



## Comparative Analysis of Factor Markets for Agriculture across the Member States

245123-FP7-KBBE-2009-3



WORKING PAPER

**No. 65, August 2013**

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**Edited version to be published soon**



# The Impact of the SFP System on Italian Farmland Prices and Tenure Contracts

## ABSTRACT

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FACTOR MARKETS Working Papers present work being conducted within the FACTOR MARKETS research project, which analyses and compares the functioning of factor markets for agriculture in the member states, candidate countries and the EU as a whole, with a view to stimulating reactions from other experts in the field. See the back cover for more information on the project. Unless otherwise indicated, the views expressed are attributable only to the authors in a personal capacity and not to any institution with which they are associated.

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ISBN 978-94-6138-354-9

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# The Impact of the SFP System on Italian Farmland Prices and Tenure Contracts

**Davide Viaggi, Fabio Bartolini, Marco Puddu,  
Francesca Minarelli and Meri Raggi\***

**Factor Markets Working Paper No. 64/August 2013**

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## **1. Introduction and objectives**

The connection between policy and other context variables and land markets is at the core of the policy debate, including the present reform of the Common Agricultural Policy. Factor markets are a central issue in analyses of farm development and of agricultural sector vitality. Among the different production factors, land is one of the most studied. The land market is an imperfect market, because of its low substitutability, poor transparency and high transaction costs. It is characterised by a low number of transactions and a local dimension, and is also influenced by economic, policy and institutional frameworks. In particular, the agricultural economics literature has highlighted the effects of the Common Agricultural Policy (CAP) on factor markets (Floyd, 1965; Parsch et al., 1998; Latruffe and Le Mouel, 2006; Ciaian and Swinnen, 2006; Bartolini et al., 2011) and specifically studied the way in which the CAP reforms have changed these effects over time.

The aim of this paper is to contribute to the estimation of the potential effects of the CAP reform on propensity to transaction, particularly comparing the effect of different new instruments/policy settings with the current policy (CAP health check) used as a baseline. The work is focused on three of new policy instruments within the post 2013 CAP reform proposal: regionalization, greening and capping. The first and second are analysed in more detail.

The analysis will be based on a survey of farmers in the Province of Bologna, Emilia Romagna, Italy. The questionnaire focuses on mechanism of access to land and related incentives towards different land use/economic behaviour. The survey includes information about respondent characteristics (farm, farmer, household and payments received) and stated intention about potential changes in land operated under alternative agricultural policy scenarios (particularly the post-2013 reform proposals)

The paper is organized as follows. In section 2 we look at the background literature, in section 3 we describe the main features of the new direct payment introduced by 2013 CAP reform proposal. In section 4 we illustrate the case study area, in the section 5 we introduce the survey and the methodology. In section 6 we illustrate the results. A discussion is provided in section 7, followed by conclusions in section 8.

## **2. Background and literature**

Factor markets are a central issue in farm development analyses and for agricultural sector vitality. Among the different production factors, land is one of the most studied. Land market is an imperfect market, due to the low substitutability, poor transparency and high

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transactions costs. The land market is characterized by a low number of transactions and a local dimension and is, also, influenced by the economic, policy and institutional framework. In particular, agricultural economic literature has highlighted the effects of the CAP on factor markets (Floyd, 1965; Parsch et al. 1998; Latruffe et al., 2006; Ciaian et al. 2006; Bartolini et al., 2011). Such literature has studied the way in which the CAP reforms have implication on changes of productive factors price and quantity over time. In this section, we briefly analyze the literature on farmland price or rental price, and their determinants, as a background to the core issue of this paper.

Floyd (1965) analyzes the policy direct effect on land demand and the impact of agricultural price supports on factor returns and on distribution of income. Other papers show a close relationship between the policy effects on the supply of production factors and their elasticity, as well as with other factor substitution possibilities (Parsch et al. 1998; Goodwin et al. 2005; Latruffe et al., 2006). Several works have the aim to estimate policy payments effects in terms of their capitalization into land value or land rental prices, and to calculate a share of capitalization depending on type of policy support (Ciaian et al. 2006; Dziemianowicz et al. 2008; Courleux, 2008; Latruffe et al. 2009). These studies agree that payments and other types of policy support are significant in explaining land prices and account for a large share of it. A share around 15-30% is estimated, although it could be up to 70% depending on specific regions and time periods (Latruffe et al., 2006).

The literature also underlines the effect of policy change on the reallocation of productive factors over time (Bartolini et al., 2011). Several papers analyze the decoupling effects introduced in 2003 by the Fischler reform, on the dynamics of exchange of land. These works identify the determinants of capitalisation of payments into land prices. The main policy design variables include the distribution of payments among beneficiaries, the possibility of exchange of entitlements and the ratio between eligible area and number of entitlements own (Le Mouel, 2004; Kilian et al., 2008; Courleux et al., 2008; Zier et al., 2010; Viaggi et al., 2010).

Both ex-ante and ex-post analysis are available in the literature. Ex-ante approaches are found in the evaluation of policy effects as a result of different scenario. Ex-post approaches are developed through the evaluation of policy effects after the policy is implemented and are based on analysis of surveys information or secondary data.

Studies focusing on the effect of different policy scenarios on the changes of the land demand or land rented/sold are often derived or are expressed by changes in the marginal value of land.

Mathematical programming models have been used to simulate the impact of policy reforms also considering changes in farm size under different price, policy, and cost scenarios (see Zimmerman et al., 2009 for a review of relevant models applied to structural change). This typology of models have also an important use to analyze competition for land allocation between different farms, measuring the effects of drivers of changes through the marginal value of land (Galko et al. 2011). Gocht et al., (2013) found that introduction of flat-rate payments (such as regionalised payments) determines a reduction of land use about 0.6% in EU-15. Authors observed also a decrease of rental prices in the old MS and small changes in the new MS due to the introduction of a more harmonised SPS scheme.

Some studies aim to investigate farmers' investment behaviour (including land), and evaluate the impact of different CAP scenarios, with special focus on the Single Payment Scheme, in order to contributing to the understanding of the relation between policy objectives and farmers' behaviour (Gallerani et al., 2008; Viaggi et al., 2011a).

Several papers also show econometric models to address the effects of changes in policy mechanisms or property rights system on the amount of land markets transactions (Parsch et al. 1998; Latruffe et al. 2006; Gallerani et al. 2007; Ciaian et al. 2008; Jin et al. 2011). In other cases the analysis rests on stated intentions (Bougherara and Latruffe, 2010; Bartolini and Viaggi, 2013).

A subject of a large branch of recent literature is the analysis of policy effects in Central and Eastern European Countries (CEECs). In those countries a major land reform process occurred during the post-communist period and the procedure for accession to the European Union. Transaction cost in land exchange and imperfection of the land markets, such as imperfect competition, can be very significant in CEECs and the combination of imperfect competition and transaction costs has a strong impact on land prices (Swinnen, 1999; Ciaian et al., 2007).

### **3. The direct payment in the post 2013 CAP reform**

The CAP follows a development characterized by an evolution from agricultural price support, to area payments, and to the present decoupled payments. The latest scheme, introduced with the 2003 reform, and active since 2005, is called Single Farm Payment (SFP). Farmers receiving the SFP have the flexibility to grow any crop on their eligible area except fruit, vegetables and table potatoes. In addition, they are obliged to keep their land in good agricultural and environmental condition (cross-compliance). The decoupling of payments, over the years has been extended to almost all agricultural sectors. The Health Check of the CAP (2008) has added a number of measures to assist the farmers in better responding to changes on the market as the introduction of the possibility of Member State to elaborate a national strategy on sustainable operative programs on fruit and vegetable market. Several measures were abolished, such as arable set-aside, others were developed, like milk quotas, that gradually go towards their abolition in 2015, and modulation, with the reduction of direct payments to farmers in order to transfer resources to the Rural Development share of the CAP. Today the CAP is in front of a new reform process; in fact, in October 2011 the official proposal of post-2013 reforms has been published (COM(2011)625/3). In Italy, this will include the switch of the payment regime from an historical to a regional basis. The new payment will then lose the connection with per hectare payment in reference three-year period (2000-2002) and the entitlements owned by farmers. In addition, farmers can obtain payments on all of their operated land area. In the coming paragraphs the main elements of the proposal will be described.

#### **3.1 General provisions**

The proposed payment mechanism will be based on disentangling of the single farm payment into four different components: basic payments; greening component; payments to the less favoured areas and payments to young and small farms. The first two components are expected to be the most relevant because they cover almost the total of the payment that the farmers can receive. In fact, the basic payments can arrive at a maximum of 70% of the amount of payment assigned to the farm (regional ceiling divided by the number of entitlements fixed at regional level). The basic payments will be assigned only to active farmers. An active farmer is a farmer who has an annual amount of direct payments greater than 5% of the total receipts they obtained from non-agricultural activities in the most recent fiscal year and that carry out on his land the minimum activity established by member states in accordance with the definition of “agricultural activity”. These limitations do not apply to farmers that receive less than 5,000 euro of direct payment. The Member State shall decide not to grant direct payments to a farmer if the total amount of direct payments claimed or due to be granted in a given calendar year is less than 100 euro or if the eligible area of the farm is less than one hectare.

Member states can assign a small part of regional payments ceiling (respectively 2% and 10%) to young and small farms. Member states may grant a payments to farmers entitled to a compensation under a basic payment scheme whose holdings are fully or partly situated in less favoured areas. The reform, also, introduces the “capping”, that is a reduction of the amount of payments for farmers that receive more than 150,000 euro of direct payments.



### **3.2 From historical to regionalized payments**

The regulation proposals include the provisions to switch the direct payment regime from historical to regional or national bases in the countries in which the historical payment is still in place (COM(2011)625/3, Art.18-20). Member State shall divide the national ceiling between the regions and they may decide, to apply the basic payment scheme at national or regional level. In Italy the most likely strategy is to adopt the direct payments at regional level. In this case Member State shall define the regions in accordance with objective and non-discriminatory criteria such as their agronomic and economic characteristics and their regional agricultural potential, or their institutional or administrative structure. The regionalized payment is an homogenous payment per hectare for farms in the same region and will be distributed on the basis of the farm area on which some agricultural activity is carried out. This measure is prompted by the desire to have a more uniform distribution of payments per hectare across EU farms.

### **3.3 The greening component**

The greening component is assigned to farmers entitled to a payment under the basic payment scheme and that comply, on their eligible hectares, with some ecological prescriptions (COM(2011)625/3, Art.29-32). These are a) to have at least three different crops on their arable land where the arable land of the farm covers more than three hectares; b) to maintain existing permanent grassland on their holding; c) to have ecological focused areas (7% of the total farm area) on their agricultural area, such as land left fallow, terraces, landscape features, buffer strips and woodlands.

A different regime of payments is applied to organic farmers. The proposal allows to organic farmers to receive without additional commitments the greening payment. Budget allocated for pay greening payments are obtained by the 30% of the national ceiling. Application of greening payments and relations between provision of environmental good in both first and second CAP pillar are central in the on-going scientific debates (see for example Matthews 2012; 2013).

