Essays on Top Incomes in Labour Market

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Abstract

There is no consensus on what causes inequality and increasing concentration of earnings at the top in labour markets. In this thesis, we review the literature concerning this issue and find out that two contrasting theories exist: market-based theories and institutions-based theories. But, since neither has been fully validated by the empirical evidence, we suggest that they should rather be seen as two complementary explanations of the increase in top labour earnings. In this context, we study two categories of Italian workers, known to be characterized by the presence of "working super-rich": licensed liberal professionals and managers. In the first case, our results might be interpreted as evidence in support of rent extraction, even if the methodology we apply do not allow us to fully identify a causal nexus about the determinants of top earnings. In the second case, we find that both performance and power have a role in determining the compensation of listed firms' directors and managers, although we do not find conclusive evidence on which driver prevails.

Acknowledgments

Contents

Introduction

Inequality is one of the most discussed economic topics in the last years, both in the public opinion and in the academia. Starting from the beginning of the 2000s, new data on the growth of several dimensions of economic inequality in the advanced countries (especially income and wealth), often based on administrative sources, was available (e.g., Piketty and Saez, 2003). An increase in inequality was also observed in US labour market during the 1980s (Katz and Murphy, 1992).

Several studies stressed how the driving force behind growing income inequality was the remarkable increase in top incomes and, within top incomes, the growing importance of labour income at the expense of capital income (Atkinson et al., 2011).

Hence, many of the causes behind increasing income inequality between the end of the 20th century and the beginning of the 21st century seem to be placed in labour markets. This is partly due to falling wage shares and stagnating wages for the lower and middle classes, but also because of the appearance of a new class of "working rich" and "working super-rich", i.e., individuals belonging to the top deciles, or even percentiles, of the income distribution, that have labour (and not returns on capital) as their main source of earnings (Piketty, 2014).

If the consensus on the facts is nowadays widespread and solid, it is not the same for the causes behind these facts. In Chapter 1 we make a detailed review of the relevant literature on this issue. We find out that there are many hypotheses and proposed explanations, which can be broadly organized in two competing schools of thought: market-based theories and institutions-based theories of income inequality at the top.

We conclude our review by arguing that both explanations are valid and not mutually exclusive. In addition, we argue that, while both hypotheses have been tested empirically (especial the market-based one), there are not many studies testing them jointly. Thus, we suggest doing so by analysing empirically labour markets usually characterized by high inequality and very high incomes at the top of the distribution. Therefore, we analyse two categories of Italian workers that are usually known to show these two features, namely licensed liberal professionals and managers. Interestingly, the same dichotomy between market-based theories and institutions- based theories can be found in the literature concerning the increase in managerial compensation observed in the last decades of the 20th century. A similar dichotomy is also found in the literature on regulated occupations, where some see regulation as a skill-enhancing institution, while other see it as a form of rent-extraction.

In Chapter 2, we focus on the Italian self-employed licensed professionals. We do so not only because regulated occupations are receiving increasing attention in the

literature, but especially because self-employment income is deemed to be one of the main drivers of top incomes in Italy (Alvaredo and Pisano, 2010; Franzini et al., 2016). We use panel data, obtained by merging administrative records with EU-SILC data, to analyse levels and trends of the income distribution of liberal professionals, also in comparison with non-regulated workers with similar skills. Moreover, we exploit the liberalisation reforms introduced from the 2000s onwards to identify the source of the possible earnings gap between regulated and unregulated workers. Our results are partly in favour of the existence of rents from regulation.

Subsequently, we investigate the determinants of the compensation of Italian listed firms' directors in Chapter 3. As a major outcome, we build a new panel dataset, containing many variables on individuals and firms, obtained from official corporate reports. We employ this dataset to assess jointly the importance of the two competing hypotheses we mentioned above. The market-based camp argues that managerial pay is set by optimal contracts in a principal-agent framework, in order to efficiently remunerate and incentivize performance. On the opposite, the institution-based camp argues that rent-seeking managers exploit flaws in corporate governance and changing laws and social norms to capture rents. We find a possible empirical confirmation for the interpretation of the two main theories as complementary rather than competing, although our evidence is not conclusive on which one is relatively more important.

In a nutshell, this thesis contributes to the existing literature on top labour earnings in three ways: first, we retrieve and combine new data from several sources on classes of "super-rich" workers that are relevant to the structure of Italian labour income distribution; second, we empirically test the relevance of rents and power as determinants of top labour earnings, something that was not done often previously, apart from few exceptions (the most important being Piketty et al., 2014); finally, we assess rents and power together with other possible market-based drivers of top labour earnings.

Chapter 1

The Working Super-Rich: Competition or Rents? A Literature Review

Abstract

The growth of top incomes is deemed to be the main driver of income inequality, but there is no consensus on what caused this growth. The evidence suggests that labor earnings have become more unequal and at the same time a bigger component of top incomes. Hence, a new class of working super-rich emerged. The goal of this chapter is to review the literature on this topic, from which two main explanations emerge: one focusing on higher premia on human capital from growing market competition and another focusing on growing rent extraction due to rising market power and other institutional factors.

1.1 Introduction

During the last fifteen years, a solid consensus on the increasing concentration of income at the top of the distribution in advanced countries has been reached. Several contributions proved empirically this fact using administrative data (mainly from tax reports) for different developed countries and over a long time span, starting at least from Piketty (2001) for France, Piketty and Saez (2003) for the US and Atkinson (2005) for the UK. The main novelty emerging from these and several other works (e.g., Atkinson and Piketty, 2010, Atkinson et al., 2011 and Piketty, 2014) is the unprecedented, unambiguous rise in the share of national incomes accruing to the top percentiles of the distribution. Notwithstanding a substantial heterogeneity, most advanced countries experienced this fact. The data gathered in this first wave of literature stress that this growth in top incomes has been primarily driven by labour income, which has become increasingly concentrated at the top end of the distribution. In addition, the evidence also shows how labour income has increased its weight in the composition of top incomes, contrasting the twentieth-century stylized fact that saw rich people earning mainly from capital income and middle-class and poor people making a living out of their work efforts. Anyway, issues of labour income inequality were already discussed, even though with more attention to general trends than to the right tail of the distribution. At the beginning of the 1990s, a series of papers showed how wages became more and more dispersed, starting from the late 1970s (e.g., Katz and Murphy, 1992).

More recently, a second wave of literature on income inequality data proposed to combine administrative data and surveys with national accounts data, in order to make the long-run series of national income shares consistent with macroeconomic aggregates. The goals of this research line, which aims at producing a corpus of distributional national accounts (DINAs) are several: to compute growth rates for each income group, to assess better the contribution of changes in the share of labour and capital in national income and of changes in the dispersion within labour and capital income to total income inequality, to measure how redistribution affects inequality between pre-tax and post-tax income and, finally, how the increasing participation of women into labour markets affected income concentration. Piketty et al. (2018) pioneered this approach constructing DINAs for the US, proposing a baseline methodology to construct DINAs for other countries. Their data confirms that the steep increase in top incomes lead the growth of inequality and the predominant role of labour income in this trend until the end of the 20th century, but also find that capital income prevails among top incomes again in the first decades of the new millennium. The DINA approach was followed, among others, by Blanchet et al. (2022) for multiple European countries and Guzzardi et al. (2022) for Italy.

With respect to the question on whether increasing inequality is either labour income-led or capital income-led, it is worth noting that the boundary between the two concepts is not always well defined, especially at the very top of the income ladder. One obvious example is represented by stock options, which are a very common form of executive compensation in the US (Murphy, 2013) but yield dividends when exercised and capital gains when sold. Another example for the US is "pass-through" business income[1]. Smith et al. (2019) find that this type of income represents the primary source of non-wage income, which in turn makes the most of the very

top end of the distribution. They also argue that closely-held firm owners choose to remunerate their own labour effort through "pass-through" profits rather than through wages, possibly because of tax reasons.

Anyway, if the existence of the upward trend in labour income inequality is now a widely accepted fact, there is no consensus on its causes. In fact, some questions about the high concentration of income at the top in some markets were already raised in the early 1980s. Rosen (1981) developed a model to explain why many professions experience a "superstar effect", that is, a convex relationship between efforts (or skills) and earnings. This model became a landmark for all the explanations of income inequality based on human capital differentials and highly competitive markets (e.g. Gabaix and Landier, 2008).

As we said, the 1990s literature shifted the focus on general trends wage inequality and proposed an explanation based on changing relative demand and relative supply of skilled labour. The central hypothesis is that technological change favours skilled workers and penalizes low-skilled workers, so that the relative demand for skills increases as technological progress goes on. This is why this theory is now widely known as skill-biased technological change (SBTC). As long as the relative supply of skilled workers keeps on with the growing relative demand, wages remain compressed while rising on average. This is what happened until the late 70s, with a great number of highly educated workers entering the labour market. But once the relative supply stabilized, wage inequality started to rise, as relative demand for skills kept its pace.

The empirical evidence provided contrasting support to this theory. Many puzzles and problems emerged while observing the evolution of inequality, starting from the fact that the growth of wage inequality was more pronounced in Anglo-Saxon countries, but less in many other developed countries, which should have been exposed to the same technological shocks (Lemieux, 2008). Moreover, SBTC failed to explain many observed dimensions of wage inequality (Card and DiNardo, 2002). The theory was then reviewed by shifting the attention from changes in the wage structure to changes in the occupational structure, stressing the idea of a routine- biased polarization of labour market (Autor et al., 2006). Alternative explanations were proposed already in the 90s, when many pointed out that institutional factors, mainly labour market institutions, had to be enquired as a major driver (e.g., DiNardo et al., 1996). In addition, when new evidence on inequality became available, it became clear that most of the dynamics was happening at the top-end of the distribution, not throughout the whole distribution as suggested by SBTC (Piketty and Saez, 2003). The differences in top incomes trends between countries subject to similar technological developments suggested that the different institutional contexts play an important role.

As a consequence, several institutional factors causing income concentration at the top were investigated. A large variety of such factors was considered, ranging from corporate governance, pay-setting mechanisms and changing social norms (Bebchuk and Fried, 2003; Piketty and Saez, 2003, 2006) to tax policy (Piketty et al.,

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[1]"Pass-through" business income basically consists in firm profits that are taxed as personal income of the owner of the company, typical of closely-held, medium-small S-corporation or partnerships.

2014), from financialization (Philippon and Reshef, 2012) to, again, labour market institutions (Jaumotte and Osorio-Buitron, 2020). The common argument in all these explanations is that the institutional changes that took place from the late 1970s onwards have fostered rent extraction by the richest individuals.

The scope of this chapter is hence to review and describe the theoretical dichotomy between market-based and institutions-based explanations of the concentration of labour income at the top. Such an investigation appears to be of interest not just for the sake of history of economic thought, but because of the many implications that lie behind both points of view, also in terms of policy. In fact, whether top income inequality is caused by efficient market mechanisms or by rent extractions makes a huge difference in terms of the actions required to tackle the problem.

The remainder of the chapter is organized as follows: Section 1.2 will present a brief panoramic on heterogeneities in top incomes trends across countries and between genders; Section 1.3 will analyse the theories based on market competition and human capital; those based on institutions and rent extraction will be enquired in Section 1.4; Section 1.5 will offer some reflections on the economic and policy implications of the presented theories and conclude the chapter.

1.2   General Trends in Top Incomes

The cross-country heterogeneity in top incomes and top earnings is, as we will see in the following sections, one of the main issues that the competing theories face in describing the possible drivers of concentration at the top. Thus, in this section we will describe this heterogeneity by analysing trends in top incomes in different countries. Since an in-depth review of all the evidence collected on such trends is out of the scope of this Chapter, we will only present a brief panoramic here. We refer the reader to other works (e.g., Atkinson and Piketty, 2010; Atkinson and Bourguignon, 2015) for a more detailed survey of international trends in top incomes (as well as for the related issues in terms of comparability of data from different sources and different definitions of income).

The observation of cross-country, long-run time series of top income shares, calculated on data retrieved from tax files suggests the existence of commonalities and differences between countries (Roine and Waldenström, 2015). Most countries experienced a substantial drop in top incomes starting after the First World War and up until the late 1970s-early 1980s. If at the beginning of the 20th century the top 1 percent commanded around 20% of total national incomes, around 1980 this share was reduced to 5%-10%, especially in Anglo-Saxon and European countries. Afterwards, patterns started to diverge. While in Anglo-Saxon countries, such as United States, United Kingdom, Canada and Australia, top 1 percent income shares increased steeply, such an increase was less pronounced in Nordic (Sweden, Finland, Norway) and Southern European (especially Portugal and Italy, less in Spain) countries and almost absent in Continental European (France, Germany, the Netherlands, Switzerland) countries and in Japan (Roine and Waldenström, 2015; Morelli et al., 2015). These upward trends continued up until the late 2000s, when the aftermath of the financial crisis and of the Great Recession possibly halted the growth of top incomes, even though only temporarily (Morelli et al., 2015)

Given that this Chapter's focus is on labour income, it is also of interest to compare international trends in the composition of the top percentile. Morelli et al. (2015) analyse the share of labour and capital income in the top 1 percent and top 0.01% in eight countries (Australia, Canada, France, Japan, Italy, the Netherlands, Spain and the United States) and find that wages are relatively more important than capital income in all those countries in the top percentile, while capital income prevails in the top 0.01% (except for the US and Canada). Trends, instead, tend to be different: most countries experienced a further increase in the share of labour income in the top percentile, with the exception of Italy and France, in which such share did not change sensibly, and of Spain and Australia, which saw capital income increase its importance.

Alvaredo and Pisano (2010) construct and analyse time series of Italian top income shares based on tax records for the period 1974-2004. They find that top income shares persistently increased in the last 25 years of the 20th century and that such an increase was driven mainly by labour income. Italy represents a notable exception with respect to other countries, in that self-employment income (which will be at the centre of Chapter 2) represents a significant part of the increase of labour incomes at the top. In fact, while employment earnings and pension represented 30.6% of the top 1 percent in Italy in 1980 and went to 39.9% in 2008, self-employment income almost doubled its share as an income source at the top in the same period, going from 15.8% to 31% (Franzini et al., 2016). Nevertheless, even though income became sensibly more concentrated at the top than in other European countries, top incomes' growth in Italy has been relatively smaller when compared to the Anglo-Saxon countries.

Trends within the distribution of labour income are also relevant here. Overall earnings inequality increased in the US starting from the early 1980s, with both tails of the distribution playing a role in this dynamic, as we will see in the next Section, though inequality in the bottom-half stabilised in the 1990s and afterwards. Top earnings, instead, continuously grew and contributed to the increase in inequality (Salverda and Checchi, 2015). A similar pattern emerges for the other Anglo-Saxon countries too, while the evidence is similar but less clear for other OECD countries. Germany, for example, shows smaller increases in both overall inequality and concentration at the top (Salverda and Checchi, 2015).

Bloise et al. (2018) use administrative data from the Italian social security institute (INPS) to investigate the earnings distribution in Italy from 1985 to 2014. They find that overall inequality of gross earnings has consistently increased throughout the whole period. The inspection of trends in earnings share suggest that such an increase was caused at first by a steeper growth rate of the highest percentiles, though in a context of generalized increase at all parts of the distribution. After 1992 (a year in which Italy experienced a financial crisis and underwent several institutional changes, also in the labour market), earnings at the top 25, 10 and 1 percent where roughly stable, while the bottom-half of the distribution suffered a strong decrease. Thus, even though the bottom-half of the earnings distribution played a major role in the 1990s and the 2000s, top earnings had anyway a relevant effect on overall inequality in Italy.

The latest evidence on top incomes comes from the proposals of building distributional national accounts (DINAs) such as the one made by Piketty et al. (2018). The

DINA approach allows for a more solid comparison between pre-tax and post-tax income and, since it builds series on income shares consistent with macroeconomic accounts, for a better computation of growth by income quantiles. In their analysis of income distribution in the US for the 1946-2014 period, Piketty et al. (2018) confirm that top incomes, which grew from 12% of total national income in the 1980s to 20% in 2014, have been the driving force of the increase in inequality observed from 1980 onward. The income share of the bottom 50 percent basically experienced the opposite trend, going from 20% of total income in 1980 to 12% in 2014. When studying the growth by income quantiles, the authors find that the top 1 percent was the only group that experienced a growth rate (3.3.%) significantly higher than the average macroeconomic growth rate (1.4%) in the 1980-2014 period. Anyway, post-tax income is more equally distributed, reflecting an overall progressivity of the tax and transfer system. Instead, what in the authors' findings is partly in contrast with the previous literature is the relative role of capital and labour income. In fact, while the new evidence confirms that top incomes have been labour-driven until the end of the last century, capital income (which definition is much broader in DINAs than in tax files-derived series) becomes more relevant in the first two decades of the new millennium, thanks to the boom in the income from equity and bonds at the top.

Blanchet et al. (2022) construct DINAs for 26 European countries in the 1980-2017 period and find confirmation that, although less than in the US, most European countries and Europe as a whole became more unequal. This seems true for both the pre-tax and post-tax top 1 income share, which went from 8% to 11% and from 7% to 9%, respectively. Moreover, the increase in inequality was mostly concentrated in the 1980s and the 199os, while it slowed down in the first decades of the 21st century.

Guzzardi et al. (2022) concentrate their attention on Italy, building DINAs for the 2004-2015 period. Their estimate revise upwards the top 10, 1 and 0.1 percent share with respect to Alvaredo and Pisano (2010), by 2-3%. They also find that such shares have increased even after the 2008 crisis. Thus, the evidence emerging from distributional national accounting contradicts the previous evidence, not only in that income inequality in Italy is higher than previously estimated, but also increasing, rather than stagnating. Undistributed profits, capital income from-quasi corporations and remunerations to directors (which we will analyse in Chapter 3) seem to be the main drivers of the upsurge in the concentration of income at the top. The authors put their estimates in comparison with those for the US by Piketty et al. (2018) and for France by Garbinti et al. (2018). Once more, it emerges how Italy is closer to other European countries in terms of levels of shares of national income accruing to the top percentiles, but at the same time is similar to the US in terms of growing trends in inequality. Interestingly, while the growth of US top incomes is apparently at the expense of both the middle- and low-income groups, the Italian middle 40% seems to experience an increase in its income share, while the income of the bottom 50% is reducing at a faster pace than in the US.

1.3 Drivers of Top Income Inequality in Market-Based Theories

1.3.1 Technological change

Theories of income distribution based on the interplay between relative supply and relative demand of individual with different characteristics date back, at least, to Tinbergen (1956). This class of theories was recalled when the evidence pointed out to a dramatic modification of the wage structure in the US, starting from the late 70s. The main idea was that the observed rise in earnings inequality and in wage premium to education were due to shifts in relative demand for skilled workers. This shift was in turn generated by big technological changes, especially the disruption of ICT technologies into the economies, which are assumed to be complementary with human capital (Krueger, 1993).

Most of these theories, as we will see in this section, predict changes throughout the whole wage distribution. Anyway, there are some theories explaining concentration at the top (which is the main topic of this thesis) under the lenses of perfectly competitive market mechanisms, which are mostly evolutions of Rosen's theory of superstars (Rosen, 1981). We will review such theories separately in a following subsection.

Katz and Murphy (1992) describe how skill-biased technological change could have influenced wage inequality in the US. They outlined how the latter increased substantially from 1963 to 1987, driven by the relative wages of better-educated workers. But these 24 years can be broken down in three sub-periods, in which the college wage premium first increased, then decreased during the 70s and then increased again. The idea is that this fluctuating dynamic is probably due to variability in relative supply of skills opposed to a secular growth of relative demand. Educated workers were relatively scarce during the '60s, while in the '70s a large, highly-educated cohort entered the labor market, allowing the growth of relative supply of skills to keep up with the relative demand.

This fairly simple, supply-and-demand explanation received great consensus but immediately met a series of criticisms, too. Levy and Murnane (1992), while agreeing that the SBTC hypothesis may explain the rising inequality *between* groups of differently educated workers and while pointing out that it also caused a polarization of labor market, admit that it failed to explain the observed contemporaneous rise in inequality *within* these groups. Another major challenge is the fact that wage inequality did not grow as fast as in the US in other countries that probably were exposed to the same technological changes (Lemieux, 2008). A possible reason for such cross-country variability might be that institutional factors matter, something that the SBTC hypothesis does not encompass but that was already investigated empirically in the 1990s (e.g. DiNardo et al., 1996).

Card and DiNardo (2002) highlight a series of puzzles and problems that empirical investigations posed to the SBTC hypothesis. The major problem is that data show how the widening of earnings inequality slowed down in the last decade of the 20th century, while according to SBTC it should have kept on increasing, given that the technological progress further accelerated its pace, especially in ICT. Another interesting evidence is the fact that, while one should expect that computer scientist

and engineers had the lion's share, on the contrary their relative wage fell with respect to other graduates during the 1980s. SBTC fails in the explanations of many other key dimensions in wage inequality, such as the stability of the race differential, the fact that the gender differential closed uniformly and irrespectively of education and the fact that education gaps proved to be more pronounced for younger workers than for older workers.

In addition, the SBTC hypothesis assumes that earnings inequality should have involved the whole distribution of income and several dimensions. Instead, the evidence shows how most of the dynamics were concentrated in the top-end of the distribution: wage gains went mostly to the top earners, the education premium proved to be increasingly convex (that is, the gap between post-graduates and college graduates has grown more than the gap between college graduates and high school graduates, which in turn has grown more than the gap between high school graduates and dropouts). Moreover, within-group inequality has grown more pronouncedly among college workers, while changing little for other groups (Lemieux, 2008).
The supporters of the SBTC hypothesis took these problems into account and tried to revise the theory. Autor et al. (2006) agree with SBTC critics that the rise in wage inequality was concentrated at the top, while it actually slowed down (if not decreased) in the bottom half of the distribution. It was also observed that returns to skills are not linear but U-shaped, especially from the 90s onwards.

They suggest that the cause of wage inequality then had to be found by looking at the polarization of the labor market. In fact, technological change may have changed the occupational structure not only by being complementary to skills, but mostly by being a substitute to jobs characterized by a high degree of routine tasks (Autor et al., 2003). Thus, routine jobs that required medium-level skills and education and paid medium-level wages were displaced, while non-routine cognitive occupations, usually requiring high skill/education and most complementary with ICT-led technological change, increased. At the same time, employment in non-routine, manual and low-wage jobs experienced a growth (Autor and Dorn, 2013). Hence, the US wage distribution became increasingly dispersed towards the top, but at the same time compressed in the bottom-half, given that low-wage jobs grew and that medium wages were leveled down.

Acemoglu and Autor (2011) strongly insist on the distinction between skills and tasks and agree that the one-to-one mapping between the two is one of the main drawbacks of the canonical SBTC model. Such a distinction, they argue: "becomes particularly relevant when workers of a given skill level can perform a variety of tasks and change the set of tasks that they perform in response to changes in labor market conditions and technology" (see Acemoglu and Autor, 2011, p. 1045). Thus, they propose a model in which the assignment of skills to task is not fixed. Moreover, technology is assumed to be endogenous and responding differently to different labor market context. There are two important advantages in this framework according to Acemoglu and Autor (2011). First, non-linearities in the relationship between technological change and wages (i.e. of wage returns to skills) are allowed, so that the model can now explain the polarization of earnings distributions and of occupations. Second, the substitution of workers with new technologies (or similarly with offshoring and outsourcing) can be modeled explicitly.
This refined and updated version of SBTC, often referred to as routine-biased

technological change (RBTC), has hence partially moved from a "price-based" (a wage premium on skills and education) to a "quantity-based" (the growth of high-skills/high-wage and low-skills/low-wage occupations at the expense of the middle) explanation of earnings inequality. The empirical evidence provided support for this hypothesis: RBTC-led occupational polarization has been observed in the US (Autor et al., 2006), the UK (Goos and Manning, 2007) and several EU countries (Goos et al., 2014).

Therefore, this class of models may explain how technological progress may have caused income inequality. The link between the former and the latter certainly plays a big role in the story, but there may be room for further explanations. While admitting that institutions, especially labor market ones, may also play a part (e.g. Acemoglu and Autor, 2011), SBTC and RBTC theories do no explicitly account for them. Moreover, similarly to superstar theories, these models are set-up in a frictionless, perfectly competitive market framework, notwithstanding the fact that the markets involved in this story, especially the one for labor, present very often many imperfections (see again Acemoglu and Autor, 2011).

1.3.2   Globalization

Globalization is a multidimensional phenomenon and one of the most studied among the possible drivers of income and labour earnings inequality. The Stolper-Samuelson theorem in the standard Hecksher-Ohlin theory of international trade predicts that exchange flows of goods, capital and workers between advanced countries (with relative abundance of skilled workers and capital) and developing countries (with relative abundance of unskilled labour) raise inequality in advanced countries (Freeman, 2011). Nevertheless, assessing globalization as a driver of income inequality, and as a driver of top incomes above all, has proven to be difficult (Bartels and Waldenström, 2022). In particular, it is very hard to disentangle the role of globalization from that of technological change, given that new waves of trade openness are often coinciding with, if not caused by, new technologies and innovations (Nolan et al., 2019). Given that globalization is a complex concept, several factors have been considered, ranging from offshoring of labour-intense productions and services to competition and shifts between export-led and internal demand-led sectors/firms (Nolan et al., 2019).

The evidence shows that globalization is associated with increased overall wage inequality within countries, but with reduced global inequality, contradicting the standard trade theory (Freeman, 2011). Anyway, Nolan et al. (2019) point out that the most recent empirical literature has found that globalization's contribution to wage inequality is only limited.

The relationship between globalization and top income inequality is even more labile. Roine et al. (2009) and Roine and Waldenström (2015) do not find any clear evidence to confirm that globalization is a driver of top incomes. Hence, even though Bartels and Waldenström (2022) suggest that a more precise definition of the channels through which trade openness influence the top of the distribution might be more conclusive, so far there is only evidence on the role of globalization as a driver of overall inequality, thus having influence on other parts of the distribution.

1.3.3   Explanations of the Concentration at the Top

The branch of theories discussed in the previous subsections regards general trends of the whole wage distribution rather than movements at the top, although some (e.g., the routine-biased technological change theory) involve concentration of wages in the right tail. Thus, since our focus is on top incomes, in the next subsection we will analyse theories that specifically try to explain the concentration of labour incomes at the top of the distribution. The relative movements of supply and demand of skilled labour and talent, caused by factors such as technology and globalization, remain anyway the central driver. These theories mainly revolve around Rosen's superstar model, which Kaplan and Rauh (2010) describe as an interaction of scale effects and technological change effects.

The theory of superstars, appearing in Rosen (1981), is considered to be a seminal contribution to the explanation of earnings inequality at the top of the distribution (e.g. Katz and Murphy, 1992; Lemieux, 2008; Acemoglu and Autor, 2011; Atkinson et al., 2011; Piketty et al., 2014) and many relied on it for empirical investigation on the observed skewness of earnings, especially in the market for CEOs (e.g. Gabaix and Landier 2008; Tervio 2008) or in the field of optimal taxation rates (e.g. Scheuer and Werning 2017). The reason why it has been so influential certainly lies in the rigorous and yet clear way in which it explains "concentration of output among a few individuals, marked skewness in the associated distributions of income and very large rewards at the top" (see Rosen, 1981, p.845).

The many different markets possibly characterized by a superstar effect share two features: "a close connection between personal reward and the size of one's own market" and "a strong tendency for both market size and reward to be skewed toward the most talented people in the activity" (see Rosen, 1981, p.845). The model is basically an assignment problem, in which the reward function of the seller is convex in her talent, which is assumed to be observed by buyers without costs. This implies that small differences in talent bring about large differences in earnings. This convexity is a consequence of quantity being an imperfect substitute for quality. That is quite intuitive, since everyone may agree that hearing two average singers is not as satisfying as hearing an exceptional singer. Thus, sellers of lower quality are imperfect substitutes of those of higher quality because of indivisibilities, represented through a fixed cost of consumption in the price-talent indifference curve of the demand side.

The structure of supply contributes to the convexity of rewards too, as joint consumption technologies are assumed, allowing superstars to increase their market size without watering the quality of their product down. The expansion of the offered quantity is anyway bounded by internal and external diseconomies. A first peculiar assumption of the model is the one for which even though a seller charges her own price (by optimally deciding her market size, which in turn determines the price), the market is still assumed to be competitive. This is ensured by the fact that closely talented sellers are constraining each other. In fact, they become more and more substitutable as the differential in talent decreases, also because of the existence of external diseconomies. Thus, sellers will be forced to follow the market price even though they can make their own price. But since market size is increasing in talent (given that more talented stars suffer less from external diseconomies),

superstars' will be increasing in talent for both a "price effect" (price is increasing in talent) and a "quantity effect" (market size is increasing in talent). The convexity of rewards follows from these two features.

