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REGULATED OCCUPATIONS IN ITALY: EXTENT AND LABOR MARKET EFFECTS

by Sauro Mocetti*, Lucia Rizzica* and Giacomo Roma*

Abstract

This work provides a descriptive assessment of regulated occupations in Italy and examines the impact of regulation on the labor market. First, we construct, on the basis of law provisions, a set of novel indicators measuring both the extensive and the intensive margin of regulation. We then show that regulated occupations represent a significant and increasing fraction of total employment (24%), their incidence being significantly larger among workers with a college degree (52%). Moreover, these occupations are characterized by lower mobility and entry rates and by a wage premium of about 9%, which raises to 18% for the *professioni ordinistiche*. Finally, we provide causal evidence that the reduction of entry requirements and the repeal of tariff restrictions lead to an increase in entry into regulated occupations and to a reduction of the wages of the incumbents.

JEL Classification: J44, K20.

Keywords: regulation, occupation mobility, entry rate, wages.

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1 Introduction*

The study of the regulation of occupations has a long and distinguished tradition in economics, dating back to the days of Adam Smith.² Originally motivated by concerns over public health and safety, the extent of regulation has significantly increased over time. The still scant evidence suggests that as of today about 29% of US workers and 22% of EU ones are employed in regulated occupations (Kleiner and Krueger, 2013; Koumenta and Pagliero, 2019).

The extent and quality of regulation may produce large effects in the economy under several dimensions. First, by restricting the supply of labor, it may drive up the wages and the prices of the services provided. Second, because it effectively hinders competition, it likely creates a competitive advantage for incumbents, hampering the possibility of efficient firms to grow, and inefficient ones to exit; from a labor market perspective, this reduced mobility may not only entail an inefficient matching between workers and jobs, but also, in a dynamic framework, reduce the resilience of the economy by slowing down the reallocation of workers to jobs after a negative economic shock. On the other hand, the provision of entry requirements and conduct standards into several occupations likely ensures a higher quality of the services provided and thus enhances consumers' welfare.³

Despite the magnitude of the phenomenon and its large potential impact, the extent and effects of occupational regulation are still under investigated in the economics literature (Kleiner, 2000; 2017; Gittleman et al., 2018). The present paper aims to contribute to the understanding of the phenomenon with a threefold objective. First, we build a set of novel indicators that measure, for each occupation, whether it is regulated or not (i.e., extensive margin), the year from which it has been regulated and the type and extent of regulation (i.e., intensive margin). Specifically, we quantify the education and training requirements, the existence of an entry exam and of restrictions on market conduct. Second, we provide a long-run descriptive assessment of the extent of regulated occupations in Italy and of the characteristics of the workers involved. Third, we examine the impact of regulation on the labor market analyzing, in particular, the effects on occupational mobility and on wages. Finally, we provide causal estimates of the impact of a reform that modified the extent of regulation in some occupations.

According to our indicators, in Italy there are nearly 150 regulated occupations, as defined on the basis of the ISCO international classification of occupations. About 50%

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²The institute of regulating occupations finds its historical roots in the medieval guilds. Adam Smith, in the *Wealth of Nations*, argues that these institutions were not necessarily associated with increases in the quality of the output, rather they served as a restrictive mechanism. In particular, he discusses the ability of the crafts to lengthen apprenticeship programs and limit the number of apprentices per master, thus ensuring higher earnings for persons in these occupations.

³See Section 2 for a review of the literature on the effects of regulation.

of these occupations have been regulated before 1950 and the remaining ones in the second half of the 20th century (while only few of these have been regulated after 2000). In terms of employment, about 5.4 million Italians are estimated to work in regulated occupations, corresponding to 24% of overall employment (52% among those with a college degree). The corresponding figures for the *professioni ordinistiche*, a subset of regulated occupations that are subject to stricter entry requirements and restrictions on market conduct, are, respectively, 10% and 31%. Moreover, we find that employment in regulated occupations has increased steadily over time, raising by over 30% from the first half of the 1990s.

We further show that occupational mobility is considerably lower in regulated relative to non-regulated occupations both in terms of job-to-job mobility and of non-employment-to-job mobility. Our estimates suggest that over half of the raw gap in mobility is due to regulation while the rest is explained by compositional differences. Regulation mostly affects job-to-job mobility and, to a lesser extent, entry from (exit to) a status of non-employment. As far as the different dimensions of regulation are concerned, entry in regulated occupations is mostly restrained by the length of education and training requirements. We also find a large wage premium for incumbents in regulated occupations that amounts to about 9% (nearly 18% in *professioni ordinistiche*). Interestingly, the wage premium is larger for the lower quantiles of the individual wage distribution. Moreover, it is significantly larger for women and lower for younger workers who face more difficulties in challenging the advantage of more established incumbents. The wage premium is mostly driven by the length of education and training requirements and by restrictions on market conduct. Finally, we provide causal evidence that the softening of entry requirements and the repeal of tariffs regulation increase entry into regulated occupations and lower the wage premium of the incumbents.

The remainder of the paper is structured as follows: in section 2 we provide an overview of the existing literature on regulated occupations; in section 3 we describe the Italian institutional setting and its policy evolution; in section 4 we introduce the data and the variables used; in section 5 we provide some descriptive statistics of the phenomenon; in section 6 we study the impact of regulation on job mobility and wages; in section 7 we draw some concluding remarks.

2 Related literature

Occupational regulation includes requirements to enter the profession and, in some cases, also conduct rules for incumbents. The former is also usually labeled as licensing and consists of the set of legal requirements that are necessary to be formally authorized to

offer a specific good or service to consumers.⁴

The economic rationale for regulation lies in reducing problems of asymmetric information. Due to lack of expert knowledge and to the intangible nature of services, consumers generally cannot assess the quality of the product or service they receive. Licensing provides these guarantees by setting minimum skills standards for entry into occupations (i.e., a better selection of practitioners) and conduct requirements. As a result consumers are likely to receive a more homogeneous and high quality product and, therefore, obtain welfare gains (Akerlof, 1970; Leland, 1979; Law and Kim, 2005). Moreover, it is argued that occupational licensing creates a greater incentive for individuals to invest in more occupation-specific human capital because they will be more able to recoup the full returns to their investment if they don't have to face low-quality substitutes for their services (Akerlof, 1970; Shapiro, 1986). As a side effect, the existence of licenses may increase the overall demand for a given service because of the minimization of consumer uncertainty over the quality of the licensed service (Arrow, 1971). Finally, it is argued that in some cases, the provision of a poor quality service may generate negative externalities on the society as a whole. For example, a doctor who makes a wrong diagnosis may cause the spread of an epidemic disease, a boilermaker who installs a furnace incorrectly may cause a building to catch fire, injuring or killing many people. Therefore, requiring a practitioner to be trained at a minimum level may produce positive social payoffs.

However, regulation might also generate undesirable outcomes. First, it might limit competition by impeding free entry in the market and reduce the consumer welfare by inducing higher prices and lower supply than in a perfectly competitive equilibrium (Kleiner, 2000; Kleiner and Krueger, 2013). This is even more true in the case in which the regulation is written by the professional body itself, with the primary goal of maximizing its own surplus (Stigler, 1971; Pagliero, 2011).⁵ Indeed, the more demanding the entry criteria, the higher the rents to be captured by practitioners. Second, delayed entry in the occupation might have a negative selection effect on potential applicants, as time can be seen as a fixed cost of entry that increases with an agent's ability to generate income, i.e., the opportunity cost of devoting time to enter the occupation (Gonzalez-Torres, 2016). This may lead to an inefficient allocation of economic resources if time and money used to acquire the required credentials could have been better invested elsewhere. Third, nepotism, corporative practices and economic rents induced by anti-competitive

⁴Other forms of regulation are also possible. For example, certification identifies qualified professionals as those who have passed a specific test or exam, but does not forbid the offering of the same goods or services by non-certified operators.

⁵According to the rent-seeking hypothesis, suppliers of goods and services are generally more influential from a political perspective than consumers. This is essentially related to the fact that licensing is a policy with concentrated benefits (for the licensed practitioners) and diffuse costs (for consumers and would-be practitioners). Therefore, practitioners have a greater interest in licensing and will exert more effort to influence the policy maker.

regulation might bias the selection of practitioners favoring those with a family member in the same profession instead of individual merit (Mocetti, 2016; Mocetti et al., 2018). Fourth, adjustments to structural changes in the economy are hampered and slackened in more regulated labor markets, as individuals will not be readily willing to shift from one occupation to the other (Davis and Haltiwanger, 1992; Mortensen and Pissarides, 1994). Another dimension of mobility is geographical, to the extent that labor moves across geographical areas can be hampered by the absence of harmonized entry requirements (Johnson and Kleiner, 2017).

On these grounds, it becomes impossible from a theoretical point of view to determine whether a more stringent regulation will increase or decrease the social welfare. So far, the empirical evidence has shown that regulation has significant effects on the labor market outcomes of the affected professionals. Kleiner and Krueger (2013) and Gittleman et al. (2018) find that licensing in the U.S. is associated to a significant wage premium (while the effect of governmental certification is much smaller).⁶ Similar evidence has been found by Koumenta and Pagliero (2019) in European countries. Genakos et al. (2018) examine the impact of regulation on wholesale and retail prices; they find that abolishing maximum markup regulation led to a significant decrease in prices and they argue that markup ceilings provided a focal point for collusion among wholesalers.

Reliable evidence on the impact of regulation on measures of practitioner (and service) quality is scant, partly because of identification issues and of the difficulty to find accurate measures of quality. Case studies examined so far do not find that regulation increases the quality of services. Kleiner and Kudrle (2000) exploit cross-sectional variation in licensing stringency for dentists in the U.S. and find that tougher licensing does not improve dental health (but it raises the earnings of practitioners). Kugler and Sauer (2005), using data on physicians in Israel and exploiting variation induced by a policy rule, find that stricter licensing requirements lead to higher practitioner rents but also to lower quality of services. Angrist and Guryan (2008) find that state mandated teacher testing is associated with increases in teacher wages without a corresponding increase in their quality (as measured by their education background). Larsen (2015) examines the distributional effects and finds that stricter teacher licensing requirements might drive away from teaching good candidates.

