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SANTINI PAOLO

Trade unions as organizations: membership, workforce composition and wage structure

An analysis over the XX^{th} and XXI^{st} centuries in Western countries

Thesis directors: Jérôme Bourdieu (directeur), Thomas Breda (co-directeur)

Date of defence: le 19/10/2022

Referees	1	Alex Bryson, UCL
	2	Héloise Petit, Université de Lille, CEET, CNAM
Jury	1	Anna Stansbury, MIT Sloan
	2	Richard B. Freeman, Harvard University

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Les syndicats comme organisations : membres, composition de la force de travail et structure des salaires

Une analyse sur le XX^{th} et XXI^{st} siècle dans les pays Occidentaux

Thèse dirigée par: Jérôme Bourdieu (directeur), Thomas Breda (co-directeur)

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Rapporteurs	1	Alex Bryson, UCL
	2	Héloise Petit, Université de Lille, CEET, CNAM
Jury	1	Anna Stansbury, MIT Sloan
	2	Richard B. Freeman, Harvard University

Abstract

0.1 Trade unions as organizations: membership, workforce composition and wage structure

This thesis studies the composition and functioning of trade unions in several Western countries from a historical perspective. In the first chapter, joint with T. Breda, I look at the compensation policies that American unions adopt when paying their own workers, i.e. when they are entirely free to set their preferred compensation structure. Unions champion a more egalitarian distribution of resources in society but operate in a competitive and declining market. These two forces push top salaries, and hence inequalities, in opposite directions, which one will prevail? Using a novel database we newly digitized, we show that unions do pay more egalitarian wages than comparable private firms, particularly so at the top of the earnings distribution. This is due in part because unions employ a large number of intrinsically motivated workers. We show that another part comes from the view that society holds of unions: defending equality, unions should be equal themselves and not pay their leaders too much. The principle of coherency thus restrains them from overpaying their workers, even if this would be optimal for the functioning of their "business". In the second chapter, together with C. Coly, I take a further step in studying inequalities within unions by looking at gender differences. American unions have historically been a closed group, formed primarily by white and male workers, hostile to women and minorities. This might have hindered their ability to represent these groups and hence slowed down the march for equality at work. The gender composition of union members has dra-

matically changed over the second half of the XX^{th} century. In this chapter, we ask if the same happened to union leaders. Using the same rich dataset as above, we study the role of women in the American labor movement as of 1959. We find that unions have always had a better representation of women than the private sector at the top. However, they are still far from having reached the same proportion of women among their leaders that they have in their ranks, and this is why they should keep improving in this dimension. Social norms play an important role in explaining part of the lag observed: unions that had a more hostile attitude towards women in the (distant) past are still today less open to them than the others. This point to corporate culture as an important element to be addressed to end gender inequalities. In the last chapter of this thesis, co-written with C. Batut and U. Lojkine, I complement the analysis of the internal union workers by looking at the evolution of the socio-economic characteristics of union members. In this case, we take a comparative approach and study, in addition to the US, other Western democracies (Denmark, France, Germany, Italy, Sweden, and the UK) over the long run. We find that, since the '50s, the characteristics of the typical union member has changed together with the change in the labor force composition in all countries. In Anglo-Saxon countries, on top of this, we document a downward shift in the likelihood that individuals of certain groups (men, low-skilled, blue collar, private sector workers) take up union membership. We argue that these differences are driven by the institutional differences between countries, cautioning against referring to the different national trade unions in the World as one and the same thing.

JEL codes: J16, J21, J31, J51, J68, L33, N30

Keywords: Union structure and organizations, Inequality, Social norms

0.2 Les syndicats comme organisations : membres, composition de la force de travail et structure des salaries

Cette thèse étudie la composition et le fonctionnement des syndicats de plusieurs pays occidentaux dans une perspective historique. Dans le premier chapitre, en collaboration avec T. Breda, j'examine les politiques de rémunération que les syndicats américains adoptent lorsqu'ils rémunèrent leurs propres travailleurs, c'est-à-dire lorsqu'ils sont totalement libres de fixer la structure de rémunération de leur choix. Les syndicats se font les champions d'une distribution plus égalitaire des ressources dans la société, mais ils opèrent sur un marché compétitif et en déclin. Ces deux forces poussent les hauts salaires, et donc les inégalités, dans des directions opposées, laquelle va dominer l'autre ? En utilisant une nouvelle base de données que nous venons de numériser, nous montrons que les syndicats versent des salaires plus égalitaires que les entreprises privées comparables, et cela en particulier au sommet de la distribution des salaires. Cela est dû en partie au fait que les syndicats emploient un grand nombre des travailleurs intrinsèquement motivés. Nous montrons qu'une autre partie provient de la vision que la société a des syndicats : pour défendre l'égalité, les syndicats doivent être eux-mêmes égaux et ne pas trop payer leurs dirigeants. Le principe de cohérence donc les empêche de surpayer leurs travailleurs, même si cela serait optimal pour le fonctionnement de leur "entreprise". Dans le deuxième chapitre, avec C. Coly, je vais plus loin dans l'étude des inégalités au sein des syndicats en examinant les différences entre les sexes. Les syndicats américains ont historiquement été un groupe fermé, formé principalement de travailleurs blancs et masculins, hostiles aux femmes et aux minorités. Cela a pu entraver leur capacité à représenter ces groupes et donc ralentir la marche vers l'égalité au travail. La composition par sexe des membres des syndicats a radicalement changé au cours de la seconde moitié du XXe siècle. Dans ce chapitre, nous nous demandons si celle des dirigeants syndicaux a changé en parallèle. En utilisant le même riche ensemble de données que ci-dessus, nous étudions le rôle des femmes dans le mouvement syndical américain à partir de 1959. Nous con-

statons que les syndicats ont toujours eu une meilleure représentation des femmes que le secteur privé au sommet. Cependant, ils sont encore loin d'avoir atteint la même proportion de femmes parmi leurs dirigeants que dans leurs rangs, et c'est pourquoi ils doivent continuer à s'améliorer dans cette dimension. Les normes sociales jouent à nouveau un rôle important dans l'explication d'une partie du retard observé : les syndicats qui avaient une attitude plus hostile à l'égard des femmes dans un passé (lointain) sont, encore aujourd'hui, moins ouverts à celles-ci que les autres. Cela montre que la culture d'entreprise est un élément important à prendre en compte pour mettre fin aux inégalités entre les sexes. Dans le dernier chapitre de cette thèse, co-écrit avec C. Batut et U. Lojkine, je complète l'analyse de compensation et composition de syndicalistes en examinant l'évolution des caractéristiques socio-économiques des membres des syndicats. Dans ce cas, nous adoptons une approche comparative et étudions, en plus des Etats-Unis, d'autres démocraties occidentales (Danemark, France, Allemagne, Italie, Suède et RU) sur le long terme. Nous constatons que, depuis les années 50, les caractéristiques du membre syndical type ont changé en même temps que la composition de la main-d'œuvre dans tous les pays. Dans les pays anglo-saxons, nous constatons en outre une baisse dans la probabilité que les individus de certains groupes (les hommes, les travailleurs peu qualifiés, les ouvriers, les employés du secteur privé) deviennent membres d'un syndicat. Nous soutenons que ces différences sont dues aux différences institutionnelles entre les pays, et mettons en garde contre le fait de considérer les différents syndicats nationaux dans le monde comme une seule et même chose.

JEL codes: J16, J21, J31, J51, J68, L33, N30

Mot clés: Union structure and organizations, Inequality, Social norms

Acknowledgements

The original idea for my Ph.D. dissertation was based on the famous quote *"United we Stand, divided we fall"*. Departing from there, my Ph.D. has evolved into something else, but throughout these many years of thesis I have often recalled this motto (that actually used to camp in the middle of the whiteboard in my shared office). I did so each time I received the support of the persons with whom I shared this part of my life. Because of all the support I received, I stood and this thesis could be discussed. I am thus indebted to all of you and wish to deeply thank you from the bottom of my hart.

First of all, I should thank my supervisors. Five years of discussion, insights, encouragements, but also disagreements, have incredibly enriched me and have made this thesis greatly progress. I thank Jérôme for all the lengthy and powerful conversations we got as well as for his kind guidance. I thank Thomas for showing me how to combine an incredibly sharp economic intuition with a perfect balance between rigorous econometric analysis and a more humanistic approach. I also thank him for all the things he taught me while working to our joint project. I actually regret to not have spent more time together with him so to learn even more. Despite not being one of my supervisors, I believe that a thanks to Thomas Piketty is rightfully placed here. In addition to be a role model for any (left-wing) young economist, Thomas has helped my thesis and my personal life to move forward. I would also like to thank Alex Mas who accepted to host me in Princeton in the Spring 2020. Due to Covid, my American experience was short, but remains nonetheless unforgettable.

A special thanks goes to my two thesis referees, Alex Bryson and Héloise Petit, for their careful reading of all my chapters and their insightful comments. I did struggled

a bit to include them all in my thesis, but I feel it was definitively worth it. I also wish to thank Anna Stansbury and Richard Freeman for their role as jury members. I am really honored to have both of them here as I am a great admirer of their research. They represent to me what I consider fundamental in economic research and thus a great source of inspiration.

Next in line come my great co-authors. As I believe that united we can accomplish more than what we can do all alone, all my papers are co-authored. I have already thanked Thomas for his part. I will never thank enough Cyprien and Ulysse, who made me join their project and lifted with it (and their friendship) my spirit when it was at its lowest. I am looking forward for many more fruitful collaborations with you! Finally, I thank Caroline, with whom we joined forces merging our favorite topics to end our respective thesis. If the last mile is on some respect the hardest, I was in the best possible company ever.

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Florence, 18/08/2022

Contributions

Since all the papers in the present thesis are co-authored, the reader might wonder how much I have actually contributed to the realization of each chapter. Before turning to this, I want to underline that in research the sum is always greater than the parts, and that it is very hard to assess the importance of discussions and ideas on the development of a joint project. Having made this premise, in this section I try to detail the exact contributions I made to each part of this manuscript. I have been the leading researcher of the project presented in Chapter 1. At the outbreak of the project, I was responsible for the contacts with the financier (INET) and the digitisation company (3Alpha). Once the raw data has been digitised, I have checked their quality and made major cleaning. Next, I conducted most of the analysis and wrote the first draft of the paper that is reported here. Finally, I have been thus far the sole presenter of the project in seminars and conferences around Europe. Concerning the other projects, they have been carried on dividing the work in roughly equal shares between the corresponding authors. For Chapter 2, I have been more involved in the cleaning and preparation of the data and in writing the final draft of the paper than in the actual analysis. For Chapter 3, we divided the work based on the countries covered rather than by task: each author specialised in a set of countries and did the entire analysis for them (data search, cleaning, and analysis; study of institutions and history). To conclude, I am the sole author of the introduction and conclusion to this manuscript.

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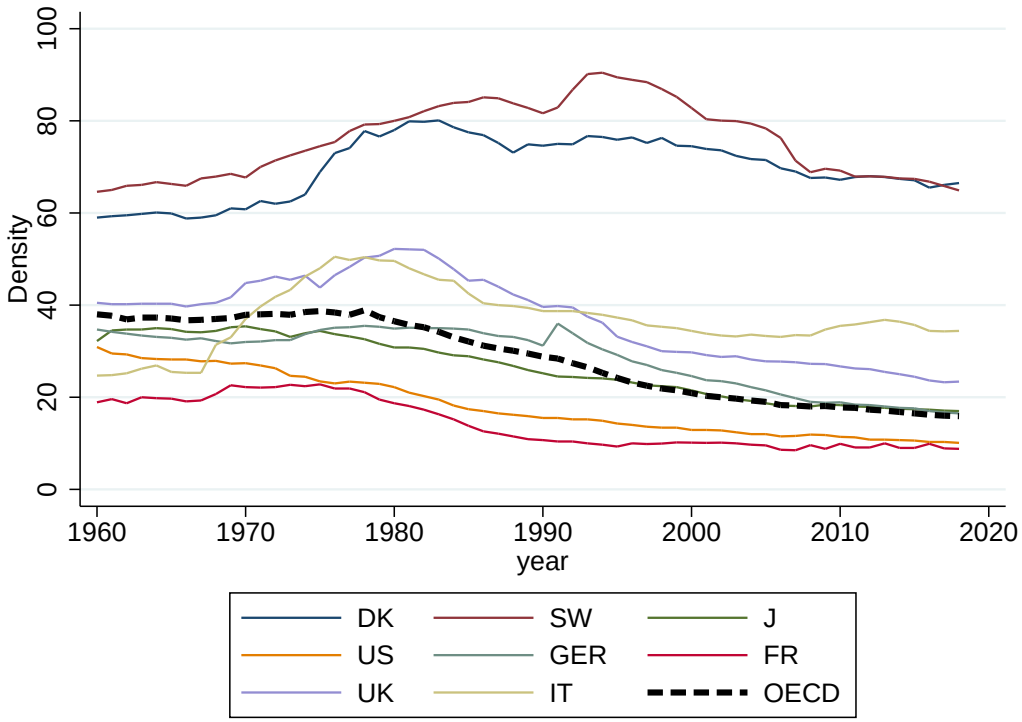
Introduction

A general overview

Different forms of trade unionism exist since the beginning of industrialization. These organizations were created with the purpose of increasing, by the means of number and unity, the resistance of their worker members against exploitation. Indeed, unions are recognized to have given working classes, especially in the mid-20Th century, access to better living conditions and a voice in economic matters: unions have been advocating to increase wages and other non-income benefits (such as health or pension insurance), reduce safety risk at work, increase job security, and lobby for working class friendly legislation. Despite all this, in the last decades Western economies have witnessed a massive decline in the number of workers enrolled in a trade union. Figure 1 shows that the average union density in the OECD countries was stable at around 40% until 1980, but has continuously fell since then to reach below 20% in 2018. As a consequence, there has been a reduction of the bargaining power and political influence of trade unions. The decline in union density has been accompanied everywhere by a raise in income inequality and a reduction in the labor share. The revitalization of the union movement is thus been pointed out as a solution to both reduce inequalities and at the same time bring back the inclusive economic growth of the post-war period.

The bulk of the economic literature on unions has focused on studying the effects that unions have on the labor market and in the society at large. In addition to confirming all the aforementioned positive things that unions achieve for their members, researchers have also shown a negative face of the unions: increasing wages, unions

Figure 1: Evolution of union density in selected OECD countries



Sources: OECD data on trade union density for Denmark, Sweden, Japan, US, Germany, France, UK, Italy and the OECD average. *Reading:* The left-axis scale varies from 0 to 100

reduce profits but also the profitability of capital investments, thus decreasing R&D and, possibly, productivity. Overall, however, the positive effects largely out-weight the costs and hence "[...] *there is place for unions to improve the well being not only of their members but of the entire society*"[1].

Another, more recent strand of the literature has investigated the factors that could explain the drop in union densities observed everywhere. Several explanations have been advanced, such as skill bias technical change, globalization, institutional factors or workforce composition, but none seems to provide a definite answer to the phenomenon.

To gain new economic insights on the labor movement, in this thesis I depart from the existing literature and take a new approach: instead of asking what do they do or why they have declined, I study unions as such, i.e. as specific organizations operating in a given sector, and ask: *what do unions look like?* More precisely, I look at

[1] Freeman and Medoff (1984) (p.247)

how unions compensate their own workers (Chapter 1), the gender composition of the workforce they recruit (Chapter 2), and who are they able to attract as members-customers (Chapter 3). Understanding unions' internal structure and functioning is a promising, yet under-exploited venue to better understand unions' strategies, how they operate, what works and what doesn't, and possibly why. The ultimate goal is to draw some lessons and a new perspective on how to revitalize the labor movement.

One distinctive element of this thesis is the historical perspective of the analysis. In all three chapters I try to take the longer time horizon possible, which means going back as far as the 1950s' in all chapters. This allows me to study the evolution of unionisation over the long-run, from the time when it was at its zenith to the present days, and hence understand what has changed and how these changes have affected the success of unionisation. To do so, suitable data sources are needed. I construct these sources in two ways. First I digitized detailed financial records for American unions since the time they have been made compulsory by the public administrator, i.e. as of 1959. The digitisation has been possible thanks to a series of actors spread all around the globe. First, the American Department of Labor (DOL), which has been always available and prompt in giving us access to the raw scanned data. Second, the Institute of New Economic Thinking (INET), whose financing has allowed to accomplish the digitisation and many other aspects of this project. Third, 3Alpha, a specialized Indian company that excellently performed the actual digitisation task. The newly digitized data constitute the backbone of the first two chapters of the present work and one contribution of the present thesis. They will be made available on the INET website for public use. The second source I construct and exploit in the third chapter is in fact a collection of a very large number of surveys that I pool together to study a common question. The most innovative part of this exercise is to include in the list of surveys also post-electoral and opinion surveys that had never been used before to study unionization in Europe. Thanks to these different sources, and particularly to the post electoral surveys, I am able to retrace unionization patterns for 7 Western countries starting in several cases from the 1950s.

The first two chapters focus on the United States, and look at different aspects of the internal labor market of unions. Americans unions face hard budget constraints and operate in a competitive environment. Looking at their management should help understand how they cope with these challenges and, possibly, what can be improved to make them more successful. This approach parallels the one developed to look at firms' management, but applies it to a specific fully non-profit sector. In the third chapter, I instead look at union costumers, i.e. workers who join unions as members, and take a cross-country comparative approach looking at six major European economies (Denmark, France, Germany, Italy, Sweden, and the UK) in addition to the US. The advantage of the comparative analysis is that while international economic shocks have been quite similar across these countries, large differences exist in their industrial relations structures. This provides a great setting to understand which institutions have been more suited to preserve or even foster unions' power. Together, the two parts of this thesis represent the two faces of the same coin, the union movement, and combined offer an overview of its evolution over the second half of the XXth century and beginning of the XXIst.

What do unions do?

There is a consensus that trade unions' goal is to improve the working conditions of their members, disagreement exists on whether they actually manage to do it and if the entire society benefit or is actually harmed by their presence. The bulk of the economic research on unions addresses these points so to make positive policy recommendations on whether the government should encourage unionism or not. According to Neoclassical theory, unions have a clear negative impact on society: raising wages above the competitive market clearance level they end up reducing total output and generating unemployment. Other schools of thought hold a more nuanced view. For instance, Post-Keynesians, stressing the role of aggregate demand over costs, do not necessarily consider unions as detrimental for the economy. Similarly, Institutionalists and Regulationists see unions as important actors of the industrial relations system. The question

become thus an empirical one.

Primarily, the economic literature has focused in estimating of *how much* unions raise wages for their members. Because continental European unions mainly bargain at the sectoral level, the quasi totality of these studies refers to the Anglo-Saxon context, where bargaining occurs at the firm level and not all firms are unionized. Since early works (e.g. Lewis (1962)), the majority of studies have found a positive union-nonunion wage gap. For instance, Freeman and Medoff (1984); Card (1996); Hirsch (2004); Blanchflower and Bryson (2004b,a) for the US and Bryson and Gomez (2002); Bryson (2014) for the UK, find a positive premium. Estimates varies between 10% and 40% and are centered at around 20% depending on the specific technique used. Through time, it seems that the erosion of the union power has however somehow reduced the size of the union wage premium. Some work (DiNardo and Lee, 2004; Frandsen, 2021), that use more precise and locally valid econometrics techniques, have found considerably smaller effects that are non distinguishable from zero. Using stock market valuations, Lee and Mas (2012) have however pointed out that large union effects are expected only when unions are strong, i.e. where they won recognition elections by a large margin, hence not in the context of the zero effect papers that leverages close elections. Moreover, unions can have spillover effects on the rest of the economy by the threat they represent. This threat might also cause the union-nonunion gap to shrink, especially when the unionization risk is higher. While this channel is harder to identify, using a semi-parametric approach Fortin et al. (2021) have shown for the US a positive wage spillover. Lowering the threat, the reduction in union density has decreased this indirect effect too. Interestingly, a firm-level wage premium is also found in countries with sectoral agreements and mandate extension to all workers of bargained contracts such as France (Breda, 2015) or Norway (Dodini et al., 2021). The magnitudes are however much smaller, at around 2-3%, but do rise with firms' rents to up to 8-10%.

Raising wages, unions end up affecting their distribution too. Theoretically, it is unclear in which direction will inequality go. In particular, it is unclear if the compression

effect (across union workers and between them and shareholders) will be dominated by an increase in unemployment and between workers differences. In Anglo-Saxon countries, the position in the wage ladder of the unionized workers will also be an important element (Card et al., 2020). Empirically, however, a strong consensus exists around the idea that unions do reduce wages and incomes dispersion. Again, most studies are centered on the US (Freeman, 1980, 1991; DiNardo et al., 1996; Card, 2001a; Western and Rosenfeld, 2011; Farber et al., 2021; Fortin et al., 2021) and the UK, (Gosling and Machin, 1995; Machin, 1996; Metcalf et al., 2001), but few cross-countries analyses (Checchi and García-Peñalosa, 2008; Visser et al., 2009a; Checchi et al., 2010; Jaumotte and Osorio, 2015) point to the same conclusion also in the European context. Aside from wages, many other aspects of the working life make the object of bargaining between unions and employers. From fringe benefits, to promotion and layoffs rules, grievance procedures and safety at work, unions try to improve all aspects of the working experience of their members, and they succeed at it. Indeed, unions are found to increase fringe benefits (Freeman, 1981; Budd, 2017; Knepper, 2020) and job security (Murphy, 2020), to have more clear promotion rules (Freeman and Medoff, 1984) and to reduce injuries at work (Sojourner and Yang, 2022). For all these reasons, union members tend to quit less their jobs.

Why has unions declined?

Despite the overall estimated positive impact on societies, union density in Western countries has substantially declined in the past decades. The extent and timing of the decline do vary, but even in Nordic social-democracies, characterized by very high density rates, membership has started to fall as of the early '90s (see Figure 1 above). Several explanations have been advanced in the literature to explain this drop. The first set of explanations look at structural transformations. The most obvious one argues that the decline of the industrial sector, the unions' stronghold par excellence, is the primary source of the declining union membership (Polachek, 2003). However, subsequent empirical evidence have found that if de-industrialization is likely to have

played a role, this is certainly not the only, nor the main factor causing de-unionization (Blanchflower and Bryson, 2009; Stansbury and Summers, 2020). Other explanations of this type identify in skill bias technical change (SBTC) (Acemoglu et al., 2001) and globalization (Lee, 2005) additional sources of unions' weakening. Here again, however, the evidence is not so clear cut, as argued by Gordon (2001); Farber et al. (2021) concerning SBTC and Scruggs and Lange (2002); Ahlquist and Downey (2020) for globalization. Lastly, business-cycle changes might have been important determinants of the fluctuations of union density as unemployment is negatively correlated to unionization[2] and positively to inflation (Checchi and Visser, 2005). However, macroeconomic fluctuations can't really explain the permanent declines observed. Another set of explanations has identified in institutional changes the major factors in explaining the fall of workers' participation. Some have highlighted the increase in repression that has occurred after the '80s (McCartin, 2011; Frandsen, 2021; Stansbury, 2021), but this explanation is very compelling mainly for Anglo-Saxon countries. Checchi and Lucifora (2002) have instead emphasized the existence of different institutions: some are complementary to the unions' activity, others are substitute. Unions thrive with complementary institutions, such as the Ghent system in Nordic countries, and fall when substituted by others, such as the high minimum wage and social protection offered by the French state. Overall, institutions do seem to be important determinants of union density rates, at least concerning their levels. Finally, the last set of explanations has looked at compositional changes within the workforce. While some of these changes might indeed have negatively impacted union density (e.g. a raise in never-membership in younger cohorts (Bryson and Gomez, 2005)), the overall impact of the compositional changes is relatively quite small (Schnabel, 2013), as also shown in chapter 3 of this thesis. Summing up, as already noted by Schnabel (2013), even if union densities have indeed declined in all western countries, common patterns are hard to identify across countries and certainly we are not witnessing a convergence towards an Anglo-Saxon model.

[2] except in countries adopting the Ghent system, i.e. where unions directly manage the unemployment benefits

What do unions look like?

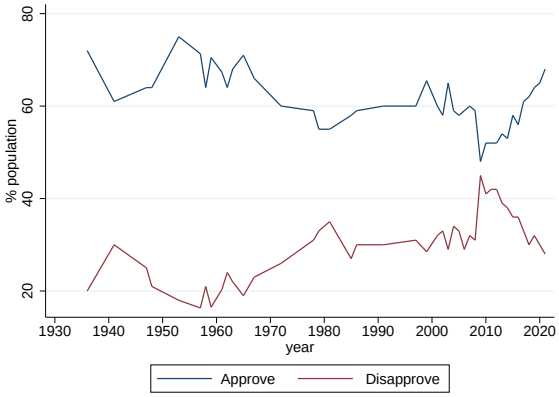
The economic literature[3] that looks at the organization, functioning, and composition of trade unions is, in comparison to the ones summarized above, rather scant. In this category, by far the most studied subject is the socio-economic composition of union members. This is also one of the object of the present thesis, I thus refer to the relative chapter (Chapter 3) for a detailed review of this literature. In addition to the studies on union membership, few works, exclusively on the US, have expressively looked at the organization of unions and their internal structure. Holmes and Walrath (2007) show that, despite declining, the union sector remains quite dynamic with union firms continuously being created and destroyed. Similarly, Breda et al. (2019) find that total factor productivity is an important element to predict union survival and that the market for union representation can be quite competitive. Finally, in line with the dynamic and competitive market structure documented, Hallock and Klein (2016) show that, although they hold a non-profit status, American unions do employ some form of pay-for-performance scheme to compensate their leaders. While the existing literature inform us on some aspects of the union movement, a lot remains still unknown. I extend this area of research in three distinct directions by looking more closely at the compensation and composition of union leaders and by enlarging and improving the literature on union membership composition.

Figure 2 gives a clear sense of why looking *within* the labor movement might be an important source of new insights. On the left panel, it displays the evolution of the labor unions' approval rate in the American population. Quite remarkably, this rate stands always, even in the aftermath of the 2008 crisis, above 50%. Moreover, it is once again growing and has reached in 2022 a stark 72%, a maximum since the '60s when union density was close to 30%, three times more than today. On the right panel is instead displayed the share of individuals that perceives the honesty and work ethics within different American professions as high or very high. Labor leaders (in dark

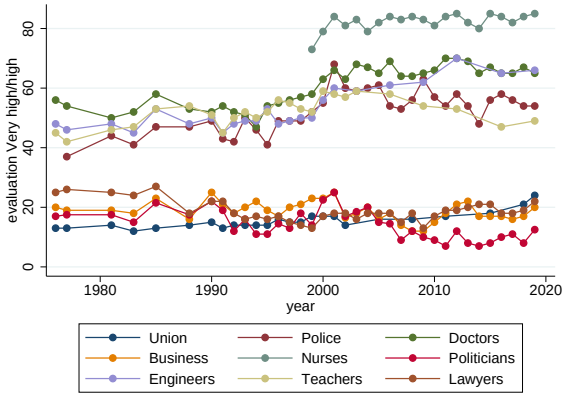
[3]Other works can be found in the management and organization literature

Figure 2: Perception of the Labor movement in the American society

(a) Labor Unions



(b) Honesty perceived for different occupations



Source: author's computations from Gallup historical surveys. *Notes:* both scales varies from 0 to 100. The politicians category is the average of the scores of deputies and senators.

blue) fared the worst among those reported[4] in the '70s, and do just a little bit better more recently. Paradoxically, we thus observe an American society that largely approve unions[5], but that does not find their leaders trustworthy[6]. This distrust might harm unionisation efforts thus contributing to lowering union participation.

Reputation is in fact an important asset when asking to become one's representative. It is also quite fragile and can be damaged by multiple factors. What does harm union leaders' reputation? How can this be changed? Firms and anti-union parties have strong incentives to undermine the reputation of labor leaders. The most common way they do so is by emphasizing the personal benefits that union leaders gain as the true reason for which they became union representatives. Indeed, Chris Small, the leader of the first successful union campaign in an Amazon warehouse in the US, reported *"we know that Amazon uses a lot of propaganda against the unions attacking their financial records, their history, the salaries [...] of the presidents..."*[7]. In the first chapter of this thesis I look at the compensation policies within the labor movement and check

[4]They fare among the worst in the society as a whole with very few occupations, such as lobbyists, car dealers, and more recently politicians doing even worse then them.

[5]Many workers would actually want to enroll in a union but don't find one as implied by the union representation gap documented for the US, but also for the UK (Freeman and Rogers, 2006)

[6]Distrust is particularly strong in the US, but do characterize also other Western countries

[7]The Economists, Money talks: state of the union, Apr. 6th 2022.

if they are truly disproportionate or are instead in line with the union egalitarian discourse. Additionally, I directly test the importance of reputation concerns in keeping top salaries low and in check.

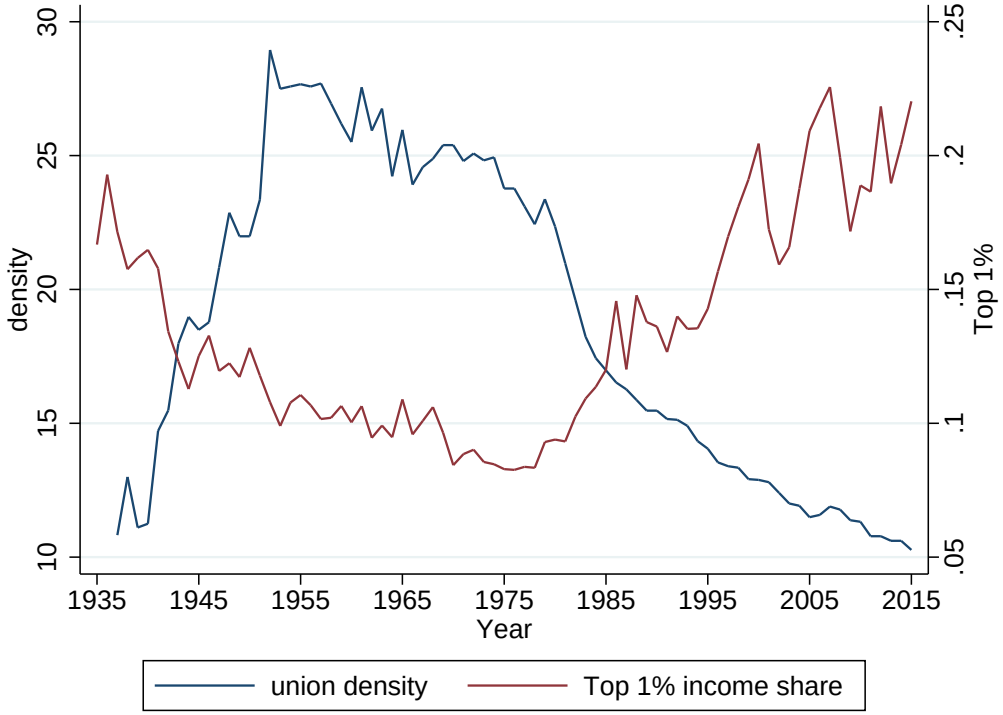
Another reason for having faith in a representative is believing that he/she understands and cares about members' needs. Trade unions have been traditionally a quite homogeneous group with a primarily native, white and masculine labor force. Sub-units within the labor movement by gender or race have often appeared to better defend the rights of these minorities. Yet, the composition of union ranks might not be as diverse as the labor force they try to represent. This might create a sense of, if not an actual lack of missing representation and thus of distrust. In the second chapter of this thesis I focus on women, who are by far the largest "minority" on the labor market, and look at their presence and role in the American labor movement. In addition to studying the composition of the workforce of the unions, looking at the composition of the union membership is also very important. In the third chapter I investigate the socio-economic characteristics of union members in different Western countries. While giving a clear picture of the union membership composition, this exercise sheds also light on which institutional setting seems more suited to foster unionization and gives representation across workers' groups. Additionally, it might give us insights on the characteristics of the groups that unions struggle to unionise and thus on which it might be worth to put extra efforts and resources.

To complement this very brief summary, in the following subsections I offer a chapter-by-chapter overview of the main structure and findings of this thesis. Each subsection is conceived to give an exhaustive picture of my work. Obviously, many additional results and details can be found in the actual chapters, to which I refer the interested readers.

Chapter 1: Do unions have egalitarian wage policies for their own employees? Evidence from the US 1959-2016

The questions of salaries and of their distribution has always been central to the trade union movement. The fight to increase the salaries of workers and reduce societal disparities is indeed the reason why workers initially joined together and formed unions. As mentioned before, unions succeed at both. This is true everywhere, and the US is no exception (Figure 3).

Figure 3: Evolution of union density and inequality in the US



Sources: Top share inequality from Piketty and Saez (2003, updated 2021). Union density data from Historical Statistics of the United States and the Current Population Survey. *Notes:* In this figure, the top-one statistics go from zero to 1 and the union density from zero to 100.

But does this focus on decent wages and lower inequality implies that unions pays very equal salaries to their own workers? Part of the American press argues this is not the case. For instance, the Chicago Tribune wrote[8]: *"Despite unions' focus on income equality, the division between the highest-paid and lowest-paid union employees has grown over time, and the* [compensations of] *rank-and-file workers especially pale in comparison*

[8]Chicago Tribune, January 13th, 2013

with the top officials tasked with representing them". In the first chapter of my thesis I use administrative data on unions' financial records to investigate the actual level of pay and inequality within the American labor movement. In particular, I am interested in knowing whether unions pay superstar salaries to their leaders, resulting in large inequalities, or if they instead adopt a more compressed pay scale with highly paid employees and relatively low paid managers. Looking at what level of inequality they choose when it comes to remunerate their own employees, i.e. when they are completely free to set their own preferred standards, gives a better idea of the objective function of unions and their true aims concerning society. This is even more interesting as unions are declining and so the market for skilled union leaders is particularly tight. Do compensations upwardly adjust to meet the high demand as classical theory would predict? Additionally to market pressures, what other channels might be important in determining the pay scale in this sector differently from the private one? To answer these questions, I collected the annual financial reports compiled by every union in accordance with the Labor-Management Reporting and Disclosure Act (LMRDA) as of 1959, i.e. since when they started to be mandatory. Part of the data was freely available online, I digitized the 1959-1999 part thanks to the financial support of INET[9]. I compare the unions with the private and public sector using the Current Population Survey and the World Inequality Lab data.

I find that, despite the competitive forces and the high stakes to survive that characterize this sector, labor unions pay salaries that are on average 30% higher than in the private sector, but much more equally distributed, and particularly so at the top of the salary distribution. This is the case both in NHQs and local unions alike and relatively constant over the whole period of analysis. Henceforth, unions do behave according to what they preach for the rest of society. Moreover, the reduction in membership has not affected to an apparent degree their compensation structure. For instance, in the 1960s, both in the unions and in the rest of the economy, the share of income accruing to

[9]INET is the Institute of New Economic Thinking

the top 1% was relatively low, at 5% and 7% respectively. Today, unions have roughly the same level of inequality, while in the private sector inequality has doubled. Given this set of results, I do wonder why and how unions were and still are so equal.

In the second part of the chapter I investigate the potential mechanisms that could drive these results. In particular, I wonder what does prevent labor unions' leaders to set their pay in line with those of private companies' managers of similar size[10]. The literature on non-profits has mainly emphasized the role of the intrinsic motivation of the individuals working in this type of organizations (Leete, 2000). The *labor donation hypothesis* argues that certain workers would get direct utility in pursuing the goal of a non-profit organization and would hence be willing to accept lower than market wages to be employed there. Labor unions do certainly employ a large number of intrinsically motivated workers, and this certainly helps to account for the low inequality found. Nonetheless, this hypothesis is unlikely to explain why any union leader is paid more than 500 000 $, a relatively low amount, nor the very high average salary in the sector. I propose three additional mechanisms to complement the intrinsic motivation hypothesis explaining my results: ideology, institutions, and social norms. Concerning ideology, I show that originally communist-leaning unions are even more equal than originally non-communists ones. This means that the ideological stand of the sector is likely to play an important role in determining the distribution of earnings, as ideology is found to play a role even within the sector. Turning to institutions, I focus on the type of governance within unions. In particular, I am interested to see if the direct involvement of members in the election of the head of the union does affect the compensations of union leaders. I do so by studying the case of Teamsters, one of the rare organizations that has changed its mode of election of the national president from indirect to direct membership vote. I document that, at least in the case of Teamsters, once allowed, members voted for the candidate that proposed a radical downsizing of the compensations of union leaders. In other words, I find that granting members

[10]For a subset of my data, Klein (2012) has shown that union top officers are paid between 1/3 and 1/7, depending if bonuses and stock options are taken into account, of CEOs of similar size companies.

direct involvement in the union management greatly contributed to lower the salary of the union National President as well as all other top officers. More generally, however, this points to the fact that union leaders cannot pay themselves whatever salary they want as their consumer base, union members, are likely to strongly oppose high salaries for their leaders. It also means that, if compensations do not follow at least in part members' preferences, they might be perceived as immorally high, and thus contribute to the decline of union membership. Internal norms, however, are not the only ones at play: other stakeholders and the general society as a whole hold a negative view of high pay in the union sector. To show this, I study the evolution of union officers' salaries before and after they are attacked in the press uniquely for their high compensations. Because union reputation is affected by the salary revelation, thereby harming their ability to attract new members and retain old ones, such pressures might result in some sort of consequences for the person that made the object of the news release. I manually collected all newspaper articles mentioning union leaders' salaries in a negative view and run an event type analysis on the compensation of the mentioned leaders. I find that a) the probability of being attacked sharply increases with the absolute level of salary and, b) after exposure, union leaders' salaries drop by around 20% in real terms, most likely to immediately tame any polemics and hence prevent real repercussion on the organization.

To summarize, while intrinsic motivation is likely to be an important characteristic of most union leaders, salaries are kept in check by other mechanisms too. I propose three additional ones: ideology, institutions and social norms. I believe these mechanisms are particularly relevant for the case of labor unions, but they are probably at play in the whole non-profit sector and possibly in other contexts too. I see this as a contribution to the theory of wage formation that question the classic demand and supply competitive model, at least in some parts of the economy.

Chapter 2: Women of Struggle: the role of women in the American labor movement

Gender inequality, especially at the top of the wage distribution, is still present in most labour markets (Goldin, 2014; Barth et al., 2017; Bertrand et al., 2010). Labour unions are among the institutions that fight to reduce the differences in compensations among workers. They are thus seen at the forefront of the effort to curb gender disparities (Corradini et al., 2022). American labour unions have however historically been a quite closed group, formed primarily by white, male, and relatively educated workers. Union members' demographic characteristics have, however, dramatically changed in the second half of the twentieth century with the rise of service and public sector unionism and their more black and female labour force (Farber et al., 2021). Did unions' own workforce composition changed accordingly to better keep up with the one of their members? In particular, do unions have a fair share of women among their leaders or they reproduce the same disparities of the rest of the economy?

These are important questions as it is now accepted that sharing the socio-economic characteristics of the represented enhance the quality of representation. This idea is already developed in the theory of representative bureaucracy, which suggests that a public workforce representative of the people in terms of sex, race, and ethnicity will help ensure that the interests of all groups are considered in the bureaucratic decision-making processes (see Bradbury and Kellough (2011) for an overview). Empirical studies have confirmed this: Chattopadhyay and Duflo (2004) has shown that increased representation of women in village councils in India has increased spending in their favor. Similarly, Pande (2003) finds that mandated political representation of minorities also in India increased transfers for the impacted groups. In France, an exogenous increase in female representation in the National Assembly resulted in an increase in laws representing women's interests (Lippmann, 2020). In the case of unions, Corradini et al. (2022) show that when the major Brazilian union confederation made women's issues a central priority, their leadership gender composition became perfectly balanced and the organized workplaces became more female-friendly. Except

from Brazil, little is known about the gender composition of unions' own workforce and particularly of their leaders. Chapter 2 of this work aims to fill this gap studying how American unions have been faring in terms of gender equality among their own ranks since the second half of the XX^{th} century. By answering this question, I shed light on the role of unions in fighting for women rights, and, indirectly, also about unions' prospects on attracting new members. Female labor participation has in fact rose constantly in the past decades. Moreover, the unionization gap with men that characterized the American union movement has been almost completely narrowed down, as I show in Chapter 3 of this thesis. If the trend continues in this direction, women will very soon be the majority of American union members. Attracting women is thus key not only for equity reasons, but also for unions' survival strategy.

To look at the role of women in the American labor movement, I exploit the same rich data source as in Chapter 1. To benchmark the level of inequalities found in the union sector, I use two additional sources. First, the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) both for the aggregate economy and for specific sectors[11]. Then, to have a better look among top earners, I use the World Inequality Lab database[12] based on the work of Piketty et al. (2018).

I find that, although the share of women employees in unions went from below 5% to almost 45% over this period, the share of women among officers was still below 25% in 2016. Results are similar for the very top positions: women represent 25% of presidents, 20% of vice presidents and 15% of secretary treasurers. Concerning salaries, women in the '60s used to earn substantially less than men in all positions, and particularly so at the top, even controlling for the size of the organization. However, the officers' compensation gap has virtually closed down completely: in recent years, women and men have been earning unconditionally roughly the same salaries, even at the very top. This points to a strong difference with the private sector, while it is in line with what has been found for the non-profit sector in general (e.g. Leete, 2000).

[11] Unions are themselves recorded as a sector as of 1992

[12] The data can be accessed here: https://wid.world/fr/country/etats-unis/

To better understand the link between the gender of the representatives and the one of the represented, I link CPS occupations / sectors to the unions organizing them. I then look at whether the share of women observed in each union corresponds to the share of women in the related occupations / sectors. Indeed, a positive relationship between the two exists. This relationship strengthened over the decades and is still present, although smaller, including occupations fixed effects. Even in most recent years, however, the slope of the relationship is well below one. Moreover, as shown including fixed effects, internally, unions react very little to changes in their workforce's gender compositions. Most of the change occurring through time is instead driven by old, male unions being replaced by new, female ones.

To explain these patterns, I further test for the role and stickiness of gender social norms in perpetrating gender inequalities within organizations. To do so, I test if unions created at different points in time, when different stereotypes concerning the role of the women prevailed in the society, and when more or less women belonged to the newly unionized establishments, do have a different leaderships' gender composition. In order to do so, I follow the distinction of Milkman (2016), who classifies American unions based on their relationship towards women in four, non-overlapping waves. Practically, I divide unions based on their year of establishment or fast growth.[13]. my results indicate that, in line with the qualitative study of Milkman (2016), unions from the first wave (created before 1908) of unionization, which were historically the most hostile to women, have the lowest number of women leaders even in recent years.[14] Unions belonging to the second wave (created between 1910 - 1929), instead, moved away from a predominantly male leadership in the mid-80s, to better match the characteristics of their organised members. Finally, unions from waves 3 (created between 1930 - 1948) and 4 (created between 1955 - 1970) gave a much more

[13]Some unions have been created in the beginning of the 20th century, but will be categorized in the 4th wave, that is the one starting after WWII. This is because they all experienced the most radical growth in membership in this period compared to the beginning. The chief example are public sector unions: while having members well before 1962, it is only after this point that bargaining in the federal sector will be authorized by law and thus membership booming

[14]One big exception is the Hotel and Restaurant Employees union (HERE). Due to its gender segregation structure, women were always present among its officers and grew steadily, see Cobble (1990) for more details

important role to women since the beginning. In particular, unions belonging to the 4th wave - established in the late '50s and organizing mostly female intensive occupations - were and still are the most feminised ones. These results point to the fact that corporate culture, and particularly the role attributed to women within a firm or institution, do matter for gender discrimination, even over the long run.

