CONFLICT SCENARIOS AND TRANSITIONS

Opportunities and Risks for Regions and Territories

edited by
Marco Modica
Davide Piacentino

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Part 2 – Transitions

Self-employment and Tax Evasion:
A Descriptive Analysis of Italian Provinces

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Abstract

This chapter investigates the relationship between tax evasion and the diffusion of self-employment in the Italian provinces (NUTS-3 level). Using a dataset that combines information coming from the Italian Revenue Agency and the Italian Labour Force Survey for the period 2014-2015, we test, in particular, whether: 1) the share of self-employment in the regional labour markets is correlated with tax evasion; 2) the sectoral structure of self-employment is correlated with tax evasion; 3) occupational profiles based on skills and task families are correlated with tax evasion. A two-stage cluster analysis on the variables correlated to tax evasion is also conducted to identify homogeneous groups of provinces. The results of this study allow to detect specific sectors and occupations to which the policy maker should pay particular attention in its local tax control activities.

1. Introduction[1]

Tax evasion is a common practice in many countries, particularly in Italy, where the latest estimates report an amount of approximately € 27 billion of evaded personal income taxes in 2022 (Ministero dell'Economia e delle Finanze, 2022)

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1   The Authors are indebted with Bruno Chiarini for having provided useful information about tax evasion in Italy.

very heterogeneously distributed across the country (Argentiero *et al.*, 2020; 2021). Two major driving factors of such heterogeneity are represented by the sectoral and occupational structure. In particular, it is commonly acknowledged that most of the lost fiscal revenues come from the tertiary industry (Artavanis *et al.*, 2016) and from self-employed workers who are not subject to withholding taxes, both in Italy (Carfora *et al.*, 2018) and worldwide (e.g., Engström, Holmlund, 2009). Less is known, however, about the relationship between the occupational profiles (and their underlying tasks and skills) and tax evasion at local level. In fact, tax compliance could vary according to sectors and occupational groups (e.g. Artavanis *et al.*, 2016), while a relationship between regional socio-economic structure and tax evasion has also been found in the literature (e.g. Argentiero *et al.*, 2020).

This chapter aims at studying the relevance, at NUTS-3 level, of a statistical correlation between self-employment and tax evasion, as well as between tax evasion, industrial structure and occupational composition. Evidence grounds on a unique dataset that merges data on tax evasion in Italian Province released by the Italian Revenue Agency with the Italian Labour Force Survey, named "Rilevazione Continua delle Forze di Lavoro" (RCFL), that provides detailed information about workers´ characteristics and job positions, including educational attainments, occupations, and industry of the employing firm. We used the quarterly waves of the surveys that have been carried out in 2014 and 2015, for which the workers' distribution by Province is made available in the public microdata. After having showed the spatial distribution of the main variables of interest, we correlate the share of self-employment workers, as well as the sectoral and occupational structure, with the propensity to evade taxes. In particular, as far as occupations are concerned, we look at the skills and tasks that are more intensively used in the workplace to identify the occupational families that are more vulnerable to tax evasion, given the characteristics of the local context. Finally, we perform a cluster analysis to identify homogeneous groups of provinces in terms of tax evasion, occupational and sectoral structure, institutional quality, and GDP per capita.

The chapter is structured as follows. Section 2 briefly reviews the literature. Section 3 describes the dataset and the variables. Section 4 discusses the geographical distribution of the main variables. Section 5 conducts a correlation analysis. Section 6 discusses the results of the cluster analysis. Section 7 concludes.

2. Tax Evasion Across Sectors and Occupations: A Snapshot of the Literature

The propensity to avoid taxes is highly heterogenous across places, sectors, and occupations. Literature has highlighted that industrial composition, occupational conditions, tax compliance, and attitude to evasion are correlated and

mutually reinforcing (Artavanis *et al.*, 2016; Hashimzade *et al.*, 2014). It has been shown in particular that certain industries are more prone to income tax evasion than others (e.g. Kesselman, 1989; Artavanis *et al.*, 2016), and that tax evasion is deemed to be higher among young and self-employed workers (e.g. Hashimzade *et al.*, 2014; Alm *et al.*, 2016).

As far as industries are concerned, tertiary services, such as professional services, media, hotels, restaurants, and retail, are characterized by the highest incidence of tax evasion (Artavanis *et al.*, 2016). Such sectors, in fact, are usually characterized by a higher diffusion of cash payments (Morse *et al.* 2009) and a lower probability for the tax payer to be discovered (Kleven *et al.* 2011; Pomeranz, 2015). Tax evasion is also widespread in those sectors that favour "moonlighting" practices, i.e. working simultaneously in the formal and informal economy (Slemrod, 2019). This phenomenon typically occurs among self-employed workers and in small firms where employers and employees can easily collude with respect to the amount of income reported to tax authorities (Kleven *et al.*, 2016).

Moving to occupations, existing analyses refer to the generic category of self-employees or entrepreneurs who usually enjoy a higher level of discretion over reporting their income to tax authorities, showing that these workers declares income that are far lower their actual one (Slemrod, 2007). Existing empirical studies, conducted in different countries, found a substantial tax gap among self-employed workers, the hidden income ranging between 20 and 50% of the total income (Johansson, 2005; Engström, Holmlund, 2009; Kim *et al.*, 2017; Kukk, Staehr, 2014; Martinez-Lopez, 2013; Kukk *et al.*, 2020; Engström *et al.*, 2023), with a peak of 55% in Greece (Artavanis *et al.*, 2016). Within this group of workers, the share of hidden income is not even constant across income levels because it tends to be relatively constant in nominal terms and thus less than proportional to earnings, (Engström *et al.*, 2023). The diffusion of tax evasion within self-employed is also stronger in specific sectors, with a consequent cumulativeness of the occupational- and industrial-driven propensity to evade (Artavanis *et al.*, 2016).

This literature, however, does not disentangle between different occupational groups (typically identified by ISCO codes), a part from a rough distinction between blue collars and white collars (Lyssiotou *et al.*, 2004), despite tax payers could be heterogenous with regard to the occupational group to which its job belongs to. When taken separately, in fact, each occupational group could be associated with an increase (or decrease) in the propensity to evade taxation, either for subjective or objective reasons. On the objective side, different occupations (for instance a taxi-driver, an house painter or a lawyer) may entail different probabilities to be audited and getting caught (Slemrod, 2019), which, in turn, are expected

to increase/decrease individual tax compliance, like for different sectors (Alm, 2019). Moreover, some occupations typically require hard work in terms of time and effort, which in turn may influence the individual attitude to tax compliance (Buhren, Kundt, 2014; Grundmann, Lambsdorff, 2017). On the subjective side, individuals' risk-aversion, intrinsic motivation, and inclination for honesty, which are usually related to the propensity to evade taxes, may not only influence the decision of being an employee, a self-employee or an entrepreneur (Pickhardt, Prinz, 2014), but they may also affect a wider set of individuals' professional choices (e.g. being a journalist or a consultant) as different occupations underlie heterogeneous risks in terms of variance of income over time (Artavanis *et al.*, 2016). Overall, therefore it is reasonable to hypothesize that tax payers behave differently according to the occupational group to which their job belongs to.

