Are EU subsidies a springboard to the reduction of pesticide use?

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Abstract

Many farms are changing their productive practices, by developing more environmentally-friendly practices in order to meet phytosanitary requirements of both private actors and public authorities. This article analyses the essential contribution of EU subsidies to the reduction of pesticide use. We use the FADN database, from 2000 to 2015, for its accuracy to measure pesticide use and to relate it to public subsidies received by farmers. The influence of EU subsidies on pesticide use is measured through a panel-data econometric model. In addition to individual, structural and financial factors which usually explain the implementation of environmental-friendly practices, our study emphasizes the role of EU subsidies. The results show that payments from the 1st Pillar increase pesticide use while payments from the 2nd Pillar lead to a decreasing intensity of phytosanitary expenses. Other key individual, structural and financial factors at the farm scale also have contrasted effects on pesticide use. The efficiency of public policies towards the issue of environmentally-friendly practices is therefore questioned.

Keywords: Pesticides, EU subsidies, FADN, France.

1. Introduction

Implementation of environmentally-friendly practices has been more and more popular over the last decades, mainly because of recent sanitary crises. These practices can take several forms including the reduction of applications and quantities of phytosanitary products as well as the implementation of integrated pest management techniques (Fernandez-Cornejo, 1996). An illustration of this growing trend is the extension of organic farming in Europe and widely in the World (Eurostat, 2017; FIBL and IFOAM, 2017).

Reducing pesticides is a challenge for a more sustainable agriculture addressed to all stakeholders, from producers to consumers. Existing studies have proven that the process underlying the implementation of more environmentally-friendly practices requires the combination of several factors such as the implementation of new production and marketing patterns and a continuous education of farm holders. The existence of taxes and incentives may also play a key role insofar farms revenue significantly depends on a public support.

The European Union has long been developing support policies for green agriculture. The Common Agricultural Policy is based on the concept of "multifunctionality", which considers according to the World Trade Organization, that "*agriculture has many functions in addition to producing food and fibre, e.g. environmental protection, landscape preservation, rural employment, food security*". More specifically, organic farming is regulated by the Council Regulation (EC) No 834/2007 on organic production and labelling of organic products, complemented by Commission Regulation (EC) No. 889/2008 with detailed rules for production, labelling and control. The CAP strategic framework for 2014-2020 reinforced the greening of EU agricultural policy (Westhoek et al., 2014).

In practice, the Concept of Common Agricultural Policy (CAP) is based on two pillars. The 1st Pillar includes direct payments which help farmers to stabilize their revenue, and market measures which tackle specific market situations. The 2nd Pillar concerns rural development policy and it includes measures for promoting environmentally-friendly practices. Within this framework, farmers receive subsidies providing they comply with rules related to the main public expectations on environment, public and animal health and welfare.

Within the CAP 2014-2020 framework, green practices are strongly encouraged with specific budget guidelines. Part of them are targeted to the development of organic farming but the range of possible actions includes in fact all types actions leading to more environmentally-friendly practices. In total, about 28.9% of the total EU budget for agriculture is focused on measures directly linked to environmental and climate issues (Table 1).

Table 1. Key EU budget allocations for transitioning towards environmental and climate friendly practices and organic farming under the CAP 2014–2020

While the previous table quantifies the efforts made in favour of green practices, it also describes a complex multi-layered structure of subsidies. The OECD (2017) annual report points out that most traditional agricultural support policies remains targeted towards production rather than quality, which may impede progress of environmentally-friendly practices.

The aim of this research is to examine in detail the influence of financial incentives on the implementation of environmentally-friendly practices. In order to complement the existing literature on these practices, the contribution provided by this paper is threefold. First, we propose an innovative analysis which considers the relationship between EU subsidies and pesticide use. Second, this analysis takes specific account of a set of individual, structural, economic and financial parameters as determinants of production choices. Third, we use data from the French Farm Accountancy Data Network for the period 2010-2015 because they provide a representative overview of professional French farms, particularly in terms of productive orientation. Our study considers more precisely the French case. This country is relevant case study since pesticide use is among the highest in Europe (Butault et al., 2012). In such a context, following the implementation of EcoPhyto I (2008) and Ecophyto II (2015) frameworks, objectives were defined to reduce the intensity of pesticide use in the French agriculture.

