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Geographical Indications: a first assessment of the impact on rural development in Italian NUTS3 regions.

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Abstract

Geographical indications (GIs) are a 25 years old European policy instrument which have, among its objectives, to foster rural development. In this respect, very few studies quantitatively investigate to what extent this policy is effective. Literature is in fact mainly focused on specific GIs, studied through case studies, trying to identify which factors are responsible for the success or failure of specific initiatives. The aim of the present study is instead to quantify the impact of such policy instrument on a single indicator of rural development: agricultural value added. In order to assess the impact we firstly built an index measuring the number of GI schemes implemented at NUTS3 level in the Italian regions. Then, following a difference-in-difference evaluation strategy and relying on an explicit theoretical model, a fixed effect estimator was implemented. The choice of the model, as well as the variables to be considered, is specified using a directed acyclic graph. Results show that an overall positive effect of GI protection on agricultural value added could be identified in Italy, thus providing evidence of a positive impact of the European policy on rural development.

Keywords: geographical indication; impact evaluation; rural development

1. Introduction

Geographical indications (GIs) are a legislative instrument created by the European Union with Regulation 2081/92[1]. Technically a labelling regulation, it is a tool for solving the asymmetric information problem between consumers and producers (OECD, 2000; Bramley, 2011; Giovannacci et al.,2009) and for preventing unfair imitation and misuses of names. On the producer side GIs are a method to link the product to the images of the production area (environment, culture, landscape) thus exploiting consumer willingness to pay for the latter (Van Ittersum et. al., 2003) .

Since their introduction GIs have spread throughout Europe, although at different paces. There is indeed a clear differentiation between the Mediterranean area that, with its first five producer countries (Italy, France, Spain, Portugal and Greece), accounts for nearly 70% of all the European registered GI products, and the rest of Europe. Lee and Rund (2003) attribute this pattern to the climatic factor, which probably could explain even the far longer and well rooted tradition of Mediterranean countries in using origin designations. Another possible explanation, according to Parrot et al. (2002), is the different characteristics of the two areas, as Northern Europe is more focused on agricultural productivity and economic efficiency while Southern Europe remains anchored to a tradition where local embeddedness and trust are still important.

in The different use of GI across EU members matches the different consumers awareness about GIs. Indeed, the more a country uses PDO and PGI labels the more its citizens are aware about the significance of these market tools (Velčovská and Sadílek, 2014).

Also in terms of economic importance the divide is confirmed. In fact, as stated by a 2012 European Commission report (Chever et al., 2012), the two major users of this instrument, namely Italy and France, are those getting the largest economic share with 6 and 3 billion euros of sales value (wines excluded), respectively.

Despite the North –South divide the GI sector seems to experience a common positive trend, both in terms of quantities produced and in terms of revenue (Folkeson, 2005). The above mentioned Commission report states that in 2010 the 1.300 European PDO and PGI products accounted for a sales value of about 15,790 billion euros, representing 5.7% of the overall European food and drink sector revenue (Chever et al., 2012). This is accompanied by a raising consumer awareness about GI products also documented by the Special Eurobarometer 389 (European Commission, 2012) and with the ever increasing number of applications for new products' registration, highlighting the relevance that this instrument has earned in the 15 years of its life.

[1] Subsequently modified by Regulation No 510/2006 and the framework Regulation on quality schemes No 1151/2012

GIs is supposed to play a significant role in fostering rural local development. This objective is expressly stated in the “whereas” of the original EU Regulation 2081/92 indicating such certification as able to benefits production areas in term of increasing farmers’ incomes and in terms of counteracting rural exodus. In the perspective of endogenous development this kind of products, especially the PDO ones, incorporate local resources specificities, both material and immaterial, which are capable of highly differentiate and characterise local foods in the market. This process promotes to the creation of niche-markets where rural areas may be rewarded for their imagery, authenticity or traditionality (Jenkins and Parrot, 1999). In addition the delimitation of the production area makes it possible the appropriation of a rent by farmers and landowners of the area (Landi and Stefani, 2015).