3 Occupational licensing in Italy

Regulation of professional services in Italy is widespread and has been rooted in the legal system since its foundations. The Italian laws regarding professional bodies of lawyers and notaries, inspired by the medieval guilds, date back to the end of the XIX

⁶Unlike unionization, where lower wage employees appear to gain, licensing effects appear to be larger for higher wage workers (Kleiner, 2000).

century and for doctors, architects and engineers to the beginning of the XX century. The increased specialization and the emergence of new demand for services has led to the expansion of the number of occupations subject to regulation, especially in regard to entry requirements.

Laws and regulations generally describe the activity of the professionals (and notably specify whether they are entrusted with exclusive rights and to which extent), set the entry requirements in terms of education and training, state whether it is compulsory to pass a professional examination and how it is organized, fix some conduct rules, such as restrictions on advertising or price-fixing. Some professions are or were subject to numerical limits. Depending on the strictness of the relevant legislation, regulated occupations may be split in two groups: on the one hand, those occupations that are subject to a stricter regulation, both in terms of entry requirements and of conduct rules, and that impose the enrollment to a professional body (the “*professioni ordinistiche*”); on the other hand, all the other regulated occupations that are generally subject to milder requirements.

In 2007 the Italian government implemented the Directive 2005/36/EC with the aim of identifying all occupations that are subject to regulation, assessing whether such regulation is necessary and proportionate, and finally allowing the mutual recognition of qualifications in the European Union. The resulting list of occupations was included in a census provided by the European Commission (EC) that contains records for all the Member States.

In the last decade, moreover, several measures of liberalization have been introduced. These affected the different categories of occupations to varying extents. As far as the *professioni ordinistiche* are concerned, the actions taken mainly dealt with the conduct of practitioners. The first liberalization, adopted in 2006 (the ‘Bersani’ decree), abolished minimum prices and reduced restrictions to advertising and to inter-professional cooperation. In 2011-2012, then, the ‘Monti’ reform completely eliminated regulated tariffs and modified other conduct obligations; it also fixed a cap to the duration of the preparatory training. The loosening of these restrictions is reflected in the OECD indicator of regulation in the professional services: Italy, which in 1998 had the second most restrictive regulation of professions, in 2013 was in line with the average of OECD countries. Specific actions were also taken regarding the entry requirements of other occupations by, for example, shortening the education and training periods required.

4 Data and variables

The empirical evidence provided in this paper is based on the combination of two datasets. On the one hand, information on workers is taken from the Italian Labor Force Survey, on the other hand, a new dataset that we constructed drawing from legal sources, contains

information on the regulation criteria regarding each occupation in each year over the past two decades. The two datasets are described below.

4.1 The Labor Force Survey

The Italian Labor Force Survey (LFS) assigns an occupational code, at 4-digit level (ISCO, International Standard Classification of Occupations), to each worker in the sample. Occupational codes describe occupations at a fairly detailed level. There are over 500 occupational codes and they identify very specific jobs (for example, a shopkeeper would have a different code from a street food salesperson).

In order to identify regulated occupations we proceed as follows. First, we go through the list of regulated occupations in the EC database and assign the appropriate ISCO occupational code to each occupation. Second, we classify each occupation of the LFS database as regulated if the corresponding occupational code is included in the EC database.⁷

The matching between the ISCO codes and the regulation indicator is not always perfect. Some occupational codes only include jobs that are subject to licensing. In these cases, we assume all surveyed workers assigned to such codes work within regulated occupations. For example, occupational code 2523 refers to notaries only. For other occupations, instead, we might mis-classify workers. Indeed, some codes turn out to include different types of jobs that might be subject to different regulatory requirements (or not be regulated at all). For example, code 3312 includes accounting associate professionals but also apartment block administrator and bookkeepers, only the first being a regulated occupation. Therefore only a (unknown) fraction of workers in this ISCO class is effectively licensed. As a consequence, our figures might overestimate the number of regulated occupations in the economy. To minimize the risk of misclassification we revise the classification using the following two strategies. First, for a sample of years we also observe occupations at a finer level, i.e., at the 5-digit level; this increases the number of distinct occupations to about 800. Relying on the 5-digit level we are able to better identify some occupations. For example, at the 5-digit level we are able to distinguish between apartment block administrators (code 33123) and accounting associate professionals (code 33121), though the latter still includes bookkeepers employed in private firms and who are not licensed occupation. Operationally, therefore, we estimate the fraction of each occupation at 4-digit level that is regulated using the 5-digit occupational classification, when available, and we use this information to better define the set of regulated occupations in the entire temporal window. Second, for a subset of jobs, we consider only self-employed thus minimizing the risk of erroneously including

⁷We further include five more occupational codes corresponding to regulated occupations in Italy (e.g. notaries and taxi drivers) but that are not mentioned in the EC database, because mutual recognition of qualifications provided for by Directive 2005/36/EC does not apply in their respect.

among licensed workers individuals who are not employed in a regulated occupation (e.g., bookkeepers employed in private firms).⁸ It is also worth noting that a subset of minor professions (e.g., mountain guides) are also excluded because they are not identifiable even with the 5-digit level specification.⁹ According to our estimates, using the 4-digit instead of the 5-digit occupational leads to an overestimation of about 150,000 licensed workers, corresponding to around 0.6 percentage points increase in the proportion over total employment.

In the descriptive analysis (Section 5) we use the 4-digit level classification with the correction derived from the 5-digit level information as we are mainly interested in providing aggregate figures. The regression analysis (Section 6) use the 4-digit level classification to have a homogeneous measure at the individual level over the entire temporal window.

To validate our measures we compare our estimates with those available from other sources. First, we compare our figures with the one reported by [Koumenta and Pagliero \(2019\)](#). Their evidence is based on the EU Survey of Regulated Occupations carried out in 2015. The sample is based on 26,640 individuals across 28 member states (i.e., on average 940 individuals per country). According to this survey, the proportion of licensed individuals in Italy amounts to 19% while our estimates for the same year are slightly larger (23%). One important advantage of the EU survey is that it collects information on licensing at the individual level and, therefore, it is not inferred from the occupational classification. Specifically, they consider a worker as licensed if the individual has a professional certification, a license or had to take an exam which is compulsory to practice the profession. However, two drawbacks of the same survey are the limited sample size and the cross-sectional dimension that do not make it possible to explore individual (and cross-occupation) heterogeneity and the longitudinal (i.e., individual occupation trajectories) dimension.

Second, we compare our figures with those derived from the LFS data using a variable available for the years 2004-2009. For this period, the LFS includes a question asking the worker whether she is member of a professional association and/or recorded in a professional register, conditional on being a liberal professional. According to this variable there were about 890,000 licensed liberal professionals, exactly the same figure that we obtain for liberal professionals employed in regulated occupations according to our indicator. Moreover, the two variables overlap at the individual level in about 85% of the cases, with the remaining share equally divided between false positives and false negatives. Overall these findings are reassuring in that, at the aggregate level, our figures

⁸Namely, we restrict the sample of regulated occupations to self-employed in the case of statisticians (i.e., actuaries), accounting associate professionals (i.e., labor consultants, fiscal experts, etc.), firms' legal experts (i.e., consultants in patent rights) and owners of food activities.

⁹Note also, that we might also have licensed workers employed in occupations that are not regulated. For example, code 2513 includes specialists in human resources, i.e., those devoted to personnel recruitment and careers, an occupation that is not regulated but in which typically professionals, in this case psychologists, are employed.

closely mirror those available from other sources. Therefore, we are confident that our measure is able to capture an accurate picture of the phenomenon.

4.2 Regulation indicators

The extensive margin of regulation, i.e., whether an occupation is subject to licensing or not, has been built (as described above) matching to each occupation listed in the EC database the corresponding ISCO occupational code. For each of these occupations we also consider the year from which they have been regulated; for this purpose, we have identified, through the study of the Italian legislation, the law that introduced the relevant regulation and the year when it was actually implemented.

Moreover, for the most representative occupations in terms of employment, we also construct a set of indicators of the intensity of regulation.¹⁰ First, we consider the individual requirements in terms of education and training. More precisely, we identify in laws and regulations regarding single occupations which education or training degree enables an individual to practice a profession (high school diploma, university degree, training course, professional experience or vocational training) and what is its length. If more than a single degree is necessary (e.g. high school diploma and training course), we consider the length of the whole period. Second, for each occupation we also record whether passing an entry (state) exam is needed to access and practice the profession. Third, we build an OECD-style index (Koske et al., 2015) to quantify the strictness of conduct regulation. The index has values on a 0-6 scale (with 0 being lack of any kind of conduct regulation and 6 being the most stringent type of regulation) and it is based on five different domains of conduct regulation: regulation of price, advertising, legal form of business, inter-professional cooperation and disciplinary power.¹¹

Table 1 provides main descriptive statistics concerning the indicators of regulation. Among regulated occupations, 75% are characterized by a compulsory examination as entry requirement. The minimum years of training (either education or professional training) is on average equal to 6.5 years. Finally, the stringency of regulation on market conduct is equal to 1.9 (on a 0-6 scale). These figures are significantly higher among *professioni ordinistiche* (the corresponding figures are 90%, 9.4 years and 3.3, respectively).

[Table 1]

¹⁰Specifically, we rank the occupational ISCO codes that we classified as regulated in the Labor Force Survey from the most to the least relevant in terms of employment. We then consider the first 45 occupational codes in this ranking, which account for more than 90 percent of workers in regulated occupations.

¹¹See Appendix Table A.1 and Mocetti et al. (2018) for more details on the construction of the index of conduct regulation.