This article is structured as follows. In the first section, we develop the theoretical framework. In the second section, we present the empirical strategy. In the third section, we develop the results using descriptive statistics and econometric models. In the fourth section, we conclude and provide some perspectives.

2. Theoretical framework

The theoretical framework relies on the growing literature based on environmentally-friendly practices and organic farming. Starting for the analysis of the papers, we set up research hypotheses that will be tested using an empirical framework.

2.1 European subsidies

European subsidies contribute to increase the total income of the farmers. While this financial support can help farmers to implement environmentally-friendly practices, almost all studies consider only their consequences on the economic potential of the farm (Rigby et al., 2001; Kallas et al., 2010). Few studies took into account the link between European subsidies and green practices (Fernandez-Cornejo et al., 1998; Stozle, 2016) while during the last decade more financial incentives have been implemented. Because Europe has set up an active regulation which can influence pesticide use, our study focuses specifically on the impact of such subsidies on farmers' behaviour.

Considering that the CAP is based on two pillars with different assigned objectives, one can assume that contrasted effects may be noticed. Subsidies from the 1st Pillar which are designed to stabilize farmers' revenue through direct payments may be more likely to incite farmers using pesticides. Pesticide use can indeed be considered as risk management tool aiming at stabilizing yields from a year to another and hence farmers' income.

H1a European subsidies from the 1st Pillar lead to an increase in pesticide use.

Subsidies from the 2nd Pillar, which comprises rural development policies seems to be better adapted to pesticides reduction. These subsidies incorporate mainly compensation for losses caused by adverse weather conditions and agrienvironmental subsidies. Such supports foster the implementation of more environmentally-friendly practices and hence may discourage pesticide applications.

H1b European subsidies from the 2nd Pillar lead to a decrease in pesticide use.

2.2 Structural characteristics

Padel (2001) and Kallas et al. (2010) emphasize that small farms are more willing to adopt organic farming. Aubert and Enjolras (2017) also show that larger farms may also be interested by this kind of farming because of a sufficient economic dimension.

H2a. Pesticide use increases with the size of the farm

According to Dinis et al. (2015) and Aubert and Enjolras (2017), farms reducing pesticide use are less diversified. The rationale lies in the production and certification constraints when adopting alternative production processes. However, Padel (2001), Hanson et al. (2004) and Kallas et al. (2010) find an opposite situation: farms which apply less pesticides may diversify their activities in order to mitigate the consequences of potential yield losses.

H2b. Pesticide use increase with the diversification of farm produces

Workforce has been continuously acknowledged as a key factor leading to the adoption of environmentally-friendly practices (Jansen, 2000; Padel, 2001; Aubert and Enjolras, 2017). An increase in working hours is needed because of additional activities, such as monitoring, required by a drop in pesticide applications (Karali et al., 2014).

H2c. Pesticide use decreases when workforce increases

Karali et al. (2014) show that available family workforce is one of the cheapest substitute to pesticides use. Dinis et al. (2015) and Kallas et al. (2010) also prove that family farming is deeper organic because of a smaller need of material investments when this type of workforce is available. Aubert and Enjolras (2017) demonstrate that, for small farms, family work is essential is the adoption of environmentally-friendly practices.

H2d. Pesticide use decreases when family work increases

2.3 Individual characteristics

Padel (2001), Sylvander and Schieb-Bienfait (2006), Kallas et al. (2010) and Aubert and Enjolras (2017) show that the most the farm holder is educated and the most he is involved in environmentally-friendly practices.

H3a. A higher level of education for the farm holder decreases pesticide use

Sylvander and Schieb-Bienfait (2006) emphasize the need for the holder to be fully involved in his farming activity when adopting organic farming.

H3b. The time spent by the farm holder on his farm decreases pesticide use

2.4 Financial characteristics

Offermann and Nieber (2000), as well as Koesling et al. (2008), indicate that farms converting to organic farming may be motivated by the perspective of a higher profitability.

H4a. Profitable farms increase their pesticide use

Galt (2008) highlights the fact that indebtedness has a positive impact on the consumption of pesticides used per hectare while Sharma et al. (2011) showed this effect is not significant. Farmers may prioritize expenses such as pesticides because their application can insure yields.

H4b. Indebtedness leads to an increase in pesticide use

2.5 Control variables

Because of their specificities, mainly in terms of sensibility to pests and diseases, some specializations are more likely to use pesticides. As a matter of fact, while farms specializing on field crops used 134€ per hectare of pesticides in 2006, farms specializing on wine growing used 394€ per hectare (Butault et al., 2010).

