Farms Employing Foreign Workers in Italy: An Analysis with Census Micro Data

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Abstract

Over the last decades, foreign workers have become a significant component of Italian agriculture workforce. Their presence and incidence are highly diversified with respect to farm typologies, type of contract and geographic location. A comprehensive representation of this complex phenomenon is thus the first step to understand the different problems and needs associated to the employment of foreign workforce. This study uses micro data from the 2010 Italian Agricultural Census to first describe what are the structural and geographical features of Italian farms employing foreign workers and then to group farms through a cluster analysis. Results give a detailed representation of the incidence of foreign workers employed, revealing which part of Italian agriculture relies more on foreign workers. The cluster analysis allows the definition of six groups: foreign workers are especially involved in livestock activities, both indoor and grazing and in farms specialized in permanent crops. Among major policy implications, analysing the presence of foreign workers can help targeting policies to agricultural production system needs.

Key Words

foreign workers; agricultural employment; census micro data; cluster analysis

1 Introduction

Worldwide, foreign workers have helped to expand labour intensive agricultural productions in many developed countries, by providing the necessary supply of labour and controlling production costs (DEVADOSS and LUCKSTEAD, 2008).

Europe has a long history of labour migration and the agricultural sector has a prominent role in this regard. Foreign workers[1] are very important for old Member States' (MS) agricultures, since in such a cyclical and seasonal sector, they offer a highly mobile workforce, thus playing a crucial role in meeting seasonal labour demand, given the declining employment of natives (HANSON and BELL, 2007; SOMERVILLE and SUMPTION, 2009a and 2009b) and their lower willingness to accept low wages and harsh working conditions (SIUDEK and ZAWOJSKA, 2016).

Particularly in Mediterranean regions, like Spain, Italy and Greece, foreign workforce is still significant, both in terms of production output and employment effects.

However, in the recent communication presented on November 2017 by the European Commission, regarding the future of the Common Agricultural Policy (CAP), although there is a final section on migration, aspects related to immigrant workforce in European agriculture, which should be much more of interest for the CAP itself, are largely disregarded. The major emphasis in this section is given to the role that the "future CAP must play in addressing the root causes of migration, implementing the outcome of the Valletta Summit" (EC, 2017), and acting for social inclusion, especially for refugees, with the Rural Development Policy (RDP) instruments. The only action suggested that could be directly linked to CAP instruments, is *"Offering opportunities for seasonal*

[1] Although, the UN Migrant Workers' Convention defines a migrant worker "a person who is to be engaged, is engaged or has been engaged in a remunerated activity in a State of which he or she is not a national", irrespective of his/her migratory legal status (UN, 1990), in this paper the term foreign worker is used to refer to both EU (other than Italians) and non-EU workers, to avoid misinterpretation with the EU policy context, where the term migration refers to movements between EU and non-EU countries (while movements within the EU as referred as "mobility").

workers in agriculture" (EC, 2017), which refers to competences reserved for MS for the admission of non-EU nationals, rather than to sectorial policies. For all the other actions proposed, the document seems to involve areas of competence within the Commission other than agriculture (MATTHEWS, 2017).

Instead, the issue of foreign workforce employment in European agriculture should become an area of interest also for the CAP, as this workforce represents a structural component of EU agricultural sector. In this context, the objectives of the policies involved, should aim at building a reciprocally fruitful framework that allows fighting irregular employment, helping farm owners to easily hire foreign workers when they need them and, in a wider perspective that goes beyond the agricultural sector, integrating these workers in the (mostly) rural economies they live in.

To set up policies addressing all these issues, a detailed representation of the phenomenon is needed.

In fact, as highlighted also by the International Labour Office (ILO), collecting better data is the first step to assess programs that admit migrants to fill farm jobs. Instead, in part because "*the employment of migrant workers in agriculture is often seasonal and considered transitional until machines or imports displace workers or urbanization absorbs farm land, there are systemic data gaps on migrant workers"* (MARTIN, 2016: 11). This data gap is also widened by the presence of irregular workers, not included in official statistics.

A detailed representation of the presence of foreign workers in agriculture should aim at describing the phenomenon in a deeper perspective, analysing which farm typologies and sizes or which territories rely more on foreign workers to carry out their activity and should also represent the basis to set up policies that allow a reciprocal cooperation.

Italian agriculture seems to be an interesting case study to investigate foreign workers concentration, because of the high presence of foreign workers and the wide diversity of Italian farming systems, together with the strong geographical specificity shown.

In Italy, since the end of the 80's, agriculture has started employing foreign workers (INEA, 2009) and, in 2017, 17% of total agricultural workforce was foreign (ISTAT, 2018).

An overlooked aspect dealing with the foreigners' presence in agriculture, is that it can largely differ within the sector due to the wide heterogeneity across farms, in terms of size and typology. It is generally assumed that immigrants offer low skill labour at low wages, mostly concentrated in low-productivity sectors. Indeed, when analysing their contribution at subsectorial level, it emerges that agricultural specializations that have a seasonal demand of unskilled labour, such as horticulture and fruits production, could greatly benefit from the presence of an abundant foreign workforce (WELLS, 1996). Instead other productions that require specialized workers, such as livestock, may benefit from immigrants with long-term experience in animal breeding (HUFFMAN and EVENSON, 2001).

Besides the type of contract involved, also the diverse legal frameworks, regarding the recruitment of foreign EU and non-EU workers, brings with it different policies needed to help agriculture meeting timely its labour demand.

Thus, understanding which part of Italian agriculture relies more on foreign workers and whether these workers are EU citizens or not, is a crucial step to have a reliable assessment of agriculture production needs and consequently, to set up policies in this field.

However, to the best of our knowledge, there is a lack of empirical literature addressing the issue of analysing foreign workforce in the whole Italian agriculture. In this field contributions are rare and focus more on the social facets of migration, rather than on the economic aspects of farms hiring immigrants. Thus, it is generally assumed in the media or in not scientific literature, that foreign workers are employed in smaller e inefficient farms, mostly irregularly and located in the South of Italy.

Instead, official aggregate statistics depict a more diversified picture, with foreign workforce's presence spreading across all Italian regions. Aggregate statistics, however, can hide the differentiated presence of foreign workers according to the highly differentiated Italian agriculture structure. Such kind of assessment, in fact, evidently requires farm-level data to match farms' structural characteristics with the presence of foreign workers.

Moving from these assumptions, the aim of this work is to analyse the presence of foreign workers that are really and regularly employed in Italian agricultural farms using the 2010 Italian Agricultural Census micro data. Indeed, one of the main value added of the study proposed, is such use of micro data that enables take advantage of the wide Italian farm heterogeneity and exploring the whole set of Italian farms hiring salaried workforce. Using these data, this work firstly proposes a descriptive analysis of the incidence of foreign workers in Italian agricultural

professional farms. Secondly, it applies a cluster analysis to focus on the main characteristics of groups of farms hiring (or not) foreign workers.

