ASSESSING EUROPEAN FARMERS' INTENTIONS IN THE LIGHT OF THE 2003 CAP REFORM

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Paper prepared for the 109th EAAE Seminar " THE CAP AFTER THE FISCHLER REFORM: NATIONAL IMPLEMENTATIONS, IMPACT ASSESSMENT AND THE AGENDA FOR FUTURE REFORMS".

Viterbo, Italy, November 20-21st, 2008.

Abstract[1]

The effects of the 2003 CAP reform on the farmers' decisions on whether to abandon their farming activity, how much to produce and what to produce are analyzed in the present paper. To this effect data collected for Hungarian, Dutch and Greek farmers on their perceptions about the reform and its effects, and on their production intentions is analyzed using discrete choice models under 3 alternative scenarios for the future produce prices. The discrete choice model applied in the present paper is sequential since farmers are confronted with a sequence of choices. In the first stage, the choice is between abandoning farming or continuing, then those farmers who have chosen to continue are presented with two additional choices related to their level of production and crop mix. Some of the results of the analysis point out that the evolution of future prices, level of information about Cap reform, farm size play an important role in the decision to abandon or continue. In the case of Hungary and Greece, younger farmers are less likely to abandon, more likely to increase production and change crop mix than their older counterparts, emphasizing the importance of aids to the young.

Keywords: CAP, Farmers choices, MTR assesment

JEL Code: Q10, Q18

[1] The present paper is based on the study undertaken under the EU Carera program (contract no. SSPE-CT-2005-022653).

Introduction

The agricultural sector in the European Union is undergoing a big change at present. In effect, while the sector has traditionally been the greatest beneficiary of domestic support, it is trying to adapt to a new situation where farm payments are decoupled from farm production. The rationale behind the 2003 CAP reform was to put an end to the overproduction of agricultural products that was the result of the substantial support payments European farmers were receiving and to enhance the competitiveness of farmers. Under the lemma "farmers should produce what the markets demand" the reform established a single farm payment scheme whereas payments are not linked to production anymore (therefore eventually reducing the incentives to overproduce) but they are linked to area and historical payments. In fact, farmers could decide not to produce anything at all and still receive the single farm payment. In addition, the reform introduced the concept of cross-compliance making the receipt of farm payments contingent on "good practice" with respect to environmental, food safety and animal standards. The new reform shifted the weight from direct aids (pillar 1) towards rural development measures (pillar 2). Rural development measures evolve around 3 main axes targeting mainly the competitiveness of the agricultural sector, the environment and the quality of life in rural areas. It is expected that the new reform will bring about changes in the employment levels of rural areas. On the one hand, the adoption of decoupled payments –by reducing the incentives to overproduce- could lead to some farmers abandoning farming activity and therefore a reduction of hired labour in some farms. On the other hand, some of the rural development measures could act as an incentive to young farmers to get involved in agricultural production and other economic activities. It was not clear at the outset what the overall effect of Cap reform on employment levels and on farmers production decisions will be (see Hennessy and Thorne ,2005; Breen et al,2005; Anton and Sckokai, 2006).

The present study tries to shed some light on the above issue by trying to elicit the future plans of farmers in the EU from the information given by the farmers themselves. Three sets of surveys were conducted in the summer of 2007 in three different regions of the EU, namely the regions of Anatoliki Makedonia-Thraki in Greece, Flevoland in Holland and the Southern Great Plain in Hungary. The surveys focussed on farmers' future intentions with respect to their farming activity and targeted crops/livestocks were specific to each region. An econometric model that takes into account the sequential nature of the decisions to abandon, to change production volume and/or crop mix is estimated with the data.

The questionnaire also contemplates three different price scenarios for the price of agricultural products to take into account possible future price fluctuations.

The survey results show that when farmers are not given information about future prices, then a substantial proportion (38.1%) will opt for abandoning farming activity in Greece, the corresponding figures are much lower for Holland (12.9%) and for Hungary (9.2%). Of those farmers who report they will not abandon, the majority will keep the same level of production and the same crop mix in the three countries. Farmers in Greece and

Hungary are much more responsive to changes in prices than Dutch farmers. Small farms are more likely to abandon in the case of Greece and Hungary while the contrary holds for Holland. More specialized farms are more likely to abandon production in Greece and Hungary while in Holland they are less likely to abandon production. Moreover, once a farm decides to continue with farming, the more specialized it is, the less likely it is to increase production in the case of Greece and Hungary but the more likely it is to increase production in the case of Holland. One striking difference among the three countries is the level of information farmers state to have about Cap reform, with Hungarian farmers being much less informed than the other two, and the Dutch farmers being the better informed ones.