The aim of this paper is to provide a first quantitative assessment of the economic impact of the EU GI policy on rural development at country level. Although quantitative assessments of single PDOs can be found in the literature, they focus on specific case studies providing results not easily extendable to other contexts. Building on policy impact assessment approach (Shahidur et al., 2010),and guided by an own-built theoretical model we try to exploit available statistical data to analyse the overall impact of the GIs policy at Italian level using the agricultural value added at the GIs areas scale.

The paper is set out as it follows: in the next section we deal with the topic of the evaluation of GIs as a policy instrument, providing a first assessment of the current state of the art and stating the objectives of our work. The results of the analysis presented in the third section. Eventually, some considerations about the implications of our work and recommendations for further research are provided in the last section.

2. Economic impact of GIs

As stated by Gertler et al (2011) “Development programs and policies are typically designed to change outcomes, for example to raise incomes, to improve learning or to reduce illness. Whether or not these changes are actually achieved is a crucial public policy question but one that is not often examined.”. GIs are a policy instrument in use from 25 years, experiencing growing interest at the Community level and one of its leading goal is actually the promotion of rural development. Given all these assumptions, one would expect to find a large number of studies investigating if, how and to which extent GIs actually produced the desired impact on rural areas.

Indeed a considerable number of case studies were carried out on the subject, These studies often consider one or few GIs (usually up to 4) and they are directed at mainly showing the reasons underlying the success or failure of different initiatives under several perspectives (economic, social, diffusion among producers). The indicators selected for assessing the evolution of PDO and PGI schemes vary greatly ranging from the amount of considered production (Barjolle and Thévenod-Mottet, 2002), product distinctive features (Barjolle and Sylvander, 2000), number and typology of producers (Barjolle and Thévenod-Mottet, 2002; Treagar et al., 2007; Belletti et al., 2014) to the analysis of GIs' product specifications and their history (Treagar et al., 2007; Quiñones-Ruiz et al., 2016). According to these studies several successful experiences can be found all around Europe showing that implementing a GI product can be a feasible and profitable choice when certain conditions are met. Identifying these factors is of crucial importance for farmers and communities who are willing to differentiate the local production with an European indication of origin. This stream of literature either suggests best practices or provide insights about if and how a GIs may be successful.

The main drawback of these studies, when considered from an impact evaluation perspective, is that they rarely offer a precise and externally valid quantitative assessment of the GIs effectiveness (to what extent they reach a given objective). When looking for such an assessment only a scanty literature can be found. The most frequent variable considered when looking at the impact of GIs is the price premium they generate over the benchmark price. There are many evidences that GI products have usually a higher price in comparison with the average price of the standards products (Folkeson, 2005) providing the producer with a higher value (Chever et al., 2012). This underline the consumer awareness toward food quality attributes, although across different European countries there are changes in the price differential. The price premium also varies across retail outlets: for example it is lower for larger retailers (Schröck, 2014). However, the presence of a price premium at the market level doesn't imply an effective impact on rural development. According to Callois (2006), highly differentiated products, such as GI ones, could tend to favour small specific groups of actors able to capture very high rent and the beneficial effects may not be shared with the local community. A more effective way to measure the impact of such certification is to select and analyse local indexes and to compare their values between areas where GIs are implemented and areas where they're not. The few available studies developing such an approach show positive impacts. It is the case of De Roest and Menghi (2000) research, that shows how Parmigiano Reggiano triggers the employment along the food chain with respect to other similar products. Bouamra-Mechemache and Chaaban (2012) extend this finding to the entire French cheese sector where the employment effect, both at industry and farm level, seem to be due to an increase in the number of firms working along the GI supply chain. Positive effects on both employment and value added are found by Coutre-Picart (1999) when studying the AOC (the French pre-existing scheme equivalent of the European PDO) Savoy cheese sector. Another relevant study looking for local effects of GIs, although addressing mainly environmental issues, is the one by Hirczac and Mollard (2004) which compares the spatial distribution of GI labels density and several ecological indexes.