The descriptive analysis is aimed at understanding: where this workforce is located, what are its main features in terms of origin (EU or not) and type of contract (temporary or permanent) and what are the farm typologies and sizes that employ most foreign workers at sub-national level (i.e. NUTS 2 regional level).

The second part of the analysis is aimed at reducing the complexity existing within the set of variables analysed, allowing the representation of the phenomenon in a smaller dimension. A cluster analysis is thus performed to derive agricultural systems that are more dependent on foreign workers and depict their structural feature or market orientation, to understand if the most market oriented farms are also the one that rely more on this kind of workers.

To carry out this analysis Section 2 presents a brief literature review; Section 3 introduces a short background on foreign workers in Italian agriculture; Section 4 describes data and methods used; Section 5 presents the results obtained both in the description of the incidence of foreign workers in Italian agriculture and with the cluster analysis and Section 6 proposes some concluding remarks and policy implications.

2 A Brief Literature Review

Research on immigrant workforce in agriculture has a long tradition in historically immigration countries, like the US (e.g. FRIEDLAND and NELKIN, 1971; GOLDFARB, 1981; MIZE, 2006). The employment of foreign workers in agriculture is one of the causes of the development of a very intensive sector, with high seasonal labour demand. The literature on the "*californization*" of US agriculture is mainly focused on highlighting the establishment of an agricultural system largely dependent on the employment of low cost and seasonal workforce (MARTIN, 1985 and 2002). Fields of analysis are often linked to migrant labour work and their vulnerable position in the labour market (e.g. WELLS, 1996; HANSON and BELL, 2007), also the appalling conditions of foreign workers has often been registered in many Mediterranean European countries (KASIMIS et al., 2003) and reported by the press and international organizations (MORCELLINI, 2009; HUMAN RIGHTS WATCH, 2011; AMNESTY INTERNATIONAL, 2012).

The majority of studies on rural migration in the EU have focused rather on the scale and implications of exodus from rural societies (SIUDEK and ZAWOJSKA, 2016; RYE and ANDRZEJEWSKA, 2010). Moreover, European literature has mainly focused on foreigners' impact on metropolitan areas rather than on their impact on agriculture (ANDERSON et al., 2006).

With regards to Southern European countries, RYE and ANDRZEJEWSKA (2010) highlight a distinguishing model of migration, characterised by heterogeneity of foreign nationalities, differentiation of their cultural origins, unemployment and underemployment in the countries of reception (see also KASIMIS and PAPADOPOULOS, 2005). Almost all European Mediterranean countries share the same model of migration characterized by the presence of "workers-without-options" (MARTIN, 1985; GERTEL and SIPPEL, 2014; CORRADO et al., 2017), mainly employed by the agricultural sector that does not require highly skilled workers. However, the extensive recruitment of low-paid foreign workers represents a challenge also for the Italian agricultural sector (MARTIN, 1985; AMNESTY INTERNATIONAL, 2012).

Nowadays, foreign workers have become a relevant and structural component of Italian agricultural workforce (PISACANE, 2017). According to MARTIN (1985), in the 80's in Italy the global trend of hiring foreign workforce was quite different from other countries both for the high presence of part-time workforce and the starting employment of illegal workers.

These peculiar characteristics are one of the reasons why scientific literature on the presence of foreign workforce in Italian agriculture has focused mainly on the social aspects of migration, like the integration of immigrant in destination countries, or on the working conditions of immigrant workers (AVALLONE, 2014; MARCHIORI et al., 2008; COLE, 2007), while the economic aspects related to typologies and structures of farms hiring foreigners, have been largely unexplored.

Recently, BALDONI et al. (2017) have investigated the relationship between the presence of foreign workforce and farm-level labour productivity of Italian farms, by adopting alternative panel model specifications on data taken from Farm Accountancy Data Network (FADN) over the years 2008-2015. The authors find a positive correlation between the share of foreigners and labour productivity at the farm level, which is robust across all farm sizes and typologies.

However, when analysing this relationship with more sophisticated model specifications, results do not confirm a clear link between the two measures. These results are interesting because they highlight that, when analysing surveyed data from commercial farms, in contrast with what is presumed by the media or non-scientific literature, foreign agricultural workers in Italy are employed by the most productive farms and not by marginal farms.

3 Some Background Information on Foreign Workers in Italian Agriculture

Between the nineties and the first decades of 2000, foreigner citizens in Italy increased significantly, from 356 thousand in 1991 to 4.9 million in 2013. Although always positive, in the second decade of 2000, probably because of the persistent economic crisis, the number of inflows begun to decrease. At the same time, as well as other EU countries (especially Germany), Italy experienced a growing demand for international protection (EUROSTAT, 2018). In fact, after 2008, while economic migration was declining, the number of asylum-seekers became more relevant[2], so in 2016, on the total of new entries (226,934), refugees amounted to one third (78,000)[3].

Despite the increase of the applications for asylum, over the past four years, the number of foreigner citizens in Italy seems to be stable both in number and as a percentage. On the other hand, the growing number of permits for family reasons, 102,351 in 2016, as well as the increasing number of acquisition of citizenship (201,591 in 2016) show that large part of non-EU citizens' migration decision is permanent or long term, and foreigners are becoming a structural part of population (ISTAT, 2016).

At the beginning of 2017, foreigner people in Italy were 5,047,028 (8.3% of the total population) and 30% of this number come from EU countries, especially Romania (76%).[4] The increasing relevance of foreigners on population is also reflected in the impact on labour market: in 10 years, since 2007 up to 2016, foreigner workers increased by 953,495 units, whilst Italians reduced by 1,090,073. As a consequence, their incidence on workforce moved from 6.3% to 10.5% on average, but it is even higher in specific - harder, more precarious and less paid - sector such as construction (17.1%) and agriculture (16.6%) (ITALIAN MINISTRY OF LABOUR AND SOCIAL POLICIES, 2017).

Looking at the agricultural sector, the growing presence of foreign workers is a well-known phenomenon in Italy, where the employment of foreign workers in agriculture has grown, even though total employment has decreased; nonetheless, this phenomenon is quite difficult to analyse from a quantitative point of view also because of the incidence of irregular workers and not declared presences that are not captured by statistics.

Looking at official figures from Labour Forces Survey (ISTAT, 2018), from 2008 to 2016, the share of foreigners on total agricultural labour forces has grown from 6 to 16% (from 51,039 to 146,924 units), with a sharpest increase in the South (from 4 to 13%), then in the North (from 3 to 6%).

As regards legal framework to hire this workforce, a distinction must be made. People coming from one of the EU member state may stay and work in Italy without any formal permission for three months. For longer period, they must have one of the following requirements: have a job, attend a regular education course and to be able to maintain themselves. Besides, when staying for longer than three months, they must register in the municipality they live (Legislative Decree n. 30, 6 February 2007).