## **4. The case study area: agriculture and agricultural policy in the Province of Bologna**

According to the 6th Agricultural Census developed by ISTAT in 2010, the Bologna Province owns 10.790 farms covering 173.224,46 ha of UAA which represents 46% of the total province extension (370.000 ha). Such value compared to the UAA registered in 2000 decreased of 7,3%, with much higher figures in mountain an hill area.

It is registered that out of 10.790 farms, 47% of farms have a land class ranged between 2 and 10 ha, corresponding to 11% of the UAA, 24% between 10 and 30 ha corresponding to 23% of the UAA, 16% with less than 2 ha covering 0,5% of the UAA and 11% have more than 30 ha covering the 64% of the UAA. However comparing data with 2000 census it can be observed an increase of farms with larger than 30 ha and a decrease of all other land classes. The comparison of the two Censuses, highlights a land consolidation process in the Province, more than in other parts of the Region. The average farm size observed in 2010 is 16.05 ha, which shows an increase of 5 ha compared to previous census. Such increase is the higher than the average value observed in the regions (3.84 ha). The average farm size increase is mainly consequence of higher amount of farmers who exist the agricultural sector in the province (35% of farmers) and a lower reduction of UAA compared to other area of the region.

Ninety-one percent of the farms are owner-run and only 8% are run with employees. Eighty-one percent of the UAA is covered by arable crops of which 53% is specialized in cereal and 27% in forage crops. The remaining surface is covered by orchards and pasture. Nine percent of arable land, corresponding to around 6.000 ha, are located in the mountain, 26%

corresponding approximately to 32,000 ha in the hill and 64% corresponding to 102,700 ha are located in the plain.

Commonly, at each altimetry the most extended land use is represented by arable crops, however in the mountain area there is a higher heterogeneity since 52% is covered by arable and 43% pasture. Such diversity is quite maintained also in the hill with 70% of arable lands, 15% pasture and 13% of orchards. Crops different from arable gradually disappear in the plain where 88% of land is covered by arable crops. The irrigated land corresponds to 24.000 ha approximately the 14% of the UAA of which 15.000 ha is arable and 8.000 ha orchards.

Because of its heterogeneous territory the Bologna province is representative of several characteristics of regional agro-food chain systems such as the fresh fruit chain located in the area of Imola (South-Eastern part of the Province ) and the Parmigiano Reggiano cheese, located in the area at the left side of Reno river (Western part of the Province). The fresh fruit-chain is mostly outlined by crops such as peach trees, apricot trees and kiwi with the existence of important fruit processing centres and storages. In the plain of Bologna the potato represents an important crop whose production is concentrated mostly in some corresponding Protected Designation of Origin (PDO) area. Among fresh horticultural crops the most cultivated are represented by onion, asparagus followed by lettuce and squash grown in the peri-urban area. Cereal production is the cultivation type that has most characterized the rural area of Bologna Province, determining the settlement and the expansion of several storage centres and important seed factories. Regarding livestock production, the most important activity is related to the existence of large medium size processing factories of milk products. Part of them processing fresh milk products are located in the plain and hill area at the right side of the Reno River the other factories located in the left side are targeted for the Parmigiano Reggiano cheese production.

Sugar beet represented for many years the most important industrial crop characterizing the Bologna plain area. Lately a decrease of -64% of UAA has been registered after the 2006 Reform of the sugar CMO. Remarkable is the increasing of olive oil production that prompted the plantation of olive trees in several hill areas surrounding the town of Imola.

Vineyards represent another important agricultural activity within the Bologna province in association with a multitude of transformation factories. Mostly located in the hill surrounding the town of Bologna and Imola, the main products are one DPOG wine which is the Albana di Romagna and seven DPO types of wines.

According to data registered in 2010, labour market in agriculture is generally characterized by a decreasing of the occupational level. The larger part of employed workforce occupies females, while the male gender is mostly self-employed. It is still increasing the use of immigrants for farm handworks.

Difficulties reported in the economy at national and international level move the investments toward rural lands maintaining a robust land market. In particular, it is registered a high concentration of the demand for medium large farm size. However, the number of transactions is limited, influencing the land prices. Land values between 2002 and 2011 reported a rate of increase of 3,9% for arable 2,6% for tree crops and 2,8% vineyards. It can be stated that the increasing value of rural land confirms the robustness of the land market compared to other market factors. In addition, 2011 showed an increasing demand of marginal lands for the application of agro-environmental measures. However, the Agricultural Land Value between 2010 and 2012 registered just a slight increase in the Bologna Province of 2.2 % for orchard and wine yard in the hill. An increasing of the land rent demand has been highlighted between 2000 and 2010 so almost the 42% of UAA in Emilia Romagna Region is now rented.

The overall amount of funding for the support and the development of Regional Agriculture in Emilia Romagna between 2007 and 2012 is estimated as 3.388 million of Euros. Of this amount 1.678 million of Euros were addressed for the “first” pillar. The average amount of direct payment is estimated around the 350 Euros per hectare.

Regarding the Bologna Province, between 2007- 2012, approximately 260 million of Euros is the estimated amount paid to the beneficiaries.

Focusing on 2012, European National and Regional aids to support the development of regional agriculture were registered around 550 million Euros. The amount reported a reduction if compared to the previous three years 2011, 2010 and 2009 where respectively 559, 672 and 710 million Euros were invested. The "first" pillar is confirmed once again as the main financed program for the Regional agriculture. The year 2012 marked a slight increase in the number of companies that benefited of the single payment. The total amount of payments involved 54.860 beneficiaries, with an increase of +2.7% from the previous year. In term of direct payment amount, beneficiaries are allocated in Emilia Romagna Region as follows: 11 million Euros in the hill, 55 million of Euros in the mountain and 241 million of Euros in the plain.

In 2012, the Ferrara province was the province that obtained the greatest amount of direct payment. However, the Bologna Province, as in previous years, was characterized by the largest number of beneficiaries, with 7,676 applications accepted representing the 15% of the total applications within the Emilia Romagna Region.

## **5. Survey and methodology**

### **5.1 Survey design and descriptive statistics**

The empirical data used comes from an ad hoc survey conducted in the early summer 2012 on a random sample of 350 farm household out of 7379 beneficiaries of CAP payments located in Bologna province. The sample has been proportionally stratified by altimetry of location (mountain, hill, Bologna hill, plain) and by the amount of CAP payments received in 2011 (below and above the mean). The questionnaire has been realized through a telephone interview which was focused on farmers' intentions about land size expansion/reduction conditional on the introduction of some specific measures of the post 2013-CAP reform proposal. More specifically, they were asked to state intentions about rent-in/out more/less land and buy/sell more/less land assuming the introduction of the regionalized payments, the greening and the capping measures respect to what they would have done in baseline scenario (current CAP system). Also information about location in disadvantaged areas has been collected.

The questionnaire (full questionnaire available as annex 3 of this report) has been divided in different sections: first, information about farm characteristics and marketing strategies have been asked; afterwards CAP payments and generic planned future activities were requested. Then questions concerning expansion/reduction intentions under current CAP and under post 2013-CAP proposal have been asked, and finally personal and household characteristics were collected.

The farm characteristics are related to farm size, location, legal form, main farm specialization, typology of crops and animals breeding, intensity of livestock production, surface at agro-environmental or ecological measure, hectares involved in photovoltaic or biogas systems. In the same section it has been asked information on changes of amount of land operated and in land tenure compared to previous years (since 2002), and on the presence of relatives between owners or tenants of the farm. Labour characteristic are referred to number of household members working full-time or part-time in the farm and the number of external workers full and part-time working in the farm. Marketing strategies are investigated through questions about sales channel through which the farms sell the products derived from the main farm specialization, about presence of sales contracts, internet use to buy inputs or sell output of farm production. Regarding CAP payments, information on amount of payments, number of entitlements owned and the amount of other payments received in 2011, was collected. Moreover, it was asked to quantify how the farm income is affected by those payments. In the category of generic planned intentions, information was asked concerning the strategy about adoption of new technology and intention to stay in



agricultural activity in the next five years. Also the percentage of total gross family income coming from farming was investigated in this section. The expansion/reduction intentions under current CAP, assuming it remains the same up to 2020 has been collected for the land in property, rented out and rented in and for each of those the interviewed could choose between the follows categories: increase, no change, decrease. Those above mentioned stated intentions have been asked assuming policy, price and market conditions of years 2011 and assuming them to be constant up to 2020. Altogether, those set of conditions is identified as the baseline scenario. Policy effects on land operated and on the land tenure are collected submitting to the interviewee hypotheses of changes in the policy scenario. In particular, stated intentions are asked assuming the introduction of new policy instruments included within the post-2013 CAP reform proposal. Stated intentions about rent-in/out more/less land and buy/sell more/less land assuming the introduction of the regionalized payments, the greening and the capping measures with respect to what they would have done under the baseline scenario, were asked. Household information is collected through questions concerning gender of family components, number of minors, of over 65 years old and number of unemployed. Personal characteristics have been asked related to farmer's age and education level, the latter divided in 8 categories ranging from no title or primary school to PHD.

*Table 1. Summary of questions contained in the questionnaire*

OUTLINE QUESTIONNAIRE	
<i>Subdivisions sectors</i>	<i>Specific questions</i>
1 Farm characteristics	Localization farm and farmland Corporate form Specialization Crops and livestock composition Total agricultural area Fragmentation of farmland Land rent-in/rent-out Changing in farmland dimension since 2002 Areas used for agro-environmental measures Solar energy and biogas production Subcontracting activity
2 Labour characteristics	Internal full-time/part-time External full-time/part-time
3 Market strategy	Sales channels/contracts Internet use (buy inputs/sell products)
4 Cap payments	SFP received in 2011 Number of titles Others payments received in 2011 SFP change since 2005 Ratio payments/Household income
5 Generic intentions	Adoption of innovations or new technologies (next 5 years) Exit from the market (next 5 years)
6 Expansion/reduction intentions under current CAP	Buy/sell and rent-in/rent-out under current CAP
7 Cap reform knowledge	CAP reform proposal knowledge
8 Expansion/reduction intentions under post-2013 CAP proposal	Buy/sell rent-in/rent-out under CAP reform (specific proposals about direct payments: Regionalization, greening and capping application)
9 Personal and household characteristics	Sex, age, education Number of female, male, young , over 65, unemployed

The sample is composed by 63% of farms located in the plain area, 16% in hill, 10% in Bologna hill and the last 10% in the mountains, reflecting the composition of the population, as expected from the stratification strategy. The location is referred to the legal head office of the farm but many farmers with the latter located in the hill actually have part of the land in plain. This is relevant especially in the hill of Bologna where there is the 6% of farms with

part of the land in plain area. The greater part of surveyed farms are specialised in cereals (47% of the sample), 27% are specialised in mixed crops, 14% in livestock (which includes the categories livestock, mixed livestock/arable, milk/meat cattle farms), and 8% are fruits farms. Moreover, the main specialisations differ across altitudes: cereals, in plains and hills of Bologna and mixed crops in the mountains and hills. The legal form of the majority of farms is individual firm (82%), while the rest are prevalently run as companies (14%). The 18% of the whole sample declares the presence of relatives between farm's owners. It is important to underline that within the sample there is an outlier that was excluded from the analysis; in fact, the sample used for the model consists of 349 instead of the 350 respondents sampled. It is a cooperative farm with dimensions of 1870 hectares, mainly cultivated with cereals and bioenergy crops, clearly outside the standard of the area. In fact, the average farm dimension of the whole sample, excluded the outlier, is about 25 hectares. Same differences are evident if we average firm size by altimetry, with a range that goes from 21 hectares for mountain to 34 hectares in case of hill region. It is worthy to note, that average farm size of the sample is larger than the average farm size in the province as highlighted by Census 2010. This could be explained by selection of farm from the universe of SFP beneficiaries to which very small farmers and farm without land are excluded.