The organization of the paper is as follows: the next section briefly describes the three regions that were chosen for the study, section 3 offers a description of the survey and data, the econometric model applied to the data is developed in section 4, the estimation results are presented in section 5 while section 6 concludes the paper.

The Regions

The Region of Anatoliki Makedonia and Thraki

The region of Anatoliki Makedonia and Thraki comprises the eastern part of Greek Macedonia along with Greek Thrace. It has a land area of 1,403,400 ha (11% of the total land area of Greece) and borders in the west with the region of Kentriki Makedonia, in the north with Bulgaria and in the east with Turkey.

The share of agriculture in the gross added value is calculated to be 20% of the total regional gross added value, against 8.8% nationally. The region produces 10% of the output of the national rural sector, 4.4% of transportation and 3.5% of services (NSSG, 2001). It also occupies the penultimate place in the classification of regions based on per capita production, with 10,200 Euros in 2002, which is 79% of the national average per capita production and 58.6% of the EU-25 average. The primary sector occupies 96% of the total regional land area. Forests and wooded areas cover 53% of the region's total area, whilst the national average is 49.7%. The main cultivated products are cereals (mostly wheat), tobacco, cotton, tomatoes, potatoes, olive oil and apples. Milk production is also important due to the regional development of livestock farming, and poultry farming.

The agricultural sector is the leader in terms of employment although its share in total employment has been declining, going from 34.3% in 2000 to 23.7% in 2004 (National Statistical Service of Greece, NSSG 2005). Of some importance is the manufacturing sector whose share has gone from 11.9% to 13.6% in the same time period and it mainly comprises food processing and tobacco industries.

The unemployment rate is higher than the national average as it was around 11% in 2006 (NSSG,2006) and with a much higher incidence of female unemployment.

The Region of Flevoland

Flevoland is the youngest province of The Netherlands and is an area that has been reclaimed from the sea.

The most important sectors that provide jobs are the business activities sector (21.1%), trade sector (19.0%), health and welfare sector (11.9%) and manufacturing sector (10.6%). The agricultural sector provides 4.7% of the jobs.

The arable acreage is mainly used to grow potatoes (26.0%), arable vegetables, including onions (21.4%) and cereals (19.2%) (table 5.2.3). Besides potatoes and sugar beets, many farms grow cereals, including wheat, and onions. The second largest type of agricultural holdings in Flevoland are grazing livestock farms (14.2%), including horses, cattle, sheep and goats. In Flevoland, dairy farming is the main livestock activity with in total 46,759 dairy cows at 306 dairy farms, 50.1% of the total number of livestock farms.

The sugar beet contributes for 5% to the total agricultural acreage and about 2% of the agricultural production. Wheat crops cover 1,520,246 hectares of the agricultural area in Flevoland (19.2%), which is 6.9% of the total acreage used for wheat in The Netherlands.

In Flevoland, 7.8% of the agricultural area is organic, while the national percentage is only 2.1%. In the 90's, the number of dairy cows in Flevoland decreased. However, the decline was lower than the national decline in dairy cows and therefore the share in the Dutch dairy stock increased from 1.5% in 1990 to 1.7% in 2000.

The participation of women in the total labor force is less than the participation of men in Flevoland and women account for a higher percentage in unemployment (almost 1 to 2).

The Region of the Southern Great Plain

The Southern Great Plain, the largest region in Hungary (19.9% of Hungary's territory), is located in the south and south-east of Hungary. Most of the region's land (85%) is suitable for agriculture and it is predominantly flat.

According to data provided by the Hungarian Central Statistical Office the employment rate for people aged 15-64 in Hungary (56.9% in 2005) corresponds with the average employment rate in the ten new member states. However, it is significantly lower than the rate of 64% for EU-15.