All these studies deal with the quantitative evaluation of the impact of a single certified product and/or on a specific limited area; the literature does not provide insight on the effect of the overall policy at EU or country level. We aim at filling this gap in the literature providing a quantitative study of the impact of the Italian GIs on agricultural value added in the rural areas. To our knowledge this is the first attempt to provide such an overall quantitative assessment.

We selected as a case study Italy, the country with the highest number of GI registered products. We first designed an index to reduce the complexity of the policy tool (number of IGs, area protected, type of product concerned, age of the IGs) to a single dimension. This was a necessary step in order to keep manageable the impact assessment design and the related econometric model. We choose as index the number of GIs registered in the NUTS3 region weighted by the area of the municipalities interested in the GIs. Then we devised a logical model to describe the pathways through which the implementation of GIs leads to higher rural development. We kept the model as simple as possible in order to to assess the impact of GI policy on the local agricultural value added drawing on consolidated methods in policy impact analysis. We chose agricultural value added per hectare as an indicator of rural development since it is one of the commonest indicator of rural development (Word Bank, 2000) and it is easily available at NUTS3 level across EU countries.

In the next section the data employed in the analysis are described with a specific focus on the index building process and its distribution on the Italian territory. We then specify which impact assessment strategy we devised and its econometric specification.

3. Material and methods

In the first stage of the work a specific index has been built in order to represent the intensity of protection through GIs implementation in NUTS3 regions. In doing this, information about Italian GI products were retrieved from DOOR, a database containing basic information on each European geographical indication, such as the type of protection[2] and the year of registration, along with its product specification. Moreover, data about municipalities and provinces areas, as well as spatial data (shapefiles), were collected from the Italian Institute of Statistics (ISTAT) web site for the period covered by the study (2000 and 2010).

The second part of the work addresses the impact assessment issue using a difference-in-difference design implemented with a fixed-effect econometric model. Data needed for the construction of variables (other than the index) included in the regression model (see paragraph 2.2.) were retrieved from ISTAT website and ISTAT Agricultural Census databases, also available on line.

2.1. Intensity of protection index

In Italy geographical indications are often associated with high variability, both in terms of product type (oil, cured meat, vegetables) and in term of size of the territories covered by the indication. For instance the "Agnello del Centro Italia IGP" can be produced in 6 different regions while the "Fagiolo di Sorana IGP" has an authorized grown area of nearly 660 ha with less than 80 quintals of production in 2012 (Belletti et al., 2014).

This consideration led us to discard the hypothesis of using the number of GI products per province[3] (i.e. NUTS3 regions) as a valuable indicator of the amount of protection of geographical indications in each territory and to build an index to consider the size of the area susceptible of protection too allowing us to consider the GIs importance in the sector.

We also decided, due to the peculiarities of the sector, not to include wines in the analysis. Indeed protection of geographical indications for wines in Italy dates back to the 60s of the XXth century (D.P.R. 12 luglio 1963, n.930: *"Norme per la tutela delle denominazioni di origine dei mosti e dei vini"*) and we would lack the temporal variability of a protection intensity index needed to estimate its impact on rural development in the last decades.

We tried to formalize the type of geographical analysis carried out by Hirczac and Mollard (2004)[4] by computing a summary measure of the intensity (or density) with which the GI policy has been implemented in a province.

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[2] EU legal framework (Regulation(CEE) 2081/92 and Regulation(EU) 510/2006) identifies three different kinds of Geographical Indications: PDO (Protected Designation of Origin) requires the entire production process is implemented in the area of origin; a PGI (Protected Geographical Indication) can be attached to a product when at least one phase of the production process is located in the concerned area; TSG (Traditional Specialities Guaranteed) does not guarantee a link with a specific geographical area certifying only production methods.

[3] Italy is administratively divided in provinces corresponding to the EU NUTS3 territorial disaggregation. NUTS stands for Nomenclature of territorial units for statistics.