Rental market shows low amount of transactions: only 5% of the farms rented-out land to other farms with an average dimension of plots rented out of 11 hectares. On the contrary, quite high number of farms rented-in land. They are about 34% and the average land rented-in is 19 hectares per farm. The 26% of the whole sample claimed to have changed the size of the farm since 2002. The majority of those farmers have stated an enlarged the land operated, through increasing land owned (10% of the surveyed farmers) or through increasing rented-in land (9.5% of the survey sample). While, at the contrary, the 8% of farmers stated to have sold a portion of farmland and the 5% have reduced land rented-in. About the land rented-out we don't have enough answers to take this into account. It is also important to underline that for all those questions relating changes since 2002 in farmland size the number of respondents was very low, less than a quarter of the sample. The 5% of whole area under investigation is invested to agro-environmental measures. The presence of areas used for energy production by biogas or photovoltaic was investigated and the answers reveal an almost null presence of photovoltaic installed on the ground and only one farm involved in the production of biogas with 200 hectares planted with energy crops.

The 7% of the sample carries out activities of subcontracting. About labour characteristics, the 90% of farmers have household members working full time on farm, of which the 60% have only one worker and the 30% have two, while the 18% of the sample have family members working part time on farm, of which the 80% have just one worker. As regards the external labour used on farm only 5% of farmer has full time outer workers and the 9% has part time.

The majority of farmers sell the main part of products through cooperative (63%) or to wholesaler or retailer (32%), and 19% directly to consumers. More than 30% of the sample have contracts for the sale of agricultural products and the 7% of the farmer use internet to buy inputs and the 3% to sell it.

Very heterogeneous answers were collected on SFP payments by altitude. In fact, in the mountain area the average SFP per farm (received during year 2011) is about 1,500 euros, in the hill of Bologna is approximately 12,500 euros, in the hill about 3,050 euros and in plain about 6,950 euros per farm. Information about the amount of entitlements is largely missing (only 43 out of 349 interviewed farmers reported this information). In the large majority of cases in which it is available, the farm UAA (largely) exceeds the number of entitlements. Only 2 cases report a number of entitlements higher than the UAA and 5 report a number of entitlements equal to that of the UAA. We ask also about the trend of payments received since 2005 and the 30% of the sample stated a decrease and the 10% an increase of payments. It's important to note that the 10 % of the sample receive others typology of payments which have a range between 200 and 150,000 euro with an average of about 15,500 euro per farm. This typology of payments is given for the implementation of specific

agro-environmental measures, for organic production or for the cultivation of specific crops. More than 50% of the sample stated that, in percentage terms, the influence of the single payments on farm revenue is less than 30%, while the 10% stated that it is between 30 and 50%.

About intentions to adopt selected innovations or new technologies in the next 5 years, a new irrigation systems or system for the production of energy are stated by about 5-6% of the sample, while the adoption of energy crops or the robotizing and precision agriculture by only the 2-3% of farmers.

The stated intentions regarding changes in farmland owned or rented in response to CAP change, were collected only for those who stated intention to do not exit from farming activity in the next 5 years (about 85% of the whole sample). Also information related motivations (cause) of leaving the sector and future intentions regarding own land use were collected. The main motivation because some farmers leave the activity is the absence of successors within the family (45% of farmers leaving the sector), others think that the activity is not enough profitable (20%) and the 25% have other unspecified reason. The 20% of those farmers who are intentioned to leave the agricultural sector, stated intention to sell the property, while 20% would like to maintain the property and give the land for rent, and the remaining 50% do not know what to do.

The percentage of the total gross income of the family coming from farming is less than 10% for the 22% of the sample, between 10 and 29% for 14% of farmer, more than 90% for 18% of the sample, and the 6% of farmer have a activity in loss. The 76% of the sample declare to live at the farm with the family, the 9% to live alone at the farm, and the 13% stated that neither the farmer nor the family are living at the farm. The average age of the Italian farmers is very high compared to other countries and in our survey the mean age is 63 years old. About education level, the 40% of the sample have no education or primary school; the 23% have middle school education level, 20% high school level, 6% professional qualification, and the 8% have a master degree. The 16% of the sample have at least one minors living in family, and the 53% of households have in at least one over 65 years old. The 5% of the sample have at least one unemployed in the family.

## 5.2 Methodology

The data collected through the questionnaire are treated in two steps. In the first step we analyse the answers to questions about the land market through descriptive statistics mainly based on frequency distribution of answers.

In a second step we analyse stated intention about land operated and land tenure through rental contracts under alternative policy scenarios using a classification tree approach. This approach has been recently applied to identify determinants of farm choice in case of small samples or limited number of answers. Form examples, Viaggi et al. (2011b) use this approach to understand determinants of farm-households behaviour.

The classification tree analysis is based on CHAID (Chi-squared Automatic Interaction Detector) method proposed by Kass (1980). This analysis allows for the identification of those characteristics that are keys to explaining the variation in response to the target variable. It represents a valid and simple non-parametric method to investigate the dependency of a response variable on several explanatory variables. The measure employed for the evaluation of such a dependency is the chi square index. The purpose of the procedure is to divide the population of interest into sub-groups based on the best predictor of the dependent variable.

In order to determine the best split at any step, the procedure considers any allowable pair of categories of the predictor variable and checks if there is any statistically significant difference within the pair with respect to the target variable. A chi square test is employed and is computed for each contingency table derived from the intersection of the target variable with every single response variable. The first split falls on the variable that presents

the higher computed chi square test and the lowest p-value (i.e. the stronger association between them). Once the first level of the tree is completed, the procedure starts again by attempting to split each of these groups into smaller sub-groups, considering all the available variables. This splitting process continues until no more statistically significant predictors can be found.

One of the advantages of the CHAID analysis is that it can visualize the relationship between the target (dependent) variable and the related factors with an easy-to-interpret tree diagram, with the most significant relationships between variables used to control the structure of the tree. The sub-groups in the tree diagram are mutually exclusive and exhaustive, which means that they do not overlap and every observation of the sample is contained in exactly one sub-group.

In our case, the choice is mainly driven by the small number of farms showing any reaction to the post-2013 reform scenarios (see descriptive results below), which makes it difficult to use most common econometric methods. Compared to the common parametric analyses, this methodology tends to be more suitable for small samples with a great variability of features that characterise the behaviour related to the dependent variable. In this case a parametric model (for example a logistic regression model) could fail to discover significant relationships and identify the explanatory variables. Secondly, the reactions to be explained concern only a minority of observations (the majority of answers are zeros) and the high frequency of zeros is a crucial problem in logistic analysis (Greene, 2008). Thirdly, the decisions to be explained are potentially marginal (regionalisation and greening are actually expected to have minor effects in many farms, and anyway such effects are not very clear at the time of the survey) and contingent upon a number of non-controlled variables (for example, specific land features at the farm level or distances of the land to urban centre). Finally, the determinants are very heterogeneous (dummy, categorical, quantitative with different unit measures) and can be expected to affect reactions to post-2013 CAP reform following very different functional forms/rules. CHAID responds to these characteristics as it tends to be more flexible than traditional statistical methods, in which more stringent underlying assumptions often need to be met.

Annex 1 presents descriptive statistics of farm survey, while annex 2 presents definitions and descriptive statistics of the variables used in the CHAID analysis.

## 6. Results

### 6.1 Descriptive analysis of intentions about land ownership and rents

The following part of the survey collects information about stated intention in operated land in next years. It is worthy to note that, only 24 % of the sample knows details of post-2013 CAP reform. Firstly questions about stated intention in the coming years are asked assuming current CAP maintenance (baseline) until 2020. The results of this section, under current CAP scenario, are summarized in the following tables 2, 3 and 4.

*Table 2. Stated intentions regard the land in property under the current CAP scenario*

<b>Intentions</b>	<b>Farmers (#)</b>	<b>Percentage</b>
<b>Increase</b>	25	9.03
<b>No change</b>	213	76.9
<b>Decrease</b>	17	6.14
<b>Does not know</b>	22	7.94
<b>Total</b>	277	100

As we can see in table 2, the farmers stating intention to not change the amount of land in property are more than 75% of the sample, while 9% say they would increase and the 6% state they would decrease the land in ownership.

*Table 3. Stated intentions regard the land rent-out under the current CAP scenario*

<b>Intentions</b>	<b>Farmers (#)</b>	<b>Percentage</b>
<b>Increase</b>	1	6.67
<b>No change</b>	9	60
<b>Decrease</b>	2	13.33
<b>Does not know</b>	3	20
<b>Total</b>	15	100

As we can see in the table 3 the farmers stating intentions to not change the amount of land rented out is the 60% of the sample, more than 6% say they would increase and more than 13% state they would decrease the land rented-out.

*Table 4. Stated intentions regard the land rent-in under the current CAP scenario*

<b>Intentions</b>	<b>Farmers (#)</b>	<b>Percentage</b>
<b>Increase</b>	20	18.35
<b>No change</b>	56	51.38
<b>Decrease</b>	21	19.27
<b>Does not know</b>	12	11.01
<b>Total</b>	109	100

Table 4 shows that the majority of the sample would not change the amount of land rented in (51%) but the percentage of increase (18%) and decrease (19%) is bigger than the previous typology of land exchange. It is evident from the results showed in these tables that the adjustments of farmland size, particularly in the short period, occur mainly through the rental market. The latter allows the farmers to respond relatively quickly to change in policy or in the market.

Then these questions were repeated assuming introduction of the new policy mechanisms included into the proposal of post-2013 CAP reform (regionalised, greening and capping). It is worthy to note that in this case the question asked for expected changes with respect to stated behaviour under current CAP scenario, i.e. forcing the respondent to consider only the difference with the baseline. Table 5 shows changes with respect stated intention about land operated assuming introduction of these new policy instruments. In next tables the option of expansion/reduction in terms of rent was built through the sum of two answers to two different questions. As regards the expansion in terms of rent, it results to be a sum of the positive answer to the question about intentions to rent-in more land and that one about intentions to rent-out less land. While the reduction in rent is obtained by the sum of positive answer to questions about intentions to rent-in less land and to rent-out more land.

*Table 5. Pattern responses*

<b>CAP measure</b>	<b>Direction of change</b>	<b>Typology</b>	<b>Farmers (#)</b>	<b>Percentage</b>
Regionalization	Expansion	buy	36	12.04
		rent	38	12.71
	Reduction	sell	10	3.34
		rent	23	7.69
Greening	Expansion	buy	30	10.03
		rent	30	10.03
	Reduction	sell	4	1.34
		rent	7	2.34
Capping	Expansion	buy	40	13.38
		rent	29	9.7
	Reduction	sell	11	3.68
		rent	11	3.68

Under new policy scenarios farmers could state three alternative strategies. The first option is to maintain the same intention stated assuming the current CAP scenario, the second strategy is to increase land operated and the third strategy is to reduce land operated. All this options are tested for both typology of tenure, land in property and rent.

