

Appendix A

Despite a long-lasting tradition in some of the Italian regions, often linked to the presence of specific agricultural products like wine and olive oil, direct selling to consumers is still a minor marketing channel for Italian farms. In 2010 the farms selling their products directly to consumers, both on farm and off farm, were 270,579, corresponding to a share of 16.7% of the total (Table A1).

The majority (11.2%) participate only in farm direct selling while a minority sold directly to consumers off farm, both exclusively (3.7%) or in combination with on-farm direct selling (1.8%). On average, farms with direct selling are larger than others both in terms of Utilized Agricultural Area (UAA: 20.9%) and even more as regards labour employed (representing about one quarter of total labour units). Average values hide the uneven distribution of the phenomenon across different regions of Italy. The prevalence of farms with direct selling is variable across the 8,094 municipalities (Figure A.1). The map in figure 1 represents spatially smoothed values of the prevalence of farms with direct selling in order to emphasize the underlying pattern in the spatial distribution. The areas where farms with direct selling accounts for a larger share of the total seems linked both to the presence of large urban areas (as in the case of Milan, Turin and Rome) and to the relevance of permanent crops in the agricultural output mix (Piedmont, Tuscany and Apulia regions). The map suggests the presence of a relevant geographical dimension of the studied phenomenon.

The dependent variable of our analysis is the presence of direct-selling in the farm. With the Census data is impossible to calculate a share of farm revenues from the direct selling at the farm level. We built anyway an index of intensity in direct selling based on the number of products sold directly to consumers. To test the robustness of our results we ran the model including among the farms with direct selling only those reaching a given share of products directly marketed (respectively 20 and 50% of farm products), getting results similar to those we present in our paper. When we set the threshold at 50% the estimation coefficients things remain almost the same apart a

few variables that maintain the same sign as before but now turns to be significant. In particular, this happens for the role of age (whose sign remain negative but now significant) and the role of spatially lagged SPG (whose sign remain positive but now significant). These changes are not due to a change in the size of the coefficients but on a reduction of their standard error: this suggests that if we focus on farm where direct sale is the main channel of sale our results appear to be more clean cut and the relationship between independent and dependent variable is more systematic (so that we obtain smaller standard errors).

A set of variables referring to the subjective characteristics of farmers and the structural characteristics of farms have been defined to be used in the model as covariates. Table A.2 in the appendix provides the definition of variables and their descriptive statistics.

All data at the firm level were based on the Census dataset while a variety of sources were accessed to define context variables, referred to both at the municipality and the province level. The source for the number of farmer markets is Coldiretti, while data for SPGs were produced from the volunteer list registered on the official website of the Italian Network of SPGs (www.retegas.org). While the number of farmer markets is available per municipality, the number of SPGs is only available per province. The source of data on CAP expenditure at the territory level are the reports that AGEA, the Italian Agency in charge of CAP payments in Italy, periodically delivers to the European Commission (Sotte and Baldoni, 2016).

Our analysis exploits the information and the spatial dimension of Census data by focusing on three groups of determinants of direct sales:

- (1) the characteristics of the farms and the farmers;
- (2) the characteristics of the area where the farm is located (the context variables);

(3) the characteristics of the neighbouring areas (context variables weighted for the distance from the farm).

Given the structure of the Census and the administrative division of Italy this means that we take into account the fact that each observation (each farm) is located in a specific municipality that in turn is included in a province that in turn belongs to a given region: in econometrical terms it means that each observation is organized on 4 nested levels.

From a theoretical point of view, the spatial dimension can be represented by considering that each different level has a level-specific error term (that captures erratic component shared among all farms in that level). This is the structure used in multilevel regressions and that will be used in our estimations.

A further spatial dimension that can be included in our analysis is represented by spatially lagged variables, that is, variables representing the characteristics of distant contexts weighted for the distance from the farm. Including spatially lagged variables is equivalent to assuming that not only the characteristics of the area in the immediate proximity of a farm (the municipality or the province in our case) affect its decisions, but also the characteristics of more distant areas. In our specific case, we compute an inverse-distance spatial-weighting matrix that is composed of weights that are inversely related to the distances between the administrative units: this is done computing the inverse of the Euclidean distance obtained from the coordinates of the area where the farm is located (the province for some context variables and the municipalities for others).

References

Sotte, F. & Baldoni, E. (2016). *La spesa PAC in Italia dal 2008 al 2014*. Collana Economia Applicata n. 4. Ancona IT: Associazione Bartola. Retrieved from https://agriregionieuropa.univpm.it/it/system/files/sitecontent/event/field_attachment/2016-9733/laspesapacinitalia2008-2014-5300.pdf

Table A1

Farms with direct selling in the Italian agriculture

Number of farms	270,579
Share of total farms	16.70%
Share of total Utilized Agricultural Area	20.90%
Share of total Labour Units	26.30%

