**PARIS SCHOOL OF ECONONOMICS**

Master Two
In
Public Policy & Development

# Measuring Inequality in the Non-Profit Sector: The Case of American Unions

*Supervisor*
Prof. Thomas Breda

*Candidate*
Paolo Santini

Academic Year 2016/2017

# Special Thanks

I would like to thank Professor Thomas Breda for his kind support and precious advices; I hope this master thesis will be the beginning of a wonderful and prolific academic collaboration. Professor Jérôme Bourdieu for the interesting conversations that we had and that I will be glad to pursue during my PhD. To Oliver Vanden Eynde without whom I would have not come in contact with the exciting world that is PSE. A special thanks to Facundo Alvaredo, for sharing with me the data on the US labour market inequality.
To my family, for their full support that goes well beyond the financial one. In particular to my grandfather Paolo, who has always read the result of my academic achievements and who will have to read also my PhD thesis. To Yajna Govind, without whom I would not have gone through all the difficult moments of this year and thanks to whom you might be able to understand the content of this work. To the Cité U study group and in particular to Sara Signorelli with whom I shared the most successful and anxious days of this year. To the PPD crew, I hope to see you all once again in another Nolay. To Sara, Marghe, Francesco, Jeremy and all my Parisian friends, that have remained such despite me always postponing a beer or a night out because "I have to study". To Cécile, the landlady that each student would like to have.

# Contents

# Introduction

In 2006 the *Centre for Unions Facts*, a foundation with the declared purpose of promoting decertification of unions, was funded. Since 2007, a related website provides its readers a series of documents that should help them to get rid of their representatives, as well as easy electronic access to detailed data regarding unions. The website presents as *Facts*, despite the possible mistakes contained in these non vouched files, all employees', officers' and unions' accounting information from 2006 onwards. The purpose is to let workers check how much their own representatives[1] are paid. In the same spirit, some right-wing newspapers[2] have published the gross salaries of the top 100 unions officers to denounce unions' rent-seeking behaviour. Unions officers are, in fact, often accused to pursue their own interests while pretending to defend workers from exploitation. The proof brought to justify this claim is the high level of compensation that some officers in this sector are indeed receiving. The criticism put forward is simple: is it fair that the same people who attack the disparity between blue collar workers and CEOs' compensations are, themselves, so well paid? It is often neglect that these seemingly over-paid representatives in fact defend the interests of highly qualified workers such as air plane pilots, professional sportive players, or film actors and directors. Similarly, it is neglected that best paid officers are at the head of large national organizations with thousands of employees and possibly millions of members. For liberal American thinkers, it seems impossible to accept that unions too might rely on performance compensations scheme to increase the effort of their leaders and attract the most productive workers[3] as has been emphasized by Hallock and Klein (2016).

This right-wing campaign against unions has certainly deteriorated the union status in the workers' and citizens' minds, facilitating the approval of anti-unionism legislations: several North-East liberal states have, in fact, recently adopted right-to-work legislation aligning their regulation with the South conservative ones. It has, moreover, potentially reduced unions membership directly too: justice and equity are among the primary demands of union members and the high level of compensations of unions representatives might have been felt as a betrayal. The aim of this research is to provide sound empirical evidence over this strongly debated subject: is

[1] Note that, as stated by John Lund in a report for the school of Workers in 2005, this was already possible under the US regulation if a worker would have asked the regional office of the labour department

[2] see for example *http://www.washingtontimes.com/news/2013/jan/10/labor-union-bosses-salaries-put-big-in-big-labor* and *http://watchdog.org/212919/union-bosses-2014*

[3] while this is perfectly understood for non-profit hospital managers

the level of payment within the union sector unjust? My goal is to understand to which extent unions' wages are high and disproportionally so. Moreover, I will study the overall level of inequality within the sector, a feature that has not attracted any right wing supporter's attention, but that might instead be the most important part of the picture regarding fairness within these organizations. Struggling to obtain higher wages, unions aim to lower the between groups inequalities. At the same time, they strongly support an equal pay for all the members in the same plant/sector. Given the importance that the fight against inequality has always had in the union history, we might wonder what is the level of inequality prevailing within the unions themselves. In particular, we wonder if these organizations do respect the principle they try to enforce on the markets or if, instead, their elites capture the larger share of the resources replicating the distinction between blue collar workers and CEOs within the union sector.
Answering these questions I do not only contribute to the internal political debate of the United States, but also on the large literature regarding the non-profit sector. In particular, I provide new micro evidence on the pay level and structure of a specific sector which is composed at 100% by non-profit organizations. Using unexploited administrative data on union gross salaries provided by the American Labor Department, my analysis aims to shed light on the compensation rules used in the union sector and specifically on inequality. In particular, it aims to understand if there are significant differences in the way managers and officers are remunerated in this sector compared to the private one and the impact of these differences on the level of inequality in the union's workplaces.

The results found in this research clearly show that the union sector is equal and much more so than the rest of the American labour market. In particular, despite their peculiar organizational structure (large employment of part-time workers and volunteers with zero wages), these organizations always show a lower level of inequality than the market in which they operate. This is especially evident at the top of the distribution i.e. among the 10% most well paid union workers. The trend in the gross salaries of top union earners, in fact, goes in the opposite direction with respect to the one of top American workers: in the latter group salaries are increasing driving inequality up, while in the latter they have remained almost flat for the period of analysis. Overall, my findings present a picture which is very far from the caricature image given by anti-unions movements and that it is, instead, in line with previous researches on the non-profit sector.
The rest of the research is organized as follow: the first chapter presents the literature on non-profit organizations and trade unions with a focus on the US; chapter two describes the data and chapter 3 presents the main results. I conclude with some remarks and possible extensions of this research.

**Keywords:** Trade Unions, Inequality, United States
**JEL code:** J51

# Chapter 1

# Literature Review

## 1.1 Non-Profit Sector

An increasing body of literature has been focusing on studying the non-profit sector. Due to data availability and economic weights of the sector, most of the empirical contributions have been focused on the United States. Since this research is also using US based data, in what follow I am going to report only the literature concerning this country. The organizations operating under the non-profit label are constrained by definition of non redistributing profits, and pay their employees a reasonable compensation[1], but are granted corporate tax exemption. Nonetheless, they sometimes operate in competitive markets, provide high quality goods (which often contain a high level of public good components), and account for a growing share of the labour force [2]. Early studies on this topic have focused on two main aspects: the level of wages paid and the methods used to ensure high productivity in the sector. As argued by Hallock (2002), although we do expect relevant differences between the two, there are no apparent reasons to treat the non-profit sector conceptually differently from the for-profit one, at least for what concern managers/officers compensations. This is why most of the contributions on this literature have tackled the same type of questions, with the same methodology, as those for the for-profit companies (see Bertrand (2009) for a review of the latter) and have used the result of that literature as a benchmark for comparison.

For what concern the level of wages, Jones (2015) finds a negative premium associated with working in a non-profit organization, but only in sectors with small share of non-profit. These findings are consistent with the idea that workers of non-profit organizations are willing to give up part of their earnings in order to work for those specific employers: if the supply of this type of workers is higher than the labour demand, than a wage penalty might prevail on the market.

[1] section 501(c)3 for charitable organizations only

[2] that is from around 5% in the mid nineteens to 7% in 2015 according to Hirsch et al. (2017)

In the literature, this phenomenon is called *"labour donation"* hypothesis. However, controlling for industry and workers characteristics, as in Leete (2001) and Hirsch et al. (2017), the negative effect becomes positive and not significant. Male workers seems to be more penalized than female, but those workers passing from one sector to the other do not suffer from any negative consequences. It thus seems that, within the main sectors in which non-profit are operating, no significant compensation penalty is found between non-profit and for-profit firms.

Another strand of the literature (e.g. Leete (2000)) has investigated the topic of non-profit level of compensations from a different perspective. Instead of the absolute level of earnings earned by a single individual, it has analysed the level of inequality prevailing in the non-profit sector and compared it with the for-profit one. The conclusion found is that the non-profit sector has, as expected, a lower level of inequality than the one prevailing in the for-profit firms. This fact is, once again, consistent with the labour donation hypothesis, but also with a different interpretation[3]: according to Rose-Ackerman (1996) a lower salary is offered to attract only those managers that do have an intrinsic reward in pursuing the non-profit firm objectives. That is, wages are used as a screening device where monitoring is hard and costly. Interestingly, according to these theories, the usual relationship between effort and wages might somehow be reversed in the non-profit sector: managers accepting the lower wages, in fact, are also expected to contribute more to the non-profit activity since personal motivation is believed to be more important in this context. Personal motivation, however, has been found to be sensitive to external pressure (Frey, 1997); that is why maintaining a high morale in non-profit firms is regarded as a crucial policy. Establishing a low level of inequality[4] is one of the tools used to motivate workers: increasing identification with the firm and cohesiveness within the workforce will in fact translate into a better workers morale and hence in a higher productivity. This mechanism is supposed to be more binding for higher officers that are more aware of the compensations in other firms and whose decisions are more likely to directly affect the company outcomes. Indeed, Leete (2000) reports that the greater difference in the variance of wages between the for-profit and the non-profit sectors is found for white collars workers and managers. Interestingly, also the racial and gender gaps are found to be smaller in these categories of workers.

For what concern the contract schemes offered to the managers in this economic area, the bulk of the literature has focused on hospitals' managers. What has been found is that those managers are less concerned by cost reducing policies, they receive a pay that is equal to that received by their colleagues in the for-profit counterpart, and that, within the limits imposed by the law, pay higher salaries to their employees[5] (Roomkin and Weisbrod, 1999). Interestingly, an increase in the assets of these hospitals does not have an effect on the quality of the services provided (e.g. number of nurses), but an impact on the financial wealth of the institutions as in any for-profit

[3] firstly proposed by (Hansmann, 1980)
[4] both within and between firms
[5] which implies, again, a lower level of inequality

structure (Duggan, 2000). Within the non-profit sector, however, coexist very different types of organizations that might have idiosyncratic characteristics. In the next section I am going to revise the literature related to the type studied in this research: Trade Unions.

## 1.2 Trade Unions

American Trade Unions are a particular sub-group of the American non-profit sector. There are three main differences between this group and the general characteristics of non-profit organizations reported above: First, in contrast with the general non-profit sector's positive trend, trade unions are experiencing a long lasting decline since 40 years. As studied in Holmes and Walrath (2007) using annual account data on unions, however, there exists a high degree of heterogeneity among unions themselves: some of them are disappearing, others are merging and some others are even rising. Despite this, in all groups there is a consistent membership creation. Second, at least in the US, unions do not have (and never had) any philanthropic objective; on the contrary their aim has always been to limit to the maximum extent the degree of publicity of the benefits they provide to avoid free riding. Despite this, their impact on the labour market might still have produced some positive and/or negative externalities on the aggregate economy[6]. Third, unions' primary income sources are provided by the recruitment and retention of their members (customers) as any for-profit firm. Finally, the good sold in this market is union representation, which is, as argued by Breda et al. (2017), a quite homogeneous good. This fact constitute an advantage for the analysis because it allows to avoid complexities associated with organizations' ability to substitute between goods and services in response to demand as in other non-profit institutions.

Several forces are supposed to affect the level of pay and the internal inequality of unions. The redistributive purpose of these organizations would probably suggest that they, themselves, have a lower than market level of inequality. Moreover, no for-profit institution is allowed to provide the same type of services as unions. This fact has two consequences: First, competition for good quality managers is supposed to be lower, which translate in a lower level of salaries paid[7]. Second, unions enjoy a monopoly power. The monopoly power is particularly strong in those states where no right-to-work laws have yet been passed, and hence all workers of a unionised firm have to pay union dues, irrespective of the vote cast in the union election. Sherk (2015) seems to confirm this hypothesis reporting that in non-right-to-work states unions charge higher dues and pay their officers higher salaries with respect to right-to-work states. The effect on inequality is then ambiguous: on one side, low officer pay is expected to reduce inequality, on the other side, the monopoly power granted in some states is supposed to increase dispersion at least across states and possibly between officers and non-officers (although this channel might

[6] higher union wages imply a better outside opportunity for non-union workers (positive) but also a lower level of employment (negative)

[7] Reversing the argument of a strand of explanation for the rise in CEO pay; e.g. Frydman (2005).

not be relevant if everyone is paid proportionally more). Overall the first effect seems to be stronger and hence we do expect a lower than market level of inequality prevailing in the sector.