Compared to the current SFP mechanism, these new instruments show a similar trend in the three options. In fact, greater part of farmers stated to maintain the same strategy that would be likely to maintain under current SFP policy. Few farmers, (10%) stated intention to increase the land operated under the new policy mechanisms. Overall in all new scenarios (regionalization, greening and capping) the intention to increase land operated is higher than the intention to reduce land operated. However, the introduction of regionalised payments seem affect farmers more than other policy instruments. In fact results show high percentage of both expansion or reduction of land operated.

The following tables show some elaborations on intention of expanding or reducing farm size with the regionalization.

*Table 6. Comparison among expansion in rented area and in land in property in regionalized scenario*

EXPANSION		BUY MORE LAND		
		NO	YES	Total
RENT-IN MORE LAND	NO	248	13	261
+	YES	15	23	38
RENT-OUT LESS LAND	Total	263	36	299

In the table above we compare the stated intentions of farmers in terms of land in ownership with that in terms of rent under the regionalized scenario. As we can see the intentions of respondent appear to be similar in the two alternatives, buy (13) and rent-in (15), and most of them would like to expand in both directions (23), giving the impression that there is not preference for one alternative over the other. Instead, in the next table, on the intentions to reduce farmland size in the regionalized scenario, we can see that there is a clear difference between the two alternative strategies. In fact, it's evident that in term of reduction farmers perceive as better strategy to rent-out the land while maintaining the properties of that. So the expected greater inclination towards the rental market, that supports the literature that



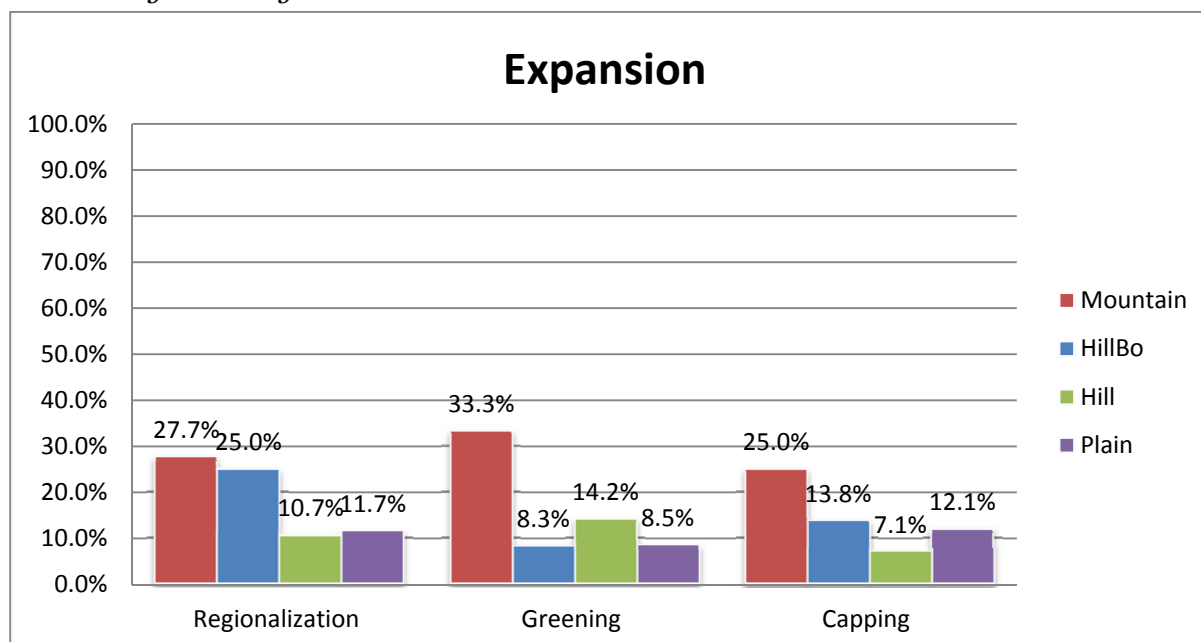
assigns to the rental market more mobility than the sales market, is more evident in case of reduction than expansion intentions.

*Table 7. Comparison among reduction in rented area and in land in property in regionalized scenario*

REDUCTION		SELL MORE LAND		
		NO	YES	Total
RENT-OUT MORE LAND +	NO	258	5	263
	YES	31	5	36
RENT-IN LESS LAND		Total	10	299

In the following figures we put together the intentions to rent-in/out and to sell/buy the land, in order to highlight the farmer's stated intentions to expand/reduce the operated land by altimetry. These charts have the objective to highlight the different perceptions of the reform depending by the zoning.

*Figure 1. Stated intentions to expand farmland size in property, or in rent or in both, sorted by altimetry*



The figure shows that farmers located in mountain area seem to be more affected by the CAP reform. Comparing to the other areas the farmers located in mountain show the highest percentage of stated intention to expand operated land for all three tested measures.

Figure 2. Stated intentions to reduce farmland size in property, or in rent or in both, sorted by altimetry

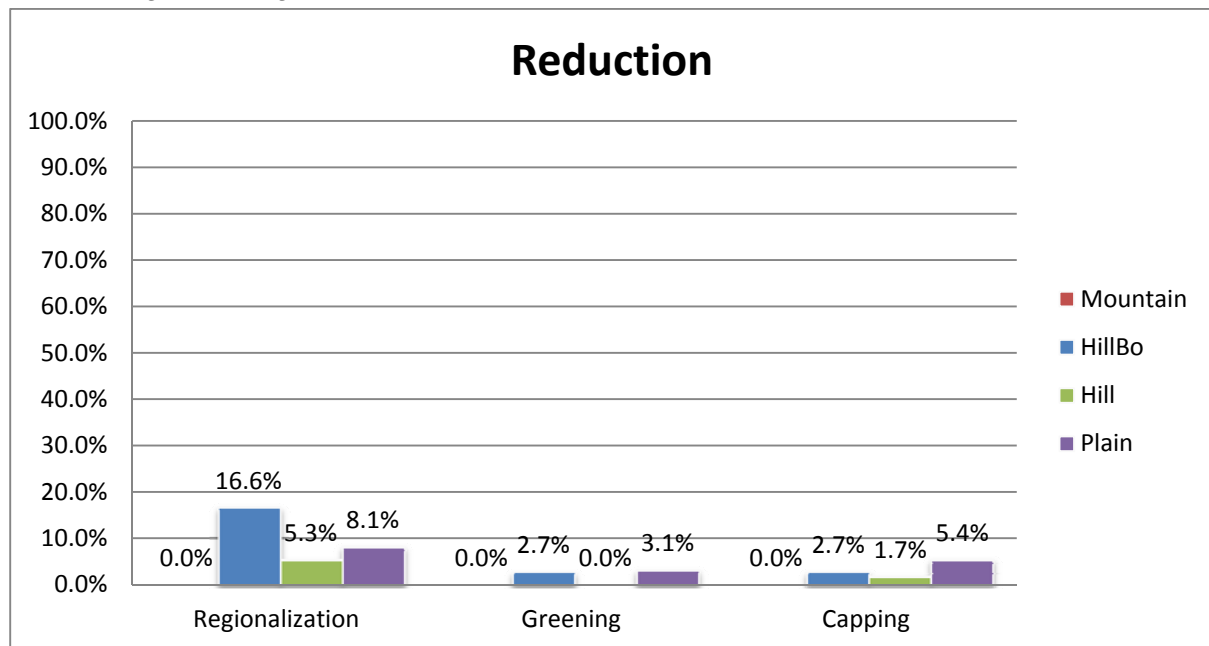


Figure 2 shows a general reduction of percentage of farmers that stated intentions to reduce the farmland area respect to the expansion intentions, and it happens for all the measures tested and in all altimetry zones under analysis. However, what is immediately evident is that in the mountain area nobody stated the intention to reduce his farmland size under all the three CAP measures.. It reflects the direction of the changes in expansion, in fact, as we can see in Figure 1, the highest number of farmers stated intentions to increase the farmland size are located in mountain area.

These behaviours seem consistent with several reasons that are rooted in the proposed policy reform. First, the regionalization of payment seems to be an opportunity to farmer that historically had perceived fewer payments than the others, like farmers in the mountain zone, to increase their payments. In fact, the declared strategy carried on by the reform proposal is to equalize payments between farmers through the allocation of payments in a homogeneous manner within the same region. The achievement of this strategy must necessarily pass through a redistribution of the amounts of payments between farmers and it will be characterized by a decrease in payments for some farmers and a consequent increase for others. This due to CAP budget constraints, in fact the annual national ceiling will be more or less the same as in previous years. These results confirm findings from the previous literature. For example, Viaggi et al. (2013) pointed out that with the introduction of regionalization payments, farmers who are located in mountain areas will witness an increase of payments per ha compared with baseline scenarios, with the effect of an increase of the marginal value of land.

Second, the less intensive production zone, like mountain farms, will have a natural inclination to have low compliance costs to respect the greening prescriptions. Hence, for example, the requisite of the greening measure to transform some percentage of farmland into ecological area will be already satisfied by a lot of mountain farms in which it is common to have inside the farm some part of forest or areas of steep gradient where it is not possible to carry out any agricultural activity. So for many of these farms complying with greening will not result as an additional cost, as it would be for other farms in the plain.

It's also important to underline the fact that farms specialized in livestock seem to be more affected by the transition to regionalized payments. In fact, for this category the payments is

not more linked to the intensity of the activity carried on; before, the payments was linked to the number of animals reared while now it is a hectares payment and this will favor again farmers who carry out extensive activities, like such as those in mountains, rather than who carries out an intensive one.

Also between expansion through the rent and by ownership of the land there are differences depending on which CAP measure is tested and depending on the altimetry location of the farm (Figures 3 and 4). In mountain the percentage of farmer stated the intention to increase the farmed area is higher for the property than the rent for all the measures tested. For the other altimetry locations there are no evidence of a prevalent strategy between rent and property of land.

