

Structural and economic dynamics in diversified Italian farms

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Abstract. Objective of this work is to investigate the structural change and economic dynamics of farms pursuing diversification and differentiation strategies in Italy. The analysis was performed on a panel of data built on the basis of information collected by the Italian FADN between 2003-2009. For the purpose of the analysis, we divided the population of commercial Italian farms into a five-fold farm typology based on size and the extent of diversification and differentiation strategies adopted by the farms. In detail, farms are defined as differentiated when they make use of a system of quality certification, while they are defined as diversified when they take up non-farming activities (agritourism, social farms etc.). The findings show that conventional farms remain by far the largest category within the population of Italian commercial farms, while only 13% of the total commercial farms are classified as differentiated and/or diversified. Farms adopting product differentiation strategies are found to have an income growth path similar to that of conventional farms. Yet the category of diversified farms is the only one showing an upward trend with regard to income per worker in the observed years, while farms relying entirely on agricultural products appear to perform poorly in terms of labour productivity.

Keywords. Income diversification; farm profiles; farm policy; Italian agriculture.

JEL codes. Q010; Q120; Q180.

1. Introduction

After World War II, Italian agriculture was affected by a wave of modernisation associated with the paradigm of productivism. During this period, the farming system underwent a major structural change encompassing a rapid decrease in the number of farms (associated with a large increase in average farm size), as well as an increase in the dependence on purchased inputs (Fabiani, 1986). These phenomena were particularly intense in the northern plains, while farms in the southern and mountainous areas primarily conserved many of the traits associated with traditional, “lagging behind” agriculture: small holding sizes, a low level of technological equipment and aged and pluriactive holders.

Any attempt at diversification (e.g., pluriactivity), was originally interpreted by the supporters of productivism solely as a strategy for survival, which was the prerogative

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of marginal, small or residential farms (Bowler *et al.*, 1996). However, over the last three decades, product differentiation and income diversification strategies have proved to be not only a survival strategy but also a means of developing attributes that were interpreted, in the view of productivism, as backward, but for which consumers were willing to pay a premium price (Gil *et al.*, 2000; Loureiro and Hine, 2001). In other words, differentiation and diversification strategies proved to be a source of competitive advantage and were effective in improving the profitability of the farms. This, in turn, explains why farmers have increasingly adopted these strategies.

Farmers have constantly tried to diversify their production either to reduce the agroeconomic and climatic risk as well as the price risk on the output or to create new and interweaved sources of income originating from on-farm activities. This tendency has been enhanced by the renewed role of agriculture and rural areas in society due to Agenda 2000 (European Commission, 1997), as well as by the increased perception of farmers as the primary natural resource managers and landscape stewards. The growing integration of agriculture into the rural economy has contributed to the creation of more opportunities to diversify farms even in fields unrelated to farming. In this process, food market segmentation and the variety of services offered by farms have also been key in explaining the interest in the diversification of farm activities.

At the same time, rural development policies, the so-called “second Pillar of the Common Agricultural Policy (CAP)”, became pivotal in widening the realms of intervention of multifunctional diversification to the production of externalities and public goods and also to stimulating other economic activities with indirect social and environmental effects (European Commission, 1997; OECD, 2005). CAP policies have been increasingly addressing the production of public goods and services in agriculture and improving the environmental function of the agricultural activities through a process of “greening” of the CAP (Matthews, 2012). However, the extent to which this process has been successful and thorough in recent years is a matter of further discussion (Mardsen and Sonnino, 2008; Zahrnt, 2009).

In summary, recent decades have seen a proliferation of product differentiation and income diversification initiatives. Product differentiation (moving farm production toward agricultural goods with unconventional characteristics (e.g., organic farming, PDO and PGI products) results in a deepening² of farming activities (Van der Ploeg and Roep, 2003). Yet income diversification replaces agricultural products with other outputs that compete for the allocation of production factors while broadening the scope of the business (OECD, 2009).

The aim of this work is to investigate the diffusion of income diversification and product differentiation strategies in Italian agriculture and to compare the structural change and economic dynamics of farms pursuing these strategies to those of farms that have not adopted them. Previous related literature has focused attention either on the diffusion of the diversification strategies among farmers and the characteristics of diversified farms over a limited period of time (Belletti *et al.*, 2003; Henke and Salvioni, 2008; Meert *et al.*, 2005) or on the role played by idiosyncratic characteristics of farmers with respect to the

² According to the original definition, deepening refers also to activities such as processing and marketing of agricultural products.

adoption of diversified activities (Aguglia *et al.*, 2009; Esposti and Finocchio, 2008; Jongeneel *et al.*, 2008; McNally, 2001). We contribute to this literature by analysing the performance of conventional compared with diversified farms over time. The analysis was performed using the data collected by the Italian Farm Accountancy Data Network (FADN) survey between 2003 and 2009 (last available year when the analysis has been performed). This time period is justified on the basis that before the year 2003 the participation to the survey was voluntary, as a consequence the sample was biased due to self-selection. From year 2003 onward the survey is conducted on a random sample that is representative of the population of commercial Italian farms.

The Italian perspective on these matters is relevant for many reasons. Regarding product differentiation, Italy has long founded its strategy of agricultural development and competitiveness on quality attributes and the ties between production and origin³ (Sylander *et al.*, 2000; Treagar *et al.*, 2007; Carbone and Henke, 2012). Regarding diversification, recent studies have focused on two aspects that are related to the potential for on-farm income diversification in Italy: the wide range of territorial features and the large spectrum of farm sizes and types, which enable new activities for farmers and their family members (Bellelli *et al.*, 2003; Di Iacovo, 2003; IEEP, 2009).

