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EFFECTIVENESS OF EU AND REGIONAL POLICIES SUCH AN ESSENTIAL TOOL IN PROMOTING THE COMPETITIVENESS IN RURAL AREAS: AN EXPLORATIVE ANALYSIS IN APULIA REGION

JEL classification: Q10; Q18; O2

M. Fiore, A. Spada, D. Caruso, P. La Sala, F. Contò

Abstract. *The rural development policies of the European Union for 2014-2020 aim at contributing to the achievement of smart growth in agriculture and multifunctional farming (Sandu, 2014; Scuderi et al., 2014). The importance of multifunctional activities is remarkably evidenced by the significant changes provided by the EU's Common Agricultural Policy (CAP). The Local Action Groups (LAGs) are local agencies that process the Measures of Local Development Programme and manage financial funds for Firms Modernization Plans; the latter is a farms tool aimed at supporting the LAG in requesting process for public aid. In fact, the beneficiaries of the measures of Axis III can participate in the public tenders only by means of a LAG. Focusing on Measure 311 Axis III, it aims at diversification into non-traditional agricultural activities in order to support farm businesses that restructure and diversify activities for providing alternative income sources. We take in account such a case study the Apulia Region - in South Italy - where 25 LAGs cover the entire region: performing integrated statistical data analysis the paper aims at evaluating the effective positive influence of FMPs on farms differentiating their activities in non-traditional agricultural. Finally, our research questions is how and if the implementation of the Firms Modernization Plans can improve economic assets and modernization and growth process in rural areas. Also, this paper provides suggestions for bottom-up policy implications deriving by the LAGs local strategies supporting stakeholder networking.*

Keywords: *EU and regional policies; Local Action Groups; Apulia region; Explorative analysis*

Introduction

In the context of the EU and the CAP, rural development aims at safeguarding the economy of the countryside by supporting programmes to invest, to modernize and to support activities - both agricultural and non-agricultural - in rural areas so improving growth process and income situation (Farm Accountancy Data Network, 2010). EU countries, in special way the less favoured regions, choose measures suited to their specific needs and manage their programmes themselves. The funds comes from the European Agriculture Fund for Rural Development (EAFRD) and part of the direct payments to farmers is now reallocated to rural development through a mechanism called 'modulation' (Council Regulation (EC), 2005; Regulation (EU), 2013). The new rural policies of the EU for 2014-2020 aim at contributing to the achievement of smart and multifunctional agriculture (Sandu, 2014; Scuderi et al., 2014). Currently, EU countries draw attention to their issues for rural development, but has to use no less than e.g. 25% on improving

the countryside and no less than 10% on diversifying the rural economy. The crucial importance of multifunctionality is remarkably evidenced by the significant changes made by the EU's CAP, within its rural development policy, that represents the future of the EU rural communities and shapes the agricultural future (Andrei & Darvasi, 2012; Popescu and Andrei, 2011); in addition multifunctionality has received a lot of attention over the last decade from scholars and policy-makers (OECD, 2003, 2005, 2006, 2008; ENRD, 2010; Ohe, 2007; Ploeg van der et al., 2009; Jongeneel et al., 2008; Grouiez, 2011; Di Iacovo and O'Connor, 2009; Wilson, 2008; Kizos, 2010; Dessein et al., 2013; Contò, 2005). In fact, the EU in recent years has focused its attention on multifunctional farming activities fulfilling the combination of functions required by society: multifunctional land use and creation of multiple values in the rural areas (Contò et al., 2013). Furthermore, the EU's Leader methodology is now well established as an effective model for funding community - based rural development activity. The LAGs are local agencies that receive financial assistance to implement local development strategies, by awarding grants to local projects; they process the Measures of Local Development Programme (LDP) and manage financial funds for Firms Modernization Plans (FMP) by the European Union and by the EAFRD. The FMP is a tool set up by farms in order to help the LAG in requesting for public aid for the different measures Countries have acknowledged the economic and social benefits that Local Action Groups (LAG) bottom-up approaches can bring. The addresses of the measures relevant to Axis III, which concern the improvement of the quality of life in the rural areas and the differentiation of rural economy, can participate in the public tenders only through a LAG. Axis III of the National Strategy Plan for Rural Development - Quality of life and diversification - and the activities of the Rural Development Plans confirm the importance of the social dimension within the context of practices and professions in agriculture in order to promote improvement in the quality of life (Contò et al., 2013).

Measures 311 of the Axis 3 of RDP mainly maintain the diversification of farm activities into non-traditional agricultural activities, that is farm "green" and social tourism and related labour intensive service activities so providing alternative income sources. In particular, Action 1 is related to investments for the supply of agri-tourism accommodation in the business context in accordance with applicable regulations; Action 2 provides investments for the supply of educational services and education for the population, with particular reference to the school and students and in synergy with the national education system; Action 3 is related to investments for the supply of health services for the benefit of vulnerable groups. Within this framework, our objective is to give an insight on the effectiveness of EU and regional policy such as an essential tool in reaching the development of competitiveness in rural areas as for example Apulia region. Furthermore, we shed some light on the successful positive influence for farms diversifying its activities with tourism, educational and health activities by means of implementation of the FPMs, measure 311, action 1, 2 and 3 of LDP.

After an overview on effectiveness of EU and regional policies, the paper analyzes such a case study the Apulia Region - in South Italy - and its 25 LAGs. Then, data and methods are presented; integrated statistical data analysis are carried out aimed at evaluating the effective positive influence of FMPs on farms differentiating their activities in non-traditional agricultural. Results are shown and discussed. Finally, conclusion close the paper providing suggestions and policy implications deriving by the LAGs local strategies supporting stakeholder networking.

Effectiveness of EU and regional policies

The Leader approach is aimed at supporting rural actors improving the long-term potential of their local areas, encouraging integrated, high-quality and innovative strategies for sustainable development of local areas too. Through this approach, support is arranged by LAGs to implement local development strategies with a view for achieving the objectives of one or more of the three Axes, as well as implementing cooperation projects involving the selected objectives (EU, 2013). Government policies, and especially EU policies, can play a crucial role in improving agri-food chain relationships; policies generally can, in a straight line or not, affect agri-food chains and can have macroeconomic or microeconomic objectives (Albisu et al., 2010). It is highlighting that the EU aid programs do not replace the national policies, but only complement them; a horizontal, territorial-based policy of stimulating rural entrepreneurship should be investigated in order to balance it with a sectoral approach in a right political way (Bryla, 2012).

Focusing on Axis 3, having a 'living countryside' and improving the social and economic structure, in particular in the more isolated rural areas, and facing depopulation are the main and crucial aims. Investment in the broader rural economy and communities is very important in order to enhance the quality of life in rural areas, by means of access to essential services and infrastructure and a better environment. Improving rural areas is also linked to the promotion of sustainable growth and to the creation of new employment opportunities, mainly for young people and women, as well as facilitating the access to advanced information and communication technologies (EU, 2013). Expected output by EU Commission as a result of the measures under the Axis 3 are 71.000 new jobs to be created through diversification of farms into non-agricultural activities, 114.000 new jobs created through support for the creation and development of micro-enterprises, and 185.000 new jobs through expansion of tourism activities across the EU countries (ibidem).

Some scholars (Homolka and Švecová, 2012) show the current subsidies have an impact on the stability of the farmers' income; in order to successfully obtain supports in frame of the CAP, farming actors have to reach aims of environment protection, food safety, health and animal welfare as well as they have to maintain agricultural land in good farming state (GAEC's - Good agricultural and environmental conditions). Others scholars (Desjeux et al., 2014) demonstrate measures 311 and 313 positively influence farm labor demand since such activities are usually more labor intensive than agricultural activities (except for horticulture and wine making); investment aids reduce the cost of farm equipment relative to the cost of labor and favor the substitution of labor by capital and so may contribute to expand production thanks to improved competitiveness and production capacity. With the 2007-2014 programming, rural development has been implemented through one fund (the European Agricultural Fund for Rural Development - EAFRD), one management and control system and one type of programming (EU, 2013). Axis 1 represents 34% of the total EAFRD contribution, while Axis 2 gets the lion's share with 45% and 18% are allocated to Axis 3 (EU, 2013).

Focusing on the case of Italy country, with EU Commission Decision 2009/545/EC of 7 July 2009 Italy, regarding the measure 311-Axis 3, were awarded additional € 465,484,000 of supplementary EAFRD share (of which 369.4 million for Health Check expenses and 96,084,000 for Recovery Plan expenses). *Table 1* shows the data concerning the progress percentage of expenditure related to measure 311 on the total of the Rural Development Programme of Italian regions.

Tab. 1 - Progress percentage of expenditure related to measure 311 on the total of the Rural Development Programme (ordinary, Health Check and Recovery Plan) - Italian regions

Regions	%	Regions	%
Abruzzo	15.18	Molise	23.74
Basilicata (C.O.R.)*	32.62	Piedmont	70.93
Bolzano	90.06	Apulian (C.O.R.)*	67.80
Calabria (C.O.R.)*	56.89	Sardinia	14.32
Campania (C.O.R.)*	44.63	Sicily (C.O.R.)*	72.20
Emilia-Romagna	61.00	Tuscany	68.41
Friuli-Venezia Giulia	57.30	Trento	68.65
Lazio	52.34	Umbria	41.99
Liguria	85.59	Valle d'Aosta	33.34
Lombardy	80.00	Veneto	64.42
Marche	53.97		

Source: Rete Rurale Nazionale (2014)
** Convergence objective regions*

As you can see, Apulia Region shows a progress percentage amounting to 67.8% (see Rural Development Programme, Decision C20139700 of 19/12/2012, updated 30/06/2014; Rete Rurale Nazionale, 2014). Among the Convergence Objective Regions (C.O.R.), Apulia region is the second region, after Sicily, and it is the eighth region among the other Italian regions. This is a positive sign of the good performance related to effectiveness of EU policy at regional level: generally speaking, higher is the progress percentage, lower is the risk of automatic disengagement.

Methodology

The aim of this research paper is exploratory (Easterby-Smith et al., 1991). As regard data collection, in order to preserve the explorative feature of the case, we have combined multiple data sources (Gersick, 1988) by Apulia Authority and the Apulia LAGs. Within EU Leader + programme, pursuant to art. 62 of EC Regulation No 1698/2005, partnered local development approach shall be implemented by LAGs that are the main parties of a bottom-up planning. Each LAG is, in short, a programming tool representing the various socio-economic sectors that brings together all potential public and private parties of the development process (such as trade unions, business associations, businesses, municipalities, etc..) in the definition of a planned policy (Contò et al., 2012). Our data collection is exhaustive because all 25 LAGs, whose actions involve almost entirely, at least for inland areas, the regional territory, are analyzed and investigated with the exception of 3 LAGs - 'Murgia Più', 'Terre dei Trulli e del Barsento' and 'Isola Salento' - as the ranking list is ongoing. These data represent the official database containing all firms information deriving from FMPs, co-financed by EU funds 2007-2013, related to the implementation of Measure 311, Action 1, 2, 3 and submitted by farms to the LAGs. The FMP is a private initiative tool for farms in order to help the LAG in requesting for public aid for the different actions expected in the public notice. Apulia Authority equips farms and LAGs with

a software whose aim is collecting data by FMPs and SIAN (National Agricultural Information System) portal.

In order to access the investment measures of the RDP 2007-2013, the EU legislation (Reg. (EC) no. 1698/2005) requires to present a business plan to bring out the economic and financial sustainability of the proposed investment and more generally, the improvement of the overall performance of the enterprise as a result of the investment admitted to contribution. The business plan provides the elements to assess feasibility and, therefore, constitutes a strategic element on which to base the assessment necessary to ensure the effectiveness of rural development measures (Gorgitano, 2003).