Figure 3. Stated intentions to expand farmland size only in rent of land, sorted by altimetry

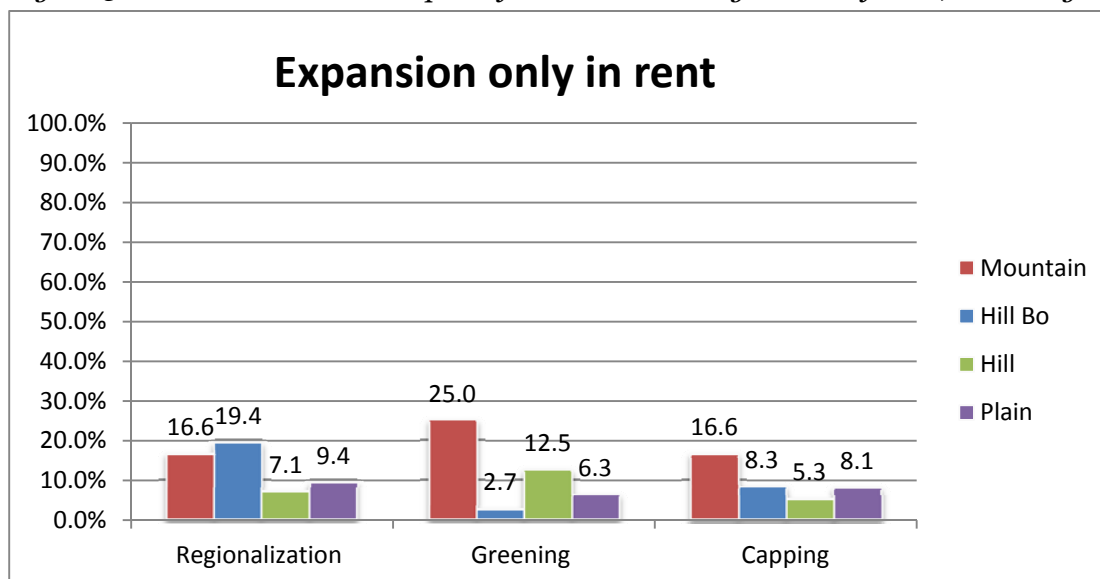
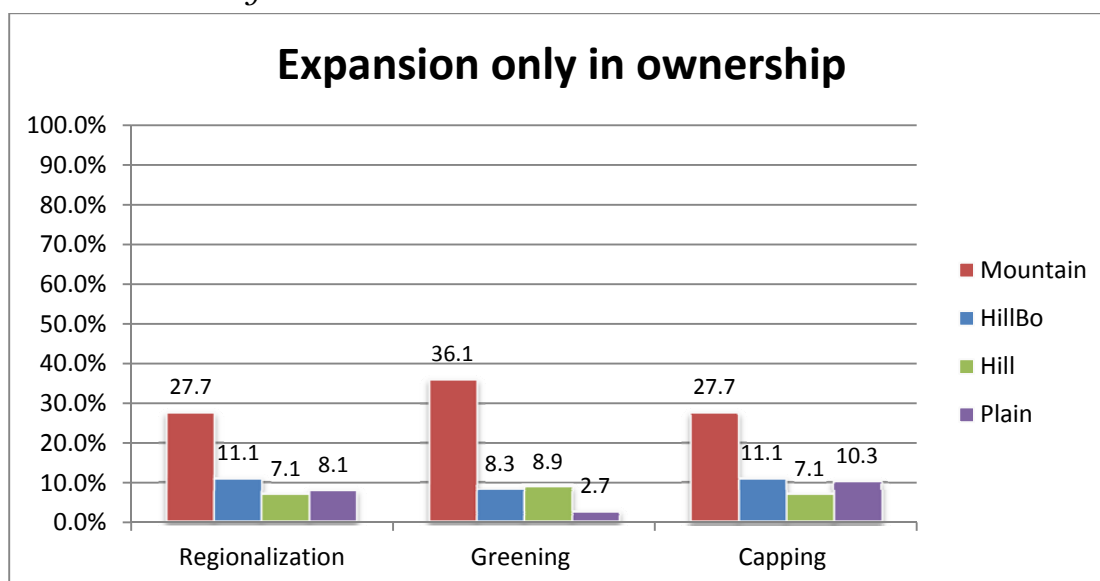


Figure 4. Stated intentions to expand farmland size only in property of land, sorted by altimetry

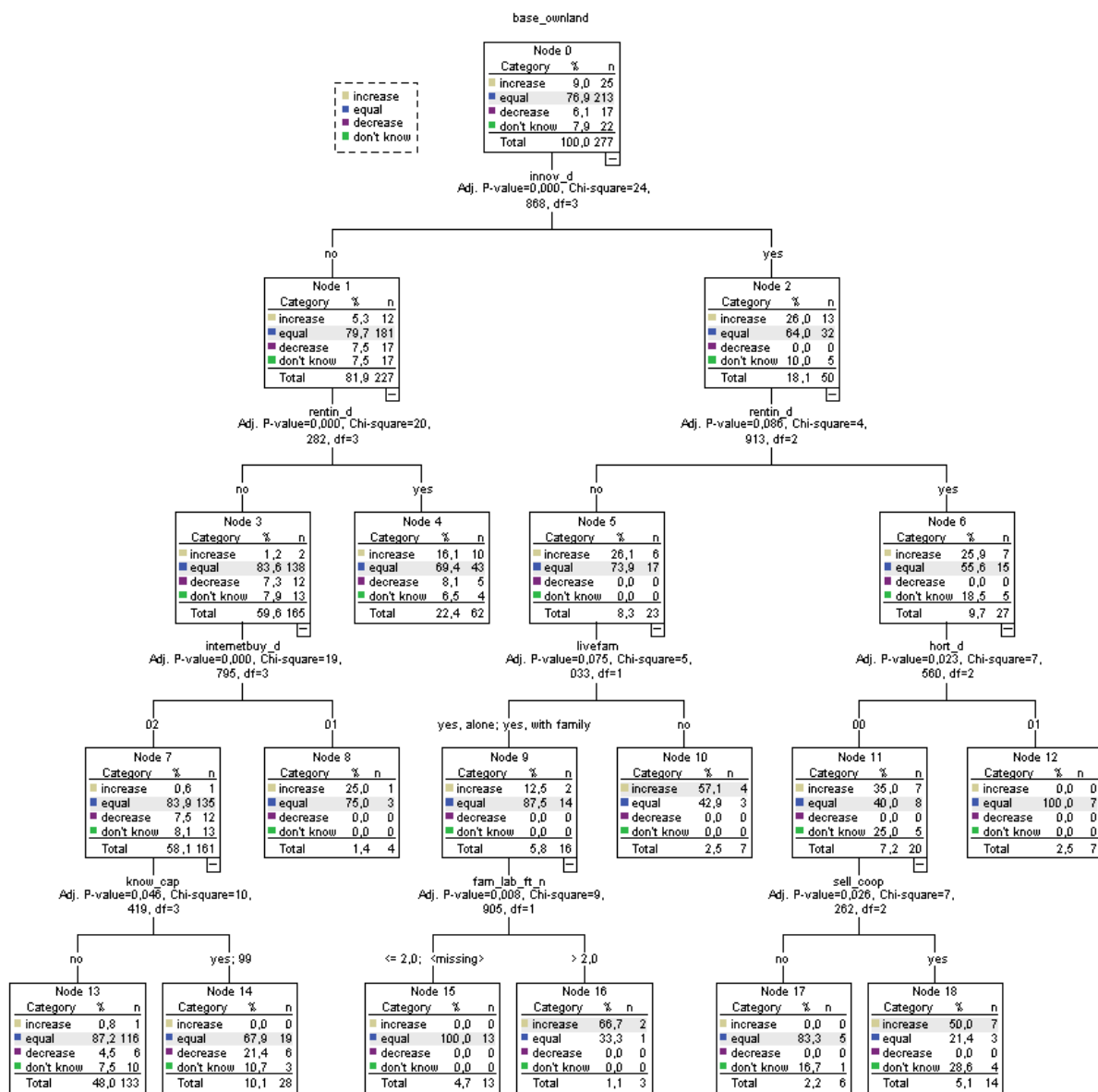


## 6.2 Determinants of land ownership and land rent reactions to the post-2013 reform

The determinants of the choices related to land ownership and land rent reactions to the post-2013 reform are illustrated in the following Figures 5 to 7.

Changes related to owned land in the baseline scenario are best explained by the innovation variable (innov\_d) (Figure 5).

Figure 5. Stated intentions to change owned land (increase, equal, decrease, don't know) in the baseline scenario



This emphasises the connection between ownership and farm innovation strategy and basically distinguishes the group with the higher amount of farms willing to increase their owned land (associated to intention to innovate – in total only 50, but with 26% willing to increase their owned land), from the others. Results highlight that land endowment is central to the process of farm modernisation and land expansion is strongly connected with innovation of the agricultural sector.

Both groups are further divided based on the variable related to the current rented-in land.

In the branch of farms non-increasing and not renting-in land, the group (about half of the whole sample) is further divided based on buying input on internet; option 01 (yes), which includes almost all of the farms in the upper group, basically maintain no change and is further split based on knowledge of the CAP. Those with no knowledge of the future CAP reform are actually the resulting group with the higher share of people stating no intention to change their owned land.

On the branch of “innovators” the fact of renting-in land remains the most important factor for the further splitting; the two resulting groups are mainly different in the share of “don’t know”, while the share of farms willing to increase owned land is the same and nobody wants to decrease owned land.

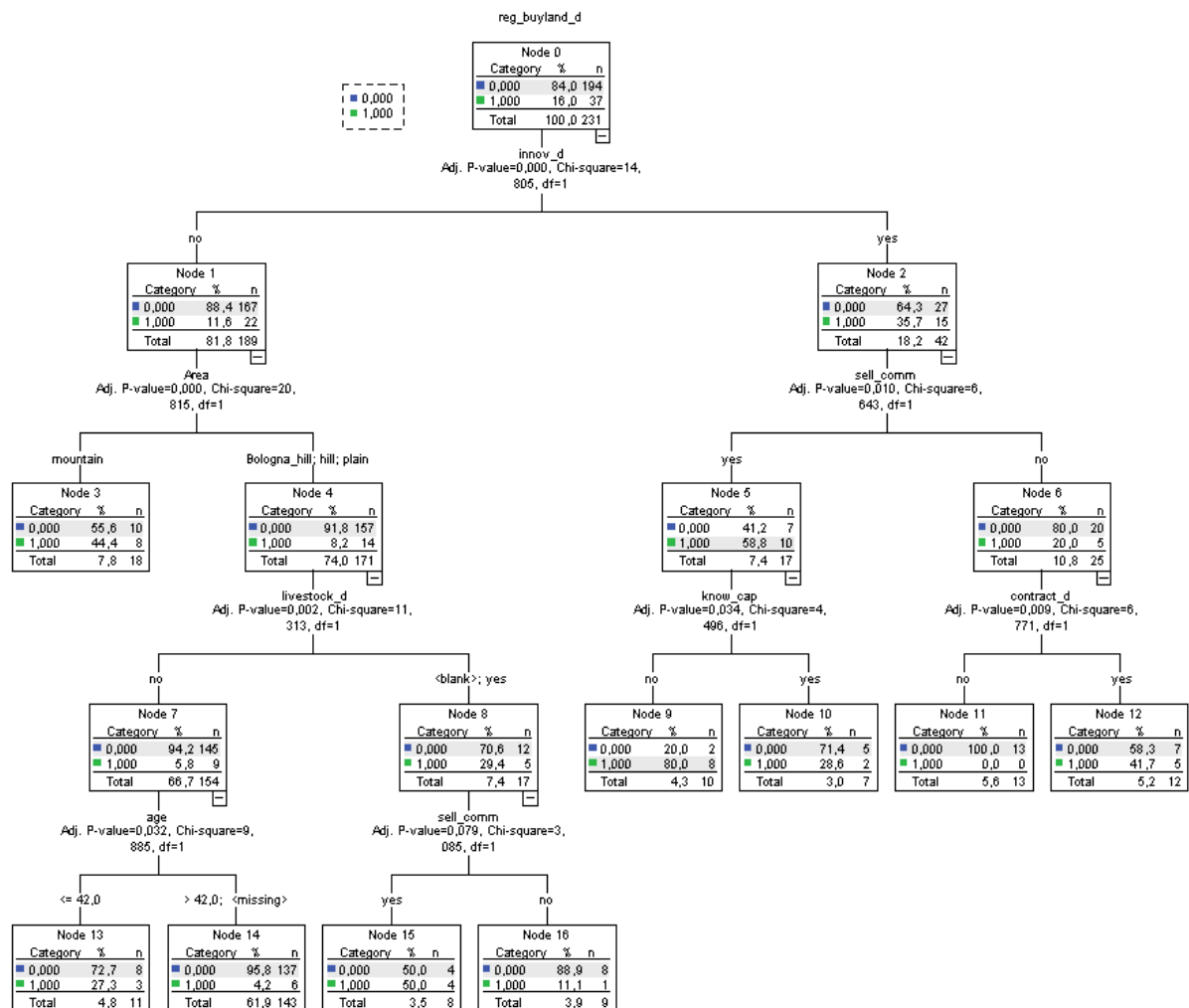
For those non-renting in land, the next most important factor is living on the farm, followed by the number of family members working full time on the farm.