Although, the Southern Great Plain accounts for only 9% of the total Gross Domestic Product (GDP) of Hungary, it accounts for 25% of the agricultural GDP. Agriculture's share of the regional GDP was 9% in 2002. The per capita GDP of the region is below the national average and up to 2003, the region had the lowest rate of growth in Hungary.

The Questionnaire, Data and Preliminary Results

The questionnaire was designed to elicit farmers' future intentions in the light of the recent CAP reform and the associated rural development measures. Emphasis was put on

eliciting the confidence level of the farmers in the business, and the possibility of future changes in their production activity in the light of the CAP reform. Future intentions about input use, labor use, size of business, investment levels and output diversification were addressed taking into account the respondent's socioeconomic and demographic characteristics as well as the possibility of their succession in the business.

The questionnaire was divided in five (5) parts. In the first part information concerning the current activity level of farming were collected. The location of the farm, crop and livestock production, ownership status, use of labor and their experience of the CAP implementation in the past. An important part of this section refers to farmers responses to previous changes in agricultural policy in order to compare those with their intentions concerning the reform towards decoupling farm incomes. This part was excluded for Hungarian farmers as they do not have any experience from the past concerning CAP. The next section of the questionnaire deals with farmers' level of information about the 2003 CAP reform as well as their sources of information. This section is important in order to make sure that they will respond adequately about the future scenarios. In part three the questionnaire focusses on their perceptions about the 2003 reform. Specifically, they are asked to evaluate the anticipated changes in regional agricultural production, employment, off-farm occupation, women and young people involvement in farming business etc. Part 4 of the questionnaire is concerned with future intentions in a 5 year time horizon. The focus of the exercise was to learn what the farmers' intentions were with respect to their continuity in the farming business and their future production plans both in terms of volume and crop mix. Each respondent was presented with a brief summary of the new SFP regime applying to his specific crops and country and then was asked to state his future intentions in the light of the new regime and under three different scenarios corresponding to no price information, a 10% price decrease and a 10% increase. For Greece the crops chosen were cotton and tobacco together with sheep breeding, sectors that the region of Anatoliki Makedonia and Thraki is specialized. For Netherlands, sugar beet, wheat and dairy farming were chosen as the most indicative activities in Flevoland. Finally, in Southern Central Plains the sectors investigated were corn, fresh vegetables and pig production.

In addition farmers were asked about the likelihood of introducing new crops, increasing their off-farm activities, increasing their capital investment, changing the amount of labour used in farm as well as the possible uses of the SFP payments between investment and leisure. Finally, in the fifth section some important socioeconomic characteristics were collected like the age and education of the head of the household, the number of family members, their experience in farming and off-farm income sources.

The initial sample of farmers was randomly selected using the information provided by the local agricultural directorates and it was 176 for Anatoliki Makedonia and Thraki, 191 for Flevoland and 225 for Southern Central Plains. Some of the collected questionnaires were incomplete as farmers were not able or willing to answer all the included questions. Therefore the final sample sizes used in the present study were 160 for Greece, 85 for Holland

and 153 for Hungary. The big difference in the response rates among the three regions is due to the fact that in the case of Greece and Hungary data was collected through face-to-face interviews while in the case of Holland, telephone interviews was the chosen method. Summary statistics of some the variables obtained from the questionnaires are presented in detail in table 1, for Anatoliki Makedonia and Thraki, Flevoland and Southern Central Plains, respectively.

The analysis of farmers' responses by country reveals some interesting patterns. In the case of Greece, although almost one third of the farmers declare having participated in some structural program in the past, less than one third considers they have at least a fair level of information about the 2003 Cap reform, only 34% have a fair knowledge of requirements for direct farm supports while more than 30% declare they are not familiar with the terms "single farm payment" and "cross-compliance".