Hallock and Klein (2016) have studied how much unions officers' pay is linked to union's performances. Performance is measured by the union membership at the local or at the national level. To disentangle different effects, they also include the average wage that the represented worker is supposed to earn[8] and the amount of union dues collected as additional controls. Their findings point towards a positive relationship of all measures included on the level of payment, even when controlling for size and union fixed effects: Unions officers that earn a positive salary, do seem to have a performance linked contract, although a specific clause might not be included formally. Breda et al. (2017) deepen the previous analyses, looking at the evolution of American local unions' productivity along 13 years, between 2000 and 2012. Productivity is measured as a residual from a union's production (membership or sales) function with capital, labour and prices as inputs. The analysis of the so computed Total Factor Productivity (TFP) substantially mimics the results of Holmes and Walrath (2007): its distribution is found to be very (and increasingly) dispersed and centred around zero, with exiting local plants having a lower than average productivity.

To the best of my knowledge, nobody has investigated the level of inequality within the union sector and compared it with the one prevailing on private markets. This is, in fact, the main aim of this research. A second step would combine these results on inequality, the incentive theories regarding the non-profit sector and the analysis on workplace productivity, to understand what are the main drivers of unions' productivity heterogeneity and if inequality among managers is one of its determinants.

[8] computed as the inverse of the share of union dues paid out of earnings multiplied by the total dues collected by the union

# Chapter 2

# Data

The dataset used in this research comes from the Labour Organization Reporting System (LORS). It covers the period 2000-2011, but I drop 2011 because the collection of information is not complete. The dataset is composed by the annual financial reports that American trade unions representing employees working in the private industry, in the US postal service and in most of the Federal government offices, are obliged to fill to the Department of Labour (DOL) as prescribed by the Labour and Management Reporting and Disclosure Act of 1959[1]. Depending on the size of the union, the organization is required to provide a more detailed number of informations. The more complete one, the LM2 file, is filled only by those unions that have more than 250.000$[2] in receipts; the LM-3 form is filled by those unions with a total receipts between 10.000$ and 250.000$; finally, the LM-4 is filled by the smallest organizations with less than 10.000$ in receipts. The LM-2 and LM-3 provide detailed informations regarding location, financial assets, membership, dues and officers' compensations[3] and are available to download.

Total compensations are divided in four sub-categories, gross salaries, allowances, official business disbursements and other non representative disbursements, that summed up gives the total compensations received by the officers. Gross salaries are supposed to be reported annually, while unions are free to report allowances and the other lines in a unit of time different from the year, without specifying it. This is why, despite some officers receive considerable amounts of payment in allowances, I will focus mainly on the gross salary definition. Another important characteristics of the data is that many officers are not paid by the unions or are paid very little.

[1] Labour organizations that include or represent only State, County or Municipal governments employees are not covered by this law and, therefore, are not required to fill.

[2] before 2005 the threshold was 200.000$. Some organizations have hence passed from filling the LM-2 report to the LM-3 one. Note that this change in the regulation was made to ease the reporting practices of relative small organizations in the same year when the LM-2 form was enriched by further disclosure obligations. Note also that starting from 2005, all forms have been compiled through an electronic system while before everything was reported on apposite paper forms that only later has been digitalized.

[3] As reported by Holmes and Walrath (2007): "The intent of the legislation was to provide the members of a given organization - and the general public - with a means of monitoring organizations". The main goal being to limit the case of corruption and fraud within these organizations

This reflects the non-profit nature of the sector (voluntarism is in fact the purest form of labour donation), but also the fact that part-time work, short period collaborations and multiple positions are widely used by unions. Following the LM-2 provisions, instead, no employee's name, surname and compensation have to be disclosed to the public authority if the total earnings of the employee are below 10.000$ per year. The LM-3 form requires organizations to disclose the same information about their employees, but these information are included in item 56 at the end of the form. In the same item are recorded also the information about officers' and employees' other positions and officers' other compensations. Unfortunately, this category is not available for electronic download. The simple fact that other officer's positions and compensations have to be listed in a separate line, however, underlines the high chances that union officers working for small locals are employed by several others, most probably affiliated to the same group, locals.

This is why I decided to split the dataset in two, partly overlapping parts: one will keep only the records for officers, keeping all the types of forms, the other one will keep only the records of organizations filling the LM-2 form with the additional requirement of having at least 250.000$ in receipts for the entire period of the analysis[4]. I additionally drop all organizations filling the LM-4 report or supposed to do so, i.e. with less then 10.000$ in receipts. This choice is driven by the concern that those organizations are too small to have paid workers. In fact, the percentage of officers' gross salaries equal to zero in this sub-group is above 60%, while it remains surprisingly constant at around 36% in the rest of the dataset[5]. I also drop the observations with wrong state name and those located in charter states outside the 50 that form the United States. Finally, I drop those organizations reporting to have been stopped operations during the year, since they have to report information only for the number of months in which they actually operated, and are hence likely to be based on less than one year disbursements.

The final datasets are composed by 922.544 and 1.286.654 respectively for the LM-2 and officers datasets. In the analysis we are going to focus mainly on union locals, i.e. the plant corresponding level of the union sector, but also on their National Head Quarters. In the final dataset for LM-2 filers there are a total of 4743 different Local Unions (LU) and 129 National Head Quarters (NHQ), with an average number of units per year of 3551 and 102 respectively. For what concern the officers file, instead, there are 14771 local unions and 152 NHQ, with an average number of units per year respectively of 11470 and 122.

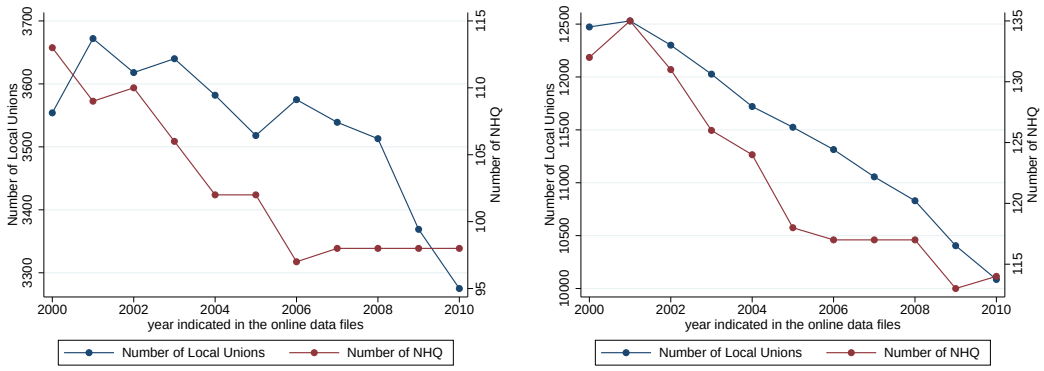
The number of unions, as expected, is declining over time in both files, but at different pastes. Figure 2.1 reports the evolutions of Locals and National Head Quarters (Branches follow a similar path not reported) in both datasets. Panel a) shows the path followed by LM-2 organizations while panel b) reports the evolution of unions having recorded officers. Large unions seem to

[4] i.e. also before the change in regulation in 2005. This additional requirement will prevent to consider as closed those unions that pass in the other category with the change in regulation.

[5] even above 1 million $ of receipts the percentage remains constant.

remain quite stable in numbers until the crisis in 2008. This fact might be due to the higher resilience that larger organizations have even in declining markets, but also to the merging trend emphasized by Holmes and Walrath (2007) that might have artificially generated new large unions from two smaller organizations. After 2008, there is a sharp drop in the number of locals that did not recover in the subsequent year. This is consistent with the structure of the American Unionism and the disruptive effects of the economic crisis: as an organized plant shout down operations, it is likely to drug out of the market also the related local union that was created to organize that plant and the others in the region. The average number of years in which a local union is recorded in this dataset is $8,2$, with 49.8% of them present for the full time of analysis. National Head Quarters have a longer average (9 years) driven by a larger number of full period presence (69%). For what concern panel b), instead, we observe a clear decline in the number of organizations. This is, again, consistent both with the closure of some of those unions, but also with the merging process just described: for each merge we only observe one record instead of two, reducing the total number of organizations. Average number of years for which organizations are recorded in the dataset is 8.5 and 9.2 for LU and NHQ respectively, with 52.7% and 68.5% of them recorded in all years. Since the relationships between locals and national head quarters is of a bottom-up type, i.e. national head quarters are created to coordinate many independent local unions, if several locals go out of the market we do expect a similar trend to replicate at the higher levels. This is what we observe for national head quarters indeed, except during the financial crisis for large organizations.

Figure 2.1: Evolution of Union Sector between 2000 and 2010




(a) LM-2

(b) Officers

A precise description of the variables used in the analysis and the corrections made to build the final dataset is provided in appendix A.

## 2.1 US Data

In order to interpret the results about inequality obtained for the union sector, I need to identify a reference group to be used as a benchmark. The most natural comparison is with the whole US labour force of which unions' workers represent a tiny fraction. One possibility to obtain information on the US level of earnings inequality would be to use the March Population Survey. The main limit of using that survey is that top incomes are often under-represented in the sample and top coding gives a truncated distribution that underestimates the overall level of inequality, and especially so at the top. Since 1995 the March CPS reports for high earnings above a pre-determined threshold[6] the average earnings of the population group that corresponds to the characteristics (e.g. education) of the individual interviewed. This method constitutes certainly an improvement with respect to truncated or top coded values replacement used before, but does not fully account for very top earners' shares as shown by Burkhauser et al. (2008). Since, instead, the rise of inequality in the top 1% has been extremely high in the US in the last 40 years (Piketty and Saez, 2003), and since we are going to focus in particular on the top of the earnings distribution of the union sector, it is important to capture the share of income accrued to this group in the American Labour market. To do so, I am going to use the inequality data on pre-tax national labour income provided by the World Income Database (WID).

This data centre is, in fact, especially devoted to study top income inequality around the world. To overcome the aforementioned limitations of surveys data, all works produced in this lab are based on tax data records. The advantage of using this source compared to survey data is that the former should in principle account better for top earnings due to compulsion of paying taxes. Tax data comes normally in a tabulated form reporting number of filers, threshold and the total income declared in each thresholds. To retrieve the total distribution of income (earnings, wealth) interpolation techniques are implemented. In particular, following the intuition of Vilfredo Pareto (1906), it is assumed that the top tail of any income distribution follow a power law, the so called Pareto distribution. The main limitation of using this source is that income concept used is slightly different from the one reported in the unions files: the pre-tax national labour income does include, in fact, all sources of labour income, while for union workers are reported only the gross earnings that each individual receives from a particular union. Also, as stated above, unions' compensations are possibly only a partial amount of the total annual compensations earned by those workers. Still, the pre-tax national labour income represents the best possible comparison group for this research: union files are administrative data where highest salaries are the main focus of the disclosure policy; not underestimating the US labour market level of inequality at the top is hence crucial to have a proper comparison group. To further address this concern I will include allowances and the other sources of income received by unions' employees and see if the relationships between the two groups is affected.

[6] The rationale of this policy being to prevent any reader to identify any interviewed person based on their extremely high level of income coupled with the other personal characteristics

# Chapter 3

# Descriptive Statistics

There are several ways to measure inequality. Each method is better suited to capture a particular feature of the distribution. For instance, the Gini index has the merit of capturing in a unique number the whole level of inequality of the population; however, in aggregating, we lose the information on the shape of the underlining earnings distribution which might instead be an important characteristics of the data. Moreover, while we can follow the evolution of overall inequality, with the Gini index it is not possible to study from which part of the distribution inequality comes from; i.e. what are the underlining forces driving inequality up or down over time. To show this, I will plot the shares of gross earnings accrued to different canonical groups that are important to understand the distribution of total earnings. Finally, I will look at income concentration in a more sophisticated and precise way: instead of plotting the evolution of a pre-determined share, I will plot the concentration of each percentile above the $75^{th}$ in different years. To measure concentration I will compute $\beta$, the Inverted Pareto Coefficient. $\beta$, in fact, measures the level of concentration of income above any defined threshold, with the important feature to be locally valid in any part of the distribution. For each measure of inequality, I will present the results for National Headquarters and Local unions since there might be important differences between the two groups that would be hidden when pooling together the data. Also, I will report most of the results for the two datasets I have constructed before. However, since most of officers are paid a salary equal to zero, I will focus more on the LM-2 organizations with at least 250.000$ of receipts.