For those renting-in land, the next most important factor is specialisation first and selling channels next, with higher intention to expand for those selling to cooperatives.

Altogether, the results show that intention to expand the farm through buying land are very concentrated in a few typologies and driven by either the concentration of household activities on the farm, or farm specialisation and selling channels, i.e. likely more profitable farming activities better embedded in the downstream chain.

Farms increasing further the amount of land purchased in case of regionalisation are very few (only 37) and split again based on intentions to innovate (Figure 6).

Figure 6. Stated intentions to increase purchase of land as an effect of the regionalization of payments



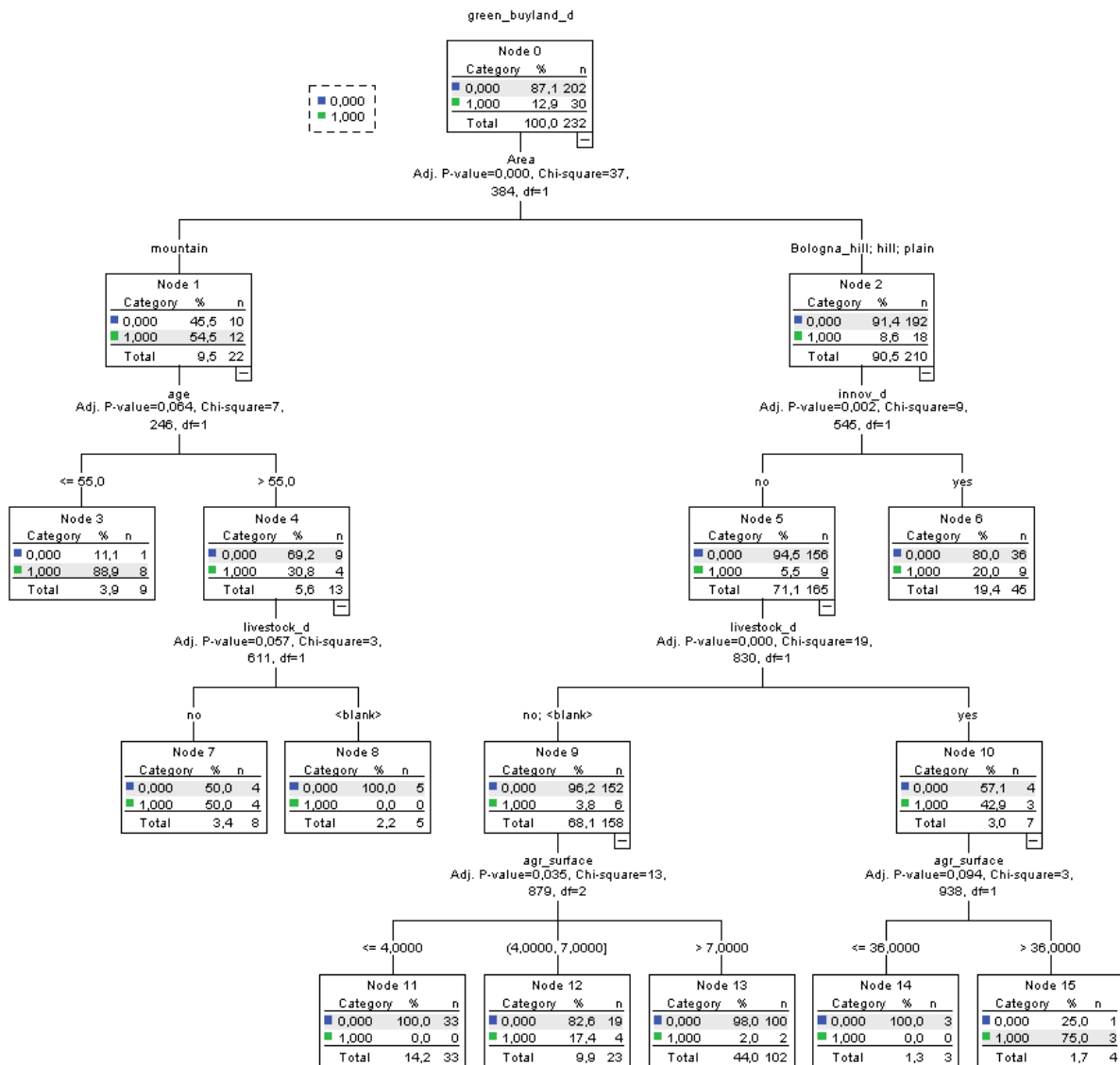
Intention to buy more land is markedly higher in the group of those that have intention to innovate. This group is further split based on commercialisation channels, with the higher share of those having intentions to expand more being associated with selling to private wholesalers. This group is further split based on the knowledge of the proposed post-2013 CAP, with, however, a much larger share of intentions to buy more land being located among those not knowing the CAP reform proposals. This hints at the fact that the answers may be driven by a general attitude towards farm expansion, rather than by a precise strategy towards the reform. The other branch, those not selling to private wholesalers, is further split based on existence of production contracts in place, with all those willing to buy more in case of regionalisation being located among those with production contracts in place. Among the group of non-innovators, the further grouping variable is related to location, with a much higher share of farms willing to buy more being located in mountain. This is consistent with the expectation of a higher level of payment due to regionalisation, with higher gains for farmers located in the areas presently getting the lower payment (i.e. mountain). Farms located in plain and hill areas are further split based on specialisation, with a higher share of those willing to buy more in the group of livestock farmers. These are further split based on the fact of selling to private wholesalers, with those selling to private wholesalers being willing to buy more frequently. The non-livestock farms are further split based on the age of the farmers, with young farmers being by far more willing to buy more in case of regionalisation.



Altogether, the regionalisation seem to provide incentives to further expansion of farms marked by a consistent growth and innovation strategy and firmly connected to the value chain. For the others, the reaction to regionalisation is almost null, with differences driven by structural factors such as location, specialisation and age.

The effects of greening on purchasing of land have a rather different profile and the first split is determined by location in mountain areas (much higher willingness to buy more) as compared to plain and hill (Figure 7).

Figure 7. Stated intentions to increase purchase of land as an effect of introduction of greening



Farms located in mountain area tend then to follow the same variables of the non-innovation, mountain farms in the tree related to greening, but in a different order. The higher shares of those willing to buy more are among the young and the non-livestock farmers. The branch of hill and plain farms is further split based on innovation intentions, with intention to expand more being (not surprisingly) associated to those intending also to innovate (which group is not further split). Among those not willing to innovate, the next factor is specialisation, with livestock farms more willing to expand. In both groups, farm area is the next splitting factors, though with rather different classes. In particular, only livestock farms above 36 hectares of

UAA (medium-large farmland size) have a majority of farms intending to buy more land in presence of greening.

Altogether, the reaction to greening shows a more prominent role of structural factors, starting with location.

## 7. Discussion

This work is affected by several limitations. A key limit of this work is the current uncertainty about the CAP reform (now still in phase of negotiation). This does not allow to make realistic hypotheses about the actual details of the allocation mechanisms.

Several other limitations apply, in relation of the specificity of the area. The Province of Bologna is rather heterogeneous, which may increase reactivity to changes in policy and over-emphasise the tendency to adaptation through land exchanges. Due to such heterogeneity, also the way the calculation of the new regionalised payment would be performed is unclear and hence its comparison with other areas may require a re-thinking of the potential differences in the regionalisation rationale.

Heterogeneity makes also plausible the different directions of reaction of farms to the scenarios of regionalisation and greening, in particular, hinting at the fact that there are farms interested in selling/buying land in opposite directions in the area in case of regionalisation.

However, the high level of no changes in the survey, which is normal when comparing modelling results with actual intentions, reveals that any change will be at least slow.

Finally, the use of a non parametric method without a precise background into a behavioural econometric model makes it somehow difficult to provide straightforward economic interpretations of the results.

Altogether, it is possible to state that intentions of farm expansion through owned land in the baseline are fairly well explained and corroborate existing literature on farm investment and land markets. Results of the reaction to the hypotheses of regionalisation also appear consistent and are supported by previous literature findings on implementation of regionalised payments (see for example Kilian et al., 2012). The results in the greening scenario are explained by rather different variables, which, again, is fairly consistent, but the effect of single variables on the results remains in some cases difficult to explain.

## 8. Conclusions

In the study area, land market dynamics are not expected to change sharply in the future, with only a minority of farms interested in transactions (either selling or buying). Altogether, the results show that intention to expand the farm through buying land are very concentrated in a few typologies and driven by either the concentration of household activities on the farm, or farm specialisation and selling channels, i.e. likely more profitable farming activities better embedded in the downstream chain.

Also the survey information shows a reaction of the land demand to the shift from the historical to the regionalised payments. The regionalisation seem to provide incentives to further expansion of farms marked by a consistent growth and innovation strategy and firmly connected to the value chain. For the others, the reaction to regionalisation is almost null, with differences driven by structural factors such as location, specialisation and age. The reaction to greening shows a more prominent role of structural factors, starting with location, but is generally more difficult to interpret.

A straightforward development of this work is to go for further survey exercises once the outcome of the policy negotiation and the national level implementation rules are clarified or at least made explicit. Altogether, it is very likely, however, that the impacts on land markets

will be minor, except in cases of major changes in the value of entitlements due to the shift from historical to regionalised payment.