3. Data and Variables

The descriptive analysis is based on three data sources and refers to 103 Italian provinces (out of 110) observed in 2014 and 2015. This restriction was necessary due to the unavailability of the entire set of variables of interest in other periods and in the remaining provinces. The first data source comes from the Italian Revenue Agency and is referred to the yearly estimation of tax evasion implemented by the Agency. From this dataset, we draw the propensity to evade taxes for each Italian province, measured through two different ratios. The former measures this propensity as the ratio the effective tax revenues voluntarily declared by taxpayers and the potential collection of taxes, according to National Accounts data. The latter is the ratio between tax gap and the value added. The aforementioned indicators provide different but complementary pieces of information. The first propensity, i.e. the one in terms of tax compliance, highlights the attitude of taxpayers to escape their tax obligations and is the most suitable measure for analyzing whether and to what extent the recovery of tax evasion is due to an improvement in tax payer behavior. The second propensity, i.e. the one in terms of value added, is more concerned on the evolution of tax evasion, once sterilized from the effects of the business cycle.

The second data source is the Survey on Italian Professions (SIP) performed by the National Institute of Analysis of Public Policies (INAPP) to identify the constituent tasks and skills of each of the 800 job titles included in the Italian occupational classification. The last wave of SIP was held in 2013 by interviewing more than 16,000 workers who were asked to self-assess their degree of utilization (in terms of complexity) of knowledge, skills and the constituent tasks to be performed on their respective job posts with 255 variables organized on a 1-100 point scale score. These variables were then organized across 7 clusters:

Knowledge (33 questions), Skills (35 questions), Attitudes (52 questions), Values (21 questions), Working styles (16 questions), Tasks (41 questions) and Working conditions (57 questions), but we only consider Skills and Tasks for their tighter connection with the occupational profile. To detect task families we run a Principal Component Analysis, henceforth PCA, to extract latent components that explain most of the variation among the single tasks. The selected components have then been coded with the same families proposed by Autor *et al.* (2003): analytical tasks; manual tasks; interactive tasks; routine tasks; other cognitive tasks. To identify the skill families, we applied the same procedure to the skill items, and then labeled the selected components in accordance to the skill categories put in place by Gregory *et al.* (2019), Fleisher and Tsacoumis (2012), OECD (2016), and CEDEFOP (2013): cognitive skills, technical skills, horizontal skills, soft skills.

The third data source is given by the Italian Labour Force Survey, named "Rilevazione Continua delle Forze di Lavoro" (RCFL), that provides detailed information about workers´ characteristics and job positions, including educational attainments, occupations, and industry of the employing firm. We used the quarterly waves of the surveys that have been carried out in 2014 and 2015 involving more than 100,000 workers per wave. By linking each occupation (3-digit ISCO codes) to the importance of task and skill families, as previously defined, we also derived groups of occupations that require an intensive use (i.e. above the median) of different skills and tasks. After having grouped each variable by Province and computed a yearly average of their values, we calculated the share of workers by type of employment, sectors, type of occupation, i.e. associated with an intense use of the main categories of skills and tasks, for each spatial unit.

Other publicly available information included in our dataset concern the per-capita income, as made available by the National Institute of Statistics (ISTAT), and the Institutional Quality Index (IQI), specifically, developed by Nifo and Vecchione (2014). The inclusion of institutional variables in our analysis fits with another stream of literature that showed the importance of the institutional setting in driving individuals' and firms' compliance behaviour (Cummings *et al.*, 2009; Andrighetto *et al.*, 2016; Zhang *et al.*, 2016).

Table 1 displays the descriptive statistics of the main variables of interest at Provincial level in 2014 and 2015. The average tax gap, with respect to declared taxes, amounts to approximately 43 per cent, while it accounts for 6.5 per cent with respect to the value added. The degree of dispersion is substantial for both the indicators as the coefficient of variation of these variables ranges between 27% and 41%. Moving to the occupational structure, we observe that 24 per cent of the workers are self-employed. As far as industries are concerned, the majority of the workers are employed in the service industry (53%), while manufacturing and retail account for

Table 1 – Descriptive Statistics of the Main Variables (2014-2015)

Variable (% of employed workers)	Year	Obs.	Mean	Std. dev.	Min.	Max.
Self-employed	2014	110	0.243	0.042	0.163	0.374
	2015	110	0.244	0.043	0.161	0.359
Males	2014	110	0.591	0.040	0.519	0.727
	2015	110	0.590	0.040	0.524	0.719
Professionals	2014	110	0.053	0.014	0.025	0.102
	2015	110	0.055	0.016	0.025	0.112
Entrepreneurs	2014	110	0.009	0.007	0.000	0.036
	2015	110	0.009	0.008	0.000	0.040
Cognitive skills	2014	110	0.437	0.049	0.297	0.551
	2015	110	0.438	0.049	0.307	0.562
Horizontal skills	2014	110	0.429	0.040	0.310	0.534
	2015	110	0.433	0.045	0.320	0.554
Soft skills	2014	110	0.430	0.055	0.273	0.555
	2015	110	0.431	0.052	0.318	0.557
Analytical tasks	2014	110	0.481	0.047	0.366	0.613
	2015	110	0.485	0.050	0.341	0.621
Routine tasks	2014	110	0.551	0.049	0.449	0.669
	2015	110	0.553	0.049	0.456	0.711
Interactive tasks	2014	110	0.482	0.045	0.373	0.591
	2015	110	0.477	0.044	0.345	0.582
Manufacturing	2014	110	0.198	0.089	0.063	0.448
	2015	110	0.198	0.090	0.062	0.483
Retail	2014	110	0.149	0.023	0.106	0.222
	2015	110	0.147	0.025	0.071	0.207
Construction	2014	110	0.073	0.024	0.036	0.193
	2015	110	0.070	0.019	0.032	0.150
Tertiary services	2014	110	0.528	0.079	0.361	0.745
	2015	110	0.531	0.078	0.315	0.751
GDP per capita	2014	103	24664	6701	14400	50300
	2015	103	25092	6796	14600	51300
Tax gap	2014	103	0.433	0.116	0.107	0.702
(tax evasion/tax declared)	2015	103	0.428	0.114	0.104	0.724
Tax gap	2014	103	0.066	0.027	0.029	0.262
(tax evasion/value added)	2015	103	0.062	0.019	0.026	0.145

Source: Authors' elaborations

20% and 14% of the workforce, respectively. Looking at the occupations, one can observe most of them require an intensive use of routine tasks, but also that interactive and analytical tasks are needed by 48% of these workers. Among the skills families, they report very similar shares of intensive use in the occupations of interest. Indeed, horizontal skills, soft skills and cognitive skills are intensively used by 43% of the workers. These figures do not report substantial changes between 2014 and 2015, a part from the tax gap, which shows a significant decrease in 2015, when tax evasion is divided by both declared taxes and value added.