The resulting aggregate demand and aggregate supply curves behave as usual, so that a unique full market price vector is determined and a conventional equilibrium is reached. The obtained result is very peculiar, since a high concentration of income and market shares coexists with the absence of rents. Superstars cannot, as a matter of fact, move away from the price that the market assigns them, since if they did so they would lose market shares in favor of their next-best competitor. This holds even if the assumption of diseconomies is relaxed: the most talented superstar would in this case serve the whole market, but would have no price-making power, because moving from the equilibrium price would result in her competitor taking her place as a monopolist.

Rosen's ultimate goal is thus to show that earnings concentration in certain markets is not necessarily caused by barriers to entry or other similar kinds of market power, but simply by efficient allocation of rewards in a highly competitive, "winner-takes-all" market.
He originally developed this model to explain the right-skewed distribution of income in markets for sports, arts and entertainment professionals, but it has an obvious application in the market for CEOs too, which exhibits a similar skewedness. Rosen himself proceeded in this direction. He later developed another assignment model, very similar to the one just described, in which the distribution of managerial rewards is more concentrated relative to the distribution of managerial ability (Rosen, 1982).

Many followed this line of research. Garicano and Rossi-Hansberg (2006) develop a model of "knowledge hierarchies" in organizations, the implications of which are similar to Rosen's results. In this model, agents are heterogeneous in cognitive skill and optimally decide to pay the cost of acquiring knowledge, which in turn is an input to production. Productive organizations are organized in layers of knowledge hierarchies, in which simpler, "routine", problems are solved at the production level, while harder problems are solved by more skilled workers at higher levels. The harder the problem, the higher the level to which it is transferred. As in Rosen (1981), the equilibrium earnings structure is such that increases in talent are compensated more than proportionally. The model also includes two crucial aspects of technology: the cost of communication among agents and the cost of accessing knowledge. A decrease in the former generates a "superstar" effect, since more problems are transferred to the top of the hierarchy. Hence, the marginal value of knowledge at the top increases, so that inequality within top managers and between them and production workers increases, while inequality within production workers falls. Instead, decreasing costs of acquiring knowledge increase inequality within all organizational layers. The authors argue that this is what explains the different patterns of wage inequality in the 1980s and 1990s (see above).

Tervio (2008) builds on Rosen (1982) and Sattinger (1979) to develop an assignment model in which both supply (executives) and demand (firms) are differentiated by indivisible characteristics. A competitive and frictionless market for managerial ability matches the most talented manager to the largest firm and, in equilibrium, each firm is willing to hire its corresponding CEO at her equilibrium wage, rather than hiring any other firm's CEO. A superstar effect emerges here since compensation

increases more-than-proportionally in ability, due to the multiplicative effect of the executive ability-firm size matching mechanism. Thus, even though executives enjoy a differential rent on their ability as in Sattinger (1979), Tervio (2008) follows Rosen (1981) in that the market efficiently assigns this rent to the most deserving one through the equilibrium solution of the assignment problem. In addition, relying on estimations, the paper concludes that the observed high levels of rewards for CEOs depend much more on the firm scale effect than on ability differentials.

Gabaix and Landier (2008) extend this strand of models with an explicit general formulation of the distribution of talent, relying on extreme value theory. They argue that the growth in average levels and in concentrations of executives' pay is an efficient equilibrium response to the increase in market value of firms and that a good fraction of cross-country variability in CEO compensation is explained by differences in firm size. Estimations performed in the paper confirm the existence of a superstar effect, since the dispersion of CEO talent appears to be very small at the top, but corresponding to very large differentials in rewards. In fact, if the best CEO and the 250th most talented one were to be switched, the change would generate a very small difference in firm value (0.016%). But the number 1 CEO seems instead to be paid over 500% more than the CEO number 250.

Anyway, these interpretations of earnings inequality suffer from several criticalities, both theoretically and empirically. For instance, while showing the existence of a finance wage premium, Philippon and Reshef (2012) claim that the model by Gabaix and Landier (2008) can only explain a small part of the excess wage finance CEOs receive with respect to their non-finance counterparts, notwithstanding the large increase in the size of financial firms.

Things are even more problematic from a theoretical point of view. Rosen's main claim is that working super-rich are an outcome of a fiercely competitive, but efficient and well-behaving, market: "Fair or not, it is the necessary and natural outcome of the unusual technology with which we now live. The distribution of rewards would look much different if modern technology did not admit such large economies of scale, but it is by no means obvious that society as a whole would be better off without it" (see Rosen, 1983, p.459). The aim is to provide a justification for something that is apparently incompatible: the coexistence of competition and very high differentials in earnings from labor. In a superstar economy, not only these two things can coexist, but the former is the result of the latter.

But, in a competitive environment, quality differences should not persist over a long time, since competitors should have the ability to emulate those having a qualitative advantage (Franzini et al., 2016). On the contrary, due to its non-substitutability, the superstar indubitably acts as a monopolist while selling her good. Franzini et al. (2016) claim that this model depicts only a halved form of competition. As a matter of fact, even if the mechanism of selection of the superstar dominating the whole market is competitive, it is the behavior of the unique seller towards the buyers that we are interested in to understand whether there is actually competition or not. Given that the superstar is inimitable (or considered to be so by consumers), she can maintain her competitive advantage indefinitely and the service she offers will continue to be scarce, granting her a rent. The feature of imitation by competitors, fundamental in the definition of a competitive market, is thus hindered by non-interchangeability of sellers.

Whether superstars are actually beneficial to social welfare or not is another matter of debate. Very often, a large part of the remuneration of some stars (sportsmen, actors, entertainers, etc.) does not come from their actual work, but from the sponsorship contracts they get because of their huge popularity. Advertising may or may not be welfare improving, but a sure thing is that sponsors do not pay for the marginal productivity of endorsers, but for the size of the public they can reach. Hence, once again, it can be argued that superstars are receiving a rent. Moreover, Murphy et al. (1991) claim that it can be detrimental to social welfare when talented people get involved in rent-seeking activities, such as reaping sponsorships or (to some extent) finance, rather than in productive activities. This matter will be treated again later on in this chapter.

1.4   The Role of Institutions, Market Power and Rents

The influence of institutions on labour income inequality was already scrutinized during the 1990s, when several economists investigated the (decreasing) role of labour market institutions such as unionization rates and minimum wages in containing wage inequality, as a response to the SBTC hypothesis (e.g., DiNardo et al., 1996; Card et al., 2004). Anyway, just like SBTC, such earlier works were centred on trends throughout the whole distribution and not on concentration at the very top. Instead, as it became clearer and clearer that what was causing the increase in income inequality were mostly rising top incomes (especially top labour earnings), those who contrasted "pure" market-based theories tried to explain more precisely this fact under the lenses of institutions- or rent-based theories. In this section, we will analyse such theories dividing them in macro-categories. We will start from explanations of the effects of labour market institutions on top incomes, proceed with theories involving pay-setting mechanisms in firms, and finish theories involving tax policies.

1.4.1   Labour Market Institutions

Lemieux (2008) is one of the first works that specifically tries to answer the question whether labour market institutions, such as minimum wages and unions, could be related with wage inequality at the top. He argues that, while minimum wages seem to affect more the bottom than the top, (de-)unionization is a better explanation for rising inequality in the upper half of the distribution. He also finds that decreases in union density can account for a third of the increase in top income inequality. Lemieux (2008) find this explanation particularly compelling, since the countries in which the increase in top incomes was most consistent, namely the Anglo-Saxon countries (see Section 1.2), were also the ones in which the bargaining power of unions decreased the most. Jaumotte and Osorio-Buitron (2020) investigate further on the role of labour market institutions, showing empirically how the erosion of labour institutions, especially union density, contributed to the rise of both gross and net inequality (as measured by Gini index) and particularly to the rise of top 10% incomes. The intuition is that such an erosion causes not only a shift in bargaining powers from workers to top earners, from which the growth of gross inequality follows, but also a reduction of unions' and workers' influence on redistributive

policies, which in turn causes net inequality to rise. They obtain the first result with an instrumental variable estimation, which evidences a strong causal link between the decline in union density and the rise of top income shares. The magnitude of this link is large, as union density seems to explain 40% circa of the increase in top 10% shares. The effect of unionization on top incomes is probably twofold: on the one hand, union density affects the bargaining power balance between workers and top earners, as argued above; on the other hand, it affects corporate decisions too, by putting pressure and scrutiny on pay-setting mechanisms within each single firm (see Section 3.2 below).

Farber et al. (2021) construct a new series on US union density using data from public opinion, starting from the late 1930s. They exploit this new source of data to study the effects of unions on income distribution and inequality. They find out that unions were a powerful income compressing force in the Post-World War II period, acting through a combination of an income premium from membership, self-selection of low-skills and non-white households into membership (which counteracted returns on skills and race), and compression of residual income inequality. They also regress several measures of inequality, including the top 10 percent income share, with both time series and state-year panel data. The results confirm the hypothesis of a negative correlation of union density with top incomes. The estimated effect is quite large, ranging from 2.3% to 3.5%. They further confirm this result with an instrumental variables strategy exploiting two large positive shocks on unionization (the legalization of union organizing in 1935 and the establishment of the National War Labor Board during WWII), which permanently increased state-level unionization and reduced state-level inequality.

1.4.2 Corporate Governance, Pay-Setting Mechanisms and Social Norms

Bakija et al. (2012) exploit data from US income tax returns to understand the occupational composition of top incomes. They find that executives and financial professionals account for about 60% of the top 0.1% percent of the national income distribution and for 70% of the increase in the top 0.1% income share. This is why many scholars investigate the role of changes in corporate governance rules, in pay-setting mechanisms and in regulation of financial markets. All these factors may have enhanced the rent capturing capacities of the executives, especially in the financial sector.

Bivens and Mishel (2013) identify the cause of the rise in executives' pay in pay-setting institutions, especially the increasing use of stock options and bonuses as a form of compensation. Those are one of the many ways in which compensations are fictitiously linked to relative performance of managers. Hiring compensation consultants and setting up peer groups is another one. Smith et al. (2019) brought more evidence to light with respect to this issue, finding that business income from closely held, "pass through" corporations (i.e., corporations whose profits are taxed as personal income of their owners rather than as corporate income) has another relevant share of top incomes, but argue that such income might be concealed labour earnings. In fact, the owners of these firms, which are found to be "human capital rich" rather than "financial capital rich", have fiscal incentives to remunerate their

own work as executives with "pass-through" income rather than with wages. It is worth nothing that Smith et al. (2019) give a very broad definition of human capital, which includes effort, skills, networks, reputation and rent-extraction ability.

Bebchuk and Fried (2003) analyse the issue of executives' pay as a principal-agent problem. Once again, pay-setting mechanisms are the main culprit, since they enhance rent-seeking by the managers instead of providing efficient incentives. The authors criticize what they define the "optimal contracting" approach to executives' compensation and propose instead a "managerial power approach". The former approach is deemed to ignore the conflict of interest between the board of directors and the management itself. It puts too much trust in market forces, too: the labour market for executives may not be competitive enough to provide the forces necessary for an optimal remuneration design.

Bebchuk and Fried (2003) also introduce the concept of "outrage costs" and argued that their diminution or avoidance, that is, an increased social acceptance of extremely high earnings, has been one of the reasons that pushed executives to further boost their pays. If a proposed scheme of compensation is expected to be harmful in terms of reputation for managers and directors, this will surely be a constraint to excessively high remunerations. As a result, there may be attempts to avoid such a constraint through camouflaging the extraction of rents as a performance-pay mechanism. The authors also claim that there has been a generalized tendency to make disclosures less transparent, for example through equity-based compensation, that may be only apparently sensitive to performance. This argument resembles the one proposed by Piketty and Saez (2003, 2006), for which changing social norms on earnings inequality made very high pays acceptable.

There are several facts that can be explained by the role of power and influence (Bebchuk and Fried, 2003). Above all, the fact that pays are generally higher or less linked to performance as manager are more powerful. There are four factors determining managerial power: firstly, internal controls may be weak or ineffective; secondly, managers are more powerful when there are no large "outside shareholders", which are more interested in monitoring than insiders; a similar role is played by institutional shareholders, which are interested mainly in the company's performance, and are able to resist to pressures; finally, anti-takeover arrangements weaken the constraints coming from the menace of a hostile takeover. There is evidence proving that each of these factors actually affects the compensation of executives (Bebchuk and Fried, 2003).

1.4.3 Finance

The increasing development, complexity and size of the financial sector, commonly known as the "financialization" of the economy, has probably contributed to the growth of top incomes. A direct channel is represented by the growing size, both in terms of the number of workers employed and of shares of national income, of the financial sector, in which many top earners are working (Nolan et al., 2019).

Financial deregulation may be counted among the possible determinants too. Bartels and Waldenström (2022) argue that dominant groups and insiders blocking entry into the market may have been able to capture the gains from financial developments after deregulation. Moreover, as anticipated in the previous section, a

major challenge to the explanation of rising wages in the financial sector based on skills premia and market competition comes from Philippon and Reshef (2012), who find that workers in this sector earn on average 50 percent more than workers with the same level of education in other sectors, a premium that rises to 250% for top executives. A superstar model with scale-effects, on the likes of Gabaix and Landier (2008), would instead predict an increase of only the 50%. This means that financial CEOs earn an excess wage with respect to their colleagues in other sectors that is only partly explained by skill premia and winner-takes-all dynamics. Moreover, the authors estimate that financiers started to earn more than similarly educated professionals (as, for instance, engineers) from 1980 onward. Hence, Philippon and Reshef (2012) point to the deregulation of financial markets as the policy change that triggered the excess wages in finance and that may have also caused the change in relative demand for skills and the growth of the average firm-scale which further reinforced this effect. They also argue that deregulation may have caused an inflow of skilled individuals from other sectors. Workers may have moved to the financial sector either to capture rents generated by deregulation or because deregulation allowed for greater creativity. This shift in the allocation of skilled workers may be not necessarily beneficial to the society, because when talented individuals are attracted by rent-seeking sectors, incentives to produce and rates of technological progress and growth are hampered. (Baumol, 1990; Murphy et al., 1991).

1.4.4   Top Marginal Tax Rates

The literature on the elasticity of labour supply and income to tax rates is broad, but relevant to the issue of top income inequality, since there is substantial evidence that top earners react to changes in the tax system. Initially, the literature focused on the compensated elasticity of labour supply to marginal tax rates as a sufficient statistic to measure the excess burden of taxation. Estimates of such elasticities are nevertheless very low. Thus, since there is instead evidence of behavioural response through the income channel, the attention shifted to the elasticity of taxable income. Although no compelling long-run estimates emerged for the latter either, there is strong evidence of behavioural responses to taxation at the top of the income distribution (Saez et al., 2012). For example, a reduction in the US top tax rate on personal income to below the corporate tax rate caused a significant shift from C-corporations to pass-through businesses, which is possibly the reason why business income is relevant within the top 1 percent (Smith et al., 2019). Moreover, the elasticity of taxable income seems to be larger for high income individuals that can shift their income to less taxed sources, suggesting that top incomes seem to take advantage of tax avoidance opportunities to react to tax rates (Saez et al., 2012).

Piketty et al. (2014) build on this literature and try to assess the role of taxation of top labour incomes in the evolution of inequality and to determine the optimal top tax rates. They indicate three main channels through which tax rates affect top incomes: a standard supply-side channel, through which tax rates influence labour supply, saving decisions and retirement behaviors of top earners (related to the market and competition-based theories of inequality); a tax-avoidance channel, that relies on the hypothesis that higher tax rates provide incentives for avoiding taxes and hence that tax breaks increase inequality due to higher earnings reporting;

a compensation-bargaining channel, based on the idea that the high tax rates of the Post-War period were part of an institutional set-up that limited rent extraction opportunities for top earners and hence that lower top tax rates provided them the incentives to bargain thoroughly for higher wages.

They propose a model with three key elasticities of top incomes to tax rates, each representing one of the above mentioned channels. The first is the supply-side elasticity, encompassing a series of real economic responses in terms of labour supply, broadly defined. The second is of course the tax-avoidance elasticity to tax rates (which is a symptom of malfunctioning tax systems when high), while the last one is the bargaining efforts elasticities. Optimal top tax rate is decreasing in the first two elasticities and increasing in the latter (as higher tax rates make compensation-bargaining efforts less rewarding). Piketty et al. (2014) proceed with an empirical investigation at both macro and micro level. The macro evidence highlights three main results. Firstly, there is a very clear correlation between the decreasing top marginal tax rates and the increasing top income shares, which suggests a long-run total elasticity around 0.5. Secondly, US data show little support for the tax-avoidance channel. Lastly, the first elasticity is probably not very high, as there is no evidence of correlation between real GDP per capita growth and tax breaks at the top.

The micro evidence regards the pay of CEOs, from which two findings emerge. On the one hand, the pay-performance link is weaker when top tax rates are low, as the fraction of CEO pay related to firms' performance not depending on CEOs' work is higher. On the other hand, controlling for firms' characteristics and performances does not reduce the negative correlation coefficient between compensation and top tax rates, that becomes even stronger when firms have a poor governance.

In summary, the paper infers the following conclusions about the three channels. For the supply-side channel, apart from the low correlation between top tax rates and economic growth, difficulties emerge from the fact that measures of labour supply do not show any increase large enough to justify the idea that tax cuts corresponded to greater efforts. Moreover, there is high cross-country and time variability in the link between tax rates and top incomes, suggesting that the institutional set matters. Anyway, if on the opposite this channel were to be the most effective one, the optimal top marginal tax rate would be at about 50%. Instead, in the second scenario of a tax-avoidance channel, the optimal rate would be only a few percentage points higher than in the first case, but the policy priority would go to narrow tax-avoidance opportunities rather than to increasing taxes. Finally, the last channel is difficult to prove because it is hard to obtain robust direct evidence that top earnings grew at the expense of lower earnings, but both US and international evidence since 1960 point in that direction, as the evidence on CEO pay does. The resulting optimal tax rate would hence be much higher than it is today, at around 83%.

Bartels and Waldenström (2022) review more studies on top tax rates and inequality, broadening the analysis beyond the US. Studies on different countries seem to confirm the negative correlation between top tax rates and top income shares, but not uniformly across countries and through the years. Rubolino and Waldenström (2019) also find an increasing responsiveness to taxes within top incomes, as the top 0.1% is the most responsive group, while the top 10-to-5% group

is almost not responsive.

1.4.5 What About Gender?

The increased participation to labour market and employment of women certainly has significant implications for inequality. First and foremost, it has reduced overall household income inequality by counteracting the effects of increasing wage dispersion (Nolan et al., 2019). Similarly, the partial closing in the gender gap has moderated the increase in inequality among adults Piketty et al. (2018). Nevertheless, this factor has received scarce attention as a driver of overall or top income inequality from both camps. The literature on earnings inequality focuses mostly on men (Salverda and Checchi, 2015) and, as we saw in Section 1.3, the SBTC literature fails to explain some dynamics in gender wage differentials (Card and DiNardo, 2002). The explanations of concentration at the top of the income distribution we reviewed in Section 1.3.3 do not explicitly take gender differentials into accounts. Assuming perfectly competitive markets and efficient assignment of talent to jobs, they implicitly predict that income gaps between genders at the top should be absent if there is no difference in talents and skills between men and women. In this framework, the existence of these gaps signals that women do not have or have less skills and talents than men. As several dimensions of women's average educational levels improved more or as much as men's Goldin (2014), such skills are probably unobservable rather than observable Card and DiNardo (2002). This implication is quite problematic, since it is an implicit assumption of a gender bias in the labour market, especially for top jobs. There is anyway a great deal of evidence of under-representation of women at the top of the distribution. Atkinson et al. (2018) analyse the tax data of countries in which the tax system is based on individuals, which allows to distinguish between male and female members of households. They find that women are severely under-represented in the top 10% and the top 1% in all the countries taken into analysis. While some improvement in terms of women's presence has taken place in the top decile, this was less the case in the higher percentiles. Moreover, the income is more concentrated at the top for males than for females, which can be interpreted as evidence in favour of the existence of a "glass ceiling" for incomes. Piketty et al. (2018) come to similar conclusions in the analysis of DINAs in the US. Although the share of women in the top percentiles has increased from the 1980s, the increase is smaller as one climbs the income ladder. In 2014, women represent 16% and 11% circa of the top 10 percent and top 1 percent US income share, respectively. Guzzardi et al. (2022) provide insights on the distribution of income between genders in Italy. They find that the share of women in income groups is increasingly lower as one moves up to the highest percentiles. While women are the majority in the bottom 50 percent, they are about a fourth of the top 10 percent an about a fifth of the top 1 percent, falling down to 10% in the top 0.1 percent. They also find evidence of a persistent gender gap throughout the whole distribution. For what pertains Italy, we also find evidence of severe female under-representation in top earnings jobs such as liberal professionals and directors of listed firms in Chapters 2 and 3.

1.5   Conclusions

Increasing inequality in personal distribution of income due to the concentration at the top of earnings from labour is now a widely accepted fact, but there is no consensus on what causes it. The relevant literature concerning this issue is divided in two main strands. On the one hand, those that point out to market factors, such as extreme forms of competition, technological progress and the dynamics of relative supply and relative demand for skills. One the other hand, those that point out to institutional factors and to market imperfections, depending on specific policy choices made in the last four decades in the field of labour, financial and international markets and of corporate governance.

To reflect on this dichotomy is useful, not just for the sake of historical accuracy, but also for practical reasons. The economic implications of the two explanations differ widely, especially in terms of policy recommendations. In this concluding section, we will take some time to understand why it is economically important to have a precise definition of the determinants of income inequality.

Firstly, this debate is clearly related to the theoretical microeconomic literature on equality of opportunities and on the role of "effort and luck" (e.g. Van Parijs, 1991; Roemer and Trannoy, 2016, 2016). IIn fact, it is straightforward to see that, according to market-based theories, the current increase in income inequality is due to changes in the way in which effort is remunerated. On the opposite, institutions-based theories see it as a result of the remuneration of factors outside individual control and responsibility, if not as the outcome of political decisions, market imperfections and rent-seeking behaviours.

Things may be even subtler. In fact, if one thinks to the case of superstars described by Rosen (1981), it may be also argued that, as perfect and efficient the reward allocation mechanism may be, nonetheless it would be problematic and maybe distortionary to give such a disproportionate reward to few individuals, especially if their talent consist merely in being born with an extraordinary size or in being able to attract a wide audience. A similar argument was made by Philippon and Reshef (2012) for finance, as already described in Section 1.4.2. Wage differentials may also be the consequence of a premium to skills, but such premium may be too strong an attractor: talents may be channeled away from productive sectors into less productive (as sports or showbusiness) or rent-capturing sectors (as to some extent is finance nowadays), at the detriment of social welfare (Murphy et al., 1991).

Roemer and Trannoy (2016) argue that an adequate policy should incentivize effort and even out the fraction of outcomes depending on circumstances, taking into account the fact that the level of effort one can offer may depend on circumstances too (e.g. access and results in high-level education for individual with a disadvantaged background). Thus, it is not indifferent for policy considerations whether one sees inequality as an outcome of "natural" market factors or as a result of inefficiencies and rent extraction.

The economic implication of the market-based strand of theories is that inequality is, again, interpreted as a result of maybe unfair, but efficient and well-functioning mechanisms. Remedies should hence focus mainly on education policies aiming at increasing and stabilizing the relative supply of skilled workers, while other measures include moderate redistribution, removing frictions from labour markets and taking

care of the bottom half of the distribution, while letting the top earners become as rich as they can. Instead, institutions-based theories are also concerned with efficiency, as they see the concentration of income as a symptom of rent capture and/or of misallocation of resources. Hence, supporters of these theories propose not only a return to stronger redistributive polices, but also "playfield levelling", pre-distributive measures to re-balance power between workers and managers, top earners and the middle-class, wages and profits, and so on.

In conclusion, we argue that both theories are insufficient to fully explain the trends in top labour incomes. Market-based theories have often been rigorously modeled and tested empirically, but in Section 1.2 we saw how they fail in explaining some observed facts, especially the time and cross-country variability of earnings at the top. Institutions-based theories, instead, provide a possible explanation for this variability and thoroughly describe the role of rents in this issue, but sometimes they lack of theoretical modelling and of empirical analysis (with some exceptions, e.g. Piketty et al., 2014). Thus, probably none of these two stories is entirely false, as certainly technological progress, globalization, supply and demand for skills on the one hand, and institutions and political decisions on the other, have all played a role. But to overstate the role of the former determinants and neglect the role of the latter is misleading. Hence, a possible path for future research might be to analyse empirically all the determinants of labour income inequality together (especially rents- and institutions-related ones) and, possibly, to elaborate a theoretical explanation that is able to understand how and to what extent each of them has contributed to this issue.

Chapter 2

Earnings Gaps Between Regulated and Unregulated Workers Along the Distribution: Evidence from Italy

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Abstract

Regulated occupations are receiving growing attention due to their increasing relevance in contemporary economies (22% of workers in the EU and 29% in the US are subject to some form of regulation). However, also because of data limits, both labour income distribution among regulated workers and earnings gaps between workers in regulated and unregulated jobs have been scantly investigated. Starting from this background, and by using an innovative panel dataset developed merging survey and administrative information, this chapter focuses on the case of Italy with a twofold aim: first, analyse levels and trends of the income distribution of liberal professionals, also in comparison with non-regulated workers with similar skills; second, exploit liberalisation reforms to identify the source of the possible earnings gap between regulated and unregulated workers, according to the idea that a liberalisation should reduce earnings premia whenever these premia were related to rents. To this aim, applying a difference-in-differences methodology, longitudinal incomes of professionals belonging to some liberal professionals' categories are compared to those of managers who hold a tertiary degree to observe whether the reduction in the regulation changed earnings differentials between the two groups of workers both at the mean and at the various percentiles of the earnings distribution.

2.1   Introduction

Regulated professions are the object of a growing strand of the economic literature (e.g., Kleiner, 2000; Kleiner and Kudrle, 2000; Kleiner and Krueger, 2010, 2013; Koumenta et al., 2014; Koumenta and Pagliero, 2016, 2019; Kleiner et al., 2016; Koumenta et al., 2018; Gittleman et al., 2018; Mocetti et al., 2022, 2021). They are receiving increasing attention due to their relevance in modern economies, given that 22% of workers in the European Union (Koumenta and Pagliero, 2019) and 29% in the United States (Kleiner and Krueger, 2013) are involved in licensing or some other form of regulation.

Amid occupational regulations, licensing is the most restrictive since it prevents non-licensed individuals from practising a given profession (Koumenta et al., 2014). Self-employed liberal professionals – lawyers, notaries, physicians and the like – represent a relevant part of licensed workers (36% of all regulated workers in Italy, Mocetti et al., 2021) and are usually subject to regulations in terms of entry requirements (e.g., university degree, professional experience, state examination), prices, tariffs and codes of conduct (e.g., on advertising and business structure). In addition, it is very often required for licensed professionals to enrol in a professional body, which enforces rules and norms with disciplinary and sanctioning power (Mocetti et al., 2022).

While initially limited to the United States, the interest for regulated occupation has grown in the European Union too. Koumenta et al. (2014) estimate the quota of regulated occupations on EU's labour force, ranging from a minimum of 9% to a maximum of 24%, with significant cross-country heterogeneity, both in the overall prevalence of regulation and in the distribution of regulation among occupations. Some countries – including Italy – stand out for a high quota of regulated professions. In Italy, estimates say that regulated occupations make up about 20% of total employment (Koumenta and Pagliero, 2019), and the share of licensed liberal professionals (*professioni ordinistiche*) over those employed in regulated occupations amounts to approximately 35% (Mocetti et al., 2021). However, despite its large and increasing importance, limited attention – also for the Italian case – has been paid to analyse, on the one hand, the characteristics of regulated professionals and, on the other hand, the effects of regulations on workers' labour market outcomes. One of the main reasons behind this gap in the literature is the lack of appropriate data, especially concerning self-employed regulated workers.

Thus, the main aim of this chapter is to understand trends over time in the earnings of self-employed licensed professionals in Italy – focusing on the whole earnings distribution – and to assess mechanisms behind these trends. Although the existing literature already provides some insights on labour market outcomes of regulated occupations, mainly on regulation-induced premia, the evidence on what causes them is somewhat mixed. Causal inference techniques exploiting exogenous effects from policy interventions have been used to address the first issue (e.g., Kleiner et al., 2016; Raitano and Vona, 2021), but only on few occasions due to the scarcity of exogenous events. Furthermore, much attention is given to the average effects of regulation and reforms, but less to their effects along the whole distributional ladder.