H5a. The technical and economic specialization influences pesticide use

The location of the farm is also an important factor which reflects the environment in which farmers evolve. Since our study aims at appreciating the importance of European support on pesticide use, location can be considered through a location in less-favoured areas characterized by a lower density, a higher degree of isolation and more complex farming activities. We assume that to be located in a less-favoured area decreases the use of pesticide since farmers are encouraged to implement environmentally-friendly practices in order to preserve these areas (Rudow, 2014).

H5b. A location in a less-favoured area decreases pesticide use

Whatever the location and the specialization, we are witnessing a fast evolution of phytosanitary requirements for all farms imposed by private actors, public authorities and consumers (Lefebvre et al. 2014; Böcker and Finger, 2016). Hence, we assume that pesticide use decreases over time.

H5c. Pesticide use decreases over time

These research hypotheses will be tested within the empirical framework developed hereafter.

3. Empirical framework

In this section, we present first the database used and second the econometric model implemented to understand to what extend farmers' behaviour towards pesticide use is conditioned not only by individual, structural and financial characteristics but also by the level of European support.

3.1 Database

In order to understand farmers' practices in terms of pesticides used, our study is based on the European Farm Accountancy Data Network (FADN) for the period 2000-2015. These data are both the most precise available at the individual level and the most complete and recent that we have. This database offers a reliable way to access structural and financial characteristics of professional farms. Professional farms correspond to farms whose standard output is superior to 25.000€.

Because of the sampling methodology, farms belonging to the FADN-RICA do not correspond to perennial farms. From 2000 to 2015, whatever the economic and technical orientation (ETO) 106,384 farms are surveyed. We consider in our study all professional farms, regardless of their specializations. Market gardeners, wine growers, fruit producers as well as sheep breeders are therefore considered.

The database let us appreciate not only the individual characteristics of the farmer and the structural and financial characteristics of farms but also pesticides used. More precisely, the latter is measured in economic terms through the declared expenses. In order to neutralize size effects, expenses are reported to farm sales.

Table 2 summarizes the variables used for this analysis, the underlying hypotheses and the direction of the effects.

Table 2. List of variables used in the analysis

3.2 Econometric models

The aim of our study is to understand to what extend individual, structural and financial characteristics lead to an intensive use of pesticides and to what extent European support specifically drives farmers' behaviour. To do so, an unbalanced panel is used from 2000 to 2015. Indeed, the renewal of farms in the sample, from one year to another, is random. This let us consider all farms present in the period and not only perennial ones. Hausman's test (1978) lets us favouring a random effects model rather than a fixed effects model. Hence, we perform a panel with random effects in order to consider not only individual effects but also temporal ones. We also carried out heteroscedasticity and autocorrelation tests (Wooldridge, 2002).

In order to appreciate to what extent farmers implement environmentally-friendly practices, three main measures can be considered. The first one considers directly the quantity of pesticides used (Aubert and Enjolras, 2014). The second one is indirect through the adoption of integrated pest management technics (Aubert et al., 2013; Fernandez-Cornejo, 1996; Fernandez-Cornejo and Ferraioli, 1999; Galt, 2008; McNamara and Keith Douce, 1991). The third one takes into account the adoption of a certification such as the "organic farming" label (Aubert and Enjolras, 2016). In our case, the database provides information on the measure of amount of pesticide expenditures. To remedy a possible size effect, we have to divide this amount by the dimension of the farm, which can be either physical or economic. Since our study considers all specializations, the physical size cannot be taken into account. In fact, a farm specializing in wine growing will generate a standard output of 81,414€/hectare if located in Champagne-Ardennes and 4,134€/hectare if located in Lorraine. Hence, we consider pesticide expenditures over sales as an objective indicator.