5 Descriptive evidence

In this section we describe the main stylized facts about the extent and patterns of regulated occupations. We start with a very long-run perspective on the extent of licensing. In Figure 1 (left panel) we plot the number of regulated occupations over time, from the second half of the 19th century - while the right panel plots the share of the same occupations over total employment using current shares of each occupation. These figures have been obtained using the first year from which a certain occupation has been regulated on. The graphs certify the steady increase of regulation both in terms of number of occupations and of workers involved. In particular, in the post-unification period only for few professions (lawyers, notaries, doctors) a professional body was in place. The most significant increase in the regulated occupations occurred during the fascist period and it concerned, in particular, technical professions such as engineers, architects, accountants and health professions. After World War II, new regulated occupations emerged in relation to some sectoral reforms, for example in the fields of health care and sports. Changes in the university legislation also resulted in the establishment of new degrees and new corresponding occupations.

[Figure 1]

As of today, regulated occupations represent a significant fraction of total employment especially among the highly educated. Using the 5-digit occupational classification, we identified 146 distinct regulated occupations, about one fifth of all occupations. The number of workers in regulated occupations amounts to about 5.4 million, 24% of total employment; the subset of occupations that require enrollment in a professional association (the *professioni ordinistiche*) employs 2.3 million workers, 10% of total employment. The corresponding figures with respect to the population of workers with a college degree are much higher (52% and 31%, respectively).

Employment in regulated occupations increased significantly over the past 20 years: the number of workers in regulated occupations increased from 4.0 to 5.4 million in the 15 years preceding the Great Recession; in the last decade, instead, the number of licensed workers has remained fairly stable, i.e., it decreased during the recession and slowly returned to grow in the most recent years. Relative to total employment, the share of regulated occupations increased from 20% to 24% over the entire temporal window considered (Figure 2).

[Figure 2]

There are two potential channels explaining the increase in regulated occupations. First, this might reflect changes in the demand for professional services and in the composition of the workforce; for example, certain heavily-licensed professions in fields such

as health care have experienced substantial employment gains over the past few decades (see more on this below). Second, this might reflect the increase of regulated occupations over time (e.g. health-care operators in 2001, laundries in 2006, etc.). Simple algebra shows that more than 90% of the increase over the period is due to the first channel. Therefore from now on we consider the regulatory environment as constant (i.e., regulated occupations are considered so for the entire period, independently from when they were regulated).

The increase of employment in regulated occupations is mostly driven by the *professioni ordinistiche*, which, however, were characterized by a progressive decrease in the strictness of regulation over the last two decades. The share of *professioni ordinistiche* over total employment increased by more than 3 percentage points (from less than 7% to around 10%), while the increase in the proportion of other regulated occupations was less than 1 point (Figure 3, left panel). About 35% of workers in regulated occupations are self-employed (19% among other occupations). The increase of employment in regulated occupations was stronger among self-employed with respect to employees. Looking at the shares with respect to their reference population (to account for divergent economic patterns between self-employed and employees as a whole), there is a marked increase of the proportion of regulated occupations among self-employed (from 23% to 36%) while the share of licensed workers among employees remained fairly constant and below 20% (Figure 3, right panel).

[Figure 3]

Within regulated occupations the sectoral composition has changed significantly (Figure 4). More specifically, there has been an increase in the number of workers employed in health professions (e.g. doctors, paramedical technicians, nurses, etc.) and in more business-oriented activities (e.g. accountants, lawyers, business agents, etc.), while the share of those employed in the education sector (e.g. teachers, etc.) has decreased.

[Figure 4]

At the geographical level, regulated occupations represent a higher share over total employment in the Southern regions and in the metropolitan areas (Figure 5). This is consistent with the fact that these areas display a lower incidence of manufacture and a higher concentration of employment in services.

[Figure 5]

Finally, workers in regulated occupations are characterized by a higher share of females and are remarkably more educated (Figure 6): the fraction of workers with a university degree is 69% among *professioni ordinistiche*, 34% among other licensed occupations and

less than 14% among other employed individuals. Workers in regulated occupations are also characterized by a higher age at the time of entry into the labor market, likely due to educational and training requirements, and by a lower degree of occupational mobility: the fraction of workers whose current job is also their first job is 42% among *professioni ordinistiche*, 31% among other licensed occupations and 27% among other employed individuals.

[Figure 6]

6 The labor market impact of regulation

6.1 Occupational mobility

Regulation likely represents a friction in the labor market, thus posing an obstacle to the mobility of workers across jobs and locations. In this section we analyze the impact of regulation on the flows of workers in and out of jobs.

In the empirical analysis that follows we exploit the longitudinal dimension of the LFS data from 2004 on. To analyze job mobility, moreover, we restrict the LFS sample so as to keep only those individuals that are observed at least twice with a one year distance between the two observations. This restricts our sample by about 20%. In Table 2 we report descriptive statistics for the sample of individuals included in the regression analysis (restricted sample) and compare them to the full sample. The lack of significant differences along the main observable characteristics reassures us about possible sample selection concerns.

[Table 2]

We then define entry of an individual i into a given occupation p in year t depending on the status of the worker one year before, at $t - 1$.¹²

$$Entry_{ipt} = \mathbb{1}(P_{it} \neq P_{it-1}) \quad (1)$$

where P_{it} is the occupation held by individual i at time t . We thus consider that an individual changed occupation if she reports holding a different (4-digit) occupation between two subsequent years (or if she moved into or out of employment). Because the classification of occupations in the LFS changed in 2011, we will not be able to identify entries in 2011, for this reason the variable will be missing in the specified year.

¹²Symmetrically, we define Exit of an individual i from a given occupation p in year t depending on the status of the worker one year after, at $t + 1$. $Exit_{ipt} = \mathbb{1}(P_{it} \neq P_{it+1})$. All the results presented for Entry in this paper, were also estimated for Exit producing very similar results. These are available from the authors upon request.

In Figure 7, we show the trend in the entry rate for regulated and non regulated occupations. According to our definitions, on average about 17% of Italian workers change job every year. This rate is relatively high compared to the ones estimated in the literature (Bachmann et al., 2017), the difference being due to two main factors: first, that we consider both job-to-job movers and new entrants in the labor market; second, that we use a very detailed occupational classification, thus considering new entrants also those who move to very similar occupations.¹³ Two main stylized facts emerge from the figure: first, mobility is much higher in non-regulated occupations than in regulated ones; second, for all types of occupations, but most prominently for non-regulated ones, mobility significantly decreased during the recession period.

[Figure 7]

To dig further into the difference between mobility in regulated and non-regulated occupations, in Table 3, we compute a transition matrix for all individuals reporting a change in their occupational status between t and $t+1$ (i.e., one year later). The emerging patterns confirm that mobility from and into regulated occupations is significantly lower than for non regulated ones: only 13.5% of workers in regulated occupations and 9.5% of those in *professioni ordinistiche* change job, against 19.5% of those in non regulated occupations. Secondly, looking at the direction of mobility, we observe that workers of regulated occupations tend to move to non-regulated occupations (or non-employment) more than to other regulated occupations, this is particularly true for those in *professioni ordinistiche*. The small fraction of individuals that change within the *professioni ordinistiche* is mainly due to individuals moving to a very similar profession, typically within the same professional chamber (e.g., medical doctors getting a new specialization or engineers changing type of job).

[Table 3]

The patterns that emerged from the figures above likely reflect also compositional effects. For example, to the extent that regulated occupations are more likely to have a high-skill content they may be more sticky if individuals will change occupation less often so as not to waste the occupation-specific human capital, or more mobile if they have more and better employment opportunities than low-skill workers. To account for such differences, we thus employ a regression model that will include the most relevant individual characteristics as well as a wide battery of fixed effects to account for geographical divides or idiosyncratic macroeconomic shocks. Our baseline estimating equation will be the following:

$$Pr(Entry_{ipt} = 1) = \alpha + \beta Reg_{pt} + \gamma' X_{it} + \phi_t + \Phi + \epsilon_{ipt} \quad (2)$$

¹³Bachmann et al. (2017) use a 2-digit ISCO classification of occupations, while we use the 4-digit one.

where Reg_{pt} is an indicator for whether occupation p is regulated or not at time t ; X_{it} is a vector of individual characteristics including age, gender and educational attainment; ϕ_t are time fixed effects, specifically we will separately include quarter and year fixed effects to account for, respectively, possible seasonality effects and common shocks; Φ is a set of additional fixed effects, namely province fixed effects to account for geographical heterogeneity, sector fixed effects and, in our most restrictive specification, sector/year fixed effects to account for sector specific shocks. Equation (2) will be further estimated considering the specific types of regulation and distinguishing between mobility from or into non employment and mobility from or into another job.

Table 4 reports our baseline results. We find that regulation lowers the probability of entering a given occupation by about four percentage points. This is over half of the raw difference in entry rates between regulated and non regulated occupations. The estimated coefficient is very robust to the inclusion of different sets of fixed effects, being only marginally reduced by the inclusion of sector fixed effects because regulation is typically in place in structurally more sticky sectors. As far as the coefficients of the control variables are concerned, we observe that younger individuals and women are more mobile.¹⁴ Finally, those with a fixed-term contract are the most likely to exit from a job and the least likely to get a new job. In the last two columns we distinguish between job-to-job mobility and mobility between employment and non-employment. Interestingly, we find that regulation mostly hampers job-to-job mobility. This result might depend on the fact that regulation implies investments in occupation-specific skills that, in turn, are not easily transferable to other jobs.

[Table 4]

As described in section 4, the *professioni ordinistiche* are characterized by more stringent requirements in terms of entry and market conduct relative to other regulated occupations. In Table 5, we estimate the impact of regulation distinguishing between these two groups of regulated occupations. We find that, as expected, the *professioni ordinistiche* are characterized by lower entry rates.