4. Geographical Distribution of Tax Evasion and Self-employment

In the Italian provinces, the ratio of tax evasion to tax compliance ranges between a minimum of approximately 10 per cent and a maximum of more than 72 per cent and shows a substantial variability (Argentiero *et al.*, 2021). This stylized fact indicates that the structural features of regional economies can play a substantial role in driving the propensity to evade taxes of firms and individuals. When referring tax evasion to taxes declared (Table 2, second row), the highest percentage of tax evasion (56.5%) is reached in Lazio, with other 5 regions, all located in southern Italy, exceeding the 50 per cent threshold: Campania, Molise, Basilicata Calabria, Sicilia. In northern Italy, on the contrary, the tax gap is always lower than 40% except for Liguria (44.1%). In central Italy, a part from Lazio, the other regions are quite similar, reporting shares that range around 40 per cent. In terms of value added (Table 2, third row), tax gap is always below 10%, with the highest figures reported by Molise, Calabria and Campania. The distribution of this measure mainly overlaps with the one based on tax declared, except for Lazio, whose tax gap is now lower than the one of most southern regions. In the North, the ranking of the provinces is similar too, but the variability of this measure of tax gap is much lower than before.

When looking at the distribution of self-employed across the country, it is also highly heterogeneous, with peripheral and southern provinces reporting the highest share of self-employment (Figure 1). In particular, three areas with a noteworthy density of self-employees emerge: northern Puglia, Calabria, and western Sicily. In the rest of Italy, the diffusion of self-employment is lower, a part from some spots in the western boundaries of Piedmont and Liguria, and in the southern part of Tuscany, Umbria and Marche. Concerning the industrial structure, its geographical distribution displays a concentration of the manufacturing activities in Northern provinces (Figure A.1), especially in the North-East. Construction activities, on the contrary, are more evenly distributed across the country (Figure A.2). As expected, the distribution of the highest quintiles of the retail sector (Figure A.3) overlaps quite well with the distribution of self-employment, especially in southern Italy.

*Table 2 – Tax Evasion Across Italian Regions (2015)*

Region	Tax Gap (On Tax Declared)	Tax Gap (On Value Added)
Piedmont	0.396	0.062
Aosta Valley	0.281	0.044
Lombardy	0.341	0.045
Trentino South Tyrol	0.262	0.045
Veneto	0.321	0.047
Friuli Venezia Giulia	0.344	0.050
Liguria	0.441	0.063
Emilia-Romagna	0.364	0.057
Tuscany	0.403	0.057
Umbria	0.384	0.061
Marche	0.422	0.067
Lazio	0.565	0.074
Abruzzo	0.419	0.058
Molise	0.536	0.094
Campania	0.549	0.082
Apulia	0.490	0.073
Basilicata	0.518	0.078
Calabria	0.545	0.087
Sicily	0.552	0.081
Sardinia	0.482	0.083

Source: Authors' elaborations

Other tertiary services show instead a higher concentration in the western provinces of the Centre (Figure A.4), especially in Lazio, in the northern part of Sicily, in Sardinia, and in Trentino-South Tyrol. In this sector, all the main metropolitan areas fall in the first quintile of the distribution. This is not surprising since most business services and professionals are usually located in larger cities.

Regarding occupations, the most interesting geographical distributions are those of cognitive and horizontal skills (Figures A.5 and A.6). About the former, one can observe that they are more concentrated in the Northern provinces, in the coastal provinces of the Centre, and in the peripheral areas of the South. For what concerns horizontal skills, they are more intensively used by people working in the northern and central provinces, as well as in the main metropolitan areas. As far as tasks are concerned (Figures A.7, A.8 and A.9), a more

Figure 1 – Share of Self-employed Workers by Province (2015)
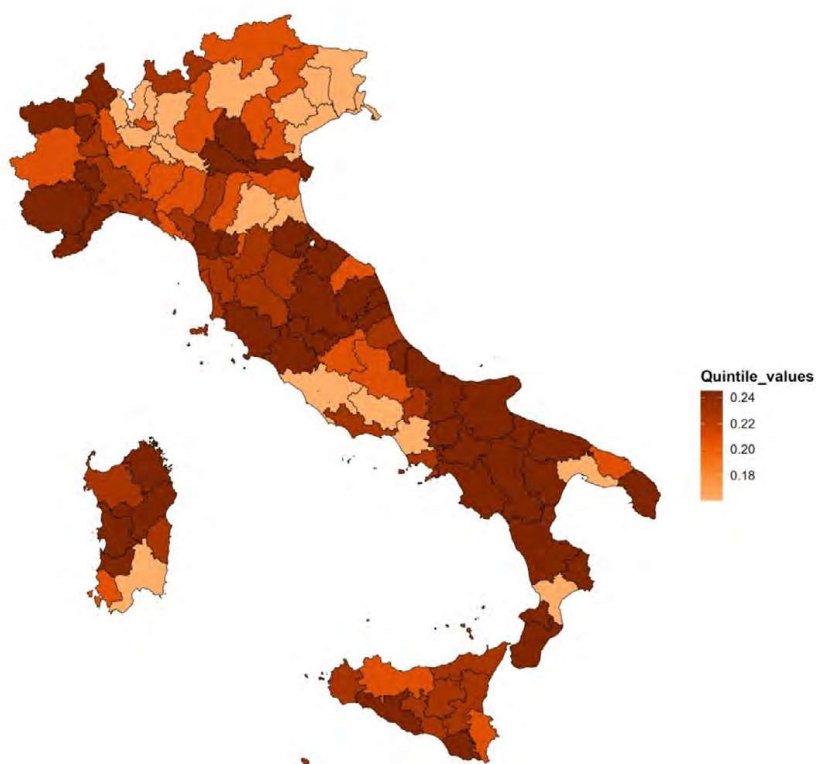
Source: Authors' elaborations

clear-cut division between the three macro-regions. Analytical tasks are more intensively used in the Northern provinces, routine tasks in the central provinces, and interactive tasks in the southern provinces. Moreover, it is worthwhile noticing that routine tasks are relatively concentrated in the two main islands: Sicily and Sardinia. Relative concentrations of analytical tasks can be also found in some provinces of Tuscany, Umbria and Marche, whereas interactive tasks are also highly required in all the provinces of Liguria.