The model explains the level of pesticide expenditures divided by sales and can be considered as follow:

$$Y_{it} = \alpha + \beta' ES_{it} + \gamma' SC + \delta' IC_{it} + \phi' FI_{it} + \varsigma' ETO_t + \varphi' Year_i + \varepsilon_{it}$$

Where:
Y_{it} is the level of pesticide expenditures divided by sales
ES_{it} is the matrix of European subsidies
SC_{it} is the matrix of structural characteristics
IC_{it} is the matrix of individual characteristics
FI_{it} is the matrix of financial characteristics
ETO_i is a control variable related to the economic and technical orientation of the farm
$Year_t$ is a control variable related to the period
α is the constant,
β, γ, δ, ϕ, ς and φ are (vectors of) parameters to be estimated
ε_{it} is a random error term

4. Results

4.1 Descriptive statistics

From 2000 to 2015, we observe that the level of pesticide expenditures is quite stable although it varies according to the specialization (Figure 1). Farms specializing in field crops use more pesticides than farms specializing in fruit production and wine growing.

Figure 1. Dynamics of pesticide expenditures

When we consider the distribution of pesticide expenditures, we observe a heterogeneity of farms according to their environmental practices (Figure 2). Half farmers (50.1%) exhibit a very low level of expenditures (lower than 10 %), while for a small minority (3%) phytosanitary expenditures represent more than 40 % of their sales.

Figure 2. Distribution of pesticide expenditures

More precisely, we observe that, on average, pesticide expenditures represent 12.9% of the farms' sales (Table 3a). Compared to European subsidies, we can note that supports from the 1st Pillar represent 21.6% of sales and decoupled supports from this Pillar represent almost half of this support. We also notice that supports from the 2nd Pillar represent less than 5 % of farmers sales.

Table 3a. Relative importance of pesticide expenditures on sales

Farms located in less-favoured areas and specializing in field crops seem to implement the least environmentally-friendly practices (Table 3b). As a matter of fact, while pesticide expenditures represent 12.9% of sales at the national level, they represent respectively 14% and 27% for these farms.

Considering farmers' characteristics, descriptive statistics indicate that farmers who are more educated and who work more than ¾ time on their farm implement more environmentally-friendly practices. These practices seem also to be linked to the type of employment. Farmers employing only family members present a lower level of pesticide expenditures than farms with waged workers.

Table 3b. Relative importance of pesticide expenditures on sales according to farms and farmers' characteristics

4.2 Econometric models

The econometric model let us appreciate the dynamics of pesticide expenditures considering both individual and temporal dimensions (Table 4).

Table 4. Econometric models

Results highlight the role of European support on farmers' behaviour. Considering the 1st Pillar, the model underlines that this support has no influence when considered in an aggregated way but has a positive influence when only decoupled payments are considered (H1a validated). These subsidies appear to be a springboard to develop production. Considering the 2nd Pillar of the European support, the results demonstrate that, whatever the nature of the support, each kind of subsidy translates into a reduction of pesticide expenditures (H1b validated). Because these supports are targeted to improve the environment, our results confirm the effective importance of such support to the implementation of environmentally-friendly practices.

Beyond the individual characteristics of farmers, the level of pesticide expenditures appears to be conditioned by structural characteristics. Farms who apply more pesticides are more likely larger (H2a validated) and more diversified (H2b validated). The results also highlight that farms on which there is more workforce are more likely to reduce their use of pesticides (H2c validated). This confirms the fact that pesticides and workforce are substitutes. To reduce the use of pesticides, farmers need to employ workforce for direct observation and treatments. Moreover, family farms are more likely to reduce pesticide use (H2d validated).

The results also highlight the importance of farmers' characteristics. We confirm that farmers who are more educated are more likely to implement environmentally-friendly practices (H3a validated). This level of education has to be considered with the time spent on the farm by the holder since the implementation of such practices supposes a higher implication from the farmer, his family or waged workforce (H3b validated).

When we consider the financial situation of farms, the results underline that the level of profitability has no impact on pesticide expenditures (H4a not validated). Moreover, the results confirm that farmers who are more indebted apply less pesticides. This can translate the fact that these farmers may use environmentally-friendly practices as a way to reduce their indebtedness (H4b not validated).

The econometric model confirms the specificity of specialization (H5a validated) as well as the importance of the location. Farmers who are located in less-favoured areas are more likely to apply pesticides than farmers located in other areas. The reason may lie in the risk-decreasing effect of pesticides in these specific areas (H5b not validated). Annual effects are only significant in the second model. They tend to prove that pesticide use decreased after 2010, when public policies in favour of the environment and organic farming were reinforced (H5c partially validated).

5. Conclusion

In this article, we have analysed the influence of EU subsidies on pesticide use. This question is salient as an increasing number of farms are progressively converting their production towards environmentally-friendly practices in order to meet phytosanitary requirements. This study focused on French farms, by using data from the FADN for the period 2000-2015. This database appears well suited to provide precise information regarding the farms individual, structural and financial characteristics, including pesticide expenditures and the detail of EU subsidies.