[Table 5]

In Table 6 we examine the impact of intensity of regulation more directly, using three different dimensions of regulation. Namely we include in the regression the minimum length of education and/or training required to enter the occupation (measures as number of years), the existence of a compulsory examination and a measure of the stringency of conduct regulation. We find that one additional year of training reduces entry by 0.6 percentage points. The existence of a professional exam decreases the entry rate by

¹⁴This seems consistent with the fact that women's labor supply is more elastic than men's.

about 2 percentage points. Finally, each point of the conduct index determines a drop of almost two percentage points in the likelihood of entering an occupation. In column (4) we plug all the three variables in the same regression and we find that only the length of education and/or training maintains the significance, although this might be due to the fact that the three indicators are positively correlated to each other.

[Table 6]

6.2 Wages

As discussed in section 2, the existence of barriers to entry in a given occupation are likely to generate a surplus for the incumbent worker to the extent that the supply of workers is below the one demanded by the market. Moreover, the presence of conduct regulation that imposes minimum tariffs further increases the rents that can be extracted.

In this section, we thus estimate the monetary returns to regulation for incumbents. We rely on an empirical specification alike the one described above (Equation (2)) using a Mincerian version of it. We thus estimate:

$$\log(w_{ipt}) = \alpha + \beta Reg_{pt} + \gamma' X_{it} + \phi_t + \Phi + \epsilon_{ipt} \quad (3)$$

where $\log(w_{ipt})$ is the logarithm of the monthly net salary reported by workers. Unfortunately the LFS only reports data on wages for employees. This likely implies that, *ceteris paribus*, the wage premium (penalty) that we estimate will be a lower (upper) bound of the real one to the extent that self-employed professionals are generally subject to a stricter regulation. Moreover, the sample size is further reduced because information on wages has only been collected in the LFS since 2009.

Our estimates (Table 7) reveal the existence of a wage premium for employees in regulated occupations in the order of about 9%, in line with that estimated in other recent studies (Gittleman et al., 2018; Koumenta and Pagliero, 2019)). The sign and magnitude of the coefficients of the explanatory variables appear reasonable and consistent with the existing literature: women experience a wage gap in the order of 25%, earnings increase with age and education, the returns from attaining a tertiary education degree being about 36% relative to compulsory education only.

[Table 7]

The conditional mean represents a powerful, synthetic indicator of the extent of the wage premium; however, it provides a rather incomplete picture of the relationship between regulation and wages. A useful instrument for our purposes is the quantile regression as it enables us to quantify the effect of the explanatory variables across the

distribution of individual wages.¹⁵ In Figure 8 we show that the impact of regulation is larger for lower deciles of the wage distribution and decreases almost monotonically as quantiles increase; specifically, the coefficient moves from around 11% at the 1st decile to around 5% at the 9th decile. Therefore, the premium generated by regulation is particularly high for those at the bottom of the wage distribution.

[Figure 8]

In Tables 8 and 9 we explore heterogeneous effects depending on the type and extent of regulation. Specifically, we show that the wage premium is largely concentrated among the *professioni ordinistiche* (about 18%) while it is positive but not statistically significant for other regulated occupations. When we separately consider the different dimensions of regulation we find that the premium derives mostly from the training requirements and from the conduct restrictions.

[Table 8]

[Table 9]

Finally, in Table 10 we provide evidence on some heterogeneity in the regulation wage premium. Specifically we show that the premium is similar in the public and private sector but higher in the South. Looking at the individual characteristics, the premium is much higher for women, thus reducing the gender pay gap; it is lower for youths, consistently with the fact that regulated markets have been progressively liberalized so that the rents that can be extracted have become lower and that incumbents generally benefit from a competitive advantage over new entrants. On the other hand there appears to be no extra premium for tertiary educated workers, unlike in the findings of Kleiner and Krueger (2013).

[Table 10]

6.3 Policy evaluation

The evidence discussed so far allowed us to draw a broad picture of the mechanisms and dynamics involving regulated occupations accounting, as much as possible, for compositional differences and idiosyncratic shocks. Yet, some causal evidence can be produced exploiting the policy changes that took place over the years 2000s affecting different aspects of regulation and different occupations. As discussed in Section 3, the two main reforms that were passed were the so called Bersani reform, in 2006, and the Monti reform,

¹⁵In quantile regression, the minimization problem concerns absolute deviations and not the squares of deviations. The theoretical and empirical literature on quantile regression is extensive since Koenker and Bassett (1978).

in 2011.¹⁶ In Figure 9 we show how these two reforms affected the regulation indicators that we constructed: the first reform increased the entry requirements while lowering the strictness of the conduct rules; the second one, instead, lowered both. In terms of conduct rules, both reforms only affected the professional services of *professioni ordinistiche*, for which tariffs regulation were gradually abolished and limits on advertising loosened.

[Figure 9]

Because of data limitations, specifically the fact that we do not have information on wages until 2009, we will focus on the 2011 Monti reform and estimate its effects on entry rates and wages. It is crucial to consider both aspects when evaluating the impact of the reform in that there may be an effect on wages - and thus on the final price of services paid by consumers - that comes either directly from the abolishment of the minimum tariffs or indirectly from the increased competition that will likely be generated by the loosening of the limits to advertising and by the possible changes in the pool of incumbents. Hence, the need to first assess the impact of the reform on entry rates. From a theoretical point of view, entry into regulated occupations may increase, to the extent that the reform lowered the education and training requirements, or decrease because the softening of conduct rules that limit competition among incumbents may lower the expected gains from entering a regulated occupation.

Our estimation strategy is a Difference-in-differences with two treatment groups: the *professioni ordinistiche* and the other regulated occupations. We will trim our data in a time window of 3 years before and after the reform and, in a more restrictive specification, compare only the *professioni ordinistiche* to other high skilled professionals and technicians (i.e. ISCO groups 2 and 3). Results are reported in Table 11.

[Table 11]

In columns 1 to 4 we estimate the impact of the reform on entry rates. Our results show a positive and significant effect, i.e., more workers started a job in a regulated occupation, when we consider the full sample of workers. On the other hand, once we restrict the analysis to a subsample of high-skilled occupations only, we find neither any significant gap between regulated and non regulated occupations, nor any significant reduction of this gap due to the reform, i.e., we do not find any increase in entry rates. In columns 5 to 8, we carry out the same analysis on the earnings of the employees in the regulated and non-regulated occupations. Our results show that, when we compare the *professioni ordinistiche* to other high-skilled occupations, the large monetary gain from regulation is significantly reduced.

¹⁶Note that these two reforms can be regarded as a sudden and unexpected change in the Italian legislation. Indeed, they were approved by two different governments, shortly after they took office, via emergency decrees. The Monti reform was notably adopted as a response to the financial and sovereign debt crisis.

We resort again to a quantile regression to estimate non-linear effects of the reform across the wage distribution. Figure 10 shows that the drop in earnings was mainly driven by the lower tail of the earnings distribution, thus suggesting that these were the ones that were most “protected” by the existence of stricter conduct rules that limited competition.

[Figure 10]

These results only considers the impact on employees’ earnings and not on the self-employed. As already specified, the fact that we do not observe the earnings of the self-employed in the Labor Force Survey is a major limitation of our data. The effects estimated in Table 11 are thus to be considered a lower bound of the real effects on the prices charged by professionals and thus on their earnings to the extent that the latter will pass through to the wages paid to employees too.

In order to obtain an estimate of the effect of the reform on the earnings of the self-employed in regulated occupations, we resort to a supplementary data source, i.e., the data of the Ministry of Economics and Finance containing the (aggregate) earnings reported by the self-employed that are subject the National Tax Authority’s sectoral studies. In Table 12, we report the results of a Difference-in-differences analysis, where we compare the earnings patterns of the *professioni ordinistiche* with those of a control group before and after the 2011 reform. The control group occupations were chosen among those operating in the service sector, with a cognitive and non-routine content and with high wages (the same characteristics that distinguish the treated occupations).¹⁷ As in Table 11, we consider a symmetric interval of three years width around the policy change (columns 1 and 2) and then extend it to five years width (columns 3 and 4). Our results reveal that the reform generated a large and significant drop in the earnings of the affected professionals, the effect being considerably larger in magnitude relative to that on employees (Table 11).

[Table 12]

As a final piece of evidence, we consider directly the prices charged for professional services. The information on prices is collected by the National Institute of Statistics for the estimation of the inflation rate and thus refers to only some standard activities of lawyers and accountants.¹⁸ Therefore, these data may not capture the overall effect

¹⁷Specifically, we consider the following treated occupations: accountants and labor consultants, agronomists, architects, biologists, doctors and dentists, engineers, geologists, lawyers, notaries, pharmacists, psychologists and veterinarians. The control professions are instead: advertising workers, building managers, designers, financial advisors, IT consultants, translators, conference organizers, real estate agents, wholesalers of medicines and tobacconists, insurance intermediaries, paramedics, directors and actors, and pollsters.

¹⁸For example, the activities currently included in the computation of the inflation rate consist of legal assistance in case of separation or eviction and tax assistance for tax returns.

on the prices of professional services if the increased competition on prices induced by the reform mostly affected other tasks and activities of the professionals. The evidence reported in Figure 11 shows that prices for professional services increased more than the average (and more than the average of services) before 2006, they were in line with the overall trend between 2006 and 2011 and flattened after 2011. Over the observed time window, therefore, the price dynamic of professional services has progressively weakened, with two stark decelerations in the aftermath of the two reforms.

[Figure 11]

All in all, therefore, our policy evaluation analysis showed that the 2011 reform of the professional services, which reduced the education and training requirements and lowered the obstacles to competition among incumbents at the same time produced the effects of (i) increasing entry into regulated occupations and (ii) lowering the average earnings of the affected professionals.

7 Conclusions

In a world of growing complexity of tasks and, consequently, deeper information asymmetries between sellers and buyers of services, regulating occupations has become the most widespread tool to ensure minimum quality standards. In Italy, employment in regulated occupations represents 24% of the total and it has increased steadily over time. Similar patterns are observed in the U.S. and in other European countries.