Table 1 - Means for some variables

Variable	Greece		Holland		Hungary	
	N	Mean	N	Mean	N	Mean
Age of head	160	47.9	85	49.9	153	51.3
Family size	160	3.6	85	2.6	153	3.6
Tenure	160	1987	85	1986	153	1994
Probability retirement	160	24.8	85	26.7	153	20.7
Probability more working off-farm	160	18.9	85	16.4	153	11.0
Total acreage crops	139	351.9[a]	84	42.7	152	125.7
Total number of livestock	37	239.3	30	120.2	52	830.7
Percentage rented land	160	0.27	85	0.5	152	0.44
Herfindahl index crops	139	0.76	84	0.4	152	0.46
Herfindahl index livestock	37	0.91	30	1.0	52	0.94
Share head in working hours at farm	160	0.44	85	0.7	139	0.44
Share hired workers in working hours	160	0.27	17	0.3	139	0.26
Probability introduction new crop	160	28.3	85	21.7	153	32.4

[a] *measured in stremmas, 1 stremma=0.1 ha.*

This lack of information can be explained from the sources of information that farmers declared. The main source consisted of private agricultural extension agents that regularly visits their farms (78.4%), other farmers (77.5%) and from various media like TV or newspapers (73.3%). It is obvious the lack of organized information campaign from both local and central governmental authorities as well as from farm cooperatives. The 29.5% of the farmers declare that they get the information from their cooperatives, the 1.1% from private or state banks, the 1.7% from local governmental agencies, the 33.5% from local authorities, the 13.1% from the internet, the 35.8% from farmers' unions and the 11.4 from public extension agencies. With regard to their perceptions about the future changes in their region initiated by the recent CAP reform the 89.4% of the questioned farmers agree that the agricultural production in their region will decrease after the implementation of the new

regime. With regard to the crop they cultivate the share is also high 86.2%. Only the 29.3% believes that the new policy will increase job opportunities outside farming, whereas the 39.4% strongly disagree. They strongly disagree (83.1%) that employment levels will increase in their specific farm activity in the next five years. Finally, only the 2.5% thinks that farm income arising from the specific crops that they cultivate will increase as a result of the decoupled farm payments. Almost 70% of the farmers responded they will use the single farm payment for investment, around 20% still don't know how they will use the SFP and the rest will use it for leisure. Of those farmers planning to invest the single farm payment, the majority intends to invest it in the farm.

On the other hand, for Holland only 1.2% of the farmers have participated in a previous EU structural program, while all of them declare to be familiar with the term "single farm payment" and 93% are familiar with the term "cross-compliance". While only 28% have a fair amount of information about the Cap reform, as many as 63% know the requirements for direct farm supports. The opinion of the farmers about the decrease of agricultural production, the creation of new jobs outside the agricultural sector and the decrease of agricultural production for the specific farm activity, caused by the CAP reform, is not unambiguous (table 5.2.25). Most farmers disagree with the fact that the CAP reform creates new jobs in the specific farm activity (71.8%) and the income of farmers in the specific farm activity is increasing (55.3%). More than half of the farmers will use their single farm payment for the investments (54.1%), mainly inside the farms (97.8%). Only 3.5% of the farmers will use single farm payment for leisure. The remaining farmers do not know yet for what they will use the single farm payment.

In the case of Hungary, only 12% of respondents declare to have at least a fair amount of information about the Cap reform and the corresponding figure for knowing the requirements for direct farm supports is 28%. In addition 82% of the farmers are not familiar with the term "cross-compliance" and 32% with the term "single farm payment". Concerning their perceptions about the effects of the CAP reform, these are not very positive since 39.9% believe agricultural production will decrease, while only 15.7% think there will be new jobs created outside of agriculture. Almost half of the farmers will use their single farm payment for investment (47.1%) while the rest still don't know, and all of the former are planning to invest inside the farms.

Tables 2 and 3 below, show the percentage of farmers, for the three regions, who declared that sometime in the next five years they will either abandon farming activity, or change their level or production or change their crop mix, under the three alternative price scenarios. As it appears on the table, Greek and Hungarian farmers appear to be very reactive to different price scenarios, with 62.5% and 28.1%, respectively, declaring their intention to abandon if prices were to decrease by 10%, while the corresponding percentages under the scenario of a price increase are only 8.1% and 5.9%. If we consider the age distribution of respondents choosing the abandon option it turns out that for Holland, older farmers are a majority across scenarios while in the case of Greece and Hungary the percentage of young

farmers greatly varies across scenarios. As far as changing their crop mix, the majority of farmers would keep the same mix, except for Greece under the scenario with increasing prices.