5. Correlation Analysis

Table 3 reports the matrix showing the pairwise correlation coefficients between tax evasion, self-employment, sectors, and occupations, as previously defined. For sake of simplicity, only the variables significantly correlated with tax evasion are reported. The main evidence deals with the positive correlation between self-employment and tax evasion (Figure 2), which holds for both

Table 3 – Correlation Matrix of the Variables Significantly Correlated to Tax Evasion (2015)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Self_empl	1.000												
(2) Tax gap (on declared taxes)	0.436* (0.034)	1.000											
(3) Tax gap (on value added)	0.386* (0.206)	0.655* (0.445)	1.000										
(4) GDP per capita	-0.369* (0.000)	-0.834* (0.000)	-0.599* (0.000)	1.000									
(5) IQI	-0.325* (0.017)	-0.767* (0.031)	-0.595* (0.066)	0.818* (1654)	1.000								
(6) Constructions	0.310* (0.211)	0.175 (0.589)	0.043 (0.107)	-0.171 (35503)	-0.108 (1.202)	1.000							
(7) Retail	0.374* (0.157)	0.353* (0.451)	0.273* (0.078)	-0.400* (26551)	-0.465* (0.848)	0.120 (0.072)	1.000						
(8) Manufacturing	-0.271* (0.044)	-0.435* (0.116)	-0.449* (0.020)	0.516* (6633)	0.635* (0.194)	-0.118 (0.012)	-0.303* -(0.025)	1.000					
(9) Interactive tasks	0.311* (0.088)	0.546* (0.223)	0.407* (0.041)	-0.640* (12238)	-0.692* (0.369)	0.064 (0.040)	0.441* (0.048)	-0.662* (0.146)	1.000				
(10) Routine tasks	0.592* (0.068)	0.474* (0.206)	0.341* (0.037)	-0.398* (12861)	-0.410* (0.429)	0.233* (0.035)	0.422* (0.043)	-0.465 (0.155)	0.416* (0.079)	1.000			
(11) Analytical tasks	-0.186 (0.082)	-0.390* (0.222)	-0.151 (0.040)	0.324* (13367)	0.154 (0.467)	-0.168 (0.356)	-0.111 (0.047)	-0.095 (0.174)	-0.109 (0.086)	-0.338* (0.090)	1.000		
(12) Horizontal skills	0.205* (0.091)	-0.029 (0.272)	0.007 (0.045)	0.066 (16127)	0.000 (0.529)	0.032 (0.401)	0.159 (0.052)	-0.010 (0.194)	0.167 (0.095)	0.120 (0.106)	0.399* (0.098)	1.000	
(13) Cognitive skills	-0.180 (0.083)	-0.369* (0.222)	-0.316* (0.038)	0.407* (12997)	0.365* (0.436)	-0.240* (0.352)	-0.194* (0.047)	0.433* (0.158)	-0.244* (0.083)	-0.314* (0.091)	0.455* (0.086)	0.568* (0.071)	1.000
(14) Professionals	0.225* (0.250)	-0.004 (0.004)	0.078 (0.118)	-0.012 (41288)	-0.111 (1.396)	-0.062 (0.111)	0.032 (0.146)	-0.166 (0.530)	0.102 (0.263)	-0.040 (0.295)	0.450* (0.264)	0.351* (0.249)	0.335* (0.277)

Note: * shows significance at p<.05. Standard error of the corresponding linear regression in parentheses.
Source: Authors' elaborations

Figure 2 – Correlation Between Tax Evasion and Self-employment Share (2015)
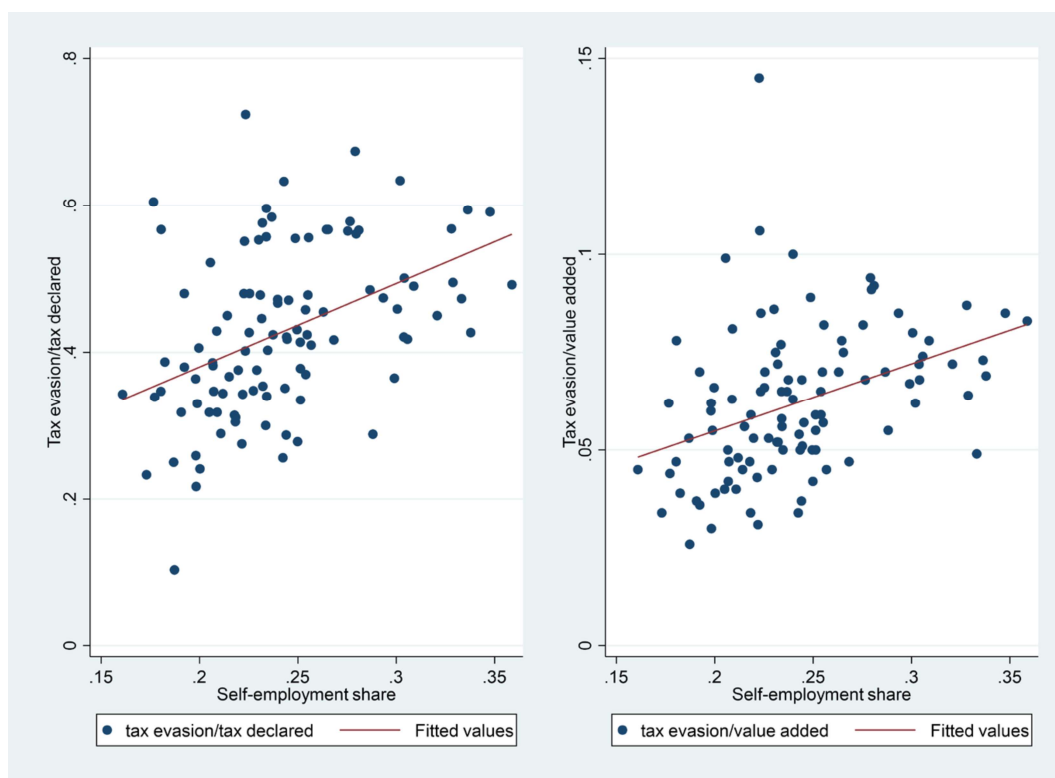
Source: Authors' elaborations

measures of tax evasion. This result is in line with the evidence found by the reviewed literature that addressed this topic.

Looking at the sectoral structure, the highest significant and positive coefficient is the one attached to the weight of the retail sector. The construction sector is also positively correlated with tax evasion but to a smaller extent. A potential reason for the higher coefficient attached to retail is that transactions in this sector are often made in cash, making difficult for tax audits to discover the hidden income. For the construction sector, the positive correlation with tax evasion could be instead caused by the higher diffusion of moonlighting in this industry, with the consequence that it is more probable that employees are more often paid in "envelope wages" (Putnins, Sauka, 2015). On the contrary, the correlation is negative for manufacturing and non-significant for the other tertiary sectors (i.e. excluding retail). This latter result, however, could be misleading due to the absence of a more fine-grained disaggregation in the dataset, which does not autonomously consider specific industries that are more likely to be associated with tax evasion, such as hotel and restaurants. Interestingly, the share of professionals is only positively

correlated with one measure of tax evasion (tax evasion/tax declared), and with a lower intensity than the retail and the constructions sectors. This suggests that the role of professionals in explaining the heterogeneity of tax evasion across local systems may be less important than in other countries, such as Greece.