[4] Hirczac and Mollard (2004) produced thematic maps were the number of AOC per municipality, a measure of density of protection, were plotted and compared with thematic maps about environmental indicators to see if any overlapping were in place.

The index was computed according to the following formula:

$$PII_{i,t} = \frac{\sum_m (n_{m,t} * A_{m,t})}{A_{i,t}}$$

where n_m is the number of GIs per municipality, A_m is the municipality area and A_i is the province area. The subscript t indicates the year the index refers to. Thus the index can be considered as a weighted average of the number of GIs per province or NUTS3 area.

3.2. Impact analysis

AS a part of the impact analysis, we set out a theoretical framework, presented in section 3.2.1., in order to select the econometric model better suited to measure the impact.

3.2.1. Theoretical model

The hypothesized casual patterns between the GI policy and local rural development, was modelled with a “directed acyclic graph” (DAG). DAGs are diagrams originally developed in the epidemiology field in order to make clear the causality pattern characterizing the study framework on which the researcher works. Causal relationships among variables are represented by directed paths according to the researcher prior beliefs and hypothesis. Graphs “provide a direct and powerful way of thinking about casual systems of variables and the identification strategies that can be pursued to estimate the effects within them” (Morgan and Winship, 2008, p. 62). DAGs can be thus considered useful instruments to fully understand the logic of a causal relationship and to take important decisions about which covariates should be included in an econometric model and which confounding factors are in place (Glymour, 2006).

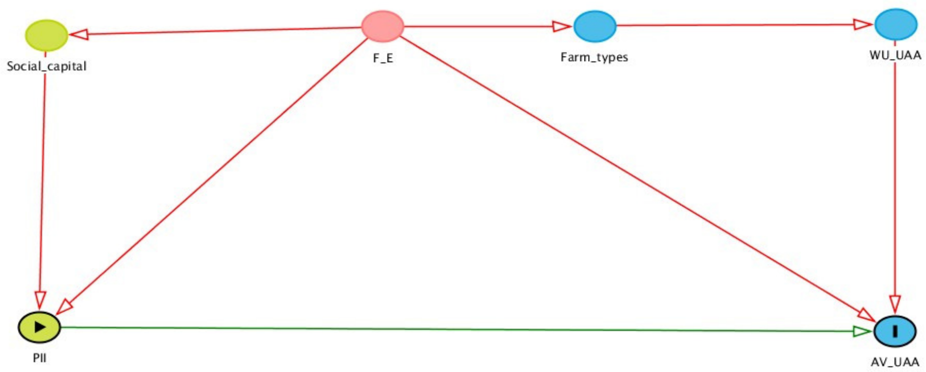
In Figure 1 a DAG shows our model assumptions. We are interested in estimating the direct effect of the GI policy, applying the previously built GI index, on rural development of the region. The latter is measured by agricultural value added, one of the commonest indicator of rural development[5], for unit of utilized agricultural area. However, we posit that this relationship is confounded by other local specific variables implicated in the dimension of both the policy and the outcome variable. Notably the local, time invariant, agronomic, pedoclimatic and social conditions on the one hands influence the prevalent farm types in the area and consequently the ratio of labour over land, which in turn is a component of the value added[6]. On the other hand, the same local conditions, especially the social ones, influence the capacity of local communities to bring about the

5 See for example World Bank (2000)

6 We can consider the VA/UAA variable as a function of the value added per unit of work times the unit of work per hectare of land: VA/UAA= VA/UW*UW/UAA

geographical indication protection process which requires a collective effort from the local actors (Quiñones Ruiz et al. 2016). At the same time marginal areas with poor farm types (e.g. hilly or mountain areas) are the very ones who seek a way out of their marginalization through the GI policy. Thus areas which, according to the productivist paradigm (Van der Ploegh et al, 2000), are considered marginal, find in the GI policy a way to pursue a different development trajectory. Therefore we expect social capital rich but agriculturally poor areas being characterized by high GI intensity index and a low VA over UAA[7] ratio.