Table 2 - Abandon, increase, decrease or same production level (in %)

	Abandon			Decrease			Same			Increase		
	GR[a]	HO	HU	GR	HO	HU	GR	HO	HU	GR	HO	HU
No info.	38.1	12.9	9.2	3.8	0.0	3.9	36.3	51.8	54.2	21.9	35.3	32.7
Fut. prices	62.5	18.8	28.1	6.3	1.2	6.5	16.3	49.4	43.8	15.0	30.6	21.6
Fut. prices	8.1	14.1	5.9	0.0	0.0	2.6	29.4	50.6	55.6	62.5	35.3	35.9

[a]GR=Greek region, HO= Dutch region, HU= Hungarian region.

Table 3 - Abandon, keep the same crops/livestock mix, change the existing mix (in %)

	Abandon			Change Mix			Keep mix		
	GR[a]	HO	HU	GR	HO	HU	GR	HO	HU
No info. Fut. prices	38.1	12.9	9.2	20.6	32.9	29.4	41.3	54.1	61.4
Fut. prices Decr. 10%	62.5	18.8	28.1	10.6	29.4	28.1	26.9	51.8	43.8
Fut. prices Incr. 10%	8.1	14.1	5.9	51.3	28.2	26.1	40.6	57.6	68.0

[a]GR=Greek region, HO= Dutch region, HU= Hungarian region.

In order to further analyze the factors that affect the different choices of the farmers: abandon, change production level, change crop/livestock mix, we develop an econometric model, where the farmers face a sequential choice under the firs scenario only. In the first step they choose whether to abandon or not and then those who choose to stay in business, are faced with the simultaneous choice of the production level and crop mix.

The Econometric Model

Each choice described above can be represented by an equation linking the "propensity towards a choice" or latent variable Y* to a set of characteristics of the farmer denoted by X.

First Equation: to abandon or not

$$Y_{1i}^{*} = X_{1i}\beta_1 + \varepsilon_1 \qquad (1)$$

Second Equation: acreage (livestock size) decision

$$Y_{2i}^{*} = X_{2i}\beta_1 + \varepsilon_2 \qquad (2)$$

Third Equation: crop (livestock) mix decision

$$Y_{3i}^{*} = X_{3i}\beta_1 + \varepsilon_3 \qquad (3)$$

where, , j=1,2,3 are the usual latent variables governing each decision and ε_j are stochastic terms representing possible factors that affect the farmers' decision but are not observed by the researcher. Since the latent variables are not observed we define the following three observable dichotomous variables:

$$Y_{1i} = \begin{cases} 0, & Y_{1i}^* < 0 \\ 1, & Y_{1i}^* \geq 0 \end{cases} \qquad (4)$$

to represent whether a farmer plans to continue ($Y_{1i} = 0$) or abandon ($Y_{1i} = 1$),

$$Y_{2i} = \begin{cases} 0, & Y_{2i}^* < 0 \\ 1, & Y_{2i}^* \geq 0 \end{cases} \qquad (5)$$

to represent whether a farmer plans to increase acreage/size ($Y_{2i} = 1$) or not ($Y_{2i} = 0$) and Y_{2i} is observed only when $Y_{1i} = 0$. The last observed variable gives us information about whether a farmer is planning to change the crop/livestock mix ($Y_{3i} = 0$) or not ($Y_{3i} = 1$) and is defined analogously as,

$$Y_{3i} = \begin{cases} 0, & Y_{3i}^* < 0 \\ 1, & Y_{3i}^* \geq 0 \end{cases} \qquad (6)$$

where once again the latter is observed only for respondents who answered "not abandon".

In order to allow for correlations among the three decisions, the three errors terms ε_1, ε_2, ε_3 are assumed to follow a trivariate normal distribution with zero means, unit variances and correlations ρ_{12}, ρ_{13}, ρ_{23} . The log-likelihood corresponding to equations (1) to (6) is given by:

$$\begin{aligned} logL_n = & \sum_n y_{1i}\Phi(x_{1i}\beta_1) \\ & + \sum_{n_2} (1-y_{1i})\{y_{2i}y_{3i}P(\varepsilon_1 \geq -x_{1i}\beta_1, \varepsilon_2 \geq -x_{2i}\beta_2, \varepsilon_1 \geq -x_{1i}\beta_1) \\ & + y_{2i}(1-y_{3i})P(\varepsilon_1 \geq -x_{1i}\beta_1, \varepsilon_2 \geq -x_{2i}\beta_2, \varepsilon_1 < -x_{1i}\beta_1) \\ & + (1-y_{2i})y_{3i}P(\varepsilon_1 \geq -x_{1i}\beta_1, \varepsilon_2 < -x_{2i}\beta_2, \varepsilon_1 \geq -x_{1i}\beta_1) \\ & + (1-y_{2i})(1-y_{3i})P(\varepsilon_1 \geq -x_{1i}\beta_1, \varepsilon_2 < -x_{2i}\beta_2, \varepsilon_1 < -x_{1i}\beta_1)\} \end{aligned} \qquad (7)$$

where, due to the sequential nature of the model, the first summation is taken over all respondents and the second over the respondents who do not abandon. Thus the first line of equation (7) describes the probability of abandoning, the second line the probability of not

abandoning and increasing acreage/livestock size and keeping the same mix and so on. The computation of expression (7) involves the evaluation of trivariate integrals and therefore the GHK algorithm (Hajivassiliou et al., 1996) will be used to simulate the log-likelihood with 100 replications.

Estimation results

The econometric model presented in the previous section was estimated for the three regions separately, the likelihood ratio test was used to select the set of explanatory variables included in the estimated model and also to test correlations among the three equations. After several attempts and using different variables as explanatory ones in the trivariate probit model we ended up with the specifications presented in tables 4-6 while table 7 gives a description of the variables used in the estimation. The signs of the coefficient estimates give us information about the direction –but not about the magnitude-of the effects of explanatory variables on the three different probabilities: to abandon, to increase production and to keep the same mix. With respect to te decision of abandoning the estimation results show that as expected, the closer a farmer is to retiring the more likely he is to abandon. The level of satisfaction with the current situation of farming business affects negatively the probability to abandon for Greece and Hungary. The higher the specialization of the farm the higher the probability that farmer will exit farming in the case of Greece and Hungary indicating the significant risks that farmers perceive about the future course of the sector in the light of CAP changes. It is the foremost important factor influencing the probability to abandon in Greece. For Holland the opposite holds with respect to specialization. In the case of Greece the level of information about the CAP reform and the previous experience with CAP structural programs lessens the adverse perceptions as it reduces the probability to exit the sector, while the latter factor contributes positively as well in the decision to increase production. However, small farms seems to be more vulnerable to changes as they have less opportunities to survive exhibiting a higher probability to abandon farming both in Greece and Hungary.

This is also supported for Greece by the parameter estimate of FFARMINC which is negative and statistically significant indicating that farms with high profitability (mainly of large size) are having a lower probability to abandon. Once again, we get an opposite effect in the case of Holland in the case of small farms. Finally, for Greece the age of the head of the household increases the probability of abandoning but the experience of the farmer (as measured by tenure) does not. The more experienced the farmer is, the higher is the possibility to adjust himself into the new environment and thus the less the probability to exit the business. Although small farms are more likely to exit, we have in the case of Greece that if they stay in business they are also more likely to increase production, while the opposite holds for Holland and Hungary. Also, conditional on staying, more specialized firms are more likely to increase production in Holland, while the opposite holds in Greece and Hungary. More educated farmers are more likely to increase production in both Greece and Holland than less educated ones.

Table 4 - Estimation results for trivariate model-Greece

Parameter	Abandon		Production		Mix	
	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
CONSTANT	-2.2850	0.8656	2.6266	1.0173	0.1788	0.7774
PROBRET	0.0126	0.0043	-	-	-	-
SATISF	-0.7439	0.3145	-	-	-	-
PARSTRUC	-0.4429	0.3159	0.6971	0.3266	-	-
INFCAP	-0.6858	0.3606	-	-	-0.8499	0.3445
HDAGE	0.0274	0.0184	-0.0615	0.0190	0.0471	0.0213
FFARMINC	-0.0335	0.0164	-	-	0.0054	0.0054
SPEC	2.2843	0.6434	-1.4841	0.6322	-	-
TENURE	-0.0300	0.0191	-	-	-0.0253	0.0228
SIZLO	0.5820	0.4122	1.0850	0.8353	-	-
PINVT	-	-	0.0150	0.0046	-0.0069	0.0044
DEDU1	-	-	-0.5916	0.4244	-	-
DEDU2	-	-	-0.3506	0.4499	-	-
DCOTTON	-	-			-0.8443	0.3457
ρ_{12}	-0.5065	0.4347				
ρ_{13}	0.8108	0.2751				
$Ln(\theta)$	-156.31					

