ROLE AND EFFECT OF AGROFORESTY SUBSIDES ALLOCATED BY THE COMMON AGRICULTURAL POLICY IN ITALIAN FARMS

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Abstract

Since the early 1990s, the European Union has financed a lot of specific measures aimed at promoting agroforestry on farms. In fact, the reform of Common Agricultural Policy proposed by the European Commissioner Ray MacSharry has put in place several actions with the predominant aim of changing the European agricultural model based on an environmental protection instead of a growth of agrarian productions. The purpose of this paper was, using a multiple regression model, to assess the impact of the Common Agricultural Policy, specifically financial subsidies allocated by the second pillar of the CAP, in promoting agroforestation actions on the overall output of farmers over the time 2004-2012 and on the growth of woodland surface. Findings have pointed out a positive correlation between financial support paid by the Rural Development Program and the farmer total income with positive consequences on the growth of afforested surfaces particularly in lowland areas.

Keywords: Common Agricultural Policy, rural areas, multiple regression model, FADN, Rural Development Plans.

1. Introduction

Since the early 1990s the role of primary sector in Europe is completely changed as a consequence of a new role attributed to farmers in the countryside, which are become one of the main pillars in the process of environment protection by producing positive externalities. Thus, the European agricultural model shifted from a productivist model towards a post productivist one (Ilbery, 1998) characterized by specific features, intrinsic and extrinsic values, both in terms of agricultural production and also in terms of ecological activity, through the promotion of multifunctionality (Galluzzo, 2009; Galluzzo, 2010). Nowadays, agriculture has a fundamental function of public good able to deal with lots of socio-economic externalities in order to reduce the marginalization of rural territories in many European countries (Galluzzo, 2012a). Main consequences of this post productivist transition in the primary sector have been a growth of awareness by public institutions in order to implement actions with pivotal effects in protecting rural space. The multifunctionality has drained financial resources from the European Union budget aimed at disbursing funds and subsidies to farmers with the unique purpose in reducing agricultural overproductions through actions of productive diversification such as afforestation in lowland areas.

The second pillar of the Common Agricultural Policy (CAP) has defined since 2000, recognizing many suggestions proposed during Cork Conference in 1996, some principles in
order to improve the rural development through the multifunctionality. This has implied for farmers planning and putting into practice different activities with the aim to protect the rural space both in environmental terms and also in socio-economic terms, with the consequence to increase the sense of belonging to a rural community (O’Hara, 1998); hence, farmers are become an active part in the endogenous path of rural development and they were also not excluded by processes of local governance with other stakeholders.

In the same time the main role of rural development has been to implement standard living conditions in rural and in urban areas, both satisfying local needs (Wilsom & Whitehead, 2012) and also allowing an holistic protection against climate change, by agroforestation, in a new model of integrated and endogenous development in the countryside (Heley & Jones, 2012). Urban citizens have recognized in favor of rural population a specific task against environmental issues with the consequence of developing a new ecological perception in urban people about the role and functions of farmers in order to contrast climate change. In particular, the agro-forestation by different actions put into place since the early 1990s by the European Union Forest Regulation 2080 published in 1992, has produced positive environmental impacts reducing negative effects of overproduction in the primary sector and changing or rather reshaping the countryside landscape in many Italian regions as well, with the diffusion in the last 30 years of afforested areas in small lowland areas and in upland territories (Galluzzo, 2012b).

Many Italian regions, giving subsides to farmers, have improved the level of agroforestation in different rural territories with a plenty of positive socio-economic relapses, able to improve the level of farms’ income (Camaioni & Sotte, 2009). During the phase of rural development called Agenda 2000, over seven year time 2000-2006, there has been a significant use of European Community funds aimed at implementing initiatives of agroforestation, put into practice since the MacSharry’s reforms in the 1990s, with an effect of stimulating other farmers in converting, re-addressing and transforming their agricultural model of production in plane areas.

1.1 The Transition of the European Agricultural Productive Model

In the European Union, over the last 30 years, the Common Agricultural Policy has undergone the most and foremost significant transformations as a consequence of a development of a new model of agrarian production and an expansion of a more sensitive behavior in urban citizens towards farmers, who are not considered single units of production of commodities in the European agriculture framework. Therefore farmers are become dwellers and active agents of an endogenous rural protection process, in its planning, able to increase the level of involvement of rural communities in their development process and in lessening social exclusion as well (Galluzzo, 2012a; Galluzzo, 2010; Murray, 2010; O’Hara, 1998).