Overall, my findings suggest that even if labor unions could not entirely escape from the gender norms prevailing in a given time in their society, they have always been better than private markets and do incarnate, albeit imperfectly, a more progressive vision of the role of women. Future research should dig more on how much having a union leader sharing the same demographic characteristics of the majority of the workers in a given workplace increases the likelihood, everything else equal, of a union victory. If a positive effect will be found, all unions should think about the cost of having a leadership that does not share the same characteristics of the representatives. Aside from the ability of unions to attract new members, the quality of representations might also be affected by not sharing the same, more salient demographic characteristics. In fact, minorities often face additional challenges on the labor market, if union leaders come exclusively from the majority group they might not be aware of those issues for lack of direct experience and thus neglect them.

Chapter 3: Which side are you on? A historical analysis of union membership composition in 7 Western countries

In the last chapter of my thesis, I turn to the external part of the union movement, studying the workers that decide to join as trade union members. In addition on union membership rates, I focus on the socio-economic characteristics of union members and compare them with those of non-union workers. I believe these are important topics to be studied for several reasons. First, studying membership is crucial since unions'

power (and survival) is tightly linked to their ability to actively mobilize workers[15]. Second, similar to political parties (Gethin et al., 2022), unions have to ultimately meet the demands of their adherents, if they want to retain them. Studying membership composition can thus shed light on the strategies adopted by unions and help rationalize their choices[16]. Third, unions' impact on the labor market depends on the type of workers they organize (Card et al., 2020; Farber et al., 2021). For instance, if members are mostly low-paid workers, unions' compressing effect on the wage distribution will be stronger compared to a situation where members are mostly high-paid workers. Finally, assuming unions' objective function is to maximize membership, looking at which types of workers unions are actually able to recruit, indirectly hints from a micro perspective, to the likely causes of their decline and thus inform us about their chances to survive.

Different industrial relations settings can create very different incentives to become a union member. For this reason, I look at union membership and its composition across a long time horizon (going back up the 1950s) and several countries (Denmark, France, Germany, Italy, Sweden, the UK, and the US). Together, this wide set of time and space covers roughly all the industrial relations spectrum of the Western World: highly-coordinated bargaining at the national and sectoral level and union-managed unemployment insurance (Ghent system) in the two Nordic countries, industry-wide bargaining in France and Italy, plant-level bargaining in the UK and the US, and an intermediate system between the last two in West Germany. I focus on workers' characteristics to examine the composition of unions (e.g. the share of men in unions) in different countries, its evolution over time, and in addition, the selection of various groups into unions (e.g. the relative union density of men and women). In terms of characteristics, I focus on gender, occupation (blue vs white collar), education and sec-

[15] An alternative would have been to focus on coverage, but I believe this is less compelling for the object of my study, while it might be more important concerning the consequences of trade unions on national labor markets.

[16] For instance, an older than average union membership will make the union more leaning to prioritize the demands of older workers relatively to those of the young ones. Grandfathering clause bargained by the unions for existing contracts against some reform are an example of this.

tor of employment (public vs private) to get the most comprehensive picture of the typical union member as possible.[17]

To carry on this study, I construct a new, homogeneous, individual-level dataset combining large public surveys with cross-national surveys and post-electoral and opinion surveys. In all these sources, I code union membership as an affirmative answer to close variants of the question "Are you a union member?". In total, my sample is composed of more than 3 millions observations, extracted from more than 400 surveys, with each country covered by more than 20 surveys and 20,000 observations. Thanks to this data collection effort, I am able to considerably predate the existing literature by going back up to the 1950s[18] while using a consistent definition of union membership.

Using the newly assembled data, based exclusively on surveys and a constant definition of union membership, I find that unionization rates have been at time miscalculated. For some countries at specific times, frequently used union density series such as the ones of Visser (2015), give a distorted picture of the strength of the union movement. In particular, for France in the 1970s, I show that union density indirectly estimated from union declarations and professional elections data was underestimated: instead of 20%, I find that French union participation was closer to 35% at its peak in 1977. In the case of contemporary Italy, I show that union density built from unions' declarations is overestimated, and argue instead that union density has continued to fall in the 2000s, reaching slightly more than 20% in 2018 rather than the 33% claimed. Finally, for Denmark over the period 1981-85, I show that the rise in union density was more important than previously thought. Since then, the trend has been correctly estimated, but the level reported has been constantly below the actual one.

[17] Note that, due to data limitations, industry is absent from the current analysis, although it is probably quite important.

[18] I am able to go back to the '50s in Sweden, West Germany and the US, to the '60s in Italy and the UK, and to the '70s in Denmark and France.

Moving to the selection of workers into unions, my second contribution is to uncover several stylized facts that allow us to group the seven countries of interest in three families. In the first group of countries (UK and US), in the 1960s, blue collar, unskilled and male workers were strongly over-represented in unions, while public sector workers were not. This has completely reversed over time: today there is no significant over-selection of male or blue collar workers, while there is a positive selection of skilled workers and a very high selection of public sector employees. In the second group of countries (France and Italy), selection is approximately constant over time along all dimensions considered: moderate over-selection of men, moderate to high over-selection of public sector workers, no positive selection of skilled or blue collar workers. The third group of countries (Denmark and Sweden), characterized by very high aggregate densities, displayed a positive but moderate selection of male and blue collar workers which has vanished over time, while the selection of public sector workers has increased. No significant selection by skill is present throughout the whole period. Finally, I show that West Germany does not fit neatly into any of the previous groups, but can be located somewhere between the first two.

The three families mentioned above correspond to the three institutional settings aforementioned (decentralized bargaining, industry-wide bargaining, national bargaining in a Ghent system). These differences generate different incentive structures, which help explain why selection levels and their evolution over time are significantly higher in Anglo-Saxon countries and almost absent in Mediterranean and Nordic ones. In particular, in the Anglo-Saxon system, the decision for a worker to join is mainly based on a cost-benefit analysis, which makes selection more likely to happen and evolve. In Mediterranean countries instead, the quasi universal coverage of industry agreements makes adhesion to a union resembles to the affiliation of a political party. As a consequence, selection is moderate and more stable. Finally, in the Ghent system, the strong benefits associated with unemployment insurance makes union density exceptionally high, and thus selection small by construction. A common pattern to all systems does though exist: in all countries, although at different degrees, when union

density decreases, the selection of public sector workers rises. It thus seems that the public sector comparatively better shields union power than the private one. This empirical regularity hints that the availability of rents might be an important element to explain de-unionization (Blanchard and Giavazzi, 2003). Additionally, using a slightly modified version of the multi-variate shift-share analysis (Green, 1992; Bryson and Gomez, 2005), I show that selection of blue collar workers has contributed to downsizing unions in all countries in the past 30 years, but particularly so in the UK, the US, and West Germany. This means that, especially in these countries, even if the share of blue collar workers would have remained the same as before, unions would still be shrinking. More generally, I document that the part of decline that can be explained by compositional changes within the labor force are relatively small compared to the selection ones and the unexplained component. The conclusion is that reasons for de-unionization should be looked at primarily within defined categories of workers rather than across them.

Chapter 1

Do unions have egalitarian wage policies for their own employees? Evidence from the US 1959-2016

The work presented in this chapter was realized in collaboration with Thomas Breda

While labor unions bargain for more equality among their members and in the general society, little is known about their own compensation practices. Using newly assembled administrative data covering union NHQs for the period 1959-2016 and almost all U.S. labor unions workers over the period 2000-2016, we show that unions do "as they preach". They pay wages that are on average almost 20% higher than in comparable U.S. private firms, but much more equally distributed: Gini coefficients are 20% smaller among unions and the share of total earnings accruing to the top 1% of wage earners is twice smaller. We argue that such a low level of

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inequality, especially at the top, is puzzling because union leaders do have substantial margins to set their own pay. We show that the low level of inequality observed among union employees cannot be accounted for by market-type explanations, such as a low dispersion of skills among them, a lower average size in union than non-union firms, or fewer hierarchical levels in these firms. Rather, we provide evidence of the existence of a social norm against high pay in the union sector, which results in low inequality. Our results shed new light on how pay norms and institutions can affect real pay, even in a declining sector where firms have strong incentives to perform well in order to survive.

JEL codes: J31, J51, J68, L33

Keywords: Inequality, Trade Unions, Transparency, Social Norms

1.1 Introduction

Trade unions fight for raising salaries of workers and reduce the compensations of those at the top of the earnings ladder. Alongside, they propose a more egalitarian distribution of resources in the society as a whole. Several scholars have shown that a substantial share of the rise in wage (Autor et al., 2008) and income (Piketty, 2003) inequality can be explained by the decreasing power of unions (see e.g. Freeman, 1980, 1991; Card, 2001a; Card et al., 2004, 2017; Farber et al., 2021 for the US, **??**Machin (1997) for the UK, and Visser et al. (2009b); Jaumotte and Osorio Buitron (2020) for a cross-country analysis). But if unions strongly endeavor equality, does this imply that they are and should be themselves equal too? Failing to respect one of their funding principles might harm union reputation and so eventually contribute to the decline of their membership. Coherency is likely to be a valuable asset for these and other goal-oriented organizations. Notwithstanding this, American unions are regularly alleged by detractors to not behave according to their own values.[1] For instance, the Chicago Tribune wrote:[2] *"Despite unions' focus on income equality, the division between the highest-paid and lowest-paid union employees has grown over time, and the* [compensations of] *rank-and-file workers especially pale in comparison with the top officials tasked with representing them"*. What is the actual level of inequality within labor unions? Are they paying superstar salaries to their leaders, resulting in large inequalities, despite their fight for equality? What determines the pay scale in this sector possibly differently from others?

In this paper, we look at what is the level of inequality chosen by American labor unions for their own employees and investigate the reasons behind this choice. This is interesting for two main reasons. First, studying compensation practices of labor unions allows us to shed new light on the effect of social norms and institutions on real pay and income distributions. Particularly, since equality is the most iconic fight of the union movement, we wonder what these organizations choose when they have

[1] In addition to be corrupted and have ties with organized crime
[2] Chicago Tribune, January 13th, 2013

the freedom to decide their preferred distribution of salaries, i.e. when they set salaries for themselves. Relatedly, we are interested to know if they reward productive characteristics differently than in the for-profit labor market to achieve the desired wage distribution. Second, union membership in the US has been shrinking, and thus labor unions are facing a declining market: only the most efficient unions are able to survive (Holmes and Walrath, 2007; Breda et al., 2019). In such a context, the demand for high skilled union leaders able to retain union members is likely to be high, possibly driving wages up. How do market forces shape the compensations of the leaders of these organizations facing harsh competition and hard budget constraints? How do they interact with the fact that unions' main goal is to enforce equality in the society?

To answer these questions, we rely on the financial reports compiled by every union in accordance with the Labor-Management Reporting and Disclosure Act (LMRDA) as of 1959. These sources are administrative data that each union plant is obliged to fill every year to the American department of labor. The administration randomly audits them to monitor their correctness and to asses the legality of the union activity. In addition to the financial situation of the organizations, these reports contain precise details on the positions and compensations of almost all union employees. These records are publicly available for the whole union sector from 2000 onward at the website of the Office of Management and Labor Standards (OLMS). To extend the analysis backward in time, we collected and digitized the paper-format (and initially handwritten) reports provided by the union National Headquarters, i.e. the main direction center of each organization, as of 1959, the first year for which these reports are available. Together, these sources constitute an excellent body of information to study the compensation structure of the union sector over the past 60 years. They have however two limitations: i) only total earnings are available, without hours worked; ii) compensations for employees earning less than 10K dollars in nominal terms are not reported for the whole period. While for recent years this is not a major drawback, further in the past 10K dollars were a large compensation. We address these two issues in several ways.

First, we use the Current Population Survey (CPS), and particularly the sector recorded as labor union, as an auxiliary data source in which hours worked are available. Second, we impute the number of employees we do not observe in each year based on the observed earnings distribution above 10K and additional information on the total wage bill (including employees below 10K). Third, we compute inverted Pareto coefficients, which are locally valid measures of inequality that are largely independent of the data truncation.

Despite the competitive forces and the high stakes to survive that characterize this sector, we find that labor unions pay salaries that are on average almost 20% higher than in the private sector, but much more equally distributed, and particularly so at the top of the salary distribution. This is the case both in NHQs and local unions alike and relatively constant over the whole period of analysis. Henceforth, the reduction in membership has not affected to an apparent degree the compensation structure of this sector, which has not experienced the general increase in wage inequality observed in the US. For instance, in the 1960s, both in the unions and in the rest of the economy, the share of income accruing to the top 1% was relatively low, at 5% and 7% respectively. Today, this share has remained roughly the same in the union sector, while it has doubled in the private sector. Given this set of results, we do wonder why unions remain so equal.

In the second part of the paper, we investigate the potential mechanisms that could drive our results. In particular, we wonder what does prevent labor unions' leaders to set their pay in line with those of private companies' managers of similar size[3]. The literature on non-profits has mainly emphasized the role of intrinsic motivation of the individuals working in this type of organizations. The *labor donation hypothesis* argues that certain workers would get direct utility in pursuing the goal of a non-profit organization and would hence be willing to accept lower than market wages to be employed

[3]For a subset of our data, Klein (2012) has shown that union top officers are paid between 1/3 and 1/7, depending if bonuses and stock options are taken into account, of CEOs of similar size companies.

there. Labor unions do certainly employ a large number of intrinsically motivated workers, and this certainly helps accounting for the low observed level of inequality. Nonetheless, this hypothesis is unlikely to explain why we do not see any union leader being paid more than 500 000 $, a comparatively low amount given their level of responsibility and the size of the unions they manage. This is even more striking if we look at the considerable amount of corruption scandals related to the embezzlement of union funds by union leaders[4] that still plague the American labor movement. What is then that prevents at least some union leaders to increase their own salaries as done by CEOs in the private sector (Bertrand and Mullainathan, 2001)?

In order to explain our results, we propose three additional mechanisms to complement the intrinsic motivation hypothesis: ideology, institutions, and social norms. Concerning ideology, we show that originally communist-leaning unions are even more equal than originally non-communists ones. This means that the ideological stand of the sector is likely to play an important role in determining the distribution of earnings, as historically rooted ideology is found to play a role even within the sector. Turning to institutions, we focus on the type of governance within unions. In particular, we are interested to see if the direct involvement of members in the election of the head of the union does affect the compensations of union leaders. To this aim, we study the case of the Teamsters, one of the rare organizations that has changed its mode of election of the national president from indirect to direct membership vote. We document that, at least in the case of the Teamsters, once allowed, members voted for the candidate that proposed a radical downsizing of the compensations of union leaders. In other words, we find that granting members direct involvement in the union management greatly contributed to lower the salary of the union National President as well as all other top officers.

More generally, this points to the fact that union leaders may not pay themselves what-

[4]The most famous case is the one of Jimmy Hoffa, international president of the Teamsters, well depicted in *The Irishman* by Martin Scorsese.

ever salary they want as their consumer base, union members, are likely to strongly oppose to high salaries for their leaders. Indeed, if compensations do not follow at least in part members' preferences, they might be perceived as immorally high, and thus contribute to the decline of union membership. Internal rules, however, may not be the only mechanisms curbing wage inequality: other stakeholders and the general society as a whole may hold a negative view regarding high pay in the union sector and indirectly impact compensation within unions that care about their reputation. To show this, we study the evolution of union officers' salaries before and after they are attacked in the press uniquely for their high compensations. Because a violation of a social norm can be seen as a scandal in itself, despite no law violation, newspapers can expect to sell well a story reporting such violation. This gives newspapers an economic incentive to cover those cases where a union officer is receiving a "high" compensation. If the compensation is indeed perceived as going against the social norm, then after it is exposed in the press we should expect that the public will protest against it. Possibly the external pressure would be mixed with an internal one from the members of the organization. Because union reputation would be affected, harming their ability to attract new members and retain old ones, such pressures might result in some sort of consequences for the person that made the object of the news release. We manually collected all newspaper articles mentioning union leaders' salaries in a negative view and run an event-study type analysis on the compensation of the mentioned leaders. We find that a) the probability of being attacked sharply increases with the absolute level of salary and, b) after exposure, union leaders' salaries drop by around 20% in real terms, most likely to immediately tame any polemics and hence prevent real repercussion on the organization. This mechanism can explain that even when union members do not elect their leaders and have no direct control on their compensation, this compensation almost always remains much lower than what is observed in private sector firms of similar size.

To summarize, while intrinsic motivation is likely to be an important characteristic of

most union leaders, salaries are kept in check by other mechanisms too. We propose three additional ones: ideology, institutions and social norms. These mechanisms are particularly relevant for the case of labor unions, but they are probably at play in the whole non-profit sector and possibly in other contexts too. This challenges the idea that compensation is exclusively set according to market adjustments (e.g. supply and demand) or formal institutions (e.g. the minimum wage) and instead points out that they can also be influenced by pay norms, that is the beliefs that various stakeholders or the general population hold on how people should be paid.

The rest of the paper is organised as follow. Section 1.2 reviews the relevant literature we contribute to. Section 2.2 describes the institutional context and the detailed functioning of American labor unions. Section 2.3 details the data collection effort and the baseline descriptive statistics. Section 2.4 reports the descriptive inequality results. In section 2.5 we discuss our results and propose the new mechanisms to rationalize them. Finally, section 2.6 concludes.

1.2 Literature review

This work bridges several literatures. The most important one is the literature on non-profit organizations. However, it also relates to the accountability of politicians and the effect of information on salaries.

1.2.1 Pay in the non-profit sector

The main studies on the wage structure and organization of non-profit institutions have focused on two aspects: the level of wages paid and the methods used to ensure high productivity in the sector. The nature of non-profit organizations, in fact, is expected to have an impact on the level of compensation, its distribution, and the management practices used in this sector.

Concerning the level of wages, early work has theorized and tested the existence of a wage penalty for working in the non-profit sector. The main argument (Preston, 1989), known as the labor donation hypothesis, is that certain workers would be so motivated to work in a non-profit institution, that they would be willing to accept wages that are lower than market ones. This would be beneficial for the non-profit institution too because of the productivity enhancing effect of intrinsically motivated workers that have a personal wish to see achieved the objective of the organization. Lower wages would hence solve both adverse selection, attracting the most motivated employees (Hansmann, 1979; Rose-Ackerman, 1996), and moral hazard, making control superfluous in a context in which monitoring might be hard and costly (Handy and Katz, 1998). Several scholars have tested the existence of a non-profit wage penalty, finding ambiguous results. In particular, the negative premium seems to be concentrated in specific sectors and categories even after controlling for detailed industry and workers characteristics as in Leete (2001). Hirsch et al. (2018) do also find a negative effect, but only for male and white workers. However, when controlling for individual fixed effects, the effect disappears, meaning that it was entirely driven by a negative selection of workers. Jones (2015) proposes and tests the hypothesis that the relative offer of intrinsically motivated workers might be the determinant of the wage penalty. He argues that in those industries-localities with a low share of non-profits the demand for intrinsically motivated workers is lower than the supply while the opposite is true in industries-localities with a large share of non-profits. Assuming it is impossible to discriminate salaries between two workers with different degrees of internal motivation, a wage penalty for working in the non-profit sector should exist only in places with excess supply. This is indeed what he finds. It thus seems that, within the main sectors in which non-profits are operating, and controlling for individual unobserved characteristics, no significant compensation penalty exists between non-profit and for-profit firms. Note, however, that the distinction between profit and non-profit organizations might not be the relevant one. Recent work has shown that a wage penalty is also present in all those private firms that have a pro-social component in their job descrip-

tion (Burbano, 2016; Wilmers and Zhang, 2022). We provide evidence of the existence of a wage *premium* in the union sector, especially concerning the bottom half of the earnings distribution.

Turning to inequality, Leete (2000) finds that the US non-profit sector has a lower level of inequality than the one prevailing in for-profit firms. This is confirmed in Ben-Ner et al. (2011) for a set of service industries in Minnesota. One explanation advanced refers again to the high presence of intrinsically motivated workers. As noted by Frey et al. (1997), intrinsic motivation is quite fragile and sensible to external factors. Keeping inequality at a low level might hence be an important organizational policy in this specific sector. This mechanism is supposed to be more binding for higher-up employees that are more aware of the compensations in other posts and whose decisions are more likely to directly affect the organizations' outcomes. Indeed, Leete (2000) reports that the greater differences in the variances of wages between the for-profit and the non-profit sectors are found for white collars workers and managers. Finally, concerning the types of contracts used, Hallock (2002) for charitable organizations, and Hallock and Klein (2016) for labor unions, do find some evidence of the existence of pay-for-performance remuneration. However, the estimated link between performance and compensation is weaker than the one typically observed in the private sector (see Bertrand (2009) for a review of the latter) and less precisely estimated, being the performance of non-profit organizations harder to measure. We contribute to this literature in two ways: first, by studying the evolution in the level and dispersion of compensation using administrative individual data for a specific 100% non-profit sub-sector: labor unions. Second, proposing a new mechanism that do not rely on intrinsic motivation to explain the low pay observed at the top of the earnings distribution in such organizations.

1.2.2 Transparency and accountability

A second body of literature we relate to is the one that studies the effect of increasing transparency on a variety of political and economic phenomena. Broadly, it is found that information diffusion has an effect in shaping the reactions of those receiving the messages and, possibly, also on the groups/individuals that are the objects of the information diffused (see Prat and Strömberg (2013) for a survey of the political economy part of the literature). A large part of the literature has focused on the effect of information diffusion on voters' and politicians' behavior. Because union leaders are also elected into office, they might respond to the same types of incentives as politicians are. According to Besley and Burgess (2002), free information 1) fosters political knowledge of citizens, allowing better screening of politicians; 2) increases politicians' accountability, by means of closer monitoring; and 3) shapes the policy content, by making a policy issue salient. The empirical findings point indeed towards these effects (see e.g. Strömberg, 2004; Snyder and Strömberg, 2010).

As voters might decide to change their political support depending on the information revealed on a candidate, in the same fashion members and donors might react to the information disclosed regarding the non-profit organization they are supporting. This is what is shown by Bottan and Perez-Truglia (2015) by looking at the evolution of local participation to religious groups and charity donation after that a sexual abuse scandal about the community priest is revealed by the press. Also, some research in the management and accounting literature on non-profits have investigated the effect of disclosure of CEOs' pay on donation behaviour, finding that contributions are inversely correlated to the CEO salary (Balsam and Harris, 2014; Galle and Walker, 2016). In a similar way, we might expect that members of a labor union will leave the organization that is overpaying its officers. This threat can keep salaries in check. Finally, a growing body of work has been looking at the effects of pay transparency on compensations. Overall, a positive shock in transparency seems to lead to pay compression between otherwise similar workers (Mas, 2016; Baker et al., 2019; Bennedsen et al., 2019; Obloj

et al., 2020; Cullen and Pakzad-Hurson, 2021), pushing salaries downward if bargaining power is low, upward if high. More closely related to this work, Mas (2017) has also shown that transparency in top public sector positions (US city manager) might lead to real pay cuts of the advertised salary. According to the author, the most likely mechanism at play is a distaste of the governed population for the high pay paid with taxpayers money to the public official. This is irrespective of the performance or the responsibilities of the public officer. Our paper contributes to this literature analyzing a third case, the non-profit sector, and showing that here too norms might be such that advertising high salaries leads to their reduction.

1.3 Institutional background and context

The American labor movement has its origin well rooted in the XIX century. However, except for specific and more or less blunt pieces of legislation[5], it is only as of 1935, with the New Deal era Wagner Act, that private sector unions were officially granted legal recognition and the right to bargain. Despite subsequently modified, the Wagner Act still constitutes the backbone of the industrial relations system in the United States. According to this law, labor unions have the right to bargain with an employer if they have obtained more than 50% + 1 of the votes among the concerned workers in a certification election. Similarly, workers need to vote to de-certify a union. The National Labor Relations Board is in charge of supervising these elections that ought to be fair for both parties. Only one union at a time is allowed to be voted and can hence, if victorious, represent workers in a given establishment. Workers benefit from better contracts and other excludable services offered by the union in exchange of a monthly payment. The benefits ought to cover all workers employed in a unionized establishment, for this reason all employees were forced to pay union dues if a union were voted in by the majority of them. As of 1947, the Taft-Hartley Act has granted the States' legislators the power to out-rule this part of the original act, introducing

[5]Lloyd–La Follette Act of 1912 for the public sector, Clayton Antitrust Act of 1914 for the right to strike

the so called Right-to-work laws, allowing covered workers to opt-out from the full dues and pay only a fee for services[6]. These payments are the unique resources of American labor unions. These organizations in fact, differently from most of their continental Europe counterparts, do not benefit from any direct or indirect state help. For this reason, they resembles private firms selling representation and legal protection, competing with each other and against employers to attract members in order to survive. They are, however, exempt from corporate taxes, being granted the non-profit status. Another important innovation of the Taft-Hartley Act was the obligation for union officers to sign anti-communist affidavit. Many union organizers employed by the Congress of Industrial Organizations (CIO) were communist. The CIO had been created in 1935 in open opposition to the historical confederation, the American Federation of Labor (AFL). The CIO sought to organize entire industries and not specific occupations of relatively skilled workers as the AFL. Additionally, the CIO wanted to embrace all workers (i.e. women, migrants and black workers) in its ranks-and-files, again in contrast with the AFL mainly-white, male and relatively skilled membership. As a consequence, the relationship union-occupation, already partially loosened during the '10s with the so called "New unionism", further weakened. Refusing to sign the non-communist affidavit, many communists left the CIO, mitigating its radical stance. Moreover, thanks to the openness of the AFL to industrial unionism, the two confederations converged and finally merged back together in 1955 giving origin to what is still the largest union confederation in the country: the AFL-CIO.

Departing from the confrontational climate of the 1920s, the decades 1930s-40s and their new regulations institutionalised the labor movement. Particularly, the relationship between the Democratic party and the union movement, started under Roosevelt, crystallized in this period and is still strong. The institutionalisation, the membership success, and the decline in militancy led the union movement to become a real busi-

[6]In 1947, only 12 states, mostly concentrated in the South, adopted some forms of Right-to-work legislation. Today, 27 out of 50 States have passed Right-to-work laws weakening the financial resources of the union movement (Feigenbaum et al., 2018)

ness with full-time employees. It also led to corruption and mafia infiltration[7]. In order to curb corruption, in 1959 the Labor Management Reporting and Disclosure Act, also known as Landrum-Griffin Act, imposed new regulation on unions. First, to avoid entrenchment, unions were obliged to hold regular elections to elect local officers and national leaders, normally held every 3 to 5 years. Since 1959, local leaders are elected directly by members, while national leaders, with few but noticeable exceptions[8], are most of the times elected by national assemblies of local leaders, thus resembling the formal election of the US President. Second, to discourage fraud, all compensations paid to officers and to the best paid employees (earning above 10K $), together with the financial records of each union local plant, had to be filed every year to the department of labor. Those files were randomly audited by the public authority. Failure to disclose the financial situation or misreport in the data, if not amended, resulted in financial penalties to the union. The data collected according to this regulation are those used in this study. Surprisingly, the regulation has never been updated so that we observe only a minor fractions of employees at the beginning of our sample and the quasi-totality at the end. Additionally, this regulation was binding only for unions not organizing exclusively public sector workers. This is why we do not cover 100% public sector unions in this work. Note, however, that the main education and health related unions, organizing both private and public institutions, are included. Part of the reason for this exception was that public sector workers could not yet meaningfully unionize at the time of the Act. The Lloyd–La Follette Act of 1912, the original law regulating public sector employment, in fact, did not grant any real bargaining rights to these workers. Proper public unionism started only with the Executive Order N 10988, a series of amendments to the 1912 Act made by President Kennedy in 1962. It subsequently gained additional strength with the Civil Service Reform Act of 1978 under president Carter. The last change in the regulation of public sector unionism arrived in 2018 when the Supreme Court of the United States ruled in Janus v. American

[7]Most famously, the racket in the ports shown in the movie *On the waterfront* (1955) or the collusion between the Mafia and the Teamsters to build Las Vegas depicted in the movie *The Irishman* (2019).

[8]In particular, the Teamsters as of 1991 allows members to directly vote for the national president. The United Auto Workers (UAW) too have voted on Dec. 2, 2021 to do the same too.

Federation of State, County, and Municipal Employees, Council 31 that public sector employees too have the right to avoid paying full union dues even if covered by a union contract. With the organization of public sector workers and the explosion of the service sector, the distinction along occupations has further blurred. Nonetheless, contemporary unions are still divided on some clear lines and many craft unions are still tightly linked, symbolically at least, to the unique group of workers they used to organize.[9]

1.4 Data

1.4.1 Datasets

1.4.2 Unions annual fiscal reports

The data to study the union sector comes from the administrative records that all labor unions have to submit to the American Department of Labor each year according to the Landrum-Griffin Act of 1959. These documents contain information on unions' accounting structure, funds, membership and, most importantly for the present research, unions' workforce compensations. Since 1959, they have been available upon request, while as of 2002, they have been made publicly available on the web site of the Office of Labor-Management Standards (OLMS) and can be downloaded without charge for all calendar years from 2000 onward. For this work, we have digitized all the reports filed by the union National Headquarters for the period 1959-1999. These reports were kept in .pdf format at the US Department of Labor. We launched a successful request for all these .pdf files and had them shipped to us and then digitized through a specialised company.[10] Unfortunately, we could get only NHQs files as the rest had been

[9]This is for instance the case of the Teamsters: once exclusively organizing truck-drivers, today many locals organize nurses and other services occupations. Nonetheless, the symbol of the union is still made by two horses, reminiscence of the time when transportation was made possible thanks to these animals

[10]This was possible thanks to the financial support of the Institute of New Economic Thinking.

destroyed according to the data preservation rules that applied to each document. [11] For each year, we collected information on individuals' names and surnames, compensations and job titles. Additionally, we have the main financial information of the unions they worked for. We complement this newly assembled data with the reports publicly available for both union locals and National Headquarters from 2000 to 2016. We re-direct the interested reader to Holmes and Walrath (2007) and Breda et al. (2019) for a description of the accounting variables available in these reports. In what follows, we are going to describe the data choices made regarding our variable of interest: annual gross earnings.

Total compensation is divided in four sub-categories: gross salaries, allowances, other financial business disbursements and other non-representative disbursements, that summed up give the total compensation received in the fiscal year. 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 fiscal year, without specifying it. This is why, even if sometimes officers receive considerable amounts of payment in allowances, we mainly focus on the gross salary definition, from here onward called annual earnings.[12]

Depending on their size, which is measured by the law in terms of the annual receipts they receive, unions are asked to report different amount of details. In this analysis, we focus only on the largest organization category (as of 2005, unions reporting at least 250 000 $ in receipts) that are asked to fill the most detailed form, the so-called LM-2 form. Our choice is driven by the fact that the unions' workforce is composed by two groups: officers and employees. Officers are responsible for the main activity of the union (such as organizing, bargaining, etc.). Employees are the support staff that

[11] Paper files for locals and branches for the period 1990-1995 were still available at the Federal Record Center in Washington DC when we started the project. We had planned to copy these paper files directly on site, but due to Covid-19 crisis, we eventually had to renounce.

[12] In the Appendix Table 1.B.1 we provide evidence that this choice is completely irrelevant concerning the inequality results.

deals with the routine tasks (being them administrative or practical, e.g. cleaning) of the union activity. Smaller institutions are asked to report officers' compensations, but not employees'. Since we are interested in the union pay structure in its entirety, we make the choice of disregarding from the analysis these organizations and their (very few and mostly voluntary) workers. However, since officers sometimes hold multiple positions within the union (e.g. they can be both the secretary of the union at the national level and serve as the head of a tinier local union), we decide to sum all earnings accruing to employees or officers having the same first and last names within a union in a given year.[13] In practice, we sum up the earnings of individuals across all types of sub-entities belonging to the same national union, but keep only those individuals employed in at least one organization filling the LM-2 form[14]. Note that the threshold in terms of receipts received triggering the obligation to fill a LM-2 reportis varying over time, but it is always very low (for instance, it passed from 200K to 250K $ in 2005 and remained constant since then). Always observing officers, who are by definition the only ones volunteering, we are confident that our data selection still captures the vast majority of union workers. Table 1.A.1 in the Appendix shows the number of entries and the individuals appearing with such entries. 97% of our sample appears only once, 2.7% twice and the remaining 0.03% more than 3. Since before 2000 we only have data for NHQs, we are forced to focus on the compensations they pay out alone. In the data after 2000, the share received from the NHQ always represents above 80% of the compensation for those holding multiple positions.

The second data restriction we make concerns the lower bound of annual earnings that each individual has to make to appear in our dataset. As reported above, this threshold is set at 10 000 $ per year in terms of total compensation. This is a relatively

[13]Since we do not have a unique individual identifier, we might sum up the earnings of two or more different individuals, potentially leading to higher inequality. We think that this risk is limited–and it cannot challenge our conclusions–while the gains from the collapse are important to assess properly inequality, especially at the top of the distribution, where multiple jobs holding is not infrequent.

[14]The main difference between the LM-2 and LM-3 forms that is of interest for this study is that in the LM-2 form unions are asked to report employees' compensations together with officers' and financial information

low amount already in 2000 being below the Federal minimum wage for a full-time. worker[15] It was however a substantial compensation in the 1960s. We address this data limitation in two ways: for NHQs, to compute the correct earnings share that is accruing to top percentiles, we estimate the number of employees we do not see in our data exploiting the shape of the distribution of earnings we do observe above the threshold and the reported total amounts paid to the workers paid below it (deducted from the total wage bill reported in the financial statements). Details on the methodology can be found in appendix 2.A.1. For local unions, since the analysis starts in 2000 when the minimum earnings for a full-time worker is already above 10 000 $, we apply this threshold to everyone. One element we do omit in this way is that unions strongly rely on voluntary work, and possibly also on part-time and short-term contracts. We present some evidence on voluntary work among officers in Figure 1.A.2 in the Appendix. On average, 20% of officers are volunteers in the sector, but some unions "employing" considerably more of them. These people represents very important out-of-balance sheet resources for the organizations and are probably fundamental for their functioning. Not being paid, however, we leave them for future work. In what follows, results should be intended to apply only to full-time union workers. While the threshold of 10 000 $ has remained fixed for the entire period under analysis, the market wages (and the minimum wage too) have been rising during the same period. To avoid to capture more individuals at the bottom of the distribution as time passes, we transform the fix threshold in an inflation-adjusted one with the base year in 2000 and we keep only those nominal annual earnings above the year-specific threshold. This choice guarantees comparability over time and, since we do not find any pattern in inequality, it also allows us to pool together the observations from different years in some analyses.

Finally, because these files are raw files, with only a random sub-sample that is verified by the public authority every year, they contain a certain number of mistakes, likely

[15] 5.15 $ per hour, i.e. 10 712 $ a year.

the result of mistyping or misreport. We correct the most striking outliers both in our digitized data for the period 1959-1999 and in the data available online for years 2000-2016, using a very conservative approach that is described in more details in appendix 2.A.2 (together with a more detailed description of variables) while leaving the rest of the sample untouched.

1.4.3 Wage and Income inequality in the general population

The primary comparison source is taken from the March Supplement of the Current Population Survey (CPS). This is the best source to measure gross earnings in the American labor market. For comparability, we focus only on employees that are not self-employed.[16]. The main drawback of using survey data such as the CPS is the top coding of very high earnings used to protect the confidentiality of the respondents. Moreover, top-coding replacement values have changed several times. To obtain a consistent series for the period 1962-2016, we apply the corrections formulated by the Integrated Public Use Microdata Series (IPUMS) when available[17] and otherwise substitute the top coded values for 10 times the occupation median earnings as prescribed by the Luxembourg Income Study recommendations (Checchi et al., 2016). One additional interesting feature of the CPS is that it records labor unions as an independent sector since 1992. We are thus able to compare our estimates based on exhaustive administrative data for union headquarters with the survey estimates based on the CPS, cross-validating our methodological choices on the one hand and lending credibility to the estimates based on the smaller CPS sample on the other. Thanks to this feature of the CPS, we can compute hourly wages starting from earnings and usual hours worked last year, allowing us to take into account hours worked and part-time more directly. As an alternative way to deal with top coding and sample limitations in capturing the very top of the earnings distribution, a limitation that our administrative data do not have, we compare our results to the top income shares taken from the World Income

[16] Adding them reinforces our conclusions.

[17] These tables are based on the internal data of the Bureau of Labor Statistics that are less severely truncated

Database (WID) project based on the work of Piketty (2003).

1.4.4 Media Coverage 2000-2016

To test the effect of information in limiting the compensation of union leaders, we manually collected media scandals about high salaries paid in the union sector released since 2000. Our main sources are the *NewsLibrary.com* website, a website that collects records for almost all newspapers published in the US, and the *New York Times* historical archive. However, we also collected information on blogs and smaller websites using google searches. To find scandals on the individuals that are at the top of the earnings distribution, we performed a series of queries exploiting the full names, the sector in which they work and the time span of the data. This gives us 252 officers names quoted to earn very high salaries. Note, however, that some individual is attacked multiple times. Although we cannot guarantee the completeness of our data, our search should cover the majority of the articles published over the topic in the the period 2000-2016 in our sources. For each article, we collected the names of the people reported, the source and basic article information such as its length and the number of other union workers attacked. For each individual subject to a media attack, we then counted the number of articles that report his name in order to measure the intensity of the exposure. We finally collapsed the result at the individual level taking the publication date of the first article as the beginning of the treatment period. In total, we successfully matched this information to our main data source for 194 union workers out of the 204 originally recorded that are employed as international, national or local union leaders.

For clarity, Table 1.1 summarizes all our data with their period covered, original sources, format, main limitations and the methodological choices we made to address them.

Table 1.1: Data summary

Data	Years covered	Source	Format	Limitations	Methodological choices
Union NHQ	1959-2016	US Department of Labor	digitized .pdf	Only NHQ, all officers but employees above 10K in nominal terms.	Impute number of individuals earning below 10K.
All union entities	2000-2016	US Department of Labor	.csv	All officers but employees above 10K in nominal terms. Only workers above 10K in real terms.	Sum earnings across different sub-entities.
CPS	1962-2016	IPUMS	.csv	top coded	IPUMS correction tables, LIS guidelines
Top labor income shares	1960-2016	World Inequality Database	.csv	Aggregates only	
Median releases	2000-2016	NewsLibrary.com, New York Times Archive	digitized .pdf		

1.5 Results

In this section we present our results. In the first part, we compute inequality for the whole union sector between 2000 and 2016. We then compare it with other economic sectors in the US using the CPS and the World Inequality Lab data. In the second part, we focus only on NHQs and present the results for the period 1959-2016.

1.5.1 Union sector: 2000-2016

In order to show the levels of inequality in the different sectors, we start by simply comparing the various gross earnings distributions using different canonical statistics. We focus on the means, Gini coefficients, P99/P50 and P90/P50 ratios, and different income thresholds shares. This allows us to have precise comparisons and hence to draw clear cut conclusions on the differences between the union sector and the other

selected groups. We chose as comparison the macro private and public sectors plus detailed 3-digit sectors that we believe similar to the labor union in some key aspect. In particular, we select the religious organizations as another 100% non-profit sector, and the legal service as a sector selling the closest good to the one offered by the unions. Table 1.2 displays the results[18]. Many important differences emerge. First, the average salary is considerably higher for union employees than for general private or public sector workers, but it is lower than the one paid in the legal sector, a sector from many respects similar and with whom employees are sometimes exchanged. Second, labor unions are much more equal than the private sector, and particularly so at the top. For example, in the union sector, the top percentile accounts for only 4% of the total earnings while this goes up to 9.7% among the wage and salary earners in the private sector and reaches 10.4% in the legal service sector. Unions are instead very close to the level of inequality prevailing in the public sector and in typical 100% non-profit institutions such as religious organizations, but still more equal in terms of top incomes. Note that the results cannot be driven by the size of the sectors since both the religious organization and the legal service sectors do have a comparable size in terms of employment with respect to the sector we are interested in. Third, labor unions are recorded as an independent sector in the CPS as of 1992. We can thus compare the average salary and its distribution in the sector measured by our administrative data and the CPS. Reassuringly, the two are very close, if not identical. We drove the conclusion that some limitations of our data might be addressed using the CPS.

Several important factors that might confound the results are however excluded from this preliminary analysis. First, we do know that size is an important factor to explain differences in salaries (Gabaix and Landier, 2008). We replicate the analysis above dividing the CPS sample by firm size brackets. Table 1.3 shows the results: in all size brackets, inequality is substantially lower in the union than elsewhere. Also, differently that the rest of the economy, the average salary is pretty constant and does not

[18]While our focus is on gross salaries, we present in Table 1.B.1 in Appendix the same results computing inequality for the union using total compensations. As it is apparent, only the average compensation does noticeably go up, while the distribution is unchanged.

Table 1.2: Descriptive statistics: compensations and top income shares, by sector

	Unions LM-2	Private Sector	Public Sector	Unions CPS	Relig. Org	Legal Services
Average	65 175	55 736	56 289	70 752	43 299	99 458
Bottom 50%	27,9	23,8	29,1	29,7	29	17,25
Middle 40%	49,6	43,9	46,8	48,5	47,3	39,05
Top 10%	22,5	32,3	24,1	21,8	23,6	33,34
Top 1%	4,0	9,7	5,4	3,9	4,8	10,4
Gini	0,32	0,40	0,31	0,29	0,30	0,51
P90/P50	1,92	2,49	1,92	1,88	2,01	3,52
P99/P50	3,30	7,04	3,47	3,08	3,63	13,45

Notes: Pooled annual earnings for the period 2000-2016 from union administrative data and the the CPS. Only individuals above 10K$ (in 2000 real terms) a year in total compensations are included.

seem to increase linearly with size.