As far as tasks are concerned, two task families are positively correlated with tax evasion: routine and interactive tasks. Routine tasks are easily replicable by applying standardized rules, and they are usually intended to encompass those situations requiring setting of limits, tolerances or standards, i.e. routine cognitive tasks, or moving fingers and manipulating small objects, i.e. routine manual tasks (Autor *et al.*, 2003). Following our analysis of the task items, the occupations that mostly demand these types of tasks are typically low-skilled and include, for instance, the following job titles: "riggers and cable splicers", "power-production plants, boilers, incinerators, water-treatment and related plants operators", and "machinery mechanics and repairers". Interactive tasks, conversely, are typically activities that "create and provide value through complex interpersonal communication such as negotiation, management, and consulting" (Ikenaga, Kambayashi, 2016). According to our proxies, three illustrative occupations with an intensive use of such tasks are: "artisans of textile, wood, leather and hide products, engravers, papier-mâché makers", "painters and sculptors, designers, restorers of cultural heritage, actors, artists, acrobats", and "hairstylists, beauticians, make-up artists, masseurs".

Looking at the skill families, horizontal skills are positively related to tax evasion when the latter is divided by the amount of declared taxes. These skills basically include those competences that are sophisticated relational and socio-emotional (OECD, 2018; Iversen, Soskice, 2019), and are not tied with specific fields of study. They mainly include those organizational abilities that allow the individual to correctly assess and develop information. According to our classification, three exemplary jobs reporting an intensive use of such skills are "small entrepreneurs", "retailers", and "hotel keepers".

6. Cluster Analysis

To classify Italian provinces according to a set of variables that include both tax evasion and the territorial features identified through the correlation analysis, we use a two-step cluster analysis. In the first step, we run a PCA on all these variables. Then, we select those components having an eigenvalue higher than one and explaining at least 75% of the variance. Following this criterion, we kept the first five components, as their cumulative explained variance is approximately 76%[2]. The vectors associated with each selected component are thus used

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2.   Results of the PCA are available upon request.

as variables of a non-hierarchical cluster analysis (Ward's method) in which the number of clusters is determined through a stopping rule based on pseudo-T-squared values (Duda *et al.*, 2000). Such analysis leads to the identification of six groups of provinces, whose geographical distribution is represented in Figure 3 (and reported in Table A.1), and whose main features are displayed in Table 4.

Looking at the first two clusters (Clusters 1 and 2), one can primarily notice that they both report lower shares of both tax gap and self-employees than the national average. The main difference between them is that the first one includes the largest urban areas of the North and the Centre, where the share of tertiary activities is relatively large (58.2%), whereas the second one gathers smaller cities located in the northern part of the country and characterized by a vigorous manufacturing specialization. The last two clusters (Clusters 5 and 6), on the contrary, are both characterized by large tax gaps and self-employment shares, their main difference

Figure 3 – Geographical Distribution of the Six Clusters
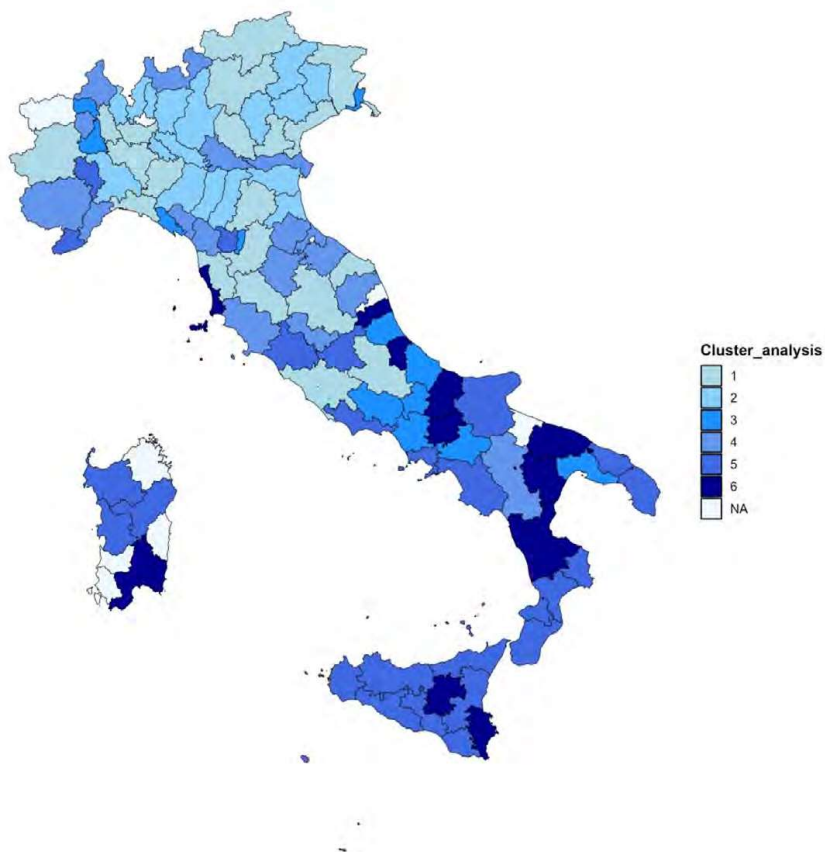
Source: Authors' elaborations

Table 4 – Clusters' Main Features

	Cluster 1 Mean	Cluster 2 Mean	Cluster 3 Mean	Cluster 4 Mean	Cluster 5 Mean	Cluster 6 Mean
Self-employment	0.219	0.205	0.214	0.274	0.266	0.267
Tax gap (on declared taxes)	0.307	0.354	0.478	0.428	0.541	0.480
Tax gap (on value added)	0.047	0.048	0.066	0.060	0.076	0.082
GDP per capita	32,286	30,047	22,600	2,6035	18,188	20,064
IQI	0.797	0.801	0.557	0.703	0.337	0.455
Tertiary services	0.582	0.448	0.516	0.502	0.555	0.580
Constructions	0.061	0.066	0.070	0.083	0.073	0.062
Retail	0.132	0.135	0.141	0.146	0.171	0.147
Manufacturing	0.194	0.319	0.231	0.225	0.110	0.139
Interactive tasks	0.454	0.444	0.461	0.459	0.522	0.513
Routine tasks	0.532	0.511	0.518	0.555	0.604	0.543
Analytical tasks	0.524	0.494	0.438	0.482	0.461	0.524
Horizontal skills	0.431	0.463	0.370	0.438	0.437	0.463
Cognitive skills	0.457	0.487	0.395	0.436	0.405	0.460
Professionals	0.061	0.048	0.041	0.055	0.052	0.077

Source: Authors' elaborations

lying on the stronger presence of the retail sector of the fifth cluster, along with a lower diffusion of analytical tasks and cognitive skills, as well as a poorer level of institutional quality. These clusters include all the southern provinces, except for Avellino, Caserta and Taranto, and Potenza, with the adding of some provinces of the North and the Centre, namely Livorno, Pescara, Ascoli Piceno, Rieti, Pistoia, Latina, Imperia, Viterbo, and Asti. Interestingly, Clusters 3 and 4 identify those small provinces characterized by a lower correlation between self-employment and tax evasion. Cluster 3 includes 11 provinces heterogeneously distributed across the country that report a relatively high share of tax evasion, despite the relatively low share of self-employed workers. The level of tax evasion in these provinces, therefore, seems to be unreasonably high compared to the rest of the country. Cluster 4 includes 17 provinces and combines, instead, a noticeable share of self-employed worker and a substantial weight of the retail industry with a level of tax evasion (and GDP) that does not exceed the national average. This indicates that in this cluster the level of tax evasion is lower than the one envisaged by its occupational and sectoral structure. Most of these virtuous provinces are small-sized and located in the North and in the Centre, except for Potenza. It is also worth noticing that their institutional quality is remarkably high, being just slightly lower than in the first two clusters.

