

# Between markets and policy: farm household's reaction to decoupling

Gomez y Paloma S.<sup>1</sup>, Raggi M.<sup>2</sup> and Viaggi D.<sup>3</sup>

<sup>1</sup> Institute for Prospective Technological Studies, JCR, Seville, Spain

<sup>2</sup> University of Bologna, Department of Statistics, Bologna, Italy

<sup>3</sup> University of Bologna, Department of Agricultural Economics and Engineering, Bologna, Italy

**Abstract—** The main objective of this paper is to evaluate ex post the effects of 2003 decoupling, with a specific focus on farm investment behaviour. In the past years a number of studies have addressed the issue of the impact of EU policy reforms. However, long term effects of policy changes and related impacts on structural and investment behaviour received relatively little attention in modelling exercises concerning CAP reform up to now. This study is based on a survey about 250 farm households in Italy, Germany, Poland, Spain, Greece, The Netherlands, France and Hungary. In the majority of cases, farmers stated they were indifferent to decoupling. Where any change occurred, the impact of decoupling was highly differentiated. Differences in reaction are better explained by different individual household/farm characteristics, rather than by association with a specific agricultural system.

**Keywords—** Investment, Common Agricultural policy, public payments

## I. INTRODUCTION

Decoupling of direct payments from production, started in 2003, set a major step in the reform of the Common Agricultural Policy (CAP). In the past years a number of studies have addressed the issue of the impact of EU policy reforms. These studies concern different territorial levels and in many cases focus on the effects of reforms on the market of agricultural products. On the contrary, long term effects of policy changes and related impacts on structural and investment behaviour received relatively little attention in modelling exercises concerning CAP reform up to now.

The main objective of this paper is to evaluate the effects of 2003 decoupling, with a specific focus on farm investment behaviour.

The paper is based on a survey about 250 farm households in Italy, Germany, Poland, Spain, Greece, The Netherlands, France and Hungary. The survey

collected a wide range of information about household and farm characteristics, as well as ex post information about household reaction to decoupling.

The remainder of the paper is organised as follows. Section 2 briefly illustrates the background and literature. Section 3 illustrates the survey methodology and data treatment. Section 4 reports the main characteristics of the sample. Section 5 illustrates the results, while section 6 provides a discussion..

## II. BACKGROUND AND LITERATURE

The literature on farm investment behaviour includes a variety of contributions, focusing on the determinants of investment behaviour, the effects of policy on investment behaviour and the tools for analysing farm investment behaviour.

Contributions on this issue have been relatively less numerous than for other fields of agricultural economics research, despite its evident importance for the representation of farm behaviour. The analysis of investment at firm level became an important issue in the general economic literature during the 1950s and 1960s, and burgeoned in the agricultural economic literature during the 1990s. Early approaches, based on the neoclassical theory of the firm, were subsequently discussed and improved.

During the last two decades the literature focused on a number of investment-related topics such as asset fixity and adjustment costs, uncertainty and information, risk and other objectives, household characteristics, on-farm vs. off-farm investment, investment and labour allocation, investment and farm structure, investment and technical change, investment and contracts and investment and credit constraints [1], [2], [3], [4], [5], [6], [7]. Despite the variety of themes and approaches, the present understanding of farm investment behaviour is considered to be, to a large extent, unsatisfactory. The main research gaps

include the need for: a) more adequate instruments for ex-ante analysis; b) model adaptation to incorporate empirical information about farm preferences and expectations; c) closer attention to the connection between investment, technical change and learning; and d) a more empirically relevant treatment of the decision maker's (farm household's, firm's) objectives.

The amount of literature and the state of the art appear particularly unsatisfactory as far as policy analysis is concerned. Although a few recent studies tackled this issue, focusing to a large extent on decoupling, the analysis of policy impact on investment behaviour still appears to be a particularly challenging task. This may be attributed to the fact that policy scenarios interact with all other (numerous) determinants, particularly whole household/firm management, risk perception, asset liquidity and output prices.