This chapter tries to address the issue of data availability and reliability by

exploiting a novel dataset, obtained by merging survey data from various waves of the Italian Statistics on Income and Living Condition (IT-SILC) and administrative information from INPS social security records. This dataset allows many improvements in the availability and quality of data on regulated professionals with respect to the existing literature.

We thus focus on the case of Italy with three main goals: first, we analyse levels and trends of earnings distribution of four major categories of liberal professionals (lawyers, accountants, engineers and architects), also in comparison with non-regulated workers with similar skills; second, we retrieve our estimate of the earnings premium from regulation; finally, we exploit the liberalisation reforms of regulated professions occurred in 2006 and 2011 to identify the source of the possible earnings gap between regulated and unregulated workers, applying a difference-in-differences methodology, in the likes of Kleiner et al. (2016) and Raitano and Vona (2021). We also use the recentred influence function (RIF) methodology (Firpo et al., 2009) to perform an unconditional quantile regression (UQR) and obtain the distribution among deciles of the effects of the reforms.

Our results confirm the existence of an earnings premium from regulation, even when regulated and non-regulated high-education workers are compared. We also exploit liberalisation events to infer drivers of that premium. Indeed, following Raitano and Vona (2021), we should expect that a liberalisation should foster earnings premia of the most skilled workers. As a consequence, if a liberalisation brings to an earnings premium reduction one can assume that the previous premium was on average, at least partially, related to rents instead of a return from high abilities. However, the DiD analysis provides mixed evidence. The 2006 reform apparently (and counterintuitively) increased the regulation premium, while the evidence for the 2011 reform is mixed. The picture however changes when the focus is on the whole earnings distribution and UQR estimates are adopted. As a matter of fact, the increase in the premium following the 2006 reform was concentrated in the lower deciles of the earnings distribution. Instead, individuals in the top-end of the distribution experienced a reduction in their earnings relative to the control group. This fact leads to the main takeaway of this work: it is crucial to look beyond effects on the average of reforms when analysing labour markets characterised by significant levels of inequality.

The remainder of the chapter is organised as follows. Section 2.2 will summarize the related literature. Section 2.3 will present the institutional context, describing regulated occupations in Italy and the reforms between 2006 and 2012. Section 2.4 will describe the dataset and Section 2.5 will explain the empirical methodology employed in the analysis. Section 2.6 will present the main results, while Section 2.6 will investigate possible heterogeneity effects and provide robustness checks. Finally, Section 2.7 concludes by discussing the results and their implications.

2.2 Related Literature

From a theoretical point of view, economists see licensed occupations either negatively or positively. On the one hand, some argue they are a form of rent-seeking by powerful professional bodies that gives rise to wage premiums and creates barriers to

entry (Friedman and Kuznets, 1945). On the other hand, others consider licensing helpful in improving occupation-specific human capital and skills (Shapiro, 1986) or overcoming asymmetric information on the quality of specific goods and services, thus favouring consumers (Akerlof, 1970).

From Kleiner and Kudrle (2000) onwards, some empirical studies have found little or no evidence on the improvement in human capital nor the reduction in asymmetries, while there is some evidence of rents and market distortions. Kleiner (2000) find that more restrictive standards do not significantly affect service quality. In turn, they affect entry levels in the market negatively and service prices and wage levels positively.

The relevant literature has focused much on the effects of regulation on labour market outcomes. Above all, licenses seem to create a significant wage premium for licensed professional workers. Estimates for the US range from a 7.5% (Gittleman et al., 2018) to an 18% (Kleiner and Krueger, 2013) premium on hourly wages for workers required to have a license. Similarly, Koumenta and Pagliero (2019) estimate a 4% wage premium from regulation for the European Union, with a considerable degree of variability between occupations.

At the same time, and unlike other premium-inducing institutions (e.g., unions), licensing seems to contribute to wage dispersion among regulated workers, especially in the upper tail of the distribution (Kleiner and Krueger, 2013). Furthermore, Gittleman et al. (2018), while confirming that licensing does not induce wage compression, find that US workers in the bottom quartile seem to gain from having a license too. Finally, Koumenta and Pagliero (2019) analyse the effect of licensing on the entire wage distribution in the EU, finding once more that licensing increases dispersion at the top and the bottom of the distribution, thus benefitting those at the top. These results suggest that regulation has relevant effects on income distribution and inequality.

The existing literature presents more interesting evidence, such as that for which none of the most frequent requirements (educational levels, internships, further education after the entrance, examinations) has an additive effect on wages (Kleiner and Krueger, 2013). In addition, having a license when it is not required has no apparent effect on wages, while it does when it is required (Gittleman et al., 2018). Moreover, Koumenta and Pagliero (2019) estimate that at least one-third of the wage premium from regulation can be attributed to restrictions instead of skills signalling. Altogether, the results in the relevant literature are consistent with the hypothesis of licensing as a barrier to entry and of the resulting wage premium as a monopolistic rent.

For what concerns Italy, one of the most recent works on regulated occupations is by Mocetti et al. (2021), who use data from the Italian Labour Force Survey (LFS) and the Regulated Occupations Database of the European Commission. Their estimates show that regulated occupations present lower mobility than non-regulated occupations, both to/from and within regulated occupations. Regulations are estimated to contribute to more than half of the reduced mobility, while the other half is due to compositional factors. Moreover, Mocetti et al. (2021) find a significant wage premium – approximately 18% for *professioni ordinistiche* – higher for female and self-employed workers and lower for younger workers. These results are hence in line with findings in the international literature.

As we said in the previous section, the literature on regulated occupations often stresses the lack of appropriate data (Kleiner and Kudrle, 2000; Koumenta et al., 2014). Another frequent problem involves the risk of estimates of wage premia being biased by unobservable variables (Kleiner and Krueger, 2013; Koumenta et al., 2014). Therefore, several works in this field have recurred to causal inference econometric techniques, exploiting regulation reforms as an exogenous event to isolate the actual link between licensing and the observed labour market outcomes. For instance, Kleiner et al. (2016) employ a difference-in-differences methodology to analyse the relaxation of regulations on nurse practitioners' possibility to prescribe drugs and their scope of practice. They find that this policy raises nurses' wages and lowers physicians' wages while lowering the overall prices of health care services. No significant effects on the quality of medical services were observed. These findings suggest the existence of a rent-induced wage premium for physicians.

Raitano and Vona (2021) analyse the intergenerational transmission of earnings inequality within licensed sectors (lawyers in this case). In a quasi-experimental setting, liberalisations (the 2004 reform of bar exams and the 2006 "Bersani" decree) were used as an exogenous discontinuity to disentangle the effects of lower monopolistic rents and increasing returns to specific skills that parents can transfer to children. They argue that such an empirical strategy, which compares pre- and post-reform earnings of lawyers with a law family background with those of lawyers with no family background, can help understand the nature of their earnings premium: they hypothesise that a post-reform reduction in the premium would signal that rents were prevailing ex-ante, while if the post-reform premium increases, then the enhanced market competition would reward parent-transmitted specific skills better. They find evidence in support of the first hypothesis and thus deduct that the earnings premium was generated by monopolistic rents from nepotism.

Mocetti et al. (2022) investigate a similar issue, exploiting the liberalisations of 2006 ("Bersani" decree) and 2011 ("Monti" decree) to understand the link between regulation and intergenerational occupational mobility on a variety of professional services and found that liberalisation leads to a reduced propensity for career following.

2.3   Institutional Context

Italy has a tradition of strict regulation of professional services, although a series of reforms put in place in the last two decades has loosened it (two of which, the "Bersani Decree" of 2006 and the "Monti Reforms" of 2011-2012 are at the centre of this chapter). In 1998, the OECD indicator of Product Market Regulation for professional services[1] saw Italy as the most regulated country for architects and engineers (4.02 for both), the third most regulated for accountants (3.67) and the sixth most regulated for lawyers (3.92). Twenty years later, this indicator reflected the process of liberalisation that occurred in the meantime, since Italy went down

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[1]OECD has been producing the indicators of Product Market Regulation since 1998 and updates them every five years. These indicators are available for many sectors, including professional services, and measure regulatory barriers to entry and competition (such as educational and membership requirements) and conduct requirements. They range from a maximum of 6 to a minimum of 0.

to sixth place for architects (2.68), to twelfth place for engineers (2.15), to the fifth for accountants (2.61) and down below for lawyers (2.57), ranking among the ten less regulated countries.

Like many other developed countries, Italy has observed a growth in the prevalence of regulated occupations over total employment. For example, estimates by Koumenta and Pagliero (2019) for 2015 show that regulated occupations make up 19.3% of total occupation. Estimates by Mocetti et al. (2021) describe well their growing relevance: they went up from about 20% in the early 1990s from slightly less than 24% in 2020.

Regulation of occupations in Italy, especially licensed professions, includes entry requirements and restrictions, professional associations (*ordini*), codes of conduct and disciplinary procedures and, previously, price regulation (Pellizzari et al., 2011). Regarding entry requirements, these include educational attainments (usually a tertiary degree or a specialisation school degree) and compulsory practice. Enrolment in an association is always conditional to passing a state examination, with specific formats and organisational characteristics for each profession.

Every association has its code of conduct and its disciplinary procedures, which the association itself enforces. Before the liberalisation process, these codes included rules on prices, limitations to advertising, rules on competition between colleagues and multi-disciplinary practices. Rules on prices usually included minimums and maximums, fee schedules, either fixed and mandatory or recommended. Competitive advertising used to be prohibited as well as advertising price and costs, and many associations imposed both ex-ante and ex-post controls on the contents of advertising.

Hence, a process of liberalisation has taken place starting from the mid-2000s. The 2006 "Bersani" reform and the series of reforms adopted by the Monti government between late 2011 and early 2012 represent the most important acts in this process. The "Bersani" reform abolished minimum fees and the restrictions to advertising while permitting to offer contingency pricing and to form "multi-disciplinary" societies (i.e., societies between different kinds of professionals). Subsequently, the "Monti" reforms completely abolished fixed or recommended prices and fees (both floors and caps), made the written previous agreement on compensation mandatory and reiterated the possibility to advertise prices, qualifications and professional activity. Thus, the liberalisation process regarded conduct requirements more than entry barriers, which were only slightly affected by "Monti" reforms by shortening the required training periods. This is another reason why we focus on earnings effects rather than mobility effects.

2.4 Data and Descriptive Evidence

2.4.1 Dataset

We employ a dataset obtained from merging the 2004-2017 waves of the Italian component of the EU-SILC (IT-SILC) survey with the administrative longitudinal social security records collected by the Italian National Social Security Institute (INPS). We call this dataset "AD-SILC" (where "AD" stands for "administrative") to symbolise the union of administrative and survey data. INPS records contain the employment and earning histories of all individuals working in Italy, from the moment

they entered the labour market up to the end of 2018. Thus, the main advantage of this dataset is the possibility to reconstruct working careers in Italy, year by year and with a high degree of confidence, granted by data from administrative sources. Furthermore, it allows having a comprehensive picture of working weeks, type of employment (e.g., public or private employment, self-employment), contractual arrangements (such as subordinate, "para-subordinate", consultancies) and gross earnings, yearly and for each working relationship. We enrich this information with records on workers' education provided by IT-SILC.

Therefore, on the one hand, the merged dataset provides much information on working histories and workers' characteristics. On the other hand, it allows reconstructing other helpful features, such as working experience. For the sake of our purposes, this dataset provides information on employees and self-employed earnings, job qualifications for private employees (i.e., managers, white collars or blue collars, but for private employees only) and on the specific pension fund the worker is enrolled in. This latter information allows us to precisely identify the types of liberal professionals (e.g., physicians, lawyers, engineers, technicians, see Table 2.4) which, are mentioned, are compulsory enrolled to pension funds, managed by their professional association. Thus, in this chapter we precisely distinguish the various professional categories, disentangling regulated and non-regulated occupations.

Table 2.1. Sample composition by gender, age, geographical location, educational level and job qualification (2000-2017).

	Full Sample	Professionals
Gender - Female	45.38%	31.38%
Age		
<30	30.21%	9.96%
30-39	27.82%	35.12%
40-49	23.67%	28.5%
>50	18.3%	26.42%
Area of work		
North	52.69%	47.41%
Centre	23.48%	27.45%
South	22.83%	25.14%
Educational level		
Not reported	0.46%	0%
Primary	21.16%	0.85%
Lower Secondary	27.95%	1.72%
Higher Secondary	37.81%	25.10%
Tertiary	12.62%	72.34%
Job qualification (private employees only)		
Manager	1.48%	
White collar	25.75%	
Blue collar	60.9%	
Apprentice	11.87%	
N. of individuals.	147,494	6,824

Table 2.1 represents the socio-demographical composition of the individuals included in the AD-SILC sample (i.e., those individuals interviewed in the various IT-SILC waves who had at least a working spell tracked by the INPS archives). The whole AD-SILC dataset under-represent professionals before 2000 (since some private funds did not send all information to the INPS register about workers, named *Casellario degli Attivi*). Henceforth, we only considered years from 2000 onwards. In addition, we cut observations belonging to the first percentile of the earnings distribution, since they are most probably severely affected by reporting errors. Table 2.2 reports the percentage of workers belonging to the various workers categories in 2000-2017, as identified by the INPS fund where they are enrolled. We aggregated all pension funds of professional associations together to represent liberal professionals as a whole. *Gestione separata* is the pension fund covering "parasubordinate" workers. These individuals are formally self-employed, even though their working activity relies mainly on one or few clients, that can be considered as their *de facto* employer. Observations of individuals enrolled in *Gestione Separata* are then disaggregated in consultants and other (non-regulated) professionals. The figures show the distribution of workers among the various types of employment according to the most relevant (in terms of incomes) working spell in a year (e.g., an individual working both as an employee or a professional is recorded as a professional once her highest yearly labour income comes from the professional activity). The percentage of licensed professionals is lower than the estimates available in the literature, averaging 3.33%. The percentage of professionals grows throughout the years, probably reflecting an improving representativity of the sample, since some private funds might have been some delay in past years to transmit their administrative records to the *Casellario degli Attivi* archive. Instead, Table 2.3 represents the percentage of individuals worked at least once a year as liberal professional, also including those who have another main occupation. This percentage is is about 1 point higher than that in Table 2.2. We then restrict our sample to include professionals and non-regulated high-skilled occupations, similar in characteristics to regulated professionals, to make more reliable and meaningful comparisons. We thus select graduated managers from the private sector, graduated consultants and graduated non-regulated professionals when making comparisons on descriptive evidence and delete blue- and white- collars from the sample when estimating the earnings premium.

Table 2.2. Occupational structure of the full sample, 2000-2017.

Year	Private Employees	Public Employees	Other Consultants	Artisans and Professionals	Shopkeepers	Professionals
2000	61.01	13.76	3.16	0.64	19.07	2.36
2001	60.73	13.89	3.7	0.64	18.6	2.43
2002	60.83	13.64	4.36	0.66	18.03	2.47
2003	60.42	13.65	4.94	0.68	17.68	2.63
2004	60.29	14.13	4.55	0.74	17.53	2.75
2005	60.16	14.36	4.40	0.78	17.4	2.90
2006	59.95	14.58	4.63	0.81	17.06	2.98
2007	60.33	14.61	4.61	0.79	16.63	3.03
2008	60.63	14.76	4.36	0.78	16.39	3.08
2009	60.61	15.01	4.01	0.85	16.26	3.25
2010	60.58	15.2	3.91	0.88	16.07	3.35
2011	60.58	15.22	3.98	0.93	15.84	3.46
2012	60.73	15.3	3.75	0.98	15.63	3.61
2013	61.43	14.75	3.29	1.02	15.63	3.89
2014	61.53	14.71	3.18	1.07	15.4	4.11
2015	62.05	14.79	2.83	1.09	14.96	4.29
2016	62.45	15.25	2.33	1.10	14.56	4.3
2017	63.39	15.03	2.19	1.09	13.97	4.33
Average	*60.97*	*14.6*	*3.8*	*0.86*	*16.47*	*3.29*

Notes: *The columns report the percentage of individuals belonging to each pension fund. "Professionals" refers here to all liberal professionals enrolled in an association.*

Table 2.3. Occupational structure of the full sample

Year	Professionals (%)
2000	3.28
2001	3.37
2002	3.43
2003	3.62
2004	3.79
2005	3.94
2006	4.05
2007	4.15
2008	4.26
2009	4.46
2010	4.61
2011	4.72
2012	4.91
2013	5.21
2014	5.37
2015	5.64
2016	5.65
2017	5.64
Average	*4.45*

Notes: *"Professionals" refers here to all individuals working at least once in a year as a liberal professional enrolled in an association*

To limit mis-reporting issues and obtain a more meaningful sample, we also re- strict the sample of regulated professionals. As previously noted, the dataset contains information from every single pension fund of professional associations, thus allowing us to select distinct typologies of self-employed professionals. Table 2.4 shows the composition of the sample in terms of these typologies.

We proceed with selecting the professions for which tertiary graduation is a require- ment for enrolment, for which we may observe individuals with relatively high earnings and for which there is a sufficient number of observations. We do so because a strand of literature on income inequality says that its increase is often lead by the top-end of the distribution (e.g., Atkinson et al., 2011), and since skills and education are often included among the leading causes of rising earnings gaps (e.g., Acemoglu and Autor, 2011). Thus, we select a subsample including engineers and architects (who belong to the same professional association), lawyers and accountants. However, we exclude physicians since the observations on their earnings from self-employment are often plagued by cross-reporting with earnings from public employment.

We check for the representativeness of our subsample of professionals by comparison with data disclosed by pension funds in Appendix A.

Table 2.4. Number of professionals per typology (2000-2017).

Profession	Individuals	Observations
Psychologists	276	2,796
Nurses	280	2,688
Industrial technicians	112	1,939
Agricultural technicians	29	298
Biologists	60	643
Chemists, geologists et al.	122	1,849
Engineers & architects	859	9,751
Lawyers	794	9,548
Physicians	1,133	25,112
Veterinarians	136	2,399
Surveyors	474	8,150
Bookkeepers	100	2,399
Pharmacists	276	4,881
Accountants	257	3,627
Labour consultants	110	1,842
Notaries	18	279

In further analyses, as mentioned, we compare professionals with a subsample of high-skilled individuals in order to make more meaningful analyses and comparisons on earnings levels and distribution trends. Table 2.5 summarises the demographic characteristics of these subgroups.

Table 2.5. Summary of the characteristics of the reference categories (2000-2017)

	Professionals	Accountants	Engineers/ Architects	Lawyers	Managers	Consultants	Other Professionals
Women	40.84%	29.57%	33.06%	52.90%	24.19%	52.26%	44.28%
Age							
<30	4.62%	4.55%	5.25%	4.26%	0.64%	33.43%	14.78%
30-39	40.15%	40.15%	40.28%	42.17%	24.73%	34.82%	35.01%
40-49	37.03%	39.49%	36.38%	38.76%	43.46%	14.30%	25.22%
>50	18.2%	15.81%	18.09%	14.81%	31.17%	17.44%	24.98%
Geographical area							
North	42.57%	47.22%	50.53%	38.26%	67.22%	52.74%	59.94%
Centre	27.11%	23.41%	26.22%	28.22%	23.55%	27.49%	26.40%
South	30.33%	29.37%	23.25%	33.52%	9.23%	19.77%	13.66%
N. of Ind.	1,910	257	859	794	1,190	9,135	1,139

2.4.2 Descriptive Evidence

We now present descriptive evidence on earnings trends and inequality. We start by looking at the evolution of mean and median earnings of professionals in the reference period 2000-2017 in Figure 2.1. Despite some issues of representation of individuals with very high earnings in our dataset cannot be ruled out (also due to income underreporting in administrative archives), mean earnings have increased substantially in the first half of the 2000s. However, we observe a large and increasing gap between mean and median earnings, which signals very high inequality. Furthermore, mean earnings peak in 2007 and fall for the following ten years, partly due to the 2007-2008 crisis, while our analysis in Section 2.5 will try to understand the role of liberalisations in this trend. Finally, the mean earnings of employees in the private sector are presented as a reference point for the rest of the economy, suggesting that regulated professionals' earnings are significantly higher than those of other workers.

In Figure 2.2, we can observe trends in mean earnings of the three typologies of liberal professionals in analysis. Accountants' earnings appear to be significantly higher, but as we will see later, we also observe more inequality and higher top earnings among them. We suspect that under-reporting might have affected lawyers' earnings since the mean is lower than that of engineers and architects in the first years and surpasses it as more top earners are included in the dataset.
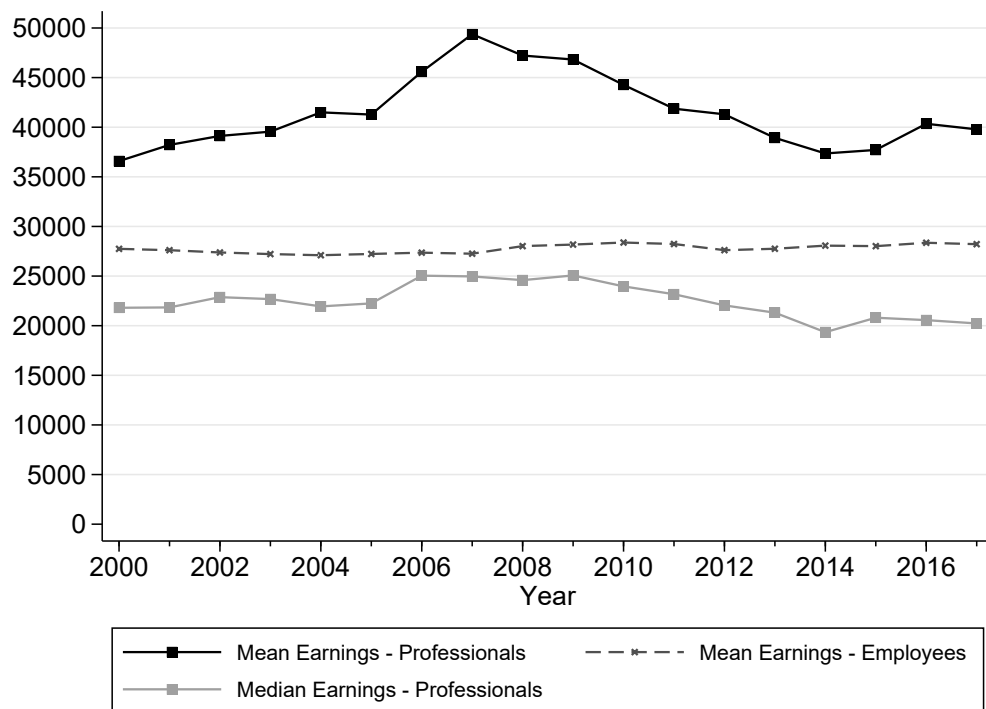
Figure 2.1. Trends of mean and median earnings of professionals (2000-2017) - Notes: the selected subsample of professionals (accountants, architects, engineers and lawyers) is now considered. Mean earnings of private employees are represented for reference.
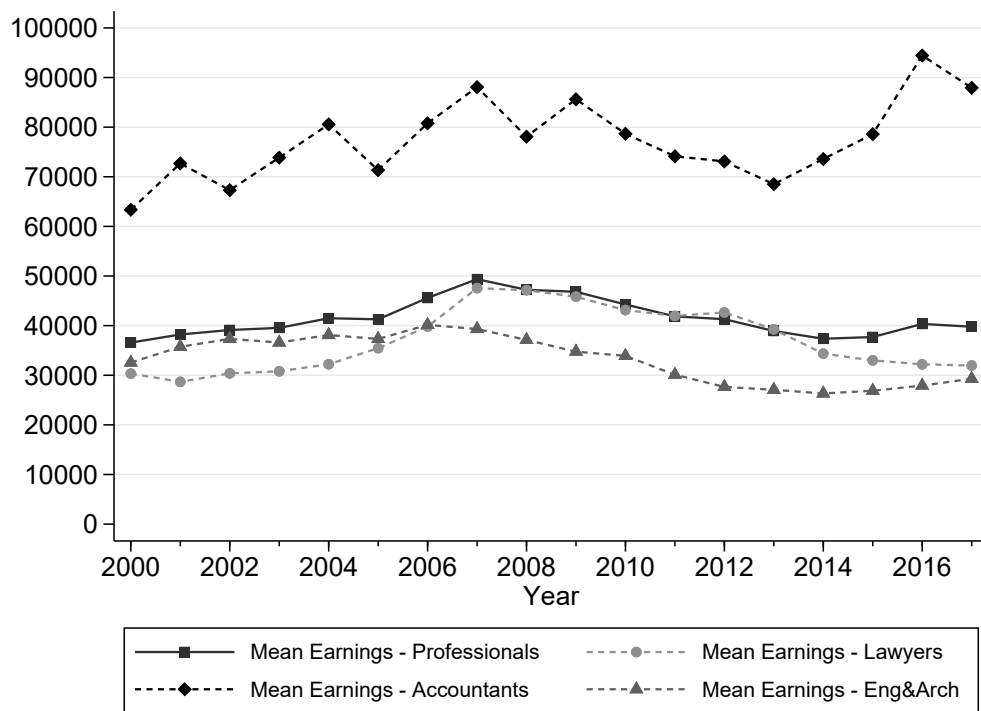
Figure 2.2. Aggregated and disaggregated mean earnings of the three selected categories (2000-2017).
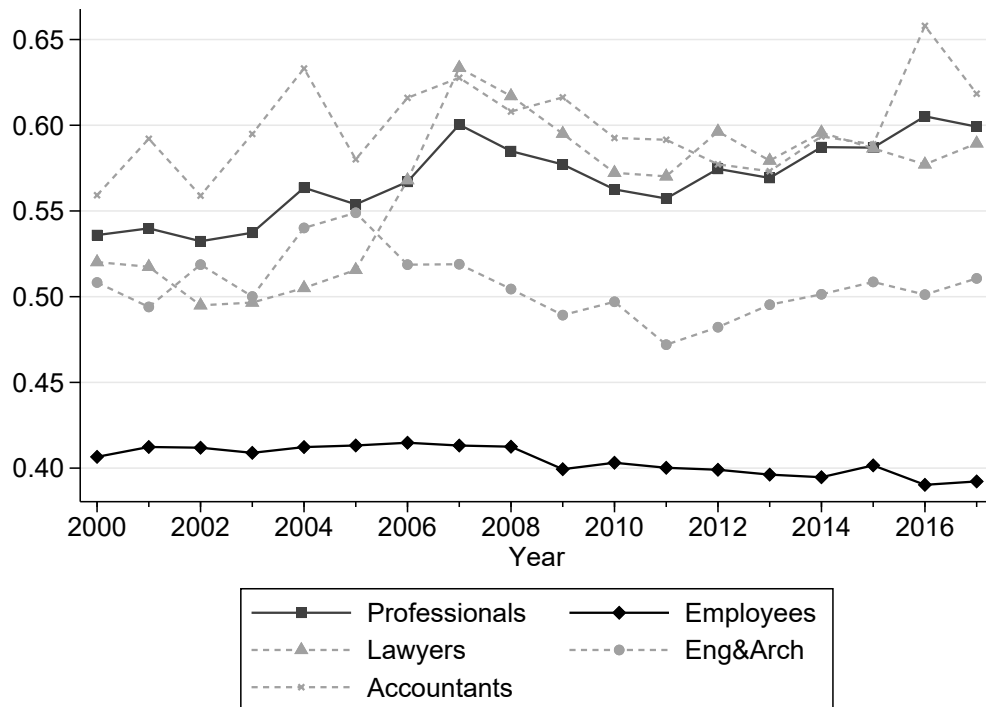
Figure 2.3. Aggregated and disaggregated Gini Index for the earnings of lawyers, accountants and engineers/architects (2000-2017). - Notes: private employees are represented as a benchmark.

We now take a look at inequality indexes. Figure 2.3 presents the trend in Gini Index in the reference period, computed on the earnings of workers enrolled to Cassa Forense, CNPADC and Inarcassa (both jointly and separately for the three categories) and on those of the employees of the private sector as a benchmark. Zeroes and negative values are excluded (as they are not included in our sample at all)[2]. Indeed, our subset of professionals presents exceptionally high inequality, with a Gini well above 50% for the whole period and rising to 60% in 2017. Lawyers and accountants are, perhaps unsurprisingly, the occupations showing the highest inequality. At the same time, it is slightly more moderate for engineers and architects, but still way higher than the Gini Index for private employees (about 40% - remember that we are taking gross earnings into account, which are usually more unequally distributed than disposable incomes).