7. Conclusive Remarks

This chapter identifies those sectors and occupational groups correlated with a higher probability of evading taxes in different local contexts. Once established that the diffusion of self-employment is positively correlated with tax evasion in the Italian provinces, as suggested by the literature, the correlation analysis provides a twofold result. First, it highlights the potential role of the retail industry, and to a lower extent of the construction industry, in nurturing tax evasion. Second, it shows that those provinces characterized by an intensive use of horizontal skills, routine tasks, and interactive tasks are associated with higher levels of tax evasion.

When delving into these tasks and skills, it is possible to link them to the occupational-related objective and subjective reasons of tax evasion suggested by the reviewed literature. In the case of horizontal skills, the higher propensity to evade may arise from both subjective and objective reasons. Indeed, workers in the corresponding occupations are typically small entrepreneurs, theoretically conceivable as risk-neutrals or risk-lovers, who need to assess the costs and revenue of their activities on a daily basis, and therefore could be more capable to compare tax evasion and tax compliance in terms of expected utility. Routine-intensive occupations could be associated with conditions of hard work in terms of time and effort, which in turn may curb the worker's willingness to be tax compliant. Highly interactive occupations, are characterized by idiosyncratic relations between the self-employed worker and her customers, which limits the capabilities of an external agent (such as the Internal Revenue Agency) to identify tax avoiders through reliable predictions. In particular, it could be difficult for the tax auditors to distinguish those workers that hide part of their income through presumed income initiatives. These insights represent our main contribution to the literature. Previous research, indeed, only analysed the relationship between self-employment and tax evasion without digging into specific occupational groups. By looking at different occupations and isolating the underlying skills and tasks, our paper offers original insights into self-employees attitudes towards tax evasion relying on the assumption that such attitude could change according to the type of tasks and skills mostly used in the job post.

Our correlation analysis, obviously, does not allow us to interpret this relationship as causal. It does not take into account any potential confounding factor either observable or unobservable. Moreover, at NUTS-3 level, i.e. our unit of observation, the share of self-employees can be influenced by sources of spatial heterogeneity that can also explain the individual attitudes towards taxation. This limitation couples with the short time span of the analysis, which is caused by the unavailability of the information about the working province for more than two years of

observations (2014 and 2015). Future research could therefore access dataset that include such observation for a longer period and try to get a causal interpretation of the results through appropriate econometric techniques. Finally, our analysis cannot be repeated at worker level to provide a more robust empirical microfoundation of the results. Such limitation stems from the impossibility for the Italian Revenue Agency to release individual data on tax evasion for privacy protection.

The cluster analysis then offers some useful insight to identify a set of local features that could be viewed as drivers of tax evasion or tax compliance, and thus that should be taken into account in the design of place-based tax policies and audits. First of all, it identifies two groups of provinces reliant on self-employment and on sectors and occupations that are more vulnerable to tax evasion, such as retail and constructions, on the one hand, and interactive and routine occupations, on the other hand. These provinces are mainly situated in southern Italy, but they also include a bundle of small provinces located in north-western and central Italy, in particular in Lazio. In these areas, the enhancement of institutional quality, along with the implementation of educational and training program aimed at developing cognitive skills, could be viewed as initiatives potentially capable to reduce tax evasion tendencies at local level.

Finally, the results of the cluster analysis allow us to isolate a group of small provinces, mainly located in the Centre (excluding Lazio) with relatively low tax evasion rates, despite their occupational and sectoral structure would suggest the opposite. A thorough examination of the geographical, demographic and socio-economic characteristics of these clusters could be a preliminary valuable step to create an environment conducive to compliance in the other provinces and to help to reduce the overall tax evasion at country level. On the contrary, the other two "virtuous" clusters, mainly constituted by large urban areas of northern and central Italy and manufacturing specialized provinces of the North-East, do not seem to represent a useful benchmark for the rest of the country, despite their low levels of tax evasion, due to their very dissimilar industrial and occupational structure from the rest of the country.

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Sommario

Lavoro autonomo ed evasione fiscale: un'analisi descrittiva delle province italiane

Questo capitolo analizza la relazione tra evasione fiscale e la quota di lavoro autonomo nelle province italiane (NUTS-3). Utilizzando dati provenienti dall'Agenzia delle Entrate e dall'Indagine sulle Forze di Lavoro italiane per il periodo 2014-2015, l'analisi empirica riguarda in particolare: 1) la correlazione tra quota di lavoro autonomo nei mercati del lavoro regionali ed evasione fiscale; 2) la correlazione tra struttura settoriale del lavoro autonomo ed evasione fiscale; 3) la correlazione tra i profili occupazionali, basati sulle competenze e sulle famiglie di mansioni, e l'evasione fiscale. Un'analisi cluster a due stadi individua inoltre sei gruppi di sistemi locali tra loro omogenei rispetto alle variabili correlate al tasso di evasione. I risultati dello studio consentono di determinare specifici settori e occupazioni cui i policy maker dovrebbero prestare particolare attenzione nelle loro attività di controllo tributario a livello locale.
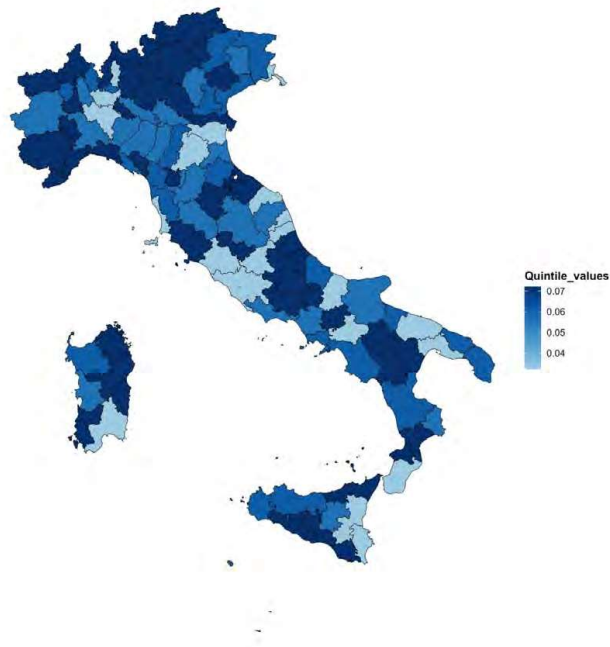
Appendix

