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# An attempt to measure the economic sustainability of farm diversification

Ascione E., Henke R. and Salvioni C.

National Institute of Agricultural Economics - Italy

ascione@inea.it

# **DRAFT**

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# An attempt to measure the economic sustainability of farm diversification

Ascione E., Henke R. and Salvioni C.

#### Abstract

The recent CAP has increasingly supported the process of farm diversification throughout a set of measures aimed at enhancing alternative forms of incomes. The paper focuses on evaluating to what extent the diversification strategy enhanced the economic sustainability of different typologies of farms, ranking from micro farms to traditional conventional ones and to the diversified and quality-differentiated farm. The paper analyses the evolution a set of indicators used to assess and compare the performance of these farm typologies over the 2003-09 period. Results show that a certain level of multifunctionality and diversification is actually featured in most farms. The majority of farms in the panel is focused on the strategy of differentiation through quality products, which is key for Italian agriculture performance and competitiveness. Moreover, the indicators of economic sustainability seem to confirm the complementary role of rural development policies to the first pillar of the CAP.

Keywords: income diversification; multifunctionality, farm profiles, Italian farm strategies

JEL classification: Q010; Q120

## 1. Introduction

Farms have always implemented strategies of production as well as available input use diversification. For example, direct sale and on-farm transformation of both food and non-food products have always been set up in farms in order to supply an extra source of labour, alongside the proper on-farm activity, to the surplus of family work (Henke, Salvioni, 2008 and 2010). The average level of farm income, in fact, often below that of other sectors, made alternative sources of income necessary, in order to ensure a comparable life standard to the whole family farm, if not its own subsistence.

The growth of profitability of farm resources and the need to absorb in the farm the surplus of family labour are still in to explain new and post-modernist diversification process. In a nutshell, after the decades of success of a modernist paradigm that has pushed farms into process of production intensification and specialisation, the unsustainability of this process, stressed by the economic crises and the long-standing process of agriculture economic decline, has led to a change of paradigm that has encouraged an increasing search of other and differentiated sources of income, sometime off-farm but more and more often on-farm and however outside the mere constraints of the agricultural activity (Wilson, 2007 and 2008). The result of this process has been that of a co-existence of different models of agricultural

development, that have been differently catalogued as post-modernist, neo-modernist, multifunctional, according the specific aspect underlined within this more generalised decomposition of the dominant model (Ravenscroft and Taylor, 2009).

Although economic reasons are in most cases the main engine in the start-up of production and input use diversification strategies, non-economic reasons as the drivers of the change process have also been deeply investigated, such as the social conditions of the farmers, or the more general economic and social conditions of the territory where the farm is located.

Starting from the Nineties, alongside the acknowledgment of the environmental role of agriculture and the rethinking of the public support in agriculture, that led to measures finalized at the reduction of negative externalities in agriculture and the control of production surpluses, a new "virtuous circle" has been set up, around the concepts of farming sustainability and multifunctionality of the primary sector. As a consequence, a process of multifunctional diversification has been increasingly involving farms, that now produce not only food and fibres but also, and in a conjunct way, services and new products (often unfairly recognized as "secondary products").

At the same time, the recognized success of the rural development policies, as the "second pillar of the CAP", was key in widen the action field of multifunctional diversification not only to the production of externalities and pure public goods, but also to other economic activities whose social and environmental effects are of an indirect nature. Alongside this success, also policies in the first pillar of the CAP have been addressed to support the production of public goods and services in agriculture and to improve the environmental function of the agricultural activities, through a process of "greening" of the CAP.

The growing integration of agriculture in the rural economy has contributed to create more opportunities of diversification within farms, even in distant fields from the mere agricultural one. More in particular, one can test the proliferation of initiatives that accompany the food production in the farms, sometimes replacing it, such as the production of services connected to the main farming activity (tourism, recreational activities, educational ones, social services, and so on) as well as new non-farming products (energy, land and territory stewardship, etc.).

The choice of diversification often depends, to a large extent, on farms' attempt to react to the progressive decline and instability of agricultural incomes. Although economic motivations are often at the roots of a diversification process, it has also been highlighted how such choice can be driven by non-economic reasons, such as environmental concerns or social issues expressed at the local territorial level.

Given this as a background, our main research question is how sustainable these processes of diversification are in economic terms?