On opposite, non-EU citizens must always have a residence permit, that may be for work, family reasons (reunification or marriage), study, asylum and humanitarian reasons, health care, or religious reasons.[5]

The number of non-EU citizens entering Italy for working reasons, is limited by a quota established periodically - generally once a year - by the so-called "Immigration quota decree" by the Presidency of the Council of Ministers on the recommendation of the Ministry of Labour and Social Policies. This number

[2] To this respect it must be noticed that, in recent years, the so-called phenomenon of "environmental migration" from southern Mediterranean countries has become a more and more relevant issue, because of increasing global warming effects (CODERONI and PERITO, 2014).

[3] Source: http://dati.istat.it/, accessed on April 2018

[4] This data is a consequence of the fact that Italy is among the few MS that did not restrict migration inflow from countries entered in 2007 in the EU (OECD, 2012).

[5] Depending on the reason, duration of the permit may vary from three months to two years. Permits to work may reach two years in the cases of autonomous or permanent job. The renewal must be asked at least 60 days before the expiration.

is estimated based on trends in employment and unemployment rates, the needs of the labour market and assessments of need carried out at regional level (EUROPEAN MIGRANT NETWORK, 2010). The quota for seasonal workers in Italy doubled between 2001 and 2006, from 39,400 to 80,000. Then, since 2011 it has been reduced to 60,000 and again to 35,000 in 2012.

The 2018 "Immigration quota decree" establishes 30,850 new arrivals: 12,850 for permanent work; 18,000 for seasonal work. A procedural simplification for seasonal workers has been introduced recently, to implement Directive 2014/36/UE (OJEU, 2014). In addition, decree 203/2016 allows the opportunity of multi-annual permit (up three years) for workers employed at least once over the past five years in the same job typology.

As regards salary, in accordance with Italian law, for each category trade unions and employers' representatives negotiate work conditions (time of work, wages, etc.), and they sign collective agreements that represent the minimum threshold. Even if there are no kinds of discrimination for foreign workers, according to official sources, foreigners are frequently employed in lower and less attractive position. Therefore, their earnings on average are lower than Italians': generally, the gap is higher for non-EU (-25%) than for EU citizens (-20%), but in agriculture the difference is deeper for EU citizens (-12%) than for non- EU ones (-7%) (ITALIAN MINISTRY OF LABOUR AND SOCIAL POLICIES, 2017).

4 Materials and Methods

4.1 Data used

Data used in this analysis are micro level information collected by the 6th Italian Agricultural Census (ISTAT, 2010) that provide a proper description of the role of the workforce in Italian agriculture and allow a better understanding of the sectorial internal changing aspects of the farms. The use of micro data is one of the major added value for the analysis as it allows capturing the wide diversity of Italian farms and matching the structural features of the farms with the number of foreign workers hired. The aggregate level of analysis can in fact hide significant differences in the real contribution of foreign workforce in Italian agriculture.

The overall survey field of observation comprises 1,620,884 farms, but for the purposes of the paper, only farms employing hired workforce have been analysed. These represent a dataset of 221,671 farms (14% out of total), which employ both permanent and seasonal salaried workers.

As regards Census micro data use, two major shortcomings could be highlighted: the first one is related to the fact that Census data refer to 2010 and thus they cannot give an updated representation of the phenomenon under study, as foreign workers in agriculture have increased their shares over the last year (see Section 3); the second one is related to the issue of irregular workers that is not revealed by official statistics.

Regarding the first drawback, two issues must be clarified. Firstly, though the presence in absolute and relative terms (on total workforce) of foreign workers in Italian agriculture has increased since 2010 (from 9 to 17%; ISTAT, 2018), their relative presence on the territory has not deeply changed. The share of foreign workers in North Italian regions has decreased from 36% in 2010 to 33% in 2016 (last available year), the same holds true for the Southern regions (from 42% to 39%; ISTAT, 2018). As the purpose of our analysis is not to evaluate the presence in absolute terms of foreign workers, but their relative shares in different regions (and subsequently in different agricultural systems), these shares show that Census data still offer a good representation of the North-South divide of the phenomenon. Moreover, it is worth noticing that, in absolute terms, Census data analysed regard the subsample of farms employing salaried workers, and reveal a presence of 233,055 of foreign, representing 25% of total workforce. This share is very similar to what BALDONI et al. (2017) found using FADN sample in 2015, in which 23% of total salaried workforce was foreign. Instead, the last available data from ISTAT labour survey, estimates a presence of 146.924 units in 2016, that is only 16% out of total. This difference is not surprising as the Census is the only source of data that allows having a comprehensive and detailed representation of Italian agriculture.

As regards the issue of irregularly employed foreign workers, this problem affects especially agricultural seasonal activities (MAC, 2013) for they both concentrate a higher share of foreign workers and need them in a timely and often not easily predictable way, which can make more difficult to recruit them regularly. Indeed, this well-known phenomenon could hardly be captured by any official statistics (MACRÌ, 2013), thus, this is not a problem that refers only to Census data. The real relevant issue here is rather that, if the problem of irregular workers affects only some

Italian regions (namely, the South), by using any official statistics, the presence of foreign workers in the South would be systematically underestimated.

However, looking at the only available statistics on irregular workers at territorial level, this North-South difference does not seem to emerge in the years analysed. According to ISTAT estimates, in fact, in 2010, the year of the census, the number of irregular employed in agriculture in the North and in the South are quite similar (40% or total irregulars are in the North and 46% in the South), representing very similar shares on total labour units (24% in the North and 25% in the South).[6]

Hence, though the share of irregular workforce on total workforce is high and then the probability of underestimation of the presence of immigrants in Italian agriculture exists, we could assume that it is equally shared between regions and, again, does not deeply affect the relative distribution of these workers, that is the focus of the analysis.

All these arguments make the use of Census data, though updated, still representative of the phenomenon analysed. Moreover, the Census is the only source of micro data can provide an accurate representation of the phenomenon at sub-national level, thus emphasizing the relative importance of foreign workers within the highly differentiated Italian agriculture and allowing exploiting other farm structure characteristics (size, typologies, location) which cannot be detected with aggregated figures of labour surveys.

4.2 Methods

Using these micro data, in the first part of the analysis a description of the distribution of foreign workers among farm typologies, economic size, type of farming and region is provided, while in the second part a cluster analysis is performed using the main variables that describe farms which employ salaried workers, including the nationality of workers.

The empirical approach adopted to cluster farms uses a multivariate analysis to identify uniform types and a small number of easily interpretable categories. Through this approach, statistical units can be grouped to minimize the logical distance within each group and to maximize that between groups. The logical distance is quantified by means of similarity or dissimilarity measures defined between statistical units and measured as distance among couples of observations. This procedure allows the management of a large amount of data and reduces the complexity existing within the set of examined variables. More in detail, a multiple correspondence analysis (MCA) and a cluster analysis have been used on the qualitative and quantitative information collected by the Italian Agricultural Census. This approach is based on extensive statistical literature (JAMBU and LEBEAUX, 1983; ROMESBURG, 1984) and has been already adopted in other studies of the Italian agriculture (RUSSO and SABBATINI 2002; CARDILLO et al., 2004; ADINOLFI et al., 2005).