The high level of earnings concentration at the top is also clear from trends in the top 10% and bottom 50% earnings share (Figure 2.4). The top 10% share rises from 40% in 2000 to about 50% in 2017. At the same time, the share of earnings for the bottom half of the distributions slightly decreases, remaining at around 15%. The analysis of disaggregated earning shares confirms that accountants and lawyers are characterised by higher top earnings, while earnings of engineers and architects are slightly less unequally distributed.

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[2]No sample weights were used.
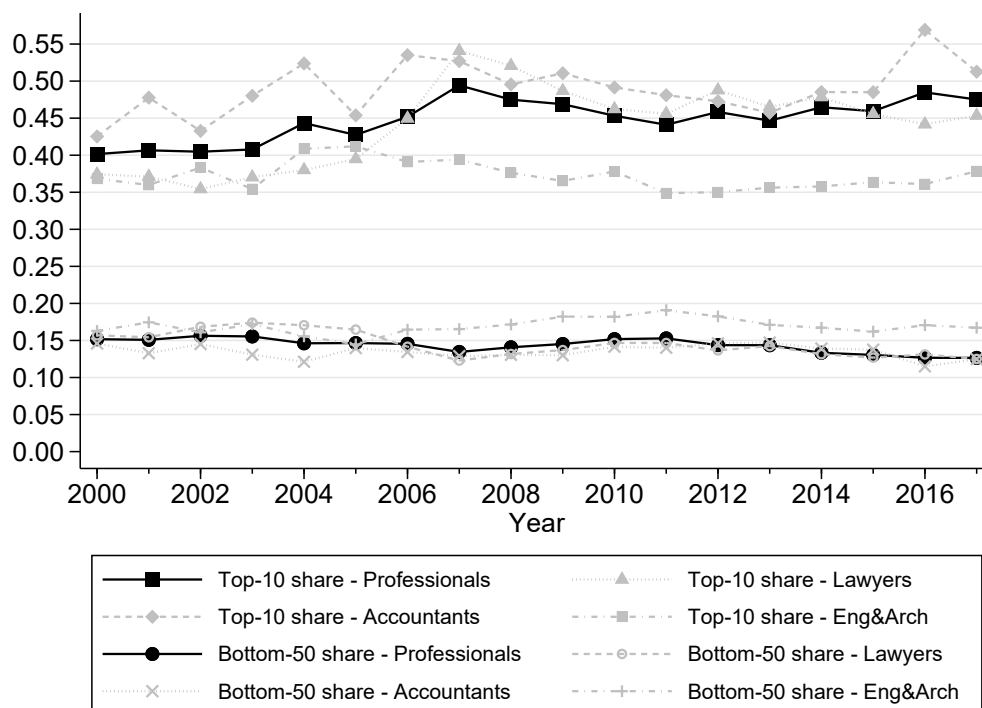
Figure 2.4. Top 10 and bottom 50 percent earnings share of professionals (2000-2017).

We now proceed to compare regulated professionals with other categories of high-skill/high-education workers. Figure 2.5 compares trends in mean earnings of regulated professionals, graduated managers of the private sector, graduated consultants and graduated (non-enrolled) professionals. Even though there is a wide gap in levels, we can see that managers and regulated professionals share a similar trend. We will see this in depth in Section 2.5. However, managers earn unsurprisingly more on average than the other three types of workers, while consultants and non-enrolled professionals earn less on average.

Nevertheless, as we see from Figure 2.6, earnings are more compressed within managers. Instead, we observe more dispersion for professionals (both enrolled and non-enrolled) and consultants: earning shares of the top 10% increase from 35% to about 40% for non-enrolled professionals and stay above 40% throughout the whole period for consultants. Thus, these three categories seem to be characterised by extremely high inequality if we compare them to the usual reference point provided by employees of the private sector.

2.5 Estimation of the Earnings Premium from Regulation

This chapter's first goal is to estimate the earnings premium of regulated liberal professions and to verify how liberalisations have affected it, estimating the effect both at the mean and on earnings deciles. Hence, we will do so by from the estimating

Figure 2.5. Comparison of mean earnings trend between professionals and other high-skill occupations (2000-2017).
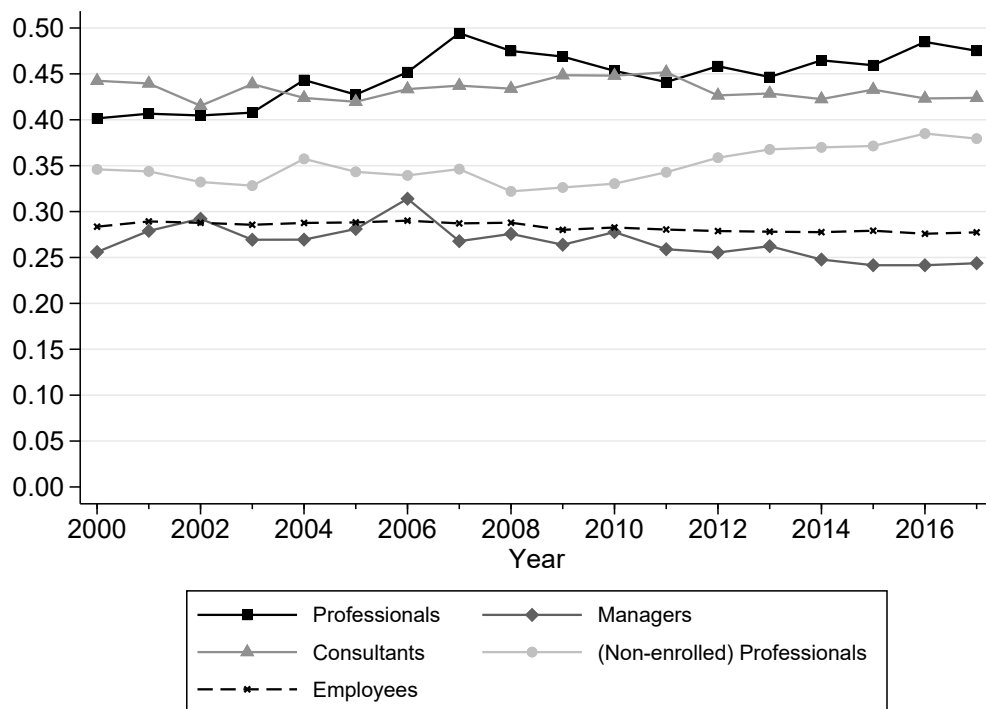
Figure 2.6. Comparison of top 10 percent income share trend between professionals and other high-skill occupations (2000-2017). Notes: private employees are represented as a benchmark.

of the following (log) earnings regression:

$$log(e_{it}) = \alpha + \beta R_{it} + \boldsymbol{\gamma\prime}\mathbf{X}_{it} + \phi_t + \epsilon_{it} \tag{2.1}$$

where R_{it} is the relevant independent variable (i.e., the worker's category), X_{it} is a set of individual control variables including gender, age and age squared, and a dummy for attaining a tertiary degree.

Furthermore, since *Cassa Forense* (lawyers' pension fund) abolished the minimum income threshold for mandatory enrolment in 2014, we also control for lawyers entering the market after that year. Finally, ϕ_t is a year dummy controlling for possible common shocks and other time trend effects.

We will estimate this equation with a pooled OLS (POLS) methodology using three different specifications. In the first specification, we exploit the whole sample to estimate a regression in which R_{it} is a set of dummy variables representing the different pension funds. The idea behind this model is to estimate premia and penalties of the various categories, hholding professionals as a baseline to estimate the relative earnings for the other categories.

In the second model, we restrict the sample to regulated professionals, managers, consultants and non-enrolled professionals. Here, R_{it} is a dummy indicating self-employed regulated professionals, thus allowing us the estimate the earnings premium of regulated professions.

Finally, in the last specification, we further restrict the sample to the three typologies of professionals mentioned above and to graduated managers, consultants and non-enrolled professionals (obviously, we eliminate tertiary degree from controls to avoid multicollinearity). R_{it} is now a dummy indicating the subset of high-skill professionals. This will obviously cause a reduction in the sample size, but it should assess more precisely the premium from regulation.

Table 2.6 shows the estimated coefficients of the three models we employ to assess earnings premium for regulated liberal professionals. In the first model, male professionals from Northern Italy represent the baseline to estimate the relative earnings for the other categories. The estimates are negative and statistically significant for all categories except private and public employees, for which the coefficient is less significant. In particular, we can see that the coefficient for belonging to a category of professionals that is not subject to mandatory enrolment is negative, thus suggesting the existence of a premium from regulation for workers enrolled in a professional association.

In the second model, we focus on workers usually considered to be highly skilled, such as managers, consultants and professionals. The estimated earnings premium for professionals is about 13%, only slightly higher than estimates from the relevant literature for the European Union and Italy (e.g., Koumenta and Pagliero,2019; Mocetti et al., 2021). Anyway, the premium from regulation appears to be lower than the premium from having a tertiary degree, estimated at about 36%.

In the third model, we further restrict the sample to professionals, managers and consultants holding a tertiary degree. This specification seems to confirm the greater importance of education in determining earnings since the coefficient for being a regulated professional is now slightly negative and not statistically significant.

Table 2.6. Earnings premium for professionals (2000-2017)

	1st Specification	2nd Specification	3rd Specification
Constant	7.453***	5.923***	5.452***
	(0.0787)	(0.111)	(0.252)
Private Employee	0.120**		
	(0.0364)		
Public Employee	0.194**		
	(0.0528)		
Consultants	-0.378***		
	(0.0374)		
Non-enrolled Prof.	-0.280***		
	(0.0368)		
Artisans & Retailers	-0.204***		
	(0.0483)		
Prof.		0.131***	
		(0.0318)	
Prof. (3 categories)			-0.00656
			(0.0373)
Education – Tertiary Degree	0.290***	0.359***	
	(0.0103)	(0.0172)	
Experience	0.000722***	0.00128***	0.00139***
	(0.0000190)	(0.0000446)	(0.0000600)
Gender – Female	-0.333***	-0.447***	-0.464***
	(0.0160)	(0.0167)	(0.0208)
Age	0.109***	0.169***	0.203***
	(0.00217)	(0.00611)	(0.0144)
Macro-area			
Centre	-0.0705**	-0.174***	-0.193*
	(0.0210)	(0.0439)	(0.0687)
South	-0.214***	-0.477***	-0.519***
	(0.0202)	(0.0522)	(0.0690)
Obs.	1089165	174684	64611

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *in (1), we exploit the full sample and use dummies for different pension funds as independent variables; in (2), we restrict the sample to professionals (regulated and non-regulated), managers and consultants and use a dummy for professionals as the independent variable; in (3), we further restrict the sample to accountants, lawyers, engineers and architects, graduated consultants, graduated managers and graduated non-regulated professionals. Standard errors are clustered at regional level.*

We also want to have a first insight into the distributional aspects of the premium from regulation, something that will be at the centre of the next Section. It seems interesting to understand if there are heterogeneities in the premium in different quantiles of the earnings distribution. Thus, we estimate again Equation 2.1 with a linear quantile regression, employing the second specification of the model we described previously.

Table 2.7. Earnings premium for professionals (2000-2017) - Linear Quantile Regression

Percentile	5th	10th	25th	50th
Professionals	0.164***	0.0426**	-0.0295***	0.0406***
	(-0.0195)	(-0.0133)	(-0.0073)	(-0.00546)
Tertiary Degree	0.517***	0.468***	0.430***	0.380***
	(-0.0195)	(-0.0136)	(-0.00728)	(-0.00512)
Experience	0.00217***	0.00200***	0.00165***	0.00128***
	(-0.0000284)	(-0.0000218)	(-0.000012)	(-0.00000832)
Age	0.319***	0.299***	0.232***	0.160***
	(-0.0062)	(-0.0045)	(-0.00298)	(-0.00191)
Female	-0.694***	-0.613***	-0.492***	-0.393***
	(-0.0212)	(-0.0142)	(-0.00767)	(-0.00541)
Centre	-0.302***	-0.236***	-0.153***	-0.143***
	(-0.0213)	(-0.0153)	(-0.00827)	(-0.00566)
South	-0.748***	-0.656***	-0.527***	-0.389***
	(-0.0282)	(-0.019)	(-0.0109)	(-0.00808)
Obs.	174684	174684	174684	174684
Percentile	75th	90th	95th	99th
Professionals	0.0786***	0.0871***	0.0994***	0.146***
	(-0.0048)	(-0.00568)	(-0.00707)	(-0.0151)
Education - Tertiary Degree	0.288***	0.235***	0.221***	0.284***
	(-0.00466)	(-0.00539)	(-0.00699)	(-0.0138)
Experience	0.000977***	0.000735***	0.000637***	0.000565***
	(-0.00000778)	(-0.0000086)	(-0.000011)	(-0.0000185)
Age	0.134***	0.121***	0.110***	0.103***
	(-0.00158)	(-0.00178)	(-0.00209)	(-0.00276)
Gender - Female	-0.347***	-0.327***	-0.325***	-0.348***
	(-0.00483)	(-0.00539)	(-0.00692)	(-0.0123)
Centre	-0.137***	-0.142***	-0.147***	-0.143***
	(-0.0052)	(-0.00567)	(-0.00771)	(-0.0135)
South	-0.317***	-0.323***	-0.342***	-0.354***
	(-0.00641)	(-0.00762)	(-0.00892)	(-0.0156)
Obs.	174684	174684	174684	174684

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *for this regression we restrict the sample to professionals (regulated and non-regulated), managers and consultants and use a dummy for regulated professionals as the independent variable.*

Table 2.7 shows the estimated coefficients of the linear quantile regression. The coefficient on the premium from regulation is statistically significant at all the percentiles in analysis and seems to be relatively higher at the two opposite ends of the earnings distribution: its highest value is at the 5th percentile, then it rapidly fades away until it becomes negative at the 25th percentile, then it slowly increases again, reaching another peak at the 99th percentile. Figure 2.7 clearly shows this U-shaped pattern. Both the coefficients for the 5th and 99th percentiles are higher than the (average) coefficient estimated in Table 2.6. Interestingly, this pattern does not show up in other relevant covariates (education, experience, age, gender, geographical location), which show a higher premium (or penalty, in the case of gender and location) at the 5th percentile and then progressively lower as we climb the earnings ladder, with some covariates showing just a relatively slight reversal of
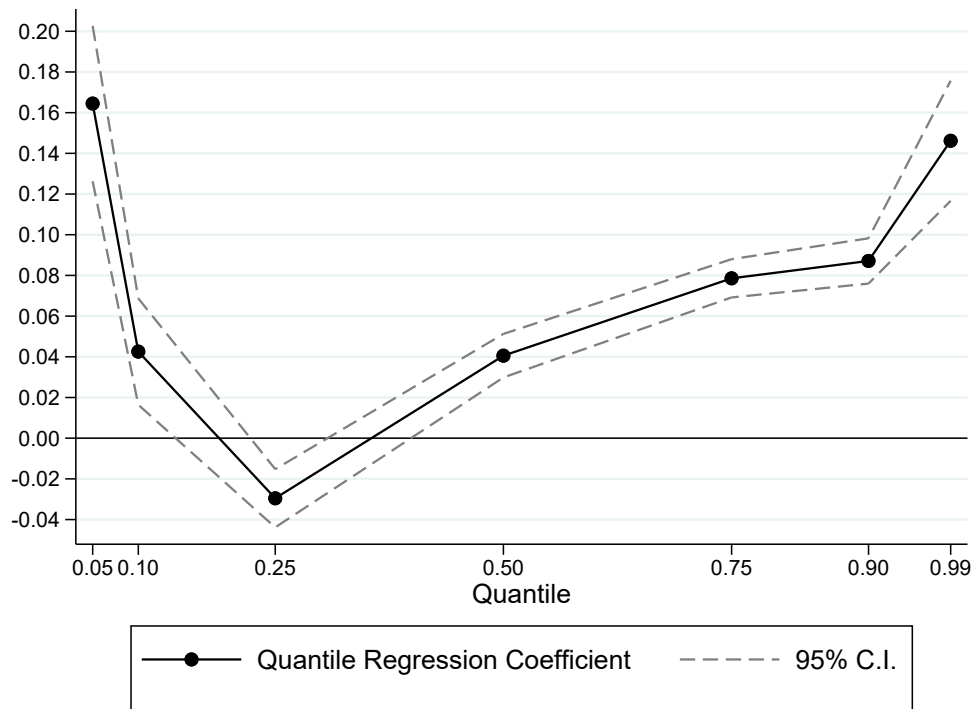
Figure 2.7. Coefficients and 95% confidence intervals of a linear quantile regression to estimate the earnings premium for regulated professionals at the 5th, 10th, 25th, 50th, 75h, 90th, 99th percentiles

the pattern at the top 1 percent.

2.6 Liberalisation Reforms Evaluation

Our next goal is to verify how the liberalisations reforms that took place in 2006 and 2011 have affected the premium that we estimated in the previous section, analysing the effect both at the mean and along the earnings distribution. We exploit such reforms as exogenous shocks to gain insights on the possible drivers of the premium, following Kleiner et al. (2016) and Raitano and Vona (2021), Analysing the magnitude and the direction of the impact of the policy change might be in fact helpful in the assessment of which possible channel prevails, as we will explain more in depth in subsection 2.6.1. We will present there the results of a difference-in-differences estimation.

Furthermore, as in Section 2.4 we described that *professioni ordinistiche* are characterized by high levels of earnings inequality, we might want to look at how liberalisations affected the earnings distribution too. Thus, subsection 2.6.2 will present the results of an extension of our DiD model employing an unconditional quantile regressions, to investigate possible heterogeneities in the effects of liberalisations along the distribution.

2.6.1 Effects at the Mean

We now evaluate the effects of the 2006-2011 liberalisation reforms, which can help to assess the existence and the determinants of an earnings premium from regulation, given that mere OLS estimation of an earnings regression may be confounded by other unobservable variables (Kleiner and Krueger, 2013; Koumenta et al., 2014). We run a regression including interaction terms for both the 2006 and 2011 reforms, with a before-after interval of four years (hence we consider the 2002-2015 period). The estimated DiD model is the following:

$$
\begin{aligned}
log(e_{it}) = \alpha + \beta_1 Post + \beta_2 Professional + \beta_3 Post2006 \times Professional + \\
\beta_4 Post2011 \times Professional + \boldsymbol{\gamma\prime}\mathbf{X}_{it} + \phi_t + \epsilon_{it}
\end{aligned}
\tag{2.2}
$$

Our preferred specification takes only individuals who were already working before the reform into account to eliminate effects related to changing composition of employment. We estimate this DiD regression employing both POLS and Fixed Effects models (FE). The latter would allow us to control for unobservable variables, thus obtaining more reliable estimates of the effect of the policy on earnings premium. Since the β_4 coefficient probably represents the cumulative effect of the two reforms, we also run two separate regressions for each policy, again on a $\pm$ 4 years window (2002-2010 and 2007-2015), to infer their net effect.

In a DiD framework, it is crucially important to select the treatment and control groups carefully. The choice of the treatment group is quite evident at this point: The choice of the treatment group follows from what emerged previously: we can use the subgroup of professionals made of accountants, engineers and architects (which are observed jointly, since they share the same pension fund) and lawyers for the reasons described in Section 2.4. These three categories of regulated professionals are the most represented in our dataset (except for physicians, which we exclude given the issue of their earnings from self-employment are often cross-reported with their earnings as public employees) and they all have enrolment into professional associations as a mandatory requirement to practice. Hence, the two liberalisation reforms we are analysing here applied to all three of them. In addition, they all have a university degree as a requirement for enrolment, thus they can be considered as high-skilled workers.

The choice of the control group requires instead more attention. We already observed a similar trend in mean earnings between professionals and graduated managers (Fig. 2.5). This similarity is crucial since the common trend assumption is notoriously fundamental in a DiD framework (e.g., Angrist and Pischke, 2008). We will now investigate this common trend in depth and compare the two groups from other points of view to verify whether graduated managers are a suitable control group for this analysis.

First, even though we do not observe fields of education, we can assume that managers and professionals are graduated in similar disciplines. On the one hand, degrees in business and economics, law, engineering and architecture are required to become accountants, lawyers, engineers and architects. On the other hand, managers of private firms are usually graduated either in business, engineering management or law. Thus, we can assume that managers and professionals have followed similar curricula during their university careers and hence have similar skills.

We now compare the most relevant observable variables of the two groups. In Tab. 2.4, we saw that, in the 2000-2017 period, professionals have a higher percentage of women, are more concentrated on the 30-39 and 40-49 classes of age and more distributed in Central and Southern Italy than graduated managers. Tables 2.8-2.9 show the trends of gender composition, mean and median age and geographical area through the 2000-2017 period.

These variables seem either to remain stable or to change with a similar trend through the period in analysis. Regarding gender composition, the percentage of women among professionals remains about 15 percentage points higher than among managers, with an average difference of 13.5 points. Instead, mean and median age show different trends, as both mean and median age increase more rapidly for professionals than for managers. However, the difference in levels is not so pronounced, given that mean and median age are only slightly higher on average for managers than for professionals. Regarding the geographical composition of the two groups, things do not change significantly through the years. The distribution of professionals is fairly stable at about 45% in the North, 27% in the Centre and 28% in the South. Managers are stable at 67% in the North, 24% in the Centre and 9% in the South.

Table 2.8. Trends in gender composition and mean and median age

	Women (%)		Age			
	Professionals	Managers	Professionals		Managers	
Year			Mean	Median	Mean	Median
2000	30.35	16.27	37.5	36	44.3	44
2001	32.78	16.61	37.6	37	44.6	44
2002	33.78	18.82	38.2	37	44.4	44
2003	34.78	17.91	38.7	38	44.7	45
2004	35.94	19.17	39.0	38	45.1	45
2005	37.76	20.97	39.3	38	44.6	45
2006	37.49	21.06	39.6	39	44.9	45
2007	38.58	23.14	39.8	39	44.9	44
2008	38.38	23.81	40.6	39	45.2	44
2009	38.79	24.61	41.0	40	45.6	45
2010	38.73	26.01	41.7	40	45.6	45
2011	38.64	27.01	42.2	41	45.9	45
2012	38.92	26.75	43.0	42	46.1	45
2013	39.19	27.63	43.4	42	46.4	46
2014	40.21	27.61	43.6	43	46.8	46
2015	40.07	27.99	44.4	43	47.1	46
2016	39.25	27.4	45.5	44	47.5	47
2017	39.45	28.27	46.3	45	47.9	47
Average	38.14	24.19	42	41	45.8	45

Table 2.9. Trends in geographical composition

	Geographical composition (%)					
	Professionals			**Managers**		
Year	*North*	*Centre*	*South*	*North*	*Centre*	*South*
2000	45.81	27.93	26.26	69.59	22.2	8.21
2001	45.63	27.68	26.69	69.51	22.45	8.04
2002	46.79	26.76	26.46	69.68	21.9	8.42
2003	45.74	26.93	27.33	68.89	22.08	9.03
2004	46.1	26.52	27.39	69.26	22.01	8.72
2005	46.08	27.13	26.79	67.77	23.27	8.95
2006	45.53	27.86	26.61	67.29	23.17	9.54
2007	44.88	27.8	27.32	66.32	23.98	9.71
2008	45	27.41	27.59	65.62	24.4	9.98
2009	45.48	27.05	27.47	65.71	24.02	10.26
2010	45.19	27.16	27.65	66.32	23.88	9.8
2011	45.54	26.84	27.62	66.12	23.98	9.9
2012	45.52	27.05	27.43	66.04	24.58	9.38
2013	45.75	26.58	27.67	66.8	24.51	8.69
2014	43.44	26.17	30.39	67.31	23.94	8.75
2015	42.74	26.54	30.72	67.47	23.79	8.74
2016	42.91	26.69	30.4	66.67	23.8	9.54
2017	43.11	25.9	30.99	67.31	23.43	9.27
Average	*44.77*	*26.89*	*28.34*	*67.22*	*23.52*	*9.23*

Therefore, the analysis of relevant observable variables seems to confirm the comparability of the two groups and to explain the difference in levels of earnings too, since Italy is notoriously characterised by regional, gender and intergenerational gaps and professionals are less concentrated in Northern Italy and more concentrated in Southern Italy, have a higher percentage of women and are slightly less young on average.

We proceed with the visual inspection of trends in mean earnings in the periods of interest for the DiD regression to verify the common trend assumption. Figure 2.8 plots the change in mean earnings of professionals and managers for the whole reference period, indexing the values in the starting year (2000) for both variables at 100. Figure 2.9 compares trends in (levels of) mean earnings of the two categories before and after the 2006 and 2011 reforms of regulated occupations. Again, Fig. 2.8 suggests that the two groups experienced a similar (although not exactly identical) evolution of their mean earnings.

In Figure 2.9, a common trend can be seen in pre-2006 mean earnings. We can also see a discontinuity in mean earnings of professionals after 2006 and a slight divergence with respect to mean earnings of graduated managers. However, the inversion in both trends is most probably due to the aftermath of the 2007-2008 crisis. Things are instead less defined for what regards the 2011 reform. The pre-policy trend is less common because of the overlapping effects of the previous reform, and the mean earnings of the two groups do not seem to diverge very much. We also have

to keep in mind that the 2011 reform coincides with the Italian sovereign debt crisis. Thus, even though we control for the economic cycle, the latter might affect and be correlated to trends in mean earnings of the two groups, which may be affected differently (given that the treatment group is made up of self-employed workers, while the control group is made up of employees).