We answer this question by analyzing the evolution a set of indicators used to assess and compare the performance of conventional, differentiated and diversified farms, over the 2003-9 period. The analysis is performed on a panel of 3,101 farms in the Italian Fadn data base. survey. Previous literature on diversification focuses the attention on the diffusion of these

strategies among farmers and the characteristics of diversified farms in a limited period of time (H. Meert et al., 2005) and the role played by idiosyncratic characteristics of farmers on the adoption of diversified activities (Aguglia et al. 2009; Esposti and Finocchio, 2008; McNally, 2001; Jongeneel et al. 2008). We add to this literature by comparing the long term, namely over the 2003-9 period, performance of conventional to diversified farms

The results of this work has been used, on one side, as a test to assess how solid and sustainable is the process of farm diversification compared to other farm development paths (conventional farms, non-professional farms...) and whether farms have actually adapted to the recent policy indications about diversification; on the other side, as a feedback for further policy reform aimed at smoothing adaptation problems for farms and to enhance latent aspects of diversification that are not fully acknowledged and properly regulated by the present CAP.

#### 2. METHODOLOGY ISSUES AND DATA

In this paper we make use of a typology recently developed by INEA (Ascione et al., 2011) with the aim to exploit the new information gathered starting from 2008 and classify farms taking account of both farming and non farming activities present on farm. Generally speaking, statistics on farms, in order to ensure homogeneity and comparability of observations, do refer to the sector as a whole or to specific specialization branches, paying scant if any attention to the "innovative" component of the agricultural and farm activities. In spite of that limit of official statistics, reality in agriculture and rural areas has becoming increasingly more complex and multidimensional, and what farms supply is less and less limited to "conventional" agricultural products, but new ones are added to them, such as quality products (intended in a broad sense, that is including organic products, denominations of origin, territorial brands and so on). Moreover, the idea of diversifying the production is more and more diffused in European and Italian farms, and that explains the larger and larger combination of goods and services supplied by farms (the so-called "connected activities"), such as agro-tourism, rural tourism, educational farms, therapeutic farms and so on. As a consequence, statistics are making a serious effort in trying to adapt to these changes and report with a closer zoom, reality as it is displayed in farms and in agricultural and rural areas. The results of such an effort often are realized in new and different farm typologies, which represent in an adequate way, the new functions of agriculture and products associated to them.

More in details, the farm typology developed by INEA (Ascione et al., 2011) classifies the Italian commercial farms into 7 mutually exclusive and relatively homogeneous groups according to the degree of diversification and differentiation of production, and by size. The degree of diversification and differentiation is assessed on the basis of the quota of **gross saleable production** (**GSP**) associated to differentiated and diversified farm products. More in detail, the quota of GSP originated from PDOs, organic farming products and other certified products is used to identify whether a farm is following a quality, i.e. differentiation, strategy. The share of GSP originated from agro-tourism, on-farm recreational activities and other

services, on-farm processing (wine, cheese, and so on) is used to assess whether the farm is diversified. The share of the value of these types of production on the total farm GSP has been used to determine the three main typologies: conventional, differentiated and diversified farms.

The economic size is defined on the basis of the value of **total farm gross saleable production** (**TGSP**). Three classes of size have been defined: the micro-farms that are characterized by a TGSP below 15,000 euro, the small farms (TGSP between 15,000 and 100,00 euro) and the large farms (TGSP over 100,000 euros). The choice of using the TGSP rather than the standard gross margin (SGM), usually used in the main classifications of farms at the EU level, is a consequence of the objective to produce a classification of farms that takes into account the value of quality agricultural products as well as the value of non agricultural products (e.g. agri-tourism, etc.) produced by the farm. SGM is, by definition, a standardized value so that it does not consider the variability of sale prices according to the quality level of marketed goods and does not take into account the non-agricultural activities.

The variables and the thresholds used to segment the farms in the typology have been set up on the basis of the advice of a panel of experts (Table 1).

The resulting farm typology discriminates farms into the following categories:

- Micro farms. It includes very small farms that, even though are classified as
  professional as all Fadn farms, are so small that their relationship with markets are
  marginal if not null. Some of these farms provide various functions so that they can be
  considered "multifunctional".
- Conventional farms. It includes small and large conventional farms.
- **Diversified farms**. It includes small and large farms running "diversified" activities.
- **Differentiated farms.** It includes small and large farms producing quality products.