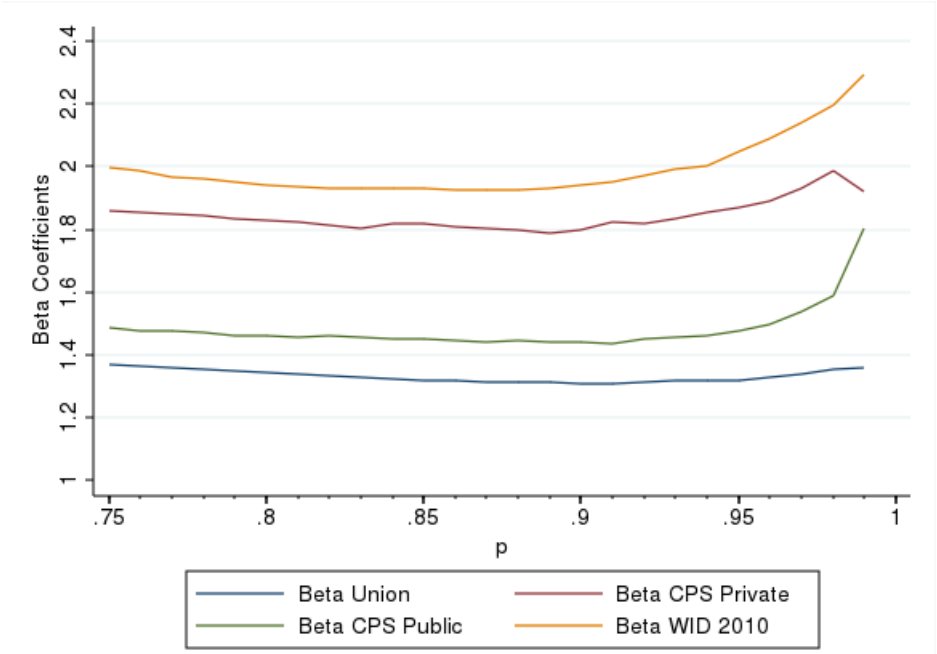
Table 1.3: Controlling for Firm Size

	Union Data					CPS Data				
	10-999	10-99	100-499	500-999	**+1000**	**10-999**	10-99	100-499	500-999	**+1000**
Average	63 891	64 357	65 422	60 679	65 678	54 421	52 464	55 991	58119	61 724
Bottom 50%	26,8%	25,4%	26,5%	28%	28,3%	24,5%	24,1%	25,2%	25,2%	24,9%
Middle 40%	49,0%	47,9%	48,9%	49,7%	49,8%	43,2%	42,3%	43,9%	44,3%	45,4%
Top 10%	24,2%	26,8%	24,6%	22,3%	21,9%	32,3%	33,6%	30,9%	30,5%	29,8%
Top 1%	4,6%	6,2%	4,7%	3,6%	3,8%	10,1%	10,8%	9,4%	9,3%	8,6%
Gini	0,34	0,36	0,34	0,31	0,31	0,39	0,40	0,38	0,38	0,38
P90/P50	2,00	2,14	2,1	1,94	1,89	2,34	2,39	2,28	2,24	2,26
P99/P50	3,77	4,47	3,95	3,12	3,13	7,22	7,98	6,5	6,33	5,75

Notes: Pooled data of annual earnings statistics for the period 2000-2016 from union administrative data and the the CPS. Private and public sector are mixed together in this exercise, but results would be even more striking using only the private sector. Only individuals above 10K $ a year (in 2000 real terms).

Second, the truncation of the earnings distribution at 10 000 $ we apply might have different implications in the different sectors. This is an important concern given that many union officers are registered with a salary close or equal to zero. By excluding them we might have completely changed the real distribution of earnings in the sector, hence making any comparison of precise percentiles wrong. To account for this possibility, we first check the share of union workers actually working for the union and earning below 10K dollars over the period 1992-2016 in the CPS. We find that they account for less than 5% of total employment. Still, to overcome any doubt in the comparison of exact percentiles, we introduce a measure of inequality that is locally valid

Figure 1.1: Inverted Pareto coefficients 75^{th}-99^{th} percentiles, by sector



Note: The figure depicts the Inverted Pareto coefficients, Beta, calculated for each percentile of the union, the public, and the private sector, and for the whole economy. *Reading:* A beta of 2 at the 75^{th} percentile (beginning of the yellow line) tells that the average income of the individuals earning above 75^{th} percentile is twice the amount of the earning threshold to be part of the given percentile

through the whole distribution: the inverted Pareto coefficient. The inverted Pareto coefficient, also known as Beta, captures the degree of inequality of a distribution above a defined threshold. It is equivalent to the ratio of alpha, the Pareto coefficient, i.e. the power of the Pareto distribution, and alpha minus one. It is also equivalent to the ratio between the earnings at any given threshold and the average earnings of the population above or equal to that threshold for all possible thresholds. Since there is no predefined threshold to be used in the computation, the Inverted Pareto coefficient can be calculated for any point of a distribution regardless if the distribution is itself of a Pareto type or not. Formally, we compute:

$$\beta_i = \frac{W_i}{\bar{W}_i} = \frac{\alpha}{\alpha - 1} \qquad \forall i$$

Note that the second equality will hold if and only if the distribution does indeed follow a Pareto law. The advantage of using the Inverted Pareto coefficient is that we can compare two distributions straying from the precise definition of a percentile: if the line of Betas constructed for the union sector lies below the one of the other compari-

son groups in each, and for each percentile, then the dispersion of earnings is lower in the union than in any other sector at least at the top of the distribution. This is what we find looking at Figure 1.1, where we plot the inverted Pareto coefficients of labor unions (blue), private (red) and public (green) sectors of the CPS plus the WID data (yellow) for the year 2010, from their 75^{th} to their 99^{th} percentiles. The same result holds dividing by sample size as shown in Appendix figure 1.B.1.

Wage gaps controlling for individual characteristics

Another reason why unions might pay more equal compensations is that they employ a specific labor force that is more homogeneous concerning their observable characteristics. This fact would automatically translates into a lower dispersion of salaries everything else being equal, regardless of the sector of employment. We exploit the information contained in the CPS to address this possibility. Additionally, we take into account that different work arrangements, i.e. the possibility that in the union sector some workers work few hours, computing hourly wages for the whole distribution. In the spirit of Leete (2000), we focus both on the returns of observable characteristics across sectors and on the difference in the dispersion of log wages. For comparison, we take again private and public employees. In order to show that labor unions do have a lower dispersion of salaries even controlling for workers' and sectors' characteristics, we decompose the actual log wages in a predicted and a residual component using a linear regression model à la Mincer for each sector. We control for observable characteristics adding them in three major groups: the original Mincer model of experience and education, a set of variables capturing discrimination, and a set of variables controlling for size and industry of employment. The most completed model will be the one of equation (1) where Disability is a dummy for having a work disability, Gender is a dummy for being a women and Race are three dummies for Black, Asian and Others ethnic groups. Size is a vector of dummies as the size brackets shown above, and Sector is a vector of dummies for each specific sector as classified in the 1990 CPS

classification.

$$Y_{ij} = \alpha + exp_{ij} + exp_{ij}^2 + educ_{ij} + disab + gender_{ij} + \mathbf{race}_{ij} + \mathbf{size}_{ij} + \mathbf{sector}_{ij} + \epsilon_{ij} \quad (1.1)$$

The results for the returns to characteristics are shown in Table 2.5.1. The first important set of findings is that unions tend to reward experience more, but education less. This means that returns will be higher than in the private sector for a long tenured worker, but lower for a highly educated one. Moving to Model 2, it is interestingly to note that unions are, on average, the ones least differentiating according to observable physical traits: unions seem in fact to pay disabled, Asian and other ethnic groups as much as white man, the reference group. They also seem to pay women less, but comparatively less so, than other sectors do. The only group of workers for which they fare less well than the private sector are black workers. This might reflect the historical hostility that unions had towards this minority, but also the fact that they employ a larger share of this group. Finally, looking at Model 3, we see that the pattern of the size premium in the union is quite different to the one in the private sector: smaller unions seem to pay more than big ones. This might be driven by the existence of unions representing particular workers as sportive, actors or flight pilots that are very small in size, thus need little representing personnel, but extremely well paid, thus allowing union officers to be paid high salaries. Controlling for sectors fixed effects does not qualitatively alter the previous conclusions, but some coefficients become statistically indistinguishable from each other such as the one on gender. Summing up, unions seems to reward productive characteristics differently, emphasizing experience more and education less, and discriminate less on non productive ones. Note, however, that the R^2 in the union regressions is almost half of the one in the private sector in Model 3, and lower than the typical Mincer equation's R^2 of 0,3. This means that we are not able to explain much of the variance in the union sector. For this reason, we turn to comparing the differences between predicted and residual variances between labor unions and private and public sectors. Results are reported in Table 1.4. In all but one comparison, unions have significantly lower log-wages variances. When this is not the case,

i.e. between the residual variances of public and union sectors in model 3, they are on the margin to be. Overall, we conclude that labor unions do pay more egalitarian salaries than private and public sectors, and that this is mainly due to a precise choice to do so rather than other confounding factors.

Table 1.4: Differences in real, predicted and residual variances between private/public sector and the labor unions

	Private	Unions	Difference	Public	Unions	Difference
			Model 1: Mincer			
Real	0.4953	0.30205	0.19325***	0.36811	0.30205	0.06606***
Predicted	0.11671	0.05078	0.06537***	0.08196	0.05078	0.03118***
Residual	0.36281	0.25126	0.11155***	0.28615	0.25126	0.03489***
			Model 2: Discrimination			
Real	0.4953	0.30205	0.19325***	0.36811	0.30205	0.06606***
Predicted	0.13376	0.06246	0.0713***	0.09518	0.06246	0.03272***
Residual	0.34576	0.23958	0.10618***	0.27292	0.23958	0.03334***
			Model 3: Firm Characteristics			
Real	0.4953	0.30205	0.19325***	0.36811	0.30205	0.06606***
Predicted	0.09743	0.06619	0.03124***	0.09643	0.06619	0.030***
Residual	0.30994	0.23585	0.07409***	0.25468	0.23585	0.01883

Sources: Results are computed based on the pooled observations from the March supplement of the CPS survey for the period 2000-2016. Only workers earning at least $ 10K per year are included in the analysis. * p<0.1, ** p<0.05, *** p<0.01.

Union Wage Premiums

The fact that unions pay higher average wages and have lower wage inequality than in the private sector suggests that they pay more people at the bottom of the wage distribution and that they pay less those at the top. We already know that at the extreme top, unions pay their leaders 1/7 of what is paid in similar size private firms (Klein, 2012). We further test this mechanism by plotting the earnings at each percentile of both the private and union sector wage distributions. To have a more targeted comparison group, as above we use the legal service sector, a sector with which unions share substantial activity and with which workers are occasionally exchanged, as an additional comparison. To do so we use the March supplement of the CPS from 1992 to 2016. Figure 1.2 plots these results. In the first two panels we show the average earnings paid of each percentile, while in the bottom panels we plot the ratio between

Table 1.5: Determinants of log wages, by sector

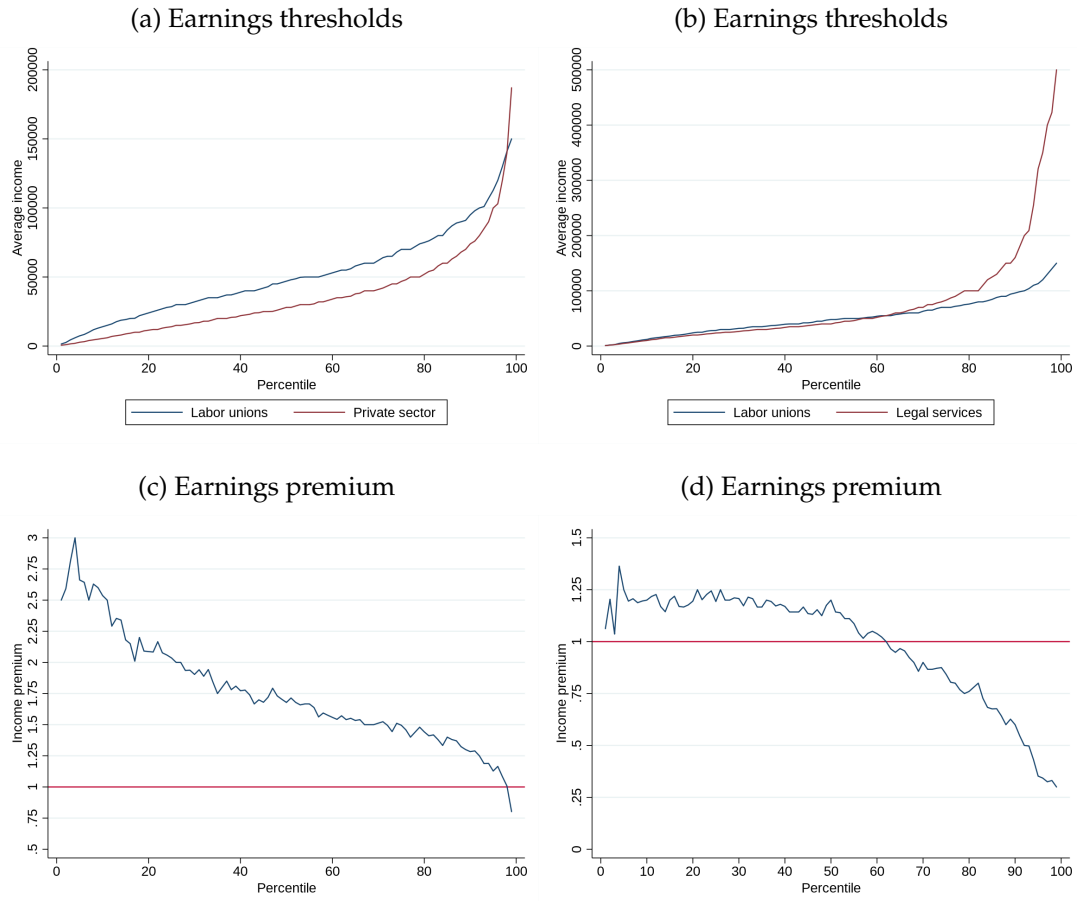
	Model 1: Mincer			Model 2: Discrimination			Model 3: Firm characteristics		
	Private	Public	Union	Private	Public	Union	Private	Public	Union
Experience	0.0354***	0.0317***	0.0330***	0.0348***	0.0322***	0.0310***	0.0272***	0.0274***	0.0317***
	(254.08)	(98.18)	(6.16)	(252.10)	(100.82)	(5.78)	(201.10)	(85.93)	(5.97)
Experience^2	-0.000514***	-0.000467***	-0.000365***	-0.000499***	-0.000470***	-0.000348***	-0.000372***	-0.000380***	-0.000359***
	(-165.41)	(-67.84)	(-3.65)	(-162.27)	(-69.26)	(-3.48)	(-125.87)	(-56.48)	(-3.64)
Education	0.104***	0.0937***	0.0653***	0.105***	0.0948***	0.0662***	0.0854***	0.102***	0.0630***
	(445.83)	(202.92)	(7.58)	(456.35)	(206.40)	(7.94)	(351.25)	(205.42)	(7.58)
Work disability				-0.170***	-0.117***	-0.0819	-0.129***	-0.108***	-0.0969
				(-43.27)	(-14.16)	(-0.85)	(-34.41)	(-13.43)	(-1.03)
Female				-0.235***	-0.226***	-0.162***	-0.196***	-0.151***	-0.163***
				(-212.04)	(-102.92)	(-4.71)	(-160.40)	(-63.93)	(-4.79)
Black				-0.134***	-0.0260***	-0.188***	-0.123***	-0.0507***	-0.183***
				(-77.05)	(-8.35)	(-3.42)	(-73.14)	(-16.50)	(-3.24)
Asian				0.0225***	0.0239***	-0.0492	0.0165***	-0.00742	-0.0453
				(8.12)	(4.15)	(-0.69)	(6.40)	(-1.32)	(-0.65)
Others				-0.0662***	-0.0506***	0.0637	-0.0522***	-0.0514***	0.0688
				(-16.45)	(-7.03)	(0.59)	(-13.43)	(-7.33)	(0.63)
10-99							0.0723***	0.0485***	0.181***
							(38.56)	(4.66)	(3.57)
100-499							0.122***	0.120***	0.179***
							(57.28)	(11.86)	(3.06)
500-999							0.152***	0.148***	0.147*
							(55.46)	(14.05)	(1.90)
1000+							0.189***	0.163***	0.131**
							(97.36)	(16.73)	(2.50)
Constant	0.991***	1.178***	1.736***	1.285***	1.400***	1.944***	1.446***	1.147***	1.863***
	(294.48)	(154.56)	(12.12)	(248.05)	(121.61)	(11.00)	(268.94)	(76.39)	(10.41)
Industry FE	X	X	X	X	X	X	224	208	X
Observations	1713732	357057	1160	1713732	357057	1160	1713731	357047	1160
Adjusted R^2	0.243	0.223	0.166	0.279	0.259	0.201	0.354	0.308	0.211

Note: In this table we use the dependent labor force recorded in the ASEC form of the CPS from 1992 to 2017. We compare the gender gaps in wages between the private and public sectors and labor unions. In the first specification, only the main Mincerian variables plus gender are included. In Model 2 are introduced other demographics characteristics for which workers are often discriminated. In model 3 we add firm size and 3-digits industry fixed effects (limited to the private and public sector). * p<0.1, ** p<0.05, *** p<0.01. Errors are robust to heteroskedasticity. T-statistics are reported in parentheses.

the two, which represents the union earnings premium/penalty with respect to the reference group. Unions pay better earnings to their workers except at the very top with respect to the private sector. This results in a substantial union wage premium that decreases all along the distribution until it becomes negative. Given the wide range of occupations in the labor market, a large part of the union premium is possibly just coming from differences in the occupations considered. To account for this possibility, we turn to compare unions with the legal service sector. Doing so, we find a qualitative similar, but clearer picture: unions pay better salaries to their poorer workers, and lower salaries to their richer ones than what is done in the legal service sector. This means that unions pay an earnings premium for those at the bottom and an earnings penalty for those at the top. This automatically results in lower inequalities. More generally, these results suggest that the non-profit wage penalty (in the union sector or other non-profit sectors) is likely to vary strongly along the wage distribution since non-profit organizations also tend to have more egalitarian compensation practices. Future research should take this into account.

A limitation of the analyses presented so far is that they may reflect selection effects: workers in the union and non-union sector may be paid differently because they are different, for example with those at the bottom being over-qualified and those at the top under-qualified within union. To examine if such selection is driving our earnings comparisons, we examine the wage premiums experienced by individuals moving in and out of the union sector. This gives a sense of how workers in the union sector are valued on the outside market. The career of Martin Walsh illustrates this idea very well. Walsh joined the union Laborers in 1988, at the age of 21, and worked for them for 25 years, reaching the position of Branch leader of the Boston area. In 2013, he became the mayor of the city of Boston and remained so for two terms. Finally, in 2021 he became the US secretary of Labor. At each change of position his salary moderately increased, from which we can argue that both the state and the union were valuing the work of Mr. Walsh about the same. A more formal way to study the same thing is to use the CPS and exploit all individuals that move across jobs in different sectors to

Figure 1.2: Union earnings premium, by percentiles



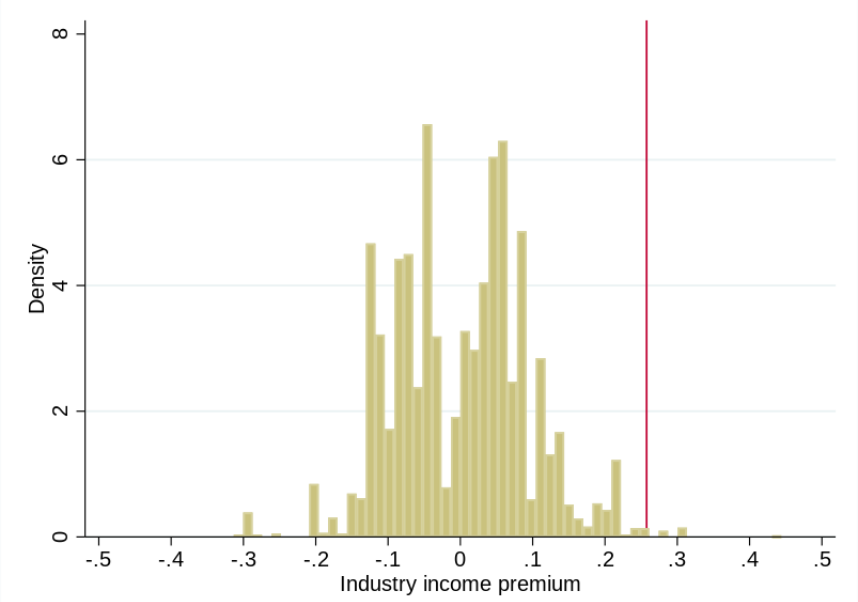
Sources: All figures are drawn using the March supplement of the CPS from 1992 to 2016. *Note:* Upper panel graphs depict the earnings thresholds to belong to different percentiles comparing unions with the private sector (on the left) or the legal service sub-sector (on the right). Bottom graphs show the ratio between the lines above and thus depict the earnings premium (penalty) of working for a union. *Reading:* Union workers receive a substantial unconditional premium compared to those working in the rest of the economy (left) or specifically in the legal sector (right).

compute sector wage effects. This should purge out from the analysis any individual unobserved effect and leave just the sector premium. To do so, we compute an AKM type model (Abowd et al., 1999) where instead of firm fixed effects we estimate 3-digit sector fixed effects. As we suspect heterogeneity by earnings levels, we replicate the above analysis dividing the sample in workers earning below and above the median of their respective professions. To estimate the sector fixed effects we run the following regression:

$$ln(Y_{it} == \alpha_i + \delta_t + exp_{it}^2 + \phi_j + \epsilon_{it} \tag{1.2}$$

Where ln(Y) is the log of annual earnings, α is a collection of individual fixed effects, δ are year fixed effects, exp^2 is the square of the experience on the labor market for individual i at time t, ϕ_j are 3-digit industries fixed effects, and ϵ is a i.i.d random error component. Figure 1.3 shows the histogram of the estimated sector fixed effects ϕ_j (which are dummy variables taking the value one when worker i works in industry j in year t). The red line marks the value computed for the union sector. As apparent, American labor unions grant on average a pretty high wage premium to their workers. Again, due to top coding, the very top of the distribution is not captured in this exercise.

Figure 1.3: Sector wage fixed effects



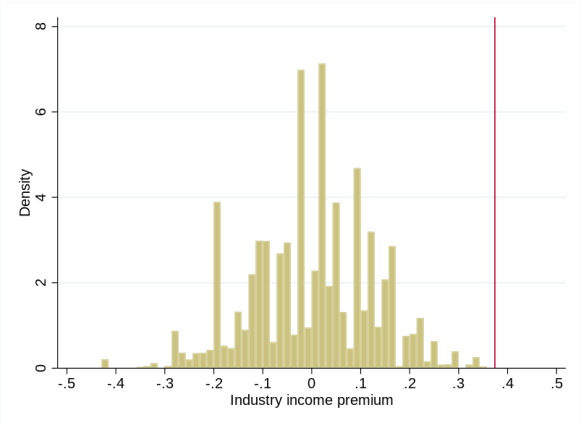
Sources: Sector wage premia computed using the March supplement of the CPS between 1992 and 2017. The red line indicates the value taken by the union sector.

Because comparing unions to the legal sector we found a wage premium up to the 60^{th} percentile that then became a wage penalty, we redo the same analysis as before dividing the sample in two groups using the median within each sector as threshold. Results of this second exercise are shown in Figure 1.4. Unions offer a premium to both workers being paid below and above the median in their former occupation. Below median workers do receive however a particularly good treatment being one of the absolute highest wage premium estimated. Using these estimates, we can further compute the internal redistributive effect of the sector wage premia by subtracting one

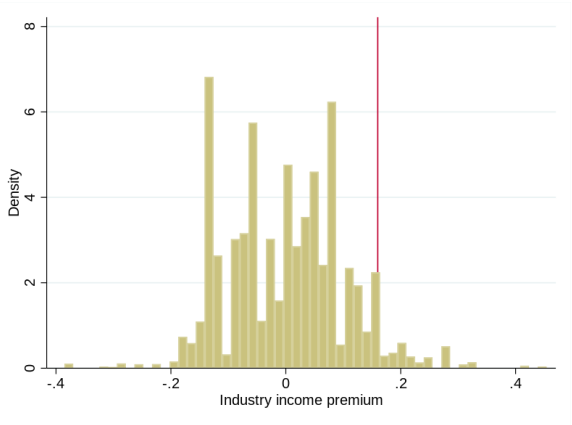
from the other. Since those premium are expressed in log points, the difference is approximately equal to the ratio between the premium obtained in a given sector in the bottom half and the obteined by the top half. Figure 1.5 displays this result. As expected, unions have among the strongest redistributive wage policies on the market.

Figure 1.4: Sector wage fixed effects by earnings groups

(a) Below median

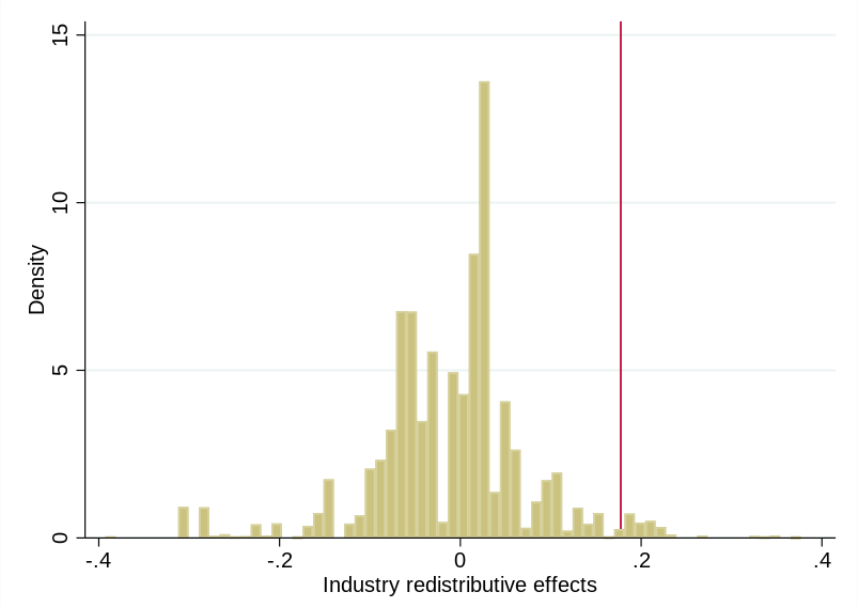


(b) Above median



Sources: Sector wage premia computed by groups using the March supplement of the CPS between 1992 and 2017. The left panel figure is computed using only individuals with below median compensations with respect to their jobs in t-1. The right panel instead with those having compensations above the median. The red lines indicate the value taken by the union sector.

Figure 1.5: Sector wage redistribution



Sources: Sector redistribution effects computed subtracting from the below median wage premia those of the above median. Computed using the March supplement of the CPS between 1992 and 2017. The red line indicates the value taken by the union sector.

To sum up, we found that unions pay very egalitarian wages to their own employ-

ees and that this is driven by specific wage policies. In particular, we have shown that union leaders receive a lower than market compensation while the rest of union workers, especially the least paid, receive high or even very high wage premia. The earnings distribution is thus compressed from above and below.

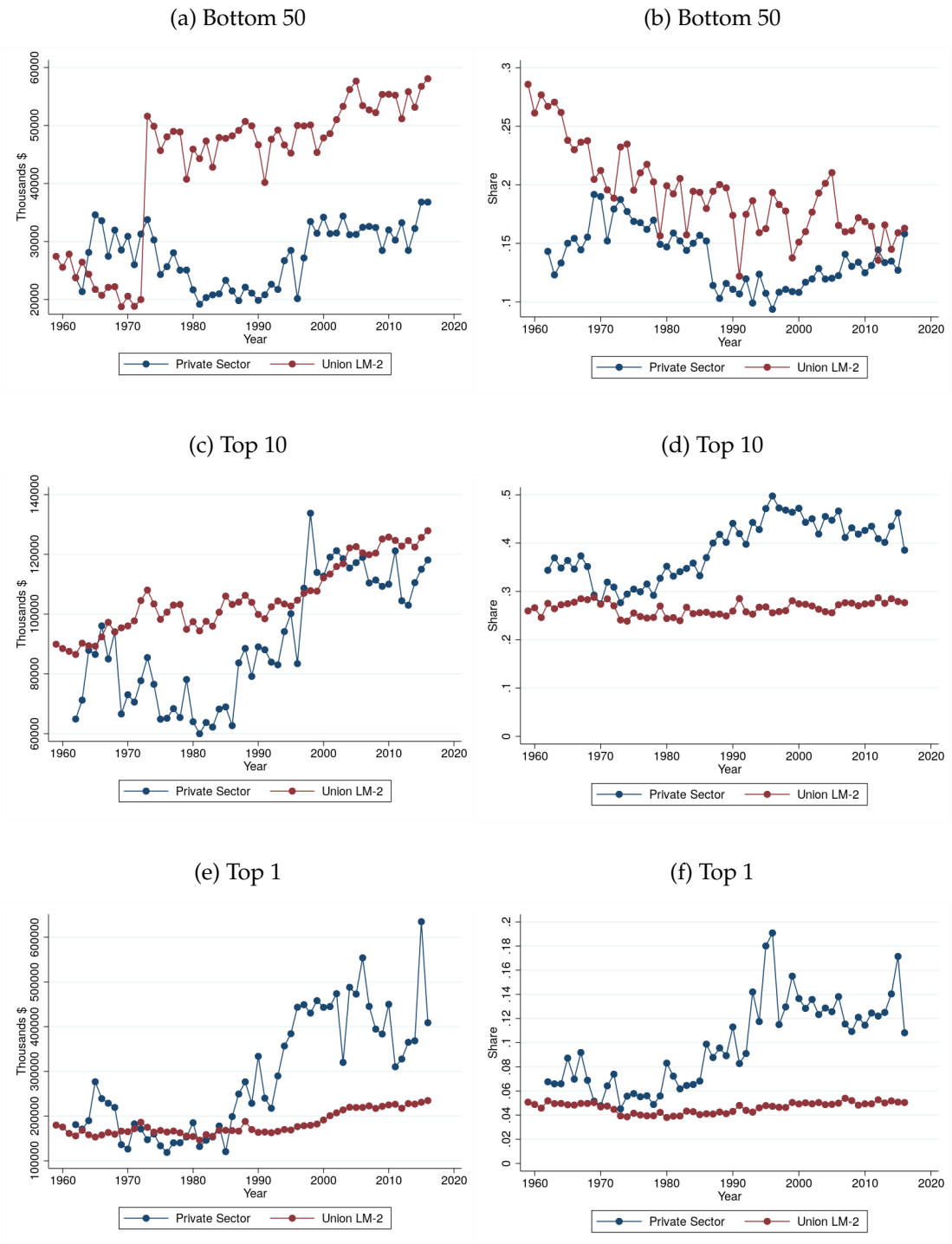
1.5.2 National Headquarters: 1959-2016

In this section we turn to the NHQs. This allows us to look at inequality over a much longer time horizon. Having an historical perspective is interesting for two additional reasons. First, since the fast raise in wage and income inequality in the private sector happened across the '80s and early '90s (Autor et al., 2008), we wonder what happened in the union movement during the same period of time. Did the factors that pushed inequality up in the private sector also affected the union or did unions kept their compensation choices unaltered? Second, 1981 is the highest historical peak in American union absolute membership[19]. We wonder what unions did with the larger amount of resources and how they changed the compensation packages because of their decline.

To address these questions we have collected and digitized the data between 1959 and 1999. As described in Section 2.3 and Appendix 2.A.1, we imputed the number of employees earning less than 10K in each year. We can thus not present measures of overall inequality. We rely instead on the evolution of top income shares as has become standard in the literature. This is what we present in Figure 1.6. Note that we can meaningfully interpret only those percentiles above the imputed missing observations as we assign to all of them the same average salary. We report on the left-hand panels the income thresholds to be part of a given percentile and on the right-hand panels the income shares accruing to those same percentiles. Red lines display the results for the union sector, while blue lines are drawn from CPS data for the whole US economy. In Figure 1.B.2 of Appendix 1.B we present the same graphs using the labor income series produced by the World Inequality Lab (WIL) based on Piketty (2003).

[19]Union density was already declining, but in relative terms. Since 1981 also absolute union membership will start to decline

Figure 1.6: Top income thresholds and shares in the lon-run: Union vs. Private sector



Sources: Lines for the union are built from our OLMS administrative data. Lines for the private sector are built using the ASEC supplement of the CPS. *Note:* On the left-hand side, the graphs show the evolution of the thresholds to be part of different income groups (Bottom 50, Top 10, Top 1) in the union and in the private sector. On the right-hand side, are presented the evolution of the relative income shares that the different groups get. The jump in panel a) reflects the fact that more than 50% of union workers earned until 1970 less than $ 10K. As a consequence we attribute to all of them the average income we estimated. This means that the threshold and the income share associated to it should be interpreted until 1973.

These sources better capture top income shares and are moreover less volatile. However, The results remains very similar both qualitatively and quantitatively to what shown using the CPS. Looking at Figure 1.6(a) we see that the share of union workers earning less than 10K before 1973 was higher than 50%, we can thus not meaningfully compare the bottom 50% with the rest of the economy before this year. After 1973, however, we see that the bottom 50% is earning substantially more in the union than in the rest of the economy. The share of income going to this group is also larger, although the gap has been narrowing down. Looking at the top 10% as in Figures 1.6(c) and 1.6(d) we do see different patterns. The wages to be part of the 10% richest earners were higher in the union but the private sector has caught up in the '80s and '90s to reach very similar levels as of the year 2000. On the other side, the share of income accruing to the top 10 was always smaller in the union sector. The difference was modest though if not null (see Figure 1.B.2) in the '70s. In the last 40 years, the share of the top 10 in the union sector has remained roughly stable, while it has largely increased in the private sector. Finally, concerning the Top 1% we see yet another story: thresholds to be at the top were exactly the same until the mid '80s in both groups. Then they diverged sharply: in 2016 you needed around double the amount than in the union to be in the Top 1% at the economy level. In other words, union leaders were part of the top 1% of best earners until the '80s. Despite still earning high salaries, they aren't anymore. Concerning income shares, labor unions always had lower concentration of income at the very top. However, the values were relatively close until the '80s, while they are in 2016 more than 3 times smaller. Overall, unions has always paid higher salaries at the bottom and similar at the top, and they have thus be always more equal. However, the gaps before 1980 were small and not always very neat. Unions' earnings distributions has remained relatively stable over 60 years. In the private sector, instead, the dramatic rise in the compensations of those at the top has pushed inequality up a great lot. In the last decades the difference between unions and the rest of the economy has become particularly big as documented in the previous section more in detail.

1.6 Discussion

As we have seen in the previous section, inequality in the union sector is low, and lower than any comparison group, especially at the top of the distribution. This is also confirmed in Klein (2012) who studies the compensation of the top 5 managers in the for-profit, non-profit and labor unions sectors. She finds that, even breaking down firms by size categories, union leaders earn between 1/3 and 1/7 (depending if bonuses and stock options are taken into account) of their private sector colleagues. In this section, we ask why this is so, and in particular why top officers in labor unions do not align their compensations to the one prevailing in comparable private firms.

Our main hypothesis is that there exist a social norm against high pay in the non-profit sector and in particular in labor union organizations. This norm is present at three different levels: first, among union employees themselves, second, among union members, and third, in the society as a whole. All these levels act as a source of informal control on top compensations in different ways. At the first level, union employees are not very likely to try to set their own pay much above an implicit threshold that is deemed correct. At the second level, members are likely to respond negatively to union leaders' salaries and vote against them when they have the possibility to do so. Finally, at the third level, because a violation of a social norm can be seen as a scandal in itself, despite no law violation, newspapers can expect to sell well a story reporting this violation. This gives them an economic incentive to cover those cases where a union officer is receiving a "too high" compensation. If the compensation is indeed perceived as going against the social norm, then after that it is exposed on the press we expect that the public will protest against the violation. Possibly the external pressure would be mixed with the internal ones from the organization resulting in some consequences for the person that made the object of the news release. In the next three subsections we present evidence of these three mechanisms.

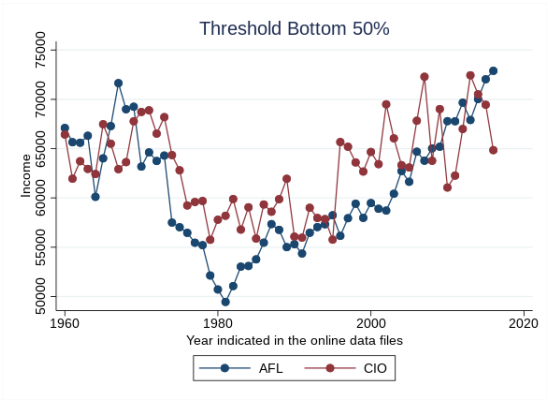
1.6.1 Ideology: AFL vs CIO

So far we have compared labor unions with the rest of the economy or with specific sub-sectors of it. In doing so, we made the implicit assumption that the union sector was altogether characterized by some peculiar attitude towards inequality. The history of the US labor movement clearly shows that this is just a rough, first order approximation. Differences between unions were very strong in the first half of the XX^{th} century, but they are likely to persist even in more recent decades. To look at this, we zoom in the differences between the originally AFL and CIO unions. As described in Section 2.2, these two groups of unions had dramatically different visions regarding unionism until they merged in 1955. Particularly, the AFL was overwhelmingly made by craft-unions organizing relatively skilled workers. The CIO, on the contrary, was organizing mainly industrial workers in large plants, most of the times with no qualifications. The two confederations also differed in their ideological stand: while never openly communist, the CIO was staffed with a considerable number of communist organizers, and thus placed a higher emphasis on equality than the AFL, whose goal was mainly improving the leaving conditions of its narrowly organized workers. In this section, we test for differences in the levels of inequality since 1959, i.e. since only 4 years after the reunification had been completed, between the two ex-confederations.

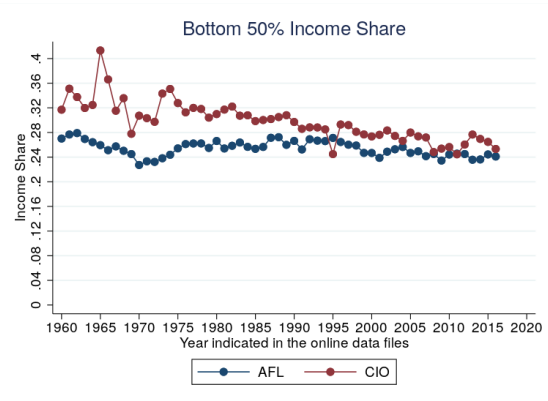
Figure 1.7 shows the main results. Again, on the left-hand panel we report the income thresholds to be part of a specific group, and on the right-hand panel the income shares accruing to that specific group. The red line displays results for the originally CIO, the more left leaning unions; the blue line for the AFL, the more conservatives ones. Looking at the income thresholds, it is interesting to note that they are identical for what concern the Bottom 50%, while they become more and more different as we move up the wage ladder. Focusing on the Top 1%, we see that while for the CIO the amount has remained stable at roughly 150 000 $ for the whole period, for the AFL it used to be around 200 000 and has now increased to almost 300 000 $.

Figure 1.7: Top income thresholds and shares in the lon-run: AFL vs. CIO

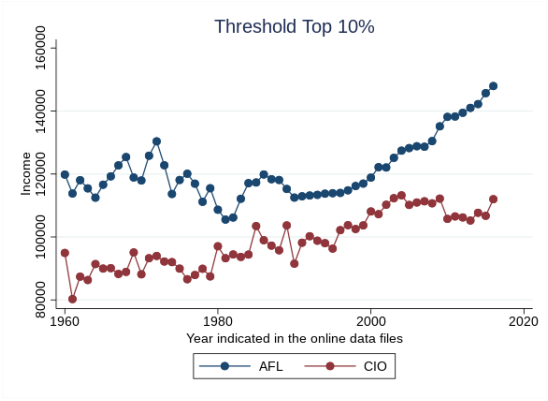
(a) Bottom 50



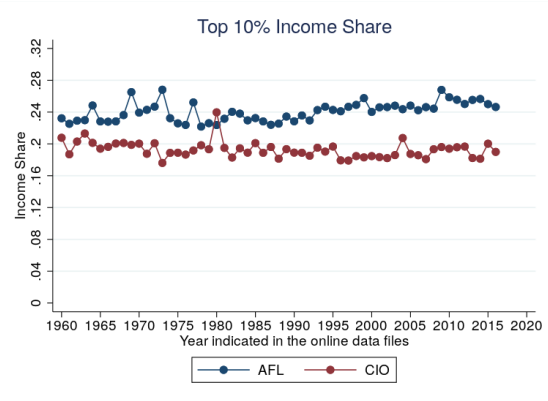
(b) Bottom 50



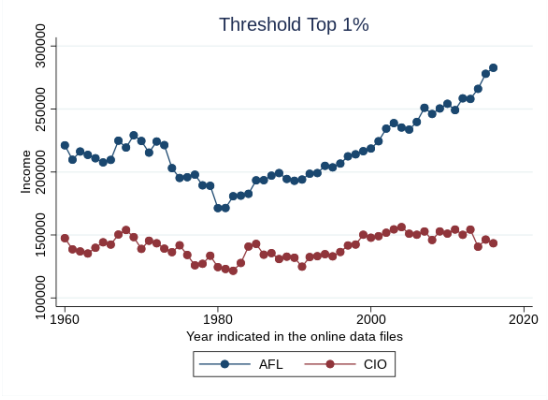
(c) Top 10



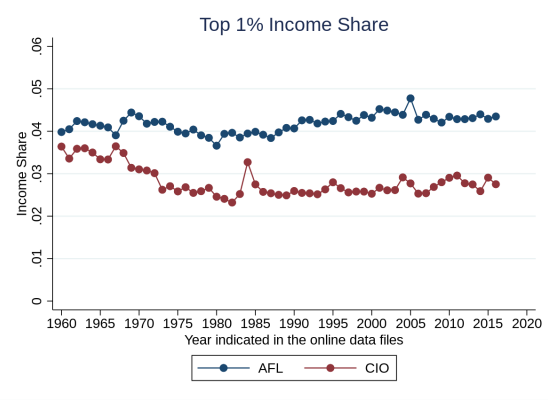
(d) Top 10



(e) Top 1



(f) Top 1



Sources: Lines for the union are built from our OLMS administrative data. *Note:* On the left-hand side, the graphs show the evolution of the thresholds to be part of different income groups (Bottom 50, Top 10, Top 1) in the originally AFL or originally CIO unions. On the right-hand side, instead, are presented the evolution of the relative income shares that the different groups get. In this Figure, we estimate the number of employees earning below $ 10K at individual union level (hence not as a whole sector) simply dividing the total amount received by this category in each union by 5000. In this way there is no jump for the Bottom 50% threshold as in panel a) of Figure 1.6

As a consequence, the share of income going to the bottom was higher in the CIO (but is now declining) while the share going to the Top 10 and Top 1 percent was and still is substantially higher in the AFL. We conclude that the ideological stance of unions is likely to play a role in the pay setting in the whole sector, but it is disproportionately more binding for those unions that had a more egalitarian rooted ideology in the past. In other words, internal pay norms do matter in the pay setting even within such narrowly defined sector, they are hence likely to matter for all unions in general.