A set of variables and related modalities have been extracted and broken down into active and descriptive, based on the contribution they provide to explain the surveyed phenomenon. The quantitative continuous variables have been transformed into nominal or discrete variables, grouping the data into modalities or classes. Then the new dataset obtained was re-processed using the cluster analysis allowing the grouping of the examined farms into type-based classes according to common characteristics.

The following group of variables have been used to allow an analysis of the related aspects of farming activities: (*i*) the farm structural information, including the utilized agricultural area (UAA), the economic size, the farm type, etc.; (*ii*) the market orientation of the farm: if a farm sells its products and the types of sales methods; (*iii*) the work force, in terms of working days/hours, nationality, out of farm activities, etc.

In particular we utilized 30 variables, among them 28 are categorical and have 112 associated categories and 2 are continuous. For clustering we used an aggregative hierarchical method that takes into account the link existing among the values of considered variables in single statistical units, in our case for each farm. An aggregative hierarchical method produces a certain number of successive partitions that are graphically represented in a dendrogram (tree diagram).

5 Results and Discussion

5.1 Foreign Workers in the Italian Agricultural Census Data

Total foreign workforces in 2010 are of 233,055 units (on a total occupation of 938,103), which represent almost 25% of the agricultural workforce in Italy. Looking at aggregate figures, we can find both Northern and Southern Regions with quite high shares of foreign workers, with Emilia-Romagna and Apulia showing the highest shares and Aosta Valley and Sardinia the lowest ones (Figure A.1 in the Annex pro-

[6] https://www.istat.it/it/archivio/39522 accessed on April 2018

Table 1. Distribution by region of: number of workers and percentages of regional foreign workers on total regional workforce

Region	Number of foreign workers	% on total regional workforce
Piedmont	17,694	54
Aosta Valley	470	53
Lombardy	16,527	42
Bolzano	19,979	69
Trento	12,906	54
Veneto	19,781	40
Friuli-Venezia Giulia	3,543	29
Liguria	1,892	39
Emilia-Romagna	28,686	40
Tuscany	11,064	27
Umbria	3,645	29
Marche	2,353	21
Lazio	12,810	42
Abruzzo	5,514	34
Molise	1,409	25
Campania	14,349	19
Apulia	26,126	12
Basilicata	5,185	22
Calabria	13,606	14
Sicily	14,407	11
Sardinia	1,109	7
Italy	**233,055**	**25**

Source: authors' elaborations on Agricultural Census data

vides a representation of Italian Regions together with the shares of foreign workers by Region). However, beyond absolute figures, regions differ quite a lot in their dependence of a foreign workforce, measured as the ratio between foreign workers and total regional workforce (Table 1). In fact, we can distinguish a group of regions that employ a percentage of less or equal to the national average (25%), which are mostly southern regions (namely Sardinia, Sicily, Apulia, Calabria, Campania, Basilicata, Molise) and one central region (Marche); a group of regions that employ from 27% to 42% foreigners (Toscana, Friuli-Venezia Giulia, Umbria, Abruzzo, Liguria, Veneto, Emilia-Romagna, Lombardy and Lazio) and regions whose workforce is over 50% foreign (Aosta Valley, Piedmont, Trento and Bolzano). This "dependency index" gives an important information as, interestingly, regions like Aosta Valley, that shows the lowest absolute value, is among the regions that are more dependent on foreign workforce to carry out agricultural activities; while the most of regions in the south that show high number of foreign workers, are in fact less dependent, on aggregate, on them. This North-South divide is even more evident looking at the distribution of farms that employ only Italians, Italians and foreigners or only foreigners, by Region (Table 2), because these data make emerge more clearly where are the farms that rely solely on foreign workers.

On average, 11% of Italian farms employ only foreign workforce, while 13% both Italian and foreign. At regional level, significant figures emerge: more than 30% of Liguria and Piedmont farms employ only foreigners; this share is more than 40% in the Trento and Bolzano provinces and more than 50% in Aosta Valley. This issue can be just partially linked to the issue of data reliability, but it rather depends also on the different relative importance of the agricultural sector in the regions and on the different structural features of regional agricultures in Italy.

With regards to the data reliability, at regional level, this issue becomes much more important and some (even not scientific) literature highlights that a lower incidence of foreign workers in Southern regions, is influenced by the higher presence of irregularly employed workforce (MSF, 2008). However, (as detailed in section 4.1) looking at official statistics, the underestimation of irregular immigrants seems to be equally distributed between the North and the South.

Instead, what seems to emerge from this data is linked more to the different economic structures of Italian regions. In fact, it must be noticed that the South and Islands of Italy have experienced a lower industrialization process, thus local workforce still considers agriculture as an attractive job opportunity. As a consequence, the shares of the employees in agriculture are higher than in the North. In the Census subsample analysed, Italian workers in the South are 67% while in the North only 27% (10% in the Centre).

Besides, these different behaviours depend also on some structural features of Italian agriculture; to better understand this phenomenon, data must be analysed more in detail, sorting them according to the structural features of farms and of the type of foreign workforce employed.

Looking at the data on type of contract[7] by region some other differences emerge (Table 3). While at

[7] Within the Census data classification, the following type of contracts is sorted: "permanent" or "temporary" (which depend on the duration of the contract) and "Other contracts". This last category includes people who are hired from third parties, for example from labour con-

Table 2. Distribution of farms that employ only Italians, Italians and foreigners or only foreigners region (% on regional farms)

Region	Only Italian	Italian and Immigrant	Only immigrant
Piedmont	45	22	34
Aosta Valley	30	16	54
Lombardy	53	26	21
Bolzano	43	15	42
Trento	51	9	40
Veneto	63	18	19
Friuli-Venezia Giulia	62	25	13
Liguria	52	16	32
Emilia-Romagna	53	27	19
Tuscany	64	22	14
Umbria	66	21	13
Marche	74	16	10
Lazio	57	16	27
Abruzzo	73	12	15
Molise	79	10	11
Campania	82	10	8
Apulia	88	9	3
Basilicata	75	18	7
Calabria	88	10	3
Sicily	88	7	4
Sardinia	91	4	5
Italy	**76**	**13**	**11**

Source: authors' elaborations on Agricultural Census data

national level 21% of permanent workers is foreign (41% of which come from the EU), at regional level, percentages of foreign permanent workers range from 7% in Molise and Sardinia, to 39% in Veneto and 35% in Piedmont. Temporary workers, at national average level are 26% foreigners, the bulk of which from EU (61%). This confirms that the majority of temporary immigrants are from others EU MS, even in the southern regions (Sicily and Sardinia) as other recent studies have found (DINES and RIGO, 2015). This is also a consequence of the fact that, being an EU citizen widely simplifies the legislative framework for hiring this workforce.