In the agricultural European model of production, capital intensive farms, as a consequence of an increase of investments, have a high level of economic and technical risk compared to the small farms; hence, a crop diversification is a good opportunity to reduce these issues particularly in territories at risk of socio-economic marginalization (Santeramo et al., 2013). In the same time, the public intervention in primary sector is pivotal in reducing income vulnerability towards farmers because of weather changes (Capitanio et al., 2014; Santeramo et al., 2013). Moreover, this latter aspect is a fundamental pillar in order to solve the out-migration from the countryside, increasing the multifunctionality in agriculture and the production of non commodities agrarian productions with a better use of land capital (Coble & Barnett, 2013; Capitanio et al., 2014).
A new ecological point of view and a more sensitiveness of urban inhabitants to the primary sector have implied a process of productive reconversion of farmers all over the world by the pluriactivity, or rather by a diversification in agrarian activities (Van der Ploeg, et al. 2002), in particular in lowland areas using financial supports in order to reach the target of agroforestation with a high level of environmental protection, throughout carbon sequestration, tightly linked to a different land use (Yin et al. 2007) and connected to a reduction of agricultural overproductions as well. The agroforestation is an important measure in order to solve issues directly connected to the forest transition argued by Alexander Mather in 1992 as a consequence of a demographic change (Rudel et al. 2010) and after a transformation from a pre-industrial to an industrial forest (Mather et al. 1999) able to improve the quality of land exploitation in favor of less favoured areas and poor rural spaces (Mather & Needle, 1998).

Since the late 1960s, when the CAP has been set up, the goals of European legislators were to protect the European agriculture against the price volatility in international market, ensuring an adequate level of income towards farmers by prices of agricultural commodities higher than international ones, throughout specific price strategies and target purposes, achieving as final goal a self-sufficiency of many European agrarian productions (Vieri, 1994). Unfortunately the effect was to stimulate an overproduction of commodities impossible to sell off with the consequence to absorb much of the European financial budget (Vieri, 2012; Cunha & Swinbank, 2011).

As a result of international agreements, during the Uruguay Round of the General Agreement on Tariff and Trade (GATT), commenced in 1986 but completed and ratified only in 1994, the European Union decided to change its agricultural policy strategy focusing its efforts in changing the paradigm of production of European farmers implementing agroforestry actions. The European Commission has put in place the reform proposed by the Commissioner Ray MacSharry aimed at dealing with the excessive cultivated surfaces with cereals, sweet corn and soy by interventions of set aside strategies, organic agricultural productions and also by agroforestation actions, with a key consequence in the socio-economic development and environment protection of rural areas (Galluzzo, 2012b). The most important consequence of this structural change has been in favor of the strengthening of a new image of agriculture, which is considered in the public opinion a sector able to produce positive externalities, or rather positive effects towards environment, urban areas and rural territories. The agroforestation is only one of new functions assigned to the primary sector in order to ensure multifunctionality in terms of socio-economic development of rural areas, with positive consequences in reducing marginalization and rural depopulation and also in expanding multiple activities, which are a part of the vitally process of diversification and protection in rural space and in rural communities (Kinsella et al. 2000; Van der Ploeg et al. 2002).

The agroforestation is one of the most important path in order to protect less favored rural areas and it is also, according to what stated during Doha development round which is part of negotiations in the World Trade Organization (WTO) aimed at reducing trade-distorting price support policy in favor of agriculture (Orden et al. 2011), the pivotal tool to lessen the climate change and to reduce agricultural overproduction in the EU. Therefore, in the Rural Development Programs and specifically in the second Pillar of the Common Agricultural Policy, the agro-forestry and other agri-environment measures are axes to implement environment protection in the countryside, using a significant percentage of the European budget with positive effects on the landscape and in its protection (Thenail et al. 2009; Brouwer & Silvis, 2010; Dupraz et al. 2010; Hill, 2012). Summing up, agroforestry has allowed to diversify the farmer’s profitability, to protect environment through the cultivation
of arboreous crops, such as chestnut, walnuts, hazelnuts, scattered in small portions of Italian farms, producing intangible public goods in terms of positive externalities and niche products as truffle, mushrooms and forest fruits (Galluzzo, 2013).