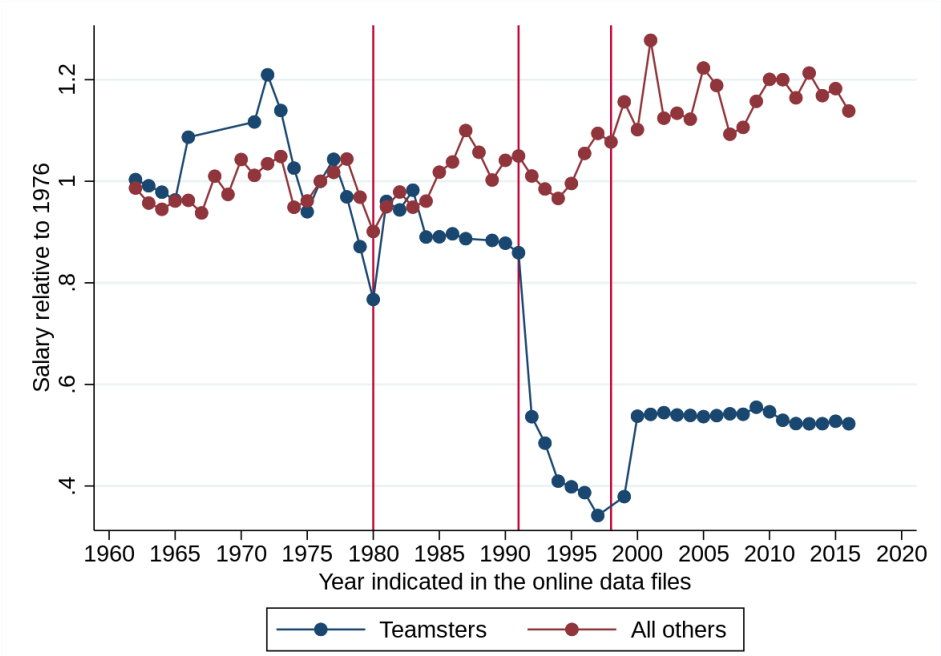
1.6.2 Institutions: the Teamsters

To look at the impact of the preferences of union members on the salaries of their union presidents, we look at a specific union: the Teamsters. This union, originally organizing truck-drivers, constitutes a perfect case study to illustrate how much members might be against the high salaries their leaders receive, but also how much they normally lack direct instruments to enforce their preferences. In this respect, we can consider union members as the multitude of shareholders of a company where managers has gained almost full control. Union members will face the classical hold-up problems discussed in the corporate governance literature. The incentive compatibility constraints might be especially severe in the union case because of the way general union presidents are selected. While the Ladrum-Griffin Act imposes direct elections of local leaders, it does not say anything about the appointment of all other positions in the higher-up hierarchy of the union. The vast majority of unions vote their presidents at a general assembly in which only the local union leaders are invited. This somehow mimic the election of the US president as voters elect big electors that will then be in charge of electing the president. The big difference is that while in national elections this is little more than a formality, this is not the case for the unions. Career concerns in fact are likely to play an important part in the decision of which candidate to vote into presidency. This creates a clear incumbent advantage and makes changes in the union governance very rare.

Indeed, very few unions experienced a change in the voting system of their National presidents. The Teamsters are the most noticeable exception. This is most probably due to a series of events. At the end of the '70s, the Teamsters had gone through two major crisis. First, the allegations of being entangled with the Mafia at the end of the '60s, and second, the two oil shocks, that led to diffused protest in the truck-driver industry until the 1979 independent truck-driver strike. In this context, in 1976 a group of provincial organizers started an internal group to reform the union: the Teamsters for a Democratic Union (TDU). The TDU's main goal was to involve union members more and break the power of entrenched leaders accused of doing their own interests rather than the workers' one. In the same years, they started a newspaper, the Convoy Dispatch, where, as of 1980, they started to publish the total salaries of the top union leaders denouncing them as self-dealing compensations. Together with this publication, they campaigned for the direct election of the union president. After 10 years of campaigning, they finally won this right with the 1991 elections. Somehow unexpectedly, voters supported John Carey, the leader of the reformist group, versus the establishment. Carey was re-elected in 1996, but then expelled by the union in 1997 accused of using union funds to finance his campaign. Despite no actual prosecution, Carey has never been reintegrated in the union. In his place, as of 1998, has been elected Jimmy Hoffa Jr., the son of the famous union leader of the '60s and '70s mysteriously disappeared.

Figure 1.8 shows the evolution of the compensation of the Teamsters' president and compares it with the average compensation of the other presidents. Both lines are normalized at one in 1976. Looking at this figure, we find several interestingly insights. First, it seems that the Teamsters' presidents had more unstable compensations than other unions' presidents before 1980. This is so for two main reasons: i) the arrest of Jimmy Hoffa at the end of the '60s, and ii) the strong consequences that the oil shocks had on the truck industry. Nonetheless, we do see a common pattern. This pattern starts to diverge in the mid-'80s. Possibly because of the TDU publications, the salary

Figure 1.8: Evolution of Presidents' salaries: Teamsters vs other unions



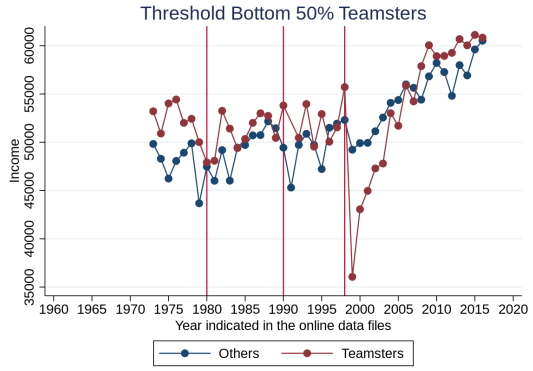
Sources: Lines for the Teamsters and the rest of the unions are built from our OLMS administrative data. *Note:* The Figure depicts the evolution of the Presidents salaries in the Teamster union and in the rest of the union movement with respect to the salaries of 1962. The three vertical lines are set in 1980, the first publication of the TDU; in 1991, the first Teamsters' presidential elections with direct members' vote; 1998, the year when the reformist Carey was dismissed as Teamsters' union president.

of the Teamsters' president does not come back to its 1976 level, while it clearly does in the rest of the union sector. Secondly, and much more strikingly, there is a drop in compensation as of the new reformative president is elected into office. Historically, this was the result of the pre-election campaign where compensations within the union became one of the main topic discussed, imposed as a theme for both candidates by the TDU. Eventually, members picked the candidate with a more radical view. The president compensation is in 1996 less than 40% of what it used to be in 1976 and below 1/3 of its highest peak. When Hoffa Jr. is elected into office, the salary of the president is immediately increased, but remains substantially lower than what it used to be at the time of his father: the change in the compensation practices had been structural.

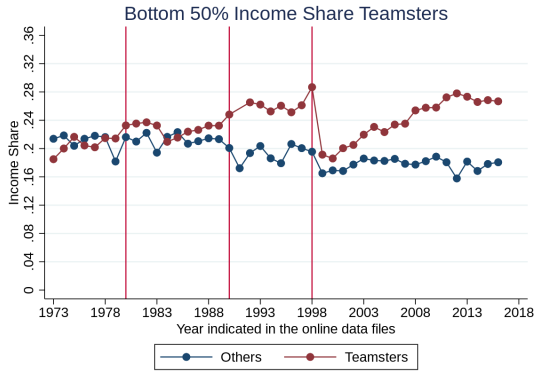
As the reformist president had imposed that no one could be paid more than the president, the entire Teamsters' earnings distribution was affected by his salary cut. For this reason we investigate the what consequences this had on the overall inequality level.

Figure 1.9: Top Income thresholds and shares in the lon-run: Teamsters vs. other unions

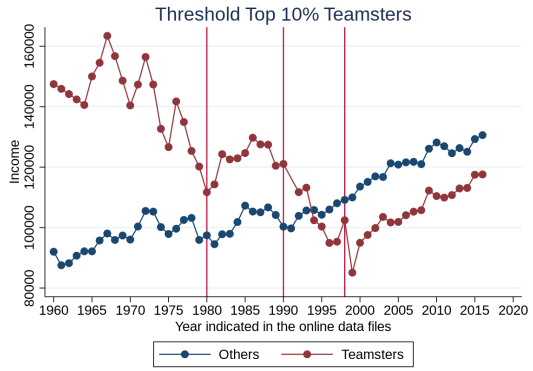
(a) Bottom 50



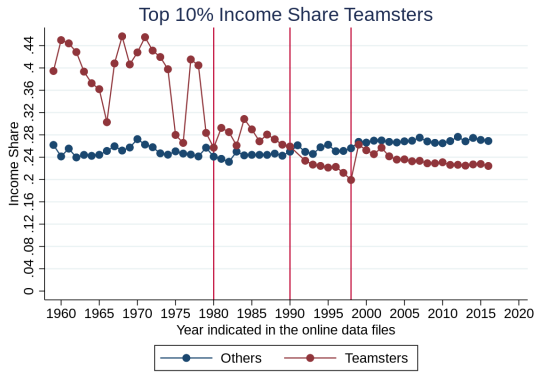
(b) Bottom 50



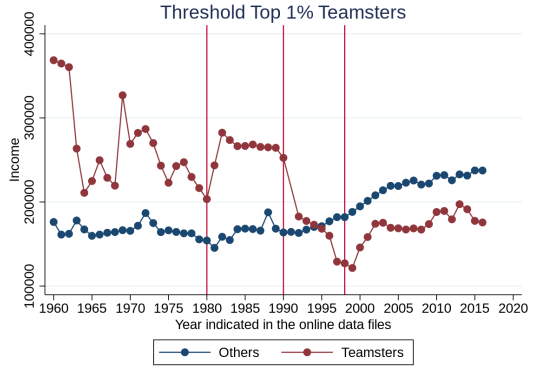
(c) Top 10



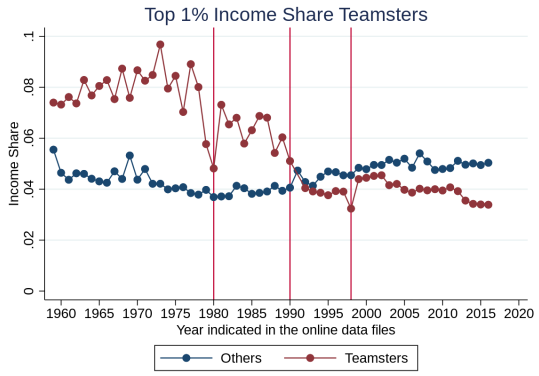
(d) Top 10



(e) Top 1



(f) Top 1



Sources: Lines for the Teamsters and the other unions are built from our OLMS administrative data. *Note:* On the left-hand side, the graphs show the evolution of the thresholds to be part of different income groups (Bottom 50, Top 10, Top 1) in the Teamsters and in the other unions pooled together. On the right-hand side are presented the evolution of the relative income shares that the different groups get. The jump in panel a) (not shown) reflects the fact that more than 50% of Teamsters workers earned until 1970 less than $ 10K even dividing the amounts by 5000.

In Figure 1.9 we plot once again the thresholds to be part of a certain percentile on the left-hand panels and the income shares of the relative percentiles on the right-hand panels. The three red lines represents again the beginning of publication of top union leaders' salaries, the elections in 1991 in which the reformist Carey won, and the elections in 1998, when Hoffa Jr. won. Looking at these figures, we discover that Teamsters presidents, as well as many other top officers in the union, had been paid way more than the average union equivalent. We also discover that the big reduction in compensation in 1991 affected up to the threshold to be part of the top 10%. Paralleling, the income shares accruing to top percentiles were substantially higher before 1991 (although there had been a reduction already after 1980) and dropped to just below the average union level afterwards. We conclude from this case study that members indeed strongly oppose high pay among union leaders: once they are allowed to express their preferences more directly, salaries are permanently reduced.

1.6.3 Social norms: media

Our last exercise test the role that the widespread social norm against high pay in the union sector, combined with the press, has in keeping the compensations of union leaders in check. Our proposed mechanism is as follow: we argue that the social norm gives incentives to the media to release articles about high-wage union employees because it will make a small scandal. Since scandals sell well, newspapers have an economic reason to do so. Such releases are a real threat to unions' reputation in the society and thus might affect unions' behaviour to avoid them or to mitigate their effects once they have been already published. It is about this last part of the chain we try to provide evidence for with data. Two important features are needed to assure the effectiveness of the media in limiting earnings among union employees. First, those earnings are publicly available. Second, the idea that union employees should not be highly paid is indeed widely spread among the general public. Concerning this last point, it is perhaps indicative that union leaders' reputation is among the lowest, just above

politicians or car-sales persons, in surveys such as Gallup[20].

Before turning to the statistical analysis of our sample, it is worth, for the sake of the argument, to focus on the likelihood of being targeted by the press given a certain level of salary. Note, however, that if the power of the press, together with the other mechanisms outlined before, is truly binding, we would observe very few union leaders openly "misbehaving", i.e. paying themselves high salaries. To illustrate better this possibility, let's take the case of Richard J. Hughes Jr., President of the Shipyard Workers union. Consulting OLMS fiscal records, the Washington Times[21] found that Mr. Hughes had been paid 1.2 millions $ from his union. Once contacted by the newspaper, the president told them he would give back more than half of the amount he had perceived the previous year, claiming it had been a mistake he got that much. This seems to be quite unlikely as financial records are compiled by the unions themselves and such a costly mistake should have been easily spotted[22]. Nonetheless, even if it was a mistake, this example perfectly illustrates two things: the absolute freedom to pay whenever salary to their leaders that unions in theory have, and, at the same time, the strong effect media can have in affecting union leaders' salaries: simply being reached out made the union president give back more than 600K dollars to avoid a scandal!

Table 1.6 presents the number of observations recorded with a salary above a series of earnings brackets and the total number of articles released on those individuals. As it is evident, the odds of being accused of excessive pay by a newspaper are increasing with the salary perceived. Note, however, that these statistics do not take into account the size of the organization, the position held, and the earnings of the represented workers among other things. All of these might be important elements to determine the degree of exaggeration of a compensation. Still, the probability of being covered by

[20] Saad, L. (2015): "Americans' Faith in Honesty, Ethics of Police Rebounds"; Social Policy Issue, Gallup

[21] Article published on the Washington Time on the May 11, 2009

[22] Additionally, note that the amount has not been denied as false, just said it was wrongly too high.

Table 1.6: Number of observation and media releases by earnings brackets

Workers above...	2006	2010	All Periods	Media Releases	Percent Attacked
100 000$	10197	11080	147952	146	0.01%
300 000$	83	111	1332	57	4.3%
400 000$	17	16	251	28	11.1%
500 000$	7	6	87	17	19.5%

Sources: The observation for the union workers come from the administrative records of the OLMS. We have manually assembled the one related to press attacks. *Note:* Only individuals recorded with a positive earning the two consecutive years after being mentioned in press are used to construct this table. All figures refer to the number of observations, not to the number of individuals.

a newspaper article is less than 1 out of 20 for people earning above 300 000 $, while this goes up to 1 out of 5 for those earning above 500 000 $.

Next we turn to the econometric analysis. In order to identify the effect of a media release on the salary of a union leader we run an event analysis looking at the evolution of his compensation just before and just after the news release in a static (equation 2) or dynamic (equation 3) way.

$$w_{it} = \Phi_i + \delta_t + \gamma T_{it} + \mu_{it} \tag{1.3}$$

$$w_{it} = \Phi_i + \delta_t + \Sigma_{j=-12}^{j=12} \gamma_j * 1(t - t_i = j) + \mu_{it} \tag{1.4}$$

In both equations Φ are individual fixed effects, δ are year fixed effects, and γ should capture the effect of the media release in the static (equation 2) or dynamic (equation 3) specifications. Finally μ, is in both cases an i.i.d. random error component.

Table 1.7 reports the results of the main event analysis. Log of annual earnings is the dependent variable in Panel A, while in Panel B we present the results using actual annual earnings. The estimated elasticity of individual salaries with respect to the media release varies between 0,16 to 0,25 depending on the specification. In all columns, the results are significantly different from zero even when individuals that are also ac-

Table 1.7: Effect of media releases on union leaders earnings

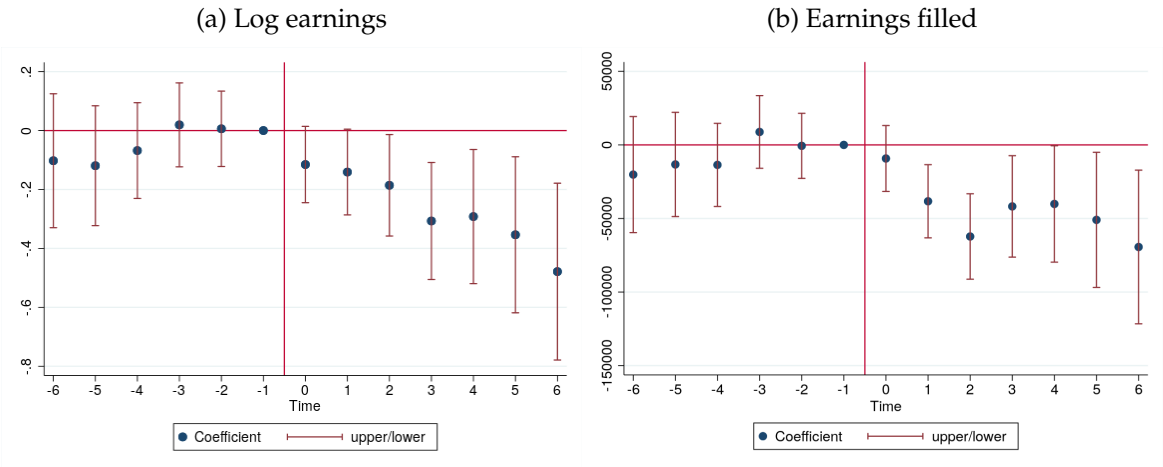
	Panel A: Log Earnings			
Treated	-0.165***	-0.248***	-0.206***	N.A.
	(0.04)	(0.048)	(0.046)	(-)
Const	11.87***	11.86***	11.83***	N.A.
	(0.056)	(0.057)	(0.055)	(-)
	Panel B: Annual Earnings			
Treated	-12 868**	-21 557***	-21 107***	-29 271***
	(6 115)	(7 351)	(5 527)	(9 439)
Const	182 985***	182 245***	179 752***	192 279***
	(6 428)	(6 578)	(5 562)	(11 329)
Restrictions				
(t=0) excluded	No	Yes	Yes	No
Last year excluded	No	No	Yes	No
Exiters put at 0	No	No	No	Yes
N	1856	1702	1555	1973

Notes: The Table reports the results of the event study analyses of media releases on union leaders earnings. Dependent variable in Panel A is the log of earnings, while in Panel B we use actual annual earnings. Robust SE in parenthesis. * *p<10%*, ** *p< 5%*, *** *p<1%*

cused of additional real crimes and that might end up going to courts for these different reasons, are excluded (column 3). The fact that a sizable share of those individuals classified as excessively well paid is also involved in criminal activities seems to confirm that, indeed, high pay among union officers is most probably considered as something wrong that should not be done and that only those with less moral constraints are willing to do. This does not mean that all persons reported by the press are misbehaving. As already stressed several times, in most cases union leaders pay themselves considerably less than CEOs of private firms of similar size. However, because the level of their pay might still pass an implicit threshold, they might be forced to reduce their compensations if exposed by the press.

Figure 1.10 shows the time varying coefficients estimated from equation 4. Figure 1.10(a) has as dependent variable the log of earnings, while 1.10(b) uses the absolute level of earnings filled with a zero if the union leader disappears. The drop in earnings becomes apparent and stable as from the first year of the scandal. It however keeps

Figure 1.10: Dynamic effects



Notes: The Figure depicts the average dynamic effect of a press attack on the salary of the attacked leader. On the left-hand panel, the dependent variable is the log of earnings. On the right hand panel we fill with a zero for two consecutive periods the earnings of a leader that exit our sample after an attack.

decreasing afterwards. This might be due to two things: first, some individual is attacked in the press several times in different years, as it is the case for John Bowers, the long-lasting leader of the East Longshoremen union. Although after each attack we do observe a reduction in his pay, the drop becomes stronger after the second attack. Since we classify a person as treated as from the first time he appears in the press, delayed effects are somehow expected. Second, some union officers leaves the sample, making the panel not perfectly balanced, especially at the end. Selection might thus be also partly at play. We control for this problem in Figure 1.10(b), where indeed the drop is larger until period 2 and then stabilize at around -50 000 $. To conclude, the social norm pushes the media to release articles about high-wage union employees, and it makes such releases a real threat for unions' reputation. Union leaders adjust their compensations as a response to limit the possible negative consequences on old members retention and new members affiliation.

1.7 Conclusion

American labor unions are often accused to replicate within their own organizations the same inequalities they fight on the outside; i.e. to have extremely well-paid bosses and poor employees. This narrative might have contributed to the reduction in union-

ization rates because American workers might have lost faith in their leaders. In the first part of this paper we address this question providing a careful measure of inequality in the union sector. We find that, contrary to what is often claimed, unions have a level of inequality that is much lower than the one prevailing in the private sector. On the other hand, we found that inequality in these institutions is comparable to that prevailing in other non-profit organizations, such as religious organizations, and the public sector. We document that our results are mainly driven by a different wage setting policy used by labor unions, rather than other possible explanations such as the organizations' size, the differences in the workforce composition or the number of hours worked. Our findings hence confirm, using administrative micro-data, that labor unions do behave according to their own values. They are also consistent with the broader empirical regularity that non-profit organizations are characterized by a lower level of inequality with respect to the one prevailing in comparable for-profit firms.

In the second part of the paper, we investigate what are the mechanisms that guarantees such a low level of inequality. We argue that such a low level of inequality, especially at the top, is puzzling because union leaders do have consistent margins to set their own pay due to the absence of governance mechanisms exerting a strong internal or external control on the pay-setting. In particular, it is not clear why union leaders would not align their compensations to those observed in private firms of similar size despite the little difference that exists in the actual management of these two types of organizations. One possible explanation advanced in the literature is that non-profit organizations employ a considerable share of intrinsically motivated workers. This would translate into the possibility to pay managers lower salaries. The presence of intrinsically motivated workers is indeed an important feature of labor unions, however we argue that this is unlikely to fully explain the empirical regularity observed. In particular, it is not able to account for the accusations of embezzlement of union funds that are still present in the American labor movement. If no constraint is in place, why a greedier union officer would not raise his salary rather than engaging in illegal

actions? To account for this, we propose a different set of arguments that can help explain our findings. The main idea is that there exists a social norm, widespread among union workers, union members, and the general public, that union officers should not receive too high compensations. The existence of this norm takes different forms and ensures that nobody has an interest in deviating from it. We test for the internal presence of the norm comparing two groups of unions that should be differently affected by it, namely originally communist influenced and originally non-communist influenced unions. We find that originally more left wing unions are even nowadays much more equal than the others. Second, we present evidence that the typical union member dislikes high compensation of his union leaders. We do so by looking at the salary evolution of union top officials in the Teamsters and elsewhere before and after that the Teamsters allowed their members to directly vote for the general union president. We find that, once members are directly involved in these elections and a candidate propose so, the salaries of the union leaders are strongly reduced. Finally, we show that the norm is present and binding for the union also in the general population. Violation of a norm might constitute a small scandal. Thus newspapers have incentives to cover those stories where a union officer is perceived to be paid too much according to this established common sense. Because reputation is crucial for the retention of the unions' consumer base, and hence it is crucial for survival, union leaders have a strong pressure to adjust their salaries in order to comply with the social norm. Transparency thus acts as a binding force that prevents the compensations of this particular category of workers to rise, even when this would have been possible and perfectly legitimate, if not optimal. To test this hypothesis we construct a new dataset gathering all the articles in which a union leader is attacked exclusively for his high compensation. We then test if the release of the article has had an impact on the future earnings of the targeted officer. As expected, we find that the earnings of the union leader under attack are lowered after the media release. In particular, we find that union officers' salaries are cut by an average of 20% in real terms. These results show that pay norms can have a real effect on salaries, at least when reputation is a crucial feature for the

continuation of the business. This mechanism might generalize beyond labor union officers: since information on top managers' compensations is also available for other non-profit organizations such as charitable organizations, the underlined mechanism might play an important role in keeping down the inequalities in the whole non-profit sector. More generally, the fact that norms influence the pay setting mechanism contradicts, at least in some sectors and at given conditions, the classical wage formation theories according to which workers are always paid their marginal product.

Appendix

1.A Preparation of the data

1.A.1 Estimating the number of individuals earning below 10K

In order to compute full-distribution measures of inequality we would need to know the salary of each individual in the distribution. Unfortunately, our data only covers all officers plus the employees earning at least 10K dollars. This threshold has not evolved over time and hence represents a fairly high cutoff in 1959, while it is mostly not binding after 2000. In order to account for this truncation of the data we have proposed 3 strategies:

1. Present the inequality evolution only for officers

2. Present the inequality evolution for officers and employees by transforming the 10K threshold in 1959 in actual dollars in all the remaining years (hence using 1959 as base year)

3. Imputing the number of individuals and their earnings for those employees earning less than 10K dollars

Point 3 exploits the information regarding the total amount paid to employees receiving less than 10K dollars that is available from 1959 to 1999 and then again from 2005 to 2016. The idea is that, in any given year within those boundaries, we can plot the distribution of employees' salaries for all unions. Fitting a functional form on those data and knowing the total amounts, we can retrieve, as an approximation, the part of

the distribution that we do not observe. In practice, this exercise is reduced to find the parameters of a quadratic equation of salary of the type $(a + bX + cX^2)$ such that they fulfill the following restrictions:

$$a + b10 + c10^2 = d(10)$$

$$b + 2c10 = d'(10)$$

$$\int_{min(x|a+bX+cX^2 \geq 0)}^{10} x(a + bX + cX^2)\, dx = M.\frac{I'}{M'}$$

Where $d(10)$ is the density at 10K observed in the data; $d'(10)$ correspond to its first derivative and M is the reported amount paid to all those employees earning less than 10K. Finally I' is the density of the observed function (i.e. the one above 10K), while M' is the unknown density density of the estimated function below 10K.

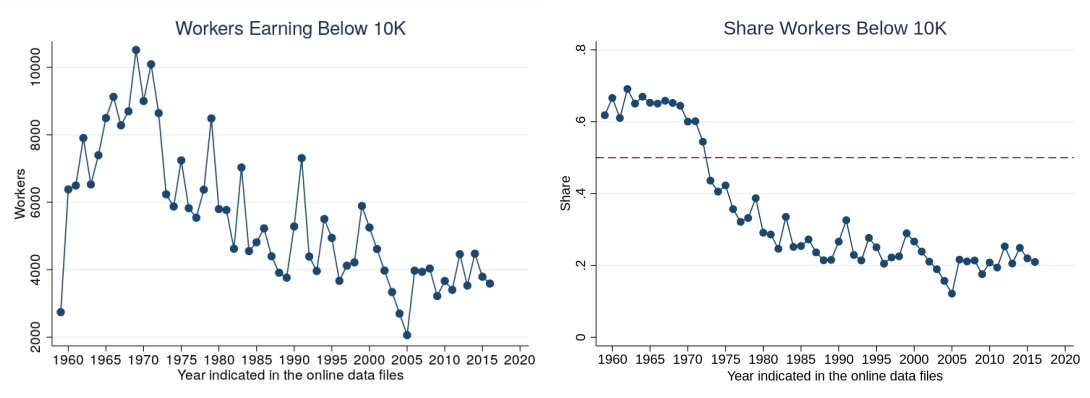
With all these parameters we will be able to estimate the ratio of the number of people above divided by the number of people below the 10K threshold. Hence multiplying this number by the number of people above you get what we were looking for. Mathematically this should be equal to:

$$N_{below} = N_{above} * \int_0^{10k} (a + bX + cX^2)\, dx$$

Figure 2.A.1(a) plots the number of estimated workers earnings less than 10K $ in each year. Figure 2.A.1(b) plots the relative weight of these workers among employees. As expected, they represented the bulk of them in the '60s and '70s, while they are nowadays less than 20%. This is still probably an overestimation given that we observe only 5% of people earning less than 10K using the CPS.

Figure 1.A.1: Estimating number of individuals below 10K

(a) (b)



Notes: Panel a) shows the estimated number of employees that in every year earn below $ 10K in union sector. Panel b) displays the weight that this group has on the total workforce of the unions. The red, dotted line represents 50% of the workforce.

1.A.2 Creating the main data

Labor Unions

The data used in the present study contains some misreporting mistakes because only a small fraction of the files is audited by the public authority. The fact that auditing is random should enhance the reporting accuracy, but there are no large penalties for simple and small mistakes. In addition to this, we manually digitized the entries for the period 1959-1999. Some typing mistake is unavoidable in this process, despite we lengthy verified the (actually extremely high) quality of the work done. To remove the most striking ones we use a combination of information. First, we check if any salary paid is higher than the total amount paid to officers (or employees respectively) or the total disbursements made. This rule of thumb is particularly useful for observations before 2005 when the total compensation line had to be written separately from the single amounts spent. After 2005, the completion of the total amount given to officers (employees) are made automatically by the electronic form, summing up all the earnings listed. It is thus always greater or equal than the single earning. Second, we compute the best and second best salary per worker within the years and we compute

the ratio between the two. Note that this is possible only if the worker is in office for more than one year. Finally, we 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 respective categories and the total disbursement, and the ratio between first and second top salaries is above 10; then we substitute the median salary for the detected mistake. Most probably, this method is effective only in capturing the biggest mistakes, leaving many others uncovered. However, it has the merit to target the most problematic ones leaving the raw data basically intact. Results shows that no important outlier remains except few that we fix manually. For instance, we 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 most probably driven by the fact that the electronic form does not take into account comas and hence scale up of a factor of 10 or 100 the amount reported.

We also proceed in correcting the main spelling mistakes in the full name of individuals so to have the longest possible panel of individuals. The correction of the spelling mistakes proceeds in 4 steps. The first one matches the full names of individuals that share the same surname, employment status (officer or employee) and the same union. In the second step we look at holes in the tenure of individuals. We then try to merge the names that should have appeared to have a continuous panel for individuals with those names in the same union, year and employment position that instead appears only once and that are hence likely to be another name misspelled. The third step apply the same logic of the second one to the observations at the extreme years (beginning and end of any individual observed more than twice). Finally, the fourth step is a pairwise match of all individuals (excluding those that contain a Jr or III in their names). In this case I might match two observations with different employment status in different years. Importantly, the score required to declare two names as the same in this last step is set quite high (at 0.7468). Moreover, we re-assign the original name

every time that a change in the name would create a duplicate in a given year.

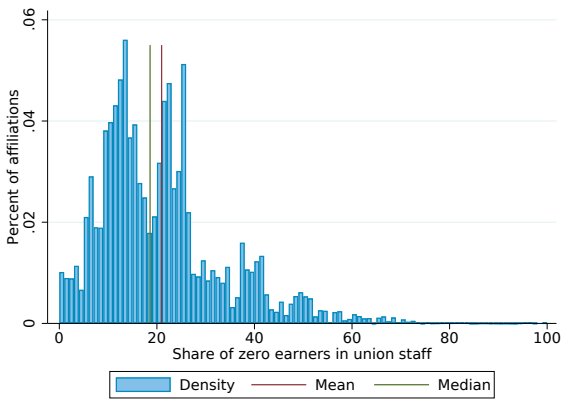
Table 1.A.1: Number of entries collapsed at the individual level

Entries	Individuals	Percent
1	3 079 883	97.01
2	86 857	2.74
3	6804	0.21
4	988	0.03
5	250	0.01
6	103	0.00
7	33	0.00
8	5	0.00
9	3	0.00
10	1	0.00
11	2	0.00
15	1	0.00

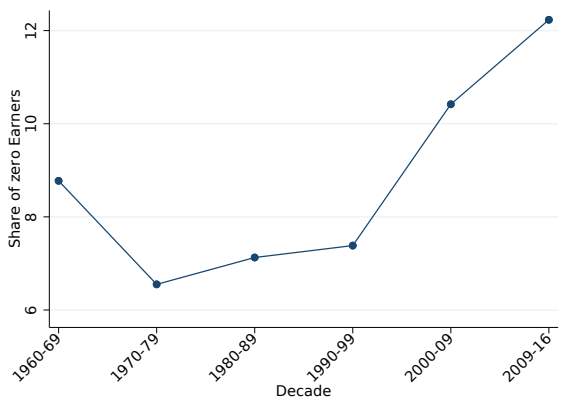
Notes: The table reports the number of positions occupied by a single individual and the associated frequency in the union labor force. This is the outcome of collapsing at the union name - year level for the first and last name. These table is computed only for the period 2000-2016, when multiple positions across locals can be detected. *Reading:* Most individuals hold a single position but a significant 3% hold at least two of them.

Figure 1.A.2: Share of listed officers earning a zero compensation

(a) Locals + NHQs: 2000-2016



(b) NHQs: 1960-2016



Notes: The left hand panel shows the distribution of the share of union officers earning a zero compensation together with its median and mean for the pooled years 2000-2016. The right hand panel instead plots the share of officers working in a NHQs not earning a positive salary over 6 decades, from 1960 to 2016. *Reading:* Local unions and other smaller units "employs" a larger share of volunteers than NHQs. However, in the last two decades the share of volunteers in NHQs has risen substantially probably reflecting the hard budget constraints faced by the unions.

March CPS

The annual earnings of salary and wage earners are constructed using the sum of the variables INCLONGJ and OICWAGE, each adjusted using the rank proximity swap values provided by the IPUMS, for all class of workers except self-employed. Total earnings includes OINCBUS and takes into account self-employment.

Firm size is computed as the number of employees employed by the same employer in any place last year. The categories recorded on the different years of the CPS change over time. We do create a uniform classification in 5 groups as of 1992, the first year labor unions are recorded as a separate sector: smaller than 10, between 10 and 99, between 100 and 499, between 500 and 999 and more than 1000 employees. We also aggregate categories 2, 3, and 4 in a unique one.

1.B Additional Results

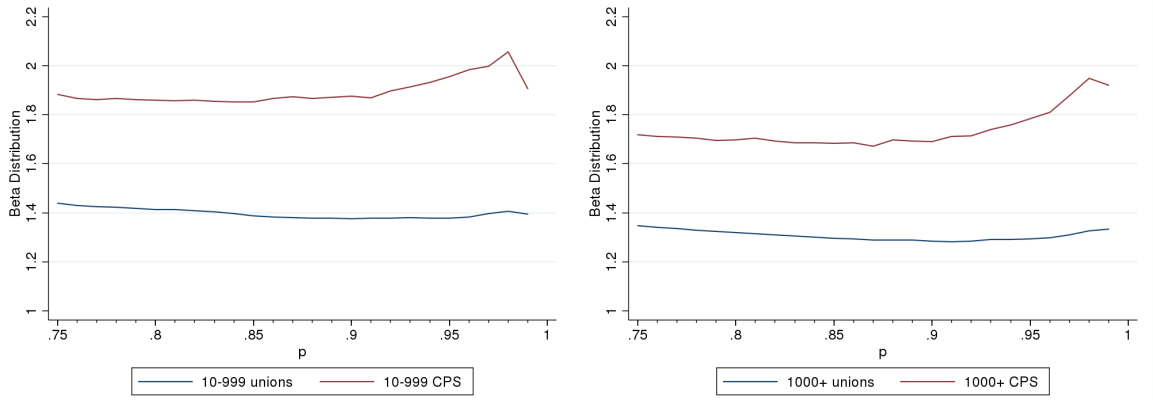
Table 1.B.1: Descriptive statistics: compensations and top income shares, by sector

	Unions LM-2	Private Sector	Public Sector	Unions CPS	Relig. Org	Legal Services
Average	81 381	55 736	56 289	70 752	43 299	99 458
Bottom 50%	27,4	23,8	29,1	29,7	29	17,25
Middle 40%	49,9	43,9	46,8	48,5	47,3	39,05
Top 10%	22,7	32,3	24,1	21,8	23,6	33,34
Top 1%	4,0	9,7	5,4	3,9	4,8	10,4
Gini	0,33	0,40	0,31	0,29	0,30	0,51
P90/P50	1,98	2,49	1,92	1,88	2,01	3,52
P99/P50	3,41	7,04	3,47	3,08	3,63	13,45

Notes: This table replicates Table 1.2 in the main text. Instead of using earnings, here we compute the Unions' distribution using total compensations for the period 2000-2016 pooled together. We keep comparing them with the total earnings in the rest of the economy. Only individuals above 10K$ (in 2000 real terms) a year in total compensations are included.

Figure 1.B.1: Inverted Pareto coefficients by firm size

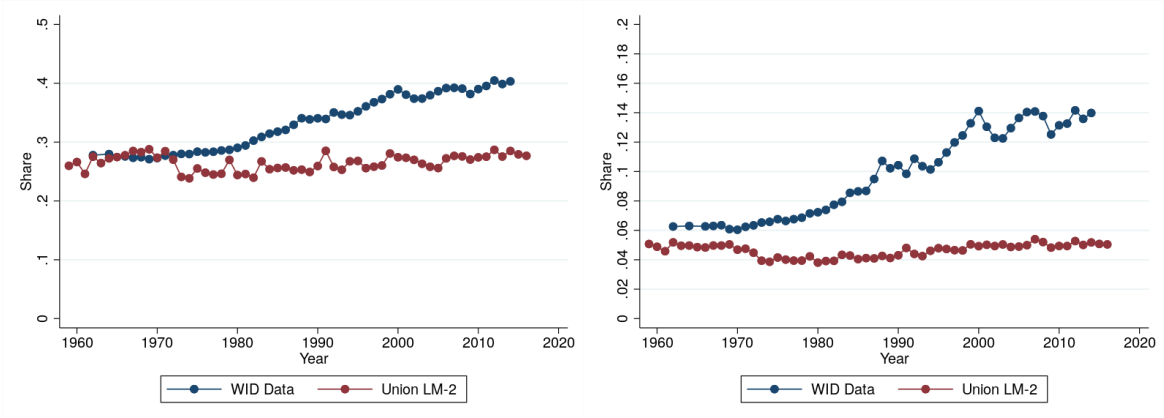
(a) 10-999 (b) 1000+



Sources: Union figures are built from administrative (OLMS) data. The figures for the rest of the economy are based on the ASEC supplement of the CPS. *Note:* The two figures depict the Inverted Pareto coefficients, Beta, from the 75^{th} to the 99^{th} percentiles of the respective distributions for two firm size brackets.

Figure 1.B.2: Share of top income shares: Union vs US labor income

(a) Top 10% (b) Top 1%



Sources: Union figures are built from administrative (OLMS) data. Estimates for the US labor market inequality come from the World Inequality Database (WID) and are based on the work of Piketty (2003). *Note:* Panel a) shows the evolution of the income share accruing to the Top 10% of workers in the respective distributions. Panel b) does the same concerning the Top 1%.

Chapter 2

Women of struggle: the role of women in the American labor movement

The work presented in this chapter was realized in collaboration with Caroline Coly

Labor unions have traditionally been the advocates of workers' equality, but women have been under-represented among their ranks for a long time. How do unions fare in terms of gender equality? Have they been precursors or followers in the empowerment of women? Using a novel rich dataset on the composition of American unions' workers between 1959 and 2016, we analyze the evolution of gender inequalities within these organizations, and compare them with the evolution of inequalities in the general society using the CPS. We find that the share of women among union workers rose quickly in the 1970s as women labor force participation increased. In 2016, around 20% of union top executives were women, almost 4 times the value in listed corporations (Matsa and Miller, 2011). Moreover, as women's enrollment in unions' key positions has increased, the officers' gender wage gap in headquarters has decreased and is now very close to zero, even at the very top. Albeit imperfectly, we thus find that unions hold a more progressive view of women in society. Large heterogeneities however exist even within

[0]We thank Thomas Breda, Eric Maurin, and all participants to the Chair Travail seminar (PSE), the 2021 IAAEU labor workshop (Trier). All remaining errors are our own.

the union movement, pointing towards the fact that gender gaps are strongly influenced by corporate culture.

JEL codes: J16, J31, J51

Keywords: Unions organization and structure, Gender, Social norms

2.1 Introduction

Gender inequality, especially at the top of the wage distribution, is still present in most labour markets (Goldin, 2014; Barth et al., 2017; Bertrand et al., 2010). Labour unions are among the institutions that fight to reduce the differences in compensations among workers. They are thus seen at the forefront of the effort to curb gender disparities (Corradini et al., 2022). Despite this, American labour unions have historically been a quite closed group, formed primarily by white, male, and relatively educated workers. Union members' demographic characteristics have, however, dramatically changed in the second half of the twentieth century with the rise of service and public sector unionism and their more black and female labour force (Farber et al., 2021). Little is instead known about the gender composition of unions' own workforce and particularly of their leaders.

Our aim is to fill this gap studying how American unions have been faring in terms of gender equality among their own ranks since the second half of the XX^{th} century. Our goal is to understand whether unions have been precursors, if they have been merely following the general trend, or if, instead, they have been laggards in the important fight against gender inequality. Since the largest disparities between men and women in the labor market are concentrated among the highest paid workers, we are especially interested in studying the gender gaps in access to, and compensation for, union top leaderships' roles. This is even more interesting as, in addition to their ideological stand, American unions have a peculiar labor market status too. On the one hand, they operate in a very competitive market selling a service, representation, in order to survive. In this sense, they are close to typical for-profit firms. On the other hand, they are granted corporate tax exemption, which makes them a 100% non-profit sector. In the for-profit sector a glass ceiling is still present, resulting in sizeable unconditional gender gaps (Bertrand and Hallock, 2001; Bertrand et al., 2010); in the non-profit one, although unconditional differences do exist, they are smaller and completely accounted for by simple organizations' characteristics (Hallock, 2002). Will gender inequality at the top of the union ranks be closer to the one observed in the for-profit

sector or to the one prevailing in the non-profit one?

We believe that studying the role and the position of women in the union sector is relevant for at least two reasons. First, representation is a complex activity: sharing the same demographic characteristics of the represented might increase the representatives' awareness of specific difficulties faced by them. Better knowledge should increase the efficacy of the policies undertaken and consequently the trust of the represented in their representatives. In our case, it is likely that women's interests might be better understood and defended by other women and, consequently, that women might trust more a female leader. Thus a balanced gender leadership should be beneficial for the quality of representation. The existence of separated unions by race or gender is well documented in different countries and time, pointing indeed towards the existence of a (unsatisfied) demand for same demographic characteristics representation (Hill, 1996). This idea is consistent with the theory of representative bureaucracy, which suggests that a public workforce representative of the people in terms of sex, race, and ethnicity will help ensure that the interests of all groups are considered in the bureaucratic decision-making processes (see Bradbury and Kellough (2011) for an overview). Empirically, Chattopadhyay and Duflo (2004) has shown that increased representation of women in village councils in India has increased spending in their favor. Similarly, Pande (2003) finds that mandated political representation of minorities also in India increased transfers for the impacted groups. In France, an exogenous increase in female representation in the National Assembly resulted in an increase in laws representing women's interests (Lippmann, 2020). Finally, Corradini et al. (2022) show that when the major Brazilian union confederation made women's issues a central priority, their leadership gender composition became perfectly balanced and the organized workplaces became more female-friendly.