Of course, these data also reflect farm specific characteristics, for example farm size. Data on the presence of foreigners in relation to farm size in terms of standard output (SO) for each region are quite clear (Table A.1).[8] The presence of foreign workers encompasses all farm sizes, however, at national level, the bigger the farm the higher the presence of foreigners: from 3% in small to 7% in medium and 15% in large ones. This finding is coherent with what found at international level (OECD/ILO, 2018) and national level (BALDONI et al., 2017), were firms employing foreigners tend to be larger than firms that do not.

At regional level, while the small farms do not show very differentiated patterns (with few exceptions, like Trento), medium ones behave in quite a different way. Big farms with foreigners are highly concentrated in the North and in the Centre of Italy (with an average of 28% and 25%, respectively); while in the South only 8% of the workforce of big farms is made up of foreigners. Indeed, a crucial role in explaining the differentiated regional patterns is played by farm specific characteristics, such as farm typology.

Table 4 shows the incidence of foreign workforce by Region and farm specialization.[9] Permanent crops specialists represent more than half the farms in the census (Table A.2), however, only 15% of these farms employ salaried workers (Table A.3) and they show also one the lowest share of foreign workers employed.

Field crops, which are also very relevant (24%), have the lowest share of farms with salaried workers, due to the use of mechanisation, however 29% of them is foreign. Grazing livestock (8%), though showing a low presence of salaried workers have one of the higher shares of foreign. According to some studies, foreign shepherds are playing a fundamental role in assuring a generational renewal, offering relatively skilled and low cost workers (NORI, 2015). Horticultural farms (2%) are the ones the employ more salaried workforce (mainly seasonal in the period of harvest),

tractors, carrying out work agricultural activities or related activities, or by groups of companies (Passive subcontracting is excluded). Source: http://www.istat.it/it/censimento-agricoltura/agricoltura-2010.

[8] Farms are grouped in three categories: small farms (with a SO less than 25,000 euros), medium farms (with a SO between 25,000 and 100,000 euros) and large farms (with a SO higher than 100,000 euros).

[9] Annex 1 provides detailed information on farms' structure in Italy detailing the numbers of farms within each farm typologies (Table A.2.) and the number of farm that have salaried workers in each farm typology (Table A.3).

Table 3. Incidence of foreign workers on total regional workforce by region and type of contract (%)

Region	Permanent		Temporary		Other contracts	
	Foreign	Of which EU	Foreign	Of which EU	Foreign	Of which EU
Piedmont	35	46	54	43	80	40
Aosta Valley	28	58	62	38	37	0
Lombardy	29	22	47	60	76	49
Bolzano	29	46	43	67	44	41
Trento	20	56	32	73	40	27
Veneto	39	17	42	22	18	11
Friuli-Venezia Giulia	31	29	44	54	21	43
Liguria	21	40	29	47	49	28
Emilia-Romagna	21	44	32	43	39	38
Tuscany	19	39	22	40	15	52
Umbria	33	43	46	52	42	81
Marche	24	57	36	29	30	57
Lazio	21	23	26	72	29	67
Abruzzo	14	45	21	47	9	59
Molise	7	50	12	61	15	84
Campania	19	48	23	62	12	88
Apulia	8	64	11	67	25	77
Basilicata	15	54	12	46	3	59
Calabria	7	58	7	48	3	58
Sicily	12	86	75	96	56	94
Sardinia	26	67	57	82	46	89
Italy	**21**	**41**	**26**	**61**	**26**	**59**

Source: authors' elaborations on Agricultural Census data

with high shares of foreign. The same situation occurs for granivores, which are very few farms out of the total (1%) and rely heavily on salaried workers in general and on foreign in particular. Both these latter activities are in fact low attractive for natives.

If at aggregate level differences are yet rather small, at regional level, again, data are highly differentiated, partly reflecting the lack of job opportunities, which makes agriculture attractive to local workers, partly depending on different territorial pattern. Farms' structure in the North of Italy shows a higher presence of farms with salaried workers (i.e. bigger farms or professional farms (ARZENI and SOTTE, 2013) and this affects also the presence of foreign ones.

For permanent crops, Piedmont, Lombardy, Bolzano and Trento's workforce is mainly foreign (60%, 53%, 75% and 56% respectively). This is the effect of both Southern regions` farms being smaller (and thus occupying on average less salaried workers) and also because they have different kind of permanent crops (like olives) having different labour requirements.

As regards horticultural farms' workforce, in Veneto, Friuli Venezia Giulia, Lazio and Trento it is mainly foreign, while in the South figures are lower. These figures could reflect, from one side the different structures of farms (again in the South the share of salaried is less than in the North), but it could also be argued that, in this particular farm typology, the use of official statistics underestimates the presence of foreign as disregards irregular one.

Also, in the livestock specialists a North South divide exists, though less strong for the few granivores specialists.

Table 4. Incidence of foreign workforce by region and farm specialization (% on regional salaried workforce)

	Cereals	Horti-culture	Permanent crops	Bovine	Granivores	Mixed cultivation	Mixed livestock	Mixed crops and livestock	Not classified	Total
Piedmont	36	31	60	44	45	45	24	46	17	54
Aosta Valley	41	13	27	78		20	0	4		53
Lombardy	26	35	53	40	39	51	38	36	27	42
Bolzano	17	41	75	35	18	82	0	73		69
Trento	4	64	56	49	53	53	17	59	0	54
Veneto	40	68	31	32	51	46	30	39	1	40
Friuli-Venezia Giulia	13	53	28	35	25	13	10	12	9	29
Liguria	28	49	25	36	50	39	40	32	25	39
Emilia-Romagna	32	45	42	46	48	38	33	36	24	40
Tuscany	31	35	25	30	36	26	20	31	9	27
Umbria	39	26	22	40	32	26	50	28	7	29
Marche	19	31	16	45	37	17	21	24	5	21
Lazio	40	63	35	40	34	49	32	40	6	42
Abruzzo	43	35	30	53	24	30	20	32	30	34
Molise	33	18	18	41	28	25	11	21	3	25
Campania	34	27	10	34	11	17	10	11	0	19
Apulia	31	20	6	22	22	13	10	19	4	12
Basilicata	28	19	18	33	25	23	35	22	0	22
Calabria	17	22	14	8	11	13	6	7	3	14
Sicily	10	35	5	13	8	16	6	12	2	11
Sardinia	3	7	2	13	6	6	42	5	0	7
Italy	**29**	**37**	**21**	**31**	**38**	**24**	**27**	**25**	**7**	**25**

Source: authors' elaborations on Agricultural Census data

5.2 The Cluster Analysis

To better understand more in detail the effects played at farm level by each of the characteristics analysed in the descriptive part, a cluster analysis has been performed in order to simplify and synthetize the information provided and delineate groups of quite "homogeneous" farming system in relation to their productive structure and employment of foreign workers.

Through the MCA three differentiation factors that synthesize some of the features of the surveyed phenomenon have been identified. The first factorial axis is related to farm size, both in physical and economic terms: variables used for the aggregation of clusters are the class of UAA and of SO. Along the axis, farms with large economic size are in opposition to those with a small one. The second factor of aggregation is hired workforce, in terms of different available contract (fixed, temporary or other). Finally, the third factor of aggregation is represented by the market orientation of farms, which can be derived from the presence of self-consumption opposed to sales activities and different sales methods. Through the cluster analysis, the combination of these aspects allows the identification of six groups of farms chosen in order to maximize their heterogeneity (Table 5).