The software, made available by the Apulia Region Entity, includes the construction of the Business Plan by means of:

- a series of basic data about the structure and activities of the farm (e.g. surface, crop, yield, prices etc. that can be derived from the database SIAN);
- a detailed description of the proposed investment (including its financial data);
- some information sufficient to assess the investment impact on some non-economic aspects of business performance (environmental performance, job security, employment aspects, gender equality etc.).

From these input data, the software is able to automatically build the final budget (before) for the two years previous the investment, and a forecast balance (after).

The construction of the final and provisional budgets, consistent in terms of the application of the financial principles, is the necessary basis for the development of additional tools and indicators to assess the firm's performance. In particular, the system allows to analyze financial flows through the development of cash flow and economic and financial analysis based on the construction of budget indicators (Gorgitano, 2003).

This software is structured in three sections: 1. Context analysis and actual budget of farms; 2. Investments (goods and services requested by means application for aid); 3. Forecast budget deriving from the first and second section. Regarding this latter section, our choice for using forecast data is corroborated by eminent scholar (Hirst et al., 2008; Rogers, J.L., & Van Buskirk) that provide a framework in which to view management earnings forecasts. Studies related to range forecasts have evolved to be the most common form of management forecasts (Tang et al., 2015).

We collected the database with these data related to 411 farms representing the total number of firms which have applied for aid in Apulia Authority until November 2013. Every LAG has on average 18 farms submitting the FMPs to LAGs, ranging from 2 farms for the 'Città di Castel del Monte' LAG to 48 farms for the 'Gargano' LAG. The other LAGs with upper number of farms are 'Valle d'Itria' LAG and 'Capo di Santa Maria di Leuca' LAG: these LAGs are overlooking the sea and so the farms falling in ones can be more suitable to not agricultural activities. The average farm size is 41.7 ha. The production regulations was not be considered in this analysis. The individuated variables are as follows:

- *Rev_before* that are the revenues before investment representing the revenues derived from the exercise of non agricultural related activities;
- *Rev_after* that are the revenues after investment indicating the forecast of revenues from non agricultural related activities, obtained from the FMPs implementation;
- *Inv* is the total amount of the expenditure required to implement FMPs;
- *Publ Aid* indicates the net amount of contributions collected by the farms;
- *Farm Size* that is the size of the company in acres;

So, risk capital is obtained by the difference between *Inv* and *Publ Aid.*

The statistical data analysis was performed by an integrated statistical approach consisting in the following four steps: 1) exploratory analysis of the above mentioned five variables: *Rev_before*, *Rev_after*, *Inv*, *Publ Aid*, *Farm Size*; also two new variables were created *Δ_Funds = [Inv - Publ Aid]*, and *Δ_Rev = [Rev_after - Rev_before]*; 2) non-parametric test for paired data (Wilcoxon test) in order to verify the significance of the difference between *Rev_before* and *Rev_after* and so to evaluate the effective positive influence of FMPs; 3) estimate of non-parametric correlation coefficient of Spearman's rho between *Inv* and *Δ_Rev (*$-1 \leq \varrho \leq +1$); 4) tests for differences between the LAGs by means of the ANOVA procedure for the above mentioned variables in order to evaluate differences of farms income among LAGs. Data analysis has been performed using the SPSS 16.0.

Results

The exploratory data analysis for *Rev_before* shows a mean of € 12,301.9 and a skewness to the right, while the *Rev_after* has a mean value of € 59,871.5 (*Table 2*). The variable *Inv* has a mean value equal to € 153,393.0 while *Publ Aid* mean is equal to € 97,377.5. The average *Farm Size* is 41.7 ha. The variables *Inv, Publ Aid* and *Farm size* show a low asymmetry tending to zero. All variables show a high variability, as demonstrated by the values of standard deviations. The box-plot in *Figure 1* shows the greater variability of *Inv* than the *Publ Aid* that appear more concentrated; we have to pay attention to the farm outlier belonging to 'Terre del Primitivo' LAG, that spent € 667,493 such as *Inv vs Publ Aid* that is equal to € 200,000. The values of *Δ_Funds* are more concentrated than the other two variables, except for a few anomalous cases that are outliers: 'Terre del Primitivo' LAG, 'Terra d'Arneo' LAG and 'Capo di Santa Maria di Leuca' LAG. Since the *Rev_before Rev_after* variables were shown to have a non-normal distribution (respectively, the Kolmogorov-Smirnov test for normality $Z = 4.018$, $p < 0.001$ and $Z = 7.919$, $p < 0.001$), we chose a non-parametric test in order to verify the difference between the variables. The Wilcoxon test for paired data (i.e., for each company we analyzed values before and after investment) showed a statistically significant difference ($t = 20.78$, $p < 0.001$). Even *Inv* and *Δ_Rev* variables did not show a normal pattern (respectively, the Kolmogorov-Smirnov test for normality $Z = 3.815$, $p < 0.001$ and $Z = 3.593$, $p < 0.001$) so in order to reach the aim to analyze their correlation, we used the Spearman's rho that showed the value $\varrho = 0.53$, significantly different from 0 ($p < 0.001$). The scatter plot of *Δ_Rev vs Inv* (*Fig. 2*) shows an increasing but moderate trend, with a significant densification of companies for values of *Δ_Rev* and *Inv* less than € 100,000 and greater variability for greater values than this threshold. In particular, we note the excellence of a farms belonging to 'Terre di Arneo' LAG for the highest value of *Δ_Rev*.

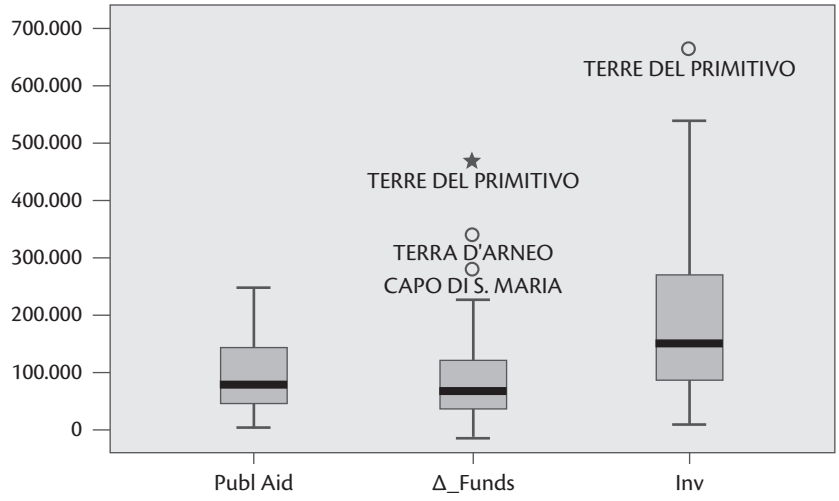
We have to pay attention to the difference between 2 LAGs: 'Terre di Arneo' LAG and 'Terre del Primitivo' LAG. As you can see in *Figure 2*, the first one is an outlier regarding *Δ_Rev* variable - with an investment of € 539,240 euro (and a value of risk capital equal to € 339,240) - while, as you can see in *Figure 1*, 'Terre del Primitivo' LAG is outlier value regarding risk capital (*Δ_Funds*) that is equal to € 467,453 (both farms belonging to two LAGs have a *Publ Aid* value equal to € 200,000). So the value of incidence of risk capital on total investment is equal to 63% for the farm outlier belonging to 'Terre d'Arneo' LAG otherwise is equal to 70% for the farm outlier belonging to 'Terre del Primitivo' LAG. In consideration of the nature of FMPs activities aimed at diversifying activities of rural area, we can explain this difference in consideration of the

degree of area 'attraction' and tourism; as regard 'Terre di Arneo' LAG, it covers a very important touristic area, the Salento, that in recent years is at the forefront as an Italian and international tourist destination (Porto Cesareo, a municipality belonging to 'Terre di Arneo' LAG, is the second touristic destination after Rimini - Central Italy). So developing non agricultural activities by means of the FMPs in this LAG, such as tourism, educational and health activities, is definitely more successful than in the 'Terre del Primitivo' LAG covering a part of Apulia region that is internal and much less touristic.

Tab. 2 - Mean, median, standard deviation (SD) and Skewness of the selected variables

Variables	Mean	Median	SD	Skewness
Rev_before	12,301.9	0.0	37,740.2	5.3
Rev_after	59,871.5	40,000.0	62,560.1	3.4
Inv	153,393.0	153,393.0	113,787.1	0.7
Publ Aid	97,377.5	80,000.0	58,346.4	0.5
Δ_Funds	85,612.9	70,520.0	58,036.6	1.4
Δ_Rev	47,569.6	32,400.0	46,400.7	2.6
Farm size	41.7	18.7	71.0	0.7

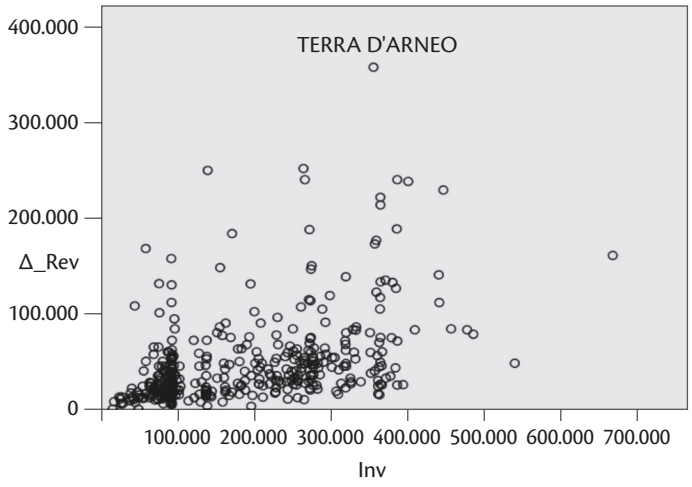
Fig. 1 - Box-plot of *Publ Aid*, *Δ_Funds* and *Inv* (€)



The ANOVA procedure was carried out and the results showed significantly dissimilar differences (p-value <0.001) for LAG, with respect to the seven considered variables (*Table 3).* Therefore the 22 LAGs showed a strong heterogeneity. Further steps are related to investigate the causes that have led to a heterogeneity of investment and public aid (policy markers, pre-existing structural conditions, support strategies, services and info point etc..). The explanation can be due to the essence of Leader approach that is a bottom-up approach with a decision-making

power for LAGs concerning the elaboration and implementation of local development strategies, and multi-sectoral design and implementation of the strategy based on the interaction between actors and projects of different sectors of the local economy. As actors, strategies and multi-sectoral design are strictly lie to environmental, economic and territorial context, results change depending on the considered area. If we pay attention, for example, on the above mentioned LAGs, we can highlight a different shareholding structure that is crucial in determining the effectiveness of a regional policy; in the case of 'Terre d'Arneo' LAG, it is composed by 115 members between local governments and government agencies, trade associations, banks and, in particular, 9 municipalities and 101 private partners; 'Terre del Primitivo' LAG shareholding structure is composed by 11 municipalities and 62 private partners (organizations, professional and trade associations, economic actors) (Rete Rurale Nazionale, 2014).

Fig. 1 - Scatter plot of *Δ_Rev vs Inv* (€)



Tab. 3 - ANOVA results for the selected variables

Variable	df	Mean Sq	F-value	p-Value
Rev_before	21	3261726,370.46	2.46	<0.001
Rev_after	21	9036163,412.65	2.48	<0.001
Inv	21	50276148,759.75	4.50	<0.001
Publ Aid	21	13400142,395.37	4.67	<0.001
Δ_Funds	21	12037676,814.43	4.15	<0.001
Δ_Rev	21	5129190,399.72	2.57	<0.001
Farm size	21	12,976.26	2.81	<0.001

Finally, in line with the aims of this preliminary exploratory research, the results of this study provided an hint on the effectiveness of regional policy such as an essential tool in reaching several objectives including those to promote the development of competitiveness in rural areas.