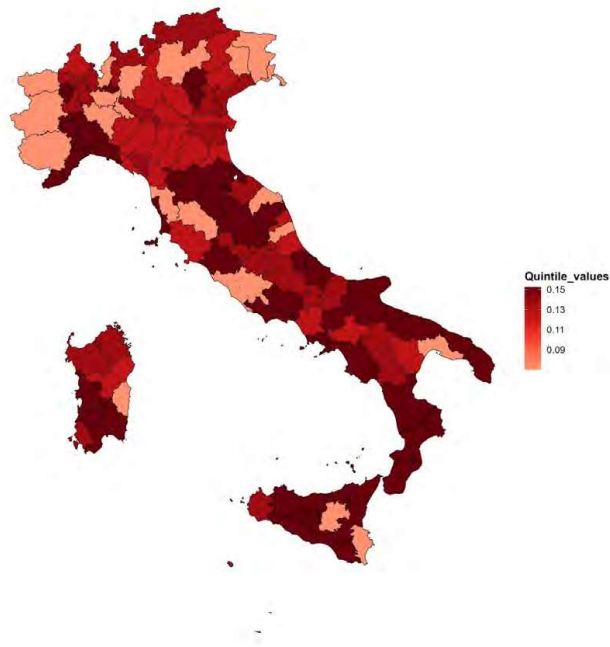*Figure A.1 – Share of Workers in the Manufacturing Sector by Province (2015)*
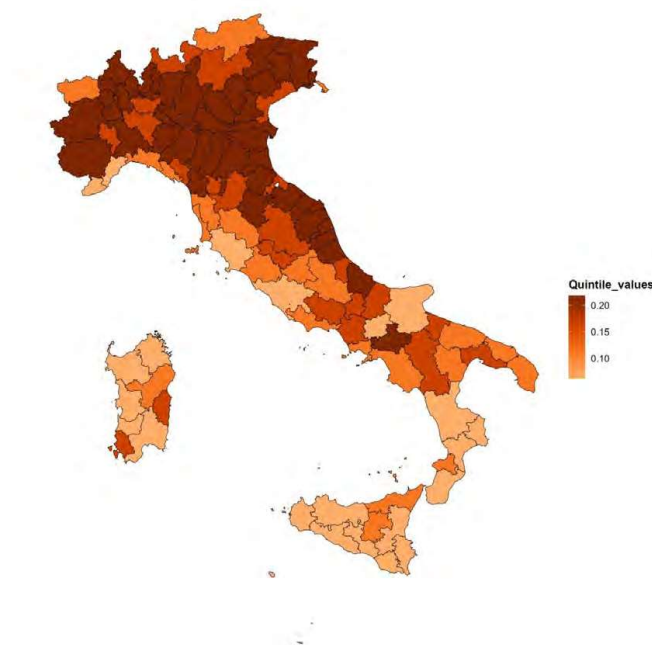
Source: Authors' elaborations :

Figure A.2 – Share of Workers in the Construction Sector by Province (2015)
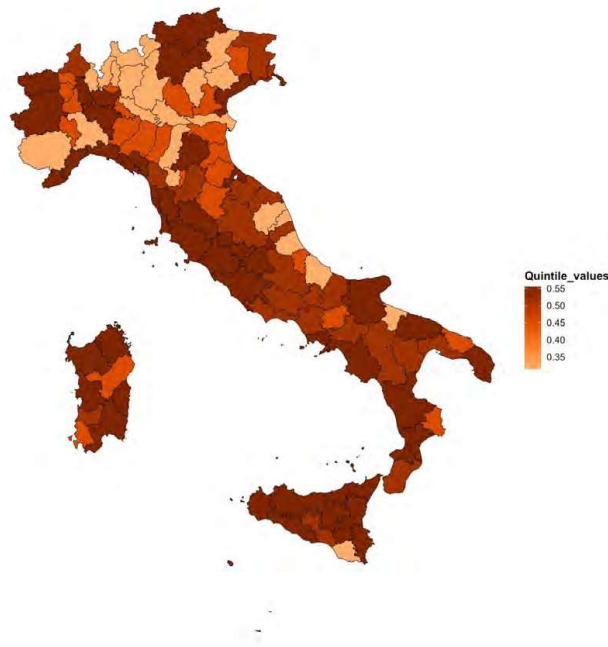

Source: Authors' elaborations

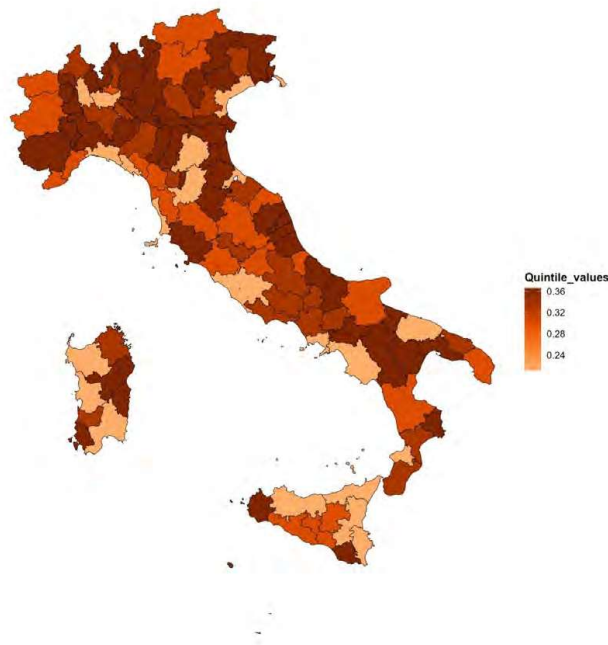*Figure A.3– Share of workers in the retail sector by Province (2015)*

Source: Authors' elaborations

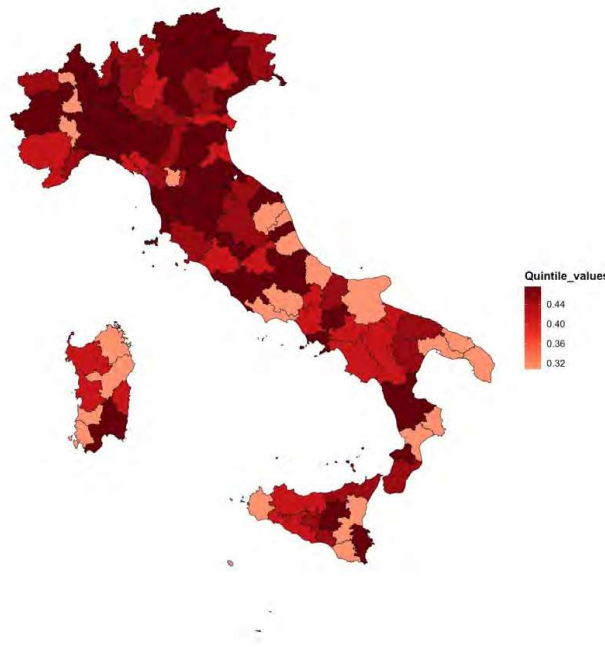*Figure A.4 – Share of Workers in the Tertiary Sector (Excluding Retail) by Province (2015)*