### III. SURVEY METHOD

The methodology adopted in this study is based on a survey of about 250 farm households. Farms were selected in case study areas in Italy, Germany, Poland, Spain, Greece, The Netherlands, France and Hungary.

Data treatment is based on descriptive statistics and the analysis of correlation of the main policy effects with candidate explanatory variables.

The study covers the following combinations of areas, types of farming and farming systems defined ex-ante:

- plain continental regions, (ii) plain Mediterranean regions, (iii) hilly/mountainous continental regions, and (iv) hilly/mountainous Mediterranean regions;
- for each area, the types of farming are: (i) predominantly crop farming systems, (ii) predominantly livestock farming systems, and (iii) predominantly orchard/vineyard/forest (tree) farming systems;
- for each area and types of farming, both conventional and emerging farming systems are considered.

A questionnaire was designed to collect data about the farm and the household, their perspectives and

intended investment behaviour, their reaction to policy changes. The structure of the questionnaire included the following chapters: Location and contact details, Farm structure, Household structure and labour management, Farm activities and production, Farm organisation, constraints and connections, Policy and decoupling, Farm household assets and past investments/disinvestments, Vision of the future & expectations, Household status and objectives, Foreseen farm-household and farm developments, Activity-related details.

The section on policy and decoupling collected in particular straight information about the household's reaction to decoupling, in particular: Single farm payment received, Use of money from the Single farm payment, Other payments received (e.g. axis 1 RDP, etc.), Use of money from other payments received, What are or are expected to be the changes in the farm/household as a reaction to the introduction of the single farm payment.

The survey was carried out in the second half of 2006.

### IV. CASE STUDY AREAS

A summary of the case studies analysed in the study with the number of questionnaires is shown in Table 1.

Altogether, 248 farms were surveyed, distributed into 43 case studies. Of these, 33 were located in the three countries chosen as the main targets of the study (Italy, Germany and Poland). Of the 248 household case studies, 195 were conducted in Italy, Germany or Poland. Questionnaires were asymmetrically distributed among conventional and emerging farming systems, with a higher number for the former (166) compared to the latter (82). Sample composition in Italy, Germany and Poland was designed to cover all the production specialisations that were chosen ex-ante. However, for some of them, namely emerging mountain arable and trees in Poland as well as emerging plain trees in Germany, it was not possible to identify relevant examples (with the exception of very peculiar cases that were excluded).

The legal status of the farms was normally individual/family farms.

## V. RESULTS: USE OF CAP MONEY AND EFFECTS OF DECOUPLING

The households in the sample show a positive attitude with respect to investment. Out of 248 households, 33 (13%) state the intention to carry out a off-farm investment in the next five years. In more than half of households, such investments are expected to be building a new house or restructuring an existing one, in most cases for household use. About one-fifth of off-farm investments consists of a new car.

With respect to farming related investments, about 31% of farms state the intention to buy land. The amount of land that is predicted to be bought is only about 7% of the total land already owned and it is concentrated among a few farms. Land purchase intentions are to a large extent concentrated in Poland. The emerging profile is that of purchases aimed at complementary land acquisition, while rent remains the main expansion mechanism. Stated expected prices of land range from about 2700 euro/ha in Hungary to 40000 euro/ha in The Netherlands.

Out of 248 households, 90 (36%) state the intention to make an investment involving farm buildings, for a total of about 130 investments (roughly 0.5 per farm). In most cases these are cow houses and related parts of buildings (i.e. cow house restructuring and improvements, milking rooms, etc.).

A second group of investments, far less relevant, is machinery recovery and analogous items. About 50% of the farms reported intentions to invest in machinery, with about one piece of machinery per farm. Among machinery types, the most frequently cited were tractors (more than 30%). Other types of machinery were very varied, depending largely on the farm specialisation.