The results highlights the role that FMPs can have in influencing the variation of revenues and in ensuring a greater share of total income in farms that decide to diversify with investments by means the three Actions of Measure 311 of Local Development Programme.

Conclusions

Research was exploratory, and then, by its nature, needs further empirical validation. The research builds a workable framework for an analysis of economic opportunities and benefits offered by implementation of FMPs. This implementation can lead to develop and promote rural areas and, so increasing the farm income. The theoretical considerations established at the beginning of this paper drew the attention to the importance of investment in the growth process, especially when one is dealing with less favoured regions. Despite the numerous difficulties that can stand out, investment is likely to have a relatively more significant impact, given the expected externalities. The expected results can be consistent with the theoretical and policy review that has been undertaken. The crucial aspect to be remembered is the relevance of diversifying the rural economy in order to modernize and support new activities and so to improve the quality of life in the countryside. Results deriving from analysis of data - before and after FMPs implementation - highlight how favouring an integrated and multi-functional approach is crucial for the revitalizing rural area, so creating innovative organizational models able to develop new jobs and improve competitiveness. In accordance with the literature, a few years are required before the effects of development policy is reflected on the financial statements of individual farms. Therefore, it is necessary a deeper study, taking into account the average revenue related to non agricultural activities after typically 3 years post-investment. Concluding, in consideration of the good performance of Apulia Region about percentage of expenditure of measure 311 on the total of the RDP and analyzing our results, we can say that as regard the effectiveness of EU policy at regional level we have a not high level of risk of automatic disengagement: this can be considered crucial in order to define the importance of the multifunctionality as possible main tool of economic recovery in rural areas. So further steps are aimed at obtaining and analysing the real value of revenues post-investment by means of administrating a web survey to the 411 selected farms.

The comparison between the estimated and real values will be carried out by using statistical methods (e.g. paired t-test) and will also be functional to verify that the business plan instrument is realistic and efficient. In case of significant differences, calibrating business plan software by means of more complex models such as multivariate regressive models or neural networks can be necessary. Confronting business forecast level with the real values is crucial in order to define the effectiveness of a regional policy to avoid a waste of economic resources too; then a impact valuation should be carried out in order to investigate in which measure a defined investment follows the desired direction.

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HEALTH AND GREEN CONSCIOUSNESS IN CONSUMER BEHAVIOR: A CASE STUDY ON ECO-LABELLED FOOD PRODUCTS.

JEL classification: M31; D12; Q56

M. Gregori, F. Nassivera

Abstract. *TThis study examined the antecedent determinants of purchase intentions of minimally processed fresh cut products. In order to gain this purpose we developed a field study that involved 425 consumers. Questionnaires were administered in Italy on a Likert scale. Questions were focused on intentions to purchase fresh cut lamb's lettuce from environmentally sustainable farms, and with this aim we simulated a fresh cut product with an Eco-label. Using Structural Equation Modelling for data analysis, we proposed the approach that sets out two different types of antecedent determinants: health and green consciousness. Managerial implications are proposed to assess how much the consumer's green consciousness affects the attitude and the consequent behavior. Some considerations on managerial implications for new marketing strategies for minimally processed food products are proposed, highlighting the opportunity to take advantage via the potential adoption of an Eco-label.*

Keywords: *consumer behavior; environmental sustainability; fresh-cut products; Eco-label; Linear Structural Relationship.*

1. Introduction

According with Lancaster's (1991) approach, what is creating utility to consumers is not a good *per se*, but a mix of characteristics existing in the product, which are responding to the expectations of consumer. In this study, between the large set of possible attributes generating utility, attention has been focused on the attitude to food product in order to meet to the "health consciousness" (HC) and to the "green consciousness" (GC), e.g. consumers' behavior impact on environment. In several studies, the concept of Health and Green Consciousness has been frequently mentioned as a factor strongly influential on subsequent consumer behavior and consumption in relation to organic food. According to Hamm and Gronefeld (2004), food safety consciousness is the most important buying determinant in most European nations. Moreover, Zanoli and Naspetti (2002), Lockie et al. (2002), Magnusson et al. (2003) and Ureña et al. (2008) all find health to be the most important antecedent determinant in purchase.

Abundant literature on consumer's needs for convenience are correlated with food choice (Grunert et al., 2001; Verbeke, 2001; Verlegh and Candel, 1999). In term of these needs, time saving as first "aspect", an increasing assortment of minimally processed vegetables and fruits has been developed (Ahvenainen, 1996) and proposed in target markets. The term "minimally processing" has been defined in various detailed rules, e.g. as "the least possible treatment to achieve a purpose" (Manvell, 1997).

Numerous studies about the food category of minimally processed vegetables and packaged

fruits focus on microbiological quality, safety, processing and packaging issues (Foley et al., 2002; Luna-Guzmán and Barrett, 2000; Allende and Artés, 2003; Alves de Azeredo et al., 2011). Consequently, more and more companies are trying to adjust their offerings to the new demands. These new demands include the requirement to have information about traceability through the agro-food chains, the origin of the product and its method of processing, its safety as well as the environmental impact of the production. For this reason, an increasing interest is developing in the production and the consumption of environmentally sustainable food. The demand for these environmentally sustainable food products and related services is continually growing. In relation to these changes that affect modern society, it is evident that, for example, if is possible to communicate that a producer is also "environmentally sustainable", the final consumer may be more sensitive to this product attribute. In this way the European Union Eco-labelling Board commissioned a feasibility study to establishing reliable criteria covering environmental performance during the whole life cycle of food products (Couturier and Thaimai, 2013; DG environment EU, 2011).

Consequently, with these premise, the aims of this work were to test the capacity of HC and GC to affect the consumer's attitude and his willingness to pay for a minimally processed food products, with a simulated Eco-label, due to the fact a label that summarize this kind and a wide range of information could alter consumers' purchasing decision. To accomplish this aim, the research was performed on a convenient sample of consumers who were aware of the term "Eco-label".

2. Conceptual framework

2.1 Health and Green consciousness.

Health consciousness expresses the readiness to undertake health actions (Becker et al., 1977). Health-conscious consumers are motivated to improve and/or maintain their health and quality of life (Hartmann, Siegrist & van der Horst, 2013). Previous research has identified interest in health as a primary motive for the purchase of organic food (Grankvist and Biel, 2001; Lockie et al., 2002). In addition, health consciousness has been found to predict attitude, intention and purchase of organic foods (Magnusson et al., 2001, 2003). Although the relationship between health consciousness and attitude has not been uniformly supported in all studies (Tobler,Visschers & Siegrist, 2011; Bravo et al.,2013), our aim was to assess the effects of the measurement scale proposed for this latent construct as antecedent of attitude towards a minimally processed Eco-labelled fruit product.

Numerous studies proposed an investigation of green motivations as determinant of food purchase. Some authors examined the relationships between the natural environment and consumer behaviour (Diamantopoulos et al., 2003), others focused on marketing strategies (Menon & Menon, 1997), public initiatives and macro marketing (Kilbourne & Carlson, 2008). Among environmentally significant activities, the production, trade, and consumption of food products have been identified as crucial contributors to numerous environmental problems (Marques & Almeida, 2013). Several studies have demonstrated that processes involved throughout the entire life cycle of food products, from production to consumption, contribute to emissions of greenhouse gases, farmland erosion, excess sewage, avoidable waste, and loss of species, to name only a few of the negative consequences (Jungbluth, Tietje, & Scholz, 2000). Such changes in production, trade practices, or consumption, are crucial steps in the quest for sustainable development (Ballestrazzi, Mason & Nassivera, 2011). The aim of this study is to add knowledge about how to foster purchases of green food. The extent of consumers' environmentally friendly behaviors

can be facilitated or inhibited by acts of marketers, depending on how green products may be defined. Green food products are generally defined this way: they are domestically cultivated rather than imported from foreign countries; they are organically rather than conventionally grown; they are seasonal and fresh rather than frozen; they are not wrapped; and they support fair trade (Tanner & Kast, 2003). In terms of food products, green is often loosely translated to mean support for organically grown food, when other crucial product features affecting sustainability are neglected by this narrow definition. For instance, conservation practice, innovation in term of water saving process, and recyclable packaging are some of them. According to Brownlee et al. (2013), the role of factors within the individual, such as knowledge, environmental concern, attitudes, norms, and values, could be measured in a psychological environmental research. With this premise our study focused on detection of a measurement scale evaluating the green motivation as antecedent of the attitude towards minimally processed food product with an Eco-label, to investigate the consumer behavior after this kind of information.

2.2 Attitude

According to the Theory of Planned Behaviour (Ajzen and Fishbein, 1980; Ajzen, 1991), attitude has a strong relationships with behavior and behavioral intention in multiple contexts (Kalafatis et al., 1999; Shaw and Shiu, 2002a; Choo et al., 2004). In the context of organic food purchases, Magnusson et al. (2001, 2003) and Tarkiainen and Sundqvist (2005) find attitude to explain purchase intention. In line with this research, we hypothesize that attitude towards minimally processed Eco-labelled food products will positively affect the willingness to pay.

2.3 Willingness to pay

A large body of research regarding consumers' willingness to pay (WTP) for environmental friendliness and/or quality/safety in food production (Ballestrazzi, Mason & Nassivera, 2011; Husted et al., 2014), as well as for non-food products (Vlosky et al., 1999; Laroche et al., 2001; Sexton & Sexton, 2014) or services (Tse, 2001; Johnston et al., 2013) can be found. Prices paid over and above the "fair" price that is justified by the "true" value of the product, may be indicators of consumers' demand for that product (Tse, 2001). WTP for Eco-labelled food products can be a good predictor of these food products demand. Consumers are highly fragmented in terms of their level of environmental awareness and willingness to choose higher-priced environmentally oriented products. Laroche et al. (2001) argue that consumer attitudes towards the environment are very good predictors and antecedent of their WTP more for green products. On the other hand, there is limited information as to how much consumers are willing to "sacrifice" for such products (Uchida et al., 2014). Henson (1996) claims that WTP is the theoretically valid measure of the value consumers attach to improvements of food safety. It is true that the validity of WTP depends on the measurement method followed. In this study the measurement scale for WTP is proposed to evaluate the intention to pay a premium price for minimally processed Eco-labelled fruit products from companies with high environmental sustainability.

3. Proposed model

With the premise of the theoretical framework relating to health and green consciousness as determinant of attitude and willingness to pay for minimally processed Eco-labelled fruit products, in this study is proposed a theoretical model, presented in *Figure 1*, that investigated the

relationships between these constructs with the following hypothesis:

hypothesis 1 (H1): Health Consciousness (HC) have a significant impact on consumer attitude (ATT) towards minimally processed Eco-labelled food product from high environmentally sustainable companies.

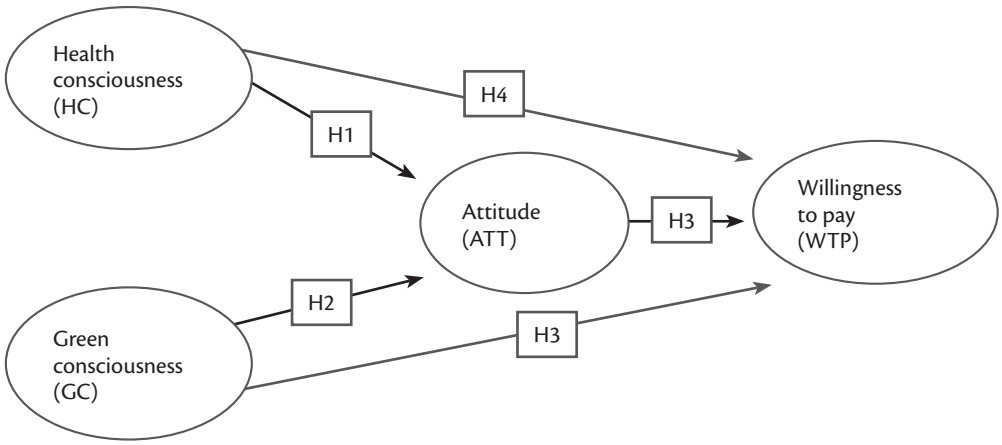
Hypothesis 2 (H2): Green Consciousness (GC) have a significant impact on consumer attitude (ATT) towards minimally processed Eco-labelled food product from high environmentally sustainable companies.