*Table 1 -* The *INEA farm typology (variables and thresholds)* 

Farm Typology	Micro	Multifunctional Micro	Conventional Large	Conventional Large Quality	Conventional Small	Conventional Small Quality	Diversified Large	Diversified Small	Differentiated Large	Differentiated Small
Productive Strategic Focus	Pluriactive and part-time	Mixed	Cost leadership	Mixed	Homogenous to the local context	Mixed	Farm activity diversification	Farm activity diversificatio n	Quality and production tipicness	Quality and production tipicness
	GSP < 15,000 €	GSP < 15,000 €	GSP >= 100,000 €	GSP >= 100,000 €	15,000 € <= GSP < 100,000 €	15,000 € <= GSP < 100,000 €	GSP >= 100,000 €	15,000 € <= GSP < 100,000 €	GSP >= 100,000 €	15,000 € <= GSP < 100,000 €
	Share of Quality brands on GSP < 10%	Share of Quality brands on GSP >= 10%	Share of Quality brands on GSP < 10%	10% < Share of Quality brands on GSP <= 30%	Share of Quality brands on GSP < 10%	10% < Share of Quality brands on GSP <= 30%	Share of Quality brands on GSP < 30%	Share of Quality brands on GSP < 30%	Share of Quality brands on GSP >= 30%	Share of Quality brands on GSP >= 30%
Variables and thresholds	Share of other revenues on GSP < 30%	Share of other revenues on GSP >= 30%	Share of other revenues on GSP < 30%	Share of other revenues on GSP < 30%	Share of other revenues on GSP < 30%	Share of other revenues on GSP < 30%	Share of other revenues on GSP >= 30%	Share of other revenues on GSP >= 30%	Share of other revenues on GSP < 30%	Share of other revenues on GSP < 30%
	Share agritourism = 0	Share agritourism = 0	Share agritourism = 0 Share of processed GSP < 30%	Share of	Share agritourism = 0 Share of processed GSP < 30%	Share agritourism = 0 Share of processed GSP < 30%	Share of	Share of	Share of	Share agritourism = 0 Share of processed GSP < 30%

Source: elaborations on Italian FADN

The INEA typology has been applied to the FADN data collected in 2008 and 2009.

In order to compare the economic performance of the identified groups of farms, we applied the same typology to a panel of 3,101 farms observed over the 2003-2009 period. This panel has been obtained from the Italian FADN-RICA 1 sample. After removing those observations with incomplete and missing data, we extracted a 7 wave balanced panel of farms for which continuous records are available for the period from 2003 to 2009.

For the 7 farm groups of the INEA typology we first calculated the changes in structural and economic characteristics over the 2003-4 and 2008-9 period.

We then calculated a set of indicators to assess the economic sustainability of different farm groups. More in detail, we calculated the value added to gross production ratio, that is a proxy of profitability, and Farm Net Value Added (FNVA) per unit of labour and per hectare of utilized land. In addition, we calculated the ratio of the actual level of support coming from the CAP over farm net income, from which one can infer on the level of support ensured to each farm group. These indicators have been calculated for the 2003-4 and 2008-9 period in order to follow the economic performance of different farm groups over time and assess the economic sustainability of the 7 groups of farms identified by the INEA typology.

#### 3. STRUCTURAL AND ECONOMIC CHARACTERISTICS BY FARM TYPES

In Table 2 the growth rate over the period under study of the main economic and structural features of farm typologies discussed in section 2 are displayed. It is worth to remark that the two periods chosen correspond to two different moments of the CAP implementation: before and after the Fischler reform. This can also supply important reflections about the effects on income of the changes in policies, with specific regards to the diversification tools, and, more in general, on the effectiveness of public support to farm income diversification aimed at boosting competitiveness.

The panel is composed of 3,101 farms per each year. It is characterised by a large predominance of "traditional" farms (conventional and micro farms) rather than the more "innovative" farms such as the diversified farms and the differentiated ones. As Table 2 shows, conventional farms are far more than 50% of the total panel farms (2,230). Within the conventional profiles, the largest group is that of small farms (GSP between 15,000 and 100,000 euro), which includes 1,440 units. The figures highlight that conventional profiles (and especially small farms) show some sort of interest towards diversification and multifunctionality, through the realisation of certified products and denominations and also through secondary functions connected to agricultural production. This tendency seems to confirm the idea that a certain level of multifunctionality and diversification is actually featured in most farms (Henke 2004; Wilson, 2007; Henke, Salvioni, 2008).

