almonds (Yavuz).

The variable intrate was introduced to try to measure the costs connected with the maintenance of hazelnuts stock. It is the interest rate on Turkish deposit and the idea is that hazelnut stocks are similar to a lending operation of capitals that are not used in the bank system. If the interest rate increases, money is not used to stock hazelnuts but is used in different operations. The stock could be "disinvested" and put on the market. So, the coefficient sign is positive.

As mentioned before, the negative sign of the export fund is reinforced. In the first ten years of the period examined, the tax decrease resulted in exports increase. Looking at the elasticity values, a drop of 10% in the export fund determined an export increase of 4,7% (on average).

As regards the exchange rate between Turkish lira and dollar, the sign is coherent with the economic theory. A rise in the exchange rate causes a growth in competitiveness on the market: the foreign demand increases and, as a result, the exports, including hazelnuts, increase as well.

Eq.3: intpr = f (resport, fisko, cocoa, excrtld)

In this equation the dependent variable is the price of hazelnuts on the international market. It is very difficult to estimate this variable because there are a lot of uncertain factors to take into account.

Among the various functional forms, the reciprocal one was chosen to represent exports. The coefficient sign is positive, coherently with the economic theory according to which, generally speaking and for this type of good, the price decreases when the supply increases.

Concerning cocoa, this product is used in processing plants together with hazelnuts: an increase on the international market determines an increase in the hazelnut price.

These two goods are complementary and this relation was emphasized in other works (Dono).

Looking at elasticity values, one of the most important variables affecting the price of hazelnut on the international market is the purchase price of Fiskobirlik. On average, a 10% rise in this price generated an increase in the hazelnut price equal to 7.3%. It seems that the quotations on the international market are influenced by the decisions taken by the Turkish Government.

Eq.3: $tgr = f(intpr, export, exclud, ass)$

The dependent variable is the producers' price of Tonda Gentile Romana and this equation tries to explain the important variables which determine it.

The international market price plays a very important role in the determination of the Italian hazelnut price. The Italian price is subjected to the Turkish price and relations between prices seem to be stronger and more relevant than the productive ones. Furthermore, as the negative sign shows, Turkish exports bring down the Italian price.

On average, a 10% increase in the international market price caused a 6.7% increase of Tonda Gentile Romana producers' price.

In addition, if the dummy is not highly significant, it is positive and this could mean that the Producers' Association in Viterbo played an important role in price definition.

4. Simulations about future scenarios

Generally speaking, this econometric model, apart from showing the behaviour of the most important variables in the market, could be used to make predictions. In particular, it was used to formulate some hypotheses about the possible future trends of the endogenous variables when the exogenous variables change.

In this case, predictions are made on four different scenarios connected with important changes and with the implementation of Turkish and Italian policies in the hazelnut sector. Table 3 shows the results of the four scenarios and the variation between the reference situation and the situation where changes occur.

The first case regards a decrease in the purchase price of Fiskobirlik. The new agricultural policies in Turkey include an intervention in the hazelnut sector completely different from the past. One of the most important changes regards the support price: the Turkish Government does not subsidize Fiskobirlik to buy hazelnuts, so the prices could be re-oriented to the market. Looking at the model output, the result of this decrease must be a general depression of the market. Accordingly, this purchase price reduction has important repercussions not only on the amount of Turkish production and exports (-3%) but also and mainly on the international market price (-10%). As a consequence, the Italian producers' price decreases (-5%), which means that notwithstanding competition with Turkey, our country too has drawn some benefits from the sector support policies implemented in Turkey.

The second scenario is proposed assuming a positive im-

plementation of the new Turkish agricultural reform project. One of the expected results of this reform is the reduction in the hazelnut surfaces for a total amount of 100.000 ha. These surfaces are localized not only in marginal areas (especially in hilly regions very important for their forestry contest), but also in flat areas where alternative crops are possible. In this case, the new law provides for a payment to help farmers establishing new crops and therefore, it is a matter of voluntary participation.

The simulation considers a progressive decrease in these surfaces in 5 years, as set by the project. Obviously, it is very difficult to know in advance what type of areas will access this program (hilly or flat areas) and consequently, the yield considered in the simulation is an average yield. The hypothesis is that both areas will be taken into account in the project.

The results are a general reduction in Turkish production (-9%) and exports (-6%) and an increase in Turkish and Italian prices (3%). The same variations are obtained considering a general decrease in production and stocks.

Finally, the last scenario tries to predict what could happen to Italian producers' price in case of suspension of the Producers' Association action. The result is an average 8% decrease in the price of Tonda Gentile Romana.

Obviously, this hypothesis should be made taking into account different aspects of the Producers' Association functioning, but in general, a negative effect of the Mid-Term Review on the hazelnut sector in Viterbo may be suggested. This is true from a global point of view: other studies (Perone, Dono) emphasize the importance of assistance and concentration supply in the hazelnut sector and their usefulness for the economy of the whole area.