These trends are likely to generate major effects on the economy: as entry in regulated occupations is subject to more stringent requirements, incumbent professionals will benefit from rents and competitive advantages that hamper competition. From a labor market perspective, moreover, such frictions are likely to hamper the process of workers' reallocation in case of an economic shock thus reducing the economy's resilience.

In this paper we provided a descriptive assessment of the regulated occupations in Italy and estimated the impact of regulation on occupational mobility and earnings. This analysis significantly contributes to the existing literature which has largely overlooked the potential impact of regulation on the economy. Indeed, especially for EU countries, the amount of available evidence is very scant.

Our findings revealed that the size of regulated employment in Italy is of primary importance: almost one worker out of four is employed in a regulated occupation. This share becomes much larger if one considers only highly educated workers: amongst those with a tertiary education degree, 52% is employed in a regulated profession.

Looking at the relation between regulation and labor market outcomes, then, we showed that higher regulation is associated with a significantly lower degree of occupational mobility. Over half of the raw gap in entry rates between regulated and non-

regulated occupations is due to the presence of entry requirements, whereas the rest is explained by compositional differences. As for wages, we estimated a large premium for regulated occupations, thus confirming that incumbents can extract a rent from their position. The estimated premium, moreover, is significantly smaller for younger workers and larger for women, thus reducing the gender pay gap.

Exploiting the policy changes that were ruled in 2011, we finally show that the liberalization of professions increased entry into these jobs and lowered the earnings of the incumbents.

In conclusion, our results indicate that regulation creates significant frictions in the labor market which generate inefficiencies in the allocation of workers and in the distribution of earnings. The final impact of regulation, though, should be evaluated comparing these costs to the benefits that regulation is supposed to produce in terms of quality of the services provided. The latter aspect, which is hard to investigate and measure, is beyond the scope of this paper and left to future research.

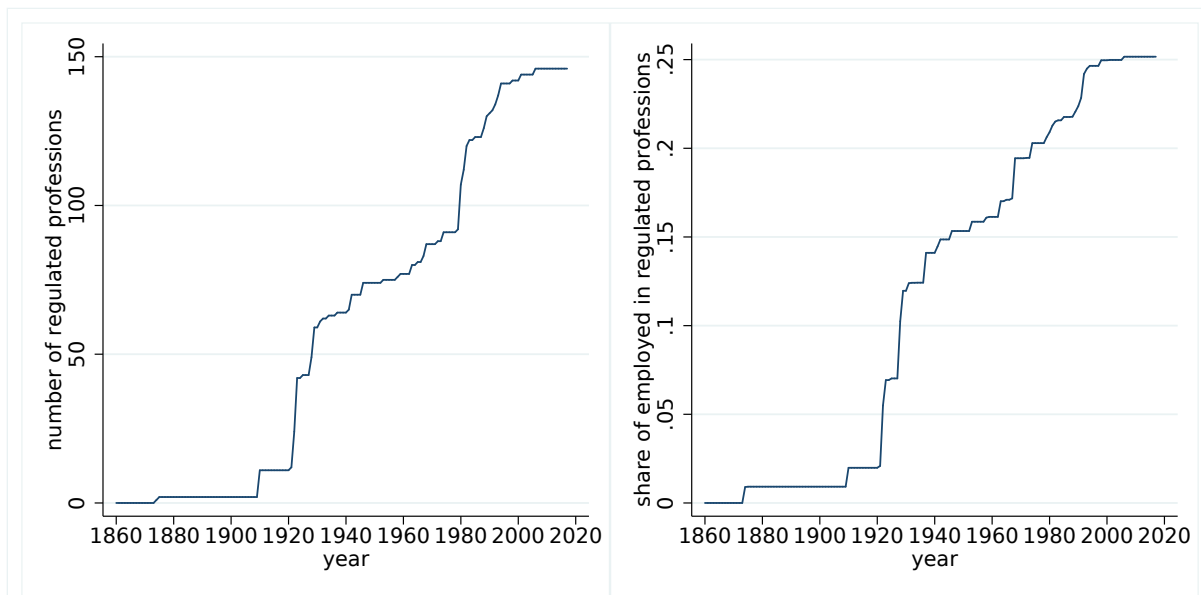
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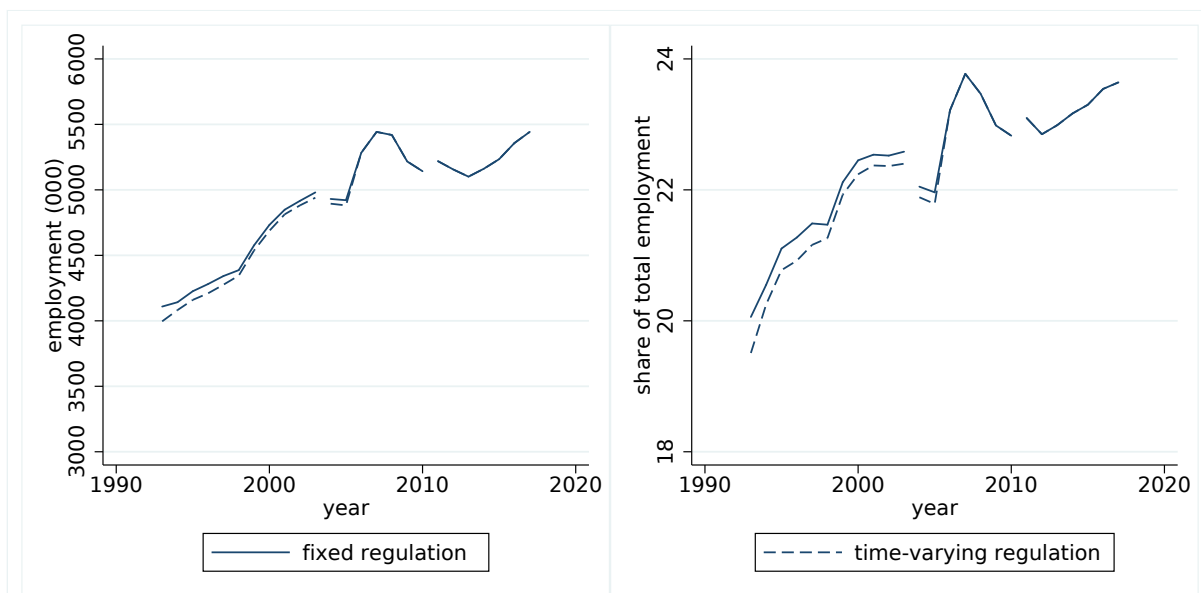
Figures

Figure 1
Long-run trend of regulation



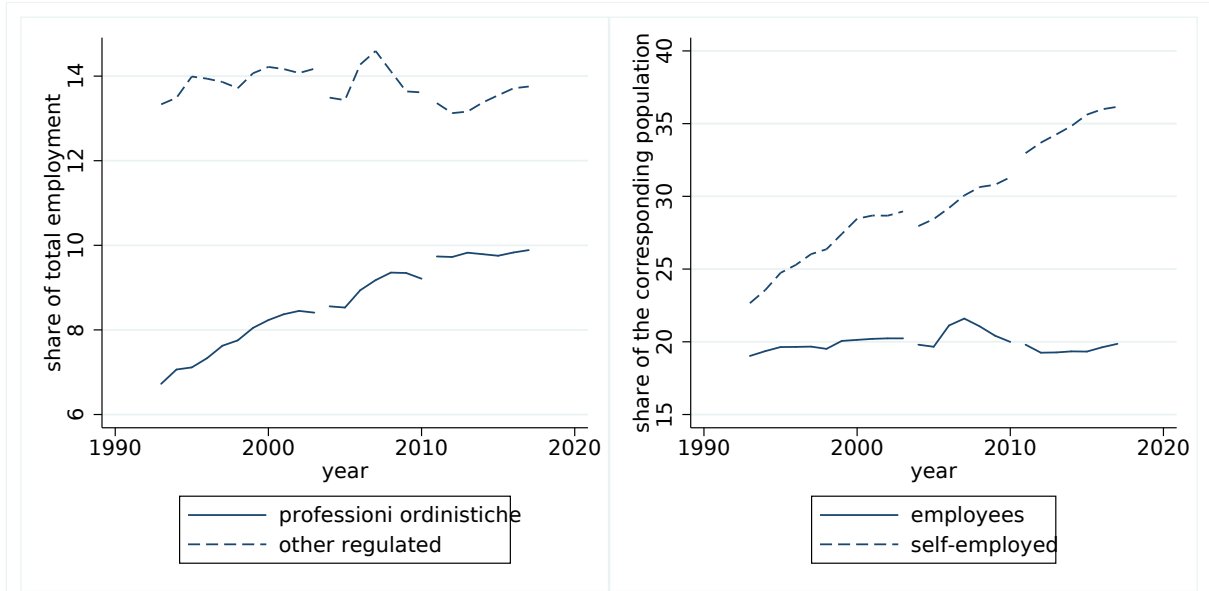
Notes: Authors' elaborations regulation indicators and LFS data. The lines represent the number of regulated occupations (left panel) and the number of workers in regulated occupations (right panel), obtained assuming that the number of workers in each profession was stable over the entire period. The period is from 1860 on.