In terms of employment, we can distinguish two sub-groups: one with farms that employ foreign workers and the other one that employs mostly Italians (Table 6). The first group includes what we have defined, for the purpose of this analysis, as: the "farms with seasonal workers" (with 65% of foreign workers on total workers in the cluster), "extensive grassland" (25%) and "indoor livestock" (40%). These three groups represent just 28% of total farms employing salaried workers (61,398 farms), however their average UAA and SO are much higher than to the ones of farms that employ mostly (or only) Italians (Table 6).

Table 5. Main characteristics of the six groups resulting from the cluster analysis

Group Label		Number of farms	Labour demand (% on total farm labour)	Prevalent farm typology (% of farms)
Farms that employ foreign workers	Extensive grassland	16,216	Permanent workers: both Italian and foreign (13); only foreign (22)	Grazing livestock (73)
	Indoor livestock	7,278	Permanent workers: both Italian and foreign (50); only foreign (23)	Granivores (39) Grazing livestock (29)
	Farms with seasonal workers	37,904	Seasonal workers mainly foreign	Permanent crops (60) Arable (15) Horticulture (14)
Farms that employ mostly Italians	Integrative income	91,880	Seasonal workers mainly Italians	Permanent crops (74)
	Self-consumption	41,785	Seasonal workers mainly Italians	Permanent crops (90)
	Diversified	26,608	Permanent workers mainly Italians	Field crops (42) Permanent crops (28) Horticulture (17)

Source: authors' elaborations

Table 6. Share of foreign workers on total group's workforce and average values of Utilized Agricultural Area (UAA) and Standard Output (SO) by group of farms

Group Label		Foreign workers on total workers (%)	Average UAA (ha)	Average SO (€)
Farms that employ foreign workers	Extensive grassland	25	58	134,489
	Indoor livestock	40	102	1,524,345
	Farms with seasonal workers	64	15	122,011
Farms that employ mostly Italians	Integrative income	1	9	42,335
	Self-consumption	3	1	3,669
	Diversified	11	55	122,502

Source: authors' elaborations

The largest and most important group that employs foreign workers is the "farms with seasonal workers" which mainly includes individual holdings (87%), managed directly by the holder (90%). The employment is prevalently seasonal and foreign workers play an important role since more than 50% of the farms rely only on them to carry out their activities. Prevalent specialization is in permanent crops (60%), followed by arable and horticulture. Most of the farms in this group are distributed in the classes of SO over 50,000 euros, almost 40% over 100,000 euros. The physical size is medium (60% between 5 and 50 ha).

The other two groups employing foreign workers are represented by two different Italian types of livestock system: the "extensive grassland", which are mainly sheep farming located in the South and the "indoor livestock", specifically the dairy and beef farms located in the Pianura Padana area (North of Italy).

The "extensive livestock" farms are mainly individual holdings (78%), managed directly by the holder (83%) and with quite big farm size in terms of UAA: more than 66% of the farms are over 20 ha (15% more than 100 ha). 34% of these farms have other activities, especially food processing and agro-tourism. Employment is mostly permanent and workers are both Italian and not: 22% of these farms employ only foreign workers.

The "indoor livestock" are mainly partnerships (43%) or corporate bodies (10%), while individual holdings are only 39% of the farms. Most frequent farm types are granivores (39%), grazing livestock,

arable crops (11%). They are large farms, both in physical (more than a half is over 50ha) and in economic terms (90% over 250,000 euro; 44% over 1 million). 23% of them carry out other activities related to livestock: production of fodder; livestock maintenance, renewable energy, food processing. Employment is mainly permanent and foreign workers seem to be very relevant: 23% of the farms employ only foreign workers and 50% both Italian and foreign workers.

The second sub-group employs mainly Italians workers and is composed by the "integrative income farms" (with only 1% of foreign workforce), "self-consumption farms" (with 3%) and "diversified farms" (with 11% of foreign workforce). These farms together are defined as "marginal farms" (FANFANI and MONTRESOR, 2000), as opposed to the other groups that together represent the "professional farms": i.e. farms that are large enough, both in physical and economic terms, to guarantee an adequate income at least to the holder.

Most of these marginal farms are individual holdings, managed directly by the owner. Income is sometimes integrated with other activities. Prevalent specialization is permanent crops. Employment is mainly seasonal, this is coherent with prevalent specialization, which implies a higher demand for labour during the harvest period, and workers are largely Italian citizens.

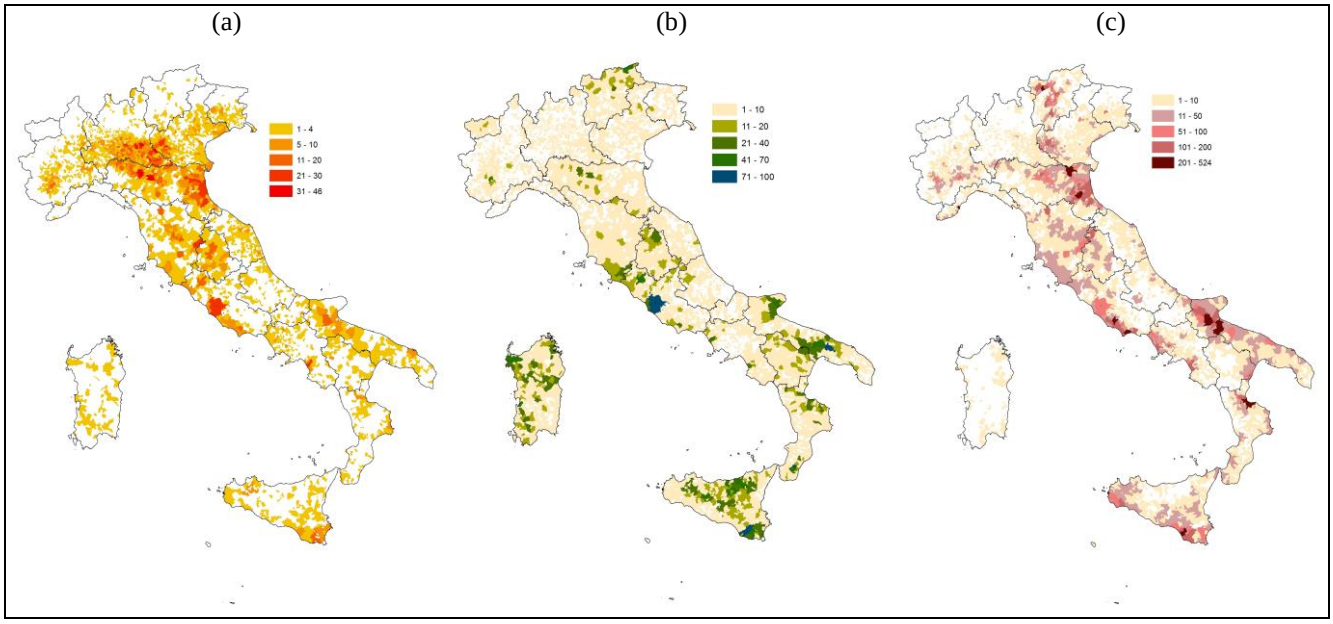
Finally, the "Diversified" group includes medium-large farms, more than half are over 10 ha of UAA, and 13% over 100 ha. Prevalent farms' specialization is field crops (42%), followed by permanent crops (28) and horticulture (17%). Other activities are quite frequent, especially agro-tourism, contractor work, gardening. Workers are mainly permanent and Italians.