The paper is structured as follows: in the first section, we review the new diversification trajectories that have emerged in Italy in recent decades; in the second section, we describe the data and the farm typology used to segment the population of Italian commercial farms in mutually exclusive categories that take into account the extent of differentiation and diversification activities in farms. The results of the application of this typology are presented in the following sections: in section 4 we compare the structural and economic characteristics of Italian commercial farms by farm type, while in sections 5 we follow their evolution between 2003-2009. Finally, section 6 draws some conclusions and sketches possible future work.

2. Paths of diversification in agriculture

2.1 A glance at the farm income problem

One of the traditional problems affecting the primary sector is the low level of income caused by a limited endowment of financial capital, a low rate of return on farm assets, the inelasticity of either supply and demand and, ultimately, the technological changes that progressively worsen the price-cost squeeze (Gardner, 1992; Cochrane, 1958; Tweeten, 1979).

For example, in Italy from the 1970s onward, the percentage of agricultural to total real net value added at factor costs (also referred to as factor income) has slowly increased from 20% to 40% (Henke and Salvioni, 2011). In spite of that, only a third of the farms has been able to remunerate the factors of production at a level equal to or slightly higher than the opportunity cost. Moreover, this level of remuneration clearly decreases if one considers the remuneration levels net of the public support ensured by the European Union.

³It is worth recalling that Italy has a high number of Protected Designation of Origin (PDOs) and Protected Geographical Indication (PGIs) (244), the first in Europe, with a share of 22%.

The remedies suggested by the economic theory to overcome the farm income problem in the view of productivism have been growth and specialisation. More recently, farms have begun to tackle this problem by adopting different diversification strategies.

Diversification in agriculture has been discussed in a recent debate on the methods and potential results of transition and reorganisation processes underway in agriculture (Van der Ploeg, 2002; Van der Ploeg and Roep, 2003; Wilson, 2007). According to this literature, the move toward multifunctionality and diversification in Western agriculture can be interpreted as a reaction to the dominant socio-technological regime of the agri-food system, i.e., large-scale production, the gradual replacement of natural capital by financial and man-made capital, a tendency toward mono-crop agriculture, the abandonment of artisan processes and products, the centralisation and vertical integration by which costs are externalised (e.g., environmental, social), and the concentration of control and profits. These aspects of industrialisation carry negative effects for the quality of the natural environment (e.g., pollution, loss of biodiversity) and the food produced, as well as a loss of autonomy for those involved in agricultural production and a growing subjugation to the logic of the agri-industrial system.

Likewise, other practices such as on-farm sales can be viewed as instruments for reducing dependence on the industrial and financial system, increasing employment and value added in agriculture, and regaining autonomy. This process of change garners strong support from social movements that are concerned with the relocation of food products, environmental issues or social equity.

After decades of success of the modernist paradigm that has pushed farms into production intensification and specialisation, the lack of sustainability of this process (stressed by the economic crises and the long-standing process of agriculture economic decline) has stimulated a search for new activities that lead to other and differentiated sources of income that are sometimes off-farm but are increasingly on-farm, however of a non-agricultural nature (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 catalogued as post-modernist, neo-modernist, or multifunctional, according to the specific aspects highlighted within this more generalised decomposition of the dominant model (Ravenscroft and Taylor, 2009).

2.2 Off- and on-farm diversification

One possible trajectory of the diversification process (Figure 1) is off-farm income diversification (Arkleton Trust, 1983; Evans and Ilbery, 1993; Marsden, 1990). Following this strategy, farm households decide to allocate part of their labour resources to off-farm employment (pluriactivity) with the goal of maximising and stabilising family incomes, which is referred to as the sum of on- and off-farm family income⁴.

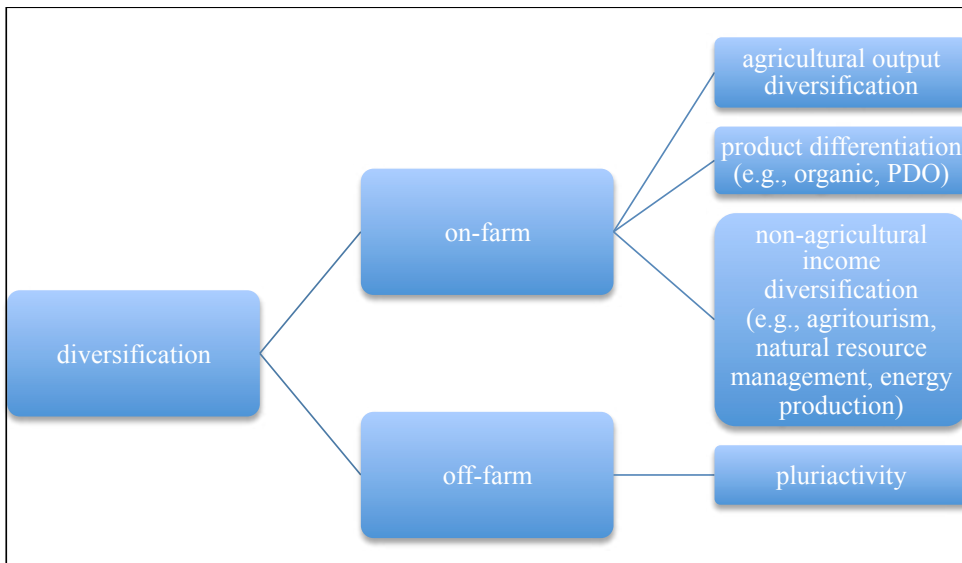
Pluriactivity has been a very successful model in Italy, as shown by many studies in the 1980s and 1990s (De Benedictis, 1990; Fabiani, 1991; Saraceno, 1985). These stud-