Consequently, graduated managers seem to be a suitable control group for this DiD setting, especially for the 2006 reform. We then proceed with using these two groups for our empirical analysis, exploiting them for the analysis of their relative earnings after the liberalisation process for the sake of comparability, in order to gain some insights on the mechanisms behind the premium from regulation.
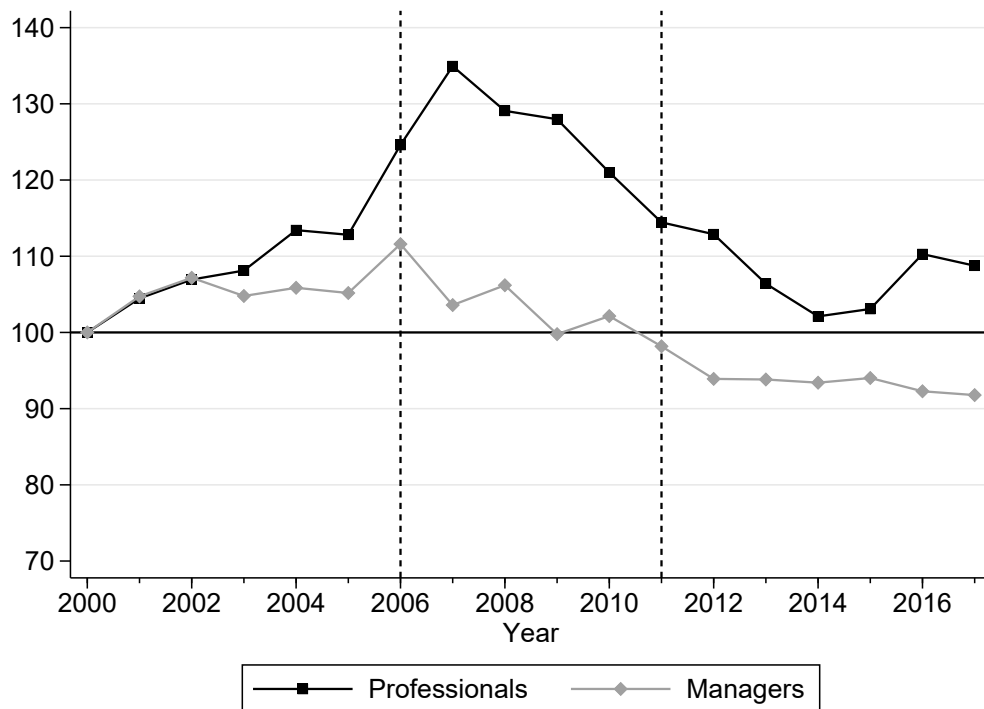
Figure 2.8. Change in mean yearly gross earnings earnings of professionals and managers (2000-2017, 2000=100)
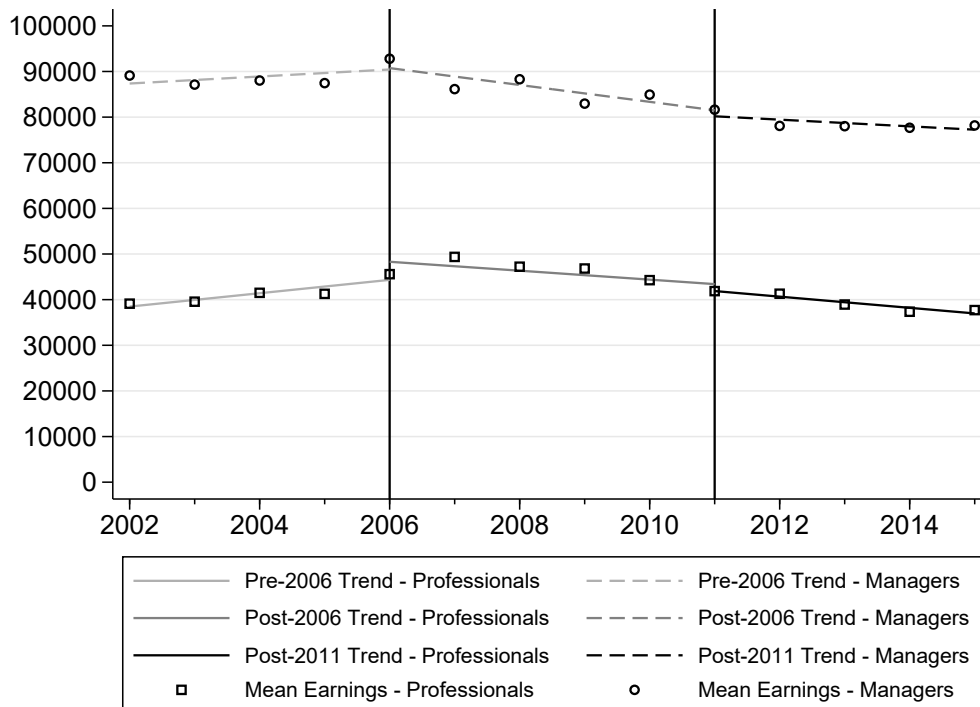
Figure 2.9. Pre and post-reform trends in mean yearly gross earnings (in €) of treatment and control groups (2002-2015)

Hence, by comparing two groups of workers that are supposedly similar for both observable and unobservable variables (a supposition which should be enforced by common trends in the relevant outcome variable, i.e., earnings), the DiD methodology should help to retrieve reliable estimates of the effects of changing regulations (relaxing them, in our case). Furthermore, understanding how and in which direction these changes modify the premium may allow us to get some clues on what causes this premium on a first stance. We expect several possible effects on earnings from a liberalisation of the professional services market. First, if it is a consequence of rents from imperfect competition (which is the prevailing hypothesis in the literature), then liberalisation should reduce the average premium. But, similarly to what Raitano and Vona (2021) do, we hypothesize a possibly countervailing effect: at the same time, we might observe an increase in the earnings of those with (unobservable) skills that were not efficiently remunerated because of market imperfections (generating a sort of "superstar effect" in the fashion of Rosen, 1981). In addition, if regulation generates some degree of price-setting power for professionals, removing them should reduce the price of services for consumers and induce an increase in demand (thus, average earnings might grow, even in comparison with non-regulated workers). We cannot observe the "demand-side" effect, since we do not have data on business volumes of professionals, hence we focus on the latter two effects.

Table 2.10 shows DiD results of POLS and FE estimations of the 2006 ("Bersani") and 2011 ("Monti") reforms. We consider incumbent individuals (i.e., those who were already working previously) only, to depurate the analysis from the changing

composition over time of the professionals' group. Estimates for effects of "Bersani" reform on earnings of professionals are positive and quite significant with both estimation methods, while estimates for "Monti" reform show a negative sign and are not statistically significant.

As we said, the positive sign of the coefficients for the first reform might look counterintuitive at a first glance: according to the prevailing consensus in the literature, we expected liberalisations to lower the average earnings of regulated workers relative to non-regulated workers. Liberalisation may have instead enhanced the rewarding mechanisms of professional skills and lowered the price of the same quantity of services offered, resulting in an increase in average earnings. We may also reflect on the fact that the primary feature of this intervention was the removal of minimum fees. Hence, after the policy was introduced, we can hypothesise that individuals earning less could make more competitive offers than those earning more. In other words, the removal of rents may have benefitted low-earnings workers, offsetting the penalties for rent-extracting workers, thus resulting in a reduction of rents from regulation at the top and/or a redistribution towards the bottom of the distribution, with a positive average effect. This is why looking at the distribution of the effect of liberalisation (as we will do in the following Section) might be more telling than just looking at the mean.

Previously, we argued that the coefficient for the second interaction term, measuring the effect of the 2011 reform, is actually a measure of the cumulative effect of both reforms. We try to estimate their net effect by running a separate DiD regression for each intervention. Results are shown in Appendix B and are similar to the previous ones, except that the coefficient for the 2011 reform is now statistically significant.

The fact that estimates for the latter policy have a negative sign is also puzzling. One explanation might be that the "Monti" reform has tackled rents from regulation more strongly, thus causing a generalized fall in relative earnings rather than an internal redistribution of rents. Or perhaps the fact that this reform removed price caps along with price floors may have allowed the high-earnings professionals to raise further their fees, counterbalancing the effect of the previous reform. Alternatively, these results may be affected by the fact that most of the provisions introduced in 2011 were only reformulations of what was already introduced with the "Bersani" reform. This fact may reduce the exogeneity of the "Monti" reform and hence its significance in a DiD framework. Similarly, we might expect that professional association were "prepared" to face the new intervention and thus "reacted" by adjusting the supply side to influence the structure of the market.

Also, the after-treatment period of the "Monti" reform coincides with the 2011-2012 recession. This factor may explain why in the joint DiD estimation (as well as is in the event history analysis in Section 2.6.3) the 2011 reform loses statistical significance.

However, since standard DiD does not allow to look at heterogeneity of the effect along the distribution, performing a UQR seems crucial to assess these results and verify these hypotheses.

Table 2.10. Difference-in-differences estimates

2006 Reform and 2011 Reform Joint DiD Estimation		
	POLS	FE
Professional	-0.782***	-0.346*
	(0.0687)	(0.135)
Post2006×Professional	0.0720**	0.0810**
	(0.0198)	(0.0210)
Post2011×Professional	-0.0504	-0.0518
	(0.0498)	(0.0282)
Obs.	24886	24886

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *we consider only incumbent individuals, thus excluding those who started working after the introduction of the 2006 policy. We include the same controls used in the third specification presented in Table 2.6. Standard errors are clustered at regional level.*

As an extension to evaluate the robustness of our results, we run again our DiD regression, this time including both incumbents and entrants.

Table 2.11 presents the results of our DiD model with the inclusion of individuals who entered the market after the reforms in analysis. This extension does not change the signs nor the significance of the estimated coefficients, as well as their magnitude. Thus, the result of our principal specification seems to be robust with respect to the selection of incumbent individuals only into the sample.

Table 2.11. Difference-in-differences estimates

2006 Reform and 2011 Reform Joint DiD Estimation		
	POLS	FE
Professional	-0.799***	-0.348*
	(0.0682)	(0.127)
Post2006×Professional	0.0603**	0.0697**
	(0.0210)	(0.02107)
Post2011×Professional	-0.0462	-0.0512
	(0.0440)	(0.0248)
Obs.	27190	27190

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *we now consider both incumbent and entrant workers. We include the same controls used in the third specification presented in Table 2.6. Standard errors are clustered at regional level.*

In the following paragraphs, we will look for heterogeneities in the effects of the policies along the distribution, with the help of the unconditional quantile regression methodology. Lastly, we will check the robustness of our analysis by looking at year-by-year interaction terms.

2.6.2   Effects Along the Distribution

Standard difference-in-differences methodologies allow estimating the average effect of a policy on the variable of interest. Nonetheless, when analysing labour markets showing very high levels of inequality, such as the one we are analysing in this chapter, it would seem reasonable to go beyond average effects and try to understand the effects along the earnings distribution. With this objective in mind, we perform again our DiD employing the Recentred Influence Function (RIF) methodology proposed by Firpo et al. (2009), which allows us to run unconditional quantile regressions (UQR) for deciles of the earnings distribution. This methodology builds upon the concept of the influence function of a distributional statistic, which represents the influence of an individual observation on that same distributional statistic. If one adds back the latter to the influence function, a "recentred" influence function can be obtained. This allows to estimate the direct effect of changing an explanatory variable (in our case, the dummy interacting the "treated" individuals with the post-policy period) on quantiles of the marginal (unconditional) distribution of the outcome variable (in our case, deciles of the earnings distribution). This methodology has two convenient features: first, it can be extended to several distributional statistics and inequality measures, including the Gini coefficient; second, it can be easily implemented as an OLS regression, as well as a fixed effects model.

Thus, the analysis of the distributional effects of the two reforms is the core of this chapter. Figures 2.10 and 2.11 graphically present the unconditional quantile regression results for the "Bersani" reform, with POLS and FE estimation. These results seem to confirm the intuition presented previously: the effect of the liberalisation is not homogeneous across the earnings distribution. In fact, the bottom deciles have benefitted more than the top deciles from the liberalisation of regulated liberal professions. Interestingly, the coefficients for the top deciles are significantly negative in the FE model.

Simply put, if we interpret the estimated coefficients of the FE model, the 2006 reform increased the relative earnings of professionals with respect to those of managers in the lowest part of the distribution, but this positive effect vanishes away as we reach the median value and then reverses as we climb further up the earnings ladder. For example, the 2006 reform relative earnings of professionals in the bottom-10 percent of the distribution increased by 50.6

Therefore, we might deduce that professionals at the top were extracting rents from regulation, while those at the bottom where perhaps earnings less than they deserved because of imperfect competition. Thus, loosening regulation resulted in a more efficient remuneration (and possibly a better employment too, but, as we said when discussing the DiD model, we do not observe the demand side of this story) of the skills of those at the bottom and in the reduction of rents extracted by those at the top.

Hence, the 2006 liberalisation had a significantly positive effect on the bottom deciles of the distribution and a negative effect (more or less intense depending on the estimation method used) on the top half of the distribution. We should then observe some influence on earnings inequality within these regulated professionals. We will investigate this later by performing a RIF-UQR analysis on the Gini index. Table 2.12 summarises the results of this analysis.

Figure 2.10. Effects of the "Bersani" (2006) reform on deciles of the earnings distribution. - POLS estimation of a RIF-UQR (Firpo et al., 2009) in a DiD framework. The graph represents the coefficients (black circles) and the 95% confidence interval (dashed line) of the *Post2006×Professional* variable, which captures the "treatment" effect (i.e., the effect of liberalisation on earnings of professionals with respect to graduated managers).
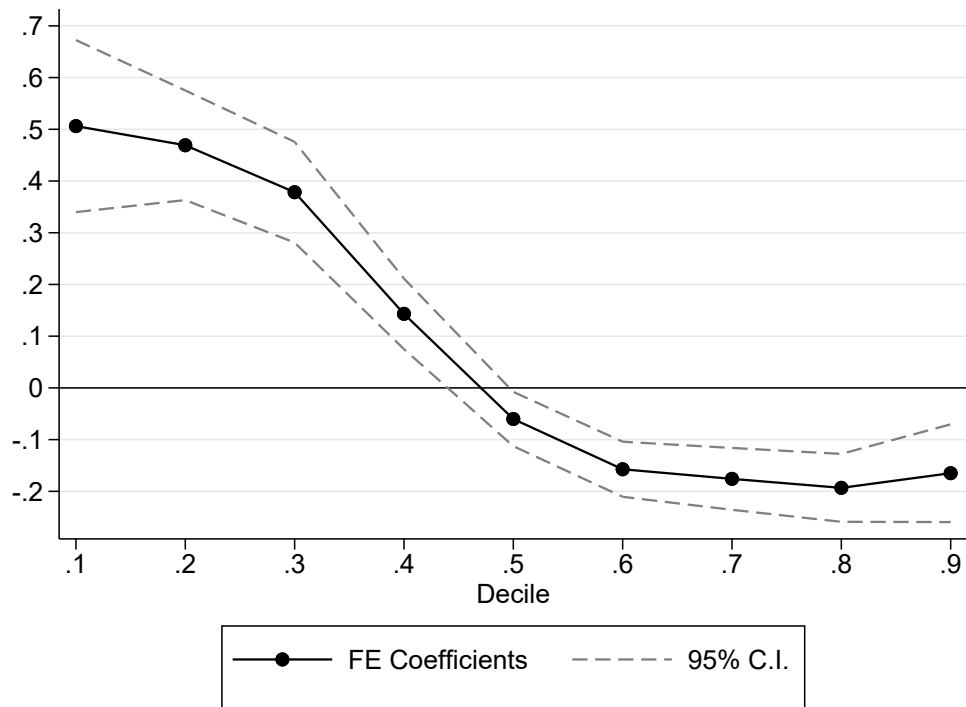
Figure 2.11. Effects of the "Bersani" (2006) reform on deciles of the earnings distribution. - FE estimation of a RIF-UQR (Firpo et al., 2009) in a DiD framework. The graph represents the coefficients (black circles) and the 95% confidence interval (dashed line) of the *Post2006×Professional* variable, which captures the "treatment" effect (i.e., the effect of liberalisation on earnings of professionals with respect to graduated managers).

Table 2.12. RIF-UQR for effects on deciles of the earnings distribution of the "Bersani" reform.

"Bersani" Reform	Post×Professional	
Decile	POLS	FE
10	0.261***	0.506***
	(0.0761)	(0.0848)
20	0.249***	0.469***
	(0.0500)	(0.0540)
30	0.143**	0.378***
	(0.0466)	(0.0497)
40	0.0131	0.143***
	(0.0312)	(0.0348)
50	-0.0215	-0.0602*
	(0.0224)	(0.0268)
60	-0.0442	-0.157***
	(0.0228)	(0.0272)
70	-0.0141	-0.176***
	(0.0266)	(0.0305)
80	-0.0328	-0.193***
	(0.0293)	(0.0335)
90	0.0195	-0.165***
	(0.0422)	(0.0482)

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes*: Coefficients of the "difference in differences dummy" are represented for both the POLS (first column) and FE (second column) models. Standard errors are clustered at regional level.*

We now turn our attention to the "Monti" reform. Figure 2.12 presents the POLS estimation of deciles of RIF-UQR, while Figure 2.13 presents FE estimation. As in the case of standard DiD, evidence for this reform goes in the opposite direction.

POLS estimation suggests that earnings of the bottom deciles have been apparently penalised, while those at the top have been benefitted, for an average reduction of the earnings premium for professionals. FE estimation yields instead not very significant results. Table 2.13 presents a summary of the analysis of the "Monti" reform.
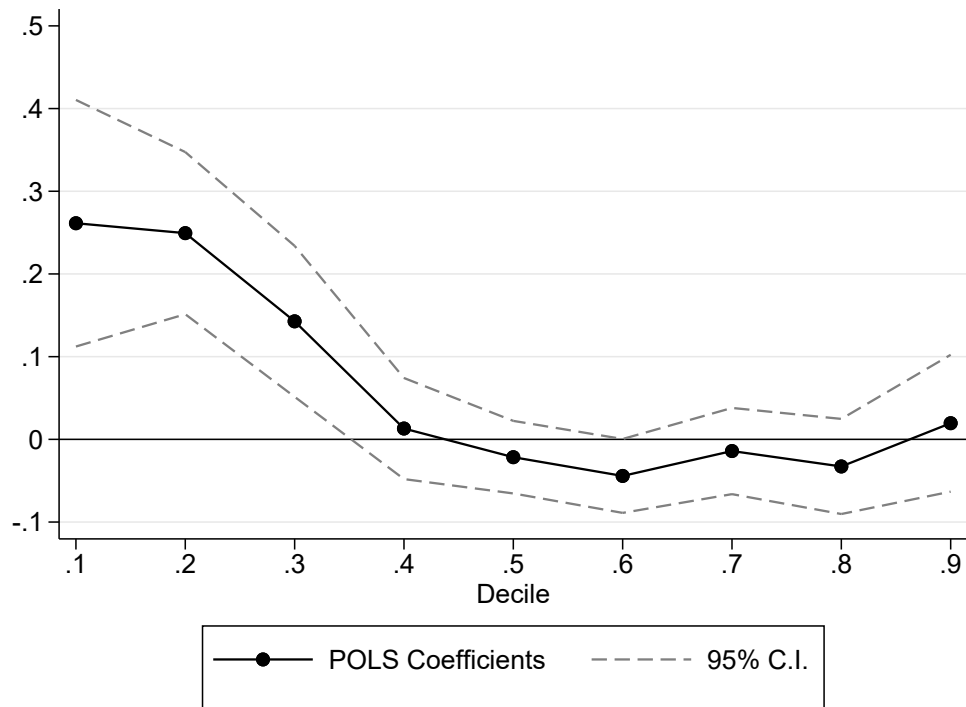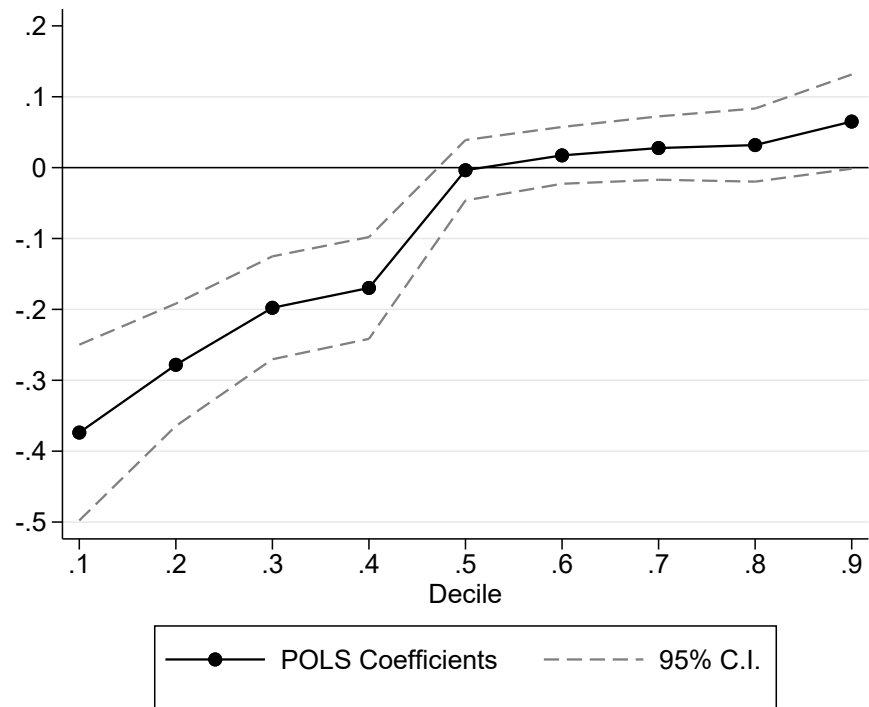
Figure 2.12. Effects of the "Monti" (2011) reform on deciles of the earnings distribution. -
POLS estimation of a RIF-UQR (Firpo et al., 2009) in a DiD framework. The graph
represents the coefficients (black circles) and the 95% confidence interval (dashed line)
of the $Post2011{\times}Professional$ variable, which captures the "treatment" effect (i.e., the
effect of liberalisation on earnings of professionals with respect to graduated managers).
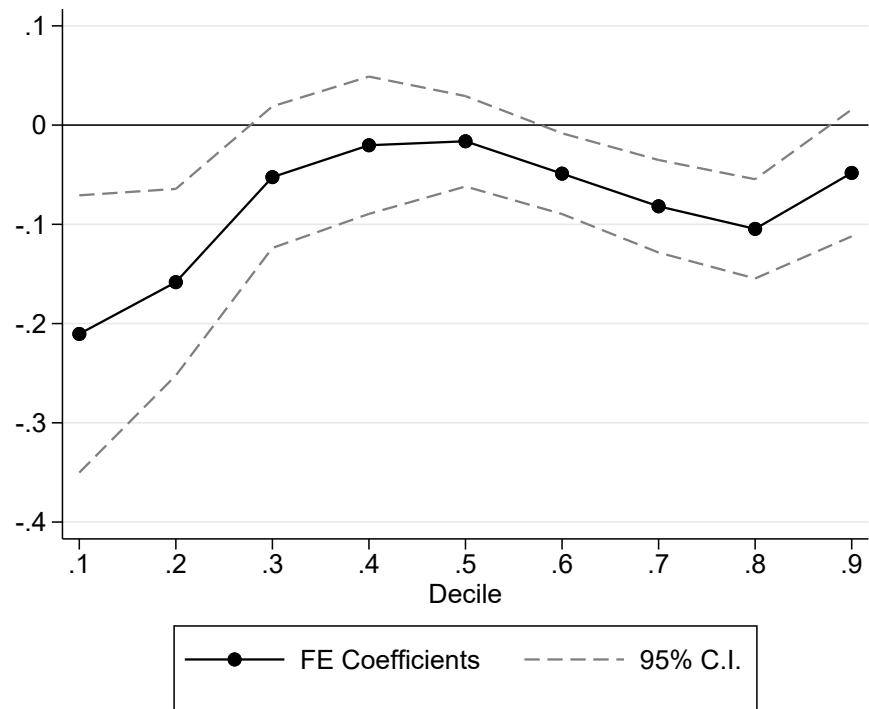
Figure 2.13. Effects of the "Monti" (2011) reform on deciles of the earnings distribution. - FE estimation of a RIF-UQR (Firpo et al., 2009) in a DiD framework. The graph represents the coefficients and the 95% confidence interval of the $Post2011{\times}Professional$ variable, which captures the "treatment" effect (i.e., the effect of liberalisation on earnings of professionals with respect to graduated managers).

Table 2.13. RIF-UQR for effects on deciles of the earnings distribution of the"Monti" reform.

"Monti" Reform	Post×Professional	
Decile	POLS	FE
10	-0.495***	-0.210**
	(0.0688)	(0.0712)
20	-0.299***	-0.158***
	(0.0437)	(0.0479)
30	-0.197***	-0.0524
	(0.0400)	(0.0364)
40	-0.0636*	-0.0203
	(0.0271)	(0.0353)
50	-0.0199	-0.0163
	(0.0197)	(0.0232)
60	0.0268	-0.0489*
	(0.0203)	(0.0207)
70	0.0217	-0.0818***
	(0.0234)	(0.0238)
80	0.0144	-0.105***
	(0.0254)	(0.0255)
90	0.0786*	-0.0482
	(0.0348)	(0.0326)

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *Coefficients of the "difference in differences dummy" are represented for both the POLS (first column) and FE (second column) models. Standard errors are clustered at regional level.*

Thus, the two reforms apparently had opposite effects on earnings inequality. Table 2.14, presenting results of RIF-UQR for Gini Index, confirms that. The coefficient for the 2006 reform is negative (meaning a reduction in the contribution of professionals to total inequality among professionals and managers jointly) although not much significant, while the coefficient for the 2011 reform is positive (hence, a greater contribution). However, both coefficients have a small magnitude.

Table 2.14. RIF-UQR for effects on Gini index.

	Effect on Gini Index	
	"Bersani" Reform	"Monti" Reform
Professional	0.0320***	0.0272***
	(0.00130)	(0.00115)
Post×Professional	-0.00349*	0.00842***
	(0.00175)	(0.00162)

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: *Coefficients of a RIF-UQR on Gini index. The "PostXProfessional" coefficient measures the effects of the 2006 (first column) and 2011 (second column) reform on the contribution of professionals to total inequality in the sample. Standard errors are clustered at regional level.*

2.6.3 Event History Analysis

We now check the sensitivity of our DiD model through an event history analysis. We do so by including an interaction term between the "treatment group" dummy variable and each year of the reference period (except for the first, to avoid multicollinearity). This analysis seems to confirm the validity of our DiD model for the 2006 reform for both POLS and FE regressions. Instead, coefficients for the 2011 reform are once again not significant (Figure 2.14).

We also test the sensitivity of the UQR for the Gini Index by using the same method. The signs of the coefficients are the same as in Table 2.14, but they are now less statistically significant (Figure 2.15).
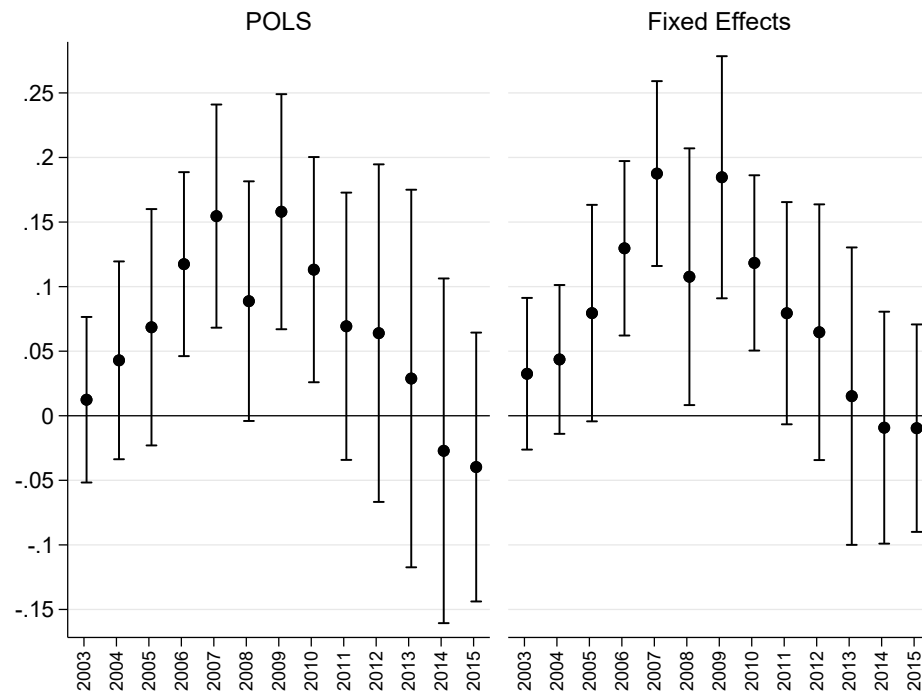
Figure 2.14. Event history analysis - Coefficients of the interaction terms between the "treated" dummy variable and each year of the 2003-2015 period, with 95% confidence intervals. Note that these coefficients are significant only between 2006 and 2011.
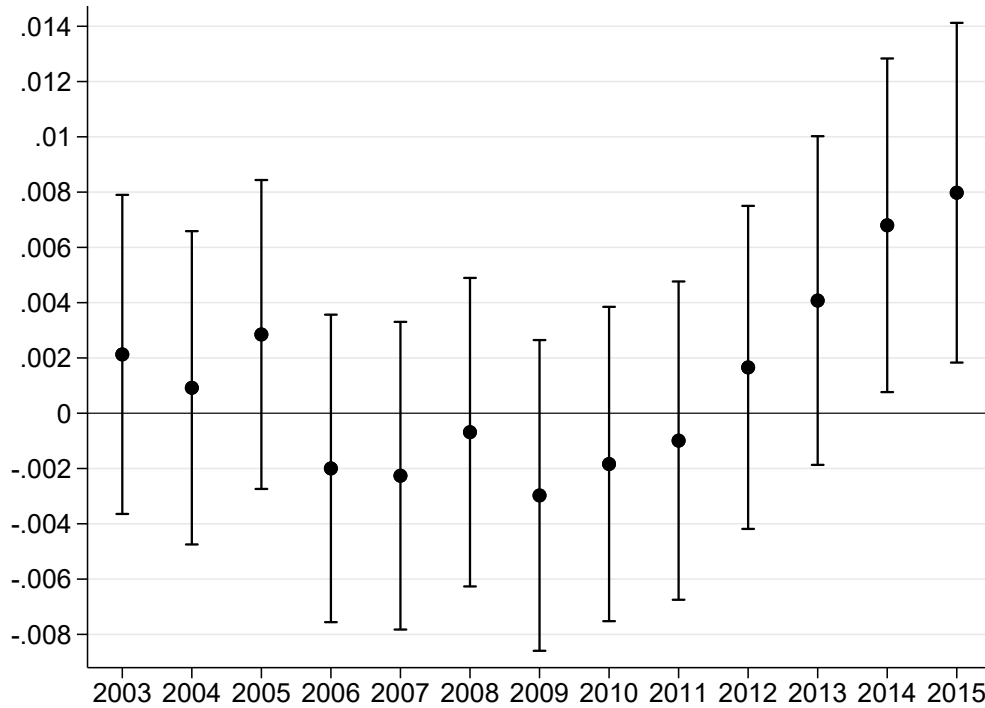
Figure 2.15. Event history analysis of the effect on the Gini Index - A POLS RIF-UQR on the Gini Index is estimated by interacting the "treated" dummy variable with each year in the 2003-2015 period. The graph represents coefficients and 95% confidence intervals of each of these interaction terms. Note that these coefficients are significant only in the last two years of the period.