## 3.1 LM-2 Results

### 3.1.1 Evolution of Shares

In table 3.1 and table 3.2 reports the different shares of earnings accrued to relevant groups plus the Gini index for all the years in the analysis. All values in the first table are quite stable, suggesting a very small variation along the 11 years under analysis. The most striking result is

the extremely low amount of earnings accruing to the bottom 50% of workers in Local Unions. This confirms that those units rely extensively on voluntarism implying a fictitious Gini index which is remarkably high. Interestingly, the rest of the distribution seems to be much more equal with the middle 40% collecting almost 60% percent of earnings. The top 0.1% of the population account only for around 1% of total earnings implying a ratio of their average earnings with the total average equal to 10. For comparison, the US top 0.1% accounts for almost 6% of total earnings, implying a ratio of 60 between their average labour income and the total one. Remember, however, that the former group does not take into account the other forms of compensations given to officers and employees such as allowances. Including the additional sources of income and re-computing the shares accruing to the top part of the distribution does not affect the results: unions' most well paid workers capture a smaller fraction of total earnings than those in the US labour market as reported in Appendix B, Table 6 and Table 7 respectively.

The picture is quite different for National Head Quarters. The bottom 50% of the distribution accounts for around 20% of the total earnings of the sector. It is however subject to a negative trend that along the 11 years decreases the amount from 23% to 19% percent. The trend is reversed and particularly evident in the top 10% and top 5% that increases their shares of respectively 3 and 2 percent. Finally, the Gini index is remarkably lower for this group than that of local unions but rising. This is especially clear as from 2005 where there is a jump of 0.05 from 0.37 to 0.42.

Table 3.3 replicates the same exercise for local unions, but with an important difference: to account for the large number of zeros and for part-time work, this plot reports only employees and officers earning more than 10.000$ per year. I choose 10.000$ because this is approximately equal[1] to the minimum wage over the period under analysis and because it mimics the requirement in place for reporting employees' compensations in both forms. For our new definition of full time workers, table 3.3 shows for Local unions that the share of the bottom 50% of the distribution considerably rises, reaching almost 30%, and the Gini index decreases from 0.67 to 0.3. Results for National Head Quarters are in line with this trend but since the change in shares is much less spectacular, they are reported in appendix B, Table 5. The only appreciable difference is that the increasing trend of inequality is much more nuanced. This means that after 2005 the increase in inequality is mainly driven by the employment of non-paid workers who have substitutes/integrated the existing employees. This trend seems to mark a shift in National Head Quarters' employment structure making them going in the direction of local unions hence smoothing the distinction between the two.

To appreciate better the comparison with the United States, figures 3.1 and 3.2 reports the trends of shares for the bottom 50%, the top 10%, the top 1% and top 0.1% for the union sector

[1] actually this is certainly a lower bound

and the US labour market. Again, considering the zeros, the bottom 50% in the union sector is almost equal to zero. Interestingly, instead, the level of the top 10% is approximately the same in the two groups. When excluding the lower wages, however, the percentage of earnings accruing to the top 10% of unions' workers is divided by two, while the bottom 50% becomes twice of the US counterpart. Focusing on the top of the earnings distribution, we do not observe such a pattern: The US' level of inequality is always higher than the union's one. This fact is consistent with previous literature on non-profit organizations emphasizing the ethical and ideological components that characterize these institutions. In particular, the result points to the possibility that unions employees' compensations, irrespective of the success of the union, i.e. irrespective of total membership or total assets held by the organization, are capped to a certain value that is well below the average market compensation of earners in the same percentile in the whole US economy.

This result is consistent both with the idea that low inequality is used as a screening device to attract more intrinsically motivated workers as suggested by Rose-Ackerman (1996) and also with the use of low inequality as an a incentive scheme to motivate altruistic workers as argued by Leete (2000). The result, however, is also consistent with another explanation firstly proposed by Gabaix and Landier (2008): if top managers are paid their marginal productivity, and if their productivity enters in a multiplicative way in the firm production function, then big firms will pay their managers much more than small firms. Since big private firms are much bigger than any unions (in terms of assets, sales and other indicators), and since the dispersion of their size is much wider, non-union managers would naturally be better paid in absolute terms than their union counterparts and with a larger concentration of total sector earnings in their hands. Whatever the explanation, unions are found to be much less unequal than the rest of the market and especially so at the top[2] in line with the findings of Leete (2000) regarding managers and other leading positions.

This is also apparent in figure 3.3 which depicts the evolution of the thresholds to be part of the top 10, 1 and 0.1 percentiles in constant 2015 dollars for both distributions. Looking at these figures, we do confirm all the findings of the previous analysis. The union sector's threshold to be part of the top 10% of the gross salary distribution is around 100 thousands dollars in 2015 constant terms for the entire period under analysis. Interestingly, this is roughly the same value for the whole US working age population. Starting with the threshold to be part of the top 1%, the divergence between the two groups becomes evident. In the union sector the level remains approximately constant at around 150 thousands dollars, while for the American rich workers, the level is closer to 200 thousands dollars and less stable: it increases until 2008, then decreases and returns to its original level. This tendency is magnified at the top 0.1% of the distribution: unions show a slightly increasing trajectory that in 11 years brings the adjusted threshold from more than 200 thousands to approximately 300 thousands dollars. The US counterpart, instead,

[2]results holds using different definitions of compensations, i.e. including allowances and other compensations in the computations; see Appendix B, Tables 6 and 7

Table 3.1: Evolution of Concentration and Inequality of Local Unions

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 1.68 | 58.74 | 39.58 | 23.01 | 6.36 | 1.07 | .67 |
| 2001 | 1.62 | 58.93 | 39.45 | 22.89 | 6.32 | 1.01 | .67 |
| 2002 | 1.84 | 58.83 | 39.34 | 22.88 | 6.36 | 1.07 | .66 |
| 2003 | 1.67 | 59.1 | 39.23 | 22.87 | 6.36 | 1.06 | .66 |
| 2004 | 1.64 | 58.96 | 39.41 | 22.99 | 6.37 | 1.03 | .67 |
| 2005 | 1.59 | 58.32 | 40.09 | 23.43 | 6.47 | 1.01 | .67 |
| 2006 | 1.64 | 58.55 | 39.8 | 23.22 | 6.38 | .97 | .67 |
| 2007 | 1.68 | 58.71 | 39.61 | 23.17 | 6.38 | .98 | .67 |
| 2008 | 1.72 | 58.73 | 39.55 | 23.15 | 6.37 | .98 | .67 |
| 2009 | 1.72 | 59.28 | 39 | 22.8 | 6.3 | .96 | .66 |
| 2010 | 1.59 | 59.19 | 39.21 | 23.04 | 6.37 | .99 | .67 |

Table 3.2: Evolution of Concentration and Inequality of National Head Quarters

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 23.25 | 53.22 | 23.53 | 13.88 | 4.14 | .66 | .38 |
| 2001 | 22.9 | 53.17 | 23.93 | 14.15 | 4.24 | .71 | .38 |
| 2002 | 23.18 | 52.66 | 24.16 | 14.29 | 4.23 | .69 | .38 |
| 2003 | 24.35 | 51.99 | 23.66 | 14.06 | 4.21 | .7 | .37 |
| 2004 | 23.78 | 52.38 | 23.85 | 14.1 | 4.29 | .77 | .37 |
| 2005 | 20.59 | 54.06 | 25.35 | 15.03 | 4.6 | .94 | .42 |
| 2006 | 20.9 | 54.23 | 24.87 | 14.63 | 4.32 | .73 | .41 |
| 2007 | 18.79 | 55.51 | 25.71 | 15.13 | 4.49 | .68 | .44 |
| 2008 | 19.12 | 55.1 | 25.78 | 15.26 | 4.58 | .77 | .43 |
| 2009 | 18.9 | 55.08 | 26.02 | 15.33 | 4.51 | .78 | .44 |
| 2010 | 19.12 | 54.79 | 26.09 | 15.36 | 4.53 | .71 | .44 |

is much higher in levels and is extremely volatile. The constant term salary to belong to the richest 0.1%, in fact, starts at 700 thousands dollars in 2000 and rises up to almost 900 thousands in 2007 to drop sharply with the financial crisis back to the level of our first observation period. Top unions' gross salaries are much less dispersed and much more stable: Unions are not affected by the trend in rising inequality in the top 1% of the distribution experienced in the rest of the country (Piketty and Saez, 2003). To better understand this important feature of the union sector, I am going to focus on top income concentration in the next section.

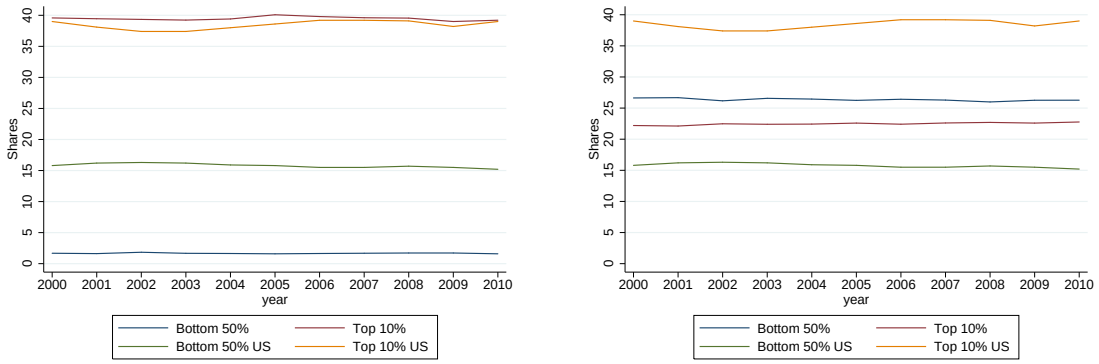
### 3.1.2 Inverted Pareto Coefficient

Focusing on the top of the gross salaries distribution is important for several reasons. First of all, top earners are the most important category of workers in each sector. They are normally in charge of leading positions and responsible for the overall functioning of it. It is thus important

Table 3.3: Evolution of Concentration and Inequality of Local Unions for Full-time

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 26.63 | 51.17 | 22.2 | 12.74 | 3.6 | .61 | .33 |
| 2001 | 26.68 | 51.21 | 22.12 | 12.67 | 3.53 | .56 | .33 |
| 2002 | 26.17 | 51.35 | 22.48 | 12.93 | 3.65 | .63 | .33 |
| 2003 | 26.57 | 51.03 | 22.4 | 12.89 | 3.64 | .62 | .33 |
| 2004 | 26.45 | 51.11 | 22.43 | 12.92 | 3.61 | .58 | .33 |
| 2005 | 26.24 | 51.17 | 22.59 | 13 | 3.57 | .54 | .33 |
| 2006 | 26.42 | 51.17 | 22.41 | 12.91 | 3.5 | .52 | .33 |
| 2007 | 26.29 | 51.1 | 22.61 | 13.05 | 3.54 | .53 | .33 |
| 2008 | 25.99 | 51.31 | 22.7 | 13.12 | 3.55 | .53 | .34 |
| 2009 | 26.26 | 51.15 | 22.59 | 13.07 | 3.54 | .53 | .33 |
| 2010 | 26.27 | 50.97 | 22.77 | 13.15 | 3.61 | .55 | .34 |

Figure 3.1: Bottom 50% and Top 10% In the Union Sector and the US

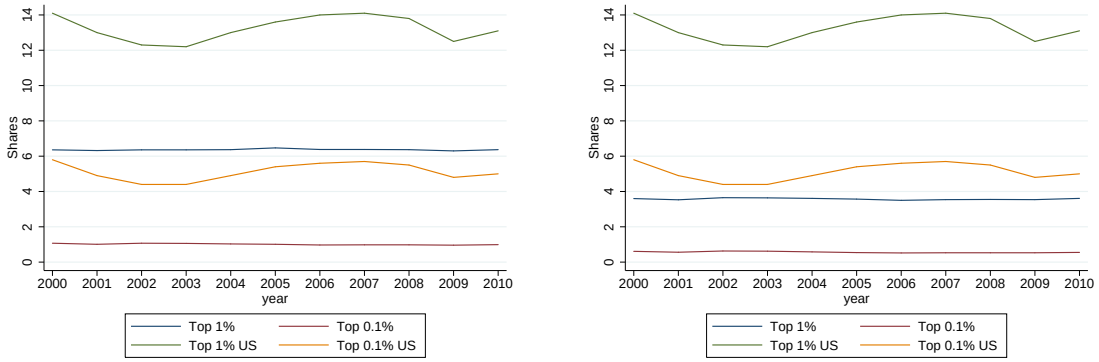



(a) All Sample

(b) full-time

to look at the level of compensations and the associated inequality among this sub-group of workers. Second, the upper tail of the earnings distribution is accounting for a constantly larger share in total compensations. This trend is particularly strong in the United States as underlined by Piketty and Saez (2003), and is driving overall labour income inequality up to new heights. This phenomenon is relatively new in history since compensations were always outweighed at the top of the income distribution by capital incomes; this is no longer the case in the US labour market. However, as we have already seen, the union sector remains an exception where top earners are not extracting a particularly high amount of revenue and their share does not seem to have been affected by any increasing trend. Third, focusing on top earnings has the advantage of weakening the difference between wages and earnings that otherwise would be also dependant on the number of hours worked. Following the relation $E = wh$, the variance of earnings would be determined by both terms and by the relationship between them. But assuming that top