Many factors drive positively pesticide use, such as farm size and location in less-favoured areas. Rationales for intensive pesticide use may be different according to the types of farms. While large farms are production-oriented, farms located in less-favoured areas use pesticides as a way to secure their yields. Conversely, family farming leads to a decrease in pesticide use. We also observe a year effect which indicates that pesticides expenses are being reduced overtime. The results also confirm that there exists sectorial difference, some sectors such as field crops being more pesticide-intensive, such as field crops.

The results show that EU subsidies have contrasted effect on environmental practices. While decoupled subsidies received by farmers from the 1st Pillar tend to increase pesticide use, payments from the 2nd Pillar have the opposite effects and act in favour of greener practices. The reason lies in the targets of each kind of subsidies: the 1st Pillar promotes production quantity while the 2nd Pillar rather fosters production quality. In these conditions, the progressive shift of subsidies observed from the 1st to the 2nd Pillar is likely to be favourable to environmentally-friendly practices. Beyond these effects, the results highlight the dynamics in favour of a reduction of pesticide use.

These results emphasize the key role of EU subsidies, especially through the 2nd Pillar, in promoting green practices at the farm level. Incentives are nowadays mainly targeted on production practices on the fields. However, more specific actions could be performed in order to encourage the development of alternative practices. Moreover, the research would benefit from more detailed data on EU subsidies targeted on environmentally-friendly practices so as to assess their effectiveness.

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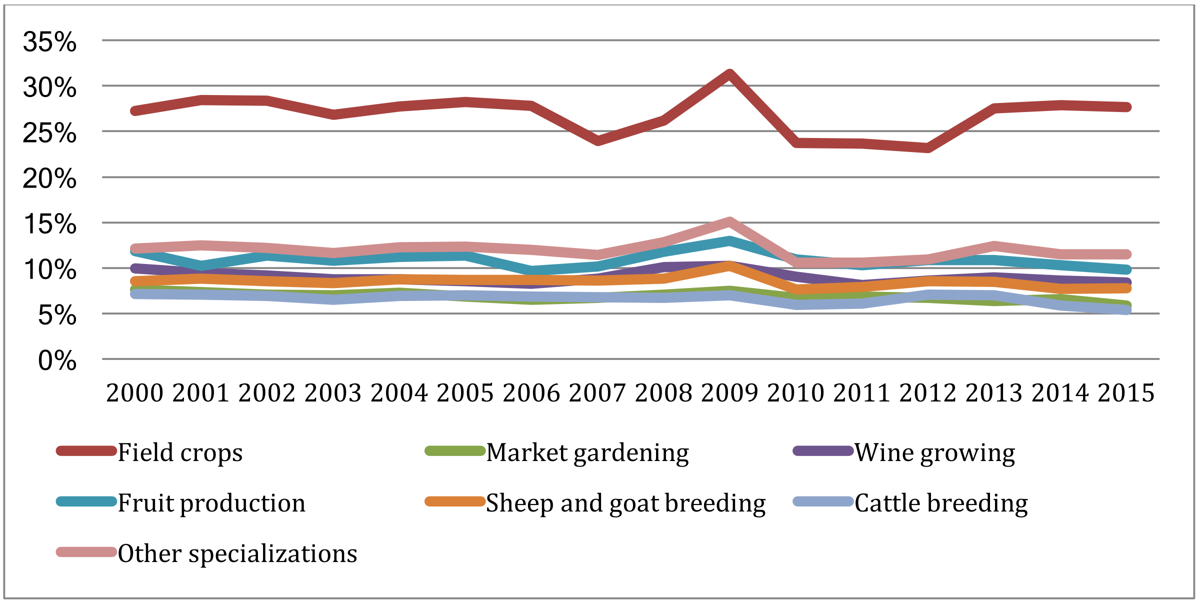
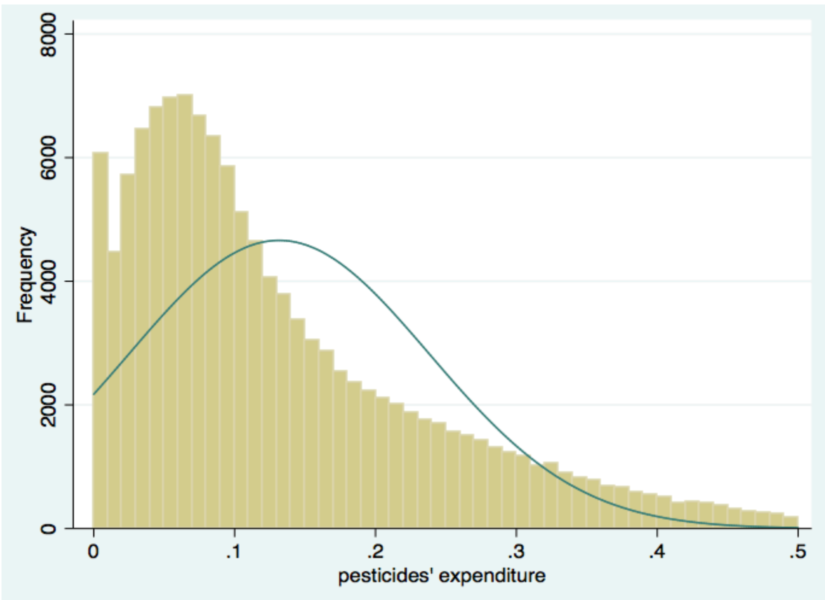
Figure 1. Dynamics of pesticide expenditures