On-farm use of SFP is widespread, reaching in many circumstances 100% of the SFP received, while off-farm use is almost irrelevant, with a few small exceptions. Among on-farm uses, covering current expenditure is the main use of SFP money. Basically, use for investment mainly occurs for livestock. Otherwise, only crops in southern Europe show a relevant use for investment.

In spite of this clear-cut response, it should be noted that the question itself is problematic. There is no such thing as a specific destination for money. This was noted by many farmers and anticipated in constructing

the questionnaire. The SFP contributes to the overall revenue and the revenue is distributed across items of expenditure. However, as the money comes at some stage of the year and as a whole sum, it tends to be associated with some specific use depending on the financial conditions of the farm.

Anyway, the use of SFP does not provide direct information about “additional” effects solely due to the policy change. For this reason a further question about the impact of the introduction of the SFP (i.e. decoupling) has been asked. For the majority of respondents, the shift to SFP has had no relevant effects on farm choices (55% of the total). This occurs in particular for systems where the absolute values of the payments per farm are lower. This is consistent with the expectation that farmers are not sensitive to small changes in payments or to changes in the way small payments are related to production.

Among farmers reporting changes, most of the respondents (27%) reported an increase in on-farm investment. This behaviour was concentrated in livestock farms and, to some extent, in trees. It was more frequent on plains. However, a small cluster of farms (6%) also stated the opposite, by reporting disinvestment. This was more frequent among livestock farms in mountain areas.

About 8% reported a change in crop mix. This group mainly belongs to livestock and crop producers.

Minor changes (which are difficult to interpret) were reported in off-farm activities.

Table 1 illustrates the relationships between the use of SFP and selected variables, defined by a simple one-to-one correlation exercise between each explanatory variable and the dependent variable.

Use for current expenditure was correlated to employment of external labour only. On-farm investment was positively correlated to the SFP/revenue ratio and the share of rented land to the total farm area. Use for off-farm current production expenditure was correlated to farm heads labouring off-farm. Off-farm productive investment was positively correlated to SFP amount and the SFP/revenue ratio and negatively correlated to farm heads labouring on-farm. Off-farm non-productive consumption was only correlated to the SFP/revenue ratio, while non-farming and non-productive durable goods investments were negatively correlated to farm

heads labouring on-farm, and positively correlated the SFP/revenue ratio.

These results confirm the consistency of farm responses with most of the literature on investment, particularly: the joint choices of labour and investment directions, the interest of farms in joint residential and labour choices and the importance thresholds of the absolute and relative values of SFP as a prerequisite to any effect on farm choices.

The same kind of exercise is performed in Table 2, where ‘explained variables’ are those related to the stated effect of decoupling.

An increase in on-farm investments is positively associated with SFP amount, successor, and total land, while it is negatively correlated with production contracts, farm head age and part-time working. An increase in off-farm productive investment is negatively correlated with on-farm labour. Increase in off-farm productive investments is negatively correlated with household head labour on farm. These results are consistent with theory, and say that bigger farms, with younger farmers and a higher share of labour allocated to farming see in the decoupling an opportunity to expand through on-farm investment. The fact that an increase in off-farm non-productive investment is positively correlated with the successor is more difficult to explain, though it may be caused

by the fact that households with a successor are more willing to invest in non-farm assets on the farm (typically a new house). Decreases are more difficult to explain, also because the number of positive answers was far lower than to the previous question. Only off-farm non-productive investments are positively correlated to SFP amount and percentage of rent on total available land, which may identify a strategy based on exploitation of farming activity as a source of income to be used for consumption or rent seeking activities outside the farm. Changes in crop mix are positively correlated with total labour off-farm. No changes are positively correlated with production contracts, farm head age or total labour on-farm, but negatively correlated to the availability of a successor. This is consistent with the expectation that there will be no reaction by specialised fruit farmers (typically based on high amount of labour), by farms more strongly constrained by relationships with the other stages of the crop chain (contracts), and by oldest farmers without successor.

The results confirm that the SFP tends to contribute to and is consistent with the general strategy of the farm, i.e. increasing investment in farms that already have a positive attitude to investment and enlargement.