Fig. 1 – Hypothesised logic model



Because of all the posited casual relationships, measuring the desired impact of the GI policy on the outcome variable would require to condition on confounding factors. However, for some of these factors, notably social capital and pedoclimatic conditions, there are no available published data easy to retrieve. Anyway, if we could condition on the idiosyncratic, time invariant, local conditions of each province we would overcame the measurement problems for other variables such as social capital provided that they can be considered time invariant. The assumption of time invariant determinants of local conditions is reasonable enough for natural elements, whose changes need a very long time to produce significant effects on the agricultural structure (farm types) of a certain region. Following the approach which considers social capital a permanent element which characterizes each society and is created by a cumulative process through centuries (Putnam,1993, p.163-185), we can assume that even this variable experiences only long-term changes and can be considered as invariable in the relatively short period of a decade.

We acknowledge that the model is a simple one and could have been made more complex. Indeed, the literature on GIs has shown rather complicated mechanisms through which this instrument can affect rural development. However, we believe that it is worth looking for the "stylized facts"

[7] Utilised agricultural area

underpinning such mechanisms in order to make feasible any overall quantitative analysis of the impact of the GIs policy at country level.

3.2.2. Impact analysis

Given the framework presented in the previous paragraph and according to the back door criterion by Pearl et al. (2016, p.61), it is sufficient to condition on a variable representing time invariant local conditions for each province to identify the effect of the index of GI protection on agricultural value added per hectare. Indeed, referring to the DAG, the local condition variable blocks every additional path (sequence of nodes and arrows connecting them) from the outcome to the intervention variable. From the econometric point of view this can be obtained by exploiting the panel nature of our dataset and estimating a fixed effect model. In addition, the availability of repeated observations on both the intervention and outcome variable allows us to implement a difference-in-differences (DD) impact estimation strategy. In its simplest form and with a binary intervention variable the DD method estimates the difference in the outcome after the intervention between a treatment group and comparison group relative to the outcomes observed before the intervention (Shahidur et al., 2010). The econometric specification for the DD is given by:

$$Y_{i,t} = \alpha_i + \delta T_{i,t} t + \rho T_{i,t} + \gamma t + \sum \beta X_{i,t} + \varepsilon_{i,t} \qquad (1)$$

Where Y is the outcome, α_i is an individual specific intercept, T is the intervention variable, t is a time dummy, X other independent variables and ε the usual error term. The subscripts in the equation represent the single unit of analysis *i* (NUTS 3 regions) and the year of the observation *t*. Independently from the chosen fixed effect estimator the parameters of the models are equivalent to those obtainable inserting in the equation a dummy variable for each province[8] (Wooldridge, 2013). In the classical DD model with a treatment dummy assuming values 1 for the treatment group and 0 for the control, the δ parameter, associated with the interaction term between the treatment *T* and the time dummy variable *t*, identifies the expected impact.

In our case the estimator assumes a different meaning as we are dealing with a continuous treatment variable (the protection intensity index), not a binary one. It can be demonstrated that in this case for the i[th] individual (province) the δ parameter is equivalent to:

[8] Which in turn can be considered as a parameterization of a qualitative variable that assumes different values for each province: the time invariant local conditions variable described in the casual model.

$$\delta = \frac{(Y_{i1}-Y_{i0}|T_i=T_{i1})-(Y_{i1}-Y_{i0}|T_i=T_{i0})}{T_{i1}-T_{i0}} \qquad (2)$$

The numerator is given by the difference in temporal outcome variation given the final and the initial values of the continuous intervention variable, the denominator is given by the difference between the final and the initial value of the continuous treatment variable. Summing up when we observe an increment of the continuous treatment variable between the two periods a positive value of δ indicates that the increased intensity of treatment promotes an higher increase of the outcome variable, that is the impact of the treatment is positive[9].

Itis worth noticing that, as previously stated, the two years considered in the analysis were 2000 and 2010. However, during this period, some changes occurred in the administrative setting of Italy since several new provinces were created. We thus decided to work with the 2000 administrative setting since translating the newer data in a more aggregate framework is a far easier operation than disaggregating old data for once larger provinces.