⁴ Pluriactivity is only one way to deal with low returns on agricultural activities. Other diversification strategies involving the off-farm deployment of resources other than labour are the leasing of land and buildings, as well as renting out of machinery.

ies focused on the persistence of pluriactivity in agriculture as a new mode of organising production factors between agriculture and other off-farm activities that would ultimately ensure the survival of primary activities, especially in remote and marginal areas that otherwise would have been abandoned. However, pluriactivity functions successfully where economic and social conditions for off-farm work for the family members exist and are prosperous. In other words, the success of pluriactivity directly depends on the non-agricultural context (Fabiani, 1991). The analysis of the non-agricultural context in which farmers operate is beyond the scope of this paper; accordingly, this topic is not investigated.

Another possible path that farms can follow to counteract a decline of income is on-farm diversification. This process occurs when a farm business undertakes a new activity that is intended to increase returns through resources available on the farm. The current literature investigates several forms of on-farm diversification (OECD, 2009). Three main forms of on-farm diversification can be identified: agricultural output diversification, product differentiation and non-agricultural income diversification.

Figure 1. Off- and on-farm diversification.



Agricultural output diversification is intended to thwart uncertainty. More specifically, the goal of output diversification is to reduce the risk of the return by selecting a mixture of agricultural activities with net returns that have a low or negative correlation (Heady, 1952).

Product differentiation (Chamberlin, 1933) refers to those strategies in which farmers produce goods with specific and unique quality attributes. The profit-maximising strategy is not to minimise costs but rather to create a differentiated product that provides the firm with a degree of market power. The differentiated product may even cost more to produce but can increase profits if customers are willing to pay more to purchase it. Differentiation makes high quality product an imperfect substitute for other standard goods; thus, con-

sumers of the quality goods are more loyal and producers are less susceptible to the activity of competitors. This means that farmers producing high quality products operate in niche markets where they may be able to charge higher prices for their high quality products than perfect competition would allow.

The diversification path can also take the direction of a new business that does not necessarily or entirely relate to the agricultural business, for example agri-tourism, energy production (e.g., photovoltaic, wind-powered) or natural resource management. In these cases, diversification can be interpreted as a process that widens the range of production possibilities of the farm business beyond agriculture but that utilises the same production factors and structures.

In this paper, we focus on the two latter forms of on-farm diversification, namely product differentiation and non-agricultural income diversification (henceforth income diversification).

2.3 On-farm diversification in Italy

Product differentiation strategies are widely used by Italian farmers. As in other Mediterranean countries, food quality differentiation in Italy has been primarily based on the territorial linkages of production. This is partly explained by the fact that this type of product differentiation is perceived as a means to foster rural development, for example by increasing cross-sectoral interactions and enhancing civic pride (Tregear *et al.*, 2007) and has received support from both national and EU policy makers. An early piece of evidence on the quality orientation of Italian farmers can be found in the rapid increase in the number of territorial food labels over the last 20 years. A second piece of evidence is the wide diffusion of organic farming. Previous works have highlighted the extent and the relevance of on-farm income diversification in Italy (Bellelli *et al.*, 2003; Henke and Salvioni, 2008). In particular, the taxonomy of the activities has revealed the relevance of the integration of downstream activities such as processing and direct sales as well as quality certification. Limited to a few but significant cases are the more innovative activities that move farms away from the primary activities, such as tourism, recreational services, etc. However, one specific feature captured by the analyses is the co-existence of activities within the same farm: “complex” systems of activities and functions are arising that cast farms in a new light and imply a reorganisation of the use of factors, entrepreneurial skills and territorial relationships.

The latest Italian agricultural census (2010) defined income diversification as the presence of other gainful activities alongside agricultural production. According to this restricted definition, only 5% of the total farms are diversified. However, even within this small category of farms, there is a wide spectrum of diversification profiles that feature farms with several gainful activities that interact with each other and farms with a complex allocation of production factors.

The amendment to the CAP has also contributed to the enhancement of diversification in Italy due to the generous financial support granted to farms that choose to diversify along this path. In particular, the rural development policy with agro-environmental programmes and investment plans has ensured the acknowledgment of diversified and multifunctional farms to units that have favoured the production of public goods and that

introduce green measures and sustainable investments in green technology, animal welfare and food quality improvement.

3. Methodology and data

This study utilises data collected by the FADN survey. The FADN is an annual sample survey, carried out with a uniform methodology at the EU level; since 2003, the sample has been randomly selected in full compliance with the requirements of statistical representativeness (Cagliero *et al.*, 2011). The field of observation consists of commercial farms, i.e., those with European Size Units (ESU) over 4800 euros.

The FADN survey provides information on the presence of differentiation and diversification activities on farms. For example, information is provided on whether the farm makes use of organic farming or low-impact techniques and if it produces landscape or bio-diversity conservation services, as well as agri-tourism, commercial (direct selling) or social (e.g. educational, therapeutic) services. In addition to these indications, FADN provides information on the use of Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) or whether the farm produces traditional products.

From 2008 onward, the survey also recorded information regarding the value of total production due to a) PDO, organic and other products covered by quality certification products, and b) agri-tourism, on-farm recreational activities, on-farm processing (wine, cheese, etc.) and other services (e.g., educational, green care). This information can be used to sort farms into homogeneous groups in terms of their efforts in the areas of product differentiation and income diversification.