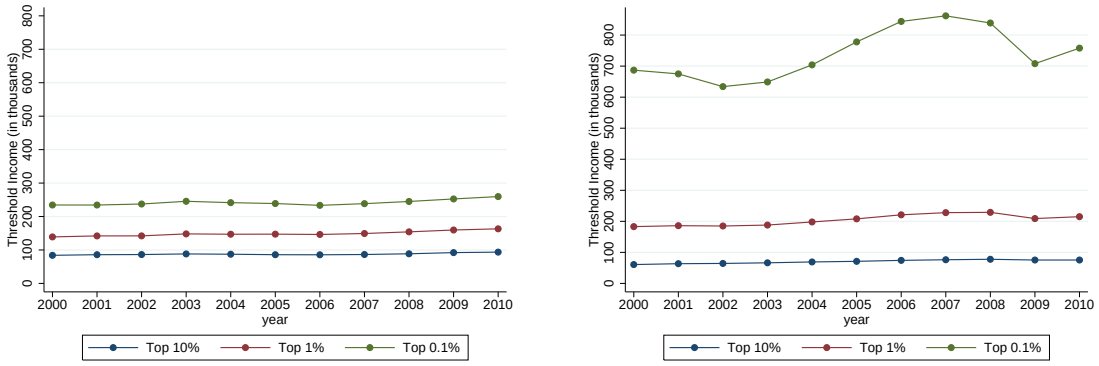
Figure 3.2: Top 1% and Top 0.1% In the Union Sector and the US




(a) All Sample

(b) full-time

Figure 3.3: Evolution of Thresholds in Constant 2015 Terms of 90, 99 and 99.9 Percentiles




(a) Threshold Salary Unions

(b) Threshold Salary US

earners tend to work more hours per day, and that their working time approach the natural limit[3], implies that most of the variance in the earnings of these workers is driven by the hourly wage variance rather than the variance of hours worked. Hence we will have that as $h \to h_{limit}$, $Var(E) \approx Var(w)$. For this reason I will use $w$ instead of $E$ to refer to earnings in what follows.

As already mentioned in the introduction of this work, it is commonly assumed that the top tail of the income distribution is well approximated by a Pareto distribution. The Pareto law has the following cumulative distribution function $F(y)$:

$$1 - F(y) = (\frac{w}{y})^{\alpha} \quad \text{with} \quad w, \alpha > 0$$

[3]That can be thought to be 24 hours but also a lower number taking into account that rest and nutrition are needed to survive

and a corresponding density function $f(y)$ equal to:

$$f(y) = \frac{\alpha w^{\alpha}}{y^{1+\alpha}}$$

This distribution has the important property that the average income $\bar{y}(w)$ of individuals with an income above any determined threshold $w$ is always proportional to $w$:

$$\bar{y}(w) = E(y|y \geq w) = \frac{\int_{y \geq w} y f(y) dy}{\int_{y \geq w} f(y) dy} = \frac{\int_{y \geq w} \frac{dy}{y^{\alpha}}}{\int_{y \geq w} \frac{dy}{y^{1+\alpha}}} = \frac{\alpha}{\alpha - 1} w$$

From the above equation it can be concluded that the ratio $\frac{\bar{y}(w)}{w}$ does not depend on the threshold chosen $w$. This term is referred to as the Inverted Pareto Coefficient, or simply $\beta$. This coefficient gives an idea of the shape of a distribution and in particular of how heavy is its upper tail. The greater the parameter is, the heavier the tail, the larger the inequality.

To measure top earnings concentration I use the Inverted Pareto Coefficient $\beta$ applied to the unions earnings distribution. Instead of fitting a Pareto distribution on my dataset and retrieve this parameter, I exploit another property of $\beta$, namely the fact that is locally true even if the underline distribution is not Pareto distributed, to compute several local $\beta$s and study their evolution in different point of the distribution:

$$\beta_i = \frac{\bar{w}_i}{w_i} \quad \text{with} \quad \bar{w} = \frac{1}{N} \sum_{i=thr} w_i$$

Dividing the distribution in equally spaced groups of 1/1000, and computing the $\beta$ for each of them using the above formula, we obtain a series of points that can then be plotted on a graph against each thousandth. By construction, the $\beta$ of the last group will be equal to 1 for any level of concentration, and is hence excluded from the analysis. Note that, as already mentioned above, such construction of $\beta$ is locally valid in each point irrespective if the distribution itself is Pareto distributed or not. However, if the inverted Pareto index $\beta_i$ is to be constant for the entire distribution, then fitting a Pareto density on the whole data would provide the same coefficient or at least a very good approximation. Conversely, if the $\beta_i$ is not stable, approximating the data using the Pareto law would give only a poor estimate of the underlining distribution.

$$\text{If} \quad \beta_i = \beta_j \quad \forall i, j \quad \Rightarrow \quad \beta_i = \beta = \frac{\alpha}{\alpha - 1}$$

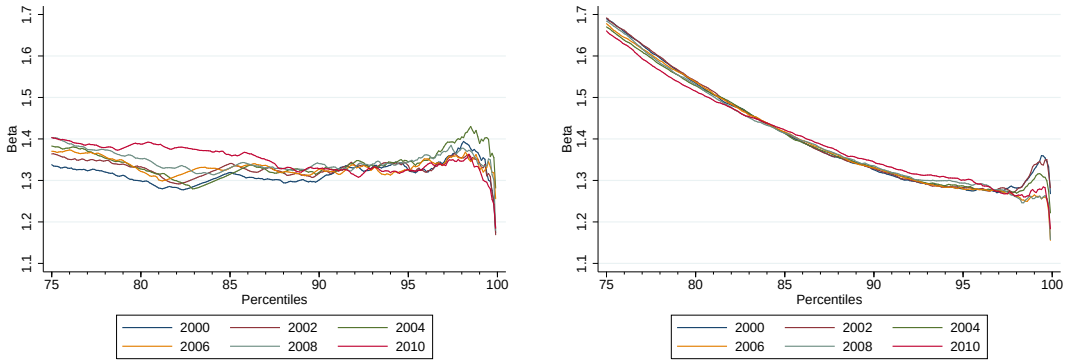
Figure 3.4 reports the inverted Pareto coefficients from the $75^{th}$ to the $99.9^{th}$ percentiles in even years[4] of national head quarters and local unions filling the LM-2 form. Concentration appears in both cases quite low but important differences exist between the two distributions.

[4]Graphs for odd years are reported in the appendix

For the national head quarters the level of concentrations is almost stable, meaning that the entire distribution (at least above the $75^{th}$ percentile) can be well approximated by a Pareto type function. The same is not true for local unions; being smaller organizations, local unions rely more on voluntarism and part time work, with fewer employees and officers working full-time. This is why here concentration tends to decline up to a higher threshold. The small increase at the end underlines the fact that there exists some officers or employees[5] that are better paid with respect to the rest of the labour force working in the sector. However, the rise remains small and negligible. A Pareto fit can be performed on the smaller range in which the values of $\beta$ are approximately constant, that is starting from the $90^{th}$ percentile.

The average value of beta for national head quarters is between 1.3 and 1.4. This implies that inequality within each subgroup analysed starting from the $75^{th}$ percentile is low: the average earnings of the population above any threshold is only 1.3 times the average earnings of the threshold chosen itself. According to the top income literature a $\beta$ comprehended between 1.5 and 1.8 is associated with top 1% owning between 5 and 10 percent of income share. These numbers are roughly equivalent to what we have found so far in the union sector. Remember, moreover, that a value of $\beta$ which is equal one would mean perfect equality above the defined threshold. A characteristics of the national head quarters data is that there is declining concentration at the very top of the distribution even before reaching the last 0.1 percentile for whom, as already emphasized, inequality is zero by construction. For what concern local unions instead, we observe a declining concentration that reaches a stable value at around the $90^{th}$ percentile. Note that the value reached is approximately the same found in national head quarters. This is in line with the structure of local unions in which non paid and part time jobs are extensively employed.

Figure 3.4: Beta Distribution of Gross Salary Unions filling the LM-2 Form




(a) National Head Quarters

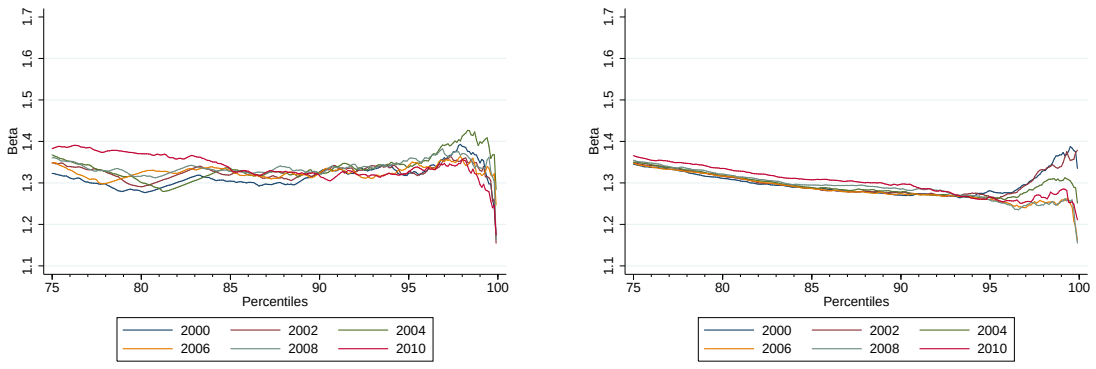
(b) Local Unions

[5] executives managers are recorded as employees

Figure 3.5 mimics the results of the previous one for the definition of full time workers already used. Interestingly, the results for the national head quarters does not seem to be greatly affected. The effect is instead quite evident for local unions. Looking only at the sub-population of presumably fixed term workers, concentration becomes flatter and almost identical in magnitude to the one recorded in the other sub-category. Remarkably, concentrations seems to rise above the $95^{th}$ percentile for earliest year in our sample. The absence of such an increase in more recent years might be due to the loss of membership and resources continuously experienced by the union sector, that led to decrease high wages, but it might also be driven by some measurement error: before 2005, as already stated, each form was compiled on paper and has been digitalized only later. This two steps procedure is likely to have generated a larger amount of mistakes that are not easily detected. In appendix A I describe the corrections made on the gross salary variable to fix some of those outliers without which the concentration at the top would have been even higher. Note, however, that the first interpretation is consistent with the results found regarding the decline in the share of the bottom part of the distribution due to the use of volunteers in place of paid workers. This is also why we do observe a raise in the top 10% of share but not much in the top 1 and 0.1 percent.

Combining all these analyses it seems that there is a substantial difference in organization between national head quarters and local unions that justify my decision of conducting the research separately for each group: the first category relies on a large number of fixed term employees, while the second one employs very few full time workers and use more extensively voluntarism and part-time collaborations. This distinction is mainly driven by resources availability and clearly has a strong impact on inequality too. Note, however, that in the analysis conducted so far, local unions have also been found to be relatively equal despite their organization.