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**Annex 1. Descriptive Statistics of farm survey**

Category	Variable (code)	Variable (description)	Obs	Mean	Std. Dev.	Min	Max
Geographical characteristics	d_hillBo	1 if farm located in Bologna area	350	0.102857	0.304207	0	1
	d_hill	1 if farm located in hill area	350	0.16	0.367131	0	1
	d_mountain	1 if farm located in mountain area	350	0.102857	0.304207	0	1
	d_plain	1 if farm located in plain area	350	0.634286	0.482319	0	1
	d_disadv	1 if the farm is in a disadvantaged area	350	0.331429	0.471401	0	1
Farm characteristics	d_rentOut	1 if the farmer have land rent out	348	0.051724	0.221788	0	1
	d_rentIn	1 if the farmer have land rent in	349	0.335244	0.472753	0	1
	d_saleCon	1 if have contracts to sell products	348	0.33046	0.471056	0	1
	d_livestock	1 if carries out livestock farming activities	349	0.106017	0.308302	0	1
	d_fruits	1 if main specialization is fruits	349	0.083095	0.276421	0	1
	d_mixedcrop	1 if main specialization is mixedcrop	349	0.272206	0.445735	0	1
	d_cereals	1 if main specialization is cereals	349	0.469914	0.499811	0	1
	HectLanProp	Farm total area in property	349	29.73066	107.5369	0	1870
	d_AATs	1 if is a small farm (AAT <=10 hectares)	349	0.492837	0.500667	0	1
	d_AATms	1 if is a medium small farm (AAT >10 <=50 hectares)	349	0.383954	0.487045	0	1
	d_AATml	1 if is a medium large farm (AAT >50 <=100 hectares)	349	0.083095	0.276421	0	1
d_AATl	1 if is a large farm (AAT >100 hectares)	349	0.040115	0.19651	0	1	
Household characteristics	d_ExPartT	1 if have external worker part time	349	0.091691	0.289003	0	1
	d_ExFullT	1 if have external worker full time	349	0.057307	0.232761	0	1
	d_HPartT	1 if have Household worker part time	349	0.183381	0.387534	0	1
	d_HFullt	1 if have Household worker full time	350	0.871429	0.335204	0	1
	d_Unemployed	1 if presence of unemployed in the household	346	0.054913	0.228141	0	1
	d_Over65	1 if presence of over 65 on household	350	0.537143	0.499332	0	1
Farmer characteristics	d_higheduc	farmer with high school, degree or PHD title	350	0.294286	0.456373	0	1
	d_LowEduc	farmer with no title, primary or middle school title	350	0.705714	0.456373	0	1
	Age	Age of respondent	347	63.29683	13.96263	25	92
	d_livOnFarm	1 if live on farm (alone or with family or only the family)	347	0.85879	0.348741	0	1
	d_Exit	1 if farmer intend to leave farm activity	350	0.145714	0.353325	0	1
	d_Sellpro	1 if sell products to processing firms	350	0.071429	0.257908	0	1
	d_selldea	1 if sell products to wholesale dealer	348	0.321839	0.467854	0	1
	d_sellcoo	1 if sell products to cooperative	347	0.636888	0.481591	0	1
	d_sellcon	1 if sell products to consumers	347	0.198847	0.399709	0	1
d_sellotfa	1 if sell products to another farm	347	0.083574	0.277147	0	1	
CAP payments	importSFP	Amount of Single Farm Payment received	257	7539.428	26404.53	36	350000
	ImpOthPaym	Amount of other CAP payments received	25	27418.4	66675.45	200	310000
	NEntitlem2011	Number of entitlements owned	44	55.29545	188.2768	1	1200
	ImpPayOnRevenue	Average influence of CAP payments on revenue	253	2.217391	1.437927	1	6



## Annex 2. Coding and descriptive statistics of variables used in the CHAID model

<b>Variable code</b>	<b>Description</b>	<b>N. obs</b>	<b>Mean</b>	<b>Standard deviation</b>
Reg_buyland_d	1 if states to buy more land in regionalization scenario than baseline	231	0.1602	
Base_ownland	Statement about buy land in baseline scenario	277		
Green_buyland_d	1 if states to buy more land in greening scenario than baseline	232	0.1293	
Area	Mountain/hill/bologna hill/plain where farm is located	350		
Agr_surface	Hectares of owned land	350	29.897	107.428
Rentin_d	1 if rent in farming surface	349	0.334	
livestock_d	1 if main specialization is livestock activities	313	0.034	
Hort_d	1 if horticulture is a farming activities	343	0.103	
Fam_lab_ft_n	Household members working full time on farm	305	1.55	0.850
Contract_d	1 if has production contract	348	0.329	
Sell_comm	1 if sales to wholesale or retailers	348	0.320	
Sell_coop	1 if sales to cooperative	347	0.631	
Internetbuy_d	1 if production mean are bought by internet	349	0.029	
Innov_d	1 if states to adopt at least 1 innovation in 5 years	350	0.151	
Know_CAP	1 if states to know CAP proposal for 2014-2020	297	0.246	
Age	Age of respondent	348	63.37	14.005
Livefam	Farm household living on farm	349		

### **Annex 3. The questionnaire**

#### QUESTIONNAIRE

##### Farm characteristics

2.00: What's the altimetry zone where his farm is located?

01. Mountain
02. Bologna Hill
03. Hill
04. Plain

2.01: Class of payment for the farm (the average)

01. Below the mean
02. Above the mean

2.05: What's the altimetry zone where are located the lands of your farm?

01. Mountain
02. Bologna hill
03. Hill
04. Plain
99. Does not answer

3.01: What's the legal form of your farm?

01. Individual firm
02. Company simple
03. Limited liability company
04. General partnership company
05. Limited partnership company
06. A cooperative
07. Joint stock company
08. Association/consortium
55. Other form: specify
99. Does not answer

3.02: Between the owners of the farm there are relatives?

01. Yes
02. No
99. Does not answer

3.03: What's the main specialization of the farm?

01. Cereals
02. Horticulture
03. Fruits

- 04. Cattle livestock (milk and meat)
- 05. Granivorous livestock
- 06. Mixed crops
- 07. Mixed livestock
- 08. Mixed arable and livestock
- 77. Not classifiable
- 99. Does not answer

(If 3.03=04 or 05 or 07 or 08)

3.04: In your farm carries out activities of livestock other than for own consumption?

- 01. Yes
- 02. No
- 99. Does not answer

(If 3.03=04 or 05 or 07 or 08 and 3.04=01)

3.05: Can you tell me what and how many animals bred on your farm among the following?

- 00. None
- 20. Text (number) \*
- 99. Does not answer
- \* 3.05.01 Dairy cows
- 3.05.02 Cattle
- 3.05.03 Cattle for fattening (calves excluded)
- 3.05.04 Sows
- 3.05.05 Fattening pig and boars
- 3.05.06 Adult goats and sheep
- 3.05.07 Adult poultry
- 3.05.08 Horses and other equines

(If 3.03=04 or 05 or 07 or 08 and 3.04=01)

3.05.09: In addition to those listed, breeding other types of animals? If yes can you specify the type?

- 01. Yes, (specify the type)
- 02. No
- 99. Does not answer

(If 3.05.09=01)

3.05.10: what's the consistence of the other type of farming?

- 20. Text (number)

99. Does not answer

3.06.1: What's the total number of hectares of land (AAT = Total Agricultural Area) owned the farm?

00. no surface properties

01. hectare of AAT

99. does not answer

(If 3.06.1=01)

3.06.1.1: It's a single piece (or body)?

01. Yes

02. No

99. Does not answer

3.06.2: Of which land rented out by the farm?

00. None area of land rented out

01. Text (number hectare of AAT)

99. Does not answer

(If 3.06.2=01)

3.06.2.1: It's a single piece (or body)?

01. Yes

02. No

99. Does not answer

(If 3.06.2=01)

3.06.2.2: The land is rented out to some relative?

01. Yes

02. No

99. Does not answer

3.06.3: Of which land rented in by the farm?

00. None area of land rented in

01. Text (number hectare of AAT)

99. Does not answer

(If 3.06.3=01)

3.06.3.1: It's a single piece (or body)?

01. Yes

02. No

99. Does not answer

(If 3.06.3=01)

3.06.3.2: The land is rented in to some relative?

01. Yes

02. No

99. Does not answer

3.07: The dimension of your farm is changed from 2002?

01. Yes

- 02. No
- 99. Does not answer

(If 3.07=01 and 3.06.1=01)

3.07.1: Can you tell me if, about the land in ownership, since 2002 there has been:

- 01. An increase
- 02. A decrease
- 03. No change
- 99. Does not answer

(If 3.07=01 and 3.06.2=01)

3.07.2: Can you tell me if, about the land rented out, since 2002 there has been:

- 01. An increase
- 02. A decrease
- 03. No change
- 99. Does not answer

(If 3.07=01 and 3.06.3=01)

3.07.3: Can you tell me if, about the land rented in, since 2002 there has been:

- 01. An increase
- 02. A decrease
- 03. No change
- 99. Does not answer

3.09: Can you tell me what the crop allocation, in hectares of UAA, for the agricultural year of 2012?

- 00. None area
- 01. Text (AAU)\*
- 99. Does not answer

- \* 3.09.01: Cereals (wheat, corn, barley, rice)
- 3.09.02: Protein-oleaginous (rapeseed, soybean)
- 3.09.03: Sugar beet
- 3.09.04: vegetable open field (potatoes, tomatoes)
- 3.09.06: alfalfa and grass
- 3.09.07: Permanent grass
- 3.09.08: Uncultivated and set-aside
- 3.09.09: Greenhouses
- 3.09.10: Fruit
- 3.09.11: Vine
- 3.09.12: Forest

3.09.13: Do you have in your farm permanent or protected crops? if yes, can you specify the type?

- 01. Text, yes; (specify)
- 02. No
- 99. Does not answer

(If 3.09.13=01)

3.09.13.1: How many hectares of AAU dedicated to these permanent crops do you have?

01. Text (AAU)

99. Does not answer

3.09.14: There are areas in the company you have invested in agro-environment, forestry or ecological measures? If so, can specify the type?

01. Text, yes; (specify)

02. No

99. Does not answer

(If 3.09.14=01)

3.09.14.1: And how many hectares of AAU you have invested in this kind of measures?

01. Text (AAU)

99. Does not answer

3.10.1: Your farm or part of it is involved in the production of photovoltaic energy?

01. Yes

02. No

99. Does not answer

(If 3.10.1=01)

3.10.1.1: And how much area in hectares is intended for the production of photovoltaic energy?

00. Panels installed only on buildings

01. Text (area under photovoltaic)

99. Does not answer

3.10.2: Your farm or part of it is involved in the production of energy from biogas?

01. Yes

02. No

99. Does not answer

(If 3.10.2=01)

3.10.2.1: And how much area in hectares is intended for the production of biogas?

01. Text (area under biogas)

99. Does not answer

3.12: Your farm carries out activities of subcontracting (on behalf of a third party)?

01. Yes

02. No

99. Does not answer

(If 3.12=01)

3.12.1: And which activities among the following:

01. Ploughing

02. Harrowing

03. Fertilizing

04. Cutting

- 05. Levelling
- 06. Weeding
- 07. Planting
- 08. Watering
- 09. Cutting
- 10. Threshing
- 11. Transport and silage
- 12. Maintenance
- 55. Others
- 77. All of these
- 99. Does not answer

#### Labour characteristics

3.13.1: Including you, how many family members are full-time employees of the farm?

- 00. Nobody
- 01. Text (number)
- 99. Does not answer

3.13.2: Including you, how many family members are part-time employees of the farm?

- 00. Nobody
- 01. Text (number)
- 99. Does not answer

3.13.3: Excluding family members, how many full-time employees have your farm?