<sup>&</sup>lt;sup>1</sup>The Italian Farm Accountancy Data Network (FADN) survey started to be conducted on statistically representative sample drawn from the census in 2003. The sample is stratified according to criteria of geographical region, economic size (ESU) and farming type (FT). The field of observation is the total of commercial farms, that is farms with an economic size greater than 4 ESU (4,800 euro). The FADN sample size is approximately 15,000 farms covering 44% of total Italian farms and 99% of UAA.

The number of micro farms in the panel is relatively high: 485 units, of which 59 can be considered to follow a multifunctional approach to the activity.

If we draw our attention to the "innovation" strategies (diversification+ differentiation), the majority of farms (206 differentiated farms) are focused on the strategy of differentiation through quality products. Referring to Van Der Ploeg categories (2003) about multifunctional farms, panel farms seem more oriented to deepening functions rather than broadening ones. More specifically, the agricultural deepening task is pursued through the realisation of quality products (organic farming, PDOs, traditional products, other denominations), which are all aimed at increasing the value added within the primary component of the production chain.

Table 2 shows the percentage variations for the two periods considered of the main variables characterising the structural and economic features of the whole panel farms, together with the prevailing production specialisation in the various groups. Among the economic indicators the Farm Net Value Added (FNVA) has been calculated, which is an estimate of the value added of farms net of mortgages and taxes, but including public support.

Small farms, either diversified or conventional, experienced a reduction of inputs (land and labour); they are specialised in quality production (vines, olive groves, fruit) but also livestock. In economic terms, the production decreases (-15.5%) in spite of a reduction in current costs and a huge increase in public support. The reallocation of income over inputs (VA and FNVA) shrinks remarkably, and this has a direct effect on the poor profitability of farms (-8%). This is partially compensated by an impressive growth of support coming for the second pillar of the CAP (rural development policies - RDPs).

Large differentiated farms feature better performances over the period considered than small ones and large farms in other profiles, both in terms of FNVA (+44.5%) and Net Income (NI) (+75.4%). This is particularly due to the RDPs and specifically to the quality measures in the second pillar of the CAP.

Table 2 - Structural and economic indicators for Italian farm profiles (% variation 2003/04-2008/909)										
	Micro	Multifunctional Micro	Conventional Large	Conventional Large Quality	Conventional Small	Conventional Small Quality	Diversified Large	Diversified Small	Differentiated Large	Differentiated Small
Number of farms*	426	59	717	73	1.276	164	59	121	132	74
UAA	-11,5	24,1	3,2	-3,2	-5,4	-5,9	-9,7	-7,4	-4,0	6,2
Total WU	-18,6	- 26,9	-1,8	-10,8	-13,9	-14,5	-17,5	-11,7	-14,6	-6,7
Farms specialised in arable crops	9,7	-9,5	-7,7	-43,8	7,7	-7,7	-33,3	-100,0	-13,6	0,0
Farms specialised in fruits and vegetables	0,0	0,0	9,1	0,0	0,0	0,0	0,0	50,0	0,0	-20,0
Farms specialised in permanent crops	6,3	2,4	5,0	20,5	8,3	-5,0	8,7	2,8	10,3	0,0
Farms specialised in herbivorous breedings	-25,0	13,3	-3,4	14,3	-9,5	13,3	-9,1	-18,2	8,0	17,6
GSP	-31,8	-28,5	19,5	16,4	-12,3	-2,9	9,0	12,0	-15,5	44,6
Support I pillar	124,1	139,0	191,4	456,6	404,4	98,0	46,5	-16,1	762,3	189,5
Other support	235,9	10,6	106,7	225,9	332,3	458,0	387,0	54,3	280,6	463,6
Variable costs	-31,6	-24,4	13,8	-5,7	-21,9	-27,4	-7,7	-16,3	-17,8	46,8
Value added (VA)	-34,3	-39,1	9,0	21,5	-14,9	-0,1	12,0	15,9	-24,6	35,9
FNVA	-23,5	-34,2	11,3	30,0	-11,3	4,3	17,2	27,0	-26,5	44,5
Net Income	-19,2	-30,7	15,1	45,8	-3,4	25,9	40,5	27,8	-7,9	75,4
*It represents the number o										
Source: elaborations on Itali										

Looking at the diversification profiles, small farms again seem to prevail. The reduction of UAA for these farms is quite substantial (-7.4%), so it is their increase in specialisation towards fruit and vegetable production and permanent crops. Compared to large conventional

and differentiated farms their economic performance is definitely better, both in GSP terms (+12%) and FNVA (+27%), as well as NI (+27.8%) This can be the outcome a sound management, given that public support is relatively low and decreasing between 2003-04 and 2008-09, particularly those coming from the first pillar (-16.1%).