5. Conclusions

This work focused on the international hazelnut market. The most important variables that influenced this market were analyzed and used to produce an econometric model of four simultaneous equations. The model tried to explain how Turkish hazelnut supply is generated (production and exports), how this supply affected the international market price and how this price affected the Italian producers' price (specifically, the price of Tonda Gentile Romana, a widespread cultivar in Viterbo). After a first discussion about the characteristic of these variables and their interrelation, the paper explained, in the second and third paragraphs, the specification of the model and the significance analysis of its output.

The last paragraph was devoted to a simulation of three different scenarios.

Considering the model results, relevant conclusions can be drawn.

First of all, this model suggests the hypothesis that the Turkish support price system, besides representing an important income support for farmers, has given an incentive for production. Despite the exports increase over time, the total sale of production on the market could not be ensured.

This resulted in a stock increase, very cheap to manage and very difficult to put on the market.

The high support level allowed to maintain very high international hazelnut quotations and to have a positive effect on the Italian producers' price. The first scenario outlined in this paper (decrease in the support price) shows the effect of support on the international market: if it decreases, there will be a slight production and quantity decrease, but also a drop in prices. So, the result is a general depression of the market. A different result is observed when surfaces are reduced. In this case, there could be an increase in price following a general supply reduction.

Accordingly, it seems that the dismantlement of the support price without adequate structural interventions is not an ideal solution to orient the Turkish hazelnut sector to the market. Without support, hazelnut prices could be closer to the market price, but this does not guarantee a relevant productions and stocks reduction.

As regards the Italian situation, the dependence on international quotations could remain unchanged in the future. But it is important to bear in mind that, after the Mid-term Review revolution, in some Italian areas (such as Viterbo) the hazelnut cultivation will continue to play an important role in local economy.

Obviously, in this new context, things become difficult because Producers' Associations do not have financial support unlike the past, when they received some funds to finance technical assistance on the farm. Now, things have changed: aids are granted per hectare of surface whereas funds are no longer allocated to the Associations. It is difficult to make predictions about the future, but generally speaking, the new regulations will have a negative impact on the whole hazelnut economy.

References

Agricultural Structure (Production, Price, Value), 1997, State Institute of Statistics, Prime Ministry, Republic of Turkey
Baskan A., Blacksea hazelnut and hazelnut Product Exporters, in Proceedings of the Fourth International Symposium on Hazelnut, Acta Horticulturae N.445, Editors Koksak, Okay, Gunes

Bozo_lu M., A comparative analysis of hazelnut production and trade policies between Turkey and European Union -, Econometric analysis of hazelnut productivity in Ordu and Giresun Provinces, Turkey in Proceedings of the Fifth International Congress on Hazelnut, Acta Horticulturae n.556, Editor S.A.Mehlenbacher

Commission of the European Communities, Commission Staff Working Paper, Analysis of the Nut Sector, Brussels, 10 July 2002, SEC(2202) 797

Dono Gabriele, 1995, Aspetti nel mercato del settore corilicolo, Quaderni del Centro Studi sull'Economia del Nocciolo n.1, CCIAA Viterbo e Ce.F.A.S.

Dono Gabriele, 1996, Un'analisi dell'andamento dei prezzi della varietà di nocciola "Tonda Gentile Romana", in Quaderni del Centro Studi sull'Economia del Nocciolo, n.4, CCIAA Viterbo, Ce.F.A.S.

European Commission, November 2000, Regular report from the Commission on Turkey's progress towards accession.

International Tree Nut Council, 2000, 2001, 2002, Global Statistical Review,

Johnston, 1963, Econometrica, Franco Angeli

Marongiu Sonia, 2003, Aspetti del sistema corilicolo viterbese. Analisi territoriale e problemi di mercato internazionale, Tesi di dottorato

Olgun Hasan, 1989, Some aspects and consequences of the agricultural price interventions in Turkey, in European review of agricultural economics

Perone Pacifico Carlo, 1996, Un'azione organizzata per la nocciolocoltura dei Cimini, in Quaderni del Centro Studi sull'Economia del Nocciolo, n.4, CCIAA Viterbo, Ce.F.A.S.

Pindyck, Rubinfeld, 1991, Econometric Models & Economic Forecasts, McGraw-Hill International Editions

Statistical Indicators of Turkey 1923-1992

USDA Foreign Agricultural Service, 2000, Turkey Tree Nuts Annual

USDA Foreign Agricultural Service, 2001, Turkey Agricultural Situation: Turkey's IMF Program - New Developments

Viesti G., Le politiche economiche dello sviluppo locale, Sviluppo locale n.14, 2000

World Trade Organization, Turkey 1998, Bernan Associates

WTO Trade Policy Review, First Press Release, 7 October 1998

Yannikaya Halit, 2000, The influence of real exchange rates on Turkish agricultural exports