2.7 Discussion and Conclusion

This chapter provided some contributions to the literature on labour market effects of regulated occupations. Employing a novel dataset, obtained by merging the Italian component of the Statistics on Income and Living Conditions (IT-SILC) survey with administrative data, we find that regulated liberal professions (professioni ordinistiche) are characterised by very high earnings inequality, pushed by concentration at the top of the distribution. We have then provided evidence on the existence of an earnings premium from working as a regulated liberal professional compared to other workers, which persist when we compare those professionals with similarly skilled workers, such as managers, consultants and non-regulated professionals.

We also evaluate the effects of liberalisations policies, such as those introduced in Italy between 2006 and 2012. Employing a difference-in-differences methodology, we found that the abolition of price floors and minimum fees (among other provisions) in 2006 has increased the earnings of professionals relatively to those of graduated managers working in the private sector. This result is quite counterintuitive since the relevant literature on regulated occupations expects an eventual earnings premium to fall when regulations are removed. In fact, this premium is often described as rent from excessive regulation. Hence, removing the latter would cause the

former to vanish. To solve this puzzle, we tried to look at heterogeneities of the effect of liberalisations along the distribution. Employing an unconditional quantile regression, we investigated how the Italian reforms have impacted deciles of the earnings distribution. We found that the "Bersani" reform of 2006 had a very heterogeneous effect along the distribution, benefitting individuals in the bottom half of the distribution more than those in the top half. Thus, we may interpret this result in the sense that excess rents from regulation were concentrated mostly at the top of the earnings distribution and that removing regulation reduced those rents, while increasing the earnings of the bottom-half of the distribution.

Another puzzle comes from analysing the liberalisation introduced in 2011 (commonly known as "Monti" reform). When we evaluate this policy separately, results have the opposite sign: earnings of licensed professionals decreased relative to those of managers. However, the distributional analysis of the reform did not clearly identify which side of the distribution was affected more by this fall in earnings. Potential issues in this analysis may come from the post-treatment period coinciding with the 2007-2008 financial crisis and the 2011-2012 sovereign crisis, which may affect results even though we introduce year dummies to control for time trends. Furthermore, we must keep in mind that we are comparing self-employed workers such as liberal professionals to managers (who are employees), two groups that may be affected differently by different phases of the economic cycle. Future research may overcome this problem by finding a more suitable control group or employing a more refined methodology (e.g., synthetic control method).

To conclude, with these results in mind, we argue that the main finding of our analysis is that it is crucial to look at the distribution of policy effects, especially when markets or workers characterised by significant inequality are studied. Most causal inference methodologies look at average effects, something that can lead to counterintuitive results. In our case, the fact that earnings of regulated professionals were raised on average by relaxing regulations in 2006 does not imply that such reform did not remove rents. We may instead infer that the removal of rent-inducing regulations favoured low-earnings individuals more than it penalised high-earnings individuals, thus resulting in a positive average effect.

Appendix A Dataset representativeness

Pension funds of lawyers, accountants and engineers and architects (Cassa Forense, CNPADC and Inarcassa) publish reports about their membership on their website, disclosing the number of members and their distribution for gender and age groups, often on a yearly basis. We exploit this information to check whether our dataset is representative, notwithstanding the low number of observed individuals. As we can see from the following Figures, the dataset seems to track well the evolution of membership numbers and gender and age group composition through the years. Then, we can assume that our sample of professionals is representative, although its size is not so large.
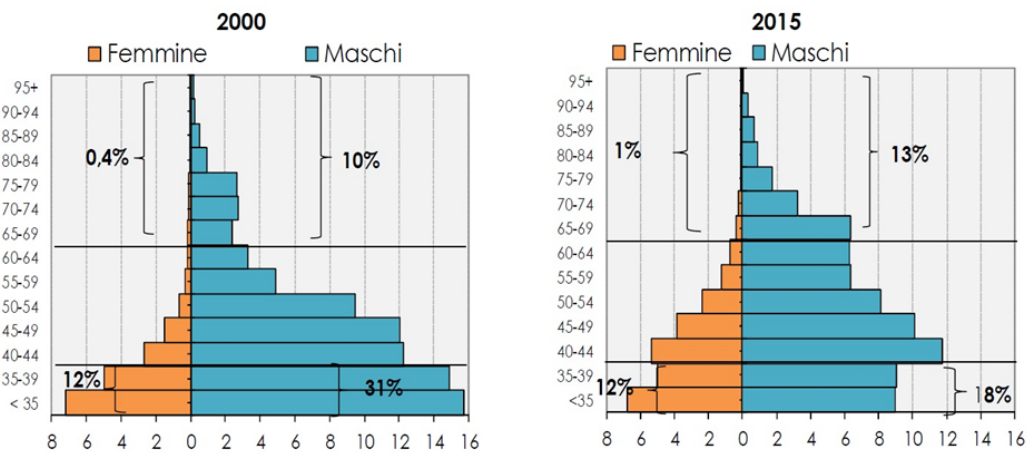
Figure 2.16. Demographic composition of the membership of *Inarcassa* in 2000 and 2015 (engineers' & architects' Pension Fund, source: Inarcassa, *Inarcassa in cifre*, 2020).
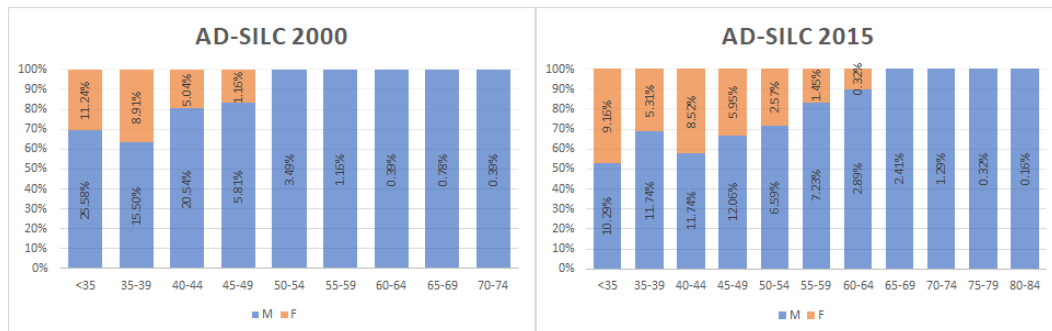
Figure 2.17. Demographic composition of engineers & architects in AD-SILC in 2000 and 2015.
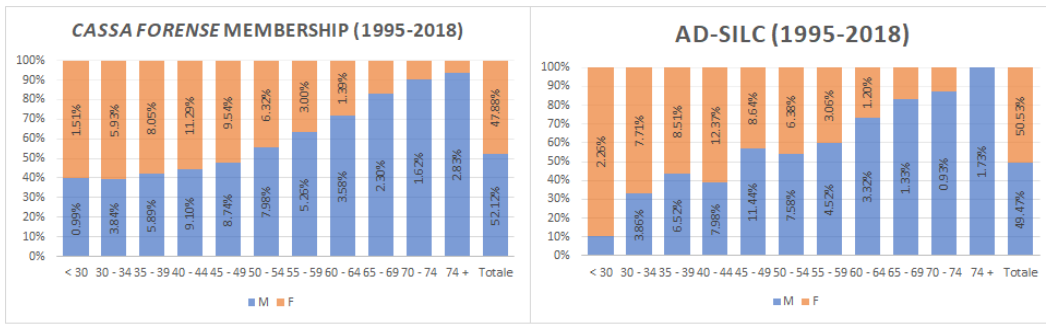
Figure 2.18. Left: demographic composition of the membership of *Cassa Forense*, 1995-2018 (lawyers' Pension Fund, our elaboration on Cassa Forense, *I numeri dell'avvocatura*, 2018). Right: demographic composition of lawyers in AD-SILC, 1995-2018.

Figure 2.19. Left: demographic composition of the membership of *CNPADC* in 2018-2014-2010 (accountants' Pension Fund, our elaboration on CNPADC, Dati statistici, 2018). Right: demographic composition of accountants in AD-SILC, 2018-2014-2010.

Appendix B   Analysing Reforms Separately

Table 2.15. Difference-in-differences estimates, separate regressions with a ± 4 year window for both reforms.

	Separate DiD Estimation			
	2006 Reform		2011 Reform	
	POLS	FE	POLS	FE
Professional	-0.760***	-0.329	-0.777***	-0.0333
	(0.0753)	(0.169)	(0.0628)	(0.233)
Post×Professional	0.0819**	0.0979**	-0.0839*	-0.0891***
	(0.0245)	(0.0275)	(0.0353)	(0.0221)
Obs.	14888	14888	19177	19177

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes*: we consider only incumbent individuals, thus excluding those who started working after the introduction of the policies. Standard errors are clustered at regional level.*

Chapter 3

Understanding the Determinants of Italian Executives' Pay through Corporate Reporting

Abstract

Executive compensation has attracted much attention in the literature. The two prevailing theories say that the steep increase in CEO pay observed in the last decades of the 20th Century are either a result of rent extraction by powerful manager or of efficient market forces, although neither has received conclusive empirical support. We employ a novel dataset built from disclosure reports on Italian listed firms remuneration policies to assess the role of power and performance in determining directors' pay. We observe that the earnings of Italian directors are highly concentrated at the top of the distribution, although there is less inequality among CEOs and GMs than among other board members. This goes against the predictions of the most relevant market-based theories, for which higher inequality should be observed within the charges of highest responsibility. Finally, we select proxies of managerial power and managerial performance to estimate the determinants of directors' pay, finding that both have an important role.

3.1 Introduction

The compensation of listed firms' top management is a topic that has stimulated an intense and ongoing debate, throughout the academia and the public opinion. This debate was first sparked by the steep increase in executive compensation, especially those of chief executive officers (CEOs), both in levels and in relation to average wages. This increase has been observed in the United States since the last two decades of the 20th century and was caused in particular by the growing use of stock-options as a form of compensation (see Murphy, 1999, 2013 for a detailed history of the evolution of executive compensation in the US). Subsequently, the debate was further fuelled by the literature on income inequality, arguing that escalating rewards for top executives were causing an increasing divide between the very top and the rest of the income ladder (Piketty and Saez, 2003; Atkinson et al., 2011; Bivens and Mishel, 2013). In fact, according to the analysis of US tax data by Bakija et al. (2012), top managers account for about 60% of top 0.1% percent earners and for about 70% of the increase in the share of national income accruing to that quantile between 1979 and 2005. This 60% is split almost evenly between "salaried" managers and self-employed, "pass-through" income (i.e., income that is not taxed as corporate income, but as personal income of their owners) earning managers.

In this regard, Smith et al. (2019) find that, although business income prevails among top earners in the US, most of it is "pass-through" income. In addition, evidence suggests that "pass-through" income earners are mostly human capital rich. Importantly, they refer to human capital as "all inalienable factors embodied in business owners, including labor supply, networks, reputation, and rent-extraction ability" (Smith et al., 2019, p. 1677). Therefore, they argue that those individuals are mostly managers-owners of closely held firms that choose to pay themselves through business income instead of wages because of tax incentives reasons.

The main explanations of this fact revolve around two competing camps: the "market-based" hypothesis and the "managerial power" hypothesis (Bertrand, 2009; Frydman and Jenter, 2010; Murphy, 2013).

The former hypothesis frames the issue as a principal-agent problem and/or as one of shifting supply and demand of managerial skills. Increasing pay is thus a result of growing size and complexity of firms in a context of rising competition in global markets. In this framework, labour market mechanisms match (scarce) managerial talent to the larger and more complex firms efficiently.

In the latter hypothesis, instead, the market for managerial labour is characterized by incomplete information and imperfect competition. Hence, managers have some degree of market power, which is exploited to extract rents and command higher pays.

However, neither camp has found decisive evidence in favour of its hypothesis (Bertrand, 2009; Murphy, 2013). As the relative importance of rent extraction and performance remuneration still has to be assessed, the availability of new data on executive compensation may be helpful (Frydman and Jenter, 2010; Atkinson et al., 2011). This is especially true for the managerial power theory, which so far has had few empirical tests.

Our work tries to fill these voids by exploiting a novel dataset containing infor-

mation on the compensation of board members of firms listed in the Italian Stock Market (*Borsa Italiana*). We hand-collect data from a series of mandatory disclosure corporate documents: directors' and managers' compensation are taken from Remuneration Reports (which were introduced in the Corporate Governance Code in 2011); demographic and professional characteristics are taken from Corporate Governance Reports; finally, firm characteristics and performance are taken from Financial Annual Reports and the official site of *Borsa Italiana*.

This allowed us to obtain a rich set of individual-level and firm-level variables, offering the possibility to assess several possible determinants of board members' pay, both power-related and performance-related, jointly. Given that the hand-collection process is particularly time-consuming, we analyse a 4-year period, starting from the first year for which Remuneration Reports are available on the *Borsa Italiana* site (2011). Anyway, the dataset can be extended in the future up until the present year. Moreover, it can be updated regularly on a yearly basis, as soon as listed firms publish the new Reports.

Even though most of the literature on executive pay, especially that belonging to the "market-based" camp, focuses on stock options plans as the main form of remuneration, we instead consider total compensation (defined as the sum of fixed cash, committee attendance fees, bonus and profit sharing, perks and in-kind benefits, other compensation in Remuneration Reports). This choice is based on two reasons. First, stock-options are still a not-so-relevant form of compensation in Italy, at least in the period in analysis. Second, stock options are reported at their fair value in the reference year. Hopkins and Lazonick (2016) raise some doubts about the validity of such a way of measuring stock-option plans, which is at risk of underestimating the value of stock-based pay, and claim that reporting actual realized gains would be preferrable.

To perform our estimates, we consider the highest retribution obtained by each director and manager in the year. Given that performance and power are obviously impossible to observe directly we select market capitalization as a proxy for performance and two different proxies for power: the number of positions held by a single individual every year and the sum of the remunerations each individual is getting from the other firms she is working for. We estimate our model with Pooled Ordinary Least Squares (POLS) and Fixed Effects Model (FE).

Our results seem to confirm that both performance and power have a role in determining the compensation of managers and directors, although it is not clear which one is prevailing.

We argue that our dataset offers a range of possible and promising expansions that might lead to a better comprehension of the determinants of executive compensation and of pay-setting mechanisms in general.

The remainder of this chapter is organized as follows. In Section 3.2, we will review the related literature, while in Section 3.3 we will give some context on the Italian stock market, especially on the evolution of the regulation of pay-setting mechanisms and of disclosure rules. Section 3.4 will describe the dataset and the source of the data. In Section 3.5 we will provide in-depth descriptive evidence on board members' characteristics, earnings levels and distribution and on several structural features of our dataset. Our empirical strategy to assess the determinants of Italian directors' and managers' remuneration will be discussed in Section 3.6,

while Section 3.7 will present our main results. Finally, we will discuss the results in Section 3.8, which concludes the chapter.

3.2   Related Literature

Many reviews of the existing literature (e.g., Bertrand, 2009; Frydman and Jenter, 2010; Murphy, 2013) agree on the fact that studies on executive compensation propose two (or three) competing hypotheses for the "explosion" of CEO pay. On the one hand, some argue that growing rewards are a consequence of the extraction of rents by "powerful" managers, who exploit weak institutions, loopholes in corporate governance norms and changing social norms to raise their own pay, possibly at the expense of stakeholders and corporate performance. This is why this is commonly known as the "managerial power hypothesis". On the other hand, the rise in rewards is seen as the outcome of efficient contracting mechanisms in an increasingly competitive market. This is broadly known as the "market-based hypothesis". This camp can be subdivided in two further hypotheses: an earlier one, framing the problem as a typical principal-agent one, and a more recent one, focusing on shifts in firms' demand for managerial skills following changing market structure and technologies, thus increasing competition for managerial talent.

3.2.1   The market-based hypothesis

According to Murphy (2013), the majority of papers on executive compensation was initially centred on the "efficient contracting/agency" theory. Rosen (1982, 1992) joins this strand of literature and proposes an explanation of executive pay setting based on his "superstar" model (Rosen, 1981), in which the most talented individuals are efficiently assigned to the largest firms, generating a multiplicative effect of superior talent through a "recursive chain of command" technology. Thus, in order to correctly allocate talent and to provide the incentives that commit managers to serve the shareholders' interests, the managerial labour market produces right-skewed pays, which are also convex in talent.

Gabaix and Landier (2008) put Rosen's model to the empirical test and show that the increase in CEOs' compensation was proportional to the increase in the size of the average firm: if the marginal product of managerial talent increases with firm size, then a shift in size distribution will cause the marginal product to grow further, thus increasing the competition for scarce managerial talent and hence pushing compensation upwards. Similarly, Tervio (2008) develops an assignment model to show the economic impact of CEO ability and how even small differences in ability can generate high and rising levels of rewards, all in a perfectly competitive equilibrium.

Another market-based hypothesis argues that increasing CEO pay reflects shifts in the demand for managerial skills. In fact, the evolution of many tasks and disciplines strictly linked to the job and, at the same time, the fact that computerization enhanced the possibility to easily communicate firm-specific information to managers hired from outside the firm, possibly shifted the demand for firm-specific skills to general managerial skills. This would simultaneously explain the upward trends

in the appointing of outsiders and in CEO compensation, due to the increasing competition for the most talented ones (Murphy and Zabojnik, 2004).

3.2.2 The managerial power hypothesis

As the "efficient contracting" hypothesis received contrasting support from the empirical evidence (Jensen and Murphy, 1990; Bertrand, 2009; Frydman and Saks, 2010), researchers started to question the efficiency of pay-setting mechanisms, proposing the "managerial power" theory as an alternative explanation. Bertrand (2009); Frydman and Jenter (2010) and Murphy (2013) unanimously indicate Bebchuk and Fried (2003, 2004) as the most representative work in this camp. In their view, the "efficient contracting" camp wrongly sees executive pay arrangements as a remedy rather than as a part of the agency problem. Since executives have some power to influence their own pay, they are thus able to extract rents. Given that there is a risk of stimulating outrage from shareholders and outsiders, executives are willing to camouflage the extraction of rents. This would explain why executives have increasingly accepted being paid with stock-option, which are (supposedly) riskier and more performance-linked, while exerting their influence to not give up cash compensation, which kept on rising as well (Murphy and Zabojnik, 2004).

Bebchuk and Fried (2003) argue that there are four factors influencing managers' power: boards' power and effectiveness, large outside shareholders, institutional shareholders and antitakeover arrangements. The more the weaker the first three factors and the stronger the latter, the more manager are powerful. In addition, Bebchuk and Fried (2003) argue that compensation consultants, less transparent form of compensation (perks, pension plans, consulting contracts) and gratuitous severance payments are other ways through which executives camouflage their extraction of rents.

Bertrand and Mullainathan (2001) find evidence partly in favour of the managerial power hypothesis. They show that CEO pay is highly influenced by changes in firm performance that are beyond CEO's control, such as movements in oil prices, changes in exchange rates and the overall performance of the sector they work in. This is especially true for firms with a weak governance (proxied by the presence of large shareholders, CEO tenure, board size and the fraction of insiders in the board).

In their analysis of top marginal tax rates, Piketty et al. (2014) replicate Bertrand and Mullainathan's methodology, applying it to a larger sample and to high top tax rates and low top tax rates periods separately. They find that there is strong evidence of pay for luck, as well as of pay for performance, in both periods. But they also find that pay is more sensitive to luck than to performance in the low-tax period, consistently with their hypothesis that lowering top marginal tax rates enhances the bargaining power of top earners. Also, pay for luck increased more than pay for performance in the same period. This is possibly due to the increasing use of stock-options: if only salaries and bonuses are considered, pay for luck is weaker. They also make an international comparison for 2006, which shows that there is a strong negative correlation between CEO pay and top tax rates. They also build a governance index, based on five governance measures: insider ownership, institutional ownership, CEO duality (i.e., CEO being also the Chairman at the same time), the average number of positions that board members hold at other companies'

boards and the fraction of independent board directors. The aforementioned negative correlation is stronger when firms are poorly governed, although the better governed firms seem to suffer from rent extraction too. Finally, they find that top tax rates affect CEO pay almost entirely through this bargaining power-channel, rather than by curbing CEOs' effort.

Managerial power may be also enhanced by managers' popularity. Malmendier and Tate (2009) find that, after a CEO wins an award, her reward increases, notwithstanding that she spends more time on other activities and that the firm she leads underperforms in terms of stock and operating performance.

Furthermore, Keller and Olney (2021) find that globalization has an impact on executive compensation too and does so by increasing non-market returns (i.e., strengthening rent extraction channels) as well as market returns.

Van Essen et al. (2015) try to assess the validity of the managerial power hypothesis through a meta-analysis of several studies that measure the influence of managerial power on CEO compensation levels and on the pay-performance sensitivity. The authors focus on studies that measure managerial power by several different proxies, such as: CEO duality (i.e., individuals holding the CEO and Chairman posts at the same time), CEO tenure, board size, percentage of independent directors in the board, ownership concentration and institutional ownership. They conclude that most managerial power proxies predict cash and total compensation well but cannot predict the sensitivity of pay to performance. This sensitivity is instead well predicted by proxies measuring the power of boards.

Anyway, there is a widespread consensus that - so far - no conclusive evidence has been produced in support of either the market-based or the managerial power hypotheses (Bertrand, 2009; Frydman and Jenter, 2010; Murphy, 2013). Murphy (2013) argues that neither fully explains the observed trends in CEO pay. On the opposite, they need to be considered jointly as co-existing and interacting explanations, rather than as competing theories.

Frydman and Jenter (2010) indicate that the relative importance of rent extraction and optimal contracting as determinants of compensation is one of the questions that is still unanswered. The emergence of new data, they argue, will help to assess the question. Similarly, Atkinson et al. (2011) indicate the study of long-run corporate data as promising in order to understand the evolution and the determinants of top incomes.

Furthermore, Van Essen et al. (2015) claim that the scarcity of analyses testing the relationship between indicators of managerial power and pay at the firm level is the reason why the managerial power theory is not verified or refuted yet.

3.2.3   Executive compensation in Italy

Several studies investigate executive compensation in Italy. Brunello et al. (2001) are possibly the first to conduct an empirical study on the compensation of Italian executives. The employ survey data to show that the structural characteristics of the Italian economy, finance, corporate governance and capital market imply a low fraction of incentive pay over total compensation and a low pay-performance sensitivity. The latter is apparently improved in foreign-owned firms, listed firms and firms affiliated to a multinational group.

Given the peculiar nature of Italian firms, characterized by the rarity of public companies, a high frequency of family-founded and familiy-led firms and a scarce presence of institutional investors (except for State-participated companies), the relationship between pay and ownership structure is a much-scrutinized topic. Barontini and Bozzi (2011) focus on four characteristics: ownership concentration, type of controlling shareholder (family, State or widely held), the wedge between cash flow and voting rights, the presence of shareholders' agreements. Each of those has an influence on the level of cash compensation paid to the board of directors. They also find that "excess compensation" (as measured by the residuals of a regression of total compensation on various firm variables) is negatively related to future performance, especially in family firms. This is seen by the authors as evidence in support of rent extraction by the founding family members. Croci et al. (2012) focus on the role of family control and institutional investors in Continental Europe, extracting data on CEO compensation in the period 2001-2008 from *BoardEx*. They find that the former is associated with lower levels of CEO pay, while the latter are associated with higher levels and higher use of equity-based compensation. Interestingly, institutional investors behave differently in family-held firms than in other firms, tending to increase CEO compensation in the former more than in the latter. Melis et al. (2012) try instead to understand how blockholder-dominated listed firms use stock options for executive compensation, exploiting a hand-collected dataset on stock options plans. They develop a model to determine whether stock option plans are the result of an efficient contract or of rent extraction, finding than a large majority of plans falls under the latter hypothesis. They also find that board independence and minority shareholders representation have a positive effect on stock option design.

Gigliotti (2013) focuses again on the relationship between remuneration and performance. A sample of 145 firms in the period 2004-2009 is analysed and data on remuneration and company performance are relied from firms' annual reports (only managing directors are considered, given that it was not possible at the time to determine whether other directors and chairmen are executives). The results do not support the existence of a link between performance and pay, while there is some evidence for a dimensional premium.

Mallin et al. (2015) investigate the remuneration of independent directors in the UK and in Italy, hand-collecting data on independent directors' characteristics, remuneration, responsibilities and attendance to meetings from firms' annual and corporate governance reports. They find a positive correlation between remuneration, effort and exerted responsibilities. Also, they show that independent directors who do not fulfil the Independence criteria set by the Codes of Corporate Governance are paid more. This result is interpreted by the authors as evidence in favour of the managerial power hypothesis.

Belcredi et al. (2014) analyse the consequences of the "say-on-pay" rules introduced by CONSOB (the Italian stock market regulatory body) in 2010 and the dissent of shareholders on remuneration policies. They find that dissent is positively correlated with CEO pay, the amount of equity granted as remuneration an excess compensation, increasingly so in remuneration quartiles and when the remuneration policy is unclear or not clearly disclosed.

3.3   Italian Stock Market and Rules on Remuneration

Notoriously, the Italian stock market is historically characterized by concentrated ownership, low presence of (private) institutional investors (Belcredi et al., 2014), paired with a relevant presence (both numerically and in terms of market capitalization) of State-controlled firms (Barontini and Bozzi, 2011) and a dominant role of founding families (Croci et al., 2012).

These factors cause rigidities in the market for corporate control and, as a consequence, in the market for executives (Belcredi et al., 2014). This is obviously relevant to the scope of this chapter, given that such rigidities have in all likelihood effects on directors' remuneration.

Policymakers and authorities have tried to modify these characteristics and mitigate their effects with some regulatory interventions.

The regulatory system of the Italian stock market is based on the Corporate Governance Code, first issued in 1999, which follows a "comply-or-explain" principle. Principles and recommendations are not mandatory for listed companies to follow, but when a prescription of the Code is not applied, the firm should explain the reason why this choice was made (Assonime, 2022).

Regarding remuneration, the Code applies the prescriptions of the Italian Consolidated Law on Finance and of the Issuers Regulations by CONSOB. First introduced in 2011, the regulation on remuneration policies and disclosure enhanced the availability of information on directors' and managers' pay with respect to the previous regime, regarding both general principles and procedures and data on awarded compensation (which is the reason why we start collecting and analysing data from 2011) (Belcredi et al., 2014).

For what concerns disclosure, CONSOB prescribes the publication of a "Report on Remuneration" at least 21 days before the Annual General Meeting of shareholders. The Report must contain two sections: the first explaining the company's policy on the remuneration of the members of the administrative bodies, of general managers and of managers with strategic responsibilities and the procedures used to adopt and implement such policy; the second provides a suitable representation of each of the item comprising remuneration and illustrates analytically, in pre-determined tables, each component of the awarded compensation, from both the issuing company and its subsidiaries and associates. The second section also contains a table detailing bonuses and incentive plans and another detailing the stock ownership of board members and strategic managers.

Concerning pay-setting mechanisms, the Corporate Governance Code recommends the institution of a remuneration committee within the board, composed of non-executive directors, the majority of which should possibly be independent, as well as the chair of the committee. The remuneration committee should assist the board in setting the pay policy, make proposals concerning the remuneration of executives, monitor and evaluate the application of the policy. Moreover, CONSOB requires that shareholders vote on the remuneration policy of the company, as described in the first section of the Report. The vote is mandatory, but non-binding. The result of the vote, as well as any eventual opinion on the policy expressed by the competent committee, needs to be adequately disclosed (Belcredi et al., 2014).

Listed firms operating in the banking and insurance sector need to follow a wider

and stricter set of rules issued by the Bank of Italy and IVASS (the Italian institute for the supervision of the insurance sector), regarding transparency and disclosure and the setting of variable compensation in particular.

3.4 Data

We collect our data from three main sources. Firstly, Remuneration Reports provide information on the compensation of each member of the board, each statutory auditor, of general managers and of other managers with strategical responsibilities (the definition of which is left to the discretion of firms). The latter are often reported anonymously or in aggregated form.