Table 1 – Correlation between the use of SFP and selected explanatory variables\*

Variable	On farm current expenditure	On farm investment	Off farm productive current expenditure	Off farm productive investment	Off farm non-productive intermediate consumption	Off farm non-productive durable
SFP amount in 2005				+		
Total external labour purchased	+					
Household head labour on farm				-		-
SFP/revenue		+		+	+	+
Household head labour off farm			+			
Number of production contracts						
Successor						
Age of farm head						
Number of partial workers						
Land rented in % of total farm area		+				
Household labour off farm						
Household labour on farm						
Total land						

\* + = positive significant correlation; - = negative significant correlation; no sign = no significant correlation; significance at 5%.

Table 2 – Relationship between the stated effect of decoupling and selected explanatory variables

Variable	Increase investment			Decrease investment			Changes in crop mix	Changes in other activities	None
	On farm	Off farm productive	Off farm non-productive	On farm	Off farm productive	Off farm non-productive			
SFP amount in 2005	+						+		
Total external labour purchased									
Household head labour on farm SFP/revenue		-							
Household head labour off farm									
Number of production contracts	-								+
Succesor	+		+						-
Age of farm head	-								+
Number of partial workers	-								
Land rented in % of total farm area							+	+	
Household labour off farm							+		
Household labour on farm								-	+
Total land	+								

\* + = positive significant correlation; - = negative significant correlation; no sign = no significant correlation; significance at 5%.

## VI. DISCUSSION

The result of this work emphasise the complexity of policy effects on investment. In the majority of cases, farmers stated they were indifferent to decoupling. Where any change occurred, the impact of decoupling was highly differentiated. Differences in reaction are better explained by different individual household/farm characteristics, rather than by association with a specific agricultural system. In the more efficient and expansion-oriented farms, decoupling is perceived as an opportunity for investment, while in small, poorer performing farms the introduction of the Single Farm Payment (SFP) is viewed rather as an opportunity for extensification. The results also confirms the role of household-related characteristics in reacting to policy and, in particular, in affecting investment.

These results are consistent with the rationale behind SFP, i.e. to leave economic activities to be driven by market forces. However they also emphasise the need, in the new policy setting, to pay an increased attention to the specific interaction between socio-economic factors and economic activities.

## REFERENCES

1. Thijssen G. (1996) Empirical Assessment of Two Specifications of Expectations, *American Journal of Agricultural Economics* 78: 166-174.

2. Andersson H., Ramaswami B., Moss C.B. et al. (2005) Off-farm Income and Risky Investments: what Happens to Farm and non Farm, 2005 AAEA annual meeting Providence, RI July 24-27, 2005.
3. Gardebroek C. and Oude Lansink A.G.J.M. (2004) Farm-specific Adjustment Costs in Dutch Pig Farming, *Journal of Agricultural Economics* 55 (1): 3-24.
4. Elhorst J.P. (1993) The estimation of investment equations at the farm level, *European review of agricultural economics* 20: 167-182.
5. Ahituv A. and Kimhi A. (2002) Off-farm work and capital accumulation decisions of farmers over the life-cycle: the role of heterogeneity and state dependence, *Journal of Development Economics* 68: 329– 353.
6. Gardebroek C. (2004) Capital adjustment patterns on Dutch pig farms, *European Review of Agricultural Economics*, 31(1): 39-59.
7. Serra T., Goodwin B K., and Featherstone A.M. (2004) Determinants of investments in non-farm assets by farm households, *Annual Meeting of the American Agricultural Economics Association*, Denver, Colorado, July 1-4, 2004.

address of the corresponding author:

- Author: Sergio Gomez y Paloma
- Institute: Institute for Prospective Technological Studies
- Street: Edificio Expo. c/ Inca Garcilaso, s/n. E-41092
- City: Seville
- Country: Spain
- Email: Sergio.GOMEZ-Y-PALOMA@ec.europa.eu