4. Results

4.2.1. Comparison of treatment and outcome variables geographical distribution

According to the model depicted in fig.1 the GIs policy density index can be considered an intervention or treatment variable supposed to affect the outcome variable, that is the agricultural Value added (AVA) per unit of UAA. Table 1 summarizes the main statistics for this two variables and for another covariate, the agricultural working units (WU) per unit of UAA, for the two years considered in the analysis(2000 and 2010).

Tab. 1 – Summary statistics of main variables

	2000			2010		
	AVA/UAA (x1000€/ha)	WU/UAA (wu/ha)	PII_{98}	VA/UAA (x1000€/ha)	WU/UAA (wu/ha)	PII_{08}
Mean	3.07	0.10	2.92	3.16	0.11	4.97
Standard deviation	2.51	0.08	1.62	3.71	0.12	2.55
Min	0.49	0.01	0.77	0.33	0.01	1.00
Max	14.57	0.15	6.27	25.29	1.15	10.27

The index values, as indicated by the subscripts, are not referred to the years of analysis, but to two years before. Indeed, we assume that the likely effect of a protection scheme implementation on economic variables is somewhat lagged as a new GI takes time to become fully operational.

[9] See Acemoglu et al (2004) for a similar application of Difference in difference with continuous treatment variable.

Furthermore a lagged policy variable can help mitigating possible endogeneity problems arising from common causes affecting both the index and the value added.

Index and AVA/UAA quantile distributions across the Italian peninsula are also reported in Figures 3 and 4.

Fig. 2 – Protection intensity index distribution in Italy, 2010

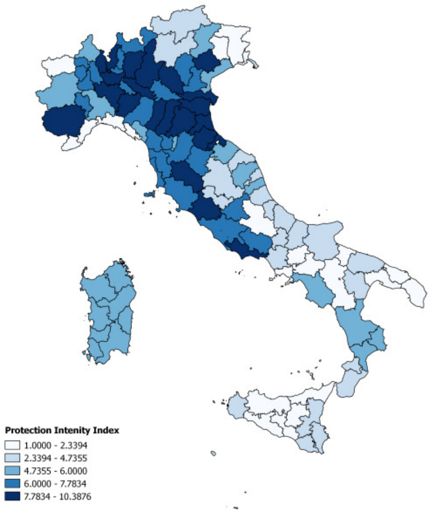
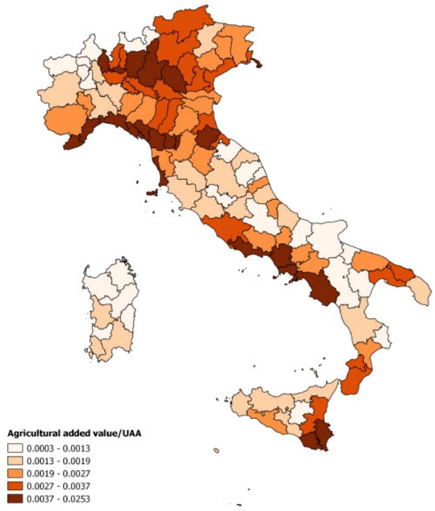


Fig. 3 – Agricultural value added per hectare in Italy, 2010



A remarkable feature emerging from the index figures is that there is no province without at least one GI registered product. As for many other phenomena in Italy, a divide emerges between the Central-Northern and the Southern regions. The highest values are observed mainly in the Padan Plain area, in Lombardy and in the upper-central Tyrrhenian coast, namely in Tuscany and in Lazio, but on average in the North of the country a higher concentration of GI schemes is observed. Despite this general pattern some exceptions can be detected such as the entire Liguria and Friuli Venezia-Giulia Regions which lay in the lowest quantile.