In other European States such as Portugal the agroforestry is the most and foremost tool to minimize difficulties in degraded surfaces in an environmental perspective. These interventions does not have implied significant outcomes in social and economic terms because of an incomplete cooperation and a shared involvement of local stakeholders, specifically during the late 1990s when the MacSharry’s reform started, as a consequence of an unsatisfactory level of subsidies paid by EU tightly linked to a severe pursuance of several agronomical constraints and management commitments (Riera, 1995; Carvalho et al. 2002; Pisanelli et al., 2012). Comparing Italy to other European countries it is possible to point out as since the 1990s there has been an increase of financial funds allocated by the European Union in order to promote the agroforestation in particular in rural stayed behind rural areas where from the Middle Ages strips and tiny plots of arboreous crops have been fundamental both in agrarian hydraulic arrangements and also in the consolidation of slopes, becoming typical elements of Italian traditional agrarian landscape of lowland and upland territories (Sereni, 1961). The European Union has increased from 251 million of euro its own financial budget, disbursed over the late 1990s, to 1,635 million of euro allocated during the seven year time 2000-2006 (Vagnozzi & Giarè, 2000; Cesaro, 2002). During 2007-2013 the Rural Development Program has allocated 2,430 million of euro in favour of agroforestry actions; even if 22% of this European total amount has been specifically allocated to finance the long-time measures carried out in the early nineties in order to put into action measures of agroforestation (Vagnozzi & Giarè, 2000; Cesaro, 2002; Pettenella, 2009).

2. Aim of the Research

In order to analyze the impact of economic decisions of the European Union in favor of farmers and towards rural development, the European Commission has arranged the Farm Accountancy Data Network (FADN), which is an unique dataset aimed at evaluating both income of farmers, output and input in farms and also different economic impacts of the Common Agricultural Policy on a sample of 4,934,100 farms whose more than 16% are located in Italy.

The FADN dataset is an useful tool to estimate with a quantitative approach and for a long time the role and effect of political decisions about the agroforestation and the actions of rural development put into place by the European Union in order to stimulate them and to support financially farmers. In Italy it is not so common to find out, with the only exception of few small geographical areas, quantitative studies finalized in assessing the impact of agroforestry actions and the role of financial supports and subsides paid by the EU aimed at stimulating agroforestation and the reforestation (Tassone et al., 2004).

The purpose of this study was to assess the impact of financial subsides and economic supports allocated by the European Union in order to promote agroforestation actions in Italy using a quantitative method focused in a medium term of 12 years and specifically during two seven year time of implementation of Rural Development Plans (2000-2006 and 2007-2011) using the Farm Accountancy Data Network time series. In this case one has taken into account as independent variable the financial supports paid in favour of agroforestry measures and also financial subsides specific to the Rural Development (II pillar), considering if farm size in terms of Usable Agricultural Surface (UAS) has had an impact on the farm income and on the afforested surface as well (Galluzzo, 2013; Galluzzo, 2014).
Agroforestry is a pivotal factor in rural areas at risk of marginalization in order to obtain a higher level of ecological sustainability in favor of urban people and farmers in all European countries (Burgess, 1999). In general agroforestry is a multicropping activity scattered in small areas generating positive externalities which are not completely understood by people in terms of economic and ecological performances (Graves et al., 2007), reducing also the emission of green house gases (Povellato et al., 2007), increasing gas sequestration and alleviating poverty in some rural areas (Rosa et al., 2004). This corroborates the positive role of financial subsides allocated by the European Union to implement the agroforestation in Italian farms (Galluzzo, 2014). In fact, the EU has stimulated a new land use of rural areas by putting in the model specific financial subsides paid throughout the second pillar of the CAP with the consequence to implement the agricultural quality diversification in European countryside in particular after the CAP reform in 2005 (Palma et al., 2007). One of the most important effect of agroforestation was to reduce the desertification in Mediterranean areas (Marinelli, 2010) requalifying agricultural landscape (Reisner et al., 2007). In Italy some authors have investigated with a quantitative approach the role of financial subsides paid by the EU in favour of the agroforestry underlining the positive effect of them (Galluzzo, 2014) in order to implement afforested surfaces causing ecological benefits in terms of environmental sustainability, which have been well appreciated by Italian farmers notwithstanding few perplexities related to clarity in pursuance of the law (Pisanelli et al., 2012).