Hypothesis 3 (H3): the attitude towards minimally processed Eco-labelled fruit product from high environmentally sustainable companies (ATT) have a positive influence on willingness to pay (WTP) for this product.

Hypothesis 4 (H4): Health Consciousness (HC) have a significant impact on willingness to pay (WTP) for this Eco-labelled product.

Hypothesis 5 (H5): Green Consciousness (GC) have a significant impact on willingness to pay (WTP) for this Eco-labelled product.

Fig. 1 - The proposed model.



4. Research methodology

The survey was performed in face-to-face modality interviewing a convenience sample of consumers at the exit of two supermarkets located in the North East of Italy in July of 2013 (*Tab.1*). The valid collected questionnaires were 425 and data were gathered on a Likert scale. Questions were focused on intentions to purchase minimally processed fresh cut lamb's lettuce from environmentally sustainable farms, simulating a minimally processed fresh cut product with an Eco-label.

Tab. 1 - Characteristics of the sample (n=425).			
			%
Females			70,3
Age		< 30	25,8
		30 - 50	55,7
		> 50	18,5
Graduates			34,5
Number of people in household		1	8,5
		2	28,1
		>2	63,4
Household with children			41,5
Household with elderly			6,8
Food purchases	Supermarkets / hard discount		98,1
	Small retailer		40,5
	City market		29,6
	Local producers		46,8
	Home sellers		5,6
Consumers of lamb's lattuce			83,3
Consumers of fresh-cut products			73,6

The majority of respondents were females, aged between 30 and 50 years (55,7%), consumers of fresh cut lamb's lettuce (83,3%) and of minimally processed vegetables (73,6%), and generally food purchases are effected at supermarkets and hard discount (98,1%).

From a methodological point of view, data analysis has been done using Exploratory Factor Analysis (EFA) and Structural Equation Modelling (SEM). The exploratory factor analysis, with the Varimax oblique rotation approach, has been used to identify the four latent constructs of the model (HC, GC, ATT, WTP). This is useful to obtain a reduction of the original variables in four latent factors, obtained as a linear combination with minimum loss of information. The reliability of each factor was analyzed by the Cronbach's α coefficient and presented in *table 2.*

Tab. 2 - Constructs and measurement items.			
CONSTRUCTS AND ITEMS	**factor**		
	labels	**loadings**	**α**
Health Consciousness (HC)			0,90
I often think about my health	v2.30	0,782	
I think I'm a person who is attentive to healthy foods	v2.31	0,778	
Be healthy is very important for me	v2.29	0,773	
I am very attentive to the effects on my health derived from what I eat	v2.32	0,758	
Green Consciousness (GC) on products from companies with high environmental sustainability			0,73
Improve the lifestyle of myself and my family	v3.2	0,773	
Improve the way of life of future generations	v3.1	0,714	
Could solve the problems of environmental impact	v3.5	0,704	
Recycle is important to conserve natural resources	v4.9	0,786	
Attitude (ATT) towards minimally processed Eco-labelled food product			0,79
I expect to consume them as soon as possible	v3.12	0,710	
I'm going to buy them as soon as possible	v3.13	0,700	
I could easily recognize them	v3.11	0,657	
Willing to pay (WTP) for minimally processed Eco-labelled food product			0,91
I am willing to pay 10% more for products from companies with high environmental sustainability	v4.11	0,918	
I am willing to pay 10% more for products with Ecolabel	v4.10	0,900	
I am willing to increase purchases of products from companies with high environmental sustainability.	v4.12	0,758	

The Structural Equation Model (SEM) was implemented with the Linear Structural Relationship (LISREL) method, using the LISREL 9.1 software (Joreskog and Sorbom, 2012). The analysis conducted with LISREL allowed testing the hypothesis imposed in the proposed causal model. It was evaluated via several fit measures, which suggest a reasonably good model fitting according to the quoted literature.

5. Results

According to the results of data analysis via EFA, the four tested constructs have a good reliability, tested by Cronbach's α coefficients, which values are in two constructs, HC and WTP, more than 0,9 and for two constructs, ATT and GC, more than 0,7.

The fit indexes of the model are produced in order to verify how well the hypothesized model reproduces the observed covariance matrix, using the χ^2 test, Goodness of Fit Index (GFI) and

Adjusted Goodness of Fit Index (AGFI), the incremental fit indexes (Normed Fit Index (NFI)), the Non-normed Fit Index (NNFI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA).

The fit indexes summarized in *table 3*, proposed by SEM analysis, confirmed the existence of the direct causal effects between the latent variables HC, GC, ATT, WTP. These relations support the hypotheses H2, H3, H4 and H5, and the same with the indirect effect of GC on WTP mediated through ATT.

Tab. 3 - Main indexes of model fitting.

Global fit indexes	Value	gdl
GFI	0.90	
AGFI	0.85	
NFI	0.93	
NNFI	0.92	
CFI	0.94	
RMSEA (Test of Close Fit)	0.076	
$\chi 2$	348.06	71
$\chi 2$/GDL	4.90	

The results indicated a good fit between the model and the observed data and allowed analyzing the assumptions of the hypothesis presented in *table 4*.

Tab. 4 - Direct and indirect effects between the constructs.

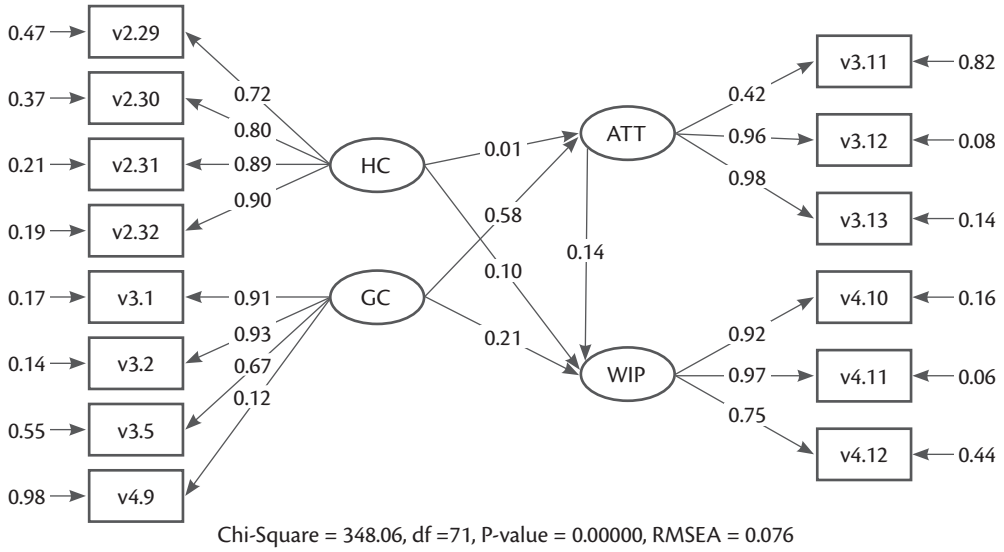
Hypothesis	Estimate (Standardized)	s.e.	t
Direct effects			
(H1) HC → ATT	0.01	0.04	0.23
(H2) GC → ATT	0.58	0.04	7.46
(H3) ATT → WTP	0.14	0.14	2.22
(H4) HC → WTP	0.10	0.09	2.02
(H5) GC → WTP	0.21	0.06	3.28
Indirect effects			
HC → WTP	0.10		
GC → WTP	0.29		

Analyzing the estimates of the causal imposed relationships, the results are the following:

a. GC has a positive impact on WTP directly and indirectly mediated via ATT construct;
b. GC is a solid antecedent of ATT towards products;
c. HC construct has less directly and indirectly impacts on WTP;
d. GC has a positive impact on WTP, stronger than HC.

Figure 2 presents the path analysis with its standardized estimates of causal relationships between variables.

Fig. 2 - The generated LISREL model (for the meaning of variables see tab.2).



6. Conclusions, managerial implications and limitations.

The minimally processed fresh cut products, from companies with high environmental sustainability and proposed with an Eco-label, are perceived more as products reducing the environmental impacts of cultivation than products affecting positively on health of consumers.

This implies important managerial implications for new marketing strategies for minimally processed food products, as:

a. the adoption of an Ecolabel, as tool for supporting the perception of lower environmental impact of fresh cut products, which characterize the evolution of consumer needs of minimally processed food products, could be a positive element of a strategy to strength the WTP.
b. The additional positive impacts of fresh cut products, as the lower contain of nitrates, are perceived by consumers minimally and they affect marginally the attitude towards products and the willingness to pay. This kind of benefits must be more stressed in the communication to the consumers.

The conclusions are relevant for both policy makers and market operators. Policy makers should stress the use of labelling for enforce informed buying behaviour not only for environmental protection, but also for health safety. Retailers of this kind of food product could plan their marketing strategy accordingly to the reactivity of the consumers not only for aspects related to attributes of environmental sustainability expressed by an Eco-label, but also on the communication focusing on the healthiness of the product.

Limitations and some weaknesses of this study are mainly regarding the sample characteristics, in terms of need to expand the sample in different countries of European Union.

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IMPACT OF THE CAP POST 2013 ON LAND MARKET. THE CASE OF THE PISA PROVINCE

JEL classification: Q1 Agriculture - Q18 Agricultural Policy • Food Policy

F. Bartolini, G. Brunori, O. Gava

Abstract. *TOver the last twenty years, the role of agricultural policy in changing the demand for productive factors had been widely studied, emphasising the role of Agricultural Policy reforms' impacts on land demand and land market. The CAP has been recently restyled. In October 2011, the European Commission first released the CAP reform proposal (COM(2011)625/3). The CAP 2014-2020 encompasses a revision of the first pillar policy and some novelties within the second pillar policy. In Italy, the reform also includes the introduction of uniform payments (regionalisation) with partial converge mechanism (so-called "Irish model"). The objective of the present paper is to provide an ex-ante analysis the main instruments of the CAP 2014-2020. The paper focuses on two novelties under Pillar I, i.e. the shift to regionalised payments and the introduction of the greening. The paper evaluates the extent to which the new CAP could affect land demand by estimating farm households' willingness to pay for additional land. A case study in Pisa Province is developed. The results point-out that the new instruments under the reformed CAP would not uniformly affect farms types and could lead to changes in the demand. Alternative policy designs can significantly affect the willingness to pay and hence shows capitalisation effects.*

Keywords: *land market; Common Agricultural Policy; Mathematical Programming Model; Capitalization; Willingness to Pay.*

1. Introduction

Over the last twenty years, the role of agricultural policy in changing the demand for productive factors had been widely studied (see, e.g., Harrington and Reinsel, 1995; Ahearn et al., 2005; Happe et al., 2008). More specifically, several Authors highlighted Common Agricultural Policy (CAP) reforms' impacts on land demand and land market, each being a key variable and a constraint on farm household models (Piorr et al., 2009).

The CAP has been recently restyled. In October 2011, the European Commission first released the CAP reform proposal (COM(2011)625/3). The proposal had been debated for roughly two years before the European Parliament and the Commission came to the agreement in June 2013. In August 2014, the new CAP was officially approved by the member states. The CAP 2014-2020 encompasses a revision of the first pillar policy and some novelties within the second pillar policy. In Italy, the main innovations are as follows: a) the introduction of "active farmers"; b) the introduction of the basic payment scheme, encompassing the shift from a historical to regional allocation system, with payments becoming proportional to the operated farmland, and the partial converge mechanism (so-called "Irish model"); and c) the disentanglement of the direct payment into four components, each contributing to the reward, i.e. (i) active farmers, (ii) green

direct payment ("greening"), (iii) disadvantaged areas, and (iv) young farmers and small farms.