Figure 3.5: Beta Distribution of Gross Salary in Unions filling the LM-2 Form

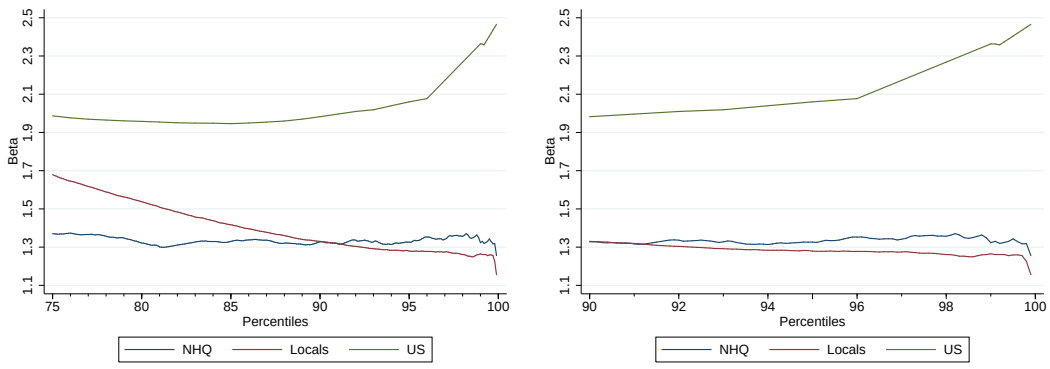



(a) National Head Quarters

(b) Local Unions

Figure 3.6 shows the concentration of the union sector disaggregated for locals and national head quarters, and the US level of concentration in 2006. From panel a) it is clear that the US level of inequality is higher than the one prevailing in unions. In all points shown, the concentration for the US data is at least equal to 2; i.e. the average income of those belonging to a group of which the chosen percentile is the lower bound is always twice the average income of those belonging to the chosen percentile. Interestingly, there seem to be a declining trend up to the $85^{th}$ percentile in the US too. After that point the trend is reversed, at the beginning slightly and then more and more markedly. In panel b) is reported a zoomed version of panel a). The focus here is on the very top of the distribution above the 10% most well paid. While the level of concentration in the union sector seems to stabilize at around 1.3, the US curve shows a strong uprising trend that brings the local beta computed for the $99.9^{th}$ percentile to be equal to 2.6, i.e. twice the value found for unions. American pre tax labour income does not seem to follow a Pareto distribution too, and especially so at the top of the distribution. In the next section I am going to deepen the analysis of inequality and top earnings shares and the relationship between the two further.

Figure 3.6: Comparison of NHQ, Locals and American level of concentration in 2006



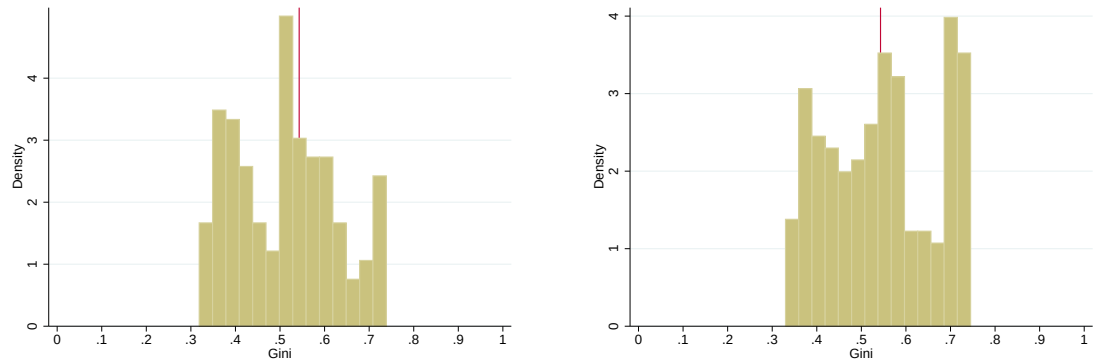

(a) from the $75^{th}$ percentile

(b) Zoom at the $90^{th}$ percentile

### 3.1.3 Inequality

Figure 3.7 plots the distributions of the Gini coefficients computed for the 20 largest national affiliations (chosen based on membership) in each year for the entire LM-2 sample and for local unions respectively. From the graphs, it is clear that the dispersion of inequality in the union sector is quite high. The values range from a minimum of 0.3 to a maximum of 0.75. Local unions show, as expected from previous evidence, a higher level of inequality than the total LM-2 sample. The inequality found using only national head quarters, reported in appendix B figure 13, is, in fact, considerably lower: the peak of density lies between a Gini index of 0.3 and 0.4, dispersion of values is very small and always lower than the US level.

Figure 3.7: Histogram of inequality within unions national affiliation




(a) All LM-2 Dataset

(b) Local Unions

The red line shows the Gini index of the 2010 Pre-tax National Labour Income of the United States; its value is around 0.54. In both figures most of the affiliation-year pairs have a level of inequality that is lower than the American one. However, there is still a considerable portion of unions that are above the American level, and especially so in local unions. This finding seems to go in the opposite direction with respect to what we said so far about the level of inequality prevailing in the union sector. However, two things has to be noted: first, all the high levels of inequality are found in unions were the percentage of zeros and of very low paid workers is extremely high. The major examples are the CARPENTERS IND and PAINTERS AFL-CIO affiliations. In the first case, out of the 29.865 observations recorded around 1/3 are zeros, and almost 40% of workers earn less than 5000$ per year. Similarly, for what concern the PAINTERS AFL-CIO, out of the 8.637 observations almost 60% are zeros while only 1238 earn more than 10.000$ per year. This statistics highlight a specific organization structure that is particularly evident in local unions: few full-time workers coordinates a conspicuous number of part-time and volunteers making the overall level of inequality artificially high. Excluding them, the level of inequality become extremely small everywhere, but the number of employees shrinks too making the statistics for this group not completely reliable.

If we focus on the top 1% of the distributions and we exclude the zeros, however, we do still have an adequate number of employees as shown in table 8 in Appendix B. Looking at this measure the picture of inequality of the union sector is again in line with our previous findings. In table 3.4 are reported the percentages of income earned by the top 1% in the largest national affiliations in all year under analysis. As the number shows, the level of inequality is everywhere remarkably low if we exclude, once again, the CARPENTERS IND affiliation, for the reason that we have already discussed. The union sector confirms hence to be very much equal and

especially so at the top. The average share of the top 1% in the 20 largest affiliations is between 4 and 5 percent, roughly the same as the one found for all the unions filling the LM-2 form as reported before.

## 3.2 Officer results

Union officers, despite their prominent position within the union, receive, on average, quite low salaries for their work. To see this, it is sufficient to report the different averages compensations among the LM-2 filers, the US labour market and the union officers. LM-2 workers received in 2010 on average 39.042$ in 2015 constant term. At a more disaggregated level, local unions were paying their employees 33.091$ while national head quarters reached an average of 78.236$ with the United States being closer to local unions at 37.208$. Looking at the officers file, we find that local unions average compensation is only 10.846$ while national head quarters reach 37.038$. There are multiple causes for the existance of such a difference. First, the officers dataset also includes smaller unions that might be financially constrained to pay their officer and any other employee a high salary. Second, as already stated previously, unions' officers are often volunteers that perform the role of president or vice-president only receiving a personal gratification for the work carried out. This is the case because of the strong idealogical motivation that characterize union activities and engagement in the non-profit sector. However, low officers' wages are also the result of the very small and symbolic role that officers sometimes are in charge of. In particular, in some cases the executive directors or other directive positions are classified as employees and are hence not reported in this analysis. One extreme example of this is the local union named Director Guild of America, the labour organization of the Hollywood film directors. This local union has constantly grown in the last decade and, being formed by very well-paid workers, has increased the amount of resources collected through dues. Nonetheless, most officers in that union are not paid a positive salary[6].

An alternatively and complementary explanations for the low level of payment among officers is that there might be professional union officers that are employed in a multiplicity of union workplaces because of their competences. In this case, officers will still receive a small compensation from each union that would, however, sum up to a normal wage taking the totality of employments. The combination of these causes makes the officers' gross salaries particularly low. Nonetheless, there are some officers receiving normal or even very high compensations. This is why, especially in local unions, the level of concentration of earnings is abnormally high in the lower parts of the distribution.

For these reasons, the focus on officers will be mainly on top earners i.e. on the top 10% of the

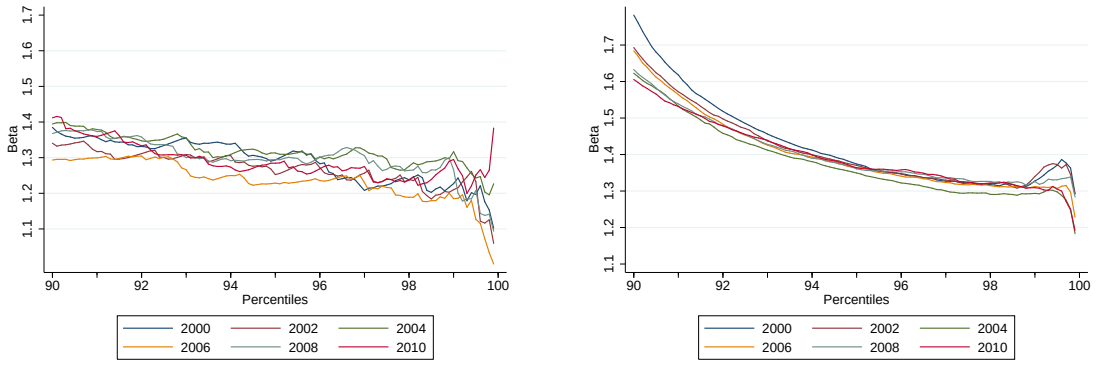
[6]The president position being held in history by several very famous directors such as Franck Capra or Joseph L. Mankiewicz.

Table 3.4: Inequality in 20 biggest unions

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 4.731 | 4.778 | 4.788 | 4.763 | 4.917 | 4.919 | 4.774 | 4.786 | 4.792 | 4.732 | 4.725 |
| AUTO WORKERS AFL-CIO | 4.663 | 4.173 | 4.517 | 4.443 | 4.869 | 4.543 | 4.560 | 4.540 | 4.554 | 4.252 | 4.070 |
| CARPENTERS IND | 11.88 | 12.80 | 11.34 | 11.86 | 13.87 | 13.40 | 13.77 | 13.82 | 14.23 | 13.38 | 13.61 |
| COMMUNICATIONS WORKERS AFL-CIO | 4.499 | 4.386 | 4.109 | 4.457 | 4.753 | 4.491 | 4.584 | 4.183 | 4.177 | 4.448 | 4.171 |
| ELECTRICAL WORKERS IBEW AFL-CIO | 3.700 | 3.888 | 3.960 | 3.887 | 4.174 | 4.249 | 4.243 | 4.400 | 4.333 | 4.359 | 4.351 |
| ENGINEERS, OPERATING, AFL-CIO | 3.550 | 3.477 | 3.517 | 3.626 | 4.172 | 4.018 | 3.789 | 3.697 | 3.717 | 3.654 | 3.907 |
| FOOD & COMMERCIAL WKRS | 4.958 | 4.954 | 5.122 | 5.228 | 5.387 | 5.316 | 5.035 | 5.045 | 5.223 | 5.087 | 5.213 |
| GOVERNMENT EMPLOYEES AFGE AFL-CIO | 2.849 | 3.087 | 2.907 | 3.217 | 2.847 | 3.087 | 3.265 | 3.121 | 3.378 | 4.330 | 3.692 |
| IRON WORKERS AFL-CIO | 4.181 | 4.078 | 4.247 | 4.140 | 4.163 | 4.124 | 4.235 | 4.340 | 4.232 | 4.346 | 4.275 |
| LABORERS | 5.194 | 5.295 | 5.035 | 5.163 | 5.343 | 5.191 | 5.188 | 5.584 | 5.548 | 5.480 | 5.818 |
| PAINTERS AFL-CIO | 7.715 | 7.601 | 7.251 | 8.269 | 8.483 | 9.380 | 8.373 | 6.872 | 7.441 | 7.027 | 6.672 |
| PLUMBERS AFL-CIO | 3.839 | 3.634 | 4.559 | 3.870 | 3.848 | 5.206 | 4.049 | 3.818 | 3.839 | 3.970 | 4.176 |
| POSTAL MAIL HANDLERS, LIUNA | 5.838 | 6.014 | 6.213 | 6.072 | 6.951 | 7.318 | 6.893 | 6.387 | 6.656 | 6.741 | 6.826 |
| POSTAL WORKERS, AMERICAN, AFL-CIO | 6.660 | 7.089 | 7.437 | 6.905 | 6.965 | 6.516 | 6.555 | 6.712 | 6.925 | 6.986 | 7.045 |
| SERVICE EMPLOYEES | 4.446 | 4.676 | 4.329 | 3.857 | 3.829 | 4.076 | 3.582 | 3.688 | 3.604 | 3.562 | 3.467 |
| SHEET METAL WORKERS AFL-CIO | 4.148 | 3.951 | 3.766 | 4.520 | 4.294 | 4.322 | 4.316 | 4.373 | 4.283 | 4.167 | 4.046 |
| STATE COUNTY & MUNI EMPLS AFL-CIO | 4.003 | 4.248 | 4.040 | 3.795 | 3.619 | 4.301 | 3.871 | 4.184 | 3.944 | 3.707 | 4.242 |
| STEELWORKERS AFL-CIO | 3.942 | 3.380 | 4.594 | 4.936 | 4.364 | 4.450 | 4.338 | 4.170 | 3.968 | 3.958 | 3.896 |
| TEACHERS AFL-CIO | 3.768 | 4.083 | 3.649 | 3.680 | 3.522 | 3.439 | 3.703 | 3.600 | 3.663 | 3.283 | 3.141 |
| TEAMSTERS | 3.879 | 3.690 | 4.059 | 4.032 | 3.752 | 3.696 | 3.763 | 3.709 | 3.687 | 3.677 | 3.838 |
| UNITE HERE | 4.757 | 5.202 | 4.299 | 4.148 | 4.876 | 4.616 | 4.484 | 4.664 | 4.467 | 4.228 | 3.956 |

distribution of officers earning a positive salary. The reason to focus on the top is that looking at this subset, the differences between the officers and LM-2 datasets are reduced as figure 14 in Appendix B clearly shows regarding the thresholds to be part of the top 10, 1 and 0,1 percent of the distribution in both datasets. As already mentioned, using the officer dataset increase the likelihood that an officer is indeed employed in multiple unions. To address this concern, I will further collapse the compensations received by an individual at the affiliation level based on the name and surname of the person. This strategy might artificially increase inequality since homonymy is more likely to exist at the affiliation level. However, the affiliation group is still a reasonably small subset in the dataset to perform such collapse and look at the results. Figure 3.8 presents the results for national head quarters and local unions respectively. Once again the national head quarters show a similar pattern as before with decreasing inequality at the top. Interestingly, the values are once again comprised between 1.3 and 1.4 underlining the fact that the wage setting policy of unions is not affected by the employment status of its workers, not even at the top.