In this paper main research questions were to analyze which variables influenced the growth of woodland areas and if financial supports allocated by the Rural Development Program acted on the level of produced output in farms belonging to the FADN using a multiple regression model. In this case we have put in the model as dependent variable agricultural surfaces subjected to agroforestry actions (Marongiu et al., 2012) and as independent variable financial funds allocated by the European Union specifically towards agroforestation actions (Veveris et al., 2007) and also by the second pillar of the CAP in favour of the rural development. In fact, financial subsides paid by the pillar II of the Common Agricultural Policy towards rural development have been pivotal in stimulating agroforestry actions in different European countries (Lefebvre et al., 2012; Lawson et al.,

Table 1. Descriptive Statistics Used in the FADN Dataset over the Time of Observation

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Unit</th>
<th>Mean</th>
<th>Std. dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total inputs</td>
<td>€</td>
<td>33,417</td>
<td>2,154.866</td>
<td>31,372</td>
<td>37,888</td>
</tr>
<tr>
<td>Woodland surface</td>
<td>ha</td>
<td>1.505</td>
<td>0.216</td>
<td>1.24</td>
<td>1.96</td>
</tr>
<tr>
<td>Farm Net Income</td>
<td>€</td>
<td>22,223</td>
<td>1,431.671</td>
<td>19,966</td>
<td>24,948</td>
</tr>
<tr>
<td>Total assets</td>
<td>€</td>
<td>333,365.1</td>
<td>34,614.8</td>
<td>284,338</td>
<td>388,298</td>
</tr>
<tr>
<td>Total subsidies</td>
<td>€</td>
<td>5,885.221</td>
<td>424.062</td>
<td>5,265</td>
<td>6,436</td>
</tr>
<tr>
<td>Other crops in farms</td>
<td>ha</td>
<td>1.8244</td>
<td>0.0141</td>
<td>1.68</td>
<td>2.02</td>
</tr>
<tr>
<td>Permanent crops</td>
<td>ha</td>
<td>1.824</td>
<td>0.134</td>
<td>1.68</td>
<td>2.02</td>
</tr>
<tr>
<td>Environmental supports</td>
<td>€</td>
<td>432.890</td>
<td>117.380</td>
<td>309</td>
<td>665</td>
</tr>
<tr>
<td>Economic size</td>
<td>€</td>
<td>63,146.67</td>
<td>7,664.94</td>
<td>54,960</td>
<td>73,320</td>
</tr>
<tr>
<td>Less favoured areas supports</td>
<td>€</td>
<td>204.780</td>
<td>72.120</td>
<td>107</td>
<td>331</td>
</tr>
<tr>
<td>Total supports II pillar CAP</td>
<td>€</td>
<td>1,735.220</td>
<td>391.130</td>
<td>1,005</td>
<td>2,327</td>
</tr>
<tr>
<td>Utilisable Agricultural Surface (UAS)</td>
<td>ha</td>
<td>15.590</td>
<td>0.610</td>
<td>14.770</td>
<td>16.580</td>
</tr>
</tbody>
</table>

Source: Our elaboration on data

http://ec.europa.eu/agriculture/rica/database/database_en.cfm
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2011; Sarvašová et al., 2010; Smith, 2010). This paper investigated also if the independent variable Utilizable Agricultural Surface, proxy variable of the farm size, was an important factor acting on farmers’ decision process in favour of agroforestry and other agri-environmental actions (Wilson & Hart, 2000).

3. Methodology

To investigate and to assess main relationships among the dependent variables afforested surfaces and total output, and different independent variables (Tab. 1) such as Utilizable Agricultural Surface (UAS), funds allocated by the EU in favor of rural development, we have used a multiple regression model. The estimation of parameters has utilized an Ordinary Least Square by the open source software GRETL 1.8.6. In our analysis the FADN data set is made up by a time series of national values of surveys published by the European Union.