Figure 2
Workers in regulated occupations (absolute values and share)



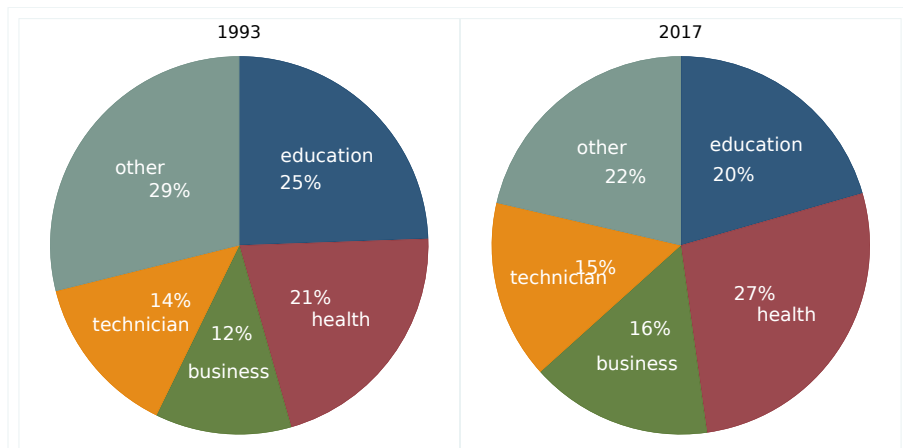
Notes: Authors' elaborations on LFS data. The two lines represent the number (in thousands) of workers employed in regulated occupations; the solid (dashed) line considers the regulatory environment as fixed (time-varying) so that a profession is considered regulated over the entire period (from the inclusion among regulated occupations on). Discontinuities in the series are due to changes (in 2004 and in 2011) in the classification of occupations.

Figure 3
Workers in regulated occupations by type of employment



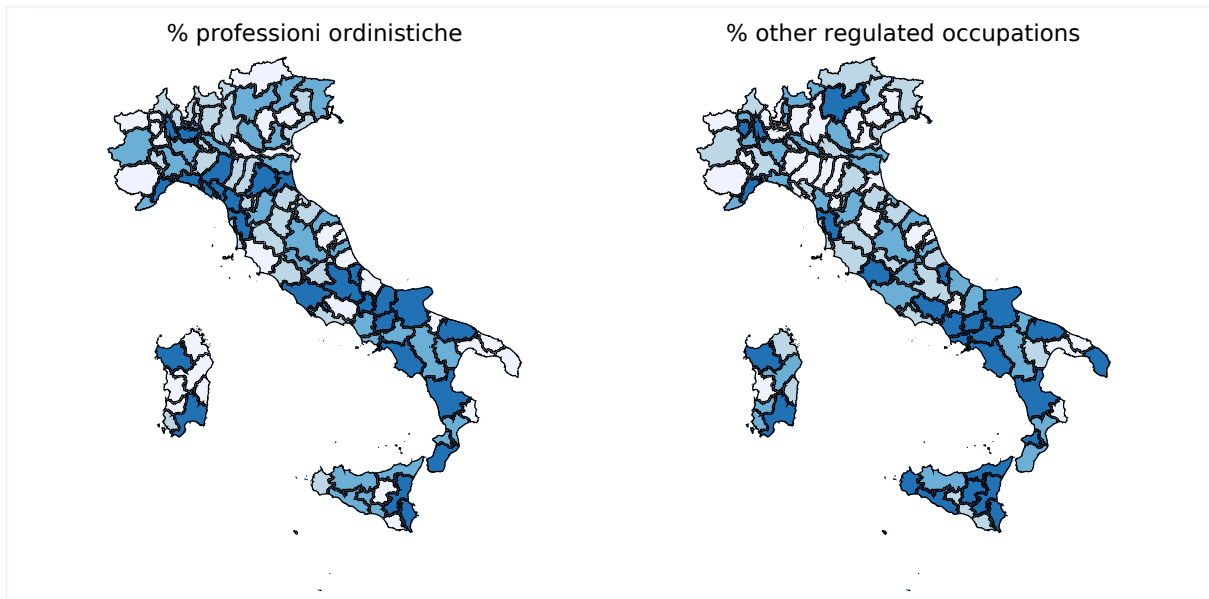
Notes: Authors' elaborations on LFS data. The two lines in the left panel represent the share (over total employment) of workers employed in *professioni ordinistiche* (solid line) and other regulated occupations (dashed line). The two lines in the right panel represent the share of workers employed in regulated occupations as employees (solid line) or self-employed (dashed line), with respect to the corresponding population. The regulatory environment is considered as fixed. Discontinuities in the series are due to changes (in 2004 and in 2011) in the classification of occupations.

Figure 4
Sectoral composition of regulated occupations



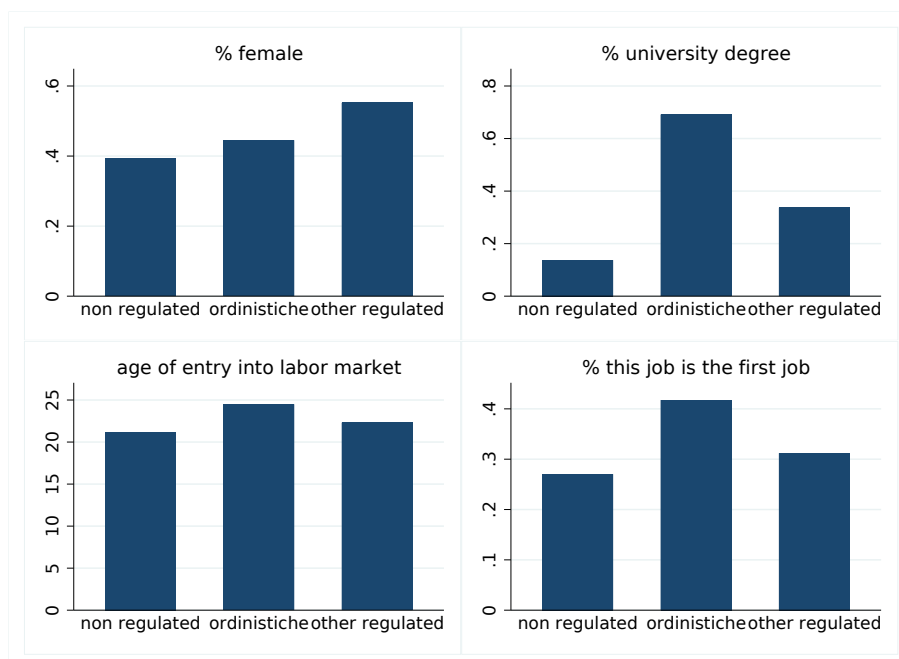
Notes: Authors' elaborations on LFS data. The two pies represent the sectoral composition of regulated occupations at the beginning (left panel) and at the end (right panel) of the considered temporal window. The regulatory environment is considered as fixed.

Figure 5
Share of workers in regulated occupations by province



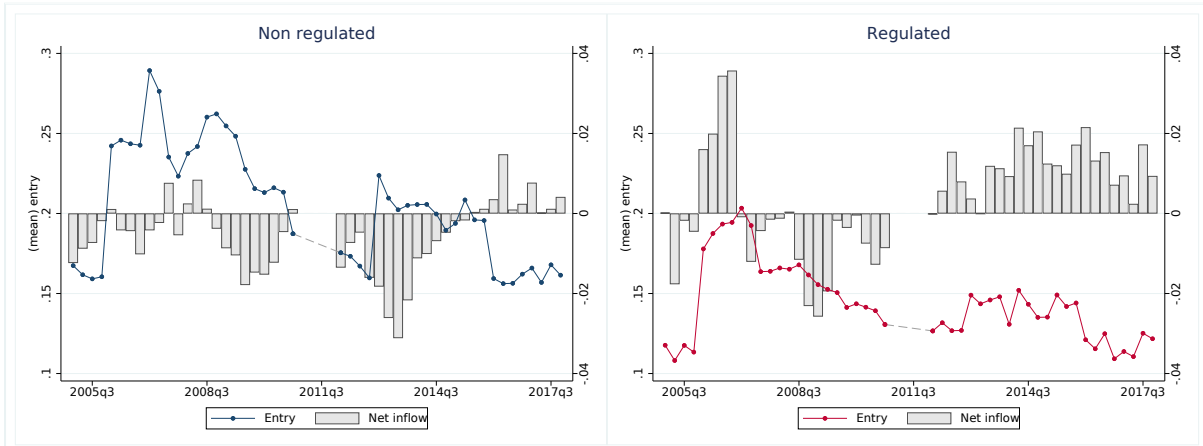
Notes: Authors' elaborations on LFS data. Share of regulated occupations (left panel) and *professioni ordinistiche* (right panel) over total employment by province; darker areas indicate higher share. The figures refer to the average over the last 5 years.

Figure 6
Individual characteristics of workers in regulated occupations



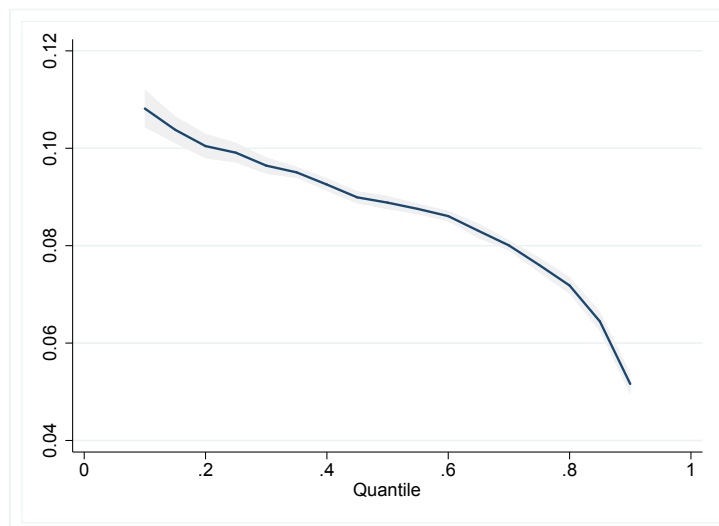
Notes: Authors' elaborations on LFS data. The figures refer to 2017 (latest available year).