The second important reason is that women and men might also differ in their way of negotiating. A large literature in psychology and behavioural economics (see Croson and Gneezy, 2009 for an overview) has shown that there exist profound differences in preferences depending on gender. This seems to be true also among top managers

in the private sector (see e.g. Adams and Funk, 2012). Differences in preferences do translate in real differences. For instance, Matsa and Miller (2013) analyze the impact of gender quotas in Norway and find that impacted firms undertook fewer workforce reductions than comparison firms. It is hence possible that men and women also differ on their goals and way of bargaining and, ultimately, in the quality of the negotiated deals.

To look at the role of women in the American labor movement, we exploit a new, rich dataset on the compensation of American labor unions workforce since 1959. In addition to compensations for all workers directly employed by a union, this data contains the first and last names of each individual recorded and its exact position within the union. Part of the data (as of the year 2000) is freely available on the internet, while we have digitized the part concerning 1959-1999. Thanks to the richness and length of the data, we are able to study the long-run evolution of the presence and role of women in labor unions, from the heydays of unionism to the present, encompassing most of the dramatic demographic change in union membership' composition. Furthermore, we can also exploit the panel dimension of the data including organizations fixed effects to control for unobserved characteristics. To benchmark the level of inequalities found in the union sector, we use two additional sources. First, we use the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) both for the aggregate economy and for specific sectors[1]. Then, to compare gender inequalities among top earners, we use the World Inequality Lab database on the United States[2] based on the paper of Piketty et al. (2018).

We find that, if the share of women employees in unions went from below 5% to almost 45% over this period, the share of women among officers was still below 25% in 2016. Results are similar for the very top positions: women represent 25% of presidents, 20% of vice presidents and 15% of secretary treasurers. Concerning salaries, women in the '60s used to earn substantially less than men in all positions, and particularly so at the top. However, the officers' compensation gap have virtually closed

[1]Unions are themselves recorded as a sector as of 1992
[2]The data can be accessed here: https://wid.world/fr/country/etats-unis/

down completely. In recent years, women and men have been earning unconditionally roughly the same salaries, even at the very top. This points to a strong difference with the private sector, while it is in line with what has been found for the American non-profit sector in general (e.g. Leete, 2000)[3].

To better understand the link between the gender of the representatives and the one of the represented, we link CPS occupations / sectors to the unions organizing them. We then look if the share of women observed in each union corresponds to the share of women in the related occupations / sectors. Indeed, we find a positive relationship between the two. This relationship strengthened over the decades and is still present, although one order of magnitude smaller, including occupations fixed effects. Even in most recent years, however, the slope of the relationship is well below one. Moreover, as shown including fixed effects, internally, unions react very little to changes in their workforce's gender composition. Most of the change occurring through time is instead driven by old, male unions being replaced by new, female ones.

To explain these patterns, we further test for the role and stickiness of gender social norms in perpetrating gender inequalities within organizations. To do so, we test if unions created at different points in time, when different stereotypes concerning the role of the women prevailed in the society, and when more or less women belonged to the newly unionized establishments, do have a different leaderships' gender composition. In order to do so, we follow the distinction of Milkman (2016), who classifies American unions based on their relationship towards women in four, non-overlapping waves. Practically, we divide unions based on their year of establishment or fast growth.[4] Our results indicate that, in line with the qualitative study of Milkman (2016), unions from the first wave (created before 1908) of unionization, which were historically the most hostile to women, have the lowest number of women leaders even

[3]Comparing the US labor unions with their French homologous we see that American unions fare substantially worse than French ones that have now achieved almost full gender parity among their employees (Mourlot and Pignoni, 2018)

[4]Some unions have been created in the beginning of the 20th century, but will be categorized in the 4th wave, that is the one starting after WWII. This is because they all experienced the most radical growth in membership in this period compared to the beginning. The chief example are public sector unions: while having members well before 1962, it is only after this point that bargaining in the federal sector will be authorized by law and thus membership booming

in recent years.[5] Unions belonging to the second wave (created between 1910 - 1929), instead, moved away from a predominantly male leadership in the mid-80s, to better match the characteristics of their organised members. Finally, unions from waves 3 (created between 1930 - 1948) and 4 (created between 1955 - 1970) gave a much more important role to women since the beginning. In particular, unions belonging to the 4th wave - established in the late '50s and organizing mostly female intensive occupations - were and still are the most feminised ones. Concerning social norms, these results point to the fact that corporate culture, and particularly the role attributed to women, do matter for gender discrimination, even over the long run.

This paper contributes to several strands of the literature. First, this paper adds to a large literature looking at the evolution of the gender wage gap in the for-profit (Bertrand et al., 2010; Goldin, 2014; Barth et al., 2017) and non-profit sectors Leete (2000). We provide long run evidence on the level of participation and wage gaps of women in American labor unions, a competitive but 100% non-profit sector, which has never been studied before. In particular, we relate to studies that focus on inequalities at the top of earnings distribution (Bertrand and Hallock, 2001; Hallock, 2002; Bell, 2005; Matsa and Miller, 2011; Shin, 2012). For instance, Bertrand and Hallock (2001) find that women represented only 2,5% of the top 5 highest paid executives in US listed companies between 1992-1997 and earned 45% less than men. Similarly, Matsa and Miller (2011) find that in 2009 the share of women had increased to just 6%. We show that in labor unions the share of women in the top 3 positions is substantially larger, at around 20%. Moreover, we show that since the 1960s, the unconditional gender wage gap in these organizations has considerably reduced and is nowadays close to zero among union officers. Our results suggest that even if labor unions could not entirely escape from the gender norms prevailing in a given time in their society, they have always been better than private firms and do represents, albeit imperfectly, a more progressive vision of the role of women.

[5] One big exception is the Hotel and Restaurant Employees union (HERE). Due to its gender segregation structure, women were always present among its officers and grew steadily, see Cobble (1990) for more details

Second, our results relate to studies that look at corporate culture in the firm (Bloom and Van Reenen, 2010; Bloom et al., 2012; Guiso et al., 2006, 2015). While most of these work have focused on the relationship between corporate culture and productivity, we show that i) corporate culture may be pervasive, affecting also the wage distribution and particularly the gender wage gap, ii) corporate culture is formed at the out-born of an organization and tend to be very persistent; iii) non-profit organizations do have a corporate culture too, but it might vary substantially even within narrowly defined sectors.

The rest of the paper is organized as follow: section 2.2 presents the historical and institutional context and the derived testable hypothesis; section 2.3 presents the data and the first descriptive statistics; section 2.4 shows the results, while section 2.5 discusses them. Finally, section 2.6 concludes.

2.2 Institutional background and context

Already in the 19th century with the *Knights of Labor*, workers in the United states started to organize and bargain for better contracts (Naidu and Yuchtman, 2016). Legal recognition of the right to bargain, however, came only with the Wagner Act in 1935[6]. According to this law, labor unions have the right to bargain with a given employer if they have obtained more than 50% +1 of the votes among the concerned workers in a certification election. Only one union at a time is allowed to represent workers in a given establishment. Workers benefit from better contracts and other excludable services offered by the union in exchange of a monthly payment. These payments are the unique resources of American labor unions. For this reason, these organizations resembles to private firms selling representation in order to survive (Holmes and Walrath, 2007). For instance, Breda et al. (2019) show that unions compete with each other and against employers to attract members and that total factor productivity is a good predictor of their survival. Unions are, however, exempt from corporate taxes, being granted the non-profit status. The Wagner Act, the New Deal economic policies, and

[6]Public sector employees will have to wait until 1962 the executive order 10988

WWII greatly increased the power of unions: in 1955, around 35% of the dependent labor force was a union member, an all times height. This success, and the money it involved, also led to corruption and mafia infiltration. Officially to curb these two, the Republican-led government passed in 1959 the Labor Management and Disclosure Act, also know as Landrum-Griffin Act. According to this regulation, unions are obliged to hold regular elections every 3 to 5 years to elect their local officers and national leaders. Local leaders are elected directly by members, while national leaders, with few but noticeable exceptions[7], are most of the times elected by national assemblies of local leaders. This difference in the election systems reflects the organization of the American union movement: local unions are in charge of grass-root mobilization and are thus those in direct contact with workers. At a higher level, regional branches coordinate the activity of several locals on a defined area. At the top, NHQs dictate the general line of the union, provide specialised assistance to bargain with the larger employers, and lobby for political support. As an additional layer, several unions might join forces to have a stronger political leverage by creating a confederation. The by far largest American confederations is the AFL-CIO, established in 1955 from the merge of the American Federation of Labor (AFL) and the Congress of Industrial Organizations (CIO).

As of 1935, American unions organize single establishments or, at the maximum, firms. A variety of unions exists, each concentrating its organizational efforts on a more or less specific category of firms / occupations and hence of workers. This is due to the accumulation of different waves of unionism that each time specialised in organising different types of workers depending on the evolution of the economy and of the labor force. According to Milkman (2016), 4 main waves of unionism can be distinguished in American history. In the late XIXth and early XXth century, the first unions started to organize specific occupations of skilled craftsmen *within* firms. In the '10s of the XXth century, the so called "*New unionism*" targeted whole plants, thus including less skilled

[7] In particular, the Teamsters as of 1991 allows members to directly vote for the national president. The United Auto Workers (UAW) has voted to have the same system Dec. 2, 2021

workers, mainly in the textile industry, creating a second wave of unionisation. The third wave started in the '30s and consisted in big unions trying to organize all blue collar workers in the heavy industries such as steel, chemicals and cars. Finally, after WWII, a fourth wave spurred organizing mainly service sector workers and, starting from 1962, when J.F. Kennedy made it legal, the public sector ones too.

Concerning gender, our dimension of interest, due to the gender segregation of the American labor market and the structure of unionism, most unions organize a majority of same sex workers. Union leaders usually came from the rank-and-file workers toiling in the same jobs they organized. A certain homophily between the union leaders and the workers they represent is thus to be expected. As pointed out by Milkman (2016), however, the four waves of unionisation strongly differed, among other things, in their regard towards women. Unions belonging to the first wave were openly hostile to women, fearing competition and skill downgrading for their male members. Many of these organizations reached the point of explicitly forbidding women to join, and some did so until the '40s. The second wave, differently to the first one, organized also less skilled workers in a given plant. Many women became members, but for a long time, even when women members were the majority, the leadership remained masculine, and women second-class members in need of protection rather than equality. As a result of the strong communist influence, the firsts to commit to equality of treatment between men and women, as well as race, nationality and any other physical or ethnic difference, in the workplace were unions from the third wave. However, due to the paucity of female workers in the industries they organized, this did not translated into a substantial female leadership. Finally, the fourth wave of unionism organized majority-female occupations and had thus a vast majority of female members. Moreover, being still relative young organizations when the role of women in the society started to improve, liberal ideas shaped these unions who have since then often had a female leadership.

2.3 Data

2.3.1 Datasets

Unions annual fiscal reports

The Data for the union sector comes from the administrative records that all labor unions have to submit to the American Department of Labor each year according to the Labor Management Reporting and Disclosure Act of 1959[8]. These documents contain information on unions' accounting structure, funds, membership and, most importantly for the present research, officers and employees compensations. Since 1959, they have been available upon request, while as of 2002, they have been made publicly available on the web site of the Office of Labor-Management Standards (OLSM) and can be downloaded without charge (first available year is 2000). One contribution of this work is to combine the openly available data with all the reports for the union National Headquarters for the period 1959-1999. These reports were kept in .pdf format at the US Department of Labor. We received them and digitize them through a specialised company. This was possible thanks to the financial support of the Institute of New Economic Thinking. We collect information on individuals' names and surnames, compensations and job titles. Additionally, we have the main financial information of the union they worked for. We re-address the interested reader to Holmes and Walrath (2007) and Breda et al. (2019) for a description of the accounting variables. In what follows we focus on the data choices made regarding our variable of interest: annual gross earnings.

Total compensations are divided in four sub-categories: gross salaries, allowances, other financial business disbursements and other non-representative disbursements, that summed up give the total compensation received in the fiscal year. Gross salaries are supposed to be reported annually, while unions are free to report allowances and

[8]Following a series of scandals concerning the embezzlement of union funds, the Republican-led government introduced this piece of legislation in order to curb illegal behaviour through transparency

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, we mainly focus on the gross salary definition, from here onward called annual earnings. Because our sources are raw files, with only a random sample vouched by the public authority every year, they contain a certain number of mistakes, likely the result of mistyping or misreport. We correct the most striking outliers concerning compensations, both in our digitized data and in the DOL's ones, using a very conservative approach that is described in more details in appendix 2.A.2 (together with a more detailed variables' description) while leaving the rest of the compensations untouched. Additionally we implement two data restrictions that we describe below.

First, depending on the size of the union, measured by law in annual receipts issued, the organizations are asked to report different amount of details that increase with their size. In this analysis we focus only on the largest organization category that are asked to fill the LM-2 report form. Virtually, all NHQs fall in this category, while not all locals do. Our choice is driven by the fact that smaller institutions are not asked to report employee's compensations but only officers' ones. Since we are interested in the union pay structure in its entirety we make the choice of disregarding from the analysis these organizations and their workers. However, since officers often held more than one position and might serve as head of a tinier local union among their duties, we decide to collapse the observations using first and last names by union and year summing up the different earnings accruing to the same individual. Since we do not have a unique individual identifier, we might sum up the earnings of two or more different individuals, potentially leading to higher inequality. We believe that this risk is quite limited while the gains from the collapse are important to assess inequality properly, especially at the top of the distribution, where multiple jobs holding is quite usual. In practice, we sum up the earnings of individuals across all types of unions, but keep only those individuals employed in at least one organization filling the LM-2 form. Note that the receipt threshold is varying over time but is always very low. We

are thus confident of capturing the vast majority of union workers in our analysis.

The second data restrictions we make concerns the lower bound of annual earnings that each individual has to make to appear in our dataset. The Landrum-Griffin Act mandated unions to include all compensations paid to officers, as well as all compensations paid to employees who earned above 10,000$ per year. This threshold has remained the same over our whole period of study. The threshold is not really binding if we focus on the years after 2000, as it is below the minimum wage for a full-time employee, but it becomes very relevant as we move further back in time. We account for this data truncation in several ways. For NHQs, the first and most simple way, is to focus only on officers, for whom we do not have such an issue. Alternatively, we estimate the number of employees we do not see in our data exploiting the shape of the distribution of earnings we do observe above the threshold and the reported total amounts paid to the workers paid below it. Details on the methodology can be found in appendix 2.A.1. On average, this method delivers very similar results as dividing the total amount paid to workers earning below 10K by 5000. We use this second option to study specific unions. For local unions, since our analysis is bound to start in 2000 when the minimum earnings for a full-time worker is already above 10 000 $, we apply this threshold to everyone. While the threshold of 10 000 $ remains fixed for the entire period under analysis, the market wages (and the minimum wage too) have been rising during the same period. To avoid to capture more individuals at the bottom of the distribution as time passes, we transform the fix threshold in an inflation adjusted one with the base year in 2000 and we keep only those nominal annual earnings above the year specific threshold. This choice guarantees comparability over time and, since we do not find any pattern in inequality, also allows us to pool altogether all the observations from different years. One element we do omit from our analysis is that unions quite strongly rely on voluntary work, and possibly on part-time and/or short collaborations. However, in the present work we are interested in the actual compensations paid within the unions and leave this extreme form of labour donation for future work.

We complement the compensations data in several ways. First and foremost, we exploit the first name of each individual whose compensation is listed in the data to retrieve his/her gender using algorithms[9]. Additionally, we clean and recode the detailed job titles. This allows us to identify those individuals with the highest positions in the union and focus the analysis on them. Finally, we augment the administrative data with two manually assembled information: i) the date of creation for each union and the relative associated wave classification based on the discussion in section 2.2 and, ii) the link between each union and the occupation/sector it mostly organize. For the interested reader, the first information is available in appendix 2.A.3, the second is available upon request.

Wage and Income inequality in the general population

The primary comparison source we use is the Socioeconomic Supplement (ASEC) of the Current Population Survey, from now on CPS. This is the best available source to measure gross earnings in the American labor market. For comparability, we focus only on employees disregarding self-employed, but adding them just reinforce our result. The main drawback of using survey data is the top coding of very high earnings used to protect the confidentiality of the respondents. Moreover top-coding replacement values have changed several times. To make a consistent series between 1968 and 2016 we apply the corrections formulated by the IPUMS when available[10] and otherwise substitute the top coded values with 10 times the occupation median earnings as prescribed in the Luxembourg Income Study recommendations. One additional interesting feature of the CPS is that it records labor unions as an independent sector as of 1992. We are thus able to compare our administrative estimates with the sample ones, cross validating our choices on one hand and lending credibility to the estimates based on the smaller CPS sample. Thanks to this feature of the CPS, we can compute hourly

[9]We use the *genderize* package of R in different rounds depending on the year, see more on this in the appendix.

[10]These tables are based on the internal data of the Bureau of Labor Statistics that are less severely truncated

wages starting from earnings and usual hours worked in the previous year, allowing us to take into account hours worked and part-time more directly. Doing so, we show that this does not influence our results. It also allows us to estimate approximately how many people are paid below 10 000 $ and thus how much it is likely to affect the results focusing only on workers above this threshold. As an alternative way to deal with top coding and sample limitations in capturing the gender of those at the very top of the earnings distribution, limitations that our administrative data do not have, we compare our results to the series taken from the World Income Database (WID) project based on the work of Piketty et al. (2018).

2.3.2 Descriptive statistics

We present descriptive statistics for the whole period and divided by decades for NHQs (Table 2.3.1) and local unions (Table 2.B.1, appendix 2.B). Over the whole sample of National Headquarters, we observe 199 different unions. In any given decade, however, only a fraction of these unions are present due to the merge, closure and openings of different organizations across periods. The number of unions peaks in the early 1990s, to sharply decrease until 2005 and then to stabilize at around 130. Differently, the average number of officers per union has stopped growing only as of 2012. This reflects on the one side the rise of union membership until 1980, on the other, the rising concentration of organizations to face declining membership since then (see also figures 2.B.1(a) and 2.B.2(a) in appendix). Turning to local unions, we see that the trends match remarkably well the corresponding ones in NHQs: there is a substantial destruction of local unions, passing from 18,000 to 14,000, a 22% drop, and a substantial raise in the average number of officers per local union, from 8.3 to 8.9, i.e. a 7% growth (see also figures 2.B.1(b) and 2.B.2(b) in appendix).

Women are under-represented for the whole period of analysis, but we do observe a clear, rising trend in the female share of union workers. For instance, between 1960 and 1969, 80% of unions did not have any women officer. This number has dropped

Table 2.3.1: Descriptive statistics on unions' National Headquarters

	1960-2016	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2016
Mean wage men	78,628	78,971	79,809	74,990	74,780	81,565	84,083
Stand. dev.	(47,180)	(37,824)	(36,688)	(38,274)	(44,865)	(60,831)	(57,085)
Mean wage women	57,255	72,862	53,914	50,399	53,705	60,761	65,726
Stand. dev.	(31,302)	(27,193)	(17,006)	(21,225)	(27,457)	(35,709)	(40,438)
Mean wage men officers	95,548	92,508	94,282	84,338	90,671	110,080	107,941
Stand. dev.	(80,176)	(70,468)	(67,887)	(62,192)	(70,410)	(112,206)	(87,749)
Mean wage women officers	58,847	46,633	44,074	36,890	46,119	78,556	76,439
Stand. dev.	(67,982)	(38,122)	(47,984)	(48,361)	(58,012)	(73,757)	(81,114)
Share unions w/o women officers	0.53	0.8	0.72	0.53	0.42	0.38	0.35
Share women	0.38	0.05	0.25	0.39	0.43	0.46	0.46
Share women (officers)	0.17	0.05	0.07	0.13	0.18	0.22	0.25
Avg number officers per union	19	12	14	17	18	24	27
Number of distinct unions	199	98	120	150	160	134	125
Number of women	265,562	2,235	23,991	55,082	65,102	71,482	47,670
Number of men	428,248	44,547	73,009	87,209	85,266	83,261	54,956
Number of observations	693,810	46,782	97,000	142,291	150,368	154,743	102,626

Note: The table shows descriptive statistics for union NHQs for the whole period of analysis and by decades.

substantially along the years, but it is still around 35% in 2016 for NHQs. Local unions are even worse but do also display a declining trend: close to 50% of locals did not have any women in 2000, against 45% in 2016 (figure 2.B.3, appendix 2.B). Paralleling, only 5% of officers were women at the beginning of our analysis, while they are 25% for 2010-2016 "decade", an increase of 5 times. Employees were most probably always more feminized than officers, but due to reporting rules we do observe too few of them in the first decades. Together with the raise of public sector unionism, they are indeed most probably responsible for a large part of the swift rise in female share between 1970 and 1990 shown in figure 2.B.4(a), appendix 2.B. Focusing on top employees (figure 2.B.4(b) appendix 2.B), i.e. those earning at least 10K $ in 1959 real terms, however, we still see a constant raise of the share of women starting from the second half of the 1970s. The rise is even more pronounced than the one for officers: starting from around 5% in 1975, women account for 35% of best paid union employees in 2016. Again, locals do worse than NHQs with just 26% of female employees and less than 20% of officers in 2016. Here too, though, the trends are positive, but their slopes is very small (figure 2.B.5).

Concerning compensations, men officers earn 38% more than women in the full sample. This gap, however, varies substantially by decade. If for the 1960-69 period the

few employed women we observe had an almost 50% earnings penalty with respect to men, the patterns are different in the other decades. We pass from almost 50% income gap between 1970-79 to roughly 29% in 2010-16. Note, however, that standard errors are quite wide for officers. Looking at the full sample including best paid employees, we observe similar, but smaller income gaps. The exception is made by the 1960-69 decade where, again most likely due to reporting rules, men and women seems to earn almost the same. In local unions too, as reported in Table 2.B.1, we do see a reduction of the average difference in compensation between men and women both for all union workers and officers only.

Table 2.3.2: Descriptive statistics on CPS sample

	1962-2017	1962-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017
% of women	46.03	37.01	41.08	45.72	48.12	48.53	48.82
Mean hourly wage of men	-	-	21.80	21.28	22.39	26.82	26.97
Mean hourly wage of women	-	-	13.71	14.22	16.17	19.23	19.86
Mean total income of men	46,121	39,463	43,727	42,892	44,124	50,462	51,224
Mean total income of women	28,350	18,231	20,466	23,325	27,917	32,983	3,532
% of unionized*	14.5	24.4	25.9	17.1	17.05	14.23	12.61
% of women unionized*	11.5	14.9	17.2	12.5	14.17	12.96	11.99
% of men unionized*	17.1	30	32	21	19.71	15.42	13.18
Number of observations	4,355,452	292,280	524,242	647,712	592,827	1,322,362	976,029

Note: The table reports descriptive statistics for the ASEC supplement of the CPS from 1962 to 2017 and divided by decades. The sample is restricted to employed workers only. Percent of unionized refers to workers that are either members of or covered by an union. * The values before 1980 are computed separately using data from Farber et al. (2021).

Turning to the CPS, we do see a clear trend in women labor market participation. In the 1960s, women account for little more than 1/3 of the total number of workers as can be seen at the top of table 2.3.2. At the end of our sample period, this number is close to 50%. Throughout the years women are paid less than men, but constantly less so, both in terms of hourly wages and total earnings. Very relevant in our setting, women have caught up men regarding their level of unionisation. Indeed, both men and women have experienced a fall in union density since the 1960s. However, the reduction for men has been way stronger. Women benefited from the relative higher public sector

employment and the increasing unionisation rate experienced there as shown in Batut et al. (2021). The fact that today both the labor force participation and the union density are very similar for men and women implies that trade union members are equally split between the two genders. In aggregate, we would thus expect a similar pattern for union leaders.

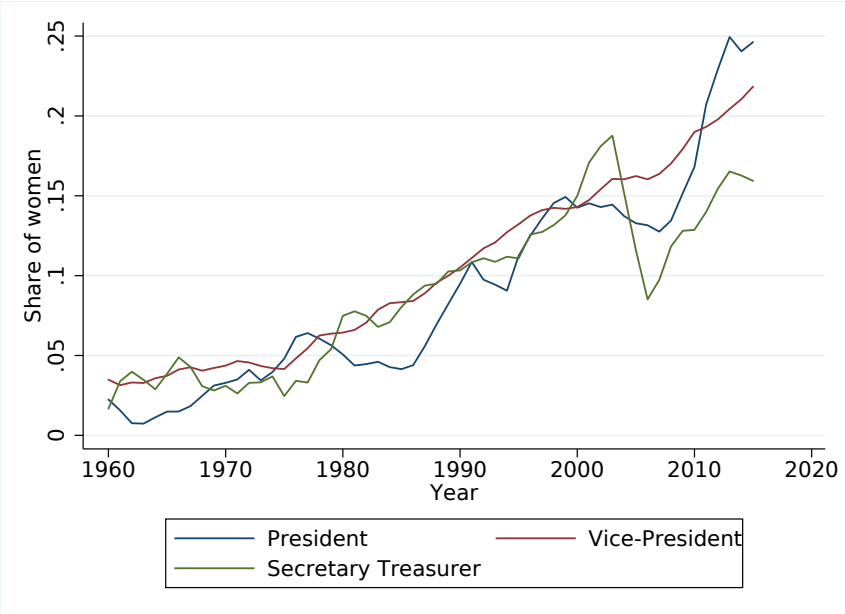
2.4 Results

2.4.1 Women gap in top positions

There are many different ways to look at gender inequalities within the union sector. The easiest one is to look at women presence in the total workforce. A slightly more complex one, that already gives an idea of the inequality that might exist, is to look at the shares of women in top positions or among top earners. We start by looking in figure 2.4.1 at the share of women among the three most important jobs within the union sector. These positions are the President, the Vice President, and the Secretary Treasurer of National Headquarters. Drawing a parallel with the private sector, they would roughly correspond to the CEO, the Vice President and the CFO of corporations. The share of women in these key positions has increased at the same pace of officers over time from virtually zero to 15-25% in 2016, depending on the position. According to Bertrand and Hallock (2001) and Matsa and Miller (2011) respectively, the share of women among CEOs of American listed companies was below 3% in the mid-90s and reached 6% in 2009. Unions thus fare a great deal better than these specific private firms, where extremely high compensations are concentrated, in having women employed in top positions.

A second way to encompass the whole distribution is to look at the share of women among defined income shares. As mentioned in the data part, in order to deal with the truncation of the employees' compensations, we need to impute the number of those paid below $ 10K. We retrieve the share of individuals paid below $ 10K in each year following Breda and Santini (2022). Starting from the amount these specific employees

Figure 2.4.1: Mean share of women among top 3 union positions

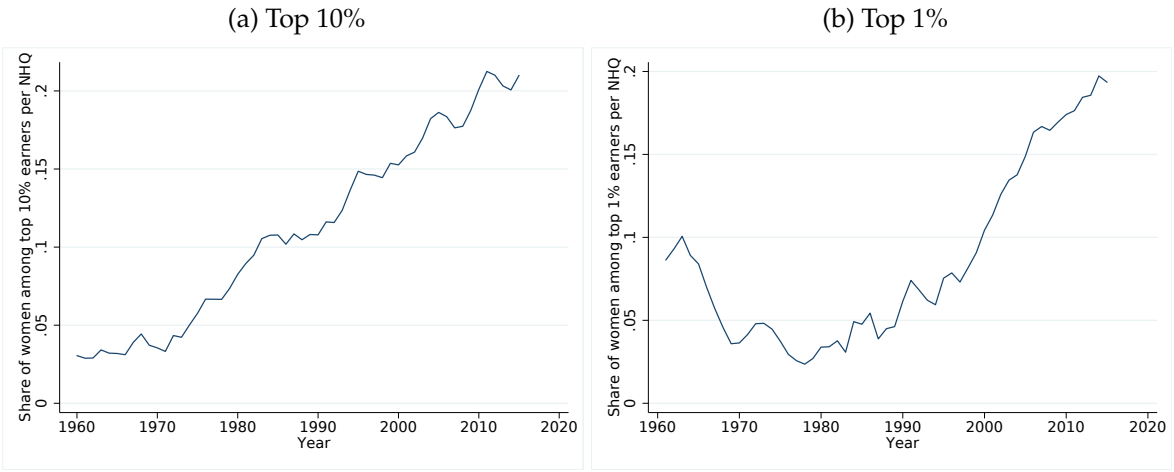


Note: The graph plots the 3-years moving average of the shares of women among the three highest positions (President, Vice President, Secretary Treasurer) in the unions from 1960 to 2016. *Reading:* The share has increased from about 2% in 1960 to around 25% in 2016 concerning unions' presidents.

receive all together (reported) and the distribution of workers earning just above the fixed threshold, we can retrieve their approximate number. Obviously, without making strong assumptions, we cannot know the exact distribution of earnings within this group. We thus take a different approach: we use the total amounts and the estimated number of individuals to computed the thresholds to be part of conventional top income groups - namely top 10 and top 1 percent - in the same spirit of the literature estimating top income shares started by Piketty (2003). Having these thresholds, we can then compute the shares of women among top earners. We conduct this analysis in two different ways. First, computing our measures of interest for each union and then plotting the averages of these measures. We call this *within* analysis, as it is first carried out within each single union. Second, computing the top income shares pooling together all the available observations and define thresholds to belong to top income shares for the entire sector. We call this second way *overall* analysis. The difference between these two approaches is that in the first one all differences in remuneration across unions as well as union sizes are cancelled out, while in the second one they are taken directly into account.

Figure 2.4.2 displays the results for the *within* analysis for NHQs, while figure 2.4.3 does the same for local unions. In NHQs, over the long-run, the share of women at the top stayed very low and increased only starting from the '70s (top 10) or '80s (top 1). In 2016, women were on average 20% of both the top 10 and top 1 percent earners within unions. Local unions do roughly the same in terms of top 1, but fare substantially worse concerning the top 10. Note also that while the dynamic concerning the top 1% seems increasing, the share of women among the top 10% earners for locals is quite flat over almost 20 years. Taking these figures together and adding the very large share of women among employees, we conclude that the American labor movement has relatively more women at the top and at the bottom than in the middle. This presence of women in *sandwich* has been found also in the French union context (Guillaume, 2018), despite the almost overall equal share of women and men employed there (Mourlot and Pignoni, 2018), and might represents an important obstacle to full parity.

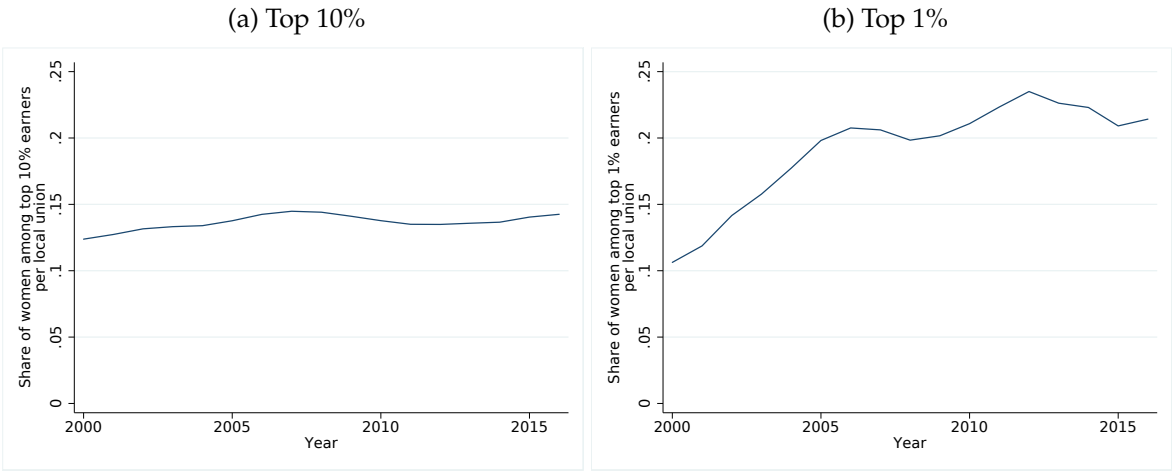
Figure 2.4.2: Mean share of women among top earners per NHQ



Note: The graph displays the evolution of the average share of women belonging to the top 10 and top 1 percent of NHQs' union workers *within* each union.

In figure 2.4.4 we report the analysis *overall* taking the whole sector, i.e. pooling together NHQs, branches and local unions (when available) as one. To benchmark with the rest of the US economy, we compare these series with the shares of women in the same income shares computed for the US working population in Piketty et al. (2018).

Figure 2.4.3: Mean share of women among top earners per local union



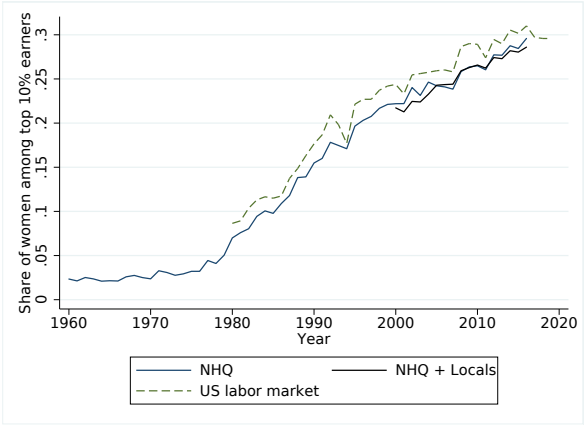
Note: The graph displays the evolution of the average share of women belonging to the top 10 and top 1 percent of local unions' workers *within* each union.

The blue line shows results for NHQs, the black one for NHQs and local unions pooled together, and the green dotted one for the US labor market. For both income shares, women accounted for roughly only 5% of the total top income groups until 1980. The relative size of women in these shares have since then grown steadily to roughly 28 and 17 percent in the top 10 and top 1 respectively. Including local unions does not affect the top 10%, but slightly increase the top 1%. This is because NHQs normally pay higher salaries and thus workers employed there are likely to be at the top of their unions' pay scales. Since, on average, NHQs do seem to have more women at the top, this pushes the shares upward. In all cases, the results for the union sector are very similar to the ones for the whole economy, if not slightly worse, particularly concerning the top 10%. Note, however, that women make up 25% of officers, only marginally more than their share among the very top ranks. This means that, conditionally on being an officer, women are equally represented at the top as in the average union workforce. This is not the case for the private sector, where women makes almost 50% of workers but only half of it at the top (and even less at the very top). A final point must be underlined: giving the strong occupational segregation characterising the US labor market and the uneven distribution of unions across these sectors, it is not clear if women are truly under-represented in unions with respect to the gender composition of their members, the most natural benchmark to compare with as argued in section

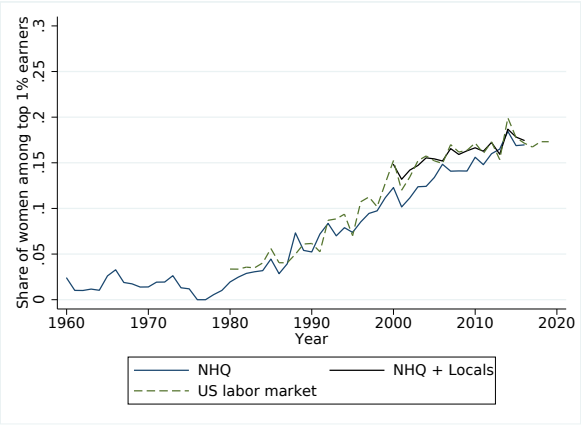
2.2. We will turn to this point in section 2.5.

Figure 2.4.4: Mean share of women among top earners

(a) Top 10%



(b) Top 1%



Note: The left panel depicts the share of women in the top 10% of different earnings groups. The right panel does the same for the top 1%. For labor unions top income shares are computed using NHQs only (1959-2016), or pooling NHQs and local unions together (2000-2016). For the US labor market, we use the gross labor income series of Piketty et al. (2018). Factor labor income excludes pensions, Social Security benefits, and unemployment insurance benefits and is gross of the corresponding contributions. The groups are defined relative to the full population of adults with positive factor labor income (either from salaried or nonsalaried work) aged 18-64.

Interestingly, there are no stark differences between the analyses *within* unions and the one *overall* in NHQs. This means that, on average, unions pay similar wages independently of their size and, as a consequence, the larger or lower proportion of women in certain unions does not impact much the results. A slight exception to this is the top 10% percent in the last years of our analysis. In this case the top 10 *overall* is a bit higher. This difference might be due to the fact that there are many women in good positions in thriving unions, notably in the public and service sector, than in the industrial ones, that are downsizing.

2.4.2 Gender wage gap

Gross earnings

From the analysis above, we learnt that women are gaining more and more space inside the union movement, but what about their pay with respect to men? As we recalled in the introduction, unions do defend an equal pay for workers, it is thus legitimate to ask how do they fare for themselves in this specific dimension of gender. Figure

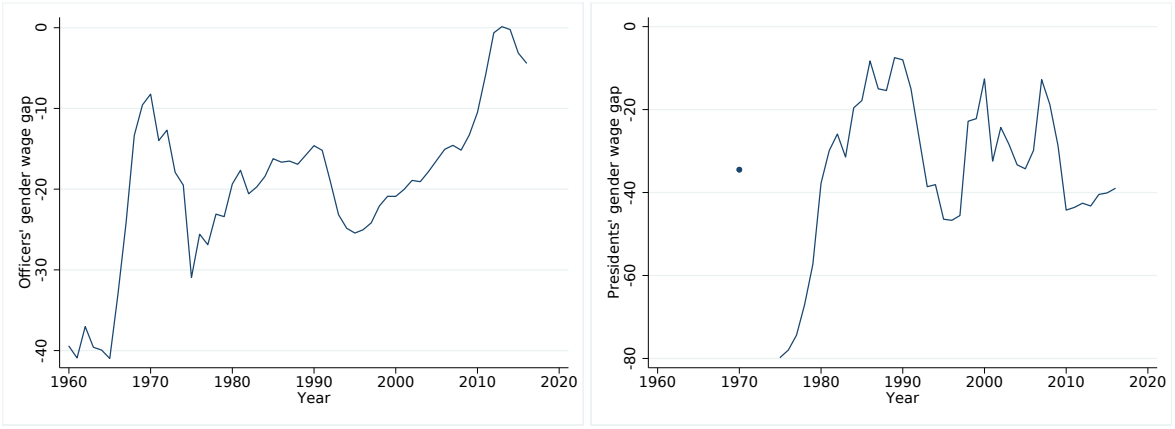
2.4.5 reports the wage gap [11] for officers earning at least ten thousands dollars in real terms in each year. We choose officers as they are always present. In addition, we implement the threshold to focus our attention only on the full-time union workers, certainly working exclusively for the union. In the '60s, we see that at the top of the union earnings distribution women were paid substantially less than men. This gap has remarkably narrowed with time and is close to zero in 2016. This means that women officers in union NHQs actually earn as much as man in gross earnings. If we zoom at the very top of the distribution looking at union Presidents only, we see that before the '80s there were basically no women above our threshold serving as President. On top of that, the unconditional gender gap was extremely large. Again, we do observe a convergence starting from the '80s with women presidents going from earning roughly 60% of men presidents to a 40% in 2016. The same holds if we look at all presidents without salaries restrictions, although less clearly. Note, however, that these gaps are unconditional, i.e. they do not take into account any firm or workers characteristics. It is known that top ranked individuals' salaries of private companies are strongly linked with size (Gabaix and Landier, 2008). For this reason we re-run the same analysis controlling for size of the managed union. We measure size as the total number of receipts emitted in a year. Results are reported in figure 2.B.8, appendix 2.B. As is displayed, results are barely affected. This means that men and women are on average in similar size unions or that size does not impact salary that much in this sector.

Figure 2.4.6 shows the *overall* gender wage gap for local unions in recent decades. In this case, we can present results for both officers and employees using 10K in 2000 real terms as common threshold. We find that the gender wage gap is much more precisely estimated but also larger than in NHQs. It varies between -30 and -20 % with small, but positive trends. Note, that these are, again, unconditional gaps. While the type of positions for officers in local unions are quite limited, and thus we can interpret the results as semi-conditional wage gaps, this is not the case for employees.

[11] The wage gap is computed by regressing the log of wages on gender. To simplify the interpretation, the y-axis of the graphs on the gender wage gap report the following transformation of the coefficient: (exp(coefficient) – 1) * 100.

Figure 2.4.5: *Overall* unconditional wage gap for officers

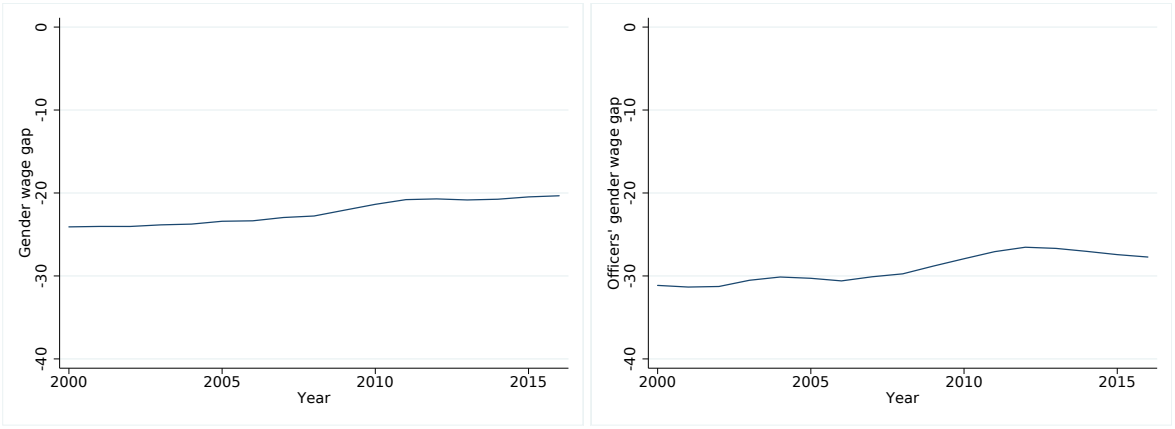
(a) All officers (b) Presidents



Note: Panel a) displays the 3-years moving average unconditional gender gap for officers employed in NHQs and earning at least $ 10K in total compensations in real terms (2000 base year). Panel b) shows the same limiting the analysis to NHQs' presidents.

Figure 2.4.6: *Overall* unconditional wage gap for locals

(a) All employees (b) Officers only



Note: Panel a) displays the overall unconditional gender gap for employees employed in local unions earning at least $ 10K in total compensations in real terms (2000 base). Panel b) shows the same for officers of local unions.