The multiple linear regression model is written with the following equation:

\[ y = b_0 + b_1x_1 + \ldots + b_jx_j + \ldots + b_kx_k + \varepsilon \]  

(1)

where \( y \) (n vector elements) and the dependent variable, \( x_1, x_2, \ldots, x_k \) (vectors of \( n \) elements) are the explanatory variables (linearly independent), \( b_1, b_j, b_k \) are parameters or regression coefficients, one for each independent variable, \( b_0 \) is the intercept and \( \varepsilon \) is the error in the model (Asteriou & Hall, 2011; Baltagi, 2011). In general, one usually assumes that error has a normal distribution with mean equal to zero and a constant variance (Andrei & Bourbonnais, 2008). The model of regression is called linear if it is linear in the parameters, namely coefficients \( b_1, b_j, b_k \) which are simple multipliers of independent variables (Verbeek, 2006). In its algebraic form of matrix, the multiple regression model can be so expressed (Asteriou & Hall, 2011; Baltagi, 2011; Verbeek, 2006):

\[ y = X\beta + \varepsilon \]  

(2)

where \( y \) is a dependent variable and \( \varepsilon \) is the error but both are vectors with \( n \)-dimensions \( X \) is an independent variable which has a dimension \( n \times k \).

Basis assumptions, to use a multiple regression model, are (Asteriou & Hall, 2011; Baltagi, 2011): error is a random variable with a mean of zero conditional on the explanatory variables, hence statistic error \( u_i \) has conditional average zero that is \( E(u_i|X_i) = 0; (X_i, Y_i), i = 1\ldots n \) are extracted as distributed independently and identically from their combined distribution; \( X_i, u_i \) have no fourth moment equal to zero. Some other important assumptions in the multiple regression model are a non existence of multicollinearity, or rather the independent variables are not related among themselves, and there is not homoscedasticity about the errors which are distributed as a normal function, because error is constant across observations (Asteriou & Hall, 2011; Baltagi, 2011). This implies as errors are uncorrelated hence, the variance–covariance matrix of errors is diagonal and each non-zero element is the variance of the error (Verbeek, 2006; Andrei & Bourbonnais, 2008; Baltagi, 2011).

In the first model of the multiple regression we have used a lin-log multiple regression model where some independent variables with positive values (total inputs, farm net income, total assets, total subsides, other crops, environmental supports, funds allocated in favour of less favoured areas supports and total supports allocated by the II pillar of the CAP) have been transformed in logarithmic value, with the purpose to consider relationships in terms of
percentage rather than a linear function, making data more homogeneous. In analytical terms, in our research this multiple regression model in its general formulation can be written in this way:

\[ y = a_0 + \ln x_1 + \ln \beta x_2 + \ln \gamma x_3 + \delta x_4 \ldots + \xi x_n + e_{jt} \]  

(3)

\( y \) is the woodland surface
\( a_0 \) constant term

\( x_1, x_2, x_3, x_4 \) are independent variables such as farm net income, total assets, total subsidies, other crops in farms, environmental supports, economic size of farm, financial subsidies in favor of lessfavoured areas, financial subsidies allocated by the Rural Development Plan (II pillar of the CAP), utilisable agricultural surface (Tab.1).

\( a, \beta, \gamma, \delta, \ldots, \xi \) are estimated parameters of the model
\( e_{jt} \) term of statistic error.

In the second model we have used a linear multiple regression because the variable in the dataset are homogeneous. In analytical terms, in our research this second multiple regression in its general formulation can be written in this way:

\[ y = a_0 + \alpha x_1 + \beta x_2 + \gamma x_3 + \delta x_4 + e_{jt} \]  

(4)

\( y \) is the produced output by Italian farms
\( a_0 \) constant term

\( x_1, x_2, x_3, x_4 \) are independent variables such as financial subsidies in favor of less favoured areas, financial subsidies allocated by the Rural Development Plan (II pillar of the Common Agricultural Policy), farm income and Utilisable Agricultural Surface

\( \alpha, \beta, \gamma, \delta \) are estimated parameters of the model
\( e_{jt} \) term of statistic error.