Finally, it is worth underlining the performance of micro-farms, which represent 16% of the panel composition. The negative structural and economic figures in Table 2 is an indirect confirm of the non-economic role of these farms, whose justification needs to be rather found in territorial and social objectives. The specialisation of conventional micro-farms is also oriented to quality production (vines, olive groves and fruit), but their economic performance has worsened in time, in spite of a significant improvement of the public support coming from both pillars of the CAP. As a consequence, the opening of these farms to diversification issues has probably more to do with the possibility of having access to public resources rather than pursuing real diversification strategies.

#### 4. ECONOMIC SUSTAINABILITY

We now focus on some economic indicators in order to assess the economic sustainability of the diversification process in Italian farms. More in details, we now propose a graphical analysis of some indicators of economic performance and share of public support on income. The former shed light on the farm management efficiency and profitability, while indicators of public support indicate the actual level of support coming from the CAP in each profile, from which one can infer on the level of support ensured to each diversification process.

To this end, we used radar figures in which for each variable the performance of the profiles per the two-year periods are compared<sup>2</sup>.

The first indicator here considered is the share of VA on the GSP. It can be considered the gross margin produced by the farm, net of any type of costs, both fixed and variable. In Figure 1, where we compare the variations of the indicator values for the farm profiles between the two periods considered, it appears that the farms oriented to broadening functions increase their net profitability. The diversified small farms show an increase of 5.5%, followed by conventional small and large quality typologies that increase their net productivity, respectively, by 3% and 1.5%.

The groups oriented to deepening functions decrease their profitability between the two periods considered. Probably, as shown in Figure 5, this decrease in gross margin for the small and large differentiated farms is somehow compensated by the corresponding increase of support from second pillar. This indicates the compensatory effect of rural development policies in the dynamics of income farms.

The micro farms (especially those following a multifunctional approach) confirm their marginal role given the poor performance of their profitability (decrease of 5% for the micro and 25% for the multifunctional micro profiles). However, the other indicators testing the remuneration of production factors of land and work (figures 2 and 3) reveal a broad improvement of average managerial efficiency for the farm typologies between the two periods.

<sup>2</sup> Data referred to 2003-04 have been normalised (equalled to 100) so that one can figure out the changes of values in the graphics.

Regarding productivity per hectare, almost all farms oriented toward multifunctional aspects (differentiated and diversified, as well as the conventional quality profiles) realise a higher productivity of the land factor. In particular, the diversified small farms increase their land productivity (+62%). This shows how the strategy of diversification can enhance the use of the land factor in a relatively more efficient way, while recording a significant reduction in the utilized area (-7.4%), compared to other groups.

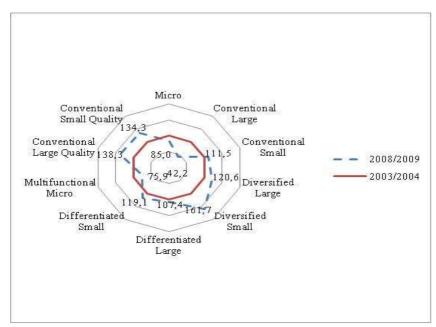
Also the economic efficiency of work improves between the two periods for almost all farm groups (except multifunctional micro-farms: -21%). It highlights the net positive outcome of the differentiated small group (+41.4%). This shows that the strategy of product quality, when it is pursued by small farms, can compensate the work productivity, despite a significant decrease in work unit employed (-14.6%).

Micro Conventional Conventional Small Quality 102,9 Large 95.2 96,8 Conventional 01 Conventional Large Quality Small. 97,0 - 2008/2009 -2003/2004 75,0 98.6 Multifunctional Diversified Large Micro 91,9 91,4 1055 Diversified Small Differentiated Small Differentiated Large

Figure 1 – Average incidence rate of value added on gross saleable production (% variation 2003/04-2008/09)