Figure A.5 – Share of Workers in Occupations Characterized by an Intensive Use of Cognitive Skills by Province (2015)

Figure A.6 – Share of Workers in Occupations Characterized by an Intensive Use of Horizontal Skills by Province (2015)

 Source: Authors' elaborations

Figure A.7 – Share of Workers in Occupations Characterized by an Intensive Use of Analytical Tasks by Province (2015)
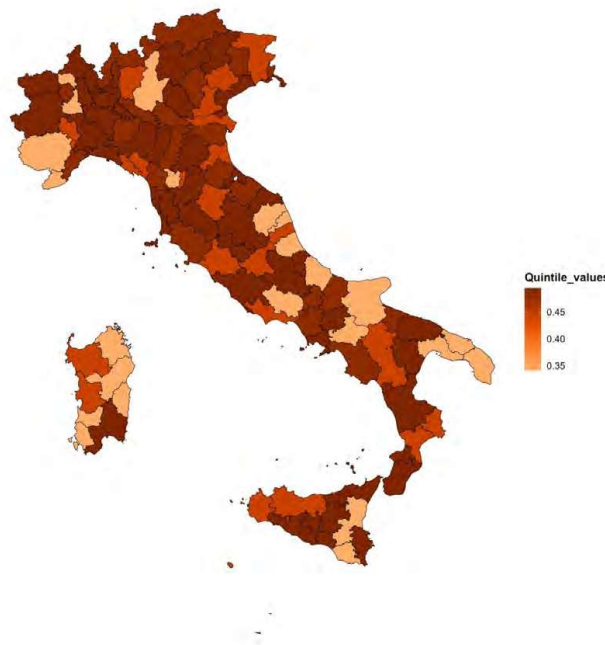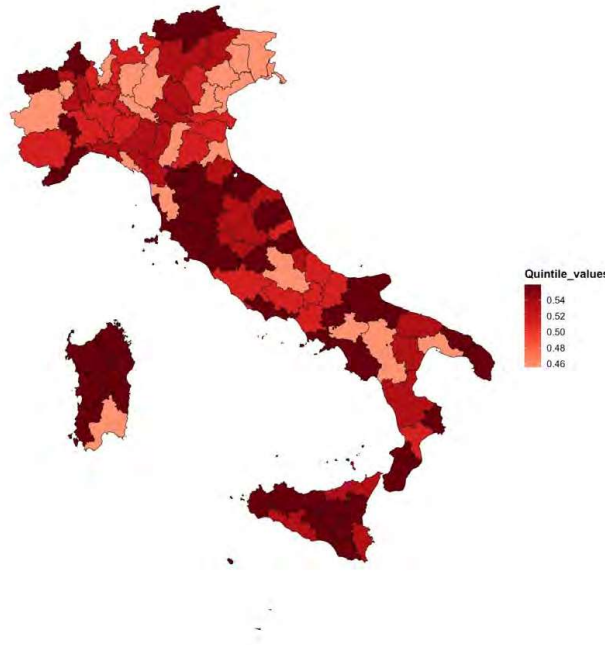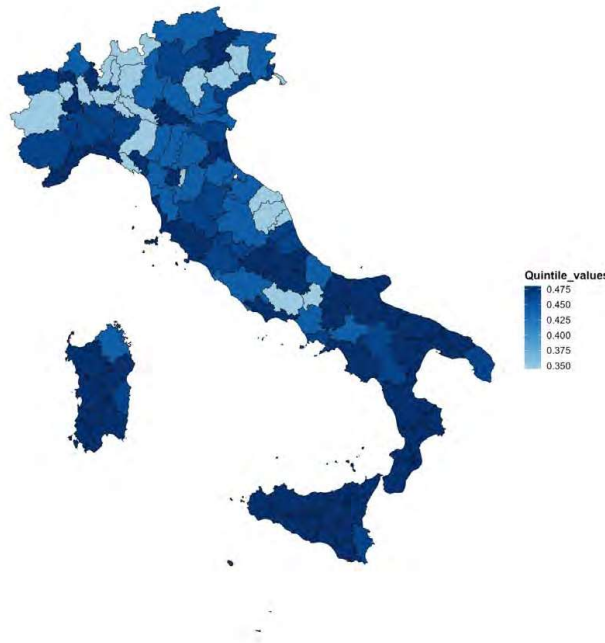

 Source: Authors' elaborations

Figure A.8 – Share of Workers in Occupations Characterized by an Intensive Use of Routine Tasks by Province (2015)

Source: Authors' elaborations

Figure A.9 – Share of Workers in Occupations Characterized by an Intensive Use of Interactive Tasks by Province (2015)

Source: Authors' elaborations

Table A.1 – Clusters Composition

Cluster1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Ancona	Alessandria	Avellino	Arezzo	Agrigento	Ascoli Piceno
Bologna	Belluno	Caserta	Biella	Asti	Bari
Bolzano	Bergamo	Chieti	Cuneo	Brindisi	Benevento
Firenze	Brescia	Frosinone	Forlì-Cesena	Catania	Cagliari
Genova	Como	Gorizia	Grosseto	Catanzaro	Caltanissetta
L'Aquila	Cremona	Isernia	Lucca	Crotone	Campobasso
Milano	Ferrara	La Spezia	Macerata	Foggia	Cosenza
Novara	Lecco	Prato	Mantova	Imperia	Enna
Padova	Lodi	Taranto	Massa-Carrara	Latina	Livorno
Pavia	Modena	Teramo	Pesaro e Urbi-	Lecce	Pescara
Perugia	Parma	Vercelli	no Potenza	Matera	Siracusa
Piacenza	Pordenone		Rimini	Messina	
Pisa	Ravenna		Rovigo	Napoli	
Roma	Reggio Emilia		Savona	Nuoro	
Siena	Treviso		Sondrio	Oristano	
Trento	Varese		Terni	Palermo	
Trieste	Vicenza		Verbanio-Cu-	Pistoia	
Udine			sio-Ossola	Ragusa	
Venezia				Reggio	
Verona				Calabria	
				Rieti	
				Salerno	
				Sassari	
				Trapani	
				Vibo Valentia	
				Viterbo	
20	17	11	17	25	11

Source: Authors' elaborations