Table 5 - Estimation results for the three univariate models[a]-Holland

Parameter	Abandon		Production		Mix	
	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
CONSTANT	2.6375	3.1744	-1.1515	0.6177	1.3400	0.6519
PROBRET	0.0807	0.0424	-	-	-	-
FAMSIZ	-3.2670	1.6918	-	-	-	-
PCTRENTL	-3.8939	2.1398	-	-	-	-
TENURE	0.0714	0.0806	-0.0376	0.0211	-0.0191	0.0173
SPEC	-3.5698	2.5280	2.0523	0.7538	-	-
SIZLO	-1.7106	1.2766	-1.1398	0.6114	-	-
INFCAP	-	-	-	-	-0.2723	0.3615
PINVT	-	-	0.0213	0.0064	-0.0125	0.0054
DEDU2			-0.1402	0.1496	0.4811	0.3883
DWHEAT	-	-			1.1241	0.4471
DSUGAR	-	-	-	-	-1.3833	0.4859
Log-lik	-	-	-	-		
	-79.645					

[a]*The likelihood ratio statistic for the null hypothesis $\rho_{12}= \rho_{13}= \rho_{23} =0$ is 0.76 and therefore we can not reject the null hypothesis. The results above are therefore from three univariate probits.*

As far as the decision to change the crop mix is concerned, the results show that more informed farmers are more likely to change their crop mix in both Greece and Holland. On the other hand cotton growers in Greece, sugar beet growers in Holland and corn growers in

Hungary are more likely to change their crop mix than farmers who do not grow those crops in their respective samples.

Table 6 - Estimation results for trivariate model-Hungary

Parameter	Abandon		Production		Mix	
	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
CONSTANT	-3.5764	1.8246	-0.3616	0.3370	0.6255	0.7377
PROBRET	0.0161	0.0053	-	-	-0.0088	0.0037
HDAGE	0.0542	0.0244	-	-	-	-
PCTRENTL	0.6428	0.4722	-	-	-	-
SATISF	-0.8448	0.4324	-	-	-	-
IMPAG	-1.0238	0.4330	-	-		
FAMSIZ	-0.4315	0.2073	-	-	-0.1845	0.1021
SPEC	1.5851	0.9222	-1.1347	0.6934	1.6809	0.7412
SIZLO	0.8420	0.4956	-0.5885	0.4464	-	-
OPCAP	-	-	-0.8405	0.2763	-	-
POFF	-	-	0.0096	0.0063	-	-
PINVT	-	-	0.0177	0.0039	0.0002	0.0003
TENURE	-	-			0.0362	0.0224
DCORN	-	-			-0.5721	0.4181
ρ_{23}	-0.3705	0.1578				
$Ln(\theta)$	-168.76					

Table 7 - Description of variables used in the estimation of the model: scenario no information on prices

Variable	Description	Sample means		
Explanatory		GR	HO	HU
PROBRET	Probability the farmer will retire	24.750	26.694	20.686
SATISF	Dummy for satisfaction current business	0.550		0.751
PARSTRUC	Dummy for part in any prev.EU st. program	0.325		
INFCAP	Dummy for level of knowledge about Cap	0.286	0.282	
HDAGE	Age of household head in years	47.956		51.294
FFARMINC	Family farm income in ths €[a]	15.407		
SPEC	Specialization index[b]	0.780	0.412	0.467
TENURE	Years in farming[c]	19.288	21.059	12.726
SIZLO	Dummy indicating small farms[d]	0.175	0.424	0.170
PINVT	Probability of increasing investment	24.300		
DEDU1	Dummy for up to primary school	0.606		
DEDU2	Dummy for up to secondary school	0.263	0.765	
DCOTTON	Dummy for growing cotton	0.475		
FAMSIZ	Family size		2.635	3.582
PCTRENTL	Percent of land that is rented		0.509	0.435
DWHEAT	Dummy for growing wheat		0.494	
DSUGAR	Dummy for growing sugar beet		0.635	
IMPAG	Dummy for import. of activity in region econ.			0.667
OPCAP	Dummy for belief agr. prod.of their act.will fall			0.353
POFF	Probability of increasing off-farm labour			11.013
DCORN	Dummy for growing corn			0.811