Figure 3.8: Beta Distribution of Gross Salary of Officers in Full-time Sample



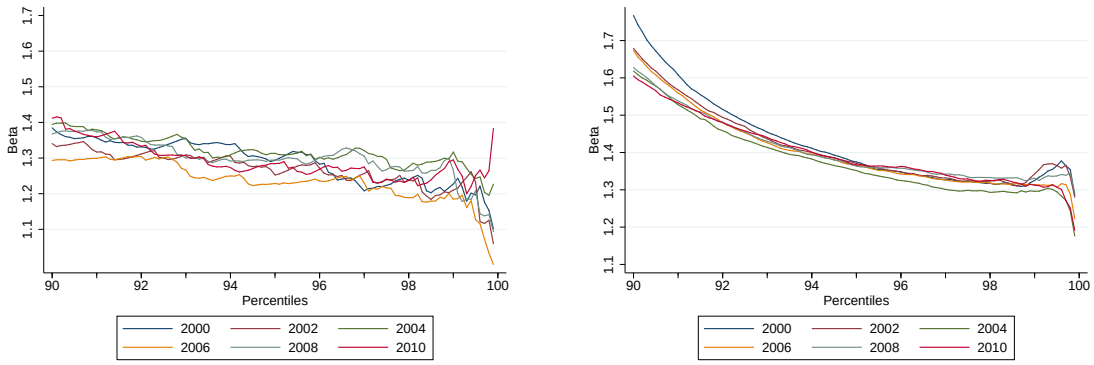

(a) National Head Quarters

(b) Local Unions

For what concern local unions instead, we do find a higher level of concentration. This is decreasing along the percentiles reaching 1.3 at the $98^{th}$ threshold. Figure 3.9 reports the same graphs but for the newly collapsed measure of inequality. Nothing seems to change in the case of national head quarters while we observe a slight decreases for local unions. This means that the equalizer effect of accounting for full compensations is greater than the counter effect of the possible mismatched caused in the collapse. Note that the collapse is made only by union type, i.e. taking into account other positions only in NHQ/locals respectively. The logic behind this is that NHQ employees are paid on average much more than local officers, as previously shown. Hence, mixing officers of the two groups would potentially harm the results more. This does not mean that there are no cases of the same officer being employed in the two subgroups.

Replicating the exercise not imposing the restriction, however, does not affect the main results as shown in Appendix B, table 15.

Figure 3.9: Beta Distribution of Gross Salary of Officers in Total Sample




(a) National Head Quarters

(b) Local Unions

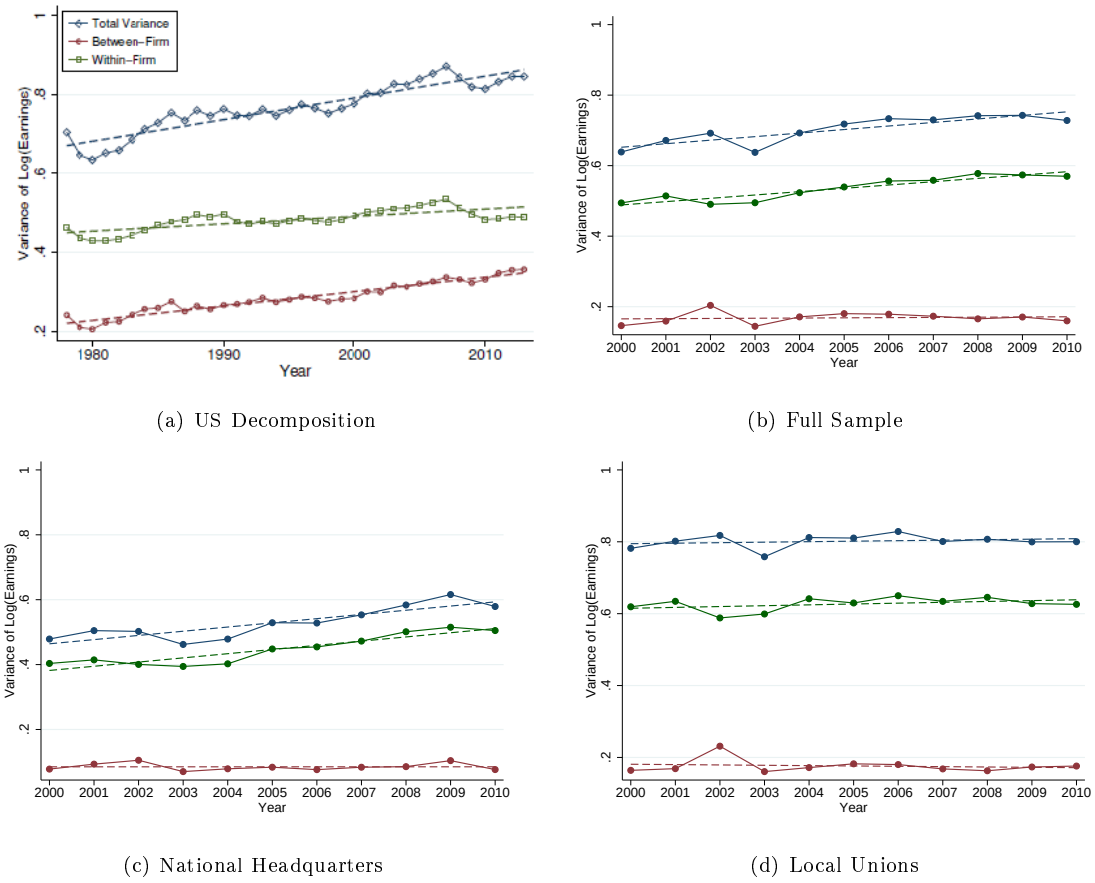
## 3.3 Variance Decomposition

The final part of this work is dedicated to study the evolution of dispersion in its two main components: within- and between-groups. As before, I am going to compare the results with a benchmark for the United States private sector. In this case the reference is a working paper by Song et al. (2016) that has constructed a thirty years employer-employees dataset for virtually all US firms and employees. What these authors show is that almost all the rise of inequality in market compensations, excluding in the very large firms with more than 10000 workers, derives from a rise in between-groups inequality rather than within-groups as is often believed. Replicating this analysis for the union sector is important because it might be informative regarding the transformation happening within the unions. In particular, a high and rising between-firm inequality would probably be explained by the rise in dispersion of workplaces' productivity emphasized by Breda et al. (2017), while a rise in within-firm dispersion would be in line with a change in the structure of employment within each union, as already hypothesized.

The focus of Song and co-authors is on firms with at least 20 employees that earns at least the equivalent of a worker working 40 hours per week for 13 weeks at the minimum wage. Their definition of firm is based on the unique identification number (EIN) under which are supposed to be recorded all workplaces, and hence all employees, belonging to the same firm (employer). I keep using the requirement of 20 employees but I look at the workplace level rather than the firm. This choice is made because the affiliation level is probably too big and even more distant

from the concept of firm used in the private market than the workplace definition, especially for LM-2 filers, in the union sector. It is worthy to notice that the results of Song et al. remain broadly unchanged when they look at the plant level[7] rather than the firm. Moreover, this choice allows to have more groups to look at the between-group dispersion that would be otherwise based on only around 40 groups. For what concern the minimum wage requirement I mimic the condition imposed by Song et al. taking into account only salaries that are above 3000 in constant 2015 terms, which is broadly the average minimum wage along the period of analysis. Given these conditions I remain with 169977 workers employed in local unions and 166441 in national headquarters.

Figure 3.10: Variance Decomposition




(a) US Decomposition

(b) Full Sample

(c) National Headquarters

(d) Local Unions

In order to present inequality Song et al. take the log of earnings decomposing its variance into between- and within-groups components. To do so it is sufficient to notice that the earnings of each workers can be decomposed in the average earning paid at each plant level, plus the

[7] inequality increases slightly

residual earnings earned by each individual as shown in the next equation:

$$y_{ij} = \bar{y}_j + (y_{ij} - \bar{y}_j)$$

From this decomposition we can then simply derive the variance decomposition as the sum of the variance of average earnings between firms, and the weighed average of the variance within each firm. The weights used are relative to the number of employees of each union.

$$Var(y_{ij}) = Var(\bar{y}_j) + Var(y_i | i \in j)$$

Figure 3.10 reports the main decomposition taken from the paper of Song et al. (2016) and my decompositions for the full sample of unions and divided in national headquarters and local unions respectively. As already stated above, panel a) clearly shows that for the whole US private sector the rise in dispersion of wages is mainly driven by the rise of the between (red line) firms inequality. This is completely reversed, looking in panel b), in the union sector. Here the small rise in inequality is almost completely driven by the rise in within-group dispersion (the green line). Note moreover, that the total level of dispersion is always lower in the union sector than in the private US market.
Decomposing the result between national headquarters and local unions we discover a number of new insights. First, as expected, dispersion is much higher in local unions (panel d) than in national headquarters (panel c). Second the rise of inequality is mainly concentrated in national headquarters and is completely driven by the within-group component. This fact combined with the seemingly stable top share of earnings found previously points towards a major use of part-time workers, i.e. towards a restructuring of employment in national headquarters that goes in the direction of local unions.

# Conclusions

This research is the first attempt to exploit all the administrative information on union employees' gross salaries provided by the American Labor Department to address from a scientific point of view the level of inequality prevailing in the union sector. This exercise is interesting for several reasons. First it contributes to the non-profit literature showing that inequality among unions is lower than the one prevailing in other markets. As already mentioned, this finding is in line with several potential explanations. It is consistent with the idea (empirically supported by the results of Leete (2000)) that low inequality is used in this context as an incentive device for workers characterized by higher social values; but also consistent with the possibility that low compensations are used to screen managers that receives an intrinsic reward from working for non-profit organizations solving the incentive compatibility constraint as argued, among others, by Rose-Ackerman (1996). Alternatively, it might be the consequences of the declining structure of the union market and the consequent lack of resources that prevent inequality to increase. Finally, it might be the result of the pressure that unions' members put on unions' employees compensations. It is in fact possible that union's members value, together with the benefits they are supposed to gain from unionisation, also the fairness of the wage policies implemented within the organizations and between them and the workplace/firm/sector they organize. In other words it is possible that equity is perceived as a requirement to be credible to the eyes of a worker when the good sold, representativeness, also entails the fight for more egalitarian wages. What is certain is that taking into account all the amount of compensations given to union employees, trade unions do not seem to be acting as rent-seekers agents neither at the top of the earnings distribution as right-wing liberal movements would like to believe.