**Table 2. Main Statistical Cultivated Surface in Italy over the Time 2004-2012 Using the Dataset FADN**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Min value</th>
<th>Max value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAS</td>
<td>15.4189</td>
<td>15.3400</td>
<td>14.0800</td>
<td>16.5800</td>
</tr>
<tr>
<td>Permanent crops</td>
<td>1.70000</td>
<td>1.72000</td>
<td>1.02000</td>
<td>1.98000</td>
</tr>
<tr>
<td>Woodland</td>
<td>1.44556</td>
<td>1.45000</td>
<td>1.06000</td>
<td>1.96000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Standard deviation</th>
<th>Variation coefficient</th>
<th>Asimmetry</th>
<th>Curtosi</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAS</td>
<td>0.758015</td>
<td>0.0491614</td>
<td>-0.203234</td>
<td>-0.599408</td>
</tr>
<tr>
<td>Permanent crops</td>
<td>0.278882</td>
<td>0.164048</td>
<td>-1.67355</td>
<td>2.22232</td>
</tr>
<tr>
<td>Woodland</td>
<td>0.257833</td>
<td>0.178362</td>
<td>0.539405</td>
<td>0.0271018</td>
</tr>
</tbody>
</table>

**Source:** our elaboration on data
http://ec.europa.eu/agriculture/rica/database/database_en.cfm
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4. Results and Discussion

As shown in Table 2, in Italy over the time of investigation there has been an increase of 2.5 hectares of Usable Agricultural Surface in farms belonging to the FADN dataset even if both permanent crops and also woodland surfaces have doubled their surface as a consequence of the improvement in financial supports allocated by the European Union in favor of agroforestry.

The analysis of time series data, published on the European website of Farm Accountancy Data Network, in the lin-log multiple regression model has outlined as the dependent variable afforested surface has been affected in a direct way with independent variables total subsides allocated by the EU to implement rural development, the economic size, in terms of hectares of UAS, the diffusion and cultivation in Italian farms of permanent crops and last but not least by financial supports able to promote the rural development in the countryside (Tab. 3). The subsides paid by the European Union as a part of the agri-environment protection scheme do not caused any impacts on the growth of agroforestry surfaces in farms belonging to the Italian FADN sample. The quantitative model has pointed out an inverse correlation between inputs used in the production process and financial funds paid in favor of disadvantaged areas or less favored territories. This finding underlines as a large proportion of agroforested areas are predominately located and scattered in lowland areas than in upland territories which in general are characterized and covered by natural woodland and agroforested areas. Therefore, these later areas need specific financial supports in order to ensure a persistent development in the countryside and reducing the out-migration from rural territories. The values of R² 0.85 and adjusted R² 0.82 has shown as the lin-log multiple regression model fits well with our purpose of analysis; furthermore, other statistical tests have underlined both no heteroscedasticity in the quantitative model and also a normal distribution of errors.

Table 3. Results of the Lin-Log Multiple Regression Model: The Dependent Variable is Woodland Surface

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-8.62</td>
<td>4.11</td>
<td>-2.09 *</td>
</tr>
<tr>
<td>Ln total inputs</td>
<td>-1.004</td>
<td>0.04</td>
<td>-20.31 ***</td>
</tr>
<tr>
<td>Ln farm net income</td>
<td>0.225</td>
<td>0.02</td>
<td>11.99 ***</td>
</tr>
<tr>
<td>Ln total assets</td>
<td>0.99</td>
<td>0.260</td>
<td>3.85 ***</td>
</tr>
<tr>
<td>Ln total subsides</td>
<td>0.075</td>
<td>0.036</td>
<td>2.06 *</td>
</tr>
<tr>
<td>Ln other crops</td>
<td>0.241</td>
<td>0.099</td>
<td>2.42 **</td>
</tr>
<tr>
<td>Ln agri-environmental supports</td>
<td>-0.380</td>
<td>0.341</td>
<td>-1.11</td>
</tr>
<tr>
<td>Ln less favoured areas supports</td>
<td>-0.234</td>
<td>0.103</td>
<td>-2.28 **</td>
</tr>
<tr>
<td>Ln total supports II pillar CAP</td>
<td>0.86</td>
<td>0.430</td>
<td>1.98 *</td>
</tr>
<tr>
<td>Economic size</td>
<td>0.006</td>
<td>0.001</td>
<td>5.52 ***</td>
</tr>
<tr>
<td>Permanent crops</td>
<td>2.56</td>
<td>0.120</td>
<td>21.42 ***</td>
</tr>
</tbody>
</table>

Source: Our elaboration on data
http://ec.europa.eu/agriculture/rica/database/database_en.cfm
Note: * denotes significance at a 10% level; ** denotes significance at 5 % level; *** denotes significance at 1%
The linear regression model using the FADN time series has pointed out, as shown in Table 4, that the output obtained in Italian farms which have put into action measures of rural development linked to the agroforestry have been directly correlated to subsidies allocated by the European Union in favor of disadvantaged areas, the total income of farmers and to the utilizable agricultural surface. A negative correlation in the multiple regression model has been found out between the dependent variable produced output and total subsidies and financial supports paid by the second pillar of the CAP in order to promote and or to implement rural development. In general, the multiple regression model has values of R² and adjusted R² very high equal to 0.98 and 0.97 with an absence of heteroscedasticity and errors normally distributed. Moreover, other specific statistical tests have shown no autocorrelation in both lin-log and linear multiple regression models.