Figure 7
Trends in occupation mobility between regulated and non-regulated occupations



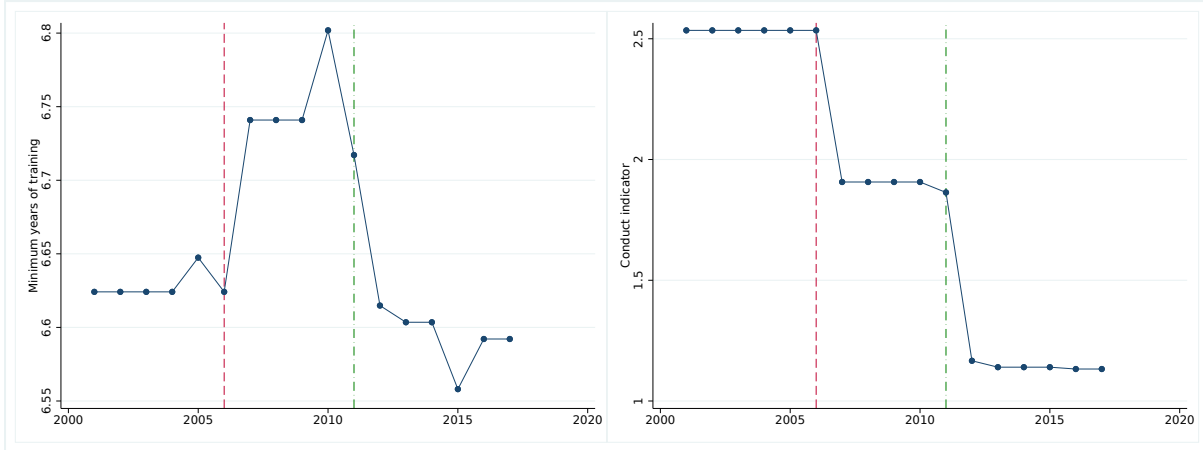
Notes: Authors' elaborations on LFS data. The lines represent the entry rate (left axis) and the bars and the net flows, the difference between entry and exit rate (right axis) in regulated and non regulated professions over time.

Figure 8
Returns to regulation: quantile regression



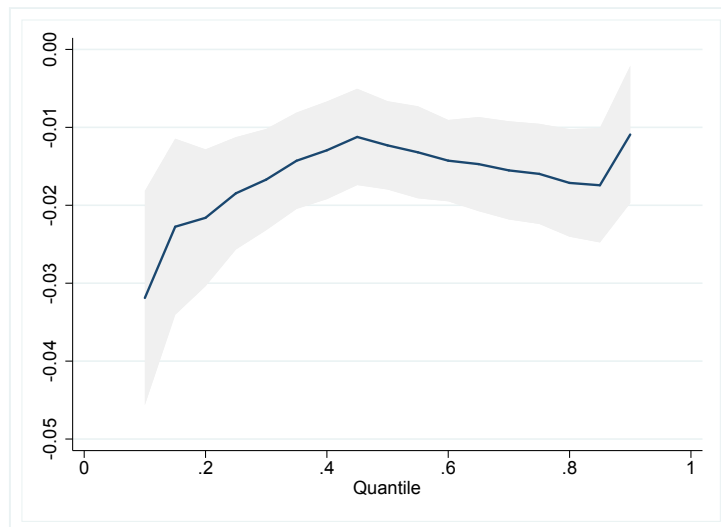
Notes: The solid line represents the quantile estimates with the shaded grey area depicting a 90 percent pointwise confidence band.

Figure 9
Changes in regulation, by type of regulation



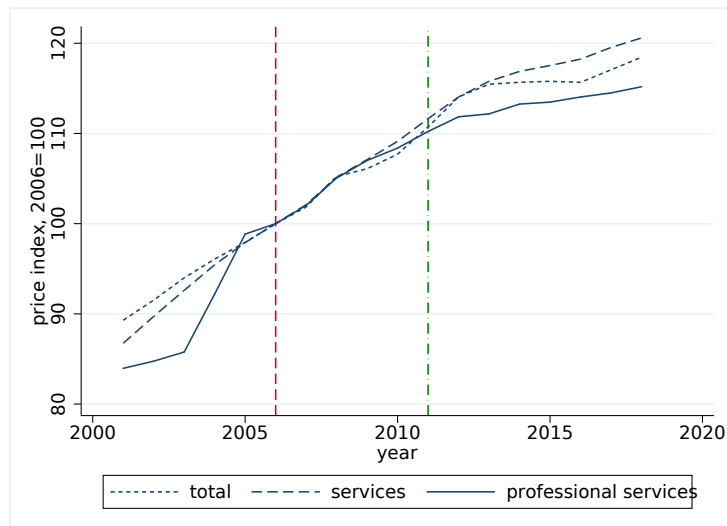
Notes: Authors' elaborations on regulation indicators. The red dashed line indicates the year when the Bersani reform was passed (2006), the green dashed-dotted line the year in which the Monti reform was passed (2011). the reforms were effective starting th following year.

Figure 10
Effects of Monti reform on wages of employees: quantile regression



Notes: The solid line represents the quantile estimates with the shaded grey area depicting a 90 percent pointwise confidence band.

Figure 11
Prices of professional services



Notes: Authors' elaborations on ISTAT data. The lines represent the price indexes (2006=100) for different groups of goods and services. The red dashed line indicates the year when the Bersani reform was passed (2006), the green dashed-dotted line the year in which the Monti reform was passed (2011). the reforms were effective starting th following year.

Tables

Table 1
Descriptive statistics for regulation indicators

	Other regulated	<i>Ordinistiche</i>	Total regulated
Entry restrictions			
Compulsory examination	0.627 (0.484)	0.899 (0.301)	0.750 (0.433)
Education and training requirements			
Secondary education degree is compulsory	0.483 (0.500)	1.000 (0.000)	0.717 (0.451)
Tertiary education degree is compulsory	0.282 (0.451)	0.676 (0.469)	0.460 (0.499)
Length of tertiary education degree (years)	1.224 (2.006)	2.912 (2.314)	1.988 (2.308)
Apprenticeship is compulsory	0.517 (0.500)	0.648 (0.478)	0.576 (0.494)
Length of apprenticeship (years)	1.041 (1.142)	1.474 (1.661)	1.237 (1.416)
Professional training is compulsory	0.454 (0.498)	0.201 (0.401)	0.340 (0.474)
Length of professional training (years)	0.372 (0.720)	0.402 (0.803)	0.386 (0.758)
Minimum years of training	4.227 (3.881)	9.386 (3.034)	6.560 (4.359)
Conduct regulation			
Conduct indicator	0.751 (0.433)	3.343 (1.281)	1.923 (1.584)
Observations	482	398	880

Notes: Standard deviations in parentheses. Number of observations is computed as: $N = P \times T$, i.e., number of regulated occupations (44) multiplied by the number of years (20).

Table 2
Descriptive statistics for full and restricted sample

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample			Restricted sample		
	Non regulated	Regulated	Δ	Non regulated	Regulated	Δ
Female	0.392 (0.488)	0.502 (0.500)	-0.110***	0.393 (0.488)	0.504 (0.500)	-0.111***
Age	42.056 (10.79)	43.685 (10.42)	-1.629***	42.274 (10.65)	43.878 (10.28)	-1.604***
Primary education	0.433 (0.495)	0.182 (0.386)	0.251***	0.430 (0.495)	0.180 (0.384)	0.250***
Secondary education	0.474 (0.499)	0.415 (0.493)	0.059***	0.477 (0.499)	0.417 (0.493)	0.060***
Tertiary education	0.093 (0.290)	0.402 (0.490)	-0.309***	0.093 (0.290)	0.403 (0.490)	-0.310***
South	0.297 (0.457)	0.333 (0.471)	-0.036***	0.295 (0.456)	0.331 (0.471)	-0.036***
Self-employed	0.224 (0.417)	0.329 (0.470)	-0.104***	0.222 (0.416)	0.324 (0.468)	-0.102***
log wage	7.017 (0.487)	7.209 (0.421)	-0.192***	7.021 (0.485)	7.212 (0.418)	-0.192***

Notes: Standard deviations in parentheses. Restricted sample is the sample containing only individuals that are observed two (or four) times with a one year distance between the two observations. Δ is the difference between the coefficients with a t-test of significance. *** p<0.01, ** p<0.05, * p<0.1.

Table 3
Transition matrix for job movers

$t \backslash t+1$	Non-employment	Non-regulated	Regulated	<i>Ordinistiche</i>	Total
Non-employment	-	81.66	12.19	6.15	100 [9.42]
Non-regulated	42.49	50.21	4.70	2.59	100 [19.47]
Regulated	44.78	35.83	15.45	3.94	100 [13.47]
<i>Ordinistiche</i>	38.06	37.38	10.20	14.36	100 [9.52]
Total	30.14	57.78	7.92	4.16	100 [14.08]

Notes: Sample is restricted to individuals who reported a different professional status between two consecutive years, i.e., “job movers”. The numbers in brackets indicate the share of job movers in each category.