If instead of conducting the analysis for the overall union sector, we first aggregate at the union level and then average the different outcomes, we get a sense of how (on average) each union rewards its employees. Figure 2.B.9 for NHQs and 2.B.10 for local unions display these results. In both cases, we do find somewhat different results: gender gaps are at least 10 percentage points smaller on average, except for employees in locals, for which they are almost the same. In NHQs, the gender wage gap within

unions has been reduced considerably since the 1960s and is actually in favor of women in recent years. This suggests that within a given NHQ, the gap between men and women is quite small. The difference between the within and overall pay gaps suggest that women tend to work more in lower paying unions. Since size does not seem to determine this pattern, it seems that this is driven by unions without female officers paying higher wages to their workers.

Hourly wages

In addition to the size of the organization, another important element we have thus far neglected from the analysis are hours worked. It is known that women tend to work more part-time and in general less hours than men. This might create a simple illusion that they are paid *in total* less, while their hourly wages are identical. To take this possibility into account we rely on the CPS. As of 1992, labor unions are recorded in this survey as a separate (3-digit) industry. Providing the sample data match our administrative records, i.e. that they are truly representative of the sector, we can exploit all the detailed information that the CPS has on workers' and firms' characteristics, including firm size and hours worked. We check this by plotting the average income and the income shares at different thresholds for labor unions using the CPS and our administrative data. Note that extremely top salaries, especially in the private sector, will not be recorded in the CPS for confidentiality reasons, although we partially correct for top coding. As can be seen in Table 2.4.1, the two sources match remarkably well, we can thus use the CPS to carry the analysis in more detail.

To account for hours worked and focus only on wages, we compute hourly wages as the fraction of usual earnings earned last year and usual hours worked. We then regress the log of this measures of wages on gender and a set of standard explanatory variables. The most complete model is presented in Equation 1:

$$Y_{ij} = \alpha + exp_{ij} + exp_{ij}^2 + educ_{ij} + disab + gender_{ij} + \mathbf{race}_{ij} + \mathbf{size}_{ij} + \mathbf{sector}_{ij} + \epsilon_{ij} \quad (2.1)$$

Experience and its square are the years of experience on the labor market, education

Table 2.4.1: Comparing union income distribution for our administrative data and the CPS

	Unions LM-2	Unions CPS
Average	74 084	70 752
Bottom 50%	27,9	29,7
Middle 40%	49,6	48,5
Top 10%	22,5	21,8
Top 1%	4,0	3,9
Gini	0,32	0,29
P90/P50	1,92	1,88
P99/P50	3,30	3,08

Note: Pooled annual earnings for the period 2000-2016. Only individuals above 10K$ (in 2000 real terms) a year in total compensations are included.

the years of the highest education achieved, disability is a dummy for having a work disability, race are three dummies for being black, Asian and other ethnic groups, size is a vector of dummies for different size brackets, and sector is a vector of dummies for each specific sector as for the 1990 CPS classification. Finally, gender is a dummy for being a women and it is supposed to capture the difference in compensation between men and women holding everything else fixed. To get a sense of the magnitude of our coefficient of interest, we compare the union sector to the private and public sectors.

We start by regressing a simple Mincer-type model, with education, experience and experience squared, adding gender as variable of interest. As shown in the first three columns of Table 2.5.1, unions have the lowest gender gap that is always significantly different from the one in the private sector and significantly different at the 10% level with respect to the public sector. Controlling for other potential forms of discrimination, the result strengthen. Including firm size and a large number of fixed effects to recover the same level of analysis as in the union column in the two other macro sectors, we still find that unions pay women less than men, but proportionally less so than in the private sector. Note, however, that most probably due to the small sample size, the coefficients are no longer statistically different from each other.

2.5 Discussion

How can we explain the increase in the share of women working for a union? The first, obvious explanation we turn to is to look at the composition of the labor force. If more women enter the labor market, particularly in some stable and unionized jobs, we might expect that the share of women officers organizing them will grow as a consequence. We test this hypothesis by linking each occupation to the union(s) that is historically mainly targeting it[12]. We then collapse the share of women in the CPS and the unions at the occupation level and put the two in relationship for each decade. The results are shown in figure 2.5.1 and table 2.5.2.

Figure 2.5.1 plots the share of women in an occupation against the share of women in the organizing union by decade. Two things emerge: i) more women-intensive occupations are organized nowadays than in the past and, ii) the relationship between the variables of interest has strengthened over time. A better sense of the magnitudes is offered in table 2.5.1. Between 1970 and 1979, a 1 pp higher share of women in an occupation translated in a 0.2 pp increase in the share of women union officers. Between 2010 and 2016, the same relationship has grown to almost 0.5 pp. The richness of our data allows us to additionally include occupation fixed effects and re-estimate the relationship using within-occupation time variation as in equation 2.2:

$$Share\ union_{it} = \alpha_i + \beta_{it} Share\ occupation_{it} + \epsilon_{it} \tag{2.2}$$

The subscripts i and t stand respectively for occupations and years; α is a collection of fixed effects at the occupation level; β is the coefficient of interest. Looking at the last column of table 2.5.2, we see that, even within a narrowly defined occupation, an increase of the share of women raises the share of women working for a labor union. The magnitude is however quite small: an increase of 1 pp in the share of women in a given occupation increases the share of women in the organizing union only by 0.05 pp. To summarize, it seems that, albeit imperfectly, unions do match the gender com-

[12] Today these distinctions are less strong than in the past, but still roughly holds.

Table 2.5.1: Determinants of log wages, by sector

	Model 1: Mincer + gender			Model 2: 1 + discrimination			Model 3: 2 + firm characteristics		
	Private	Public	Union	Private	Public	Union	Private	Public	Union
Experience	0.0355***	0.0311***	0.0327***	0.0348***	0.0322***	0.0310***	0.0272***	0.0274***	0.0317***
	(247.03)	(99.46)	(5.84)	(252.10)	(100.82)	(5.78)	(201.10)	(85.93)	(5.97)
Experience^2	-0.000496***	-0.00047***	-0.000356***	-0.000499***	-0.000470***	-0.000348***	-0.000372***	-0.000380***	-0.000359***
	(-161.50)	(-69.31)	(-3.54)	(-162.27)	(-69.26)	(-3.48)	(-125.87)	(-56.48)	(-3.64)
Education	0.106***	0.0958***	0.066***	0.105***	0.0948***	0.0662***	0.0854***	0.102***	0.0630***
	(461.63)	(209.66)	(7.58)	(456.35)	(206.40)	(7.94)	(351.25)	(205.42)	(7.58)
Female	-0.24***	-0.227***	-0.1751***	-0.235***	-0.226***	-0.162***	-0.196***	-0.151***	-0.163***
	(-215.82)	(-103.47)	(-5.03)	(-212.04)	(-102.92)	(-4.71)	(-160.40)	(-63.93)	(-4.79)
Work disability				-0.170***	-0.117***	-0.0819	-0.129***	-0.108***	-0.0969
				(-43.27)	(-14.16)	(-0.85)	(-34.41)	(-13.43)	(-1.03)
Black				-0.134***	-0.0260***	-0.188***	-0.123***	-0.0507***	-0.183***
				(-77.05)	(-8.35)	(-3.42)	(-73.14)	(-16.50)	(-3.24)
Asian				0.0225***	0.0239***	-0.0492	0.0165***	-0.00742	-0.0453
				(8.12)	(4.15)	(-0.69)	(6.40)	(-1.32)	(-0.65)
Others				-0.0662***	-0.0506***	0.0637	-0.0522***	-0.0514***	0.0688
				(-16.45)	(-7.03)	(0.59)	(-13.43)	(-7.33)	(0.63)
10-99							0.0723***	0.0485***	0.181***
							(38.56)	(4.66)	(3.57)
100-499							0.122***	0.120***	0.179***
							(57.28)	(11.86)	(3.06)
500-999							0.152***	0.148***	0.147*
							(55.46)	(14.05)	(1.90)
1000+							0.189***	0.163***	0.131**
							(97.36)	(16.73)	(2.50)
Constant	1.046***	1.231***	1.784***	1.285***	1.400***	1.944***	1.446***	1.147***	1.863***
	(310.57)	(160.35)	(12.19)	(248.05)	(121.61)	(11.00)	(268.94)	(76.39)	(10.41)
Industry FE	X	X	X	X	X	X	224	208	X
Observations	1713732	357057	1160	1713732	357057	1160	1713731	357047	1160
Adjusted R^2	0.273	0.257	0.194	0.279	0.259	0.201	0.354	0.308	0.211

Note: In this table we use the dependent labor force recorded in the ASEC form of the CPS from 1992 to 2017. We compare the gender gaps in wages between the private and public sectors and labor unions. In the first specification, only the main Mincerian variables plus gender are included. In Model 2 are introduced other demographics characteristics for which workers are often discriminated. In model 3 we add firm size and 3-digits industry fixed effects (limited to the private and public sector). * p<0.1, ** p<0.05, *** p<0.01. Errors are robust to heteroskedasticity. T-statistics are reported in parentheses.

Table 2.5.2: Share of Women in unions and occupations organized

	Share of women among union officers					
	1970-1979	1980-1989	1990-1999	2000-2009	2010-2016	1970-2016
Share women Occupation	.199***	.275***	.313***	.425***	.494***	.053***
Occupation FE	x	x	x	x	x	✓
N	1,108	1,324	1,344	1,350	977	6,281

Note: Columns 1-5 report the slope of the relationship between the share of women in an occupation and the share of women in the main unions organizing it by decade. Column 6 displays the average within union variation in share of women officers as the share of female workers within the occupation increases.

position of their members within their own ranks. This is almost completely driven by new unions organizing different crowds, namely a majority female labor force, rather than old unions transforming to match the evolving occupational composition of their workers. Why do we see such a large difference in the magnitudes between the cross-section and the panel estimations? One possibility is that social norms and customs do influence greatly the composition of an organization's leadership. Milkman (2016) has hypothesized that for the American labor union movement, different waves of organization had different attitudes towards women (see section 2.2 for more details). If norms transforms into the corporate culture of a firm at its creation, these norms can become sticky. When an organization is mature enough, we would see only a moderate change within its workforce composition even if the organized labor force would completely change demographic characteristics. At any given point in time, though, different organizations will differ on their gender norms, thus resulting in the cross-sectional correlation shown before. We now turn to explore more closely this hypothesis.

To do so, we have divided all unions in our sample in the 4 waves described in section 2.2[13]. We then plotted the *within* share of women aggregated by wave. The result is shown in figure 2.5.2. As it is apparent, more recent waves had more women among their officers in the 1960s', but also today. Unions from wave 2 are those who

[13]As a general rule, we took the year of creation, but we classified in the 4th wave all those unions that experienced very large changes in membership after WWII, such as teachers and other public sector jobs

experienced the highest increase in the share of women starting from the mid-1980s. In 2016, they reached almost the same level as unions in wave 3. Unions in wave 1 were, and still are, the least open to women. Interestingly, the same differences remain at the top of the hierarchy as depicted in figure 2.B.11. These differences do partly reflect the historical stance of each wave towards women, but they also reflect the relative weight that women have in the labor force that each union organize. For instance, unions from waves 1 and 3 organize a relatively low share of women even in recent years, while unions from wave 2 and 4 always organized very women-intensive occupations[14] as depicted in figure 2.5.3.

To gauge the gap in women's representation in each wave we can divide the shares depicted in figure 2.5.3 by those reported in figure 2.5.2: the closer the ratio to one, the most balanced the representation; the larger the number above (below) one, the more unions' heads are masculine (feminine) that ought to be looking at membership. Using this alternative, depicted in figure 2.5.4, we see that wave 2 unions used to be by far the worst in terms of representation, but that they have rapidly catching up since the '70s. The best instead are without a doubt unions from Wave 3 that do keep a ratio very close to one for the whole period of study. Using this measure, unions from Wave 4 do fare better, but not so much better than unions from Wave 1 and 3 in the recent period, having a roughly 3-2:1 representation gap depending on the period. Finally, while unions from wave 1 do get better as of the '80s[15]. They are still the worse in terms of representation.

Concerning wages paid, the analysis is way more blurred due to the paucity of infor-

[14]Unions organizing exclusively public sector workers do not appear in our data. When linking unions to specific occupations we additionally took out the AFSCME which, mainly organizing the public sector, encompasses too many different occupations. we do so because we compute the shares of women at the occupation level rather than at the union one. Having a single union potentially organizing many different occupations would give us several points with very different share of women in each occupation but a unique share of women in the union. Since this is meaningless for our analysis, we take it out. Being just one union, this should affect in any way our results.

[15]Most probably due to unions such as the Hotels and Restaurant Employees (HERE), that has gad radical changes in the gender composition of their reference labor force and that, in any case, was was always an exception among craft unions due to the enforcement of a separated gender structure that, unintendedly, favored women (Cobble, 1990)

mation. We believe an increasing trend is visible for Waves 2 unions that starts as those with the highest negative gender gap and end with a positive one (see figures 2.B.14, 2.B.15, and 2.B.13. Overall, we find that Milkman was right as the ranking in terms of gender equality among unionization waves is exactly as the one she described and that we summarize in section 2.2. We hence also validate our hypothesis that crystallized norms can have very long lasting effects.

These results offer two interesting insights: first, corporate culture is important, among other things, in determining the attitudes towards women within firms, even in a narrowly defined industry such as labor unions. Second, there exist large differences between the culture of different organizations, even within the labor movement. These findings expand the economic literature on corporate culture (Bloom and Van Reenen, 2010; Bloom et al., 2012; Guiso et al., 2006, 2015) adding the study of gender gaps as an outcome, and focusing on a 100% non-profit sector. They emphasize once more that gender discrimination is driven by a cultural choice. They also underline the stickiness of social norms and hence the difficulty to radically change them even when they are clearly out-dated by societal standards. For this reason, finding ways to change the gender corporate culture of old firms seems an important venue for addressing the gender gap on the labor market.

2.6 Conclusion

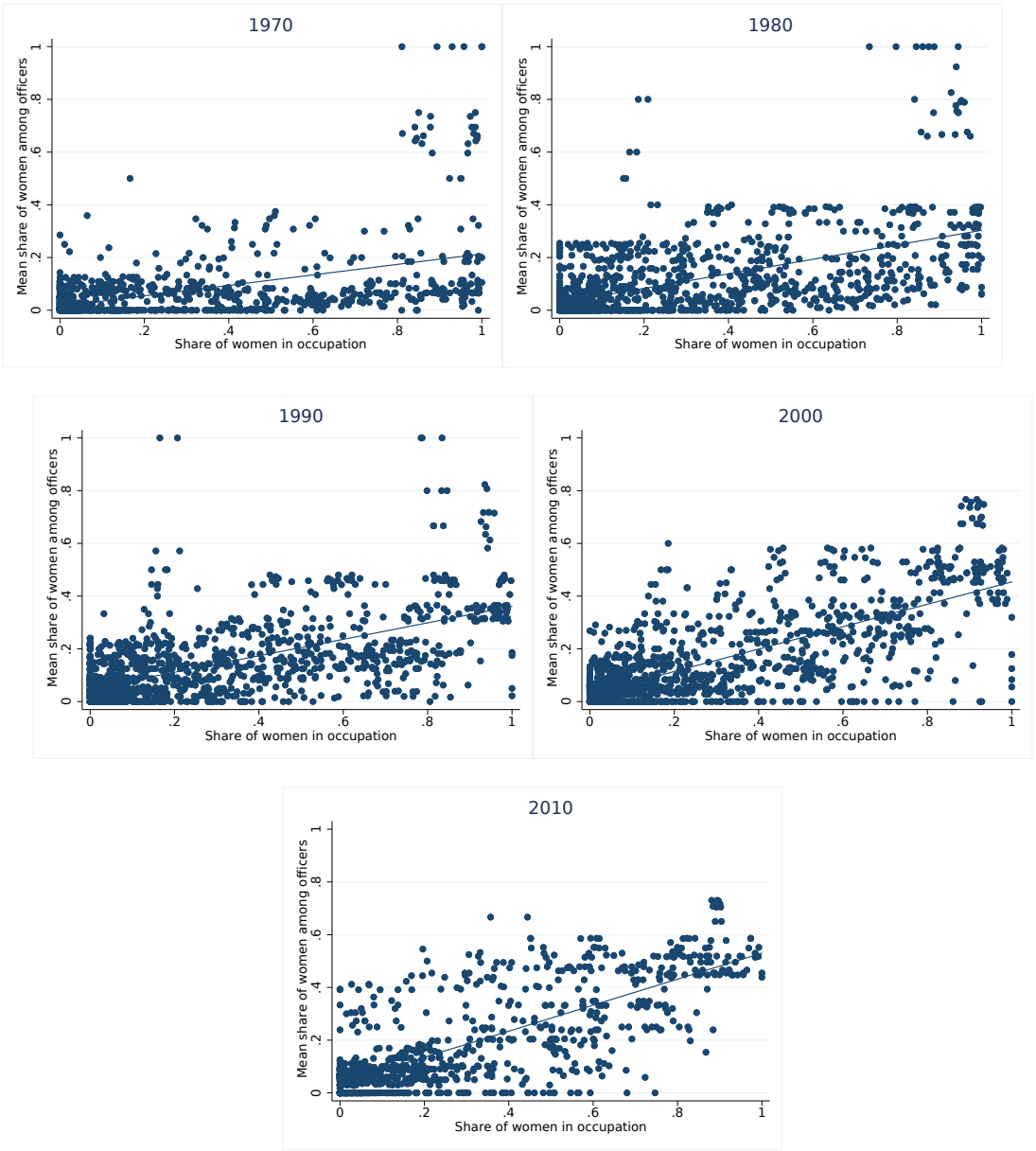
The under-representation of women can lead to real consequences in a variety of contexts: from the type of laws voted in parliaments (Lippmann, 2020), to the probability of being harassed at work (Folke and Rickne, 2020) and many others. Expectation of discrimination can also deter women from entering certain types of occupations (Breda et al., 2021). Equal representation is thus key for both equity and equality purposes. In the context of labor unions, there is even more at stake as unions are supposed to be the advocates of workers' rights and can have a strong impact on workers' working

conditions and on inequalities in general (Card, 2001b; Farber et al., 2021) and on gender related issues in particular (Corradini et al., 2022).

Using a new dataset on union workforce between 1959 and 2016, our paper look at the evolution of the role of women in the American labor movement. We find that, between 1959 and 2016, as the share of women increased in the labour force, the share of women among union workers rose as well, going from around 5% to 45%. However, as in the private sector, the share of women among union executives increased to a lower extent and remains at 25% in 2016. Still, the share of women among union leaders is much higher than among private sector's CEOs (Matsa and Miller, 2011) and is instead comparable to the one documented for the general non-profit sector (Bertrand and Hallock, 2001). Similarly, the wage gap was substantial at the beginning of our period of analysis but it has closed in the recent decades. Today, even among presidents, women and men tend to earn unconditionally the same.

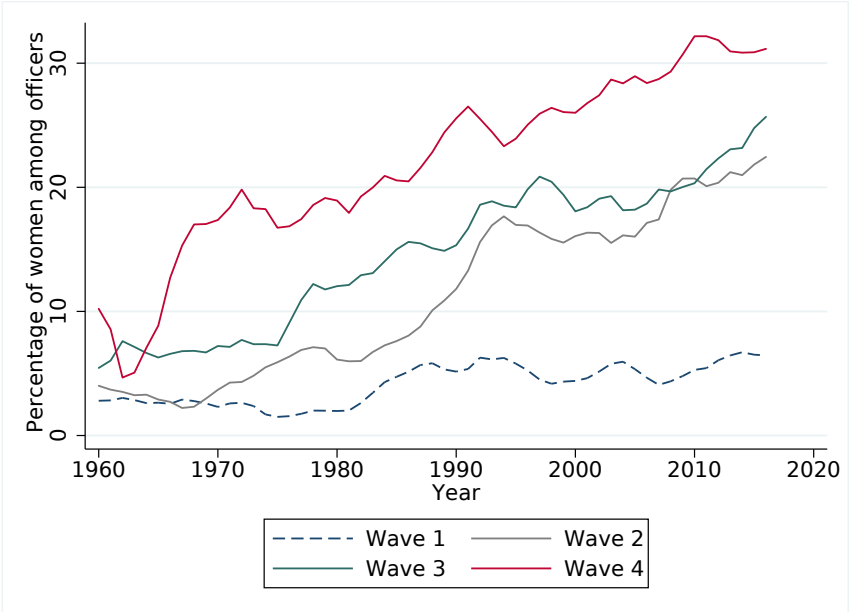
Comparing the evolution of inequalities among unions across the four main waves of unionisation, our results also highlight the role of social norms: older unions, most of them created in an openly hostile environment against women, have, even after more than a 100 years, less women among their officers. The slow replacement of the leadership and the stickiness of social constructs can explain why it took so long for some organizations to better match the gender characteristic of their members. The chief example is given by the unions belonging to the second wave of unionization. These unions, despite organizing a majority of women, got a sizeable share of women officers only as of the 1980s. To conclude, even labor unions could not escape from the gender norms prevailing in a given time in their society and particularly so when they were still young organizations. However, American labor unions have always been better than private markets and do represent, albeit imperfectly, a more progressive vision of the world concerning gender parity. To be more effective in paving the way for equality in the labor market, but also to attract more women among their ranks, they should remember to pay particular attention to such issue within their own ranks.

Figure 2.5.1: Share of Women in occupations and relative unions organizing them



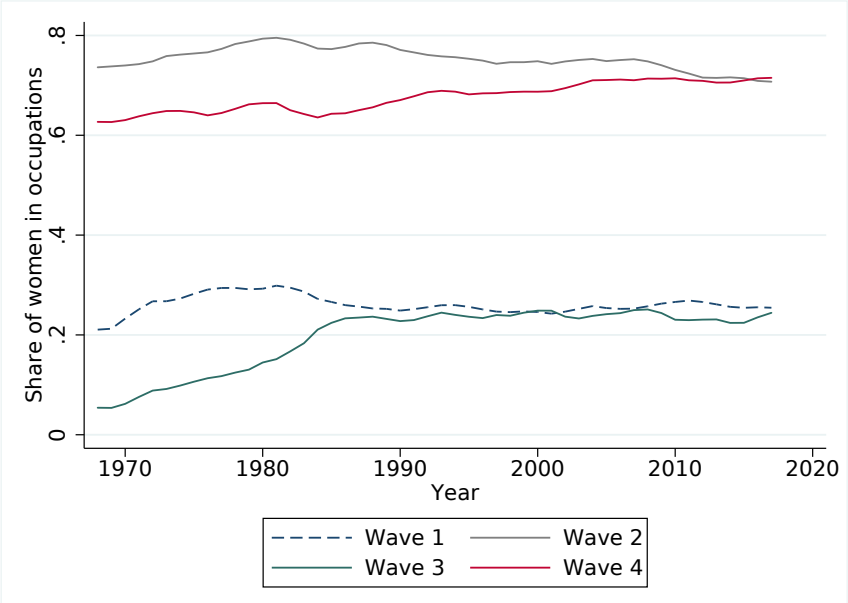
Note: Each dot represents an occupation-union pair. It tells how many women there are in the occupation and the corresponding share in the main unions organizing them. The fitted lines display the average slope of this relationship across unions. Each figure represent a decade where all years are pooled together, e.g. 1970 = 1970-1979.

Figure 2.5.2: Mean share of women among officers per union, by unionization wave



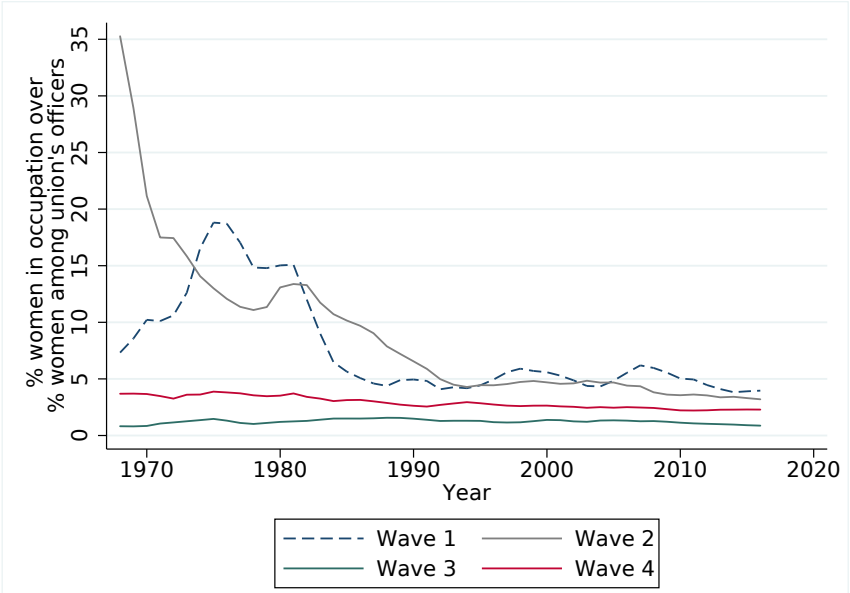
Note: The figure displays the 3-years moving average evolution of the share of women within unions by different unionization waves. *Reading:* The share of women is the lowest in unions from Wave 1 and the highest in unions from Wave 4.

Figure 2.5.3: Mean share of women in organized occupations, by unionization wave



Note: The figure displays the evolution of the share of women within occupations by the different unionization waves that organized them. *Reading:* The share of women is the lowest in occupations organized by unions from Wave 1 and 3 and the highest in unions organized by unions from Wave 2 and 4.

Figure 2.5.4: Ratio of the percentage of women in an occupation over the percentage of women among officers in the unions organizing them, by unionization wave



Note: The figure displays the 3-years moving average evolution of the ratio of the percentage of women in an occupation over the percentage of women among officers in the unions organizing them by different unionization waves. *Reading:* Unions from wave 2 were the worst at representation in the 1970, while unions from wave 3 were the best with an almost equal share of women in occupations organized and women among unions' officers.

Appendix

2.A Preparation of the data

2.A.1 Estimating the number of individuals earning below 10K

In order to compute full-distribution measures of inequality we would need to know the salary of each individual in the distribution. Unfortunately, our data only covers all officers plus the employees earning at least 10K dollars. This threshold has not evolved over time and hence represents a fairly high cutoff in 1959, while it is mostly not binding after 2000. In order to account for this truncation of the data we have proposed 3 strategies:

1. Present the inequality evolution only for officers

2. Present the inequality evolution for officers and employees by transforming the 10K threshold in 1959 in actual dollars in all the remaining years (hence using 1959 as base year)

3. Imputing the number of individuals and their earnings for those employees earning less than 10K dollars

Concerning point 3, we follow the method developed in Breda and Santini (2022) exploiting the information regarding the total amount paid to employees receiving less than 10K dollars that is available from 1959 to 1999 and then again from 2005 to 2016. The idea is that, in any given year within those boundaries, we can plot the distribution of employees' salaries for all unions. Fitting a functional form on those data

and knowing the total amounts, we can retrieve, as an approximation, the part of the distribution that we do not observe. In practice, this exercise is reduced to find the parameters of a quadratic equation of salary of the type $(a + bX + cX^2)$ such that they fulfill the following restrictions:

$$a + b10 + c10^2 = d(10)$$

$$b + 2c10 = d'(10)$$

$$\int_{min(x|a+bX+cX^2 \geq 0)}^{10} x(a + bX + cX^2)\, dx = M.\frac{I'}{M'}$$

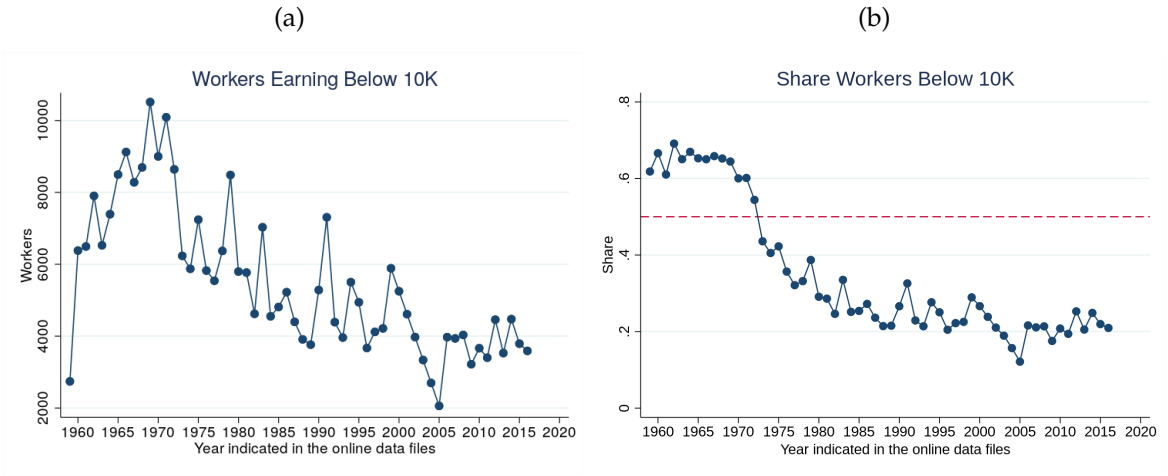
Where $d(10)$ is the density at 10K observed in the data; $d'(10)$ correspond to its first derivative and M is the reported amount paid to all those employees earning less than 10K. Finally I' is the density of the observed function (i.e. the one above 10K), while M' is the unknown density density of the estimated function below 10K.

With all these parameters we will be able to estimate the ratio of the number of people above divided by the number of people below the 10K threshold. Hence multiplying this number by the number of people above you get what we were looking for. Mathematically this should be equal to:

$$N_{below} = N_{above} * \int_0^{10k} (a + bX + cX^2)\, dx$$

Figure 2.A.1(a) plots the number of estimated workers earnings less than 10K $ in each year. Figure 2.A.1(b) plots the relative weight of these workers among employees. As expected, they represented the bulk of them in the '60s and '70s, while they are nowadays less than 20%. This is still probably an overestimation given that we observe only 5% of people earning less than 10K using the CPS.

Figure 2.A.1: Estimating number of individuals below 10K



Note: Panel a) shows the estimated number of employees that in every year earn below $ 10K in union sector. Panel b) displays the weight that this group has on the total workforce of the unions. The red, dotted line represents 50% of the workforce.

2.A.2 Creating the main data

Labor Unions

The data used in the present study contains some misreporting mistakes because only a small fraction of the files is audited by the public authority. The fact that auditing is random should enhance the reporting accuracy, but there are no large penalties for simple and small mistakes. In addition to this, we manually digitized the entries for the period 1959-1999. Some typing mistake is unavoidable in this process, despite we lengthy verified the (actually extremely high) quality of the work done. To remove the most striking mistakes we use a combination of information. First, we check if any salary paid is higher than the total amount paid to officers (or employees, respectively) or the total disbursements made. This rule of thumb is particularly useful for observations before 2005 when the total disbursements line had to be written separately from the single amounts spent. After 2005, the completion of the total amount given to officers (employees) 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, we compute the best and second best salary per worker within the years and we compute

the ratio between the two. Note that this is possible only if the worker is in office for more than one year. Finally, we 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 respective categories and the total disbursement, and the ratio between first and second top salaries is above 10; then we substitute the median salary for the detected mistake. Most probably, this method is effective only in capturing the biggest mistakes, leaving many others uncovered. However, it has the merit to target the most problematic ones leaving the raw data basically intact. Results shows that no important outlier remains except few that we fix manually. For instance, we substitute the top gross salary 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 most probably driven by the fact that the electronic form does not take into account comas and hence scale up of a factor of 10 or 100 the amount reported.

We also proceed in correcting the main spelling mistakes in the full names of individuals so to have the longest possible panel of individuals. The correction of the spelling mistakes proceeds in 4 steps. The first one matches the full names of individuals that share the same surname, employment status (officer or employee) and the same union. In the second step we look at holes in the tenure of individuals. We then try to merge the names that should have appeared to have a continuous panel for individuals with those names in the same union, year and employment position that instead appears only once and that are hence likely to be the same name misspelled. The third step apply the same logic of the second one to the observations at the extreme years (beginning and end of any individual observed more than twice). Finally, the fourth step is a pairwise match of all individuals (excluding those that contain a Jr or III in their names). In this case we might match two observations with different employment status in different years. Importantly, the score required to declare two names as the same in this last step is set quite high (at 0.7468). Moreover, we re-assign the original name

every time that a change in the name would create a duplicate in a given year.

March CPS

The annual earnings of salary and wage earners are constructed using the sum of the variables INCLONGJ and OICWAGE, each adjusted using the rank proximity swap values provided by the IPUMS, for all class of workers except self-employed. Total earnings includes OINCBUS and takes into account self-employment.

Firm size is computed as the number of employees employed by the same employer in any place last year. The categories recorded on the different years of the CPS change over time. We do create a uniform classification in 5 groups as of 1992, the first year labor unions are recorded as a separate sector: smaller than 10, between 10 and 99, between 100 and 499, between 500 and 999 and more than 1000 employees. We also aggregate categories 2, 3, and 4 in a unique one.

2.A.3 List of manually added information, by union

Table 2.A.1: List of unions by wave

Union name	Wave
ALUMINUM, BRICK AND GLASS WORKERS INTL. UNION, NHQ	1
AMALGAMATED TRANSIT UNION NHQ	1
AMERICAN FEDERATION OF MUSICIANS OF THE UNITED STATES AND CANADA NHQ	1
AMERICAN FLINT GLASS WORKERS' UNION OF NORTH AMERICA NHQ	1
BAKERY, CONFECTIONERY AND TOBACCO WORKERS INTL. UNION, NHQ	1
BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYEES NHQ	1
BROTHERHOOD OF RAILROAD SIGNALMEN NHQ	1
BROTHERHOOD OF SHOE AND ALLIED CRAFTSMEN NHQ	1
BUILDING AND CONSTRUCTION TRADES DEPARTMENT NHQ	1
CHICAGO TRUCK DRIVERS, HELPERS, AND WAREHOUSE WORKERS UNION NHQ	1
ENGINEERS AND ARCHITECTS ASSOCIATION, NHQ	1
GLASS BOTTLE BLOWERS ASSOCIATION OF THE UNITED STATES AND CANADA NHQ	1
GRAPHIC COMMUNICATIONS INTL. UNION NHQ	1
HOTEL AND RESTAURANT EMPLOYEES AND BARTENDERS INTL. UNION NHQ	1
INDUSTRIAL WORKERS OF THE WORLD	1
INTL. ALLIANCE OF THEATRICAL STAGE EMPLOYEES AND ... ... MOVING PICTURE MACHINE OPERATORS OF THE US AND CANADA NHQ	1
INTL. ASSOCIATION OF BRIDGE, STRUCTURAL, ORNAMENTAL AND REINFORCING IRON WORKERS NHQ	1
INTL. ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS NHQ	1
INTL. ASSOCIATION OF MACHINISTS AND AEROSPACE WORKERS NHQ	1
INTL. ASSOCIATION OF SIDEROGRAPHERS NHQ	1
INTL. BROTHERHOOD OF BOILERMAKERS IRON SHIP BUILDERS BLACKSMITHS FORGERS AND HELPERS NHQ	1
INTL. BROTHERHOOD OF ELECTRICAL WORKERS NHQ	1
INTL. BROTHERHOOD OF LOCOMOTIVE ENGINEERS NHQ	1
INTL. BROTHERHOOD OF PAINTERS AND ALLIED TRADES NHQ	1
INTL. BROTHERHOOD OF TEAMSTERS NHQ	1
INTL. LONGSHOREMEN'S ASSOCIATION NHQ	1
INTL. ORGANIZATION OF MASTERS MATES AND PILOTS NHQ	1
INTL. PLATE PRINTERS DIE STAMPERS AND ENGRAVERS UNION OF NORTH AMERICA NHQ	1
INTL. UNION OF BRICKLAYERS AND ALLIED CRAFTWORKERS NHQ	1
INTL. UNION OF ELEVATOR CONSTRUCTORS NHQ	1
INTL. UNION OF JOURNEYMEN HORSESHOERS OF THE UNITED STATES AND CANADA NHQ	1
INTL. UNION OF OPERATING ENGINEERS NHQ	1
INTL. UNION, ALLIED INDUSTRIAL WORKERS OF AMERICA NHQ	1
LABORERS INTL. UNION OF NORTH AMERICA NHQ	1
METAL POLISHERS BUFFERS PLATERS AND ALLIED WORKERS INTL. UNION NHQ	1
METAL TRADES DEPARTMENT AFL_CIO NHQ	1
NATIONAL ASSOCIATION OF LETTER CARRIERS NHQ	1
NATIONAL INDUSTRIAL WORKERS UNION NHQ	1
NATIONAL MARINE ENGINEERS BENEFICIAL ASSOCIATION NHQ	1
NATIONAL RURAL LETTER CARRIERS' ASSOCIATION, NHQ	1
OPERATIVE PLASTERERS AND CEMENT MASONS INTL. ASSOCIATION NHQ	1
RETAIL CLERKS INTL. ASSOCIATION NHQ	1
SHEET METAL WORKERS INTL. ASSOCIATION NHQ	1
STATE BARBERS' ASSOCIATION, NHQ	1
STOVE, FURNACE AND ALLIED APPLIANCE WORKERS INTL. UNION NHQ	1
TRANSPORTATION COMMUNICATIONS UNION NHQ	1
UNITED ASSOCIATION OF PLUMBERS AFL-CIO	1
UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA NHQ_LEGO	1
UNITED MINE WORKERS OF AMERICA NHQ	1
UNITED TEXTILE WORKERS OF AMERICA NHQ	1
UNITED UNION OF ROOFERS, WATERPROOFERS AND ALLIED WORKERS NHQ	1
AMALGAMATED CLOTHING AND TEXTILE WORKERS UNION, NHQ	2
AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS NHQ	2
AMERICAN TRAIN DISPATCHERS ASSOCIATION NHQ	2
ASSOCIATED ACTORS AND ARTISTES OF AMERICA NHQ	2
INTL. ASSOCIATION OF FIRE FIGHTERS, NHQ	2
INTL. FEDERATION OF PROFESSIONAL AND TECHNICAL ENGINEERS NHQ	2
INTL. LADIES GARMENT WORKERS UNION NHQ	2
INTL. LEATHER GOODS PLASTICS AND NOVELTY WORKERS' UNION NHQ	2
LEATHER WORKERS INTL. UNION NHQ	2
NATIONAL POST OFFICE MAIL HANDLERS, NHQ	2
OIL, CHEMICAL AND ATOMIC WORKERS INTL. UNION NHQ	2
POLICE FRATERNAL ORDER, IND	2
SERVICE EMPLOYEES INTL. UNION NHQ	2
TEXTILE PROCESSORS, SERVICE TRADES, HEALTH CARE, PROFESSIONAL AND TECHNICAL EMPLOYEES INTL. UNION NHQ	2
UNION LABEL AND SERVICE TRADES DEPARTMENT NHQ	2
UNION OF NEEDLETRADES, INDUSTRIAL AND TEXTILE EMPLOYEES, NHQ	2
AIR LINE PILOTS ASSOCIATION NHQ	3
AMALGAMATED LACE OPERATIVES OF AMERICA NHQ	3
AMERICAN FEDERATION OF GRAIN MILLERS NHQ	3
AMERICAN GUILD OF MUSICAL ARTISTS, NHQ	3
AMERICAN GUILD OF VARIETY ARTISTS NHQ	3

List of unions by wave - Continue

Union name	Wave
ASSOCIATION OF FLIGHT ATTENDANTS, NHQ	3
ASSOCIATION OF RAILWAY TECHNICAL EMPLOYES NHQ	3
BROTHERHOOD OF UTILITY WORKERS OF NEW ENGLAND NHQ	3
CHRISTIAN LABOR ASSOCIATION OF THE UNITED STATES OF AMERICA NHQ	3
CONFEDERACION GENERAL DE TRABAJADORES DE PUERTO RICO NHQ	3
DIRECTORS GUILD OF AMERICA NHQ	3
DISTILLERY WINE AND ALLIED WORKERS INTL. UNION NHQ	3
INDUSTRIAL UNION DEPARTMENT NHQ	3
INTL. GUARDS UNION OF AMERICA NHQ	3
INTL. LONGSHOREMEN'S AND WAREHOUSEMEN'S UNION NHQ	3
INTL. UNION OF ALLIED NOVELTY AND PRODUCTION WORKERS NHQ	3
INTL. UNION OF ELECTRONIC, ELECTICAL, SALARIED, MACHINE AND FURNITURE WORKERS NHQ	3
INTL. UNION PROGRESSIVE MINE WORKERS OF AMERICA NHQ	3
INTL. WOODWORKERS OF AMERICA	3
MARITIME TRADES DEPARTMENT NHQ	3
MECHANICS EDUCATIONAL SOCIETY OF AMERICA NHQ	3
NATIONAL ASSOCIATION OF BROADCAST EMPLOYEES AND TECHNICIANS NHQ	3
NATIONAL LABOR RELATIONS BOARD UNION, NHQ	3
NATIONAL TREASURY EMPLOYEES UNION, NHQ	3
RETAIL WHOLESALE AND DEPARTMENT STORE UNION NHQ	3
SCREEN ACTORS GUILD NHQ	3
SEAFARERS INTL. UNION OF NORTH AMERICA NHQ	3
THE NEWSPAPER GUILD NHQ	3
TRANSPORT WORKERS UNION OF AMERICA NHQ	3
UNITED AUTOMOBILE AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA NHQ	3
UNITED ELECTRICAL, RADIO AND MACHINE WORKERS OF AMERICA NHQ	3
UNITED FLIGHT ATTENDANTS ASSOCIATION	3
UNITED PLANT GUARD WORKERS OF AMERICA NHQ	3
UNITED RAILWAY SUPERVISORS ASSOCIATION, NHQ	3
UNITED RUBBER CORK LINOLEUM AND PLASTIC WORKERS OF AMERICA NHQ	3
UNITED STEELWORKERS OF AMERICA NHQ	3
UTILITY WORKERS UNION OF AMERICA NHQ	3
AMERICAN FEDERATION OF GOVERNMENT EMPLOYEES, NHQ	4
AMERICAN FEDERATION OF STATE, COUNTY AND MUNICIPAL EMPLOYEES, NHQ	4
AMERICAN FEDERATION OF TEACHERS	4
AMERICAN FEDERATION OF TELEVISION AND RADIO ARTISTS NHQ	4
AMERICAN NURSES ASSOCIATION NHQ	4
AMERICAN POSTAL WORKERS UNION NHQ	4
ASSOCIATION OF CIVILIAN TECHNICIANS, NHQ	4
ASSOCIATION OF COMMUTER RAIL EMPLOYEES, IND	4
ASSOCIATION OF WESTERN PULP AND PAPER WORKERS, NHQ	4
CENTRAL PUERTORRIQUENA DE TRABAJAD	4
CHANGE TO WIN	4
CLASSIFIED SCHOOL EMPLS, AMER ASN	4
COMMUNICATIONS WORKERS OF AMERICA NHQ	4
CONGRESS OF INDEPENDENT UNIONS NHQ	4
DEPT FOR PROFESSIONAL EMP, AFL-CIO	4
FEDERATION OF PROFESSIONAL ATHLETES, NHQ	4
FIRE AND SECURITY OFFICERS ASN, UTC I	4
FLIGHT ENGINEERS' INTL. ASSOCIATION NHQ	4
FOOD AND BEVERAGE TRADES DEPARTMENT, NHQ	4
INTL. SECURITY OFFICERS POLICE & GUARDS UNION, NHQ	4
INTL. UNION OF SECURITY PROFESSIONALS	4
LAUNDRY AND DRY CLEANING INTL. UNION NHQ	4
LICENSED PRACTICAL NURSES ASSOCIATION OF PENNSYLVANIA, NHQ	4
NATIONAL AIR TRAFFIC CONTROLLERS ASSOCIATION, NHQ	4
NATIONAL ALLIANCE OF POSTAL AND FEDERAL EMPLOYEES, NHQ	4
NATIONAL ASSOCIATION OF CATHOLIC SCHOOL TEACHERS, NHQ	4
NATIONAL ASSOCIATION OF GOVERNMENT EMPLOYEES, NHQ	4
NATIONAL EDUCATION ASSOCIATION OF THE UNITED STATES, NHQ	4
NATIONAL FEDERATION OF FEDERAL EMPLOYEES, NHQ	4
NATIONAL FEDERATION OF LICENSED PRACTICAL NURSES, NHQ	4
NATIONAL FEDERATION OF NURSES	4
NATIONAL FOOTBALL LEAGUE PLAYERS ASSOCIATION	4