Second it highlights the differences that exist among different types of unions. In particular, I found that local unions relies extensively on voluntarism while national headquarters employ more full-time workers. This implies that overall inequality is much higher in local unions than in national headquarters even though the absolute level of compensation is much lower in the former group rather than the latter. Since both types of unions are important and employ a considerable number of workers, this fact underlines the need to distinguish between the two in any analysis on American unionism. Third, and most interestingly, I find that inequality is particularly low (and declining) at the top of the earnings distribution. This result is in sharp

contrast with the evidence regarding the US labour market where inequality is found to be high and rising, especially at the top. It is, instead, again in line with the findings of Leete (2000) who emphasizes the importance of using a low level of inequality as an incentive device especially for managerial staff, arguing that group to be more sensible to that type of policies because more likely to be aware of the level of pay of comparable type of workers. Finally, it shows that, again in sharp contrast with the American private sector benchmark, the slight rise of inequality within unions mainly come from a rise in the within workplace variance rather than between workplaces.

Given the results of this preliminary study, there are several possible extensions that can be investigated. First, it would be interesting to include more recent years into the analysis given the extremely fast rate of transformation of the American union sector. Second, it would be more complete to also include in this research information about employees', officers' salaries and officers' other positions in other organizations filling the LM-3 form. These data are in fact not available for direct download, but might be retrieved from the server with a Python code that scraps all the files looking for those information in the non-downloadable items. Including all workers' positions would in fact give a more precise idea of the level of compensations of union workers, that might be artificially too in the present research. This fact is likely to have an impact on inequality although the sign is a priori unknown. Third it would be interesting to understand which of the aforementioned reasons is the main driver of the low level of inequality found. Perfectly disentangling all those effects might be impossible, but we can get a sense of their importance in several ways. For instance, looking at the correlation between the level of inequality prevailing in one sector and the inequality within the union affiliation that is in charge of organizing that particular part of the market or exploiting some scandals on unions' officers stealing money, might provide insights on the importance of inequality for unions' credibility on their market.

On a more broad point of view, several other possibilities are worthy to be explored: for instance, it would be interesting to study the impact that the approval of righ-to-work legislation has had on union salaries, and particularly on the possible rent-seeking behaviour of top union earners. In a preliminary analysis not reported here, I have focused on the effects of right-to-work legislation in Oklahoma. The main results show a reduction in the resources collected by unions (in particular a drop in union fees, partly compensated by a rise in average dues) that led to a reduction in officers compensations. However, the reduction in compensations is not concentrated at the top end of the earnings within the union plant. This fact seems to point towards a restructuring of unions that move away even further from full-time employees towards part-time and volunteers work rather than a reduction of a rent-seeking behaviour. Since the policy is effective as of 2002 and since the data quality for the year 2000 is not completely reliable, there is no way to verify the common trend assumption crucial to identify the true effect of the policy.

Many other states have, however, adopted right-to-work laws[8] since 2001, and can hence be used to conduct this research. The subsequent advantage of focusing on those states is that the laws have been passed at different point in time, which allow the researcher to use the states that will pass the law shortly after as a reliable control group for those that already approved the law.

Since the dataset contains a variable recording if an officer was already in charge in the previous year or if instead he arrived in the last 12 months or, finally, if he left, it would also be interesting to exploit this information, together with the added part on officers different work positions, to construct a panel data of union officers that move between unions. Having such a panel would allow us to assess the role that officers have in determining the productivity of a union in the spirit of Bertrand and Schoar (2003), extending their analysis to the peculiar context of a non-profit and declining market.

A final extension could look at the effect of compensations on different measures of productivity in the union sector. Since we observed that inequality in this sector is particularly low, if the officers' impact on productivity (membership) is found to be important, then it is possible that, at certain levels of pay, the classic compensation scheme incentive might be stronger than the low inequality tool to motivate workers and hence increase their productivity. In other words, it is possible that the level of inequality within the sector is too low, depressing productivity, rather than too high as it is often accused to be: Paradoxically, increasing compensations at the top might prove to be a solution, in contrast with the non-profit literature, to counter the fall of unionisation. As for the analysis conducted so far, this policy should be more efficient, if any, if applied to local union officers rather than the already well-paid national headquarters employees. This is even more true given the fact that local unions' officers are in charge of recruiting new members and hence countering the declining trend of the union membership market.

[8] Indiana (2012), Michigan (2012), Wisconsin (2015), Alabama (2016), West Virginia (2016), Kentucky (2017) and Missouri (effective as of $28^{th}$ August 2017)

# Bibliography


Bertrand, M. (2009). Ceo s. *Annual Review of Economic Studies*, 1(1):121–150.

Bertrand, M. and Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics*, 118(4):1169–1208.

Breda, T., Bryson, A., and Forth, J. (2017). Plant level productivity in a declining market: The case of union locals. *Working Paper*.

Burkhauser, R. V., Feng, S., Jenkins, S. P., and Larrimore, J. (2008). Estimating trends in us income inequality using the current population survey: the importance of controlling for censoring. Technical report, National Bureau of Economic Research.

Duggan, M. (2000). Hospital ownership and public medical spending. *Quarterly Journal of Economics*, 115(4):1343–74.

Frey, B. (1997). On the relationship between intrinsic and extrinsic work motivation. *International Journal of Industrial Organization*, (15):427–439.

Frydman, C. (2005). Rising through the ranks. the evolution of the market for corporate executives, 1936-2003. *V Columbia University*.

Gabaix, X. and Landier, A. (2008). Why has ceo pay increased so much? *The Quarterly Journal of Economics*, 123(1):49–100.

Hallock, K. F. (2002). Managerial pay and governance in american nonprofits. *Industrial Relations: A Journal of Economy and Society*, 41(3):377–406.

Hallock, K. F. and Klein, F. B. (2016). Executive compensation in american unions. *Industrial Relations: A Journal of Economy and Society*, 55(2):219–234.

Hansmann, H. (1980). The role of non-profit enterprise. *THe Yale Law Journal*, 89:835–901.

Hirsch, B. T., Macpherson, D. A., and Preston, A. (2017). Nonprofit wages: theory and evidence. *IZA Working Paper*.

Holmes, T. J. and Walrath, M. (2007). Dynamics of union organizations: A look at gross flows in the lors files. *NBER Working Paper*.

Jones, D. B. (2015). The supply and demand of motivated labor: When should we expect to see nonprofit wage gaps? *Labour Economics*, 32:1–14.

Leete, L. (2000). Wage equity and employee motiviation in nonprofit and for-profit organizations. *Journal of Economic Behaviour and Organization*, 43(4):423–446.

Leete, L. (2001). Whither the nonprofit wage differential? estimates from the 1990 census. *Journal of labor Economics*, 19(1):136–170.

Piketty, T. and Saez, E. (2003). Income inequality in the united states, 1913–1998*. *The Quarterly Journal of Economics*, 118(1):1.

Roomkin, M. J. and Weisbrod, B. A. (1999). Managerial compensations and incentives in for-profitand nonprofit hospitals. *Journal of Law Economics and Organization*, 15(3):750–781.

Rose-Ackerman, S. (1996). Altruism, non-profit and economic theory. *Journal of Economic Literature*, 34:701–728.

Sherk, J. (2015). Unions charge higher dues and pay their officer larger salaries in non-right-to-work states. *Report for the Heritage Foundation*.

Song, J., Price, D., Guvenen, F., Nicholas, B., and Von Wachter, T. (2016). Firming up inequality. *NBER working Paper*.

# A. Variables Description

*Gross Salary*: Following the rules to fill the LM-2 and LM-3 reports, unions should list all the positions for which each officers and each employees is in charge, and all the compensations accrued for the mansions mentioned in each different line. To obtain the gross salaries earned by each union worker at the union workplace level, I hence collapse all these rows in a unique one summing up the different amounts reported. Since no worker identifier exists in the dataset, I am forced to use names and surnames to perform the collapse. There are two threats linked to this choice. First, there may be cases of homonymy; second, there might be spelling mistakes that prevent a match to occur. The first case, however, is quite unlikely given that I restrict the collapse by year and union unit. Although possible, the chances that the second possibility of mistake can affect the results are quite slim.
Measurement errors are likely to exist. To remove the most striking ones I use a combination of information. First I check if the salary paid is higher than the total amount paid to officers/employees (depending on the type of worker) and the total disbursements made. This rule of thumb is particularly useful for observations before 2005 when the total compensations accrued to officers and employees had to be reported separately. After 2005, the completion of these two fields is made automatically by the electronic form, summing up all the earnings listed. It is thus always greater or equal than the single earning. Second, I compute the best and second best salary per worker within the years (this is possible only if the worker is in office for more than one year) and I compute the ratio between the two. Finally, I compute the median and the standard deviation of all the salaries perceived excluding the highest one. If the highest salary is higher than the median plus twice the standard deviation (and the amount is bigger than the total spent for the category[9]/total disbursement and the ratio between first and second top salaries is above 10) then I substitute the median salary for the detected mistake. Most probably, this method is effective only in capturing the major mistakes, leaving many others uncovered. However, it has the merit to target the most problematic ones and to not change the raw data dramatically. Results shows that no important outlier remains except among officers employed in National Head Quarters in 2005. I substitute the top gross salaries for the unit 29826 from 1332018 to 133201.8 since looking at the top wage of other years this observation turns out to be a clear mistake.

[9] either officer or employees

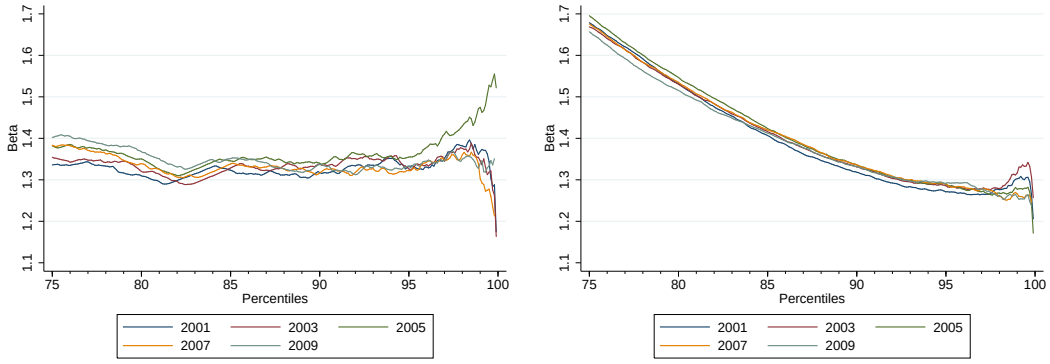
*Members, fees, dues*: I try to detect major mistakes looking at future and past values recorded and substituting with an interpolation those values that are clearly not in line with the rest of the series. To further check my variable I compute the average dues. Despite the former corrections, there is one unit in Oklahoma that do have average dues per member that are beyond a reasonable amount. This unit is identified as unit 29826, that I exclude from the difference in difference analysis.

*Affiliation and affiliation number*: I re-classify some affiliations to their correct name. In particular I re-label those variables reporting an affiliation that had to be fund only later in time or that instead ceased to exist because it was merged with another group. Both possibilities affect the UNITE HERE affiliation. This group was created in 2004 from the fusion of UNITE and HERE. Those two groups hence stop to exist and converge in a unique label. To present the result for UNITE HERE that are consistent with the other affiliations I pool UNITE and HERE units together also before 2004. In the data, however, some unit is still recorded to be part of the old organization even after that year; in that case too the name is changed according to the new formation. In 2009, part of the UNITE HERE group has left the affiliation creating a new label called WORKERS UNITED. All units reporting this name before 2009 are re-assigned to UNITE HERE while the WORKERS UNITED is left autonomous as from 2009. Two other large affiliations contained mistakes in the affiliation name reported: POSTAL MAIL HANDLERS, LIUNA and LABORERS. In both cases I have fixed the spelling inconsistencies.

*State*: When performing the difference in difference, I re-asses the correct assignment of states. In particular, I change some spelling mistakes re-labelling correctly 21 observations for Kansas. Moreover some union units are found to be recorded in different states. These unions are dropped from the analysis unless it is clear where do the unit came from as the case of unit 23463 that is located in Kansas City but is recorded twice to be in Missouri while for the rest of the time is a union of Kansas. This lead to drop other 321 observations. I then fill the gap in the dataset if a union is disappearing for some years and then reappearing later. This process generates 116 new observations.