The economic index (AVA/UAA) shows a quite different patttern, although a North- South divide seems still in place with Northern and Central provinces showing higher values than Southern ones. It is worth noticing the presence in the South of some provinces placed in the first two quintiles of the distribution, such as Lazio and Campania coastal provinces, the Sicily South-Eastern area, the lowest part of Calabria and Brindisi and Taranto provinces in Puglia.

A first comparison of the two maps reveals that, although some provinces are placed in similar class in both distribution, there is not any general accordance between the two indicators. Conversely, several provinces show quite different ranking positions in the two distributions. This is the case of the entire Liguria Region where the highest values of AVA/UAA are observed but where the PII is among the lowest in Italy. The opposite situation, although less frequently, is observed in Sardinia and few other provinces throughout peninsular Italy.

This visual examination led us to conjecture that the spatial similarities between the index and AVA/UAA are mainly linked to the classic Italian North-South divide, becoming less evident when the analysis switches from a broader to a more detailed level. This is also confirmed by the negative correlation index between the two variables. We hypothesized this to be an effect of a self-selection bias since GI policy instruments might be voluntarily adopted by local food chain actors of less favoured areas to pursue an alternative development strategy (see section 3.2.1).

4.2.2. The econometric model

In order to estimate the impact of the density of GIs on the agricultural added value according to the casual model described in section 3.2.1 we set up a fixed effect econometric model that exploits the panel dataset we built. The single intercepts, one for each Italian NUTS3 region, can be considered a "measure" of the overall effect of time invariant factors affecting both the policy variable and the indicator of rural development (the outcome).

Results of the fixed-effect regression model are reported in Table 2.

Tab. 2 – Fixed-effect estimates: Dependent variable VA /UAA

	Coefficient	Standard error	p-value
WU/ha	23.83	3.71	0.000
Index	-0.77	0.29	0.008
Index*Year	0.25	0.11	0.025
Year	-0.32	0.36	0.38
Intercept	2.66	0.77	0.001

N (groups)	103
R^2	0.417
rho	0.816
F test that all α_i=0	F(102, 99) = 7.14, p=0.00

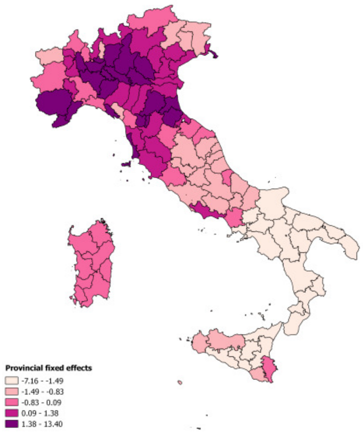
As both the independent and the dependent variables show some sign of spatial pattern like the north south divide discussed in the previous section, we also computed the Moran's *I* statistic, to check for the presence of spatial correlation among regression residuals (Arbia, 2014). We compute the statistics separately for 2000 and 2010 residuals. For both years no evidence of spatial correlation was observed, as shown in Table 3.

Tab. 3 – Moran's *I* statistic computed on regression residuals

	I statistic	*Standard deviation*	*p-value*
2000	-0.094	0.068	0.108
2010	-0.038	0.060	0.318

As expected, the occupational variable, that in our model relates to the different farm types, shows a positive and very significant coefficient in the agricultural value added per hectare regression as well as significant and positive appears the common intercept coefficient. The fixed effect estimator also allows us to compute the specific province intercepts, whose values are graphically shown in Figure 4 while regional (NUTS 2) means are reported in Table 4.

Fig.4 – Distribution of specific provincial fixed effects values



Tab. 4 – Weighted average of regional (NUTS2) fixed effects

Region	α_i	**Region**	α_i
Piemonte	0.69	Marche	-0.69
Valle d'Aosta	-1.36	Lazio	-0.66
Lombardia	1.75	Abruzzo	-1.08
Trentino-Alto Adige	0.02	Molise	-1.28
Veneto	0.73	Campania	-2.46
Friuli-Venezia Giulia	-0.69	Puglia	-2.24
Liguria	3.12	Basilicata	-1.81
Emilia Romagna	1.44	Calabria	-2.01
Toscana	0.95	Sicilia	-1.75
Umbria	-1.10	Sardegna	-0.61