Recent scientific evidence has suggested that shifting the entitlement allocation system from a historical to a (partially) regional model would deeply affects land demand in Italy (see Bartolini and Viaggi, 2013; Puddu et al., 2012; Puddu et al., 2014), due to the abolishment of the eligibility constraints, which in practice forces farmers to cultivate eligible crops to activate the entitlements. Other authors shows very high capitalisation effects of the payment on the rental value (Latruffe and Le Mouël, 2009; Povellato; 2013)Moreover, the ratio between eligible and operated land may significantly differ among farmers, due to the divergence between historical endowments over the reference period and current uses.

The objective of the present paper is to provide an ex-ante analysis of some instruments of the CAP 2014-2020. We focus on two novelties under Pillar I, i.e. the shift to regionalised payments and the introduction of the greening. Specifically, we estimate the impact on land demand and simulate the effects on land market. Additionally, we provide a mathematical programming model by which we attempt to show the potential effects of the new direct payment system. We evaluated the extent to which the new CAP could affect land demand by estimating farm households' willingness to pay for land. We calculated the change in shadow prices that result from renting-in one additional unit of land. This allowed assess the willingness to pay. The shadow prices are associated with observed land use constraints.

The model is tested to a subset of farming systems in the Pisa Province (i.e., arable, horticulture and permanent), selected for their diffusion within the province and for their likelihood to be affected by new policy regimes (Viaggi et al., 2013).

As a whole, our work show that the new instruments under the reformed CAP would not uniformly affect the different types of farms and could lead to changes in the demand for land. Alternative policy designs can significantly affect land demand and, hence, rental prices.

The rest of the paper is organised in four sections. The first section provide details on the theoretical model behind the paper. The second section is dedicated to the methodological approach. The third section is for presenting and discussing the results of our work. The fourth and final section includes concluding remarks, reflections on the limits of the paper, as well as suggestions for policy makers and insights for further research.

2. Theoretical model

In agricultural economics, land use and its connections with policy are studied under three different perspectives, i.e. i) the change in land tenure preferences, ii) the capitalization of payments into farmland selling or rental prices, and iii) the effects of the policies on land demand, land markets, and land reallocations (Viaggi et al., 2013). Here, we focus on policy impacts on land market. Econometric and statistical methods and mathematical programming modelling are major approaches to this issue (Zimmermann et al., 2009). Mathematical programming is rather used to simulate the ex-ante impacts on land demand and the changes in land prices (i.e. purchase and rent agreements), as well as to test different hypothesis about relevant parameters, such as price level change, payment amount, and cost of labour or other inputs (see, for example, Galko and Jayet, 2011).

Given a fixed policy scenario and an initial land endowment, marginal changes in land demand result from the WTA (willingness to accept) or the WTP (willingness to pay) for land, both being functions of household's geographical location, as well as of farmers' and farm's char-

acteristics (Bartolini and Viaggi, 2013). A generic farmer would claim for additional land when his WTP for land exceeds the sum of rental prices (r) plus transaction costs (tc_{in}) (Deininger et al., 2008; Bartolini and Viaggi, 2013): WTP > $r + tc_{in}$. Conversely, the farmer would shrink the surface of operated UAA (utilised agricultural area) when its WTA land is inferior to the r (received) minus the tc for renting out land (tc_{out}): WTA < $r - tc_{out}$. However, no single farmer's demand for land would change when the sum of r plus tc exceeds the WTP, while the WTA exceeds the r (received) minus the related tc: WTP < $r + tc_{out}$ and WTA > $r - tc_{in}$, respectively. Agricultural economists had widely studied the impact of transaction costs (tc) both on the demand for land and on the market of land. Total tc depend on transactions' frequency and asset, farmers' characteristics, quality of social relationships, reciprocal trust among people, and institutional factors (Williamson, 1996; Allen and Lueck, 2003; Ciaian et al., 2012). When considered together, tc and land demand changes account for the sum of total time spent for collecting information about the availability of rentable land rent plus contract registration cost. Time spent for searching farmers interested in renting-in land is an additional tc. As tc grow, the number of transactions decrease, thus pushing up rental prices.

3. Methodology

We propose a methodology divided into three sequential steps, i.e. i) identification of representative farm households, ii) development of policy scenarios, and iii) simulation farmers' behaviour. The following paragraphs provide details on each step.

3.1 Identification of representative farm households

This study refers to farms located within Pisa province of the Italian region of Tuscany. Following a common procedure of agricultural economics analyses (see, e.g., Bartolini and Viaggi, 2012), we preferred to perform the simulation by using representative (built) farms identified *via* cluster analysis, rather than real farms. Cluster analysis helps clearly discriminate among groups of homogeneous farms. In addition, median values for single group characteristics can be used to create farm profiles representative for each group of farms (see, e.g., Galko and Jayet, 2010). The cluster analysis returned 33 groups of homogeneous farms[1]. Policy impacts were quantified via scenario analysis.

3.2 Development of policy scenarios

We simulated CAP post-2013 impacts on changes in land demand by developing four alternative policy scenarios, each relying on a specific assumed combination of payment scheme and greening requirements. We built an additional scenario encompassing the complete abolishment of the CAP to capture the full effect of the payment scheme. Table 1 provides an outline of the main assumptions under which alternative scenarios were built.

[1] Cluster analysis is conducted on a subset of farms from the Italian 2010 agricultural census. The subset was made of all farms located within the boundaries of Pisa province (4868 farms), but for very small farms, i.e. farms operating less than 1 ha were excluded from the subset. The groups were highlighted using the k-means non-hierarchical clustering method. The group with the higher Calinski/Harabasz pseudo-F value was used to identify the other groups. Distinctive variables of cluster groups are farm size, amount of basic payments received and amount of household labor allocated to on-farm activities. Collinearity among selected variables was pointed out through a pairwise correlation test. The test returned low correlation coefficients among variables; specifically, the correlation coefficients are as follows: 0.4243 for pair farm size and amount of basic payments; 0.2843 for pair farm size and household labor allocated to on-farm activities, and 0.1135 for household labor allocated to on-farm activities and amount of basic payment received.

Tab. 1 - Main features of policy scenarios.

Scenario	Code	Entitlement allocation mechanism	BPS level	Rights	Cross compliance	Greening conditionality
Baseline HC 2008	ba	Historical	–	Current entitlements	Existing	–
Irish model	rp	Regionalised	Partial convergence	No entitlements; payment per ha UAA; all crops eligible	Existing	30% BPS
Full convergence 2015	rp1	Regionalised	Full convergence by 2015	No entitlements; payment per ha UAA; all crops eligible	Existing	30% BPS
Full convergence 2020	rp2	Regionalised	Full convergence by 2020	No entitlements; payment per ha UAA; all crops eligible	Existing	30% BPS

BPS: basic payment scheme; UAA: utilised agricultural area; Greening requirements: (i) crop diversification; (ii) ecological focus areas; (iii) measures to maintain permanent grassland

"Baseline HC 2008" scenario (*ba*) frames farms' state in 2013, under the 2008 CAP "Health Check". Under *ba*, firms receive the single farm payment (SFP), with entitlements being assigned on the basis of historical data. "Irish model" scenario (*rp*) differs from *ba* for the introduction of both historical payments based on partial convergence (Irish model) and the greening measures. As alternative scenarios to *rp*, we propose "full convergence 2015" (*rp1*) and "2020" (*rp2*), which encompass the implementation of uniform payments per hectare UAA (flat rates) by 2015 and by 2020, respectively[2]. As a result, the reference level for the basic payment under *rp* (nearly €173.35/right)[3] corresponds to the flat rate payment under both *rp1* and *rp2*.

3.3 Simulation of farmers' behaviour

We simulated farmers' demand for agricultural land in response to policy changes by mathematical programming modelling. As a rational behaviour, farmers aim at maximising the net present value (NPV) of their firm's profits. Equation 1 depicts NPV maximization (max *NPV*).

$$\max \text{NPV} = \sum_{n=1}^{N=2020} \pi^n (1+i)^{-n} \quad (1)$$

Where, π^n is the farm household profit in a generic year *n*, given the rate of return (*i*) over the entire period (*N*), i.e. 2014-2020. The profit equation is as follows (Eq. 2):

$$\pi^n = x_i (I_i - c_i) - x_i^d k_i + BP_c * ent - x1_{in} * P_{in} + x1_{out} * P_{out} - x_j * p_j \quad (2)$$

s.t.

[2] Collectively, we refer to *rp*, *rp1*, and rp2 as "regionalised" scenarios.

[3] The reference level is given by the overall amount of basic payment received divided by the surface area of eligible land (Frascarelli, 2014).

$$\sum_i x_i = x1_{ow} + x1_{in} - x1_{out} \quad (3)$$

Where the subscript *i* indicate a generic crop; *I* is farm income; *c* stands for variable and fixed farming costs; BP_e is the basic payment per entitlement and *ent* is the highest possible number of farmer's entitlements; l_{in}, l_{out} and j respectively stand for renting-in, renting-out and labour activities, with p_{in}, p_{out} and p_j being the relative costs. Equation 3 is land demand equation. Land and crop variables involved in NVP calculation are subject to the below technical and non-negativity constraints:

$$\sum_i x_i * a \leq A$$

$$e \leq ent$$
$$x1_{in} \geq 0$$
$$x1_{out} \geq 0$$

$$\sum_i x_i > 0$$

Where *a* is a unit of UAA and *A* is the optimal farmed area (see Severini and Valle 2011; Bartolini and Viaggi, 2013).

Due to the short time period, we assume that the rental market is the only active market of land; thus, farmers can either rent or rent-out some land, respectively to increase or shrink their farmed UAA. Modelling a short time span allow also consider the fixed factors as constants, so that variable factors only need adjustment.

Given their tight relationship with land value, rental prices are a major research topic within the field the assessment of CAP's impacts on land market (see, for example, Bartolini and Viaggi, 2013). Apart from the profitability of agricultural activities tied to land demand, rental prices can dependent on other factors, e.g. geographical location and topography, life cycle hypothesis, and credit markets, to cite some (see Swinnen and Knops, 2013 for a review). It is worth noting that the selected time span is too short to allow a coherent simulation of farmers' behaviour with respect to investments; hence, neither the purchase nor the rental of land can be robustly investigated (see Puddu et al., 2012 for an analysis of policy impact on land demand covering both rental and purchase markets).

Data used for the simulation result from the merge of Italian Agricultural Census 2010 *micro-data* with ARTEA (regional payment agency of Tuscany) database. ARTEA data covers all payments received by farmers from 2005 to present. We supplemented ARTEA data with primary data from expert interview about the dynamics of land market and land prices.

4. Results and discussion

the two tables below (Table 2 and 3) provide model's results. Farm clusters (CL1 to CL33) are classified according to their specialization into arable, vegetable and permanent clusters.

The outcomes of "Baseline HC 2008" scenario are presented in Table 2.