Table 4. Main Results in the Linear Multiple Regression Model: Dependent Variable Produced Output by Italian Farms of the Dataset FADN

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1,095.83</td>
<td>2,050.43</td>
<td>0.53</td>
</tr>
<tr>
<td>Less favoured areas supports</td>
<td>28.70</td>
<td>4.38</td>
<td>6.62 ***</td>
</tr>
<tr>
<td>Rural development funds</td>
<td>-11.67</td>
<td>1.68</td>
<td>-6.98 ***</td>
</tr>
<tr>
<td>Farm income</td>
<td>1.50</td>
<td>0.085</td>
<td>17.60 ***</td>
</tr>
<tr>
<td>Utilisable Agricultural Surface</td>
<td>1,236.18</td>
<td>228.95</td>
<td>5.40 ***</td>
</tr>
</tbody>
</table>

Source: our elaboration on data http://ec.europa.eu/agriculture/rica/database/database_en.cfm
Note: *** denotes significance at 1%

5. Conclusion

The FADN dataset gets multiple pivotal information on the CAP and specifically about the agroforestry actions arranged by local region authorities in Italy in order to implement the Rural Development. However, Farm Accountancy Data Network dataset has underlined as lots of agroforestry measures have been concentrated in lowland areas and in upland rural territories, which have involved only a small percentage of new farmers (Galluzzo, 2014). In fact, the mainly percentage of agroforestry actions started in the early 1990s have drained an awful lot of financial supports allocated by the European Union both in the former RDPs 2000-2006 and also over seven year time 2007-2013 in terms of dragging effect in favor of farmers, restricting the available of financial resources for further actions towards Italian farmers.

Findings have corroborated the role of usable agricultural surface, proxy variable of the farm size, as a pivotal variable able to influence the diffusion of agroforestry actions in the primary sector (Wilson & Hart, 2000); in the same time, this paper has underlined the role of the European funds allocated in favour of stayed beyond rural areas and by the II pillar of the Common Agricultural Policy towards agroforestation (Lefebvre et al., 2012; Lawson et al., 2011; Sarvašová et al., 2010; Smith, 2010), reducing the environmental marginalization of rural areas (Marinelli, 2010; Reisner et al., 2007) by the multifunctionality and productive diversification.

It should be desirable to implement large-scale projects of agroforestry; in fact, in the next rural development planning time 2014-2020 Italian regional authorities, national and European legislators have given a greater emphasis to the environment protection in upland territories rather than in favor of those located in lowland areas. The goodness of
agroforestry actions and environment protection initiatives is corroborated by the growth in funds provided in some Italian regional financial budget addressed to implement agroforestation, as a consequence of the process of reform of the CAP started 10 years ago (Palma et al., 2007), that has address in the next seven year time (2014-2020) lots of initiatives to a new focus area aimed at stimulating biodiversity safeguard and towards other ecological milestones. Biodiversity safeguard by agroforestation is a fundamental part of the rural development process aimed at assigning priorities in favour of regional initiatives including multifunctionality and technical assistance which may produce excellent results respecting in the same time commitments ratified by the EU in the Kyoto Protocol. For the future, it is desirable to encourage a greater participation between all stakeholders in the rural chain of value both during the planning phase of Rural Development Plan, shortening and also streamlining bureaucratic aspects as argued out by Pisanelli et al. in 2012, which have slackened actions of agroforestry in many Italian farms. To sum up, it is important to use these recent afforested surfaces to produce niche products (Galluzzo, 2014) instead of using them as sources of biomasses in particular in areas where are scattered the oldest farms, which have decided 30 years ago, to be forerunners in agroforestry initiatives becoming nowadays mentors for young farmers, which are coming back in the countryside as a consequence of economic crises in other economic sectors.

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