To give a picture of spatial distribution of the different clusters, Figure 1 shows the number of farms within a municipality belonging to each of the three clusters with foreign workers. The indoor livestock systems are more located in the North and Central Italy (Figure 1.a); the extensive grassland farming is spread in the South and in the Center (Figure 1.b), while the farms with seasonal workers are present in all the Italian territory, from the North-East to the South, though they differ in productions (Figure 1.c).

6 Concluding Remarks and Policy Implications

This study has investigated the presence of foreign workers in Italian agriculture through Census micro data. Descriptive analysis reveals that foreign workers have become a relevant and fundamental part of Italian agricultural workforce and their presence is highly differentiated across farm size, typology and at territorial scale. The use of micro data allows grouping farms in relation to other farms' features and makes clear that agriculture's characteristics matter in explaining both the size and type of foreign workers

Figure 1. Number of farms in each cluster: indoor livestock (a); extensive grassland farming (b); farms with seasonal workers (c)



Source: authors' elaborations

composition. The cluster analysis highlights that, among farms employing salaried workforce, two subgroups of farms can be distinguish: one with farms that employ foreign workers, that are mainly professional and market oriented farms and the other one that employs mostly Italians (mostly small marginal farms). Permanent foreigner workers are important in livestock farming, both extensive grassland and indoor, while seasonal workers in farms specialized in permanent crops.

Results strengthen the point that, as the presence of foreign workers has become a relevant structural component of Italian agricultural workforce, there is scope to differentiate policy responses and frameworks, according to different situations.

The objectives of the policies involved, should in fact aim at different and complementary goals: from building a reciprocally fruitful framework for both the actors of the labour market to, in a broader perspective that goes beyond the agricultural sector, integrating these workers in the (mostly) rural economies they live in.

From the labour market perspectives, policy interventions needs are related to firstly contrasting all the various conditions of irregular employment, and secondly, helping to match farm labour demand and supply, to allow farm owners to easily and timely hire foreign workers.

As regards the issue of irregular workers, the study does not provide any analysis of this phenomenon, as it uses official statistics, that cannot capture the relative figures. Official estimates of irregular workers corroborate their relevance in the sector, in both the North and South of Italy, confirming that the urgency of law enforcement is a prerequisite of any other policy intervention. The design of the needed policy instruments deserves further analysis and goes well beyond the scope of this study.

Regarding the labour market needs, from the farm owners' perspective, the legislation should provide instruments to facilitate hiring foreign workers according to agricultural production requirements; this could help also fighting irregular employment, when it is caused by the difficulty to timely find the workforce needed.

A first distinction must be made here, between permanent and seasonal workers as for this last category, recruiting workforce in time is much more challenging, as it is highly linked to seasonality issues. In this respect, legal instruments need to be diversified according to the nationality of the workers. For EU citizens, no particular requirements are needed (see Section 3), thus timeliness of hiring should depend mainly on instruments put in place to facilitate the matching of demand and supply of labour. Instead, for non-EU citizens, there is the need to set conditions on the entry and stay in the EU.

Since 2014 the European Union has a specific directive promoting the use of selection and recruitment procedures of foreign workforce directly in the areas of origin. The directive 2014/36/EU on "*the conditions of entry and stay of third-country nationals for employment purposes as seasonal workers*" (OJEU, 2014) is coherent with the architecture of the European migration policy.[10] The instrument of "circular migration"[11] is thought to be useful because it could ensure a controlled and temporary supply of labour according to the production needs, as an alternative to "traditional" migration. However, recent studies have highlighted some weaknesses of the directive, with respect to the declared objectives.

The definition of seasonal work itself would not correspond to the needs of the production areas where seasonality has changed becoming for some areas longer (up to ten months) and on for other areas shorter than the period defined by the directive (MEDLAND, 2017). Moreover, the directive does not include specific provisions for workers already irregularly employed (MEDLAND, 2017), thus partially failing to reach its declared objective that was to prevent exploitation of seasonal workers. In Italy, indeed, even though national migration policy has been harmonized with the Union's guidelines, informal cheating mechanism are still in place to recruit part of the foreign workers.

Another directive's objective is to aim at the development of areas from which migrants originate, because of their remittances and of the possibility that the skills acquired abroad could be useful when migrants return. In fact, as recommended by the ILO, a guest workers program could enable governments to reach the triple win goals to fill vacant jobs, to empower workers and to spur development in migrant areas origin (MARTIN, 2016). However, if circular

[10] The directive is based on the experience of "circular migration" programs implemented in Huelva in southern Spain, were there was a seasonal workers' scheme model used as a reference paradigmatic example of temporary work programs in the countries of origin.

[11] Circular migration is *"the temporary, recurrent movement of people between two or more countries mainly for purposes of work or study"* (UNITED NATIONS COMMISSION FOR EUROPE, 2016).

migration of skilled workers seems to impact positively on the development of origin areas (ILO, 2010), the evidence for circular migration of unskilled workers is less clear (MEDLAND, 2017) and this could hamper the potential of the directive to reach this goal.

Indeed, in order to help the agricultural job market to be more flexible, top-down policies could not be effective, since foreign workers are differently needed by different regional labour markets within a country, while, at regional level, some facilitation schemes could be put in place to connect temporary labour migration to local production needs.

Very interesting examples worldwide, include programs to link migration to regional development objectives, with the municipalities that define which migrants they would wish to attract, as well as provide integrated settlement services (like the province of Quebec in Canada as reported by BREZZI et al., 2010).

Examples like this, clearly highlight that policies to influence migration flows depend on strong multi-level governance, where each level of government contributes to the policy design and implementation (OECD, 2009; BREZZI et al., 2010).

The importance of a multi-level governance has been recently reaffirmed, in the context of rural development, by the OECD (2016 and 2018), stressing that "rural policy 3.0" should no more focus only on top-down uniformly applied policy, nor on bottom-up policies made of local strategies, but on an integrated approach with multiple policy domains (OECD, 2018: 22). This multilevel governance involves "*the collaboration and engagement of government at multiple levels, and involvement of the private sector and third sector"* (OECD, 2018: 24).

The prospect for stronger multi-level governance to address explicitly migration policies, is not limited to the local labour markets. In fact, local authorities are also better able to plan the needs for housing and services of incoming workers (BREZZI et al., 2010).