Tab. 2 - Model results under baseline scenario

Cluster	Specialization	Topography	NPV (*1000 €)	Operated UAA (ha)	Rented-in UAA (ha)	SFP (€/year)	SFP per ha (€/year)
CL1	Arable	Plain	48,749	5.20	0.68	713	137
CL2	Arable	Plain	1,068,879	143.99	53.88	25,433	177
CL3	Arable	Plain	372,149	50.00	16.00	8,297	166
CL4	Arable	Plain	2,874,602	316.27	104.18	72,570	229
CL5	Arable	Hilly	749,075	75.99	7.84	15,715	207
CL6	Arable	Hilly	115,464	18.50	2.50	3,365	182
CL7	Arable	Hilly	394,233	62.79	15.39	10,610	169
CL8	Arable	Hilly	1,379,133	249.54	92.86	34,069	137
CL9	Arable	Hilly	2,510,397	460.00	180.00	71,485	155
CL10	Arable	Hilly	246,904	37.62	6.62	6,630	176
CL11	Arable	Hilly	21,054	9.67	2.34	-	-
CL12	Arable	Hilly	1,099,071	135.66	40.44	22,821	168
CL13	Arable	Hilly	4,753,901	870.12	270.33	-	-
CL14	Vegetable	Plain	190,811	3.31	0.64	-	-
CL15	Vegetable	Plain	177,456	7.05	0.05	804	114
CL16	Vegetable	Plain	251,209	40.90	2.34	10,296	252
CL17	Vegetable	Plain	414,675	21.94	8.36	3,396	155
CL18	Vegetable	Plain	543,498	25.63	5.68	1,603	63
CL19	Vegetable	Hilly	1,312,442	76.78	38.39	7,992	104
CL20	Vegetable	Hilly	583,790	21.00	-	3,597	171
CL21	Vegetable	Hilly	8,472	4.67	1.45	-	-
CL22	Vegetable	Hilly	50,360	5.30	1.03	-	-
CL23	Vegetable	Hilly	120,130	23.50	7.50	-	-
CL24	Permanent	Plain	30,878	2.56	0.06	-	-
CL25	Permanent	Plain	204,014	36.94	-	13,192	357
CL26	Permanent	Plain	1,258,246	150.00	-	135,299	902
CL27	Permanent	Hilly	1,471,623	58.36	8.14	12,314	211
CL28	Permanent	Hilly	430,467	44.20	8.70	6,632	150
CL29	Permanent	Hilly	391,062	16.42	1.46	3,133	191
CL30	Permanent	Hilly	179,704	9.12	1.12	1,553	170
CL31	Permanent	Hilly	19,596	2.24	0.12	-	-
CL32	Permanent	Hilly	1,330,428	158.88	8.88	37,541	236
CL33	Permanent	Hilly	44,085	3.70	0.35	547	148

NPV: net present value; SFP: single farm payment; UAA: utilized agricultural area

According to our analysis, under *ba* most clusters behave similarly with respect to land demand, looking for land to rent to increase the operated UAA. Received SFPs are highly heterogeneous both within and across the three specialization categories. When entitlements are allocated on a historical basis, the share of arable clusters granted with direct payments (85%) exceeds that of other specialization clusters (80% vegetable and 60% permanent clusters). Overall, arable cluster SFP are also more homogeneous that those of other specialization clusters, with the highest figure being 1.7, 2.3, and 6.1 times the lowest for arable, vegetable, and permanent clusters, respectively.

Changes in first pillar payment schemes have a negligible impact on small farms (Viaggi et al., 2013), thus we excluded farms operating less than 1 ha from the sample. This approximation lead to overall higher SFPs than the expected ones.

Across the sample, SFPs are heterogeneous, ranging from €63/ha/year (CL18) to €902/ha/year (CL26), with an average value of €205/ha/year. This variety is mainly due to existing differences in both the amount of collected rights and the unitary payment level per farm.

Additionally, SFPs differ across farm clusters with unlike topographic features, with 42% clusters located in plain areas and 29% clusters located in hilly areas receiving unitary payments above the reference level, i.e. nearly €173/right (Frascarelli, 2014).

Table 3 displays the results from "regionalised" scenarios (*rp*, *rp1*, *rp2*) modelling. The figures refer to changes of both the operated UAA and its relative marginal rental value with respect to *ba*.

Tab. 3 - Policy impact on land demand (% change UAA and % change WTP[4]).

Cluster	Farm type	Topography	rp		rp1		rp2	
			t1	t2	t1	t2	t1	t2
CL1	Arable	Plain	-	-	-	-	-	-
CL2	Arable	Plain	33.56	36.12	61.52	57.45	-	48.16
CL3	Arable	Plain	1.39	-	-	-	-	-
CL4	Arable	Hilly	-	-	-	-	-	-
CL5	Arable	Hilly	-	-	-	-	-	-
CL6	Arable	Hilly	4.73	-	3.52	-	-	-
CL7	Arable	Hilly	-	-	-	-	-	-
CL8	Arable	Hilly	-	-	-	-	-	-
CL9	Arable	Hilly	59.91	-63.88	45.27	-41.72	1.39	- 9.09
CL10	Arable	Hilly	-	-	-	-	-	-
CL11	Arable	Hilly	3.56	-	1.15	-	-	-
CL12	Arable	Hilly	-	-	-	-	-	-
CL13	Arable	Hilly	-	-	-	-		-11.75
CL14	Vegetable	Plain	-	-	-	-	-	-
CL15	Vegetable	Plain	-	-	-	-	-	9.65
CL16	Vegetable	Plain	-	-	-	-	-	-
CL17	Vegetable	Plain	-	-	-	-	-	-
CL18	Vegetable	Plain	-	-	-	-	-	-
CL19	Vegetable	Hilly	-	-	-	-	-	-
CL20	Vegetable	Hilly	5.43	5.61	9.35	9.35	-	9.35
CL21	Vegetable	Hilly	3.23	4.10	3.33	5.35	-	5.11
CL22	Vegetable	Hilly	2.24	8.06	8.06	8.06	-	8.06
CL23	Vegetable	Hilly	-	-	-	-	-	-
CL24	Permanent	Plain	-	-	-	-	-	-
CL25	Permanent	Plain	-4.64	-2.20	-4.64	-1.09		-3.23
CL26	Permanent	Plain	-	-29.57	-	-29.19	-	-89.40
CL27	Permanent	Hilly	-	-	-	-	-	-
CL28	Permanent	Hilly	-	-	-	-	-	-
CL29	Permanent	Hilly	-	-	-	-	-	-
CL30	Permanent	Hilly	-	-	12.15	12.15	-	-
CL31	Permanent	Hilly	7.84	-	7.84	-	-	-
CL32	Permanent	Hilly	87.90	-16.32	16.17	16.17		68.71
CL33	Permanent	Hilly	-	-	-	-	-	-

rp: "Irish model" scenario; rp1: "Full convergence 2015" scenario; rp2: "Full convergence 2020" scenario; t1: treatment 1; t2: treatment 2

[4] Accurate WTP estimation should include a broad range of data, e.g. market value, not market value and option value. In this paper, the shadow price for a unitary increase of the surface area of the operated UAA is considered a proxy for the WTP. The approximation is allowed by private agent involvement and strict limitation to the rental market.

Changes in the marginal rental value measure the extent to which renting one additional ha UAA would push farmers' objective function (NPV) up. In agricultural economics, changes in farmers' marginal value and WTP are generally referred to as benchmarks to quantify rental price changes (Galko and Jayet, 2010). In fact, the model returns changes in the objective function, when one additional unit of land is added. As a result, the marginal value can capture changes in the WTP for one additional ha of land.

The shift from a historical to a regional system for entitlement allocation lead to changes in marginal rental value for most simulated clusters. The introduction of the regionalized determines a reduction in WTP for the majority of clusters (*rp*). Among them, the larger part of clusters show a relatively low increase (about 5%) which was consequence of the slights increases of payments. This result is expected due the introduction of both the gradual convergence to a flat rate and with the introducing of ceiling at convergence. This is not surprising considering that the clusters have both entitlement endowments above the average and the highest share of eligible ha UAA of all clusters. The contemporaneity of basic payment reduction with greening commitments lead shadow price to decrease in two clusters, i.e. those with the highest level of payment per ha and the highest overall grant. The ecological focus area requirement of the greening also contributed to both shadow price and direct payment reductions.

For some clusters, adjustment effects occurs over time. In fact some cluster show different changes between the two time period as a consequence of changes in the payments level across periods finally the clusters with the highest payment per ha under *ba* would see shadow prices fall with direct payment converging to a flat rate by the end of 2019.

Both *rp1* and *rp2* encompass a ceiling. Under those scenarios, the changes in clusters' marginal rental value are higher that under the "Irish model", as the ceiling mechanism allow price adaptation and gradual transition towards the regional allocation system. Under both *rp1* and *rp2*, changes occur in a high number of clusters and the magnitude of shadow price change is higher than under *rp*. Those findings are in line with previous literature on the impact of the shift from historical to regionalized payments (Puddu et al., 2014).

Overall, the results of our work confirm previous literature findings pointing out that first pillar payments help farmers maintaining agricultural land operated (Bartolini and Viaggi, 2013) and that the major effects on rental market are due to the introduction of regionalized payments (Povellato 2013).

5. Conclusions

This paper attempts to provide empirical evidence about the impact on land demand of major novelties in first pillar payments under the CAP post-2013. We used mathematical programming modelling to simulate the effects of alternative policy scenarios on a sample of Italian farms from the province of Pisa (Tuscany). Changes in the marginal value of land were used as proxies for farmers' willingness to pay for expanding their actual farmland. Model results highlight that the shift from historical to regional payments would lead to higher changes in land demand than other tested policy instruments. Our findings point out the ability of the new basic payment scheme to determine land demand changes and support previous literature (Povellato, 2013; Puddu et al., 2014). Model outcomes show that the new policy mechanism would have heterogeneous impacts on farm clusters. For some clusters, for example, the new CAP could lead to a significant decrease of the overall land demand, with potentially detrimental effects

on land rent values. Foreseeing coupled payments for specific sectors may make the negative impact milder. For example, livestock, cereal and olive farms would significantly benefit from coupled payments. Coupled payments would allow lower changes in land demand or in land rental demand for those three farming sectors.

Taken as a whole, our findings confirm the overall decrease in land demand and land market activity, due to the introduction of rationalised payments, and show that impacts are different on different representative farms. Entitlement endowments, unitary payment level, and share of eligible land over the total UAA are the main drivers of the impact. We found that direct payment convergence to a flat rate (the so-called "Irish model" chosen by Italy) should affect only slightly the change in land demand, due to the gradual adjustment allowed by the convergence mechanism The paper has several limits. For example, we attempted to simulate policy changes before legal amounts of regionalisation payments and level of coupled payments were proposed. Having being conceptualised in an early stage of the process that lead the CAP 2014-2020 to the final approval, the proposed model does not encompass coupled payments; moreover, in that stage the exact amount of the prospective basic payment was unknown. Effects of CAP's Pillar II payments on land prices and milk quota abolishment on land prices were not modelled either. Other Authors had already prospected at least two positive impacts of second pillar payments on land prices. E.g., Floridi et al. (2013) have found that the co-founding investment can help cut cost associated to scale economy strategies, thus promoting operated farmland expansion, with increased land demand, Pufalh and Weiss (2009) and Bartolini and Viaggi (2013) have pinpointed that payments for less favourable areas, or the agri-environmental measures, may raise land demand, especially in marginal areas, by increasing returns for grassland management and arable cropping. Moving to milk quota abolishment, the province under study hosts few large dairy farms, with overall low impact, compared to other regions in Italy (e.g. Emilia Romagna) or other provinces in Tuscany (e.g. Grosseto) where herds are bigger. An additional shortcoming of the paper arises from not having analysed uncertainty and risk in farming activities, both of which can affect farmers' behaviour. That research choice informed Authors' modelling approach. Specifically, having no assumptions on farmers' utility preferences, nonlinear modelling could overestimate farmers' copying strategy, thus returning higher WTP for additional hectares of land. Here, the research focus is on the influences of the new CAP on land demand. Including other variables with relevance for the land market, such as e.g. adverse weather conditions, climate change, and credit constraints, could lead to different results. Finally, the paper does not encompass land market simulation, rather using the marginal value as a proxy for land demand changes. Thus, our model covers neither interactions nor reciprocal strategic influences among farmers, that depend on attitude towards risk of single farmers or farm households. Indeed, including the above mentioned factors may provide a more realistic picture of land market in the case study area. To aim at inclusiveness, further research should entail the modified policy framework under the new CAP as a whole, model farmers' attitude towards risk, consider the investment component of farmers' behaviour and simulate the interactions among different cluster. Nonlinear modelling approaches could improve analysis' outputs.