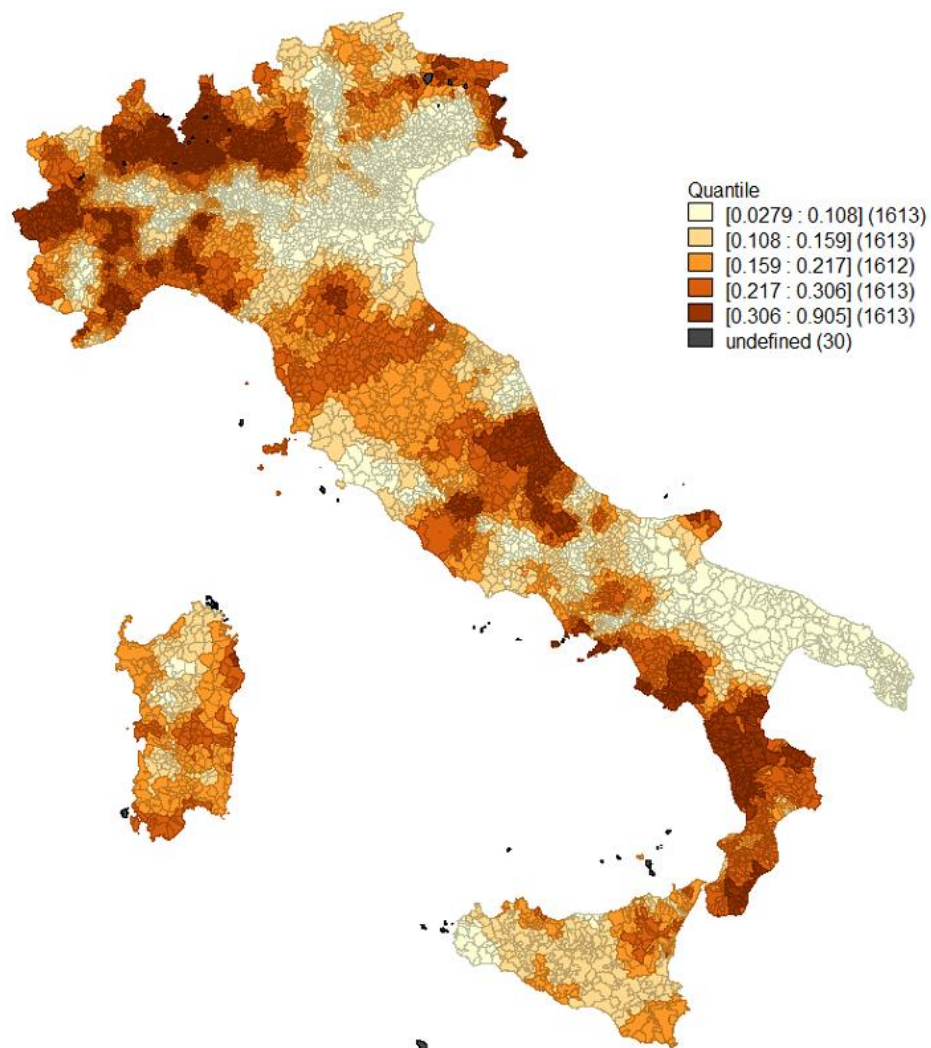
Source: own elaborations on census data

Table A2

Variables descriptive statistics

Variables	Mean or share	Standard error
<i>Farm-level</i>		
Age	59.05521	0.01153
Female	0.30715	0.00036
Lower Secondary Education	0.32025	0.00037
Intermediate Secondary Education in agriculture studies	0.00944	0.00008
Intermediate Secondary Education	0.03538	0.00015
Higher Secondary Education in agriculture studies	0.02445	0.00012
Higher Secondary Education	0.15371	0.00028
Tertiary Education in agriculture studies	0.00807	0.00007
Tertiary Education	0.05423	0.00018
Standard Output (Euro)	30 701.90000	192.72880
Share of CAP direct payment as on total revenues (%)	29.62278	0.02942
Labour intensity (labour days per ha of UAA)	0.72942	0.00292
Share of family labour	0.93660	0.00016
Only family labour	0.86323	0.00027
Farm produces organic products	0.02767	0.00013
Farm performs other activities	0.02078	0.00011
Farm has internet access	0.01200	0.00009
Farm has a web page	0.01792	0.00010
Farm uses IT devices	0.03760	0.00015
Utilized Agricultural Area (ha)	7.93150	0.02853
FT1: Fieldcrops	0.23676	0.00033
FT2: Horticulture	0.02332	0.00012
FT3: Permanent crops	0.54994	0.00039
FT4 Grazing livestock	0.07989	0.00021
FT5: Granivores	0.00577	0.00006
FT6: Mixed crops	0.06506	0.00019
FT7: Mixed livestock	0.00261	0.00004
FT8: Mixed crops and livestock	0.02196	0.00012
FT9: Other	0.01468	0.00009
<i>Municipality level</i>		
Farmer markets density (number per square km)	0.00271	0.00021
Second Pillar CAP expenditure intensity (Euros per ha of UAA)	1.22797	0.06068
Population Density (resident people per square km)	296.93870	7.02516
Plain	0.26261	0.00489
Hill	0.41609	0.00548
Mountain	0.31920	0.00518
<i>Province level</i>		
Number of Solidarity Purchasing Groups density (SPG per square km)	0.00444	0.00086
Roads density in plains (Km of roads per square km)	0.53390	0.02775
Roads density in hills (Km of roads per square km)	0.60415	0.02755
Roads density in mountains (Km of roads per square km)	0.49852	0.03234
Presence tourist visitors (number per resident people)	7.54854	0.92405
Agritourisms density (number per ha of UAA)	0.00046	0.00007

Figure A1 Prevalence of farms with direct selling
Spatially smoothed¹ ratios by Municipality



1. Neighbors defined according to a second level Rook distance