List of unions by wave - Continue

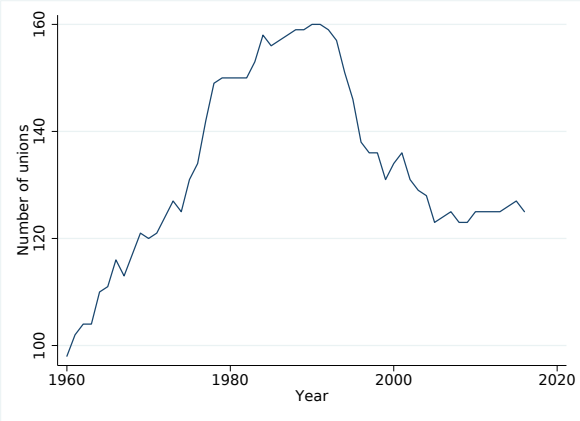
Union name	Wave
NATIONAL INFRASTRUCTURE ALLIANCE	4
NATIONAL NURSES UNITED	4
NATIONAL ORGANIZATION OF INDUSTRIAL TRADE UNIONS NHQ	4
NATIONAL STAFF ORGANIZATION NHQ	4
NATIONAL WEATHER SERVICE EMPLOYEES ORGANIZATION	4
NEW YORK STATE NURSES ASSOCIATION	4
OFFICE AND PROFESSIONAL EMPLOYEES INTL. UNION NHQ	4
PILOTS ASSOCIATION ALLIED	4
PROFESSIONAL AIRWAYS SYSTEMS SPECIALISTS NHQ	4
PUBLIC EMPLOYEE DEPARTMENT, NHQ	4
SAG-AFTRA	4
THE NATIONAL ASSOCIATION OF AERONAUTICAL EXAMINERS NHQ	4
THE PROTECTION AND RESPONSE OFFICERS OF AMERICA	4
TRANSPORTATION TRADES DEPT AFL-CIO	4
UNION OF AMERICAN PHYSICIANS AND DENTISTS, NHQ	4
UNITE HERE	4
UNITED FARM WORKERS OF AMERICA NHQ	4
UNITED GOVERNMENT SECURITY OFFICERS OF AMERICA, NHQ	4
UNITED NURSES ASSOCIATIONS OF CALIFORNIA, NHQ	4
UNITED PAPERWORKERS INTL. UNION, NHQ	4
UNITED SECURITY FORCES OF AMERICA, INTL.	4
UNITED SECURITY PROFESSIONALS OF AMERICA	4
UNITED SERVICE WORKERS OF AMERICA	4
UNITED TRANSPORTATION UNION, NHQ	4
UNITED WORKERS OF AMERICA	4
WORKERS UNITED, SEIU	4
WRITERS GUILD OF AMERICA EAST NHQ	4
WRITERS GUILD OF AMERICA WEST INC NHQ	4
AIR LINE EMPLOYEES ASSOCIATION INTL., NHQ	.
AIR TRAFFIC SPECIALISTS UNION IND	.
AIRCRAFT MECHANICS FRATERNAL ASSOCIATION, NHQ	.
AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS NHQ	.
AMERICAN FEDERATION OF UNION EMPLOYEES, NHQ	.
ATLANTIC INDEPENDENT UNION, NHQ	.
CONFEDERACION LABORISTA DE PUERTO RICO NHQ	.
CONGRESO DE UNIONES INDUSTRIALES DE PUERTO RICO, NHQ	.
FEDERACION PUERTORRIQUENA DE TRABAJADORES	.
FEDERATED INDEPENDENT TEXAS UNIONS NHQ	.
FEDERATION OF POSTAL POLICE OFFICERS NHQ	.
FEDERATION OF WESTINGHOUSE INDEPENDENT SALARIED UNIONS NHQ	.
FIRST RESPONDERS POLICE AND SECURITY	.
INDEPENDENT GROUP ASSOCIATION, NHQ	.
INDEPENDENT UNION OF PLANT PROTECTION EMPLOYEES NHQ	.
INLANDBOATMEN, ILWU, AFL-CIO	.
INTL. ASSOCIATION OF DUPONT EMPLOYEES UNION, NHQ	.
INTL. ASSOCIATION OF TOOL CRAFTSMEN NHQ	.
INTL. BROTHERHOOD OF GENERAL WORKERS, NHQ	.
NATIONAL ASSOCIATION OF AGRICULTURAL EMPLOYEES, NHQ	.
NATIONAL FEDERATION OF INDEPENDENT UNIONS NHQ	.
NATIONAL PRODUCTION WORKERS UNION, NHQ	.
OBREROS UNIDOS DEL SUR DE PUERTO RICO NHQ	.
PHYSICAL THERAPY COLLECTIVE NEGOTIATIONS COMMITTEE	.
PLANT PROTECTION ASSOCIATION NATIONAL NHQ	.
PROFESSIONAL AIRLINE FLIGHT CONTROL ASS.	.
PROFESSIONAL ASSOCIATION OF GOLF SCORING	.
SOUTHERN LABOR UNION, NHQ	.
UNION TRABAJADORES INDUSTRIALES DE PUERTO RICO NHQ	.
UNITED INDUSTRIAL POLICE AND FIREMEN OF AMERICA, NHQ	.
UNITED INDUSTRIAL WORKERS, SERVICE, TRANSPORTATION, PROFESSIONAL AND GOVERNMENT OF NORTH AMERICA, NHQ	.
UNITED PROFESSIONAL NURSES ASN	.
UNITED SECURITY SPECIALISTS OF AMERICA	.
WESTINGHOUSE ENGINEERS ASSOCIATION NHQ	.

2.B Additional evidence

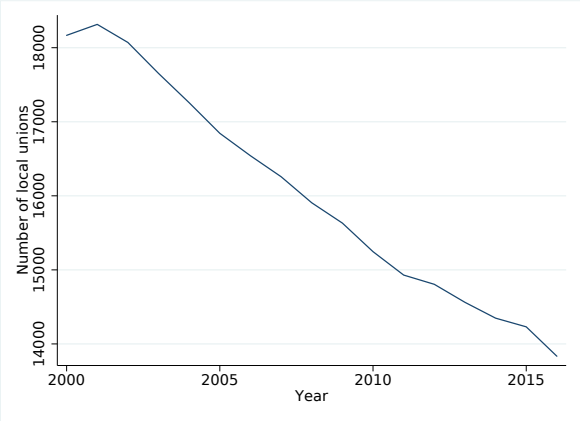
2.B.1 Descriptive Statistics

Figure 2.B.1: Number of unions per year

(a) Headquarters



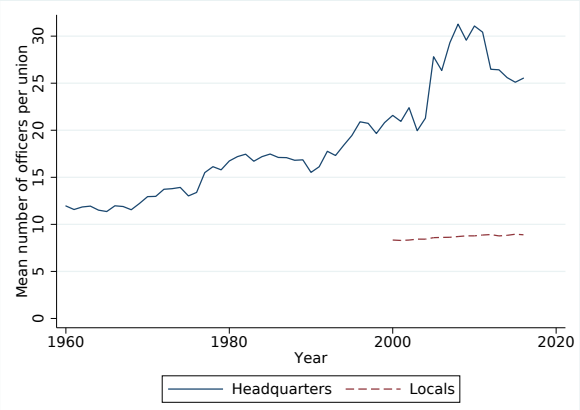
(b) Locals



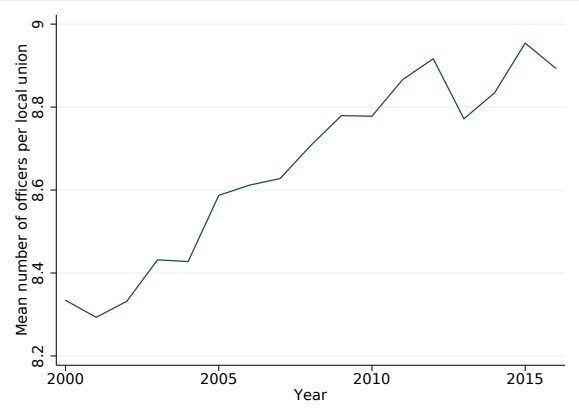
Note: Panel a) shows the evolution of the number of NHQs over the years 1959-2016. Panel b) displays the same for local unions over 2000-2016.

Figure 2.B.2: Mean number of officers per union

(a) Headquarters



(b) Locals



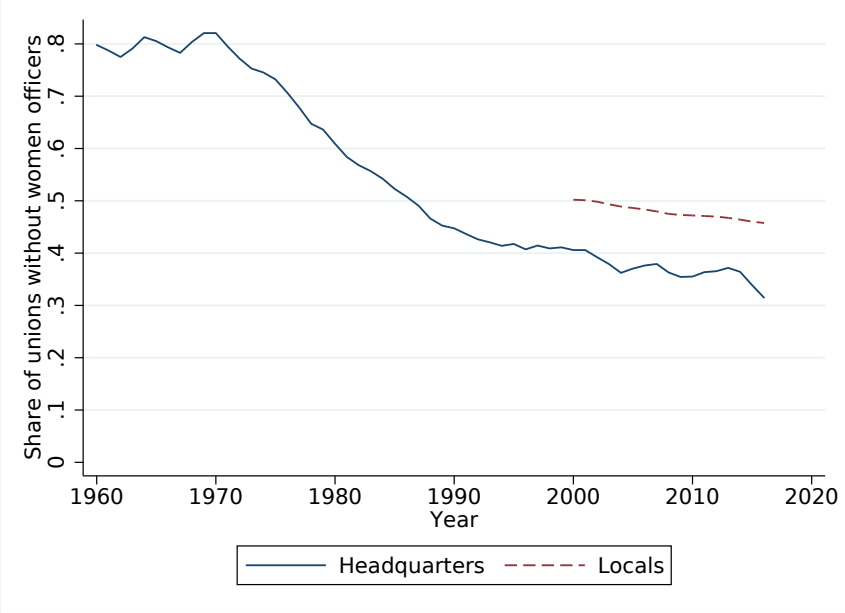
Note: Panel a) shows the evolution of the mean number of officers in NHQs over the years 1959-2016. Panel b) displays the same for local unions over 2000-2016.

Table 2.B.1: Descriptive statistics on unions' locals

	2000-2016	2000-2009	2010-2016
Mean wage men	73,519	71,156	77,324
Stand. dev.	(47,854)	(47,553)	(48,091)
Mean wage women	54,846	52,478	58,417
Stand. dev.	(30,778)	(29,603)	(32,143)
Mean wage men officers	74,864	72,126	79,548
Stand. dev.	(54,332)	(54,036)	(54,517)
Mean wage women officers	53,914	50,646	59,358
Stand. dev.	(41,260)	(39,392)	(43,658)
Share unions w/o women officers	0.48	0.49	0.47
Share women	0.19	0.19	0.20
Share women (officers)	0.18	0.18	0.19
Avg number officers per union	8.6	8.5	8.9
Number of distinct unions	18,510	17,411	14,483
Number of women	592,391	354,385	238,006
Number of men	1,532,603	946,303	586,300
Number of observations	3,088,275	1,889,535	1,198,740

Notes: The table shows descriptive statistics for Local unions for the whole period of analysis, 2000-2016, and by decades.

Figure 2.B.3: Share of unions with zero women among officers

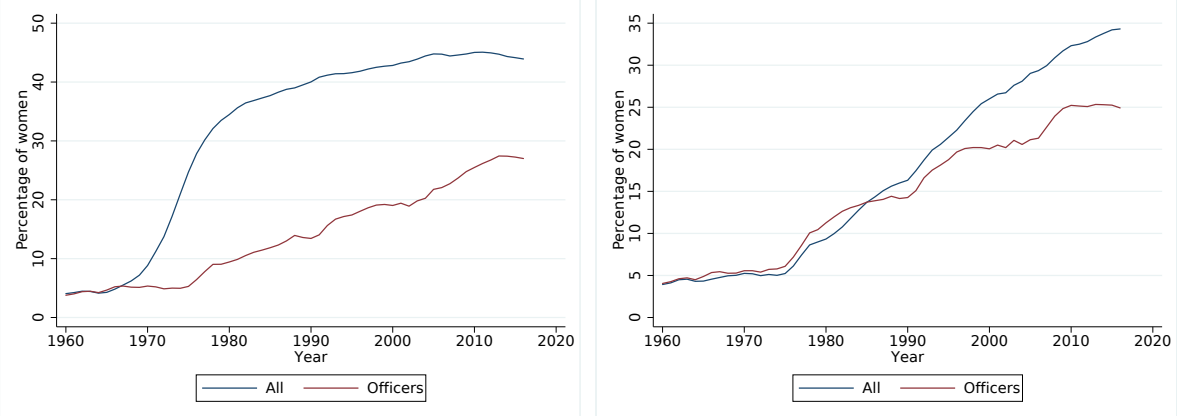


Note: Evolution of the share of unions' NHQs and Locals that do not have any woman among their officers.

Figure 2.B.4: Share of women in unions

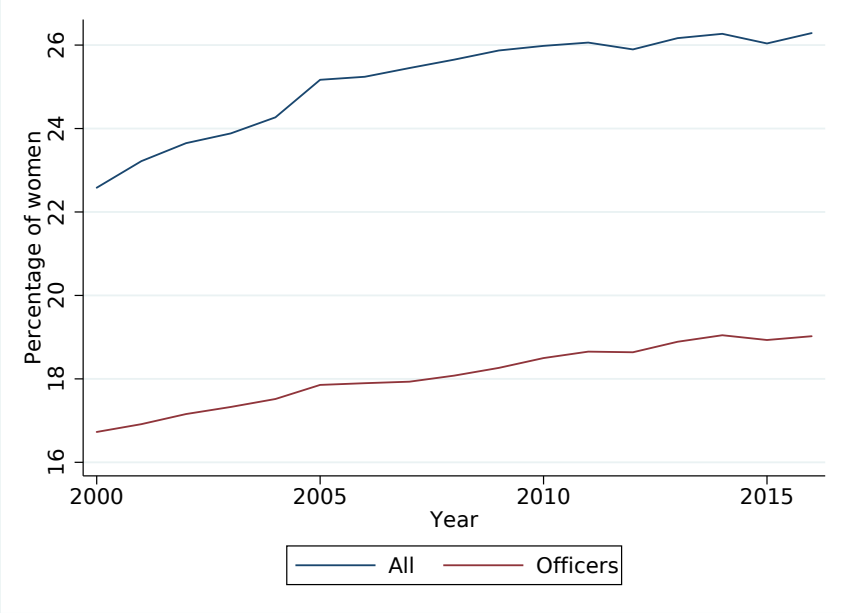
(a) No threshold

(b) Officers + above threshold employees



Note: The figure plots the *overall* shares of women among officers and employees in NHQs over the period 1959-2016. Panel a) shows the evolution of the shares of women without restrictions. Panel b) displays the same thing, but imposing that employees earn at least $ 10K in real terms (1959 base year) in each year.

Figure 2.B.5: Share of women in local unions

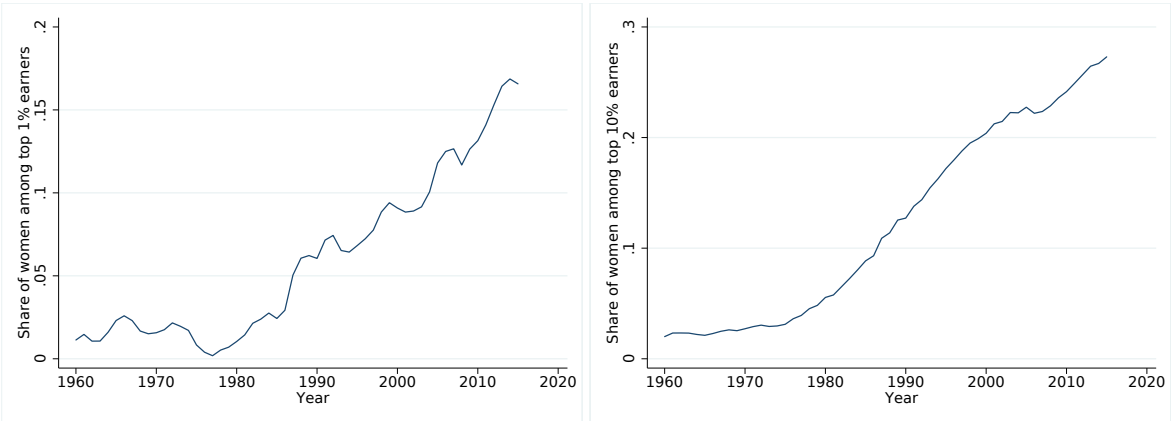


Note: The figure plots the shares of women among officers and employees earning at least $ 10K in real terms (2000 base year) in local unions over the period 2000-2016.

2.B.2 Share of women in top positions

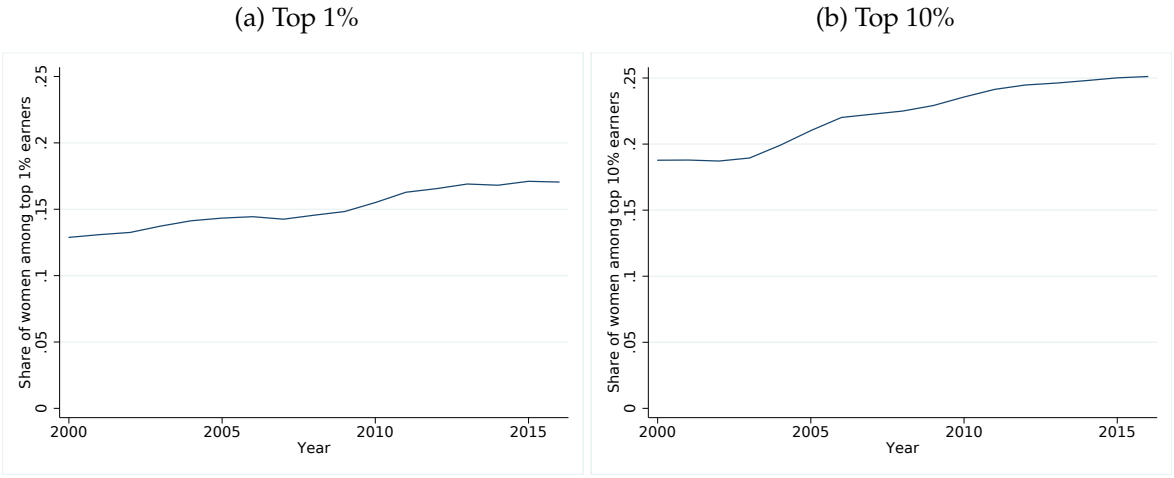
Figure 2.B.6: *Overall* share of women among top officers earners in NHQs

(a) Top 1% (b) Top 10%



Note: The figure plots the shares of women among top officers in NHQs over the period 1959-2016. Panel a) shows the evolution of the shares of women within the top 1% earners while Panel b) displays the same thing for those within the top 10%.

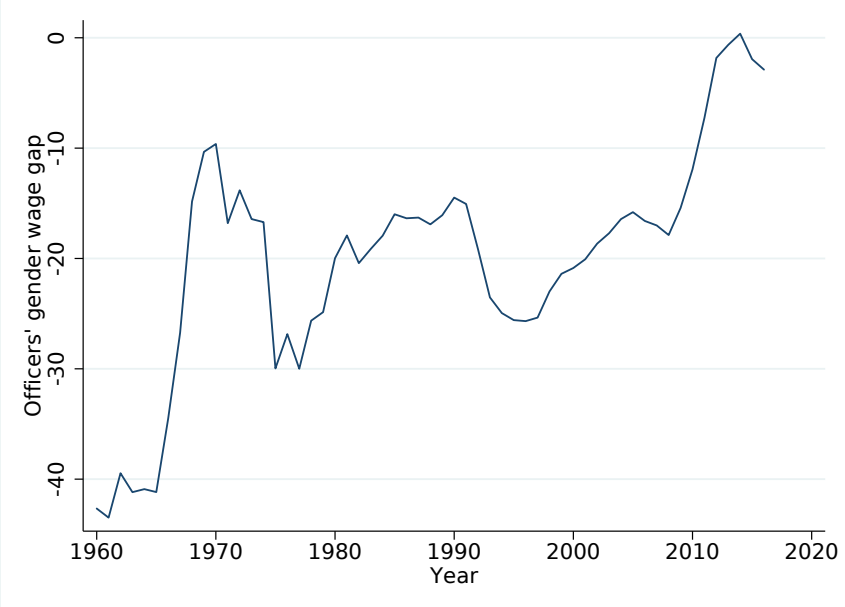
Figure 2.B.7: *Overall* share of women among top earners in local unions



Note: The figure plots the shares of women among top officers in local unions over the period 2000-2016. Panel a) shows the evolution of the shares of women within the top 1% earners while Panel b) displays the same thing for those within the top 10%.

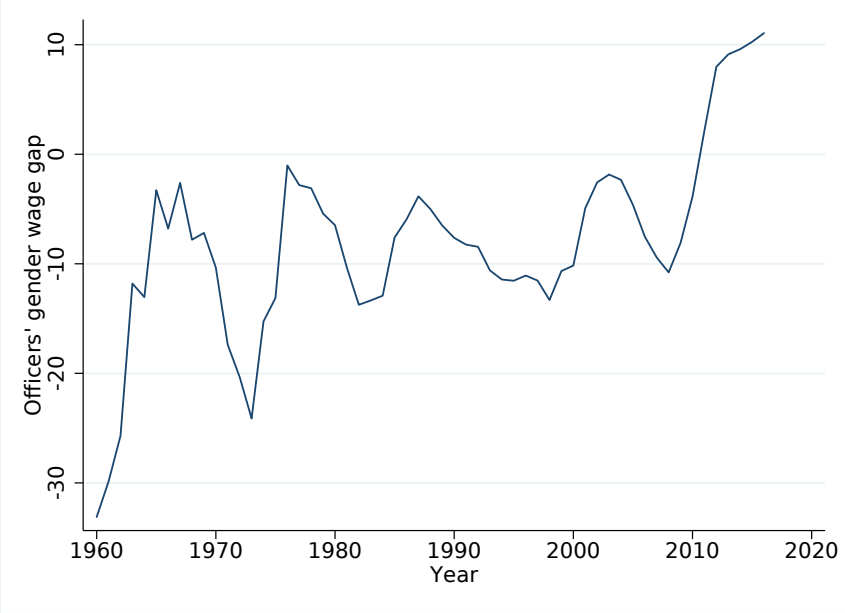
2.B.3 Gender wage gap

Figure 2.B.8: *Overall* officers' gender wage gap controlling for size of the union



Note: The graph plots the gender wage gap between officers controlling for the size of the union. Only NHQs between 1960 and 2016 are used

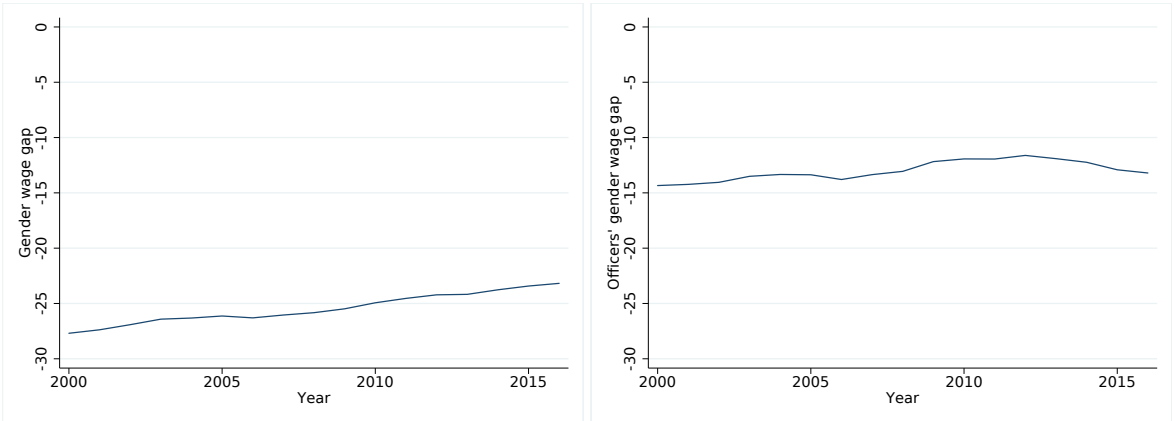
Figure 2.B.9: Mean officers' wage gap *within* union for NHQs



Note: The figure plots the average *within* wage gap for officers in NHQs over the period 1960-2016.

Figure 2.B.10: Mean wage gap *within* for local unions

(a) All employees (b) Officers only

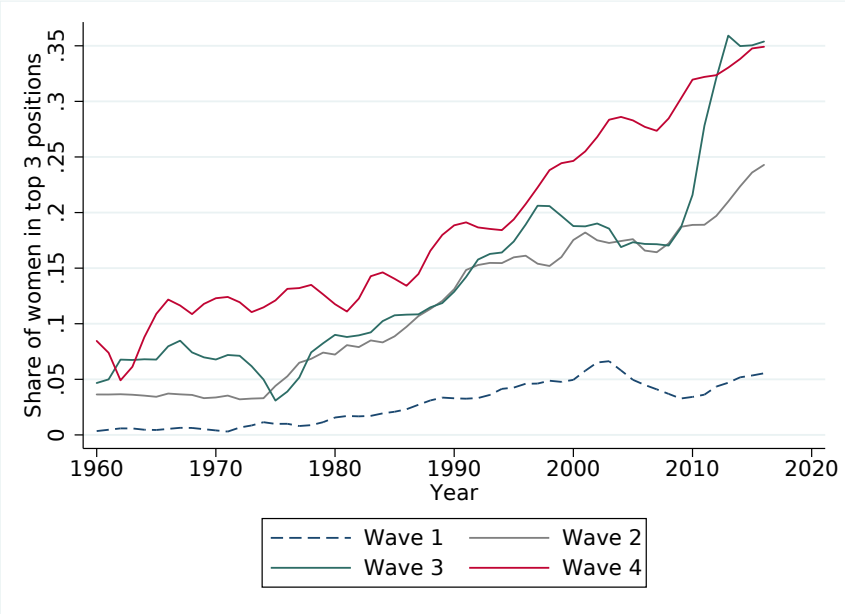


Note: The figure plots the average *within* wage gap in Local unions over the period 2000-2016. Panel a) shows the evolution of the gender gaps for employees while Panel b) displays the same thing for officers only.

2.B.4 Analysis by wave

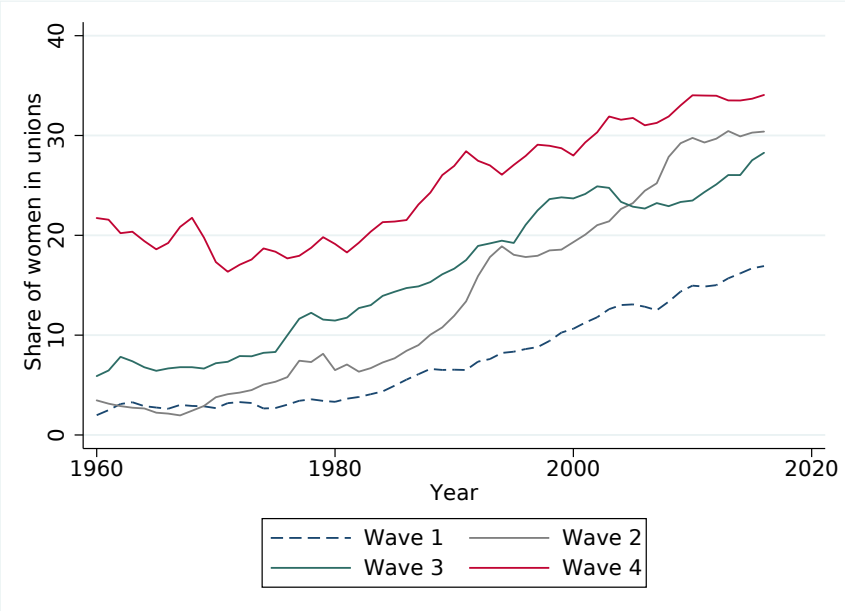
Share of women

Figure 2.B.11: Share of women among top 3 positions by unionization wave



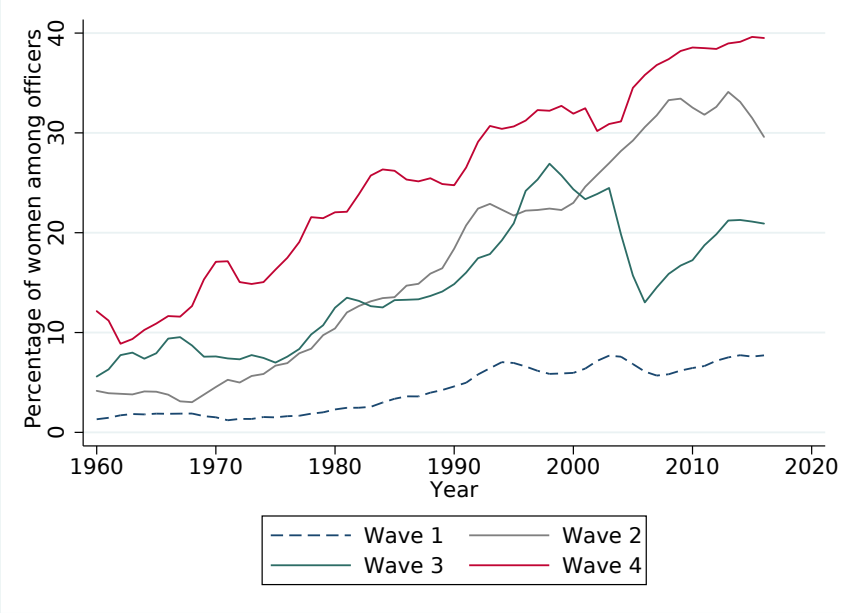
Note: The share of women among the top 3 positions is computed by wave. Only NHQs between 1960 and 2016 are used.

Figure 2.B.12: Mean share of women per union, by unionization wave



Note: The graph plots the mean share of women (officers and employees) *within* each NHQ averaged by wave. The sample of employees is restricted to employees above 10K in 1959 terms.

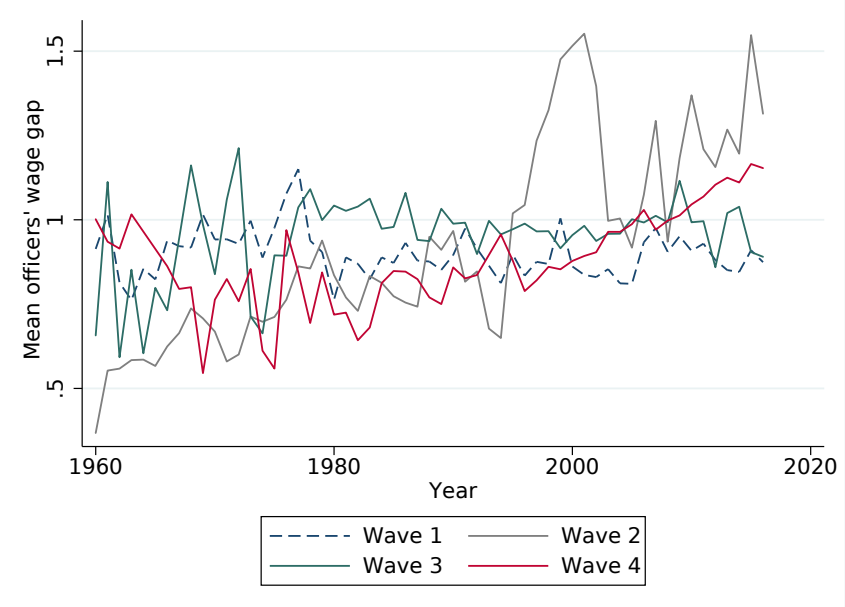
Figure 2.B.13: *Overall* share of women among officers by unionization wave



Note: The graph plots the *overall* share of women among officers for each wave.

Wage gap

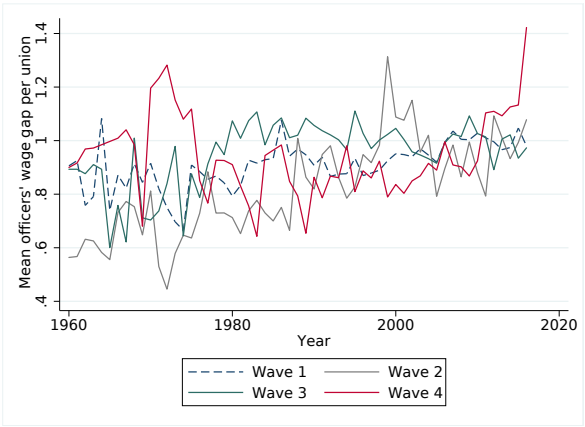
Figure 2.B.14: *Overall* officers' wage gaps by unionization wave



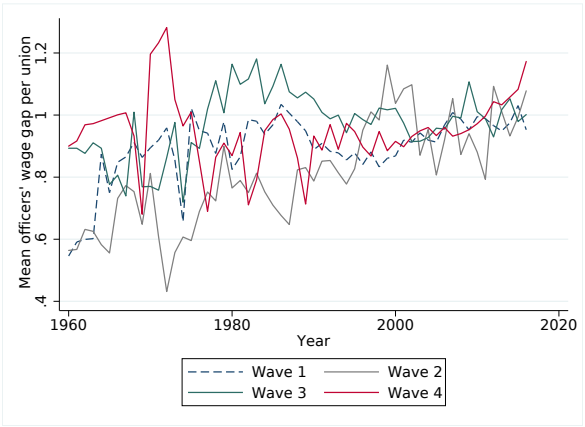
Note: The gender wage gap is computed by dividing the mean wage of all female officers in each wave by the mean wage of all male officers in that same wave.

Figure 2.B.15: Mean officers' wage gap *within* union by unionization wave

(a) Unweighted



(b) Weighted by number of officers



Note: The gender wage gap is computed by dividing for each union the mean wage of all female officers by the mean wage of all male officers. Those gender wage gaps are then averaged by wave. The weighted graph gives more weight to unions that have more officers.

Chapter 3

“Which side are you on?" A historical perspective of union membership composition in 7 Western countries

The work presented in this chapter was realized in collaboration with Cyprien Batut and Ulysse Lojkine

In this paper, we look at the long term evolution of the composition of union membership in Denmark, France, West Germany, Italy, Sweden, the United Kingdom and the United States, using unexploited micro data coming from post electoral, labor, and household surveys from the past 60 years. We first revisit commonly accepted aggregate union density levels and find that, for France and Italy, union density was at times under- and over- estimated respectively. Second, we present long run evidence on the evolution of the composition of unions in terms of the gender, occupation, education, and sector of employment of their members. Different

[0]The views expressed here are those of the authors and cannot be attributed to *DG Trésor*. We would like to thank Jérôme Bourdieu, Thomas Breda, Alex Bryson, Gemma Dipoppa, Daniele Checchi, Andrea Garnero, Yajna Govind, Tristan Haute, Thomas Irace, Nicole Kapelle, Dominique Labbé, Ioana Marinescu, Clara Martinez-Toledano, Larry Mishel, Héloïse Petit, Thomas Piketty, Claus Schnabel, Anna Stansbury, and all participants to the Applied Economic Seminar and the EPCI Seminar at PSE, the Brown bag seminar at CBS, the IAAEU Workshop, the EALE 2021 conference (Padua) and EEA 2022 conference (Milan) for all their comments. All remaining errors are our own.

stylized facts emerge for different groups of countries: the UK and the US exhibit a dramatic decline in the selection of blue collar, private sector, male and unskilled workers over the period considered; in France and Italy, selection has been approximately constant; Denmark, West Germany and Sweden displays intermediate patterns, depending on the dimension studied. We propose plausible institutional and economic forces to account for these diverging patterns.

JEL Codes: J21; J51; N30

Keywords: Union membership composition

Which side are you on boys?
Which side are you on?
My daddy was a miner,
And I'm a miner's son.

Florence Reece, 1931

3.1 Introduction

In developed countries, unions have been a key component of the social equilibrium of the postwar decades. They are widely recognized as having offered working classes a voice in economic matters, raising their living standards and contributing to the reduction of economic inequality. Conversely, the fall of union membership and influence since the 1980s has often been given a prime role in the transition away from the Fordist growth regime. There is a rich empirical economic literature that covers the main aspects of these two macro-periods. On the one hand, the literature has focused on the effects of trade unions on the labor market, such as their impact on wage levels[1], wage dispersion[2] or firms performance[3]. On the other hand, researchers have investigated the causes of the fall of aggregate union densities[4]. In comparison, little is known about trade unions themselves and their members.

In this paper, we address this gap by looking at union membership and its socioeconomic composition across time and space. We focus on a rich set of characteristics including gender, occupation (blue vs white collar), education and sector of employment (public vs private) in 7 Western countries (Denmark, France, Germany, Italy, Sweden, the UK, and the US) over a span of 60 years. We believe this is important for several

[1] Card (1996); Bryson and Gomez (2002); Hirsch (2004); Blanchflower and Bryson (2004a); Bryson (2014); **?**

[2] For instance Freeman (1980, 1991); DiNardo et al. (1996); Card (2001a); Western and Rosenfeld (2011); Farber et al. (2021); Fortin et al. (2021) for the US, Gosling and Machin (1995); Machin (1996); Metcalf et al. (2001) for the UK, and Visser et al. (2009a); Jaumotte and Osorio (2015) for a cross-country analysis.

[3] Addison and Hirsch (1989); Doucouliagos and Laroche (2003); Hirsch (2017)

[4] See for instance Checchi and Visser (2005) and Schnabel (2013) for summaries

reasons. First, studying membership is crucial since unions' power (and survival) is tightly linked to their ability to actively mobilize workers[5]. Second, similar to political parties, and to some extent also to private firms, unions have to ultimately meet the demands of their adherents, if they want to retain them. Studying membership composition can thus shed light on the strategies that unions adopt and help rationalize their choices[6]. Third, unions' impact on the labor market depends on the type of workers they organize (Farber et al., 2021). For instance, if members are mostly low-paid workers, unions' compressing effect on the wage distribution will be stronger compared to a situation where members are mostly high-paid workers. Finally, assuming unions' objective function is to maximize membership, looking at which types of workers unions are actually able to recruit, indirectly hints from a micro perspective, the likely causes of their decline and thus informing us about their chances to survive.

To study union membership characteristics, we construct a new, homogeneous, individual-level dataset combining good-quality public surveys with cross-national surveys and post-electoral and opinion surveys. In all these sources, we code union membership as an affirmative answer to close variants of the question "Are you a union member?"[7]. In total, our sample is composed of more than 3 millions observations, extracted from more than 400 surveys, with each country covered by more than 20 surveys and 20,000 observations. Thanks to this data collection effort, we are able to considerably predate the existing literature by going back up to the 1950s[8] while using a consistent definition of union membership.

We are interested in the comparative analysis as the chosen countries have different labor market institutions that assign different roles to trade unions and are thus likely to determine different incentives to become a union member. Together, these

[5] An alternative would have been to focus on coverage, but we believe this is less compelling for the object of our study, while it might be more important concerning the consequences of trade unions on national labor markets.

[6] For instance, an older than average union membership will make the union more leaning to prioritize the demands of older workers relatively to those of the young ones. Grandfathering clause bargained by the unions for existing contracts against some reform are an example of this.

[7] The exact questions of each survey are reported in Appendix 3.I

[8] We are able to go back to the '50s in Sweden, West Germany and the US, to the '60s in Italy and the UK, and to the '70s in Denmark and France.

countries cover roughly all the industrial relations spectrum of the Western World: highly-coordinated bargaining at the national and sectoral level and union-managed unemployment insurance (Ghent system) in the two Nordic countries, industry-wide bargaining in France and Italy, plant-level bargaining in the UK and the US, and an intermediate system between the last two in West Germany. We focus on workers' characteristics to examine the composition of unions (e.g. the share of men in unions) in different countries, its evolution over time, and in addition, the selection of various groups into unions (e.g. the relative union density of men and women). We thus get insights on how unions evolved in the different countries.

Our first contribution is to build new series for aggregate union densities, estimated exclusively using data from representative surveys and holding the definition of union membership constant. We thus correct frequently used union density series, such as the one assembled in Visser (2015), published in the OECD statistics too, in three cases. For France in the 1970s, we show that union density indirectly estimated from union declarations and professional elections data was underestimated: instead of 20%, we find that French union participation was closer to 35% at its peak in 1977. In the case of contemporary Italy, we show that union density built from unions' declarations is overestimated, and argue instead that union density has continued to fall in the 2000s, reaching slightly more than 20% in 2018 rather than the claimed 33%. For Denmark, starting in 1981, we show that the rise in union density was more important than previously thought. Since then, the trend has been correctly estimated, but the level reported has been constantly below the actual one.

Moving to the selection of workers into unions, our second descriptive contribution is to uncover several stylized facts that allow us to group the seven countries of interest in three families. In the first group of countries (UK and US), in the 1960s, blue collar, unskilled and male workers were strongly over-represented in unions, while public sector workers were not. This has completely reversed over time: today there is no significant over-selection of male or blue collar workers, while there is a positive selection of skilled workers and a very high selection of public sector employees. In

the second group of countries (France and Italy), selection is approximately constant over time along all dimensions considered: moderate over-selection of men, moderate to high over-selection of public sector workers, no positive selection of skilled or blue collar workers. The third group of countries (Denmark and Sweden), characterized by very high aggregate densities, displayed a positive but moderate selection of male and blue collar workers which has vanished over time, while the selection of public sector workers has increased. No significant selection by skill is present throughout the whole period. Finally, we show that West Germany does not fit neatly into any of the previous groups, but can be located somewhere between the first two.