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RESILIENCE OF AGRICULTURE IN A RURAL-BASED ECONOMIC DEVELOPMENT MODEL: THE LOCAL SYSTEMS OF THE MARCHES

JEL classification: R12, Size and Spatial Distributions of Regional Economic Activity; R52, Land Use and Other Regulations

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Abstract. *The paper aims at giving a description of the actual territorial diffusion in the Marches of the integration between the structures of the agricultural activities and the ones of other industries, interpreting the different capabilities of farming to interact and integrate with industries, giving sense to local industrial agglomeration and development. For this purpose, we have considered the 'geography' of the regional territory in 31 LLSs (Local Labor Systems of ISTAT) gathering socio-economic statistical data and elaborating them in order to model the territorial patterns of integration between farming and non-agricultural industries. Results show the capability of farming to interact with local labor markets, integrating industrial culture and labor calendars. Results give also sense to the social resilience of agriculture and light regional industrialization, offering some suggestions to eventually get better rural and agricultural policies, from a territorial viewpoint.*

Keywords: *The Marches, agriculture, statistical analysis, territorial integration, urban-rural areas.*

1. Introduction: Research Focus and Question

The Marches are an Italian region where the consistency between economic development and quality of life has been very high, in terms of several possible features of civicness. Economic history scholars have largely shown that this consistency derives from the preceding rural society, which was capable of generating a 'light industrialization', fostering its own community cultural resources founded on reciprocity (Anselmi, 1990). This model of industrialization has been based on many Marshallian districts (Becattini, 1987; Becattini et al., 2009), namely on features very different from those of big companies industrialization. These features are: (i) the diffusion of a large population of small firms, extremely specialized and strictly networked by dense input-output relations; (ii) the productive development due to the proliferation of the number of firms and not to the increase of unit dimension; (iii) a high human activity level (high L/Y ratio); (iv) a quite fair revenue distribution, due to social contiguity between entrepreneurs and workers, and in any case corrected by an effective redistribution policy performed by local authorities (Becattini, 1987; Becattini et al., 2009).

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Moreover, in a territorial perspective, the main feature of the Marchigian districts is that of having originated within the old networks of small towns and even smaller urban centers, embedded in a densely populated countryside. In the related social environment, namely the 'urbanized countryside' *à la* Becattini (1975), the urban and rural components, as usually defined, are so intertwined to be hardly distinguishable. Following this feature, we can argue that in the Marches the relations between the present urban and the past rural societies are so dense that the region can be selected as a significant case-study by researches interested in focusing on the role of agriculture in the economic development processes. A high economic development coexists with a largely diffused rural memory (institutions and habits) which is the principal background of the current social culture (Anselmi, 1990), determining a quite original socioeconomic model, capable of merging material wealth with immaterial wellbeing (Fondazione Censis, 2002). Also a progressive concentration of residents and activities along the Adriatic Sea coast took place After World War II, stemming from the same social culture of people migrating from the inner areas (Corinto, 2014).

Anyway, in the Marches, agriculture has always and everywhere integrated its features with other productive sectors in a very peculiar and variable manner, originating different forms of co-existence within local markets of productive factors, specially the labor market (Calafati & Mazzoni, 2006; Corinto & Musotti, 2012). Moreover, the recent development of rural and farm tourism - the sole type of tourism capable of increasing sleeping accommodation - gave a clear and further drive to the integration between farming and non agricultural industries, both in the pretty rural areas and in the urbanized or industrialized ones and their neighborhoods (Corinto, 2014).

Our research aims at giving an interpretation of the actual territorial type of integration between agricultural activities and other industries, assuming the 'light industrialization' model (Becattini, 1999) as a general framework, and then asking if farming has different capabilities of interacting and integrating with other industries, thus giving a specific sense to the local industrial (and urban) agglomeration and development. More in general, our research can be considered within the geo-economic studies on the urban sprawl which triggered an increasing 'farming rarefaction' in several areas of the world where urbanization caused a large and complex consumption of land. This kind of studies, originated in the United States, have been approached since many years even by European scholars (European Environment Agency, 2006; United Nations-HABITAT, 2008; European Environment Agency, 2009) and in such an Italian region as the Marches, characterized by an old and dense 'inter-penetration' between a fabric of small-medium sized cities and the country, the topic seems to be a case of 'natural' scientific attention. In fact, it contains very different characteristics than the standard model of urban sprawl, and therefore is able to provide a valuable enrichment in the spectrum of analysis.

2. The Marches and the Light Industrialization

Since the 1960s, the so called 'light industrialization'[1] has been the key-character of the Italian development, which was someway different from that of other advanced economies. Over time, the region faced a formidable wave of industrialization based on the robust pro-

[1] In a 'light industry' the productive units are characterized by a low K/Y and L/Y ratio, with K, capital, L, labor and Y, production. Those issues are largely retrievable in the typical Italian sectors of the 'made in Italy' productive system, the so-called 'fashion industry' and in many parts of the mechanical industry. Frequently, a great fragmentation in well separated sub-processes of production is clear.

liferation of small and medium sized enterprises (SMEs), often clustered within Marshallian industrial districts (Becattini, 1999)[2]. A long lasting series of specialized researches on the topic has strongly emphasized that the origins of Italian industrial districts descend from a number of factors, pertaining both to small (in many cases very small) urban and rural settlements (Fuà, 1988; Bellandi & Sforzi, 2001; Musotti, 2001). In various Italian regions, until World War II, urban and rural realities were actually connected, a real distinction being very hard at a glance. A dense network of micro-cities pervaded the countryside with a very intertwined tissue, so that rural areas always maintained close commercial, social and cultural ties with some small urban center.

With specific regard to the Marches a prominent scholar has written:

'The territory is rich in small and medium-sized towns - urban centers with a long tradition of efficient and democratic local government and vigorously engaged in commerce, professions and handicrafts.

'The countryside is governed by a good road network, is fairly endowed with infrastructures, and has reasonable access to services. The family run and small-scale enterprise (by the owner, share-cropper or tenant) is common in agriculture. The rural population has close links with the population of the towns.

'In the whole population (rural and urban) there is a high proportion of self-employed workers. The economic role of the family is often not confined to consumption, but covers production too. […] Relationships within the family and with the neighbors are supportive and there is a marked community participation and social integration […] in this world of family businesses and self-employed workers, there is some management experience, some spirit of initiative, some sense of responsibility, and all these gifts, even in small doses, are widespread among population.' (Fuà, 1988, pp. 262-263).

The Marches are the Italian region where the spread of industrial districts has been most penetrating and where - historically - there was the closest integration between the more urban and more rural settlements (Dunford & Greco, 2005; Musotti, 2001). Then, we argue that this greater integration between the two social environments has resulted in a large territorial spread of industrial districts and a corresponding geographical spread of inhabitants. The small average size of urban centers (only the municipality of Ancona has slightly more than 100,000 inhabitants) is the historical legacy of a society in which, for centuries, residents in urban areas based their way of life on contacts with the surrounding countryside (Conti, 1996).

These socio-economic and demographic special characteristics have been strengthened even by the other big driver of the regional development, i. e. the tourism activities concentrated along the coast of the Adriatic Sea (Corinto, 2014). The region has a coastline of 180 kilometers, along

[2] Namely, an industrial district is defined as a local socio-economic system having the following characteristics: 'a) a sufficiently small geographical entity […]; b) a population of families living and "mainly" working in this area […]; c) a population of manufacturing small or medium-small enterprises, one independent from each another […] composed by clusters, each specialized in a particular phase of the industrial process characterizing the district; d) a network of international trade relations, acting both in purchasing raw and auxiliary materials, and - more importantly - in selling the district typical produce; e) a specific "culture" (value of labor and family, dating capacity, risk attitude, etc.) and its own "institutional network" (commercial behavior, socio-economic and political associationism, specialized schools, etc.) inherited from a historical process of reciprocal adaptation between the conditions of social reproduction and the external competitiveness of the district; f) […] a unified image and typical characters perceived by members of the district and external interlocutors; g) […] a strong sense of belonging and identification diffused in local actors' (Becattini, 2001, pp. 95). After this 'classical' definition we should add some notations as follows. The individual manufacturing units are interlinked by a dense fabric of input-output relations, being each of them part of a cluster and specialized in a singular phase of the district productive chain (the so called 'main industry'). That doesn't mean they have no relations with external units, but the internal relations are quite prevalent. Within the district many other units (secondary industries) tend to replicate the main industry input-output model of relations

which the dissemination of tourism activities is seemingly equivalent to the light industrialization in the inner areas.

ISTAT has identified 31 Local Labour Systems (LLSs) in the Marches, with an average population of 47,844, while in Italy the LLSs are 686, with an average population of 83,084 (Orasi & Sforzi, 2005). Hence, we can concisely describe the Marches as a network of small and medium towns scattered in rural areas within which the communities do fertilize local economies and support the demographic strength quite differently than in many other Italian regions. Moreover, the socio-economic temper of rural areas fostered the regional development in reconciling the mere material wealth to a high quality of life, with a very high civic culture, in a way that has quite no correspondence in the rest of Italy.

3. Agriculture and Development

The above sketched origins of the development in the Marches underlie an ideal-type for the sociological research as well as the economic one, including agricultural economics. If the rural world had deeply contributed in shaping the regional development, by means of its own sociocultural features, we argue that it should be very interesting to ask how agriculture fits today within the overall economy of the region. We briefly outline two possible models as follows.

In a development model based on large cities and large companies, agriculture is territorially confined in a periphery, more or less remote from the main motors of growth and the socio-economic transformation. Thus, the labor markets of the 'major' centers and those of 'the green belts' result as being strongly separated.

On the contrary, in a model based on small and medium cities and systems of SMEs, with numerous and scattered urban centers, agriculture is not practiced in a 'more or less' remote periphery, but in places 'not so far' from the urban centers running specialized manufactures or tertiary industries. In this case, the labor market lays in local systems which are structured according to the actual geography of urban centers, and within which the agricultural activities tend to integrate with other sectors, both in terms of singular households, whose components have jobs in different sectors, and individuals (i. e. workers) capable of alternating farming and non-agricultural jobs.

In the first model, the territorial division and physical and cultural distances between agricultural and non-agricultural activities are very great. And, therefore, the farming activity is stronger (in terms of employment and wealth) whereas other activities are less developed (i. e. there is an agricultural persistence as a residual issue).

In the second model, the territorial integration between different jobs is possible, because jobs are both physically and culturally contiguous. Then, the 'size' of agriculture (always in terms of employment and wealth) depends more on its internal resources (especially the quality of entrepreneurial capacity and the institutional endowments) than on the concurrence of other industries for the same pool of resources (the so-called pull-effect).

In the Italian framework, the Marches are the region where, in particular, farming and non-agricultural works found the best conditions for their territorial integration. Therefore, the Marches should be a 'perfect' case-study of no-correlation between the size and activity of agriculture and industrial development (assuming the hypothesis of a weak-compatibility), or even a positive correlation (strong-compatibility).

4. Empirical Analysis

After considering the literature on the economic development of the Marches, we have made a quantitative analysis aiming at testing the eventual emerging interpretation. In particular, we tried to develop our discourse in two directions. On one hand, we tried to understand if the present geo-economic features are consistent with a transforming process strongly based on a rural economic model, and thus capable to reach high levels of development besides big urban concentrations. Namely, this model is based on local systems with a small demographic dimension (poor in external economies *à la* Jacobs (1971), but, being specialized in one specific industry, well endowed with external economies to the singular firm and internal to the local industry; on the other hand, we tried to verify if the emerging of urban external economies in certain places would have effects on the agricultural sector.