Also in this respect, permanent and temporary workers have different needs. While temporary workers are more interested in short term policies and services, like housing conditions and access to services, for permanent workers the issue of integration in local economies they live in, is crucial. To this respect, both the RDP of the CAP and the Cohesion Policy, have shown to include instruments and measures to facilitate the integration of migrants and refugees in the rural areas. Even the recent Communication of the EC (2017: 27) highlights that, through RDP, the "*CAP can play a role in helping to settle and integrate legal migrants, refugees, into rural communities*". The integration of working-age migrants in rural areas is a promising way to reverse depopulation trends, helping the maintenance or reopening of public services and creating new jobs and economic development in rural areas (ENRD, 2016: 3).

In the light of delivering a multi-level governance approach, understanding the phenomenon in detail is fundamental to provide evidence for policy making. This work represents a starting, though insightful, step in the direction of giving policy makers information to better understand both sectorial and territorial requirements.

Further analysis, should go in the direction of updating information provided and trying to understand if the apparent progressive substitution of native with foreigner workforce corresponds to a short-term strategy based on cost-cutting actions or to a long-term structural change supported by policy to confront with structural transformation of Italian economy, taking into proper account of foreign workers conditions' improvement. Such an assessment would require both data on skills of foreign workers occupied and economic performances of farms.

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Annex

Figure A.1. Share of foreign workers by region in Italy (% on total foreign workers)

The Northern Regions, according to ISTAT classification are: Piedmont; Aosta Valley, Liguria, Lombardy, Trento and Bolzano (Trentino Alto Adige), Veneto, Friuli-Venezia Giulia, Emilia-Romagna. The Central regions are: Tuscany, Umbria, Marche, Lazio. The Southern regions are: Abruzzo, Molise, Campania, Apulia, Basilicata, Calabria, Sicily and Sardinia.
Source: authors' elaborations on Agricultural Census data

Table A.1. Percentages of foreign workforce by class of Standard Output on total workforce in each region

Region	Small	Medium	Large
Piedmont	3	12	39
Aosta Valley	3	25	25
Lombardy	2	7	33
Bolzano	8	45	16
Trento	12	32	10
Veneto	1	6	33
Friuli-Venezia Giulia	1	3	25
Liguria	9	10	20
Emilia-Romagna	1	7	32
Tuscany	4	5	18
Umbria	3	6	20
Marche	2	4	14
Lazio	6	13	24
Abruzzo	2	5	27
Molise	3	6	16
Campania	3	6	11
Apulia	2	3	7
Basilicata	1	6	14
Calabria	4	4	5
Sicily	1	3	7
Sardinia	1	2	5
Italy	**3**	**7**	**15**

Source: authors' elaborations on Agricultural Census data

Table A.2. Number of farms by region and type of farming in the Agricultural Census dataset

Region	Field crops	Horti-culture	Permanent crops	Grazing livestock	Granivores	Mixed cropping	Mixed livestock	Mixed crops and livestock	Not classified	Total
Piedmont	20,504	1,625	23,660	12,140	963	4,119	153	3,487	497	67,148
Aosta Valley	835	16	996	1,270	2	292	4	139		3,554
Lombardy	22,308	2,640	7,662	15,265	1,747	1,689	403	2,393	226	54,333
Bolzano	1,727	130	8,837	8,884	50	126	47	444	2	20,247
Trento	1,276	197	12,599	1,677	41	327	15	301	13	16,446
Veneto	64,075	2,541	29,398	8,686	1,706	7,178	222	3,527	2,051	119,384
Friuli-Venezia Giulia	13,402	526	3,740	1,493	300	1,528	43	644	640	22,316
Liguria	1,807	4,545	10,561	1,452	28	1,249	50	487	29	20,208
Emilia-Romagna	32,913	1,257	22,100	7,970	746	5,835	136	1,608	901	73,466
Tuscany	12,638	3,255	42,680	3,745	288	5,749	211	2,289	1,831	72,686
Umbria	10,557	275	16,436	1,831	242	4,423	148	1,520	812	36,244
Marche	21,862	679	11,517	1,826	402	5,563	249	1,565	1,203	44,866
Lazio	17,158	2,629	58,183	9,291	284	6,954	243	2,657	817	98,216
Abruzzo	11,378	553	40,537	3,352	298	7,644	399	2,199	477	66,837
Molise	9,415	76	9,901	2,142	258	2,934	147	992	407	26,272
Campania	26,686	4,058	80,674	8,078	386	11,907	308	3,263	1,512	136,872
Apulia	34,701	2,429	214,216	3,546	187	11,261	142	1,160	4,112	271,754
Basilicata	18,847	316	21,713	3,814	125	3,697	124	1,219	1,901	51,756
Calabria	12,503	1,131	107,603	4,160	375	8,579	271	2,524	644	137,790
Sicily	40,353	7,559	141,183	11,718	256	11,396	189	1,954	5,069	219,677
Sardinia	8,816	1,361	27,205	17,153	674	2,999	733	1,215	656	60,812
Italy	**383,761**	**37,798**	**891,401**	**129,493**	**9,358**	**105,449**	**4,237**	**35,587**	**23,800**	**1,620,884**

Source: authors' elaborations on Agricultural Census data

Table A.3. Percentages of farms with salaried workers by region and type of farming (% on total Census farms)

Region	Field crops	Horti-culture	Permanent crops	Grazing livestock	Granivores	Mixed cropping	Mixed livestock	Mixed crops and livestock	Not classified	Total
Piedmont	6	27	18	7	25	6	12	7	4	11
AostaValley	2	44	4	17	-	3	25	4	-	8
Lombardy	8	43	24	15	42	18	34	12	11	16
Bolzano	35	71	47	7	12	52	9	22	-	28
Trento	25	58	37	13	46	26	13	32	15	34
Veneto	3	38	17	9	29	8	14	8	2	8
Friuli-Venezia Giulia	2	51	22	13	27	10	16	10	2	8
Liguria	8	16	6	3	14	8	8	7	14	9
Emilia-Romagna	9	49	32	17	54	23	39	23	7	19
Tuscany	11	25	12	12	26	11	18	12	5	12
Umbria	9	29	7	11	40	8	13	9	4	8
Marche	5	35	9	12	25	5	9	7	3	7
Lazio	9	37	7	10	24	8	11	7	5	8
Abruzzo	6	19	5	7	17	4	2	3	5	5
Molise	6	26	7	6	16	7	3	3	3	6
Campania	14	46	16	16	32	14	17	11	4	16
Apulia	15	37	15	24	36	20	39	29	5	16
Basilicata	5	42	9	11	28	10	22	10	2	8
Calabria	15	32	20	23	23	23	25	29	3	20
Sicily	9	47	17	15	38	17	26	21	2	16
Sardinia	11	27	9	10	12	11	12	14	6	10
Italy	**8**	**37**	**15**	**12**	**31**	**13**	**17**	**12**	**4**	**14**

Source: authors'elaborations on on Agricultural Census data