Our estimates show that Northern and Central Regions are characterised by higher specific fixed effects. In this sense the previous analysis concerning agricultural value added distribution is confirmed even after controlling for an important determinant of AVA/UAA like agricultural work per hectare. All specific time-invariant factors affecting the dependent variable (synthesised in the α_i parameters) result in Northern provinces, especially those in Liguria and Lombardia, having higher value added from the primary sector. Another remarkable observation arising from the comparison of Figure 3 with Figure 4 is the absence in the latter of those “isolated provinces” in the South showing high VA/UAA values. In that cases the higher figures for agricultural value added are likely due to higher values of the agricultural work per hectare which in turn relates to labour intensive farm types.

Referring back to Table 1, more relevant for our impact assessment exercise are the coefficients associated with the treatment variable and its interaction with the time dummy *(PII*Year)*. Both variables are significant at the 5% level but with different sign. The former is negative, probably as an effect of the already mentioned self-selection bias, whereby marginal areas tend to use GIs as a tool to foster alternative development trajectories. Alternatively, we may suppose that marginal areas have been more capable to preserve local agrobiodiversity, a fundamental input in the GI valorisation strategy. On the contrary the interaction term shows a positive sign. This means that an increase in the protection intensity index value, which is in turn a consequence of higher number of GI schemes (or even of the enlargement of the area covered by the existing ones), leads the local agriculture to increase faster its value added per unit of UAA, thus possibly fostering rural development in the area.

5. Discussion

GIs are ever and ever more important in the rural European context, considered both in terms of their number and economic value they have been fostered by consumer consciousness and search for quality. Notwithstanding the role this policy instrument has taken in the past decades and the "age" of the instrument itself, a whole comprehensive evaluation of its effectiveness still lacks. Our purpose was to provide a preliminary measurement of the impact the use of GIs on the territories where they're applied. We tried to assess the effects of these products on the agricultural value added per UAA, a common indicator of rural development. Using a specific index and panel data - easily retrievable also for other EU countries- we were able to implement our impact assessment strategy and find that, on average, the implementation of GI schemes leads to a statistically significant increase of local agricultural value added. This is quite an important conclusion, since it seems to suggest that this policy instrument have had, at least in the Italian context, a positive effect with respect to one of its primary objectives, i.e. an increase in farmers' income and the fostering of rural development. To our knowledge this is the first attempt to provide such a quantitative measure of the economic impact of the EU policy on GIs at the country level.

Despite this optimistic result some caveats must be taken into account. First of all, as previously stated, this is only a first tentative evaluation of the possible effects of GIs on local economy, based on some strong, even if plausible, assumptions, such as the time-invariability of many local variables affecting both the policy implementation and the outcome. Controlling for as many factors as possible would then lead to stronger results. Another further development could be related to a more in-depth study of product types, since, depending on their production method, they can differently affect different economic sectors such as agriculture, food industry and even tourism..

A final aspect, as suggests the quite good amount of literature produced on GIs, has to be kept in mind. The impact we identified has to be considered an overall average effect of the implementation of GI schemes throughout Italy, but it says nothing about the single cases and their possible success.

In fact, as reported by Treagar and al. (2007), the implementation of GI products doesn't assure a positive effect on rural development since local, community and product specific characteristics play a leading role in determining such an effect. It is therefore necessary to continue to study GIs on a double path, on the one hand trying to understand "if" and "in what measure" they produce the expected results, mainly through quantitative methods, and on the other hand looking for the "how" and "why" they do it, using case studies and other field methods of inquiry. Therefore, this quantitative, country level, impact assessment should be considered a useful complement of the case study evidence so far provided for several EU regions and can be easily extended to other countries provided that very simple economic data are available.
This will allow the European Union to assess the usefulness of GIs and, in case, to improve it in order to better reach its purpose, and the single countries to assess the likely aggregate effects of such an instrument in order to take the greatest advantage from it.

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