To provide a consistent basis for the description of the main characteristics of distinct groups of farms and compare their income evolution over time, in this article we make use of a farm typology that divides the FADN farms by size, and the extent of product differentiation and on-farm income diversification (Salvioni *et al.*, 2013).

The proposed typology builds on a simple two-step methodology. First, we selected all farms that recorded a Total Output (TO) of less than 15000 euros and defined these farms as micro farms⁵. In the second step, we sorted the remaining non-micro farms into four groups according to the magnitude of their efforts in terms of income diversification and product differentiation. The first group covers farms with a total output larger than 15000 euros and with at least 30% of the total output originating from non-farming goods and services⁶. This group of farms adopted income diversification strategies, henceforth called diversified farms. The second group, referred to as differentiated farms, covers farms with at least 30% of the total output originating from the production of quality-certified products. The third group, hereinafter referred to as Differentiated and Diversified (D&D), includes farms for which output from both product differentiation and income diversification was above 30% of total output value. Finally, the fourth group includes all the other

⁵ The separation of micro farms from the rest of the population under analysis is primarily because these farms play more of a welfare and environmental role rather than a productive role with respect to the rest of the population, as will be demonstrated in the following sections.

⁶ The cut-off values used to define different groups of farms were based on expert judgment (Salvioni *et al.*, 2013). The 30% threshold was intended to focus on farms where on farm diversification strategies play an important role in income generation.

non-micro farms, i.e., farms with total outputs larger than 15000 euros and with less than 30% of the total output related to the use of strategies of either income diversification or product differentiation (in this way the 100% of the FADN farms is reached). We refer to this latter group as conventional farms. It is worth noting that the term conventional in this article is not used in opposition to organic or other alternative farming practices. Rather, conventional refers to a farm that is producing only agricultural products and of standard quality.

This classification of farms into different categories may be sensitive to changes in the thresholds defined above and to the year in which the differentiation and diversification efforts were measured. This does not pose an issue in our application because the aim of this paper was not to understand whether income diversification and product differentiation emerge as important dimensions to explain differences between farms but rather to study the structural and economic characteristics of farms that adopted product differentiation and income diversification strategies and to compare these to conventional farms, i.e., to farms that have not adopted these two strategies.

We first present the main structural and economic characteristics of the different farm types observed in 2008. We then compare the economic performance over time of the identified groups of farms by making use of a seven-wave balanced panel⁷ of more than 3000 farms for which continuous records are available from 2003 to 2009. We focused our analysis of the characteristics of non-micro farms observed in the year 2008 because this was the first year in which information regarding the involvement in income diversification was collected.

4. Structural and economic characteristics by farm type

In this section, we present the main structural (Table 1 and Figure 2) and economic (Table 2) characteristics of the Italian commercial farms by the farm types described in the previous section. The data refer to year 2008; this was the first year in which the FADN survey started to collect the information used to discriminate between farms via the extent of differentiation and diversification activities. Focusing on only one year allowed us to exploit the information gathered from the entire sample⁸ that in year 2008 covered 11,234 commercial Italian farms. Most importantly, after weighting the sample observations using an appropriate system of weights, our results can be extended to represent the entire population of commercial Italian farms.

Micro farms comprise 15% of Italian commercial farms. As expected, their size (in terms of both Total and Utilised Agricultural Area (respectively TAA and UAA)) is the smallest group of the population under study. The small size also reflects a very small number of Annual Working Units (AWU). Regarding production, micro farms are relatively more specialised in the production of permanent crops (grapes, olives and fruit) and Cereals, Oil and Protein seed (COP) crops than commercial farms, while micro farms are relatively de-specialised in more labour-intensive productions such as horticultural crops and livestock.

⁷ For more detailed information about the construction of this panel, see Henke and Salvioni (2013).

⁸ This will not be possible when we analyse the balanced panel, as already mentioned in section two.