Key: This figure presents the evolution of pesticide expenditures relatively to sales.

Source: Own representation, after FADN 2000-2015.

Figure 2. Distribution of pesticide expenditures



Source: Own representation, after FADN 2000-2015.

Table 1. Key EU budget allocations for transitioning towards environmental and climate friendly practices and organic farming under the CAP 2014–2020

Budget Allocation	**Billion Euros**	**% of total EAFRD**	**% of total EU budget for agriculture**
Budget allocation for Pillar 1 and Pillar 2			
1. Pillar 1 - Market related expenditure and direct payments	312.7		76%
2. Pillar 2 – Rural development	99		24%
3. Total EU budget for agriculture (Pillar 1 + Pillar 2)	411.7		100%
Greening Component (Pillar 1)			
4. Total national ceilings for direct payments 2014 - 2020	297.6		72.3%
5. Greening component (maximum 30% of direct payments)	89.3		21.7%
Climate and environment issues (Pillar 2)			
6. Contribution to environment & climate issues - including organic farming (minimum 30% of EAFRD)	29.7	30%	7.2%
Organic farming support (conversion and maintenance payments)			
7. EAFRD organic farming support (Measure 11)	6.3	6.4%	1.5%
8. Total public expenditure (EU and Member States) for organic farming support (Measure 11)	9.9		
Total environmental and climate change spending for agriculture (Pillar 1 and Pillar 2)			
9. EU budget for transition towards environmental and climate-friendly agriculture	119		28.9%

Source: Stolze et al. (2016).

Table 2. List of variables used in the analysis

	Definition	Hypotheses	Direction of the effect
Dependent variable			
Pesticides	Value of pesticide expenditures (€/sales)	/	/
Explanatory variables			
Hypothesis 1: European subsidies			
1st Pillar	Value of EU subsidies from the 1st Pillar (€/sales)	H1a	+
Decoupled subsidies	Value of decoupled subsidies from the 1st Pillar (€/sales)		
2nd Pillar	Value of EU subsidies from the 2nd Pillar (€/sales)	H1b	-
Adverse weather conditions subsidies	Compensation for losses caused by adverse weather conditions (€/sales)		
Agrienvironmental grazing subsidies	Agrienvironmental grazing subsidies (€/sales)		
Other agrienvironmental subsidies	Other agrienvironmental subsidies (€/sales)		
Hypothesis 2: Structural characteristics			
Usable Agricultural Area	Total Usable Agricultural Area of the farm (hectare)	H2a	+
Diversification	Number of different crop produced on the farm (counter)	H2b	+
Total workforce	Total workforce (in Agricultural Work Units, AWU)	H2c	-
Family farm	The farm employs only family workforce (dummy)	H2d	-
Hypothesis 3: Individual characteristics			
General education	General education of the farm holder (4 categories: no education, primary, secondary, higher)	H3a	-
Time spent by the farm holder on the farm	Time spent by the farm holder on his farm (3 categories: less than ¼ time, between ¼ and ¾ time, more than ¾ time)	H3b	-
Hypothesis 4: Financial characteristics			
Profitability	Profitability measured by the Return on Assets (ROA)	H4a	+
Indebtedness	Indebtedness measured by the debt-to-assets ratio	H4b	
Hypothesis 5: Control variables			
Less-Favoured Area	The farm is located in a Less-Favoured-Area (dummy)	H5a	-
ETO	E economic and Technical Orientation (1: field crops; 2: market gardening; 3: wine growing; 4: fruit production; 5: sheep and goat breeding; 6: cattle breeding; 7: other specializations)	H5b	/
Year	The year considered from 2000 to 2015	H5c	-