- 00. Nobody
- 01. Text (number)
- 99. Does not answer

3.13.4: Excluding family members, how many part-time employees have your farm?

- 00. Nobody
- 01. Text (number)
- 99. Does not answer

#### Market strategy

3.14: Between the following subjects, who sells the product derived from the main specialization of your farm?

- 01. Yes \*
- 02. No
- 99. Does not answer



- \* 3.14.01: Processing firms of agricultural products
- 3.14.02: Wholesale dealer or retailers
- 3.14.03: Consortia, cooperative, chains of retail and wholesale
- 3.14.04: Consumers
- 3.14.05: Another farm

#### COMMERCIAL INSTRUMENTS

3.15.1: Have you contracts for the sale of agricultural products?

- 01. Yes
- 02. No
- 99. Does not answer

3.15.2: Do you use the internet to buy means of production?

- 01. Yes
- 02. No
- 99. Does not answer

3.15.3: Do you use the internet to sell your products?

- 01. Yes
- 02. No
- 99. Does not answer

#### CAP PAYMENTS RECEIVED IN 2011

3.17.1: How much is the amount of the Single Payment received by the farm in 2011?

- 00. None
- 01. Text (import)
- 99. Does not answer

3.17.2: How many entitlements you had in 2011?

- 00. No entitlements (if 3.17.1=00)
- 01. Text (number of entitlements)
- 99. Does not answer

3.17.3: Do you received others payments in 2011? If yes, can you specify the typology?

- 01. Text, Yes; (specify)
- 02. No
- 99. Does not answer

(If 3.17.3=01)

3.17.4: How much is the other payments received?

- 01. Text, (import)
- 99. Does not answer

#### VARIATION AND INCIDENCE

3.18.1: The amount of the single payment compared to that received in 2005 is:

- 01. Increased
- 02. Unchanged
- 03. Decreased
- 99. Does not answer

3.18.2: In percentage terms, how much, on average, single payments affect farm revenue?

- 01. Less than 10%
- 02. 10-29%
- 03. 30-49%
- 04. 50-69%
- 05. 70-89%
- 06. Over 90%
- 88. Does not know
- 99. Does not answer

#### Generic intentions

3.20: Over the next 5 years intends to take one or more of the following innovations or new technologies as:

- 01. Yes \*
- 02. No
- 99. Does not answer

- \* 3.20.1: robotizing and precision agriculture
- 3.20.2: new irrigation systems
- 3.20.3: adoption of energy crops
- 3.20.4: adoption of systems for the production of energy

3.20.5: Other than those listed above, you have the intention to adopt other innovations or new technologies in the next 5 years? Can you specify the type?

- 01. Text, Yes; (specify)
- 02. No
- 99. Does not answer

3.21: Do you think that your agricultural activities will continue in the next 5 years?

- 01. Yes, conducted by me
- 02. Yes, conducted by a familiar member
- 03. No
- 04. Depend
- 88. Does not know
- 99. Does not answer

#### CAUSE (MOTIVATION) AND FUTURE

(If 3.21=03)

3.22.1: Why you or a family member doesn't continue in farming in the next 5 years?

- 01. I think not sufficiently profitable

- 02. Too many constraints (administrative, bureaucratic, other limitations)
- 03. High risk in the farm
- 04. I don't have a successor within the family
- 05. Other reasons
- 99. Does not answer

(If 3.21= 03)

3.22.2: Therefore what you going to do with the farm?

- 01. To sell it
- 02. Maintain the property and give it for rent
- 03. Another reason
- 88. Does not know
- 99. Does not answer

3.24.1: What percentage of the total gross income of your family comes from farming (on average)?

- 01. Agricultural activity in loss
- 02. Less than 10%
- 03. 10-29%
- 04. 30-49%
- 05. 50-69%
- 06. 70-89%
- 07. 90% or more
- 88. Does not know
- 99. Does not answer

3.24.2: You live at the farm:

- 01. Alone
- 02. With family
- 03. Family live there but not you
- 04. Neither you nor your family lives at the farm
- 99. Does not answer

#### Expansion/reduction intentions under current CAP

(If 3.21=03 now go to question 5.01) (If 3.06.1=01)

4.01.1: Assuming a scenario in which the current Common Agricultural Policy (CAP) remains unchanged up until 2020, what are your intentions regarding the land in property?

- 01. Increase it
- 02. No change
- 03. Decrease it
- 88. Does not know
- 99. Does not answer

(If 3.06.2=01)

4.01.2: Assuming a scenario in which the current Common Agricultural Policy (CAP) remains unchanged, what are your intentions regarding the land rented out?

- 01. Increase it
- 02. No change
- 03. Decrease it
- 88. Does not know
- 99. Does not answer

(If 3.06.3=01)

4.01.3: Assuming a scenario in which the current Common Agricultural Policy (CAP) remains unchanged, what are your intentions regarding the land rented in?

- 01. Increase it
- 02. No change
- 03. Decrease it
- 88. Does not know
- 99. Does not answer

#### THE FUTURE OF LAND PRICES AND THE CAP

4.02.1: In your opinion, what will be the evolution of land prices between now and 2020?

- 01. Decrease between 10 and 20%
- 02. Decrease by less than 10%
- 03. No change
- 04. Increase by less than 10%
- 05. Increase between 10 and 20%
- 88. Does not know
- 99. Does not answer

#### Cap reform knowledge

4.02.2: Are you informed about the official proposals for reform of the CAP for the period 2014-2020?

- 01. Yes
- 02. No
- 99. Does not answer

4.04: You fall into the category of active farmer?

- 01. Yes \*
- 02. No
- 99. Does not answer

\* 4.04.1: Receives less than 5000 euro of direct payments

4.04.2: Have a ratio between direct payments and non-agricultural income is less than

5%

4.04.3: Carries out a minimal agricultural activity defined at national level

Expansion/reduction intentions under post-2013 CAP proposal

Regionalised payments: form of financing to farms under which it will pass from the current historic entitlements to those homogeneous in each region, distributed according to land cultivated.

4.70.1: Assuming the introduction of regionalised payments, your intention is to sell more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land ownership
- 88. Does not know
- 99. Does not answer

4.70.2: Assuming the introduction of regionalised payments, your intention is to buy more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.71.1: Assuming the introduction of regionalised payments, your intention is to rent in more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.71.2: Assuming the introduction of regionalised payments, your intention is to rent in less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not

- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.72.1: Assuming the introduction of regionalised payments, your intention is to rent out more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

4.72.2: Assuming the introduction of regionalised payments, your intention is to rent out less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

Greening payments: is assigned to farmers entitled to a payment under the basic payment scheme and that comply respect, on their eligible hectares, with some ecological constraints prescriptions.

4.80.1: Assuming the introduction of greening payments, your intention is to sell more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land ownership
- 88. Does not know
- 99. Does not answer

4.80.2: Assuming the introduction of greening payments, your intention is to buy more land than you would make with the current payment system?

- 01. Certainly

- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.81.1: Assuming the introduction of greening payments, your intention is to rent in more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.81.2: Assuming the introduction of greening payments, your intention is to rent in less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.82.1: Assuming the introduction of greening payments, your intention is to rent out more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

4.82.2: Assuming the introduction of greening payments, your intention is to rent out less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not



- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

The capping: It is a reduction of the amount of payments for farmers that receive more than 150000 euro of direct payments.

4.90.1: Assuming the introduction of capping, your intention is to sell more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land ownership
- 88. Does not know
- 99. Does not answer

4.90.2: Assuming the introduction of capping, your intention is to buy more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.91.1: Assuming the introduction of capping, your intention is to rent in more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.91.2: Assuming the introduction of capping, your intention is to rent in less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably

- 03. Probably not
- 04. Certainly not
- 88. Does not know
- 99. Does not answer

4.92.1: Assuming the introduction of capping, your intention is to rent out more land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

4.92.2: Assuming the introduction of capping, your intention is to rent out less land than you would make with the current payment system?

- 01. Certainly
- 02. Probably
- 03. Probably not
- 04. Certainly not
- 55. No land to rent out
- 88. Does not know
- 99. Does not answer

5.01: In your opinion, to reduce the cost of land for farms which actions should be taken at the level of the European Union, the Italian Government, or local authorities?

- 55. Text (specify)
- 77. Does not indicate
- 88. Does not know
- 99. Does not answer

#### Personal and household characteristics

The respondent

6.01.1: Gender?

- 01. Male
- 02. Female

6.01.2: Only for statistical purposes, can you tell me your age in completed years?

- 01. Text (age)

02. Does not answer

6.01.3: What is your level of education, the last completed?

00. No title or primary school

01. Middle school

02. Professional qualification

03. High school

04. Vocational course

05. Bachelor's degree

06. Master degree

07. PHD

99. Does not answer

Family: group of persons living in the same household

(If 6.01.1=01)

6.03.1: You included, how many male members living in your household?

00. None

01. Text (male number)

99. Does not answer

(If 6.01.1=01)

6.03.2: You included, how many female members living in your household?

00. None

01. Text (male number)

99. Does not answer

6.03.3: How many minors live in your household?

00. None

01. Text (minors number)

99. Does not answer

6.03.4: How many with more than 65 years live in your household?

00. None

01. Text (number over 65)

99. Does not answer

6.03.5: how many are unemployed in your household?

00. None

01. Text (number unemployed)

99. Does not answer

7.01: The interview is over, thank you for your cooperation. If you can leave a comment on the topic, otherwise I salute you. Have a good day. Bye.

01. Text (Comments)

99. Does not answer



## Comparative Analysis of Factor Markets for Agriculture across the Member States

245123-FP7-KBBE-2009-3

### The Factor Markets project in a nutshell

<b>Title</b>	Comparative Analysis of Factor Markets for Agriculture across the Member States
<b>Funding scheme</b>	Collaborative Project (CP) / Small or medium scale focused research project
<b>Coordinator</b>	CEPS, Prof. Johan F.M. Swinnen
<b>Duration</b>	01/09/2010 – 31/08/2013 (36 months)
<b>Short description</b>	<p>Well functioning factor markets are a crucial condition for the competitiveness and growth of agriculture and for rural development. At the same time, the functioning of the factor markets themselves are influenced by changes in agriculture and the rural economy, and in EU policies. Member state regulations and institutions affecting land, labour, and capital markets may cause important heterogeneity in the factor markets, which may have important effects on the functioning of the factor markets and on the interactions between factor markets and EU policies.</p> <p>The general objective of the FACTOR MARKETS project is to analyse the functioning of factor markets for agriculture in the EU-27, including the Candidate Countries. The FACTOR MARKETS project will compare the different markets, their institutional framework and their impact on agricultural development and structural change, as well as their impact on rural economies, for the Member States, Candidate Countries and the EU as a whole. The FACTOR MARKETS project will focus on capital, labour and land markets. The results of this study will contribute to a better understanding of the fundamental economic factors affecting EU agriculture, thus allowing better targeting of policies to improve the competitiveness of the sector.</p>
<b>Contact e-mail</b>	info@factormarkets.eu
<b>Website</b>	www.factormarkets.eu
<b>Partners</b>	17 (13 countries)
<b>EU funding</b>	1,979,023 €
<b>EC Scientific officer</b>	Dr. Hans-Jörg Lutzeyer