# B. Additional Results

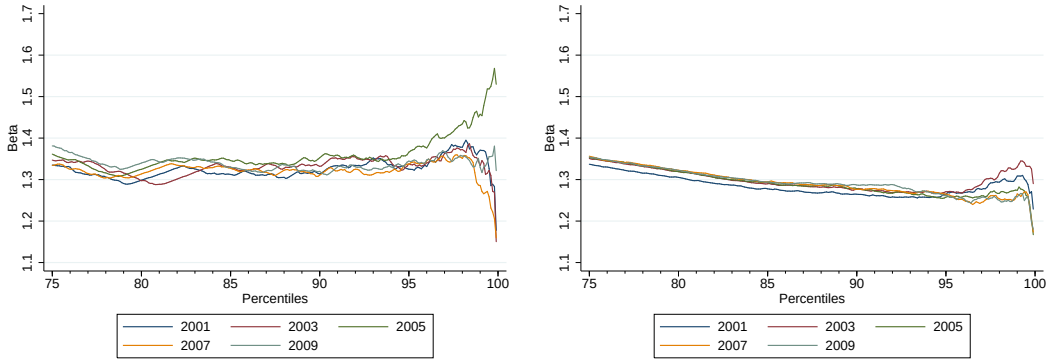
Figure 11: Beta Distribution of Gross Salaries in NHQ and LU filling LM-2 in Odd Years




(a) NHQ LM-2

(b) LU LM-2

Figure 12: Beta Distribution of Gross Salary in LU filling LM-2 in Odd Years for full-time workers




(a) NHQ LM-2

(b) LU LM-2

Table 5: Concentration and Inequality of NHQ for Full-time workers filling the LM-2 form

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 28.23 | 50.19 | 21.59 | 12.74 | 3.8 | .6 | .31 |
| 2001 | 27.59 | 50.34 | 22.07 | 13.05 | 3.92 | .65 | .32 |
| 2002 | 27.91 | 49.87 | 22.22 | 13.15 | 3.89 | .63 | .31 |
| 2003 | 28.2 | 49.66 | 22.13 | 13.14 | 3.94 | .65 | .31 |
| 2004 | 27.79 | 49.98 | 22.24 | 13.15 | 4.01 | .72 | .31 |
| 2005 | 28.06 | 49.63 | 22.32 | 13.23 | 4.07 | .85 | .31 |
| 2006 | 28.13 | 49.88 | 21.99 | 12.95 | 3.81 | .65 | .31 |
| 2007 | 28.06 | 49.96 | 21.98 | 12.94 | 3.82 | .58 | .31 |
| 2008 | 27.39 | 50.19 | 22.42 | 13.29 | 3.97 | .66 | .32 |
| 2009 | 27.22 | 50.15 | 22.62 | 13.33 | 3.92 | .68 | .32 |
| 2010 | 27.61 | 49.79 | 22.6 | 13.3 | 3.91 | .61 | .32 |

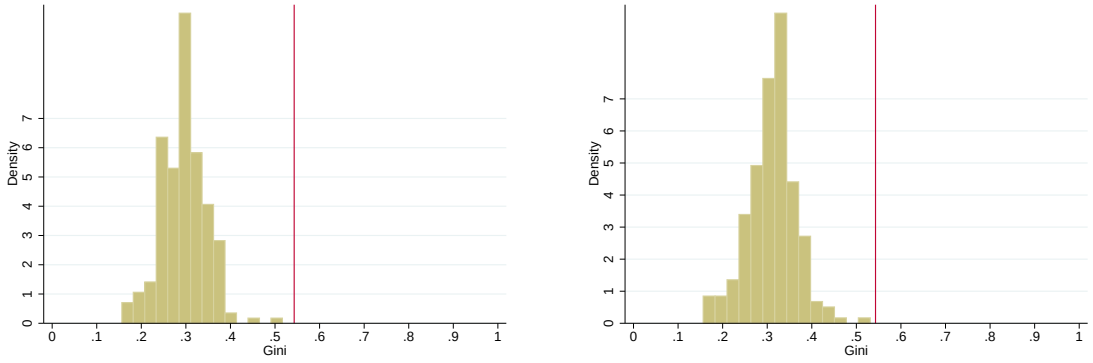
Table 6: Concetration of Compensations in LU Including Allowances

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 2.08 | 58.34 | 39.58 | 23 | 6.33 | 1.06 | .67 |
| 2001 | 2.01 | 58.59 | 39.4 | 22.85 | 6.29 | 1 | .67 |
| 2002 | 2.2 | 58.5 | 39.3 | 22.88 | 6.36 | 1.07 | .66 |
| 2003 | 2.04 | 58.83 | 39.13 | 22.81 | 6.33 | 1.05 | .66 |
| 2004 | 2.01 | 58.63 | 39.36 | 22.97 | 6.4 | 1.07 | .66 |
| 2005 | 1.95 | 58.03 | 40.02 | 23.36 | 6.43 | .99 | .67 |
| 2006 | 2 | 58.3 | 39.71 | 23.11 | 6.33 | .95 | .67 |
| 2007 | 2.04 | 58.38 | 39.58 | 23.12 | 6.35 | .96 | .67 |
| 2008 | 2.09 | 58.43 | 39.49 | 23.07 | 6.35 | .96 | .66 |
| 2009 | 2.08 | 58.98 | 38.94 | 22.73 | 6.27 | .94 | .66 |
| 2010 | 1.97 | 58.93 | 39.1 | 22.93 | 6.34 | .97 | .66 |

Table 7: Concentration of Compensations in NHQ Including Allowances

| | Bottom 50% | Middle 40% | Top 10% | Top 5% | Top 1% | Top 0.1% | Gini |
|---|---|---|---|---|---|---|---|
| 2000 | 22.93 | 52.99 | 24.07 | 14.36 | 4.21 | .66 | .38 |
| 2001 | 22.59 | 52.93 | 24.48 | 14.66 | 4.32 | .71 | .39 |
| 2002 | 22.79 | 52.53 | 24.68 | 14.73 | 4.27 | .69 | .39 |
| 2003 | 23.99 | 51.8 | 24.21 | 14.51 | 4.25 | .69 | .37 |
| 2004 | 23.42 | 52.21 | 24.37 | 14.54 | 4.35 | .77 | .38 |
| 2005 | 20.34 | 53.89 | 25.77 | 15.38 | 4.64 | .94 | .42 |
| 2006 | 20.67 | 54.08 | 25.25 | 14.97 | 4.37 | .73 | .42 |
| 2007 | 18.6 | 55.36 | 26.04 | 15.45 | 4.52 | .69 | .44 |
| 2008 | 18.93 | 54.9 | 26.18 | 15.59 | 4.59 | .77 | .44 |
| 2009 | 18.72 | 54.86 | 26.42 | 15.69 | 4.54 | .77 | .44 |
| 2010 | 18.97 | 54.62 | 26.42 | 15.67 | 4.57 | .71 | .44 |

Figure 13: Histogram of inequality within unions national affiliation




(a) NHQ

(b) NHQ including the zero

Figure 14: Evolution of Thresholds in Constant 2015 Terms of Officers and LM-2 datasets

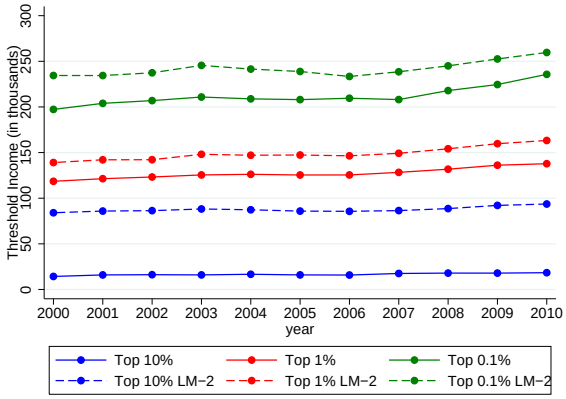
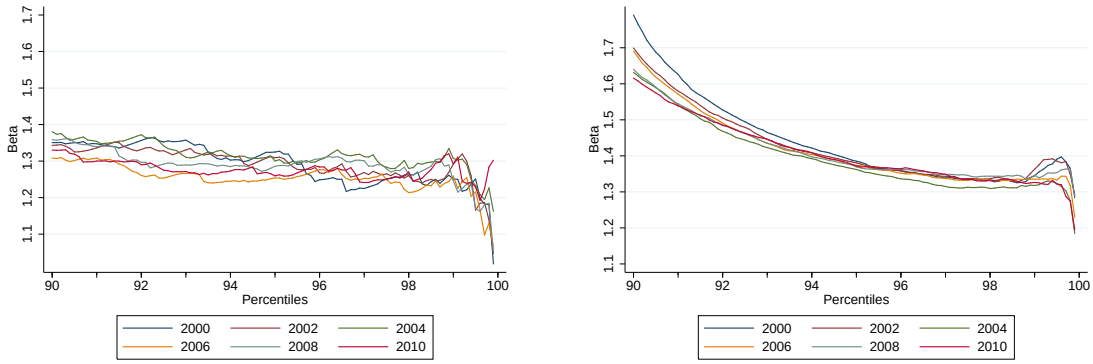



Figure 15: Beta Distribution of Gross Salary of Officers in Total Sample




(a) National Head Quarters

(b) Local Unions

Table 8: Number of Employees in 20 biggest unions

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 82166 | 86570 | 89506 | 89018 | 92072 | 92656 | 93540 | 95014 | 94786 | 90696 | 89400 |
| AUTO WORKERS AFL-CIO | 5831 | 6027 | 6244 | 5730 | 5731 | 5858 | 5658 | 5367 | 5536 | 4540 | 4303 |
| CARPENTERS IND | 2517 | 2834 | 2814 | 2876 | 2880 | 2652 | 2812 | 2892 | 2881 | 2850 | 2688 |
| COMMUNICATIONS WORKERS AFL-CIO | 3041 | 3187 | 3414 | 3582 | 3501 | 3567 | 3933 | 3535 | 3505 | 3716 | 3175 |
| ELECTRICAL WORKERS IBEW AFL-CIO | 6627 | 7400 | 7515 | 7326 | 7623 | 7719 | 7717 | 8155 | 8288 | 7973 | 7918 |
| ENGINEERS, OPERATING, AFL-CIO | 2624 | 2925 | 2889 | 2856 | 2997 | 3031 | 2961 | 2891 | 2884 | 2791 | 2770 |
| FOOD & COMMERCIAL WKRS | 4396 | 4470 | 4644 | 4497 | 4428 | 4341 | 4135 | 4216 | 4295 | 4249 | 4152 |
| GOVERNMENT EMPLOYEES AFGE AFL-CIO | 484 | 546 | 585 | 590 | 689 | 710 | 766 | 817 | 889 | 1080 | 953 |
| IRON WORKERS AFL-CIO | 1777 | 1908 | 2083 | 2099 | 2036 | 2102 | 2107 | 2048 | 2153 | 2114 | 2012 |
| LABORERS | 3935 | 4380 | 4469 | 4442 | 4328 | 4177 | 4348 | 4467 | 4417 | 4314 | 4427 |
| PAINTERS AFL-CIO | 985 | 1129 | 1020 | 986 | 892 | 876 | 807 | 819 | 861 | 791 | 728 |
| PLUMBERS AFL-CIO | 3576 | 3844 | 3781 | 4049 | 4142 | 4088 | 4244 | 4319 | 4307 | 4251 | 4333 |
| POSTAL MAIL HANDLERS, LIUNA | 449 | 493 | 563 | 477 | 523 | 512 | 465 | 462 | 515 | 464 | 465 |
| POSTAL WORKERS, AMERICAN, AFL-CIO | 1856 | 2179 | 2192 | 2044 | 2050 | 1869 | 1843 | 1922 | 2003 | 1918 | 1788 |
| SERVICE EMPLOYEES | 4271 | 4995 | 5538 | 6155 | 7176 | 7120 | 7446 | 7753 | 7600 | 7392 | 7558 |
| SHEET METAL WORKERS AFL-CIO | 1753 | 1691 | 1833 | 1969 | 1975 | 1904 | 1939 | 1850 | 1833 | 1862 | 1765 |
| STATE COUNTY & MUNI EMPLS AFL-CIO | 994 | 1408 | 1485 | 1618 | 1530 | 1645 | 1563 | 1631 | 1682 | 1611 | 1445 |
| STEELWORKERS AFL-CIO | 3233 | 2488 | 3586 | 3590 | 3268 | 3820 | 3825 | 3357 | 3199 | 2959 | 2648 |
| TEACHERS AFL-CIO | 1065 | 1194 | 1358 | 1495 | 1497 | 1551 | 1592 | 1537 | 1645 | 1605 | 2283 |
| TEAMSTERS | 6129 | 6122 | 6098 | 6108 | 6057 | 5951 | 5880 | 5901 | 5857 | 5618 | 5428 |
| UNITE HERE | 2224 | 2231 | 2107 | 1991 | 1874 | 1778 | 1773 | 1754 | 1773 | 1705 | 1520 |