Table 4
Effects of regulation on occupation entry rates

	(1)	(2)	(3)	(4)	(5)	(6)
	Entry				Entry from other job	Entry from non-employment
Regulated	-0.048*** (0.011)	-0.051*** (0.011)	-0.040*** (0.010)	-0.040*** (0.009)	-0.037*** (0.008)	-0.018*** (0.006)
Female	0.016* (0.009)	0.019** (0.009)	0.016** (0.007)	0.016** (0.007)	-0.003 (0.005)	0.024*** (0.004)
Age	-0.006*** (0.000)	-0.006*** (0.000)	-0.006*** (0.000)	-0.006*** (0.000)	-0.001*** (0.000)	-0.005*** (0.000)
Secondary Education	-0.026*** (0.008)	-0.023*** (0.008)	-0.011* (0.006)	-0.011* (0.006)	0.006** (0.003)	-0.017*** (0.003)
Tertiary Education	-0.011 (0.011)	-0.010 (0.011)	0.013 (0.009)	0.013 (0.008)	0.011* (0.006)	-0.008 (0.005)
Self-employed _{t-1}	-0.080*** (0.012)	-0.080*** (0.012)	-0.106*** (0.014)	-0.107*** (0.014)	0.006 (0.007)	
Fixed term _{t-1}	-0.041*** (0.014)	-0.045*** (0.015)	-0.053** (0.020)	-0.052** (0.020)	0.090*** (0.008)	
Observations	1,138,682	1,138,682	1,138,682	1,138,682	1,138,682	1,138,682
Year FE	y	y	y	y	y	y
Quarter FE	y	y	y	y	y	y
Province FE		y	y	y	y	y
Sector FE			y	y	y	y
Sector/Year FE				y	y	y

Notes: Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5
Effects of regulation on occupation entry rates, *ordinistiche* and other regulated

	(1)	(2)	(3)	(4)
	Entry			
<i>Ordinistiche</i>	-0.061*** (0.019)	-0.062*** (0.019)	-0.058*** (0.015)	-0.057*** (0.015)
Other regulated	-0.041*** (0.014)	-0.045*** (0.014)	-0.029** (0.013)	-0.029** (0.013)
Observations	1,138,682	1,138,682	1,138,682	1,138,682
Controls	y	y	y	y
Year FE	y	y	y	
Quarter FE	y	y	y	y
Province FE		y	y	y
Sector FE			y	
Sector/Year FE				y

Notes: Controls: female, age, secondary education, tertiary education, self-employed, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6
Effects of regulation on occupation entry rates, by type of regulation

	(1)	(2)	(3)	(4)
	Entry			
Years of training	-0.006*** (0.001)			-0.006*** (0.002)
Compulsory examination		-0.023* (0.013)		0.018 (0.015)
Conduct indicator			-0.020*** (0.005)	-0.006 (0.006)
Observations	1,123,700	1,123,700	1,123,700	1,123,700
Controls	y	y	y	y
Quarter FE	y	y	y	y
Province FE	y	y	y	y
Sector/Year FE	y	y	y	y

Notes: Controls: female, age, secondary education, tertiary education, self-employed, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7
Returns to regulation

	(1)	(2)	(3)	(4)
	log wage			
Regulated	0.099*** (0.048)	0.103*** (0.048)	0.089*** (0.033)	0.089*** (0.033)
Female	-0.316*** (0.044)	-0.326*** (0.043)	-0.246*** (0.015)	-0.245*** (0.015)
Age	0.009*** (0.001)	0.010*** (0.001)	0.008*** (0.001)	0.008*** (0.001)
Secondary Education	0.193*** (0.030)	0.190*** (0.029)	0.143*** (0.021)	0.143*** (0.021)
Tertiary Education	0.427*** (0.049)	0.428*** (0.048)	0.356*** (0.042)	0.355*** (0.041)
Employed with fixed term	-0.262*** (0.023)	-0.244*** (0.017)	-0.216*** (0.013)	-0.216*** (0.013)
Observations	1,161,909	1,161,909	1,161,909	1,161,909
Year FE	y	y	y	
Quarter FE	y	y	y	y
Province FE		y	y	y
Sector FE			y	
Sector/Year FE				y

Notes: Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8
Returns to regulation, *ordinistiche* and other regulated

	(1)	(2)	(3)	(4)
	log wage			
<i>Ordinistiche</i>	0.184*** (0.050)	0.184*** (0.050)	0.179*** (0.045)	0.178*** (0.045)
Other regulated	0.053 (0.051)	0.060 (0.050)	0.029 (0.039)	0.030 (0.039)
Observations	1,161,909	1,161,909	1,161,909	1,161,909
Controls	y	y	y	y
Year FE	y	y	y	
Quarter FE	y	y	y	y
Province FE		y	y	y
Sector FE			y	
Sector/Year FE				y

Notes: Controls: female, age, secondary education, tertiary education, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9
Returns to regulation, by type of regulation

	(1)	(2)	(3)	(4)
	log wage			
Years of training	0.017*** (0.005)			0.017** (0.007)
Compulsory examination		0.051 (0.037)		-0.039 (0.028)
Conduct indicator			0.066*** (0.018)	0.014 (0.018)
Observations	1,145,694	1,145,694	1,145,694	1,145,694
Controls	y	y	y	y
Quarter FE	y	y	y	y
Province FE	y	y	y	y
Sector/Year FE	y	y	y	y

Notes: Controls: female, age, secondary education, tertiary education, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10
Returns to regulation, heterogeneous effects

	(1)	(2)	(3)	(4)	(5)
	log wage				
x :	Public sector	South	Female	Under 35	Tertiary Education
Regulated	0.068** (0.032)	0.074** (0.032)	0.102*** (0.035)	0.053* (0.029)	0.092** (0.036)
Regulated $\times x$	0.059 (0.032)	0.052*** (0.009)	-0.059*** (0.014)	0.076** (0.024)	-0.011 (0.040)
Observations	1,161,907	1,161,907	1,161,907	1,161,907	1,161,907
Controls	y	y	y	y	y
Quarter FE	y	y	y	y	y
Province FE	y	y	y	y	y
Sector/Year FE	y	y	y	y	y

Notes: Controls: female, age, secondary education, tertiary education, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 11
Effects of Monti reforms on entry rates.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Entry				log wage			
<i>Ordinistiche</i>	-0.087*** (0.020)		-0.024 (0.016)		0.175*** (0.038)		0.095** (0.038)	
Other regulated	-0.053*** (0.018)				0.017 (0.040)			
<i>Ordinistiche</i> \times Post-2011	0.042*** (0.016)	0.040*** (0.015)	-0.003 (0.009)	-0.007 (0.008)	0.006 (0.011)	0.003 (0.008)	-0.019* (0.010)	-0.021*** (0.007)
Other regulated \times Post-2011	0.041*** (0.014)	0.043*** (0.014)			0.026 (0.024)	0.011 (0.011)		
Observations	558486	558486	172639	172639	831159	831159	249325	249325
Time window (years)	± 3	± 3	± 3	± 3	± 3	± 3	± 3	± 3
Sample	ALL	ALL	2&3	2&3	ALL	ALL	2&3	2&3
R^2	0.062	0.069	0.058	0.070	0.391	0.455	0.310	0.372
Controls	y	y	y	y	y	y	y	y
Year FE	y	y	y	y	y	y	y	y
Quarter FE	y	y	y	y	y	y	y	y
Province FE	y	y	y	y	y	y	y	y
Sector/Year FE	y	y	y	y	y	y	y	y
Occupation FE		y		y		y		y

Notes: Controls: female, age, secondary education, tertiary education, employed with a fixed term contract. Robust standard errors clustered at occupation level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 12
Effects of Monti reforms on wages of self-employed

	(1)	(2)	(3)	(4)
	log wage			
<i>Ordinistiche</i>	0.388*** (0.086)		0.381*** (0.066)	
<i>Ordinistiche</i> × Post-2011	-0.104 (0.141)	-0.096*** (0.032)	-0.131 (0.108)	-0.126*** (0.030)
Observations	144	144	240	240
Time window (years)	±3	±3	±5	±5
R^2	0.156	0.984	0.143	0.972
Occupation FE		y		y
Year FE	y	y	y	y
Weighted	y	y	y	y

Notes: Authors' elaborations on data from the Ministry of Economics and Finance. The unit of observation is a specific occupation and observations are weighted by the size of each occupation. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 13
Effects of Monti reform on wages of employees

	(1)	(2)	(3)	(4)
	Entry		log wage	
Years of training	-0.006*** (0.002)	-0.007 (0.007)	0.003 (0.003)	0.017** (0.008)
Conduct indicator	-0.009 (0.011)	0.012* (0.006)	0.011 (0.011)	0.020*** (0.007)
Observations	551073	166032	819898	239584
Time window (years)	±3	±3	±3	±3
Sample	ALL	2&3	ALL	2&3
R^2	0.068	0.068	0.452	0.364
Controls	y	y	y	y
Year FE	y	y	y	y
Quarter FE	y	y	y	y
Province FE	y	y	y	y
Sector/Year FE	y	y	y	y
Occupation FE	y	y	y	y

Notes: Controls: female, age, secondary education, tertiary education, employed with a fixed term contract. In columns (3) and (4) the sample includes only occupations with ISCO codes 2 and 3, i.e., professionals, technicians and associate professionals. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table A.1
Regulation indicators.

Question	Coding answer	Answer
Individual requirements		
Education and training requirements		
Is a high school diploma necessary in order to access to the profession?	0	No
	1	Yes
Is a university degree necessary in order to access to the profession?	0	No
	1	Yes
What is the duration of university degree which allows access to the profession?		Number of years
What is the duration of training or professional experience which allows access to the profession?		Number of years
What is the duration of vocational training which allows access to the profession?		Number of years
Conditions to access and practice the profession		
Are there professional exams that must be passed in order to practice the profession?	0	No
	1	Yes
Is membership to a professional organization compulsory in order to legally practice?	0	No
	1	Yes
Conduct regulation		
Index of the stringency of conduct regulation	0-6	Average of the six items reported below
Is conduct subject to integrity requirements?	0	No
	6	Yes
The charged fees or prices are regulated by the government or self-regulated?	0	No regulation
	1	Non-binding recommended prices for some services
	2	Non-binding recommended prices for all services
	3	Maximum prices for some services
	4	Maximum prices for all services
	5	Minimum prices for some services
	6	Minimum prices for all services
How is advertising and marketing of professional services regulated?	0	All kind of advertising admitted
	2	Only advertising on professionals and services admitted
	4	Only advertising on professionals admitted
	6	Forbidden
How is the legal form of business regulated?	0	Capital companies allowed with no restrictions on shareholders
	2	Capital companies allowed with restrictions on shareholders
	4	Capital companies forbidden
	6	Sole practitioners only
How is inter-professional cooperation regulated?	0	All forms allowed
	2	Most forms allowed
	4	Allowed between comparable professions
	6	Generally forbidden
Is the chamber entitled with disciplinary power?	0	Yes, entrusted to a specific body
	3	Yes, entrusted to the chamber board
	6	No