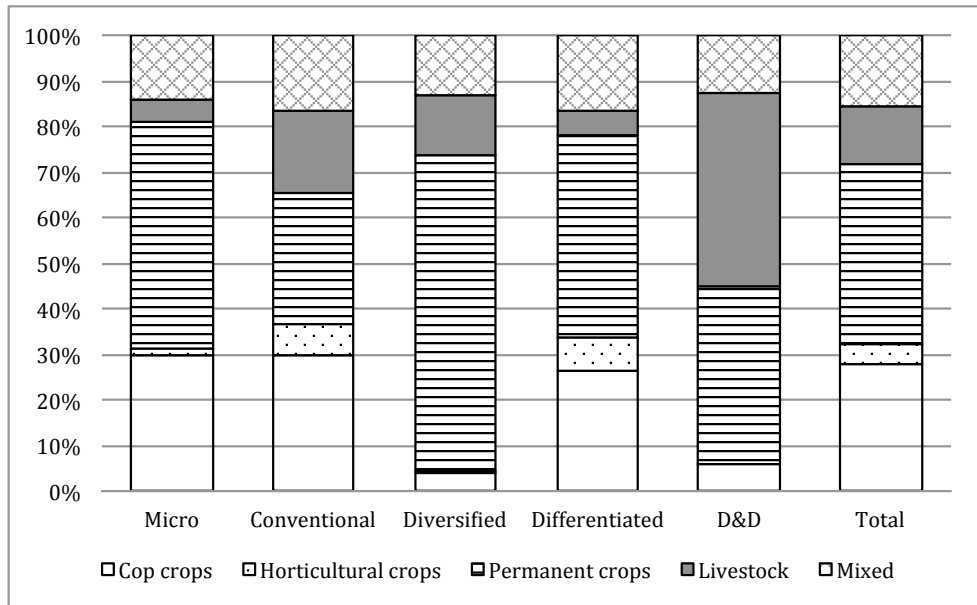
Micro farms recorded a median Farm Net Value Added per unit of labour (FNVA/AWU) that is half the value recorded in the entire sample. As expected, this group of farms presents the lowest results in terms of labour productivity. However, these findings cannot simply be interpreted as a symptom of the poverty of the farm household; rather, this low level may be due to the fact that they are hobby, residential or retirement farms. Micro farms are not oriented toward farm income maximisation but instead towards the maximisation of other non-economic variables such as social welfare of the farm household (Perali *et al.*, 2005). In many of these cases, farm income is likely used by these farm households to complement other sources of off-farm income. It is also interesting to note that the average financial aid received under Pillar 1 in percentage of the farm net value added is above the value recorded for the entire population. In other words, Pillar 1 support is an important share of farm income in this group of firms. However, the average percentage ratio of Pillar 2 payments to farm net value added is below the population average, which suggests low participation with the agri-environmental and other payment schemes under Pillar 2. The same applies to the investment subsidy scheme as noted by the null value of the percentage ratio of CAP payments related to capital assets under Pillar 2. These latter results may result from different causes. On the one hand, these farms may have little access to Pillar 2 financial aid due to the difficulties and the lack of competence in following the procedure to make a request for this kind of support; on the other hand, this result could be due to the inability of Pillar 2 to solve the structural and economic problems of this group of farms. Finally, the low percentage of payments related to capital assets may be the result of a lower propensity to invest; conversely, the farm household may easily find the financial sources needed to cover their smaller investments. The analysis needed to test these hypotheses is beyond the scope of this study.

Table 1. Structural characteristics by farm type – 2008 (weighted data).

		Micro	Conventional	Diversified	Differentiated	D&D	Total
Number of farms	%	15	71	6	5	2	100
AWU (n.)	Median	0.7	1.0	1.1	1.0	1.2	0.9
TAA (ha)	Median	5.0	11.0	7.5	11.1	12.5	7.4
UAA (ha)	Median	4.5	9.8	6.6	10.4	11.8	6.5

Source: our elaboration of the FADN data.

Of all Italian commercial farms, 71% are conventional. These farms make little or no use of diversification and differentiation strategies. Their size is large both in structural and financial terms. Their median endowment of total and utilised land as well as their working units are above the median of the farm population. The same applies to their economic results. These farms feature a relatively strong specialisation in the production of intensive and industrial products such as horticultural crops and livestock. Regarding public support, it is interesting to note that on average they receive financial aid under Pillar 1 of the CAP is in line with the aid received by other non-micro farms, while support from Pillar 2 is relatively lower. This result was largely expected because direct payments under Pillar 2 of the CAP are primarily associated with the adoption of multifunctional

Figure 2. Specialisation by farm type - 2008 (weighted data).

Source: our elaboration on FADN data.

Table 2. Economic characteristics by farm type – 2008 (weighted data).

		Micro	Conven- tional	Diversi- fied	Differen- tiated	D&D	Total
FNVA/TO %	Median	48.9	58.4	69.2	56.7	56.7	56.0
Defl. FNVA/AWU €	Median	6,622	18,245	17,832	16,597	19,493	13,142
Pillar 1/FNVA %	Mean	30.7	25.8	14.5	36.7	16.8	27.1
Pillar 2 direct payments/FNVA %	Mean	1.2	5.1	3.5	6.9	7.4	3.6
Pillar 2 non-direct payments/FNVA %	Mean	0.0	0.1	0.0	0.1	1.4	0.0

Source: our elaboration on FADN data.

Note: Financial data are deflated using the GDP deflator 2005=100.

Note: Pillar 1 and 2 median payments are always equal to zero; as a result, we report the mean values.

Note: Pillar 2 non-direct payments include the investment subsidies not included in the Pillar 2 direct payments.

and diversification activities. However, conventional farms attract more payments related to assets. This was also expected because this support mostly takes the form of investment subsidies primarily associated with the modernisation axis of Pillar 2.

Diversified farms cover 6% of the total population of Italian commercial farms. Their median land size reveals that most farms in this group are fairly small, with total and utilised land respectively equal to 7.5 and 6.6 ha. These values are significantly clos-

er to those observed among micro rather than non-micro farms. The median labour use of these farms is above the values for the entire farm population. The higher use of labour in these farms can be due to a substitution of internal labour with contracted labour because owners work mainly for non-farming activities. In terms of production, diversified farms specialise in permanent crops. The median income per worker for these farms is similar to that recorded for other non-micro farms, and it is interesting to note that diversified farms present the highest Farm Net Value Added to the Total Output ratio (FNVA/TO). This ratio is a proxy for farm profitability: an increase in this indicator reveals that a larger share of revenues is used to cover the remuneration of inputs (labour, land and capital), while the share of costs due to raw and intermediate goods decreases. In situations of farms adopting income diversification strategies, the relatively high value of profitability is likely the result of the uptake of non-agricultural activities with returns higher than farming.

It is also interesting to note that the mean percentage of the financial aid received under Pillar I over the farm net value added is significantly lower than the value recorded in all other farm types. The mean percentage ratio of Pillar 2 direct payments to farm net value added is the lowest among non-micro farms, while the percentage of non-direct payments under Pillar 2 (mainly investment subsidies) over the farm net value added is on average close to zero. The overall result is that farms that adopted income diversification strategies are less dependent on CAP support than other farms.