Table 3a. Relative importance of pesticide expenditures on sales

	Mean	Std. Dev.
Pesticides expenses	12.90%	0.109
1st Pillar	21.60%	0.216
Decoupled subsidies	8.40%	0.128
2nd Pillar	4.20%	0.105
Compensation for losses caused by adverse weather conditions	0.50%	0.030
Agrienvironmental grazing subsidies	0.60%	0.029
Other agrienvironmental subsidies	0.40%	0.029

Key: Values are expressed relatively to sales.

Source: Own computation, after FADN 2000-2015.

Table 3b. Relative importance of pesticide expenditures on sales according to farms and farmers' characteristics

		Mean	Std. Dev.
Less-Favoured Area	No	9.27%	0.081
	Yes	14.05%	0.113
Education	No	14.13%	0.110
	Primary	12.61%	0.108
	Secondary	11.42%	0.103
	Higher	11.66%	0.114
Family	No	13.91%	0.114
	Yes	11.21%	0.095
Time spent by the farm holder on the farm	Less than ¼ time	12.83%	0.105
	Between ¼ and ¾ time	14.91%	0.122
	More than ¾ time	12.82%	0.108
ETO	Field crops	27.19%	0.102
	Market gardening	6.33%	0.048
	Wine growing	8.83%	0.070
	Fruit production	10.64%	0.062
	Sheep and goat breeding	8.29%	0.053
	Cattle breeding	6.10%	0.058
	Other specializations	12.03%	0.099

Key: Values are expressed relatively to sales.

Source: Own computation, after FADN 2000-2015.

Table 4. Econometric models

	Model 1	Model 2
European subsidies		
1st Pillar (/Sales)	0.014	
Decoupled subsidies		0.152***
2nd Pillar (/Sales)	-0.027*	
Compensation for losses caused by adverse weather conditions		0.055***
Agrienvironmental grazing subsidies		-0.304***
Other agrienvironmental subsidies		-0.147***
Farm structure		
Usable Agricultural Area	0.000***	0.000***
Diversification	0.003***	0.002***
Workforce		
Total Workforce	-0.007***	-0.007***
Family farm	-0.027***	-0.025***
Time spent by the farm holder on the farm	-0.003	-0.003
Farm holder's general education (Reference: No education)		
Primary	-0.009***	-0.009***
Secondary	-0.017***	-0.016***
Higher	-0.017***	-0.016***
Financial situation of the farm		
Profitability (ROA)$^{-1}$	0.000	0.000
Indebtedness (Debt-to-asset ratio)$^{-1}$	-0.000***	-0.000***
ETO (Reference: Field crops)		
Market gardening	-0.127***	-0.117***
Wine growing	-0.124***	-0.113***
Fruit production	-0.092***	-0.086***
Sheep and goat breeding	-0.178***	-0.172***
Cattle breeding	-0.191***	-0.184***
Other specializations	-0.134***	-0.128***
Less-Favoured Area	0.006***	0.006***
Year (Reference: 2000)		
2001	0.003	0.002
2002	0.008	0.007
2003	0.002	0.002
2004	0.006	0.005
2005	0.006	0.004
2006	0.005	0.009
2007	-0.003	-0.024***
2008	0.008	-0.011
2009	0.026***	0.009
2010	-0.010	-0.029***
2011	-0.010	-0.034***
2012	-0.008	-0.029***
2013	0.006	-0.014*
2014	0.002	-0.019**
2015	0.002	-0.018**
Constant	0.248***	0.245***
Nb of observations	106,384	106,384

Key: *, ** and *** respectively denote significance at the 10%, 5% and 1% levels respectively.
$^{-1}$ denotes a lagged variable.

Source: Own computation, after FADN 2000-2015.