Reported compensation includes fixed cash pay, committee attendance fees, variable non-equity pay (divided into incentive-based bonuses and profit sharing), non-monetary benefits and other compensation. The fair value of equity pay and severance pay are reported separately. Ownership of shares at the beginning and at the end of the year is also reported in a separated table, even when the ownership is indirect (i.e., through close relatives). Each type of compensation is subdivided between money coming from parent companies, from subsidiaries and affiliates and from both jointly. In the following analyses, we do not consider the overall compensation from parent and subsidiary/affiliate companies, but compensation from parent companies only. In fact, in the first case, since several subsidiary and affiliate companies are also listed, we would face an issue of double counting. That is, individuals sitting in the board of a parent company and in the board of a subsidiary listed firm would see their pay reported twice (or more), one in the report of the holding company (as compensation from subsidiaries) and one in the report of each subsidiary (as compensation from that firm). Instead, if we consider pay from parent companies only, we avoid that problem and count compensations separately. Furthermore, when we perform our estimation of managerial pay determinants, we take into account only the highest compensation earned by each director or manager in the year, as explained in Section 3.6.

Secondly, we collect data on directors' and auditors' biography, on their role (i.e., whether they are executive or non-executive and whether they respect the criteria from both the Corporate Governance Code and from the Consolidated Law on Finance), on whether they represent a minority shareholder and on their tenure in the current position from Corporate Governance Reports.

Finally, firm-level data - including the province where the head office is located, revenues, number of employees, wage bills and total costs of personnel - are relieved from Financial Annual Reports. In addition, ATECO codes are taken from the Italian Chamber of Commerce official site, while end-of-the-year market capitalization can be found on Italian Stock Market official site statistical archives.

Since many listed firms are the parent company of a corporate group, we choose to collect firm-level data from consolidated financial statements, when possible. In this way, we can represent the situation of the whole group that is supervised by the board and the top management of each parent company and possibly have a more realistic picture of the size and performance of listed firms. Otherwise, when a listed firm has no subsidiaries or when a listed firm is the subsidiary of another

listed firm, we look at the separate financial statement.

Remuneration Reports, Corporate Governance Reports and Financial Annual Reports are issued every year by all listed firms in time for the Annual General Meeting and obviously refer to the previous financial year.

As we said in Section 2, CONSOB defined the regulation and contents of mandatory Remuneration Reports in 2011. Hence, even though the figures for directors' and top managers' remuneration were previously reported in financial reports, from 2011 onwards, these data were reported more precisely and consistently. Furthermore, 2011 is the first year for which Reports are collected on *Borsa Italiana*'s official site. Thus, we start our analysis from this year.

Given that the work of collecting, double-checking and aggregating this vast amount of data is a very time consuming one (and given that we could not find a viable way of automating this task via data scraping algorithms), we consider a 4-year period (2011-2014).

Hence, our dataset includes all the firms that issued a complete Remuneration Report in the reference period, while we excluded listed firms that did not publish a Report or that did not fully disclose their remuneration policy.

Thus, we obtain an unbalanced panel dataset containing 15,323 observations for a total of 6,389 directors, managers and auditors (see Section 3.5 for a more precise description). As several listed firms did not publish their Remuneration Reports throughout the reference period, we do not know the exact size of the total population of directors in 2011-2014. To have an idea of the coverage rates of our dataset, we compare the number of firms we observe with the list of all the firms listed in the Italian stock market each year, which we retrieve from the statistical archive of Borsa Italiana. Table 3.1 shows the coverage rates of retrieved Remuneration Reports to listed firms, firms in the sample to listed firms and of firms in the sample to retrieved Reports. Our dataset covers more than 90% of total listed firms for all the 4 years in the reference period, with a total coverage ratio of 91.5%. Listed firms that do not appear in the sample are either suspended from listing, foreign, in a delisting process (hence they did not publish the Relation for year t in year t+1) or choose not to publish the remuneration of their board members. The share of total capitalization of the missing listing firm is 2.17% on average and at its maximum in 2014 (5.47%), the year in which Fiat Chrysler Automobiles (the largest Italian industrial multinational group) delisted from Borsa Italiana. We can thus conclude that we have an almost complete coverage of the population of listed firms' board members. Tables 3.19 - 3.21 in Appendix A describe the individual-level, compensation and firm-level variables.

Table 3.1. Coverage rates of firms observed in the sample.

Year	2011	2012	2013	2014	Total
Total listed firms (MTA Intl Excluded)	268	260	254	249	1031
Retrieved Remuneration Reports	247	253	240	229	959
Firms in the database	242	241	233	227	943
Retrieved Relations/Total firms	92.2%	93.5 %	94.5%	92.0%	93.0%
Firms in the database/Total firms	90.3%	92.7%	91.7%	91.2%	91.5%
Firms in the database/Retrieved relations	98.0%	99.2%	97.1%	99.1%	98.3%
% of total capitalization of missing firms	0.47%	0.18%	2.56%	5.47%	2.17%

Notes:*The number of total listed firms is obtained from the statistical archive of Borsa Italiana (`https://www.borsaitaliana.it/borsaitaliana/statistiche/statistiche-storiche/principaliindicatori/2022/principaliindicatori2022_pdf.htm`). We exclude in each year the 36 foreign firms listed in the MTA International segment, which are not subject to the comply-or-explain rule on remuneration disclosure. The second column shows the number of Reports we were able to retrieve from Borsa Italiana's official site. The third column is the final number of firms observed in the dataset. In order to have another check on the coverage of our dataset, we look for the share of market capitalization of the firms for which we could not retrieve the Reports in the last column.*

To the best of our knowledge, there are no similar datasets regarding directors' remuneration in Italy in the existing literature. Previous studies either employed survey data (e.g., Brunello et al., 2001), focused on a single cathegory, such as CEOs (Croci et al., 2012; Barontini and Bozzi, 2018) or independent directors (Mallin et al., 2015), or on performance-related variables only (Gigliotti, 2013). Thus, this is possibly the first study employing data from official reports, with both performance-related and power-related variables, including all the individuals involved in the governance of a listed firms (CEOs, chairs, directors, top managers) and the whole population of firms listed in the Italian Stock Market (with few exceptions).

3.5   Descriptive Evidence

In this section, we analyse the descriptive evidence emerging from the data on a range of elements. Table 3.2 presents the number of individuals and firms observed each year. Table 3.3 describes the demographics of the dataset, while Table 3.4 focuses on the geographical distribution of the observed individuals.

Table 3.2. Number of observed individuals and firms

Total Observations		
Year	Individuals	Firms
2011	3959	242
2012	3988	241
2013	3763	233
2014	3615	227
Total	15325	943

We observe a progressive reduction in the number of firms and individuals, probably a consequence of the sovereign crisis and of the following economic crisis

that hit Italy in 2011-2012, which possibly caused the bankrupt of some firms, induced other firms to delist or to be involved in merger & acquisitions operations.

Interestingly, the percentage of women in firms increased dramatically, almost triplicating in the span of 4 years. This is the result of the introduction of a law on mandatory quotas for women, prescribing at least the 20% of elected members being of the less represented gender, starting from 2012, and at least 30% from 2015. Even though the target was missed, there was anyway a substantial increase in the number of elected women.

Mean and median age remained stable through the reference period. The analysis of the distribution by age classes brings out another interesting feature: over-70 individuals (11.74% on average) are far more represented than under-40 individuals (3.44% on average). Thus, Italian boards were made in the reference period more by people who were past the legal retirement age than by individuals below the age of 40.

More than three quarters of the population of directors, managers and auditors have a university degree. In 4 years of observation, the percentage of individuals with a level of education below graduation slightly falls (from 8.36% to 6.21%) and those who have a post-graduate degree grow (from 13.93% to 16.5%). Unsurprisingly, regarding the geographical distribution, the large majority (75.69%) of individuals in the dataset works in a firm located in Northern Italy. Milan, the "financial capital" of the country, and Rome, the official capital, sum up to almost half of all individuals.

Hence, what emerges from this first look at the data is that the average board member is male, in his late fifties, has a university degree and works in the North.

Table 3.3. Demographic characteristics of the observed individuals

Year	2011	2012	2013	2014	Total/Avg.
Gender					
M	2,975	2,909	2,644	2,398	4,224
%	*92.39*	*89.43*	*84.31*	*78.88*	*84.28*
F	245	344	492	642	788
%	*8*	*10.57*	*16*	*21.12*	*15.72*
Age					
Min	22	23	24	22	22 (Avg.)
Mean	57.19	57.44	57.52	57.24	57.35 (Avg.)
Median	56	56	56	56	56 (Avg.)
Max	91	92	93	94	94 (Avg.)
Age Classes					
<30	12	12	13	15	
%	*0.37*	*0.37*	*0.41*	*0.49*	*0.41*
30-39	91	96	102	96	
%	*2.81*	*2.94*	*3.24*	*3.15*	*3.03*
40-49	523	563	569	615	
%	*16.17*	*17.25*	*18.08*	*20.2*	*17.89*
50-59	602	707	790	874	
%	*18.61*	*21.66*	*25.10*	*28.71*	*23.43*
60-69	537	578	597	593	
%	*16.60*	*17.71*	*18.97*	*19.48*	*18.16*
>70	323	361	382	424	
%	*9.98*	*11.06*	*12.14*	*13.93*	*11.74*
Educational Level					
Middle-School	3	3	2	2	3
%	*0.16*	*0.15*	*0.10*	*0.10*	*0.10*
High-School	156	170	157	125	202
%	*8.36*	*8.22*	*7.57*	*6.21*	*7.01*
Graduate	1,447	1,585	1,588	1,553	2,226
%	*77.55*	*76.64*	*76.60*	*77.19*	*77.29*
Post-Graduate	260	310	326	332	449
%	*13.93*	*14.99*	*15.73*	*16.50*	*15.59*

Table 3.4. Geographical distribution of observed individuals

	2011	*2012*	*2013*	*2014*	*Total/Avg.*
Macroarea					
North	3,052	3,079	2,864	2,757	3,824
%	*77.12*	*77.17*	*76.11*	*76.33*	*75.69*
Centre	772	757	760	731	1,012
%	*19.50*	*18.97*	*20.20*	*20.24*	*20.03*
South	134	154	139	124	216
%	*3.38*	*3.86*	*3.69*	*3.43*	*4.28*
Largest 4 Provinces (by number of board members)					
Milan	1,371	1,420	1,286	1,206	1,717
%	*34.64*	*35.59*	*34.17*	*33.39*	*33.99*
Rome	468	453	439	456	556
%	*11.82*	*11.35*	*11.67*	*12.62*	*11.01*
Turin	306	362	273	250	359
%	*7.73*	*9.07*	*7.25*	*6.92*	*7.11*
Bologna	198	199	195	215	255
%	*5*	*4.99*	*5.18*	*5.95*	*5.05*

We now take a look at corporate variables in Table 3.5. The fact that in each year there are more presidents than CEOs, and less CEOs than firms, is possibly a consequence of one of the typical traits of Italian firms, i.e., the high frequency of founder-led firms. There are several companies in which the founder is the acting chairman and takes the executive decisions.

Regarding roles, we can observe an increase in the percentage of independent members, both in general and in the average presence of independents in the board. We also observe an increase in the percentage of directors elected in minority lists.

These two facts, along with the reduction in board members that are also shareholders (thus, with a potential conflict of interests) and the reduction in individuals sitting in more than one board, might be interpreted as a signal of a general improvement of corporate governance practices.

With regard to directors that sit in multiple boards, we observe that the majority of them is independent (55%). We might argue that there is a group of "directors by profession", without strict relationship to the controlling shareholders, that offer their impartial and expert services to companies. Anyway, the highest relative percentage of multiple appointments is found among non-executive, non-independent directors (33%). We suggest that the issue of multiple board membership and of links between boards and directors might be further expanded through network analysis techniques.

Table 3.5. Corporate governance variables

	2011	*2012*	*2013*	*2014*	*Total/Avg.*
Position					
President	289	291	268	261	287
Vice-President	200	207	185	165	211
CEO	221	235	208	200	277
Director	2192	2210	2051	1960	2824
GM	117	108	103	88	148
Other Managers	79	73	81	85	173
Chair of Auditors	252	252	237	248	274
Auditor	609	612	630	608	858
Role (Board Members & Managers Only)					
Executive	895	883	820	782	1,100
%	*28.90*	*28.26*	*28.31*	*28.36*	*28.06*
Non-Executive	928	963	855	789	1,117
%	*29.96*	*30.82*	*29.52*	*28.59*	*28.49*
Independent	1,086	1,234	1,194	1,174	1,536
%	*35.07*	*39.49*	*41.23*	*42.58*	*39.18*
Unknown/Unreported	188	45	27	12	167
%	*6.07*	*1.44*	*0.93*	*0.44*	*4.26*
List of election					
Majority	2,525	2,716	2,521	2,397	3,207
%	*81.53*	*86.91*	*87.05*	*86.94*	*81.81*
Minority	216	208	209	218	286
%	*6.97*	*6.66*	*7.22*	*7.91*	*7.30*
Unknown/Unreported	356	201	166	142	427
%	*11.49*	*6.66*	*5.73*	*5.15*	*10.89*
Shareholders (Direct or Indirect)					
%	33.06	30.24	29.68	26.08	29.85
Relatives of another member					
%	8.44	8.64	8.72	8.60	8.60
Sitting in multiple boards					
%	30.12	29.85	27.61	26.66	28.62
Individuals with double position					
%	6.01	4.74	5.58	6.64	5.72
Average % of independents in the board					
%	38.11	41.51	42.85	44.08	41.57

The following tables describe the distribution of total compensation from parent companies (excluding those who report a zero compensation in the year) for board members and managers jointly (Table 3.6), by position (Table 3.7) and by role (Table 3.8).

We can see that the distribution of compensation is very skewed towards the right, à la Rosen (1981), by looking at the distance between the median value and the mean value and from the presence of very high maximum values. We will present several inequality indices below.

Table 3.6. Total Compensation from Parent Company

Year	N	p1	p10	Median	Mean	p90	p99	Max
Board & **Managers**								
2011	3,009	2,000	10,000	50,000	193,365	430,000	2,146,953	21,200,000
2012	3,057	1,861	8,238	45,600	175,089	415,985	1,804,930	9,378,000
2013	2,818	2,000	10,000	50,000	183,934	436,253	2,198,000	6,171,154
2014	2,685	2,394	10,000	50,000	180,538	440,000	2,157,742	5,699,436
Total	11,569	2,000	10,000	49,271	183,262	432,000	2,092,000	21,200,000

Table 3.7. Total Compensation from Parent Company by Position

Year	N	p1	p10	Median	Mean	p90	p99	Max
Chairs & **VPs**								
2011	478	3,000	20,000	177,000	448,039	952,680	3,265,139	21,200,000
2012	486	4,000	25,000	178,800	360,743	900,205	2,968,000	5,102,369
2013	443	5,000	29,000	180,816	362,147	939,000	2,620,000	3,620,802
2014	415	4,932	26,500	195,363	353,679	900,000	2,25,0600	3,566,613
Total	1,822	4,000	25,364	180,845	382,378	914,682	2,6200,00	21,200,000
CEOs & **GMs**								
2011	332	15,805	94,500	372,012	644,539	1,554,006	3,684,500	4,884,000
2012	337	8,000	73,045	370,571	652,994	1,524,025	4,337,247	9,378,000
2013	305	4,932	100,000	415,000	719,279	1,709,282	4,477,534	6,171,154
2014	284	5,000	76,698	432,500	706,407	1,670,394	4,070,000	5,699,436
Total	1258	5,588	87,017	388,300	678,892	1,576,000	4,313,127	9,378,000
Directors								
2011	2,127	1,860	9,167	33,419	65,035	123,439	688,000	2,810,000
2012	2,164	1,699	6,667	30,000	56,711	117,800	365,776	1,645,126
2013	1,991	1,700	8,690	34,000	58,090	118,875	425,000	1,659,420
2014	1,906	2,000	8,301	34,049	60,039	118,000	469,100	3,254,300
Total	8,188	1,750	8,000	33,000	59,983	120,000	489,263	3,254,300

By looking at the disaggregated data, we can see that there can be compensations near or above 1 million of Euro among all positions and roles. This might tell that even directors, and not only top managers, may have a relevant role in the dynamics of top incomes in Italy.

The highest record in the dataset is the pay of the president of a company operating in the "Technical and Scientific Professions" sector, which earned more than 20 mln € in 2011, over 900x the average contractual annual retribution in the same sector (23,429 €) - as measured by the Italian National Statistical Institute

(ISTAT) - and about 877x the average contractual annual retribution in Italy (24,165 €).

Table 3.8. Total Compensation from Parent Company by Role

Year	N	p1	p10	Median	Mean	p90	p99	Max
Executives								
2011	874	5,000	4,0000	235,170	496,652	1,131,198	3,385,700	21,200,000
2012	860	5,000	26,500	228,075	461,536	1,167,300	3,134,000	9,378,000
2013	797	4,932	30,000	240,800	491,432	1,285,000	3,148,871	6,171,154
2014	757	3,500	27,000	249,000	478,897	1,203,069	3,209,000	5,699,436
Total	3288	4,500	30,000	236,484	482,114	1,213,511	3,209,000	21,200,000
Non-Executives								
2011	892	1,860	8,000	31,196	82,987	157,300	1,003,600	2,483,996
2012	934	1,776	6,000	28,000	70,900	156,000	761,721	2,251,750
2013	816	2,000	8,000	30,000	76,693	160,000	857,366	2,251,797
2014	749	1,200	6,000	30,000	77,297	160,000	913,000	3,254,300
Total	3,391	1,753	6,740	30,000	76,886	159,492	913,000	3,254,300
Independents								
2011	1,081	2,230	10,000	37,000	59,584	114,600	350,000	1576500
2012	1,223	2,000	8,185	35,778	55,401	120,000	307,207	1645126
2013	1,184	1,495	10,000	36,400	53,719	110,000	260,000	850000
2014	1,167	3,000	10,000	37,238	54,170	112,064	291,000	900000
Total	4,655	2,000	10,000	36,400	55,636	114,400	307,200	1,645,126

To put executive compensation in relative terms with the rest of the economy, Table 3.9 compares the evolution of CEOs' and GMs' mean compensation with Italian employees' annual retribution taken from ISTAT. Actually, the latter is a measure that represents a highly "protected" and relatively well-paid category of workers, including both blue-collars and white collars. Anyway, Italian CEOs were paid on average almost 30x what employees were paid and enjoyed a 5.5 percentage points higher increase in earnings.

Table 3.9. Evolution of mean executive compensation and average eannual employees' contractual retribution (as measured by ISTAT) in Italy.

	2011	*2012*	*2013*	*2014*	$\Delta\%$
CEOs & GMs	644,539	652,994	719,279	706,407	9.60
Employees	24,165	24,532	24,879	25,166	4.14
Ratio	26.7	26.6	28.9	28.1	

Figures 3.1 and 3.2 take the distributional analysis of compensations further. As we said previously, Italian boards show a very high level of compensation inequality, with the top 10% of individuals commanding more than 60% of total earnings and the top 1% commanding about a fifth. Income shares are fairly stable throughout the reference period.

What is perhaps surprising is that CEOs and GMs show less within-inequality than directors and presidents and VPs. This is something that goes against the intuition of the market-based hypothesis, since one would expect higher competition
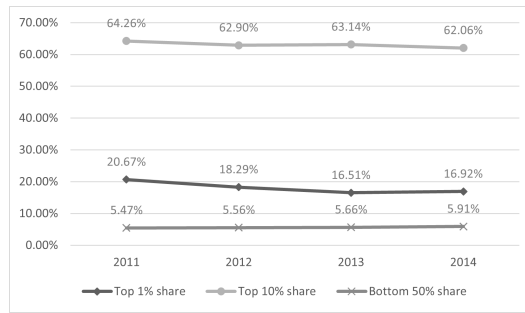
Figure 3.1. Evolution of Top 1, Top 10 and Bottom 50 shares of observed board members of Italian listed firms.
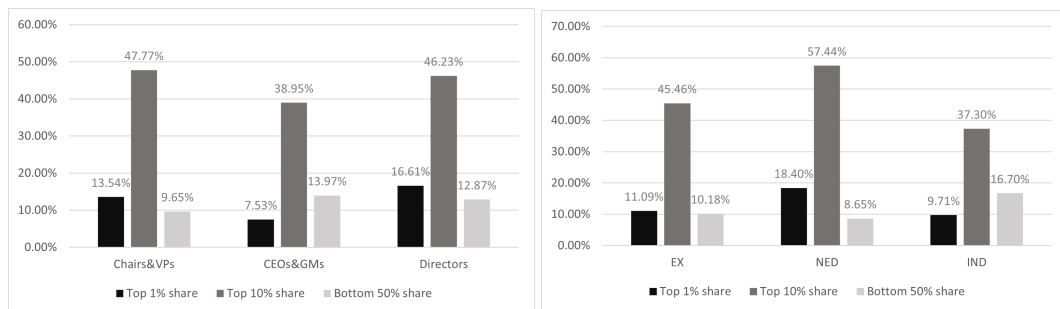
Figure 3.2. Income shares of observed board members of Italian listed firms by position and role.

- thus, under these lenses, higher levels and differentials in pay - for those that have the most important responsibilities.

Instead, we observe higher top shares and higher Gini (Table 3.10) for other positions, and for non-executives rather than for executives.

Table 3.10. Gini index computed on the population of observed board members of Italian listed firms by year, position and role

Year	2011	2012	2013	2014	Total
	0.742	0.736	0.731	0.729	0.735
Position	Chairs&VPs		CEOs&GMs		Directors
	0.623		0.539		0.577
Role	Executive		Non-Executive		Independent
	0.605		0.671		0.501

Investigating gender-gaps is beyond the scope of this chapter, but it is anyway of interest that Figure 3.3 shows how female board members earn substantially less than their male colleagues.

Finally, we investigate the relative weight of the various components of compensation in Table 3.11. Clearly, fixed cash represent the largest part of total pay. The share of bonus decreases over time and the other components are very small. There are of course differences among the various positions. The share of bonuses is larger and increasing in time for CEOs and GMs, but anyway never above 30% of the
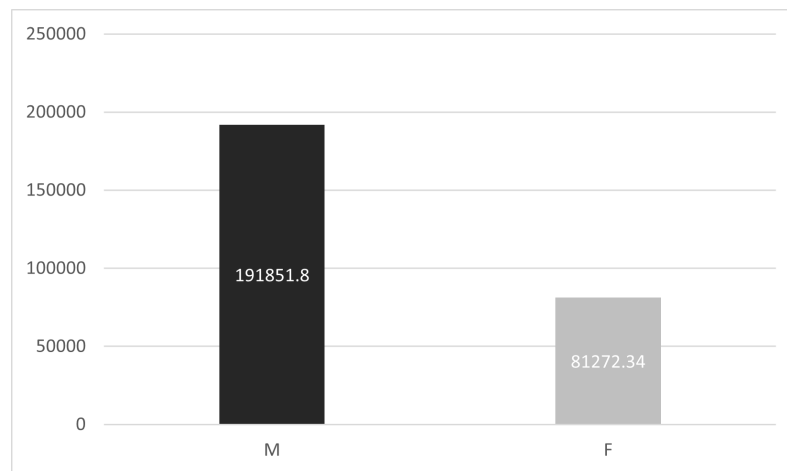
Figure 3.3. Mean total compensation by gender

total. Compensation fees are higher among directors, which is straightforward since participating to committees is a large part of their job.

Figure 3.4 shows the evolution of equity pay in the reference period, in total and for CEOs and GMs alone. Equity compensation is still quite marginal for Italian directors in the reference period, amounting to less than 10% of total non-equity compensation. In fact, only 404 board members out of 11875 (3.4%) and 143 CEOs out of 864 (16.5%) received stock options as a form of compensation. It is slightly higher for CEOs but decreasing over time.

Table 3.11. Components of compensation by position and year (%)

Year	Fixed	Bonus	C. Fees	P. Shar.	In-Kind	Other
Total						
2011	70.83	19.70	3.75	0.68	1.37	3.69
2012	72.76	16.09	4.12	0.80	1.77	4.48
2013	72.43	17.19	3.72	0.93	1.90	3.96
2014	73.18	16.96	4.16	0.70	1.75	3.38
Avg.	*72.28*	*17.50*	*3.93*	*0.78*	*1.69*	*3.89*
Chairs & VPs						
2011	64.95	31.09	0.58	0.40	1.05	1.93
2012	84.60	11.21	0.59	0.53	1.84	1.22
2013	83.96	11.90	0.56	0.48	2.60	0.50
2014	84.76	11.75	0.51	0.37	1.73	0.88
Avg.	*79.36*	*16.68*	*0.56*	*0.45*	*1.79*	*1.15*
CEOs & GMs						
2011	69.61	23.55	0.42	1.09	2.26	3.07
2012	62.61	28.43	0.52	0.87	2.47	5.12
2013	63.13	29.21	0.11	0.91	2.47	4.16
2014	62.23	30.34	0.38	0.70	2.48	3.86
Avg.	*64.50*	*27.75*	*0.36*	*0.90*	*2.42*	*4.06*
Directors						
2011	69.25	14.12	7.34	0.70	0.91	7.26
2012	71.68	16.41	2.67	1.44	1.19	6.61
2013	71.34	15.47	5.15	2.00	0.85	5.20
2014	72.94	16.46	3.30	1.57	0.84	4.79
Avg.	*71.26*	*15.60*	*4.64*	*1.41*	*0.95*	*6.01*

(a) Total

(b) CEOs
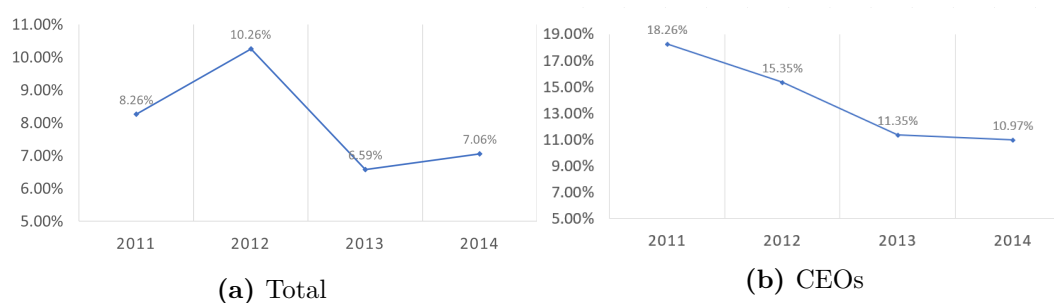
Figure 3.4. Equity-to-Total compensation ratio

3.6 Empirical Strategy

The scope of this chapter is to assess performance and power jointly as determinants of managerial compensation in Italian listed firms.

Therefore, we try to do so having the following panel data model in mind:

$$Pay_{it} = \alpha + \beta_1 Performance_{it-1} + \beta_2 Power_{it} + \beta_3' \mathbf{x}_{1it} + \beta_4' \mathbf{x}_{2i} + \epsilon_{it} \qquad (3.1)$$

where $Performance_{it}$ is a measure of managerial effort, $Power_{it}$ is a measure of managers' influence within the firm, $\mathbf{x}_{1it}$ is a set of time-varying individual and firm controls and $\mathbf{x}_{2i}$ is a set of fixed-effects.

Of course, there is no way to measure directly managerial performance and power. Thus, it is crucial to select some viable proxies for those.

The most commonly used measure of (firm) performance in pay-performance sensitivity studies is the change in shareholder wealth, first used by Jensen and Murphy (1990). This type of performance proxy clearly frames the issue into a principal-agent problem, with the aim of measuring how much the agent's (CEO's) pay responds to the pursue of the principal's (shareholders') interest.

We instead try to move away from this framework. The nature of Italian capitalism, with concentrated ownership, family-owned firms and few public companies dissuades from interpreting the relationship between managers and shareholders as a principal-agent problem (given that many times the two coincide in the same person). Furthermore, we would like to go beyond the shareholder value maximization and look at a more comprehensive definition of the benefit that a board member can bring to the firm.

Thus, we follow Gabaix and Landier (2008) in using market capitalization as our performance proxy. Actually, this creates some problems, since this measure conflates size, stock-price performance and market volatility (Murphy, 2013). We will hence use further controls for size and employ year dummies to control for time-variability.

Furthermore, we use the first lag of market capitalization, since pay policies are set by the Remuneration Committee and approved by shareholders each year on the basis of previous year performance.

Managerial power is even more difficult to identify. Van Essen et al. (2015) use six different proxies for power in their meta-analysis: duality (i.e., having a double position within the board), tenure, board size, board independence, ownership concentration and institutional ownership. At the moment, we do not observe the last two variables. We find instead all the other four to be somehow problematic. We argue that duality would be not so informative about the pay-power relationship: usually, remuneration policies fix a given compensation for each top job. Thus, being CEO and president at the same time would automatically result in a higher pay. We also find the prediction of positive correlation between pay and tenure quite trivial. Finally, board size and board independence, as measured by the percentage of independent directors over the total number of directors, are probably collinear to firm size, given that larger firms tend to have larger boards, but also a more complex governance, involving more independents. Hence, they are probably collinear to managerial compensation too (which would explain the positive sign of the relationship between board independence and compensation found by Van Essen et al., 2015, contradicting their expectations).