Differentiated farms cover 4.6% of the total population of Italian commercial farms. Differentiated farms have median large endowment of total and utilised land. The use of labour in these farms is in line with that observed in the rest of the non-micro farm population. Differentiated farms present strong specialisation in the production of horticultural and permanent crops, while they are relatively under-specialised in livestock production. The median labour productivity in these farms is lower than that of the rest of the non-micro farms, and the median index of profitability in differentiated farms is lower than diversified farms. Regarding public support, differentiated farms receive an average level of financial aid under Pillar 1 and Pillar 2 (especially in the form of direct payments) that is substantially larger than that for other farm types. These results suggest that the types and levels of support provided by the CAP meet the specific policy needs of farms that adopted product differentiation strategies.

Finally, the D&D farms cover 2% of the total commercial farms and is composed of farms that have the largest endowment of both land and labour. D&D farms are relatively more specialised toward livestock production than the rest of the population. D&D farms feature the highest median labour productivity in the population while, as observed for the differentiated farms, the median index of profitability is lower than the value recorded for the other farm types. This latter result can be partly attributed to the recent crisis experienced in the livestock production sector. Regarding public support, this group of farms receives relatively little support under Pillar I, while the mean percentage of Pillar 2 direct and non-direct payments over the farm net value added is the highest in the population. All in all, this evidence suggests that D&D farms are large users of Pillar 2 benefits, which is likely due to a larger interest in agri-environmental measures or a higher propensity to invest than the other farm types.

5. Farms' Growth paths

We will now analyse the growth paths that have been followed by the previously identified farm types using the information contained in the balanced panel of farms for which continuous records are available from 2003 to 2009. To this end, we calculated the average annual percentage changes in the median values of the main structural and economic characteristics by farm type: land, labour, value added to total output ratio, value added, and value added per unit of labour and per hectare of utilised land (Table 3).

Table 3. Average annual percentage change in the median structural and economic characteristics by farm type (2003-2009, balanced panel data).

	Micro	Conventional	Diversified	Differentiated	D&D
UAA	-1.17	0.12	-1.18	-0.56	2.17
Total Land	-0.85	0.10	-2.18	0.45	0.99
AWU	-2.21	-2.80	-2.63	-1.58	-0.87
FNVA/TO	4.31	0.51	2.06	1.76	-2.33
FNVA/UAA	-0.09	-2.46	5.23	3.15	-3.85
FNVA/AWU	4.25	0.69	6.10	1.30	-5.91

Source: our elaboration on FADN data.

Note: The financial variables have been deflated using the GDP deflator 2005=100.

Regarding the structural characteristics, the data indicate that all farm groups, with the exception of conventional and D&D farms, experienced a reduction in utilised land. It is worth noting that diversified farms were the group that most intensively disinvested in farmland. Given their decrease in total land, the reduction in cropped area does not reflect a change in land use; this reduction instead signals the progressive substitution of non-agricultural activities to farming. The other group in which we observed negative changes both in total and arable land is that of micro farms; this evidence suggests a progressive marginalisation of this group of farms likely leading to the exodus of many of these farms from the commercial segment of the sector and, eventually, from agriculture.

The negative changes in labour observed in all farm types confirm that Italian commercial farms as a whole continue to experience a process of labour restructuring. This reduction is particularly intense in conventional, D&D and micro farms. The relatively large changes in land and labour observed in both differentiated and diversified farms suggest that these two groups of farms are still searching for an optimal resource allocation that would allow them to increase their efficiency and profitability. This is partly because their transition toward high quality agricultural production and non-agricultural activities often requires a change in the set of heuristic rules that enable the farm to perform daily business. When farmers move toward diversification, these rules need to evolve (Nelson and Winter, 1982); in other words, farmers have to search for solutions to threats and opportunities implied by the new diversified activities. Most importantly, it is not always easy for farmers to build an optimal portfolio of farm and non-farm activities, especially when the latter requires highly specific labour skills that are very different

from the skills required for farming. For example, over-diversification may cause the loss of control over the farm's competence leveraging and combinative capabilities and hence its organisational coherence (Dosi *et al.*, 1992; Pavitt, 1998).

Regarding economic results, we analyse the farm net value added to the total output ratio; this indicator, a proxy of farm profitability, increased in all farm types, with the exception of D&D farms. This common positive trend is partly due to the increase in agricultural prices experienced at the end of the decade. The increase in profitability is larger in the groups of diversified and differentiated farms than in the conventional farms. Recalling that farms adopting product differentiation are less specialised than the conventional farms in COPs, i.e. in the group of crops that most benefitted from the recent agricultural price bubble, this result may be interpreted as a signal that the farms that adopted product differentiation strategies have been able to reduce their dependence on off-farm inputs and have been able to increase the share of the value added kept in the farm and not passed it to the rest of the supply chain. Regarding farms adopting income diversification strategies, an increase in profitability can be interpreted as the result of the substitution of more profitable non-agricultural activities for farming. Finally, it is worth noting the large increase in profitability in micro farms; the noteworthy specialisation in the production of COPs by micro farms is likely driven by the agricultural price bubble.