[a] The original variable in the questionnaire was measured in euros; [b] For crops the acreage of each crop was used for the index, for livestock the number of heads was used, while for farms involved in both activities we opted for using the minimum of the two indices; [c] The original variable in the questionnaire was the actual year the respondent became the main decision maker; [d] Small farms are those whose size is below the 20% quartile, where size is computed in terms of total acreage for crops and number of heads for livestock.

Conclusions

The 2003 Cap reform represents a substantial change with respect to the way the EU faces the agricultural sector. By decoupling farm payments and shifting agricultural policy towards rural development measures it is expected that the agricultural sector will undergo a structural reorganization whereas farmers whose existence depended in the past on direct supports and not on market conditions, will adapt to the new situation and become more market oriented. Therefore the new regime could in principle encourage some farmers to either abandon farming activity in the immediate years following the application of the reform, or decrease their levels of production, or switch to other crops. On the other hand, the rural development measures by targeting the development of rural areas as the main objective could lead to an increase of the employment opportunities in rural areas. The final effect that

these two forces can have on the employment levels in rural areas is not clear at the outset. In order to assess what farmers intend to do with their farming activity we have conducted surveys for Greece, Holland and Hungary. The main results worth highlighting from our analysis of the collected data are summarized in what follows.

Those farmers who intend to abandon farming in the next five years, are mostly older farmers in the case of Holland and only in the event of crop prices decreasing do some young farmers decide to abandon. In the case of Greek farmers though, some of the farmers who intend to abandon are young irrespective of the future price scenario presented to them, while the percentage of young farmers intending to abandon greatly changes across future prices scenarios. For Hungarian farmers we find that if future crop prices are to increase then young farmers are not very likely to abandon. So overall young farmers are very susceptible to market price changes in Hungary and Greece and their future actions depend greatly on what will happen to world prices. Although the biggest percentage of farmers declaring they will abandon occurs for the case of Greece, it is also the case that the biggest percentage of farmers who already know how they will use the single farm payment occurs in the sample for that country as well. Indeed, more than half of the farmers in Hungary do not know yet how they will use the SFP, while the equivalent percentages are a little bit over 40% for Holland and around 20% for Greece. However it is the case that most (in Holland) and all (in Hungary) farmers who will invest the SFP will invest it inside the farm, while this is not the case for Greece. Therefore, it could be the case that farmers in Greece feel greater uncertainty about the future and try to diversify their investments.

If we examine the factors that affect the probabilities to abandon, to increase acreage/livestock size and keeping the same mix for the three countries the following conclusions can be derived from the analysis. In the case of Hungary and Greece it is small farms that are more likely to abandon while in the case of Holland the opposite occurs. However for those farmers who intend to stay in business, the smaller ones are more likely to increase production than the bigger ones in Greece while the opposite holds for Hungary. When it comes to the effect of specialization then again we have different effects for Holland and the other two countries. Indeed, more specialized farms are more likely to abandon production in Greece and Hungary while in Holland they are less likely to abandon production. Moreover, once a farm decides to continue with farming, the more specialized it is, the less likely it is to increase production in the case of Greece and Hungary but the more likely it is to increase production in the case of Holland. Therefore policy implications differ for the two groups of countries. If the aim is to prevent farmers from abandoning farming then structural programmes should be devised that promote alternative cultivations and decrease the risk of monoculture in Greece and Hungary but the contrary holds for Holland.

Our results also indicate that the level of information is very important to reduce farmers' uncertainty about the future and that the more informed a farmer is, the more willing he will be to change his crop mix in the case of Holland and Greece. Therefore, policies that increase farmers' level of information could prove useful if farmers are to switch crops. On an

ending note we should emphasize that the evolution of crop prices in world markets could be after all the most important factor dictating farmers intentions in the light of the new policy regime.

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