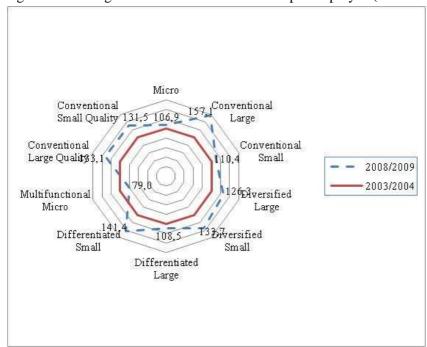
Source: elaborations on Italian FADN Sample

Figure 2 – Average indicator of the value added per hectare (% variation 2003/04-2008/09)



Source: elaborations on Italian FADN Sample

Figure 3 – Average indicator of the value added per employee (% variation 2003/04-2008/09)



Source: elaborations on Italian FADN Sample

A second aspect of the analysis measures how the net income, obtained by different farm profiles, is supported on average by public support of first and second pillar of the CAP and other regional payments. In particular, the support of the first pillar (decoupled single payment and specific CMOs) are included in the value of GSP. Instead, the other support including the

payments of second pillar by RDPs and regional payments, such as state aids, are not included in the value of GSP.

Figures 4 and 5 show how the economic performances of different profiles are all generally supported by public support in the period observed, coming from both first pillar and other sources of support. However, it is worth noting how there is a sort of complementarity effect between different sources of support, so that if one category is under-dimensioned, the other will at least partially compensate.

Given the strategic choices of farms, the large ones that pursue quality differentiation integrate their revenues with support coming from the first pillar of the CAP (for the differentiated farms the increase of support from the first pillar is +200%, while for the conventional quality farms is even larger: +267%). Such a high component of support is probably due to their prevailing specialization in the breeding sector (+17.6% for differentiated large farms and +14.3% for conventional quality large farms) which a particularly highly supported sector.

Income in diversified small (-41%) and large (-44.4%) farms is relatively less supported by direct payments, while other forms of support are much more important in integrating their revenues, especially in the case of large farms (+300%). Looking at figures 4 and 5, it is quite clear that even micro-farms feature a large increase in the share of first pillar payments on NI (+60%), while interestingly enough the variation of support coming for the second pillar is null or even negative in the case of multifunctional micro-farms (-60%).

Micro Conventional Conventional Small Quality Large 160,0 275,0 583,3Conventional Conventional Large Quality Small. 2008/2009 2003/2004 Multifunctional Diversified Micro Large 300.0 Differentiated Diversified Small Small Differentiated Large

Figure 4 – Average incidence rate of support I pillar on net income (% variation 2003/04-2008/09)

Source: elaborations on Italian FADN Sample

These results confirm that sort of complementarity between pillars of the CAP in providing income support to Italian farms, no matter what their strategic path is.

Micro Conventional Conventional Small Quality Large Conventional Conventional 233,3 Large Quality Small 320,0 109,1 2008/2009 100,0 2003/2004 400,0 Multifunctional Diversified Micro Large Differentiated Diversified Small Small 1592.3 Differentiated Large

Figure 5 – Average incidence rate of other support on net income (% variation 2003/04-2008/09)

Source: elaborations on Italian FADN Sample

#### 5. CONCLUSIONS

The main concluding remarks can be summarized as follows:

- The results of the analysis confirm the non-economic role of micro-farms, whose justification needs to be rather found in territorial and social objectives Their economic performance has worsened in time, in spite of a significant improvement of the public support coming from both pillars of the CAP. As a consequence, the opening of these farms to diversification issues has probably more to do with the possibility of having access to public resources rather than pursuing real diversification strategies.
- Conventional profiles (and especially small farms in this typology) show, to some extent, some sort of interest towards diversification and multifunctionality, through the realisation of certified products and denominations and also through secondary

functions connected to agricultural production. This tendency seems to confirm the idea that a certain level of multifunctionality and diversification is actually featured in most farms, in spite of their size and their territorial relationship. The hypothesis of a "spectrum" of multifunctionality in post-productivist agriculture is confirmed by this analysis (Wilson, 2007).

- If we draw our attention to the "innovation" strategies (both diversification and differentiation), the majority of farms in the panel is focused on the strategy of differentiation through quality products, which is key for Italian agriculture performance and competitiveness. More in general, panel farms seem more oriented to deepening functions rather than broadening ones. Particularly, differentiated large farms realise a better economic sustainability.
- The indicators of economic sustainability seem to confirm the complementary role of rural development policies to the first pillar of the CAP. In particular, it emphasizes the deep compensatory effect of the II Pillar payments to the dynamics of income of the farm typologies identified.

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