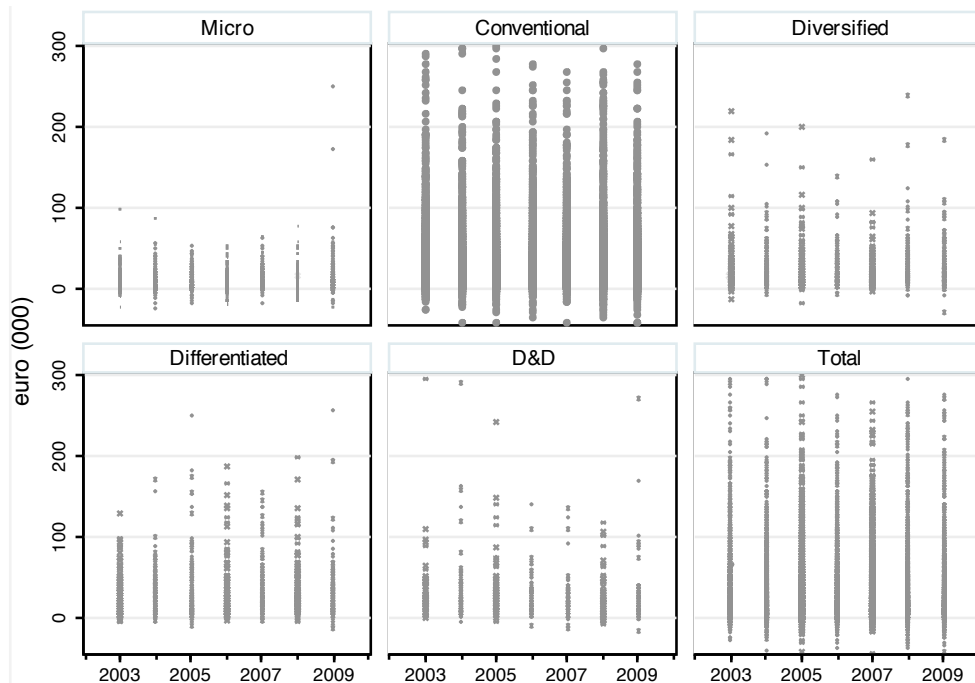
The income per unit of land declined in the D&D, conventional and micro farms. However, regarding the diversification and differentiation groups, land productivity increased. Keeping in mind that these two latter groups of farms decreased their farmland allowance over time, their increase in land productivity is partly due to the fact that they have been able to concentrate farming in the most productive land, while reducing it in marginal land, and partly to the uptake of activities more profitable than standard farming.

The income per unit of labour shows an increase in diversified, differentiated and micro farms but remained relatively stable in conventional farms. Finally, the income per unit of labour declined in D&D farms. Labour productivity is a very important indicator of economic performance because it provides a simple measurement of the efficiency with which inputs are used to produce goods and services. Income per labour unit may also provide information about the living standards of farmers. This explains why it is often proposed to assess whether the agricultural policy objectives have been achieved (Hill, 1991). Given the importance of this indicator for the evaluation of the economic performance of farms, in the following section we provide more insight into evolutionist dynamics by farm type.

Focussing on labour productivity, figure. Figure 3 reports the scatter plots of income per labour unit by farm type. These graphs are useful to understand the degree to which the distribution of labour productivity is stretched or squeezed by farm type.

Conventional farms present the most stretched distribution, which is likely because they are not specialised for specific productions and are instead active in a wide range of crop and livestock productions, each associated with different income levels. Overall, in farms adopting income diversification and/or product differentiation strategies, the distribution of income per unit of labour is more squeezed than in conventional farms despite the fact that there are farms with very high values of income per labour unit within each of these groups. Finally, the income per unit of labour in micro farms is primarily concentrated in a small region that is very close to the horizontal axis, i.e., to zero income per labour unit.

Figure 3. Scatter plot of income per unit of labour by farm type (2003-2009).

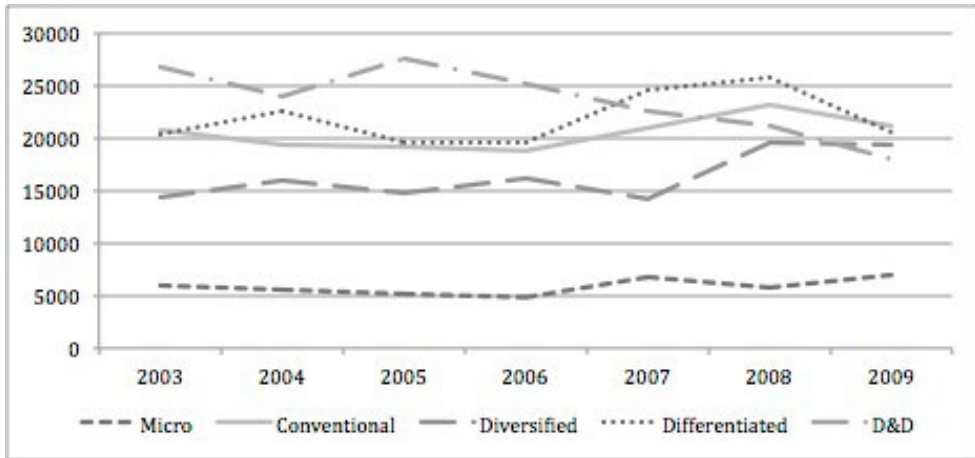


Source: Our elaboration on FADN data.

The differences in the levels of income by farm type can be more easily perceived using Figure 4, which also displays the evolution of the median values of labour productivity by farm type.