Thus, we try to propose more proxies for power. We think that a quite straightforward way to see whether a board member is "powerful" or not is to look at how

many boards she is into. By sitting in many boards, a director can increase her prestige and strengthen her network of relationships, exploiting potential conflicts of interest between firms to extract more rents. In addition, we try to proxy a director's power with the sum of her compensation from the other boards she is sitting in.

Thus, we take a look at how individuals working for more than one firm are distributed. In Table 3.5 we saw that 30% of individuals in the dataset sit in more than one board. Figure 3.5 show the distribution on individuals holding more than one position by deciles of the highest compensation in the year and of the average compensation per position held.
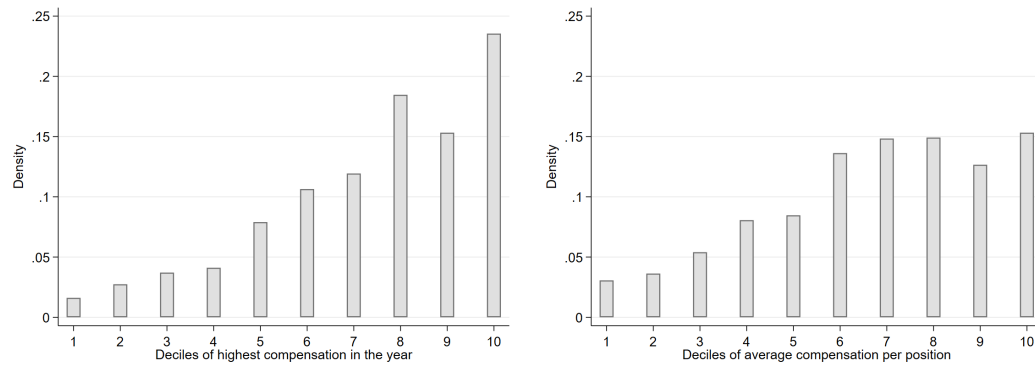
Figure 3.5. Distribution by deciles of compensation of individuals holding more than one position

Tables 3.12 and 3.13 show instead the distribution of the number of positions held by deciles of highest compensation in the year and of average compensation per position, respectively. Most of the individuals holding multiple positions are concentrated among the top deciles in the first case, while they are more evenly distributed in the second case.

Table 3.12. Number of positions by deciles of highest compensation in the year (%)

Deciles	Number of positions							Total
	1	2	3	4	5	6	7	
1	97.85	1.98	0.09	0.00	0.09	0.00	0.00	100.00
2	94.99	3.88	0.81	0.00	0.32	0.00	0.00	100.00
3	92.52	6.83	0.55	0.09	0.00	0.00	0.00	100.00
4	91.95	6.87	0.92	0.25	0.00	0.00	0.00	100.00
5	84.93	12.15	2.04	0.71	0.18	0.00	0.00	100.00
6	83.89	14.35	1.20	0.40	0.16	0.00	0.00	100.00
7	79.70	13.56	5.14	1.12	0.28	0.19	0.00	100.00
8	73.92	16.70	6.11	2.32	0.69	0.26	0.00	100.00
9	81.69	9.41	6.13	1.81	0.60	0.35	0.00	100.00
10	74.74	15.52	4.74	3.10	1.47	0.26	0.17	100.00
Total	85.69	10.10	2.74	0.97	0.38	0.10	0.02	100.00

Table 3.13. Number of positions by deciles of average compensation per position (%)

	Number of positions							
Deciles	1	2	3	4	5	6	7	Total
1	95.61	3.61	0.43	0.00	0.34	0.00	0.00	100.00
2	91.92	6.28	1.29	0.43	0.09	0.00	0.00	100.00
3	89.31	8.88	1.29	0.34	0.17	0.00	0.00	100.00
4	88.00	9.95	1.32	0.51	0.22	0.00	0.00	100.00
5	83.69	12.45	2.80	0.68	0.19	0.19	0.00	100.00
6	80.02	13.32	5.24	1.15	0.18	0.09	0.00	100.00
7	78.10	14.81	4.33	2.08	0.35	0.35	0.00	100.00
8	79.31	12.43	5.51	1.60	0.98	0.18	0.00	100.00
9	86.36	9.07	3.20	0.86	0.26	0.17	0.09	100.00
10	83.63	10.59	2.41	2.15	1.03	0.09	0.09	100.00
Total	85.70	10.09	2.74	0.97	0.38	0.10	0.02	100.00

Hence, this is the model we are estimating:

$$logTotComp_{it} = \alpha + \beta_1 logMktCap_{it-1} + \beta_2 Power_{it} + \beta_3' \mathbf{x}_{1it} + \beta_4' \mathbf{x}_{2i} + \epsilon_{it} \quad (3.2)$$

where both *Pay* (measured by total compensation from parent company) and *MktCap* are in logarithms, so that we can estimate the elasticity of pay to performance. *Power* is, as we said, either the number of positions held or the sum of rewards received from each firm by each director (in logarithms). Given that a director might earn 100,000 € from a single job or from 10 different 10,000 € jobs, we keep the former variable also when we use the latter as a power proxy, so that we make sure that the effect of compensation from other companies is estimated with the number of positions being equal.

Moreover, we consider the highest compensation in the year for each director/manager only, for a better identification of the effects of the possible determinants. In fact, if considering parent companies only avoids double counting for pay (see Section 3.4), the same is not true for corporate governance variables, including our candidate proxies for power. Considering every compensation each director gets from parent companies would be equivalent to consider each director sitting in multiple boards as several different individuals sitting in a single board. But each of these "virtual" individuals would have the same number of board memberships for different levels of pay, thus severely biasing our estimation.

Hence, our strategy consists in estimating equation (3.2) in these two specifications, with both Pooled Ordinary Least Squares (POLS) and Fixed Effects Model (FE) estimation methods.

Finally, we do several robustness checks by including those who receive a null compensation in the year, by restricting the analysis to executives only, non-executives only and independents only and by testing other firm variables as performance proxies.

3.7   Results

Table 3.14 presents the results of the regression of equation (2), showing the coefficients of our chosen performance and power proxies, plus several other variables of interest. Among others, we control for firm size (as measured by the log of employees) and for several other individual corporate governance variables.

All the relevant variables have a positive and significant coefficient. In the first specification, power (proxied by the number of positions held) seems to have a similar or more important role with respect to performance, depending on the estimation method employed. Being appointed with an additional position and a 1% increase in previous year market capitalization are both associated with an increase in compensation by 20% with a POLS regression. Interestingly, the coefficient for power is similar when employing a FE, while the one for performance goes down to 0.085 (meaning a 1% increase in previous year market capitalization is associated with a 8.5% increase in compensation). In the second specification, the coefficient or performance is almost unchanged. Instead, power (proxied by the sum of payments from the other firms) has a positive but way smaller coefficient than performance when estimated with POLS. The difference is narrower in FE. Both estimates say that a 1% increase in the sum of compensation from other firms is associated with about a 3% increase in the highest compensation in the year.

It is also interesting to look at some control variables. The number of the firm's employees (which we use to control for firm size) has a positive and significant coefficient. Thus, firm size may have a role in determining directors' compensation, as argued by Rosen (1982); Gabaix and Landier (2008) and Tervio (2008). The coefficient for being a shareholder is consistently positive and significant throughout the different specifications. Being a minority director is associated with a statistically significant reduction in compensation in POLS (it is instead non significant in FE). Unsurprisingly, being a non-executive or an independent director is associated with negative coefficient, although independents seem to have an higher penalty when the regression is estimated in fixed effects.

Table 3.14. Estimated coefficients of the regression of directors' compensation on performance and power proxies

	First Specification		Second Specification	
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.202***	0.0850***	0.200***	0.0800***
	(0.00712)	(0.0215)	(0.00712)	(0.0213)
N. of positions	0.202***	0.209***	0.0507	0.0459
	(0.0165)	(0.0304)	(0.0315)	(0.0366)
Pay from other firms			0.0304***	0.0325***
			(0.00539)	(0.00707)
Firm Size (Employees)	0.0972***	0.0441***	0.0952***	0.0457***
	(0.00657)	(0.0127)	(0.00657)	(0.0124)
Shareholder	0.154***	0.139**	0.155***	0.138**
	(0.0234)	(0.0480)	(0.0234)	(0.0476)
Minority	-0.145***	0.0452	-0.145***	0.0418
	(0.0370)	(0.107)	(0.0369)	(0.106)
Duality	0.624***	0.305***	0.623***	0.313***
	(0.0436)	(0.0910)	(0.0436)	(0.0912)
Tenure	0.00715***	0.0160	0.00709***	0.0176
	(0.00170)	(0.0103)	(0.00169)	(0.0100)
NED	-0.926***	-0.891***	-0.931***	-0.890***
	(0.0358)	(0.165)	(0.0357)	(0.163)
IND	-0.772***	-1.030***	-0.778***	-1.036***
	(0.0374)	(0.187)	(0.0374)	(0.183)
Finance	0.132***	-0.0649	0.137***	-0.0831
	(0.029)	(0.17)	(0.0289)	(0.0164
Obs.	7279	7279	7279	7279

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Moreover, in accordance with the findings of Van Essen et al. (2015), duality and (although only in POLS) tenure are associated with a positive and significant variation in compensation. Also, directors working in the financial sector seem to have a premium, as found by Philippon and Reshef (2012).

We try some alternative specifications to check the robustness of our results. First, we rerun the previous regression including those who have a null compensation (by setting $logTotComp = 0.1$ when $TotComp = 0$). Relevant coefficients are mostly unchanged in sign and significance, although they change in size.

Table 3.15. Robustness check: executives only

	First Specification		Second Specification	
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.232***	-0.0265	0.227***	-0.0261
	(0.0162)	(0.0425)	(0.0164)	(0.0425)
N. of positions	0.219***	0.0198	0.119*	0.0678
	(0.0319)	(0.0404)	(0.0564)	(0.0554)
Pay from other firms			0.0229*	-0.0115
			(0.0107)	(0.00956)
Firm Size (Employees)	0.0910***	-0.0322	0.0894***	-0.0344
	(0.0146)	(0.0203)	(0.0146)	(0.0206)
Shareholder	0.219***	0.223*	0.218***	0.223*
	(0.0522)	(0.0867)	(0.0522)	(0.0868)
Minority	-0.0991		-0.0898	
	(0.158)		(0.158)	
Duality	0.595***	-0.0821	0.593***	-0.0841
	(0.0571)	(0.0713)	(0.0570)	(0.0715)
Tenure	0.00756**	0.00466	0.00770**	0.00396
	(0.00276)	(0.0167)	(0.00275)	(0.0164)
Finance	-0.146*	-0.344	-0.136*	-0.330
	(0.0658)	(0.474)	(0.0659)	(0.469)
Obs.	1976	1976	1976	1976

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.16. Robustness check: non-executives only

	First Specification		Second Specification	
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.162***	0.0382	0.159***	0.0382
	(0.0141)	(0.0347)	(0.0141)	(0.0346)
N. of positions	0.152***	0.205***	-0.172*	0.0937
	(0.0377)	(0.0523)	(0.0716)	(0.0730)
Pay from other firms			0.0612***	0.0201
			(0.0115)	(0.0129)
Firm Size (Employees)	0.103***	0.0291	0.0998***	0.0288
	(0.0137)	(0.0188)	(0.0136)	(0.0188)
Shareholder	0.118**	0.00939	0.125**	0.00883
	(0.0437)	(0.0654)	(0.0434)	(0.0653)
Minority director	-0.134	0.315	-0.130	0.317
	(0.0919)	(0.241)	(0.0913)	(0.240)
Duality	1.198***	0.649**	1.202***	0.648**
	(0.165)	(0.230)	(0.164)	(0.230)
Tenure	0.00367	0.0274	0.00311	0.0275
	(0.00332)	(0.0254)	(0.00331)	(0.0254)
Finance	0.340***	-0.219	0.345***	-0.232
	(0.0573)	(0.298)	(0.0570)	(0.294)
Obs.	2192	2192	2192	2192

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.17. Robustness check: independents only

| | First Specification | | Second Specification | |
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.202***	0.0765*	0.202***	0.0729*
	(0.00843)	(0.0326)	(0.00841)	(0.0323)
N. of positions	0.223***	0.159***	0.100*	0.0429
	(0.0206)	(0.0379)	(0.0429)	(0.0442)
Pay from other firms			0.0226**	0.0232*
			(0.00690)	(0.00924)
Firm Size (Employees)	0.102***	0.0531***	0.101***	0.0545***
	(0.00762)	(0.0153)	(0.00761)	(0.0151)
Shareholder	0.0865**	0.173	0.0864**	0.168
	(0.0300)	(0.0942)	(0.0299)	(0.0941)
Minority	-0.153***	0.0735	-0.157***	0.0616
	(0.0335)	(0.118)	(0.0335)	(0.119)
Duality	0.180	-0.121	0.165	-0.109
	(0.139)	(0.182)	(0.139)	(0.187)
Tenure	0.00824*	0.0102	0.00776*	0.0105
	(0.00364)	(0.0178)	(0.00364)	(0.0179)
Finance	0.155***	-0.0662	0.156***	-0.0794
	(0.0344)	(0.198)	(0.0344)	(0.194)
Obs.	3111	3111	3111	3111

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

We also restrict the observations to each type of role. Results of running our regressions with executives only, non-executives only and independents only are reported in Tables 3.15, 3.16 and 3.17, respectively. The reference population is much smaller in these three cases, so we expect the significance to be low especially when FE is employed. Anyway, the sign and size of the relevant coefficients are similar to our main results also in these three regressions.

Table 3.18. Robustness check: lagged revenues as performance proxy

| | First Specification | | Second Specification | |
	POLS	FE	POLS	FE
Revenues(t-1)	0.168***	0.0392**	0.166***	0.0382**
	(0.00767)	(0.0137)	(0.00766)	(0.0137)
N. of positions	0.238***	0.216***	0.0700*	0.0425
	(0.0168)	(0.0312)	(0.0324)	(0.0378)
Pay from other firms			0.0336***	0.0343***
			(0.00552)	(0.00719)
Firm Size (Employees)	0.0932***	0.0470***	0.0909***	0.0485***
	(0.00757)	(0.0128)	(0.00756)	(0.0126)
Obs.	7245	7245	7245	7245

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finally, in Table 3.18 we use (lagged) firm revenues in logs as a proxy for performance instead of market capitalization. In this specification, compensation seems slightly less sensitive to performance and slightly more sensitive to power, but the overall picture seems to remain unchanged.

We also look for heterogeneities by gender and geographical macroarea in the determinants of board members' compensation. We run again our regression (this

time in the second specification only, including both the number of positions per director and the sum of payments from other firms) separately for men and women and for Northern and Central-Southern Italy. Tables 3.22 and 3.23 in Appendix B show the results, which are not enormously different from the main ones. Male managers' pay seem to be slightly more responsive to performance and slightly less to power than the average. If we look at macroareas, it is interesting to see that lagged market capitalization is not statistically significant for Northern Italy in the FE model, while the coefficient for the power proxy is slightly larger in values than the average.

3.8 Discussion and Conclusions

In this chapter, we contribute to the literature on managerial compensation by employing a novel panel dataset. We extrapolate data on Italian listed firms' directors pay, individual and corporate governance-related characteristics from Remuneration and Corporate Governance Reports required by the self-discipline code of firms listed in the Italian stock market. We merge those with firm-level data obtained from financial annual reports and Borsa Italiana official site.

This dataset allows the joint analysis of the two main determinants of managerial compensation identified by the relevant literature on this issue: performance and power. To the best of our knowledge, no similar attempt concerning Italian directors has been made previously.

This is relevant, since many argue that no conclusive evidence has been produced in favour of either the "efficient contracting" or the "managerial power" hypothesis (e.g., Murphy, 2013). Moreover, there is a growing consensus that the two hypotheses can be seen as complementary rather than competing Frydman and Jenter (2010).

Thus, we regress total compensation of listed firms' directors on our choice of proxies for managerial performance and power. Our estimates suggest that there actually is a role for both performance and power in determining directors' pay. Anyway, we do not find conclusive evidence to tell which one prevails over the other, since the relative importance of performance and power changes depending on the power proxy and the estimation method we choose.

Given that the process of hand-collecting data from the various corporate reports is a very time-consuming one, we could only analyse a 4-year time span in our panel of directors. Consequently, our results cannot be but partial and preliminary. An update of the dataset with the inclusion of more years, possibly up until the present year, will certainly improve the quality and the significance of the results. The availability of more years will also allow to analyse better CEOs, as most of the relevant studies do.

In addition, by retrieving data on firms' returns on stocks and calculating the differential with the average returns of each firm's industry (as in Kaplan and Rauh, 2010), we could obtain a better measure of firm performance. Another improvement could come from calculating the realized value of stock options and then adding this (and eventual severance pays) to total cash compensation, in order to have an actual measure of executives' yearly realized compensation (similar to ExecuComp's TDC2 measure, see Kaplan and Rauh, 2010). Finally, instead of looking at the highest

compensation in the year, the sum of all compensations of each individual from all listed parent companies and subsidiary or affiliate companies might be considered. Hence, an overall personal earnings distribution of managers would be obtained for every year. The problem here is that sometimes both parent companies and subsidiaries/affiliates are listed, so that when a manager seats in the board of parent and of the subsidiary/affiliate in the same year the remuneration from the latter is counted twice (once in parent company's remuneration report as compensation from subsidiaries and once in subsidiary's remuneration report). Thus, this problem should be considered and these double counting cases should be corrected.

Nevertheless, we argue that this is a very promising dataset, with a number of interesting potential expansions. Besides expanding it in time, we suggest that analysing corporate reports even more in depth (possibly with the help of text analysis techniques) might give additional relevant information on the ownership structure and the internal functioning of companies and, as a consequence, more insight on managers' performance and power. For example, a better comprehension of the influence of executives on internal pay-setting procedures might come by examining whether remuneration committees are established and how are they composed. All this information could be employed to build an index of managerial power, following the example of the governance index built by Piketty et al. (2014).

Furthermore, we now observe how many firms each individual is working with in every year. A further step might come from the employment network analysis techniques to understand how many links are there between each director/manager and if and to what extent this influences their remuneration.

Moreover, the fact that the Corporate Governance Code and various other relevant regulations have been subject to changes from 2011 onwards might be exploited too. The continuous effort by the authorities to improve the rules on corporate governance and to tackle several issues has resulted in several reforms. It could be fruitful to understand whether the strengthening of corporate governance practices affects compensation and what would be the sign of the effect. Causal inference and policy evaluation methods might be employed at this scope. Similarly, other issues, beyond executive compensation, might be explored too. Gender gaps are a promising example. The minimum percentage of the least represented gender has been raised from 20% to 40% in 2018. It could be assessed whether this had an effect on women's remuneration and participation to board.

We conclude by arguing that the use of data from corporate reports disclosing managers' and directors' remuneration and corporate policies, a relative news in Italy, might lead to better estimates of the role of several factors in the determination of managerial compensation and to a better understanding of the functioning of pay-setting mechanisms in general.

Appendix A   Variables description

Table 3.19. Description of individual variables

Individual variables	
id	*ID code identifying each individual in the dataset uniquely*
id2	*ID code identifying each individual differently when comparing in different boards*
gender	*Binary: = 1 if woman*
age	*Age*
educ	*Educational level - Categorical variable:*
	1 = Middle School
	2 = High School
	3 = Graduate
	4 = Post-Graduate
position	*Current position held - Categorical variable*
	1 = President
	2 = Vice-President
	3 = CEO
	4 = Director
	5 = GM
	6 = Other Manager
	7 = President of Statutory Auditors
	8 = Statutory Auditor
tenure	*Years of tenure in current position*
role	*Role - Categorical variable:*
	1 = Executive
	2 = Non-Executive
	3 = Independent
multpos	*Dummy for double position in the same firm (Duality)*
jobend	*Dummy for position ended in year*
minority	*Dummy for minority directors*
shhold	*Dummy for ownership of shares*
family	*Dummy for relatives (people with the same surname) in the board*
multfirms	*Dummy for positions in more than one firm*
numpos	*Number of positions in other boards*
l_othpay	*Log of total pay from other firms*
l_othrev	*Log of total revenues of other firms*
l_othcap	*Log of total market cap of other firms*

Table 3.20. Description of compensation variables

Compensation variables	
fix_parent	*Fixed cash from parent company*
fix_subs	*Fixed cash from subsidiaries*
fix_total	*Total fixed cash*
committee_parent	*Committee fees from parent company*
committee_subs	*Committee fees from subsidiaries*
committee_total	*Total committee fees*
bonus_parent	*Bonus from parent company*
bonus_subs	*Bonus from subsidiaries*
bonus_tot	*Total bonus*
profitsh_parent	*Profit sharing from parent company*
profitsh_subs	*Profit sharing from subsidiaries*
profitsh_tot	*Total profit sharing*
inkind_parent	*Non-monetary benefits from parent company*
inkind_subs	*Non-monetary benefits from subsidiaries*
inkind_tot	*Total Non-monetary benefits*
other_parent	*Other compensation from parent company*
other_subs	*Other compensation from subsidiaries*
other_tot	*Total Other compensation*
tot_parent	*Total compensation from parent company*
tot_subs	*Total compensation from subsidiaries*
tot_year	*Total compensation in the year*
equity_parent	*Fair value of stock options from parent company*
equity_subs	*Fair value of stock options from subsidiaries*
equity_tot	*Total Fair value of stock options*
sev_parent	*Severance pay from parent company*
sev_subs	*Severance pay from subsidiaries*
sev_tot	*Total Severance pay*

Table 3.21. Description of firm variables

Firm variables	
firm	*Name of the firm*
l_mktcap	*Log of market capitalization*
l_empl	*Log of number of employees*
l_rev	*Log of revenues*
l_wage	*Log of wage bill*
l_payroll	*Log of total personnel costs*
ateco	*ATECO code - 4 digits*
settore	*Industry*
firm_prov	*Province of the head office*
macroarea	*Macroarea of the head office - Cathegorical variable*
	1 = North
	2 = Centre
	3 = South
boardsize	*Size of the board*
numind	*N. of independents in the board*
percind	*% of independents in the board*
firm_finyear	*Dummy: different financial year closing date*
firm_holding	*Dummy: firm is a holding company*
firm_twotier	*Dummy: firm has a two-tier corporate system*
firm_delist	*Dummy: firm delisted in year*
firm_list	*Dummy: firm listed in year*
firm_susp	*Dummy: firm suspended from quotation in year*
firm_bankrupt	*Dummy: bankrupt declared in year*
firm_acquisition	*Dummy: firm acquired in year*
firm_merger	*Dummy: firm resulting from a merger*

Appendix B   Heterogeneities by gender and macroarea

Table 3.22. Estimated coefficients of the regression of directors' compensation on performance and power proxies - Males and Females

	Males		Females	
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.203***	0.0907***	0.185***	0.0507
	(0.00774)	(0.0238)	(0.0184)	(0.0507)
N. of positions	0.0482	0.0295	0.0696	0.00227
	(0.0335)	(0.0379)	(0.0950)	(0.117)
Pay from other firms	0.0296***	0.0320***	0.0339*	0.0324
	(0.00577)	(0.00746)	(0.0152)	(0.0203)
Firm Size (Employees)	0.0977***	0.0460***	0.0718***	0.0404***
	(0.00716)	(0.0136)	(0.0165)	(0.0239)
Shareholder	0.170***	0.159**	0.155***	0.138
	(0.0250)	(0.0519)	(0.0681)	(0.104)
Minority	-0.149***	0.0896	-0.0347	0.340
	(0.0395)	(0.126)	(0.107)	(0.263)
Duality	0.599***	0.315**	0.757***	-0.111
	(0.0452)	(0.0965)	(0.183)	(0.110)
Tenure	0.00596***	0.0167	0.0211***	0.0279
	(0.00180)	(0.0105)	(0.00539)	(0.0411)
NED	-0.921***	-0.868***	-1.057***	-0.665
	(0.0381)	(0.168)	(0.108)	(0.504)
IND	-0.767***	-1.019***	-0.895***	-0.898
	(0.0397)	(0.190)	(0.115)	(0.556)
Finance	0.121***	-0.00930	0.218**	-0.436
	(0.0313)	(0.194)	(0.0787)	(0.368)
Obs.	6284	6284	995	995

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.23. Estimated coefficients of the regression of directors' compensation on performance and power proxies - North and Centre-South

	North		Centre-South	
	POLS	FE	POLS	FE
Mkt Cap(t-1)	0.186***	0.0354	0.265***	0.0585
	(0.00812)	(0.0229)	(0.0165)	(0.0512)
N. of positions	0.0949*	0.0297	0.0536	0.0687
	(0.0372)	(0.0433)	(0.0616)	(0.0768)
Pay from other firms	0.0261***	0.0344***	0.0289**	0.0167
	(0.00628)	(0.00832)	(0.0105)	(0.0120)
Firm Size (Employees)	0.102***	0.0194	0.0617***	0.0724*
	(0.00740)	(0.0127)	(0.0149)	(0.0309)
Shareholder	0.127***	0.149**	0.281***	0.0497
	(0.0265)	(0.0578)	(0.0486)	(0.0925)
Minority	-0.0978*	0.0422	-0.160*	0.277
	(0.0440)	(0.137)	(0.0661)	(0.155)
Duality	0.612***	0.328**	0.642***	0.120
	(0.0506)	(0.106)	(0.0829)	(0.189)
Tenure	0.00665***	0.0144	0.0102**	-0.0127
	(0.00191)	(0.0120)	(0.00372)	(0.0164)
NED	-0.956***	-0.865***	-0.906***	-0.784*
	(0.0407)	(0.202)	(0.0723)	(0.308)
IND	-0.782***	-1.095***	-0.828***	-0.839**
	(0.0425)	(0.230)	(0.0762)	(0.277)
Finance	0.168***	0.0158	0.0517	-1.712*
	(0.0337)	(0.194)	(0.0574)	(0.733)
Obs.	5742	5742	1537	1537

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Concluding Remarks

Income inequality is a complex phenomenon and so are its causes. The same is true for the increase in top incomes observed in the developed economies during the last decades. Hence, it might be a mistake to indicate a single factor as the main driver behind such trends. Probably, skill-biased or routine-biased technological change, competition for scarce talents, policies and social norms, rent-seeking behaviours and weak (or weakening) institutions all contributed to rising top incomes and growing inequalities.

This is the conclusion we draw from the literature on income inequality, especially labour income, we review in Chapter 1. A conclusion we share with other scholars, too (e.g., Frydman and Jenter, 2010; Murphy, 2013). In this context, we analyse two categories characterized by a high presence of "super-rich" workers: licensed liberal professionals and listed firms managers. We investigate these categories in Italy, a country that is not often considered but that is characterized by a relatively high level of income inequality and in which the share of labour earnings within top incomes has increased, too (Alvaredo and Pisano, 2010; Franzini et al., 2016).

Chapter 2 explores trends and underlying mechanisms of Italian self-employed licensed professionals earnings, also from a distributional point of view. An innovative panel dataset, obtained by merging survey and administrative data, is used. The main results from this analysis are somehow supportive of the argument for which licenses and occupational regulations generate rents. Thus, our results might also be in support of the hypothesis that very high labour earnings are partially generated from rents.

In Chapter 3 we investigate the compensation of Italian listed firms directors and managers, exploiting remuneration, corporate governance and financial data retrieved from official corporate reporting. We jointly estimate the contribution of managers' performance and power to their compensation and find out that both have a role, although our evidence is not conclusive on which determinant is relatively more important.

Thus, the contributions of this work are the following: we reviewed the relevant literature on top labour earnings and labour income inequality, exploring several proposed explanations and theories. We found empirical evidence in favour of top labour earnings being at least partially determined by rent extraction. This is relevant since the existing literature on institutions-based theory is mostly theoretical. We also found evidence supporting the idea that power and performance need to be assessed together as determinants of executive compensation, rather than separately. Finally, we explored new combinations of data from different sources and used several econometric methods (including policy evaluation methods in the case of regulated

professionals) to understand the determinants of top labour earnings and inequality.

Future lines of research include the further expansion and refinement of the data we employed, especially in the case of managers, the use of new methods for a better comprehension of the mechanisms and the drivers of top earnings (such as network analysis in the case of managers and synthetic control method in the case of reforms of liberal professions) and the study of other classes of "super-rich" workers.

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