Accordingly, we have based our analysis on the local development perspective, considering as a statistical unit each of the 31 Local Labor Systems (LLSs) (Bellandi & Sforzi, 2001; Orasi & Sforzi, 2005), as in the official 2001 Censuses[3]. A LLS is an actual functional region drawn by self-containment (about 75 percent) of the daily home-to-work commuting, or travel to work areas.

In each LLS, after having eliminated the redundant indicators, we have selected 10 analytical variables (table 1) capable of partially reflecting the above discussed, very complex, phenomena, even though we can accept it as sufficiently consistent and useful as a first recognition approach. These variables are:

– one variable for the degree of urban concentration (and, in the opposite sense, the rural persistency), in term of population density (POPD);
– four variables reflecting the global economic development, in terms of employment rate in for profit enterprises (EMPLD), total entrepreneurial density (BUSD), manufacturing entrepreneurial density (MANUFD) and tourist entrepreneurial density (TOURD);
– five agricultural variables, three of which pertaining to the agricultural structures sensu stricto, in terms of rate of utilized agricultural area (indicating a high quality of agriculture) on total farm area (USAF), average farm area net of grassland (SIZEF), rate of professional farms on total farms (FARMS); two other variables indicating the social weight of farming, in terms of work days density (LABD) and cultivated area density (CUAD).

[3] The 2011 updating has not yet been made.

Tab. 1 - Analytical variables	
Variable	**Description**
POPD	Inhabitants (2011)/Territorial Area (km2) (2011)
BUSD	*Enterprises for profit (net of agriculture) (2010)/Inhabitants (2011)*
EMPLD	*Employees of enterprises for profit (net of agriculture) (2010)/Inhabitants (2011)*
MANUD	Manufacturing enterprises (2010)/Inhabitants (2011)
TOURD	*Accommodations and Food Service Enterprises (2010)/Inhabitants (2011)*
FARMS	*Farms in ASIA (2010)/Farms in Census (2011)*
SIZEF	Cultivated Area (net of permanent grassland) (2010)/Farms (2010)
USAF	*Utilized Agricultural Area (2010)/Area of Farms (2010)*
CUAD	*Cultivated Area (net of permanent grassland) (2010)/Inhabitants (2010)*
LABD	*Farming Working Days (2010)/Inhabitants (2011)*
Sources: ISTAT, Agricultural Census (2010), Demographic Census (2011), Industrial Census, ASIA (statistical archive of active firms)	

The variables of this data set (31 observations on 10 variables), have been rescaled into values from 0 to 1, in order to eliminate the distortion caused by the different units of measure. Then, we have made two analyzes:

– a correlation analysis, by using the Pearson's rank correlation index for any couple of variables, in order to identify the more evident association between the expressed phenomena;
– an ordinal multidimensional scaling analysis (ALSCAL method) in order to identify the fabric of relations among phenomena which characterize the Marchigian development model.

5. Correlation analysis: findings

The Pearson's correlation matrix (table 2) allows us to state that the urban densification economies, measured by the population density (POPD), have significant positive correlations with the two indicators of whole development of for profit activities, i. e. the employment rate (EMPLD) and the entrepreneurial density (BUSD). Moreover, these economies are uncorrelated with the entrepreneurial density of the two leading sectors (MANUD and TOURD), and do concentrate where the land resources are better for farming (very high positive correlation with USAF) and describe a social rarefaction of agriculture (negative correlations with FARMS, SIZEF, CUAB and LABD).

The local systems which show major urban density may be alternatively specialized in the manufacturing or tourism industry. In general, their development depends on the density of tertiary activities (other than tourism), capable of supplying services to the residents, families and enterprises, and to other systems, especially the more advanced services for businesses.

The main findings from the correlation matrix are that the density of manufacturing firms (BUSD) is positively correlated with the two indicators of whole development of the for profit activities (EMPLD e BUSD); on the opposite, the density of tourism businesses (TOURD) has a negative correlation with the rate of total employment in for profit activities (EMPLD). That is to say that depending on the nature of the industrial districts, the number of the Marchigian manufacturing firms (usually small) is directly connected to the level of development. On the

Tab. 2 - Fixed parameter logit (FPL) and random parameter logit (RPL)									
	BUSD	**EMPLD**	**MANUD**	**TOURD**	**FARMS**	**SIZEF**	**USAF**	**CUAD**	**LABD**
POPD	0,48 ***	0,34*	-0,00	-0,12	-0,22	-0,46***	0,54***	-0,78***	-0,47***
BUSD		0,13	0,38**	0,20	-0,08	-0,21	0,33*	-0,32*	-0,23
EMPLD			0,36**	-0,44***	-0,20	-0,07	0,36**	-0,40**	-0,07
MANUD				-0,32*	-0,27	-0,10	0,10	0,19	0,11
TOURD					0,34*	0,32*	-0,51***	0,15	0,01
FARMS						0,49***	-0,38**	0,35*	0,34*
SIZEF							-0,41**	0,52***	0,45**
USAF								-0,26**	-0,52***
CUAD									0,40**

Confidence: (*) 90%, (**) 95%, (***) 99%

contrary, in the case of tourism, not the number of firms but, seemingly, the dimension of units matters. Even better, a high density of tourism businesses is generally a symptom of an over dimensioned supply, as likely shown by the negative correlation (99% significance) between TOURD and USAF indicators.

The indicators of farming vitality have no significant correlations with the diffusion of manufacturing activities and, hence, there apparently is a linkage of weak compatibility, if not a strong one, between the development of industrial districts and the agricultural resilience.

6. Multidimensional scaling: findings

By means of a multidimensional scaling analysis (MDS) with the ALSCAL procedure (Kruskal & Wish, 1978; Tomaselli, 1993) on a data matrix (31 LLSs per 10 variables) we reduced the 31x10 dimensions of data to a 2x2 dimensions representation. Therefore, we can describe the relationships of proximity existing among the 11 observed variables, and then the linkages among the phenomena represented by the selected variables.

You must read the graph 1 considering that the horizontal dimension 1 may identify the continuum between an intensive agriculture (right side) and an extensive one (left side) and the vertical dimension 2 the continuum between highly populated areas (top side) and lowly populated areas (down side) (table 3). Then, you must consider the distance that separates each variable-point (i. e. each point of the 10 variables on the graph) form any of the others. Independently from the quadrant where they are localized, the closer they are the more the linked phenomena tend to jointly emerge in the Marchigian local systems. That is an intuitive reading and we try to explain it in the following.

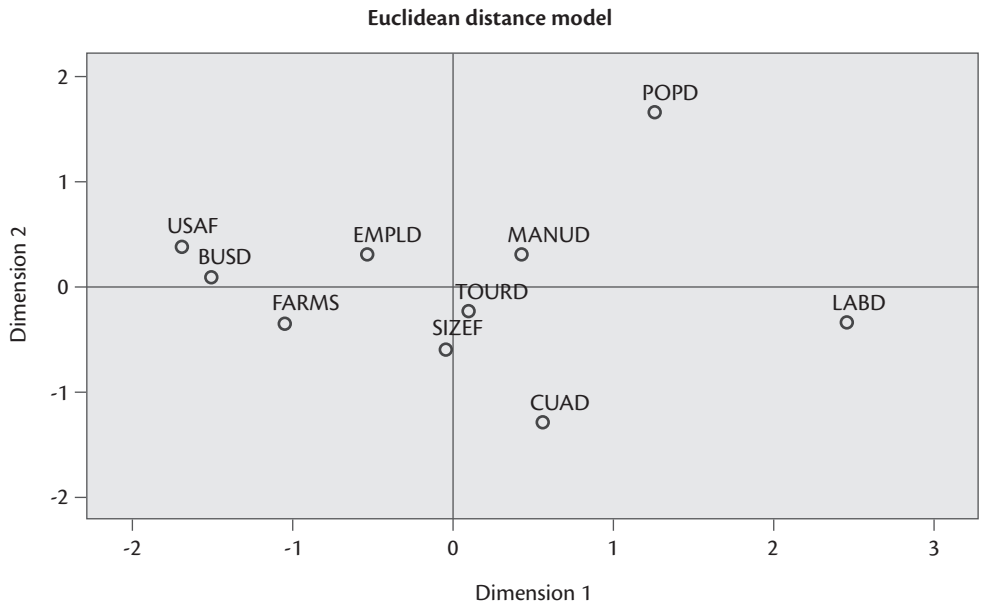
The demographic density indicator shows the greatest distances from all the 5 variables which describe agriculture. The economic development indicators are, in the average, and excluding the LABD, closer to (or less distant from) the variables describing agriculture rather than the population density. We can deductively state that even in the Marches the urban densification of population and economy produce an intrinsic and dis-aggregating trend effect on agriculture and the joined social environment.

Tab. 3 - Stimulus coordinates (Multidimensional scaling: ALSCAL)

Variable	Dimension1	Dimension2
POPD	1,26	1,65
BUSD	-1,51	0,10
EMPLD	-0,53	0,31
MANUD	0,43	0,31
TOURD	0,10	-0,23
FARMS	-1,05	-0,34
SIZEF	-0,04	-0,57
USAF	-1,69	0,39
USAF		-0,52***
CUAD		0,40**

Kruskal's stress: 0,036 (good)
RSQ = 0,994

Graph 1 - Delivered Stimuls Configuration



7. Discussion and concluding remarks

The analysis we made on the LLSs of the Marches confirmed the initial hypothesis that the Marchigian development model did not leverage to much on any sort of urban densifications, dividing in an absolutely clear manner the urban and industrial areas (and societies) from the rural ones, i.e. the agricultural use of land from that of other industries. In this sense, we posed the question if the 'light industrialization' model *à la* Becattini is still consistent with the actual general socioeconomic features of the Marches, within which agriculture has apparently enough capabilities of interacting and integrating with other industries. Our analysis did confirm that Marchigians have been able over time to combine, or at least to make compatible, the proliferation of industrial activities with the persistence of a vital agriculture, in a model of both strong and at least weak agricultural resilience.

This persistence is clearly detectable even by the typical indicators of the agricultural structures we have selected: the rate of cultivated on total areas (forests included) which indicates the physical quality of land resources; the average farm land; the rate of professional farms which produce, even in a minimal quantity, for that market and not for the farming family consumption. The two other features we considered, the social weight of agriculture, the densities of work days and intensively cultivated area, did not picture the same framework of capacity to resist the competition of alternative activities. Where they reach the higher values they describe a situation of relatively scarce capacity of development.

Our research positively matches even to main hypotheses and findings of a large historic literature which pointed at interpreting the economic phenomena toghether with anthropological, cultural and sociological features. This result is interesting because in many other regions, in the well developed center and north of Italy, the model of 'light industrialization', organized in Marshallian districts, can be conveniently applied, giving sense to similar interpretations. As this model derived many of its characteristic from the pre-existent local rural communities, then, this issue is particularly stimulating for agricultural economists if we want to understand how resilience of agriculture and rural territories can be consistent with the overall development.

Eventually giving some suggestions to better govern the land use, it is important to stress the opportunity to stop land consumption in the coastal line and in the hilly zones, these latter actually endangered by further urbanization and industrial infrastructuring, where lots of industrial and commercial warehouses have been recently built, probably due to an excessive economic expectation for the contribution of the building industry to the whole regional economy. This has a major meaning when we consider that industrial districts are currently interested in processes of tertiarization, capable of following highly varied paths of evolution.

An interesting topic for the future is the research on the same topic but in a larger geographical scale, in order to compare the very typical features of the Marches with other Italian regions which showed different patterns of development.

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