The results show that, though it increases over time, the income per labour unit in micro farms remained significantly lower than that obtained in the rest of the sample. Among the non-micro farms, those following both product differentiation and income diversification strategies are higher at the beginning of the observed period, but exhibit a sharp drop in income per labour unit in more recent years. This result is likely due to their specialisation in livestock production, a sector that experienced a drop in income in the most recent years under observation. The rest of the non-micro farms presented an increase in income per unit of labour over 2007 and 2008, which is likely due to the effect of the agricultural commodity price bubble that began in 2007. It is interesting to note, first, that farms using product differentiation strategies had better results than the conventional farms over 2004-2008. Second, it is also interesting that the farms that adopted income diversification strategies experienced a progressive increase in labour productivity and, contrary to the rest of the non-micro farms, did not incur a labour productivity reduction in 2009. This suggests that the uptake of non-agricultural activities shelters farms from the temporary shock to farm income caused by weather or price shocks. Consequently, the uptake of these activities may help to stabilise the total (agricultural and non-agricultural) farm income. It is also interesting to note that farms that adopted income diversi-

Figure 4. Median of income per unit of labour (FNVA/AWU) by farm type (euros).



Source: Our elaboration on FADN data.

fication recorded median levels of income per unit of labour below those recorded for the rest of the non-micro farms at the beginning of the observed period. However, in the most recent years, the results for the farms that adopted income diversification are in line with those of other non-micro farms. In other words, diversified farms are characterised by a positive and rapid dynamic that has allowed them to overcome their income problems and to approach the level of income per unit of labour achieved in the other non-micro farms.

Finally, we compare the annual growth rates of income per worker for the total farms to those recorded in farms that specialised in permanent crops (Table 4).

Table 4. Annual growth rate of median FNVA/AWU in farms that specialised in the production of permanent crops by farm type (2003-2009).

	Conventional	Diversified	Differentiated	D&D
Total agriculture	0.7	6.1	1.3	-5.9
Permanent crops	1.8	8.7	3.2	6.8

Source: Our elaboration on FADN data.

The focus on these farms is due to the relative specialisation of income-diversified and product-differentiated farms in the production of these crops. In the entire population of non-micro farms, as well as in farms that specialised in permanent crops, the average annual income growth rate was lower in the conventional farms than in the diversified and differentiated farms. These results suggest that income diversification and product differentiation strategies may be a solution to the low farm income problem. However, we leave the counterfactual analysis of how labour productivity would have grown, if income diversification and product differentiation strategies had not been adopted, for future research.

6. Conclusions

In this paper we used the information collected by the Italian FADN to provide evidence regarding the structural and economic characteristics, as well as performance over time, of farms that adopted product differentiation and diversification strategies. For this purpose, we divided the population of commercial farms into a five-fold farm typology. The methodology proposed is relatively simple and shows significant limits such as the arbitrary cut-off points used to classify farms. However, results produced are interesting and seem to reflect quite effectively and realistically the different behaviour of the identified groups of farms. Our first finding is that only 13% of the total Italian commercial farms have adopted product differentiation and/or income diversification strategies. This result is clearly in line with the figure produced, on this matter, by the latest Italian agricultural census. This low percentage was expected because product differentiation and income diversification are innovative strategies with respect to conventional farming, i.e., farms that specialise in the production of standard agricultural products.

Another interesting outcome is related to the dynamics of structures and economic results by farm type. Farms adopting product differentiation strategies are fairly stable in terms of structure and demonstrate a relatively better economic performance than conventional farms. This suggests that the experience gained over time in producing and marketing products with attributes for which consumers are willing to pay a premium over the standard price are leading these farms toward increasing levels of profitability. However, in the last few years, these farms appear to follow an income per unit of labour growth path that is similar to that of conventional farms. In other words, weather and agricultural price shocks cause the same types of temporary farm income shocks in all farms that rely substantially on agricultural production (even those with high-quality products).

We also find that the group of farms that adopted income diversification strategies is experiencing a process of deep structural change, as well as increases in both profitability and income per unit of labour. These phenomena suggest that farms that adopted income diversification strategies are still looking for an optimal resource allocation that would allow them to further increase their efficiency and profitability over time. The relatively low income per unit of labour in diversified farms in the first years of the study, as well as the downward trend in D&D may be partly due to the fact that it is not always easy for a farmer to build an optimal portfolio of both standard agricultural and innovative activities as well as agricultural and non-agricultural activities while maintaining the organisational coherence of the farm.

It is also worth noting that the category of diversified farms is the only one showing an upward trend in income per unit of labour in the last observed years, while farms relying entirely on agricultural products appear to perform poorly after 2008. This suggests that the new non-agricultural sources of income contribute to stabilising the overall farm income per unit of labour in diversified farms. Because farm income stabilisation is a CAP objective, effective direct income stabilisation tools or indirect ones (like diversification measure in pillar 2) seem to be highly desirable. That means, for Pillar 2, more flexibility at the farm level for access to Pillar 2 support, a better timing of payments and, more generally, the elimination of the rigidities often imposed by the rules of the current Rural Development Plans. This, in turn, would favour a larger uptake of income diversification

strategies, thus accelerating farm income stabilisation. When new and more recent data become available, it will be possible to assess whether the observed trend toward stabilisation is a permanent trait of income diversification rather than the result of a temporary shock to the income of diversified farms.

The analysis also demonstrates that micro farms often play only an ancillary role in terms of total household income generation. However, micro farms have been found to receive a larger share of payments compared to their income than non-micro farms. Given the large number of micro farms operating in Italy, future research is needed to better understand what role these farms play (e.g., productive, welfare or environmental) and what type of policy action can be designed to fulfil the objectives that are relevant to the needs and opportunities of micro farms.

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