These findings contribute to the descriptive literature on union composition and workes' selection into unions based on microdata. This literature has documented the determinants of union membership in various countries, in terms of our variables of interest and some more (e.g. part-time vs full-time employment, permanent vs temporary positions). Most of this literature focuses on specific countries: for instance, Amossé (2004) and Pignoni (2016) study France, Windolf and Haas (1989), Fitzenberger et al. (2006), and Anders et al. (2015) Germany, Bain and Elias (1985), Blanchflower and Freeman (1992), Bryson and Gomez (2002) and Gosling and Lemieux (2004) the UK, Kornhauser (1961), Rosenfeld and Kleykamp (2012) and Card et al. (2020) the US. There have also been some cross-country studies, like Blanchflower and Bryson (2003), Blanchflower (2006), Checchi et al. (2010) and OECD (2019) as well as the work of Jelle Visser (e.g. Visser (2015)). The main limitation of these studies is that they are scattered and not systematic: they most often rely on one data source each only, describing union composition and selection in one country at a specific date. Moreover, they often start after that de-unionization had already eroded union power, whereas we are able to give a homogeneous picture of the parabola of trade unions in the second half of the 20^{th} century in 7 different countries.

Although the object of study is different, some of the sources used and the comparative spirit of the work are also very close to the new empirical literature in economics on the socioeconomic characteristics of voters (Piketty, 2019; Kosse and Piketty, 2020;

Bauluz et al., 2021; Gethin et al., 2022). We complement these studies that focus on political parties by looking at trade unions, another important intermediate body in western democracies. Because of the historic tight link between trade unions and left wing parties in all our countries of interest, we might expect similar trajectories between left wing voters and union members. We find, instead, that the relative raise in education of left wing voters, the so called *brahmanization* of the left, is clearly paralleled among union members only in some countries (the UK and the US), but not at all in the others. This divergence might be in itself a proof of the change in the left platforms.

We argue that the three families mentioned above correspond to the three institutional settings aforementioned (decentralized bargaining, industry-wide bargaining, national bargaining in a Ghent system). These differences generate different incentive structures, which help explain why selection levels and their evolution over time are significantly higher in Anglo-Saxon countries and almost absent in Mediterranean and Nordic ones. In particular, in the Anglo-Saxon world the decision to join is mainly based on a cost-benefit analysis, which makes selection more likely to happen and evolve. In Mediterranean countries instead, the quasi universal coverage of industry agreements makes adhesion to a union resembles to the affiliation of a political party. As a consequence, selection is moderate and more stable. Finally, in the Ghent system, the strong benefits associated with unemployment insurance makes union density exceptionally high, and thus selection small by construction. Additionally, limited to the UK and the US, we argue that the existing models of endogenous unionization (Acemoglu et al., 2001; Açıkgöz and Kaymak, 2014; Dinlersoz and Greenwood, 2016), based on the idea that high ability workers stop joining unions preferring education and private returns leaving the unions without bargaining power, can not plausibly account for our stylized facts, strengthening the case made against those theories by Gordon (2001) and Farber et al. (2021). Instead, we make the case that industry-specific rents and occupation-specific unemployment levels should also be taken into account.

A common pattern to all systems does though exist: in all countries, although at

different degrees, when union density decreases, the selection of public sector workers rises. We interpret this finding as evidence that this sector better shields union power and that thus de-unionization explanation should account for this empirical regularity as in Blanchard and Giavazzi (2003). Finally, using a slightly modified version of the multi-variate shift share analysis (Green, 1992; Bryson and Gomez, 2005), we show that selection of blue collar workers has contributed to downsize unions in all countries in the past 30 years, but particularly so in the UK, the US, and West Germany. This means that, especially in these countries, even if the share of blue collar workers would have remained the same as before, unions would still be shrinking. More generally, we document that the part of decline that can be explained by compositional changes within the labor force are relatively small compared to the selection ones and the unexplained component. The conclusion is that reasons for de-unionization should be looked at primarily within defined categories of workers rather than across them. We see these findings as a contribution to the literature on the causes of unionization and de-unionization (Checchi and Lucifora, 2002; Checchi and Visser, 2005; Schnabel, 2013). Our contribution is to tackle this question using micro-data instead of aggregate time series.

The rest of the paper is organized as follows. Section 3.2 presents the institutional context in each country and the hypothesized impact on the selection patterns. Section 3.3 describes our sources on union membership and compares them with those previously used. Section 3.4 presents how we revisit commonly accepted union density time series thanks to our new sources. Section 3.5 analyses the changes in union membership composition in the last 60 years trying to differentiate between structural determinants and selection patterns. Finally, in section 3.6, we try to take stock of our findings discussing them and proposing some interpretations. In section 3.7 we conclude.

3.2 Institutional context

As argued above, the chosen countries have very different labor market institutions that are likely to affect the incentives to become a union member as well as the evolution of this choice over time. In this section, we revise the main differences that pertain to the role of unions and in general to the industrial relation system in each country.

The first remarkable difference is the main level of bargaining. Bargaining occurs at the workplace level (establishment or firm) in the UK and the US, while it is conducted at the industry level in France, Italy, Sweden and Denmark, with the national level also having substantial importance in the last two countries. West Germany represents an intermediate case: it used to have a mainly sectoral level of bargaining until reunification, but it has since then witnessed more and more firms opting out from them for an establishment wage negotiation (Dustmann et al., 2014), much like the UK and the US.

Second, in the so called Ghent countries, Denmark and Sweden in our sample, the insurance funds are managed by the unions with the state limiting its role to subsidize them. Although it is not mandatory to be a union member to have the possibility to subscribe to an unemployment insurance, in practice it is rare to be enrolled in one without being member of the related union. This is not the case in the other countries, where it is the state that fund and administer the unemployment subsidies (when present).

Third, only in the US and France all employees are covered by a statutory minimum wage throughout the whole period of analysis. A difference between the two still exists: while in the US the minimum wage used to be high and then plummeted in real terms along the decades, in France it has steadily increased and remained high as of 1968. In the UK and Germany, a minimum wage was introduced only relatively recently, 1999 (UK) and 2015 (Germany), while in Denmark, Italy and Sweden a minimum wage does not yet exists.

Finally, during most of the period considered, unions in the UK, the US, Germany, Denmark and Sweden were relatively united under a unique confederation at the na-

tional level[9]. Moreover, the respective confederations, the TUC for the UK, the AFL-CIO for the US, the DGB for Germany, and the LO in Denmark and Sweden, had strong links with their respective left parties (Labour in the UK, Democratic Party in the US, Social-democratic parties in West Germany, Denmark and Sweden). This is not the case for France and Italy where a political division, notably between communists (CGT in France, CGIL in Italy) and non communist (FO and CFDT, CSIL and UIL) unions, existed since the end of WWII. In these countries, during the heydays of unionization, the strongest unions were (and still are) the communist ones, with deep ties to the communist parties: in France, the leader of the CGT was a member of the political bureau of the french PCF and in Italy the two leaderships have often overlapped (even in recent years) with former union leaders becoming leaders of the party and vice-versa.

Given these differences, we follow the varieties of capitalism literature (Calmfors and Driffill, 1988; Hall and Soskice, 2001) and group the above countries based on their industrial relations systems in three families: Liberal economies (UK and US), Mediterranean economies (France and Italy), and Coordinated economies (Denmark and Sweden). The German model, with its numerous specificity and its changes after reunification (Jäger et al., 2022), comes out as an hybrid system between the first two. These underlying differences generate a different set of incentives in the three groups of countries. In France and Italy, choosing a confederation, socialist, communist or christian, is very close to a political affiliation. Economic factors do certainly play a role, but they are massively mediated by political and cultural factors and it is unlikely that a simple cost-benefit analysis could explain the membership patterns. In Denmark and Sweden, the Ghent system creates an almost universal incentive to join unions (Clasen and Viebrock, 2008; Rasmussen and Pontusson, 2018), hence there is a limited space for differential selection. In the UK and the US, because of the bargaining institutions, benefits from unionization accrue to union members only, giving rise to a significant wage premium (Farber et al. (2021); Bryson and Gomez (2002)). Therefore, for these countries, it is plausible that workers in each workplace estimate the

[9]Although one should not overlook the unions of white collar workers in Denmark and Sweden, which, although minoritarian, have at times played important roles, detailed e.g. by Swenson (2018).

amount of firm-specific rents they could appropriate through unionization, and that this explains their choices concerning membership. Additionally, because of these institutional differences, the incentives to join a union interact differently with the same economic shocks and can thus leads to different evolution patterns. For instance, a raise in the unemployment rate of blue collar workers, will likely have a different impact on selection of the affected workers in the three groups countries.[10]

3.3 Data

To conduct our analysis, we combine microdata from three different source types. The first one is labor and household surveys conducted by public institutions. They provide high quality data with a detailed information on the respondents: the *Enquête permanente sur les conditions de vie des ménages* (EPCV) since 1996 and the *Statistiques sur les ressources et les conditions de vie* (SRCV) since 2008 in France; the General Household Survey (GHS) in 1983 and the Labour Force Survey (LFS) since 1989 in the UK; the *Allgemeine Bevölkerungsumfrage der Sozialwissenschaften* (Allbus) since 1980 and the *German SOcioEconomicPanel* (GSOEP) since 1985 in West Germany and the *Current Population Survey* (CPS) since 1979 for the US. We can also include in this category the German Politbarometer survey since 1977, which is an opinion survey but with a large number of observations. These data sources are very useful, and have been used in a number of studies on unionization. In France, Amossé (2004) and Pignoni (2016) have used these surveys. In Germany, Schnabel and Wagner (2003), Biebeler and Lesch (2006) and Anders et al. (2015) have used Allbus, whereas Haggeney et al. (1998), Fitzenberger and Beck (2003) and Fitzenberger et al. (2006) have used the GSOEP. In the UK, Addison and Siebert (2002) and Gosling and Lemieux (2004) have used the LFS or GHS[11]. In the

[10] In France and Italy, since unemployment should be orthogonal to the reasons to join a union, the impact on selection should be (up to a certain point) null. In Denmark and Sweden an increase in unemployment will have, if anything, a positive effect in increasing the value of the unemployment insurance and hence possibly pushing up union enrollment for the affected category. This will translate in a increase in selection of the group. Finally, in the UK and the US, a raise in unemployment for a certain group of workers lowers their bargaining power and hence pushes their union density down: selection for the specific group will be negative.

[11] Other sources with information on union membership include the National Training Survey (1975-1976), which has been used by Bain and Elias (1985); the British Social Attitudes Survey (starting in

US, a very large amount of papers has used the CPS, with Farber et al. (2021) probably the most recent one .

The main limitation of these data, however, is their coverage in terms of time and space. We do not have any such survey with a question on unions in Italy. In France, the question on unions in household surveys appears in the 1990s, when de-unionization was already over; in the UK, the first data point from the GHS is in 1983, during de-unionization. Moreover, we could not access the LFS of Denmark and Sweden, and hence have no large scale surveys for these two countries despite their existence. Therefore, we turn to another type of data source, opinion surveys, and in particular post-electoral surveys. The quality of this type of data is not as good as the previous one, but these or similar surveys have been used for similar historical socioeconomic research, in particular to study political cleavages by Gethin et al. (2022) among others. This source of data allows us to extend the scope of our investigation in space, by including Denmark, Italy, and Sweden, and in time, allowing us to have a picture of union membership composition before de-unionization, which was not the case in the existing literature on France, Italy, Sweden and Denmark. Except in Denmark and France, we can even go back to the 1960s, which allows us to follow union membership composition during the aggregate rise in union density of the 1970s. Such electoral surveys have, to the best of our knowledge, never been used to study de-unionization in Europe, with the exception of Windolf and Haas (1989) on West German unions between 1976 and 1984, and the recent work of Farber et al. (2021) on the US.

The third category of data which we use to complete our analysis is cross-country surveys: the 1960 Civic culture survey, the Eurobarometer surveys starting in 1970, the European Value Study starting in 1981, the International Social Survey Program (ISSP) starting in 1985, and the European Social Survey (ESS) starting in 2001, are useful for providing data points in the 1960s, the 1970s and in Denmark, Italy, and Sweden. They also allow us to check if the definitions of our variables of interest are consistent across countries. The ISSP has been used by Blanchflower and Bryson (2003) and Checchi

1983), which has been used by Blanchflower and Freeman (1992).

Table 3.3.1: Sources overview

Country	Earliest survey	Number of surveys	Total N
UK	1960 (1975*)	67	1,162,371
US	1952 (1936)	62	1,615,623
France	1970 (1996)	65	105,222
Italy	1960 (1985)	43	24,661
West Germany	1953 (1976)	172	387,077
Sweden	1956 (2002)	23	29,067
Denmark	1975 (2002)	50	68,975

(*) We indicate first the date of the first survey we use, and in brackets the earliest survey used so far in the literature on unions to the best of our knowledge. | The number of surveys is the number of survey*years.

et al. (2010) to study union membership, while Blanchflower (2006) has used the European Social Survey (ESS).

These sources allow us to present a consistent, long-run, cross country overview of union membership density and composition in Europe based exclusively on survey data and using a consistent definition for union membership. These are the main advantages of our approach as compared to previous work that has relied on shorter micro-data (see Table 3.3.1 for a summary) and thus has also used unions' self declarations and sometimes even extrapolations to estimate long time series of union densities (e.g. Visser (2015)). Our sources have, however, also some intrinsic limitations. The response rate to surveys may be different among groups (see Gaxie (1990)). In particular, persons more interested in politics might be both more inclined to answer surveys and to join unions. Also, the types of respondents might have changed over time: with women entering more the labor market, respondents gender has become more balanced. Additionally, a positive answer "I am a union member" is subjective, and may have a blurrier meaning than administrative data based on the payment of dues. For example, a worker who was a union member in his previous job may still declare himself a union member, although he has not yet joined a union in his new job (see Appendix 3.B for a discussion on the relation between being a union member and paying dues). Finally, and relatedly, the heterogeneity of our sources may pose consistency problems. In particular, the questions on union membership and on educational

attainment are not always exactly the same across surveys.

We hope to partially answer these concerns in two ways. First, we aggregate all our results in the following sections in five-year bins, to average away survey-specific errors[12]. The information about which survey is included in which five-year-bin is presented in Appendix 3.I, together with the exact question about union membership asked in the survey and the number of observations. More detailed information on the formulation of other questions, the weighting, and links to the documentation are available for most surveys in an online documentation[13].

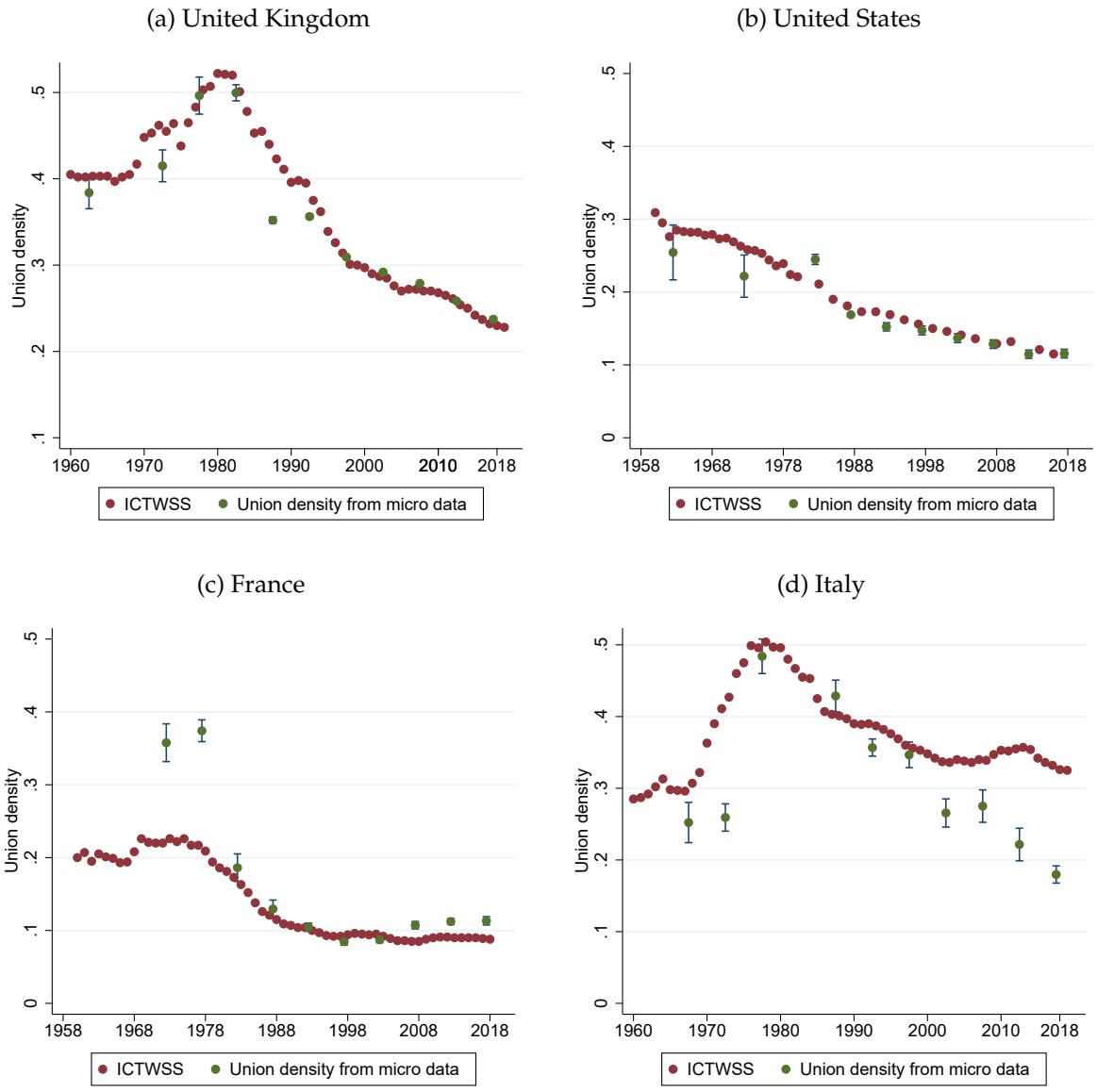
Second, we devote section 3.4 to the estimation of aggregate union density levels from our micro-data and then compare them with the administrative data released by the unions themselves and commonly used as a reference in economics. As we will see, for most countries and periods, but with notable exceptions, the two series are very close, showing that there is no systematic problem with surveys.

[12]Note that survey specific errors are on average actually very small as can be seen in the disaggregated time series in Appendix 3.A.

[13]https://www.dropbox.com/sh/ech76fiof6yrd8h/AAByeX3_3rTEui7KWwTNmQexa?dl=0

3.4 The rise and fall of unions

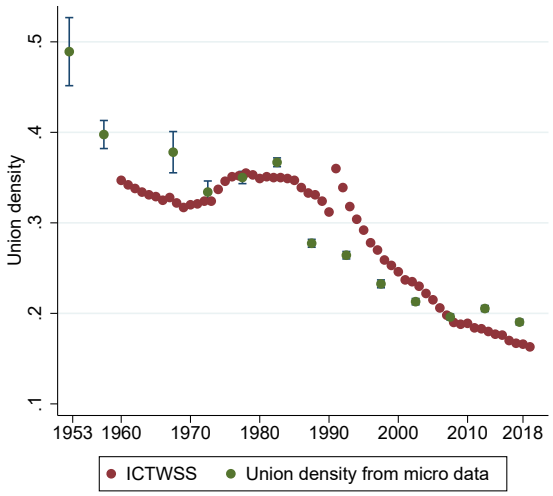
Figure 3.4.1: Union density



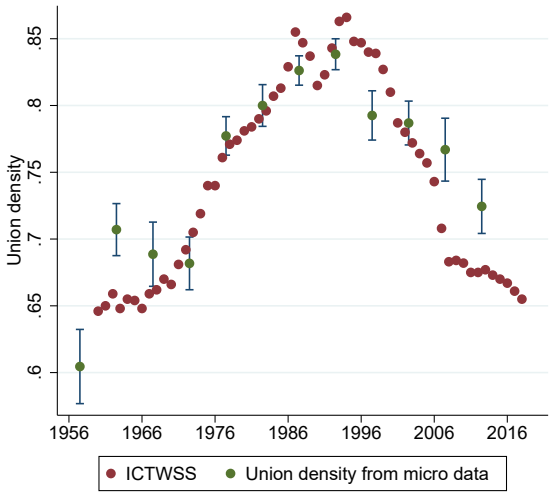
Note: The figure presents the evolution of union density as measured in our different micro-data sources by periods of 5 years for our countries of interest and compare them with the time series from the ICTWSS dataset.

Figure 3.4.2: Union density - Other countries

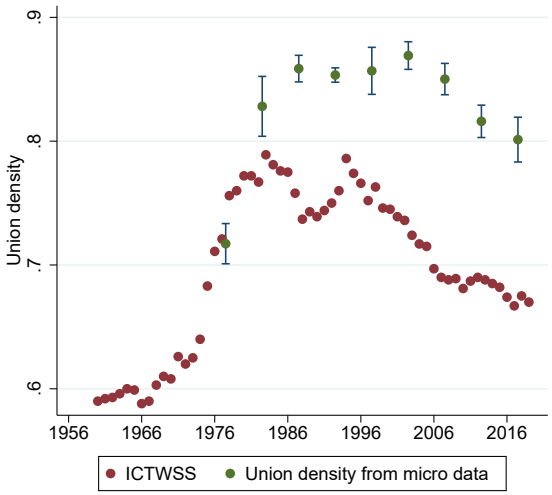
(a) West Germany



(b) Sweden



(c) Denmark



Note: The figure presents the evolution of union density as measured in our different micro-data sources by periods of 5 years for our countries of interest and compare them with the time series from the ICTWSS dataset.

We compare our data with the ICTWSS data, originally collected by Jelle Visser, and now hosted by the OECD too. These data are based on different sources. In particular, when publicly administered labor force surveys are not available, they mainly rely on union self declarations sometimes complemented by other information such as the union electoral results (e.g. France)[14]. This is mainly the case for early years (before

[14]see https://www.oecd.org/els/emp/DetailedMethodnote-OECD-AIAS_DB.pdf for the full methological notes by country.

1980), but also for Italy throughout the whole period. The ICTWSS series have been widely used in the literature, we thus take them as a benchmark to verify the quality of our series. As shown in the 5-years binned figures, as well as in the disaggregated ones presented in appendix 3.A, in most countries and for most periods, and particularly when the ICTWSS data do not come from union self-declaration reports, the fit between the two series is very good. We take this as evidence of the quality of our micro-data.

There are three significant exceptions: France in the 1970s, Italy since 2000, and Denmark as of 1980. In the dedicated appendices (3.B for France and 3.C for Italy), we present several reasons to believe that our data are more reliable than the ICTWSS estimates. The French case is also discussed in depth in Batut et al. (2022) to which we refer interested readers. We hereafter offer a brief account of our arguments. For France, the ICTWSS relies before the '90s on earlier work (Bevort, 1995; Labbé, 1995). These researches based their calculations only on the financial records of the two largest confederations (CGT adn CFDT). Building on a series of disputable hypothesis on how many payments each member used to made during a year, the authors transformed these numbers in aggregate union membership series. To account for all other organizations, they attributed membership to the missing unions in proportion of the votes they received with respect to the two largest confederations in representative employees elections. Two imputations are hence needed to reach the final number. Importantly, when these is no longer the case, our estimates and those of the ICTWSS converge, even in the case of surveys not administered by the French public authority and that go further back in time. Given all these points, to which we add a very close match between our series and strikes series, we are confident to better depict the union parabola in France than previously done. For Italy, the ICTWSS numbers come from the auto-declarations of the 3 largest confederations (CGIL, CISL, and UIL). There are sensible reasons to believe that the incentives to misreport changed in 1993. First, new firm workers elections were put in place, giving incentives to match membership and votes received. Second, a reunification attempt failed, increasing compe-

tition and the incentive to over-declare membership. Moreover, the unique, although partial, employer survey that exists[15], strongly points to our estimates as the correct ones rather than those of the ICTWSS. The consequence of correcting the two series is that aggregate density in France in the 1970s was significantly higher than previously thought, and therefore that the de-unionization process was more brutal: the density was divided by three in around a decade. For Italy, instead, we argue that the de-unionization lasted longer than commonly accepted, so that the current official density figure is overestimated by around 10 percentage points.

Concerning Denmark, we find that after 1981 unionization kept rising and stabilized at around 85% little after, to then descend slightly as of 2000. While the trends are very similar, the levels are higher than those depicted by fiscal records (union dues tax rebate, available as 1994) and the ICTWSS data (unions self-declarations). The difference might come from a substantial share of Danish workers who wrongly declare (knowingly or not), to belong to a union while this is not the case. This might possibly be because those workers are covered by a union related unemployment insurance, and thus believe to be union members. Alternatively, these workers might lie about their membership status to conform with the majority of other respondents and hence avoiding judgment from the interviewer in a country where union density is particularly high. We argued that membership ultimately matters as it very well proxy support for unions. In this sense, believed membership might be more important than actual one. Our series might hence better capture the true power of danish unions if not their exact membership. We thus still use the series built from the polls to look at selection into unionism and leave to solve this inconsistency for future work.

Overall, and despite the exceptions, the picture common to most of the countries under study is that of a rise in union density in the 1970s followed by a fall in the 1980s (or 90s). The timing and amplitude of these movements of rise and fall of unionization depend on the specific history of each country, which is briefly discussed in Appendix 3.D.

[15] available only for firms belonging to *Confindustria*, the Italian largest federation of firms

3.5 Membership composition

3.5.1 Definitions

We want to investigate the changing composition of unions, in terms of the four following variables: gender, public sector, blue collar occupation (binary variables), length of education (in years). In appendix 3.E, we also look a the relative age of union members. The most straightforward determinant of union membership composition is the composition of the workforce. For example, the share of blue collar workers in unions has declined in all the countries studied, and one obvious explanation is the falling share of blue collar workers among wage workers because of de-industrialization. But this is not the only determinant. For example, consider the public sector. It is well known that in the UK, the relative importance of public sector unions has grown spectacularly over the last decades, whereas public sector employment was falling. So another factor is at play, the increasing over selection or over representation of the public sector: being a public sector worker increases the probability of being a union member, and more and more so over time. So workforce structure is not the only determinant of union membership composition, but has to be complemented by the selection of various groups into unions.

In the following subsections, we therefore explore the evolution of these three variables - composition of union membership, composition of the workforce and selection into unions[16] - defined as follows with respect to a subset X of employees ($X =$ males, public sector or blue collar workers ; $\bar{X}$ is the complementary subset, i.e. females, private sector or white collar workers): union composition UC_X relative to X is the share of members of X in the union membership (e.g., the share of male workers among unionized wage workers); workforce composition WC_X is the share of members of X in the workforce (e.g., the share of male wage workers among wage workers) ; selection of X into unions US_X is the ratio of the union density among wage workers who

[16]We have focused our analysis on these three summary variables, but the reader interested in descriptive data can refer to Appendix 3.F where we simply display the density by subgroup in each country over time: e.g., union density among men and among women.

are members of X to the union density among wage workers who are not:

$$UC_X = \frac{|\text{Unions} \cap X|}{|\text{Unions}|} ; WC_X = \frac{|\text{Workers} \cap X|}{|\text{Workers}|} ; US_X = \frac{|\text{Unions} \cap X|/|\text{Workers} \cap X|}{|\text{Unions} \cap \bar{X}|/|\text{Workers} \cap \bar{X}|}$$

Hence the identity:

$$\frac{UC_X}{1 - UC_X} = \frac{WC_X}{1 - WC_X}.US_X$$

If the composition of unions simply mirrors the composition of the workforce ($UC_X = WC_X$), then there is no selection effect ($US_X = 1$). If group X is more represented in the unions than in the workforce ($UC_X > WC_X$), it is positively selected into the unions ($US_X > 1$). In the opposite case ($UC_X < WC_X$), it is negatively selected ($US_X < 1$).

We compute the selection variable US_X as the coefficient of a log-linear model that we estimate thanks to a Poisson regression, where $Union_{i,t}$ is a binary variable equal to 1 if the individual i in survey or period t is part of a union, X_{it} is the binary variable equal to one if individual is part of category X and μ_t a set of survey or period fixed effects.

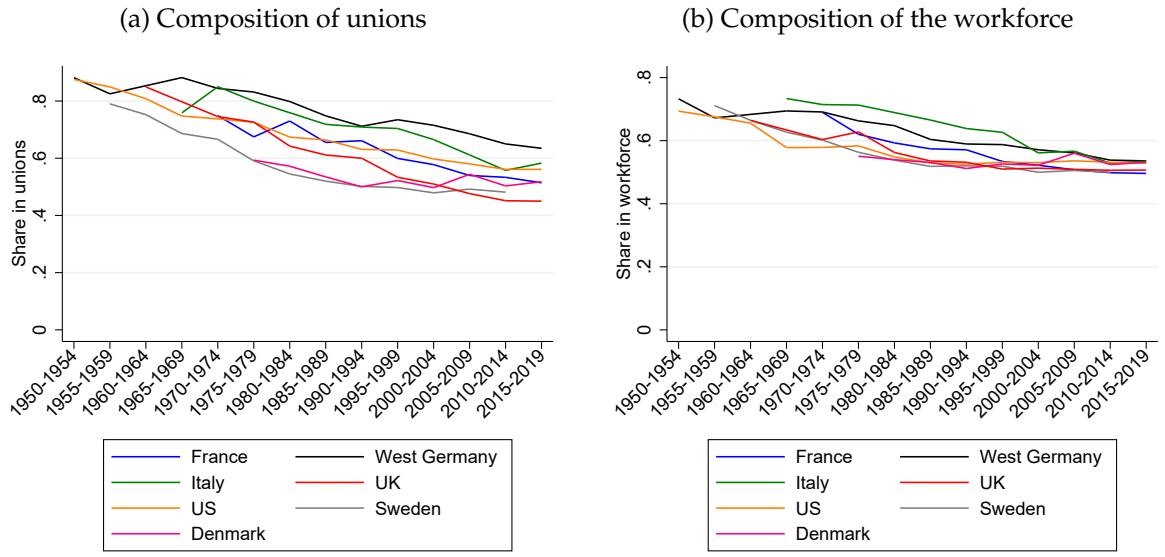
$$\log(\mathbb{E}[Union_{i,t}|X_{i,t}]) = \beta_t.\mu_t \times X_{i,t} + \mu_t + \epsilon_{i,t} \tag{3.1}$$

In this context, e^{β_t} measures the incidence rate ratio of unionism in category X in the period or survey t and is an estimator of US_X. Estimating selection this way has the advantage of giving us a sense of their uncertainty, as we can also provide confidence intervals for our estimates. This is especially important because we are using nationally representative surveys and not administrative data.

3.5.2 Gender

The first variable we start with is gender. As shown in Figure 3.5.1(a), there was a clear feminization of unions in all the countries studied. In the 1960s, the share of men in unions was around 85% in West Germany and the UK, and in the 1970s, it was more than 70% in France and Italy. Denmark and Sweden had the most feminized unions,

Figure 3.5.1: Evolution of the share of men in unions and among all employees



Reading: In the first half of the 1980s, men made up 80 % of union members in West Germany, compared to only 65% of the workforce.

with still 60% of men in the mid-'70s. This share is today less than 65% everywhere: unions have reached quasi-gender parity or complete parity in most countries, and gone beyond it in favor of women in the UK. The unique exception is represented by West Germany, where men are still relatively positively selected. This trend is of course in part explained by the massive entry of women in the dependent workforce over the same period, as shown in Figure 3.5.1(b). However, this is not the only factor at play.

As we can be seen in Figure 3.5.2, the differential likelihood of joining unions for women compared to men has also changed over the period. The clearest cases are the ones of the UK and the US, where the constantly declining selection of men accounts for more than half of their declining share in union membership composition. In West Germany, our data show an apparent rise in male selection from 1950s to the 1960s, followed by a steady decline. One should not over-interpret the initial rise, however, as our two points in the 1950s are based on one electoral survey each. The feminization of union membership in Germany started in the '60s in parallel to the feminization of the left vote as documented by Kosse and Piketty (2020). Comparing Germany to the UK and the US, it should be noted that the declining male selection stabilized earlier (around 2000 versus around 2010), and at a higher level (1,5 versus 0,8) in the for-

mer country relative to the others. For what concern Denmark and Sweden we do see here too a steady decline in the selection of women. With respect to the UK and the US, however, Nordic unions have reached gender parity 20 years in advance and then kept it for the past 4 decades. Finally, in France and in Italy, no clear long-term trends emerge. Men were always more likely to be union members than women, and this selection seems to vanish in recent years, but there were already important fluctuations before.

To better understand if the changes in selection came from a faster decline of male union membership or a rise of female union membership, in Appendix 3.F we show union densities dis-aggregated by gender. For the UK and the US, the pattern is dived in two moments: a rise of female participation until 1980, and then a faster decline in male membership (see Appendix figures 3.F.1(a) and 3.F.1(b)). For Denmark and Sweden, instead, the change came only from a fast unionization of women in the 1970s (Appendix figures 3.F.2(c) and 3.F.2(b)). Finally, for West Germany it only came from a faster de-unionization of men (Appendix figure 3.F.2(a)).

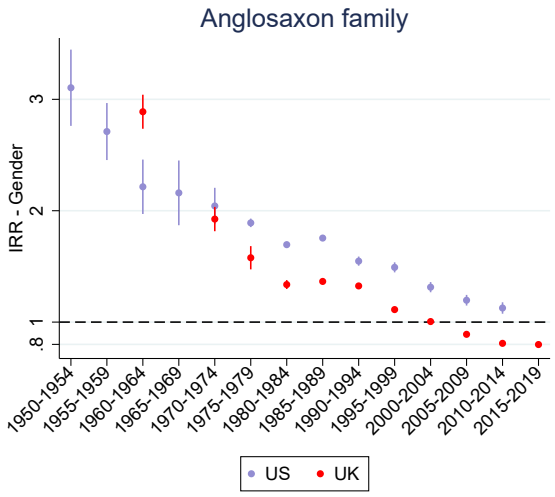
3.5.3 Public sector

Next we move to analyze the evolution of union membership depending on the sector of employment. The comparison of figures 3.5.3(a) and 3.5.3(b) shows at first glance that in all the countries studied, the share of the public sector in unions has been, over the whole period and in all the countries considered, significantly more important than its share in the workforce.

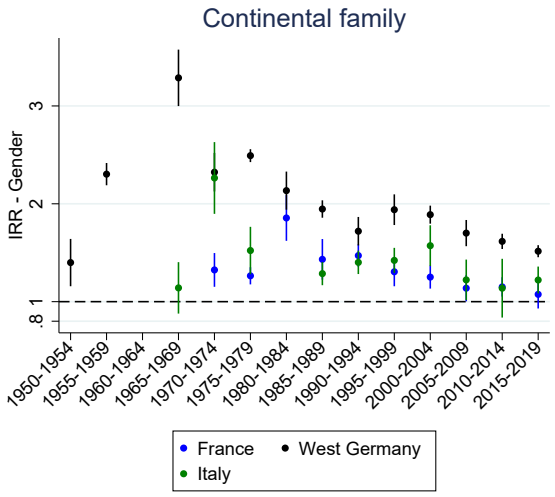
However, as figure 3.5.4 shows, this positive selection of public sector workers varies across time and space. The clearest cases of a long term rise in public sector selection are again the UK and the US, but the path is very evident also in Italy, although with a very different level of selection. For the UK and the US, the selection coefficients are so high that private and public sector unionism appear to follow different dynamics in the last decades, consistently of has been noted by Walker (2014)

Figure 3.5.2: How does gender predict union membership?

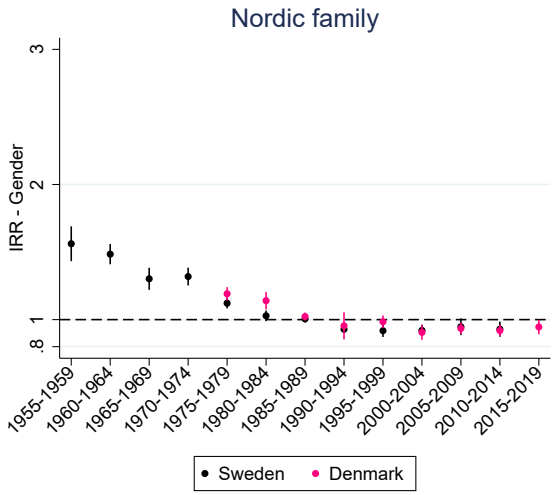
(a) Group 1: UK, US



(b) Group 2: France, Italy, West Germany



(c) Group 3: Sweden, Denmark

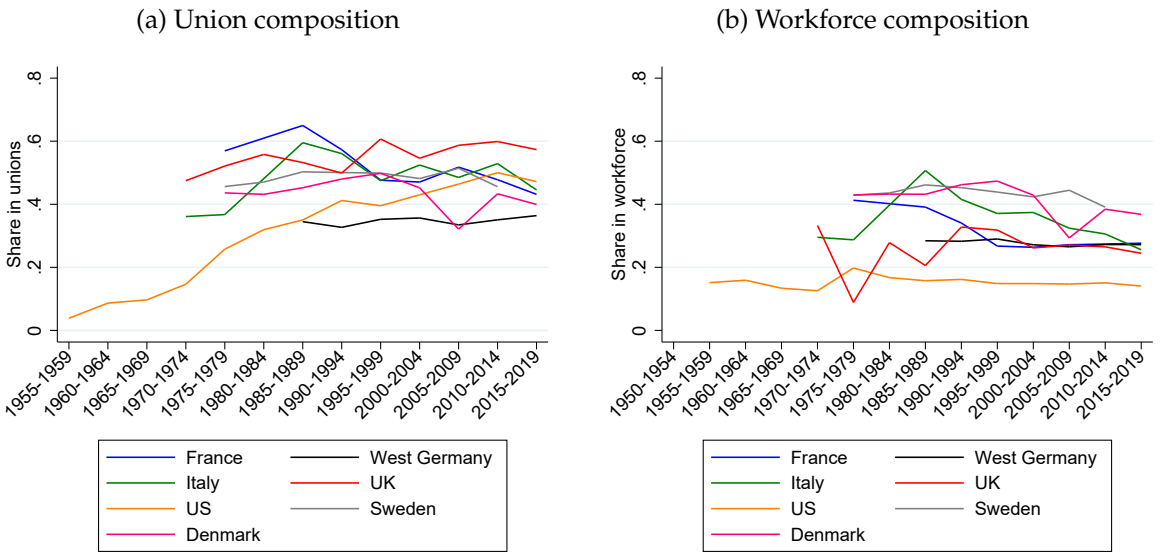


Note: Results from the estimation of equation (3.1) when the category variable is a binary variable equal to 1 when the individual is a man. We also provide the 95% confidence interval for all estimates. This represents the evolution of the ratio of union densities of working men and women in our countries of interest.

for the US. This is indeed the case, especially in the US, where the unionization rates in the two macro-sectors are almost perfectly negatively correlated as shown in Appendix figure 3.F.3(b). Graph 3.5.4(b) shows a more modest, but still evident rise in the last decades for Germany[17] While it decreases for France after having being relatively

[17]Most of the German surveys in our database tell whether the respondent is a 'Beamter', but only a minority of public sector workers (35% as of 2019, see BPB (2020)) have the status of *Beamten*. Therefore, we use only the data from the GSOEP and Allbus (from 1990 onwards), which include a question on public sector in the usual sense.

Figure 3.5.3: Evolution of the share of public sector workers in unions and among all employees

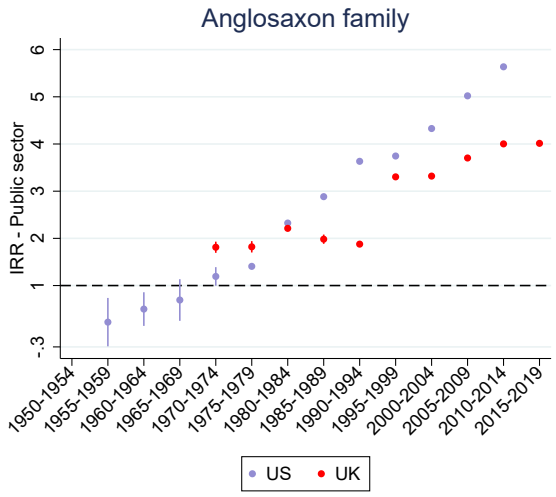


Reading: In the second half of the 2000s, public sector workers represented around 50% of union members in Italy, compared to only around 25% of the workforce.

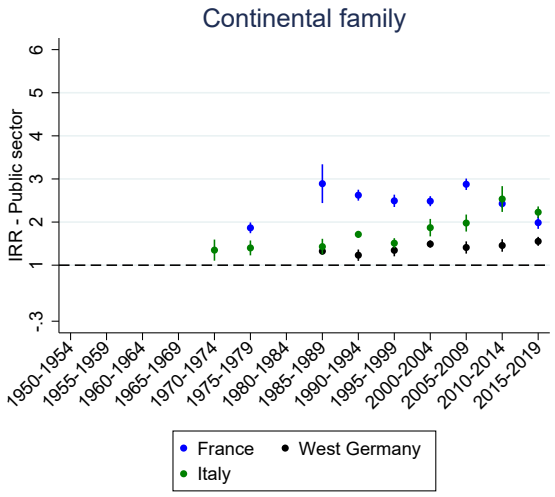
high and steady. It is tempting to connect this change to the apparent rise in density (see fig. 3.H.1(c)) and decline in selection by education (see fig. 3.5.6(b)) over the same period: it is possible that in recent years, unionization has progressed in France, driven by the entry of new private sector and relatively less educated workers. Finally, 3.5.4(c) shows that in Nordic countries too there has been a rise in selection, but much smaller due to the high union shares. To better appreciate the change that has occurred, it is worth looking to the relative unionization rates in Appendix figures 3.F.4(b) and 3.F.4(c). Here we can observe that in 1970-75, the gap was less than 5 and 10 percentage points in Denmark and Sweden. Today we are close to 12 and 20 respectively, a more than a twofold increase. The natural conjecture to explain this general rise of public sector selection, that, importantly, would also encompass the recent fall observed in France, is that when de-unionization happened because of an adverse state of the economy and of the labor market, unions in the public sector resisted better, being relatively insulated from the pressures of profitability. Market types of explanations for de-unionization, such as the one proposed by Blanchard and Giavazzi (2003), might thus be an important element of the puzzle.

Figure 3.5.4: How does working in the public sector predict union membership?

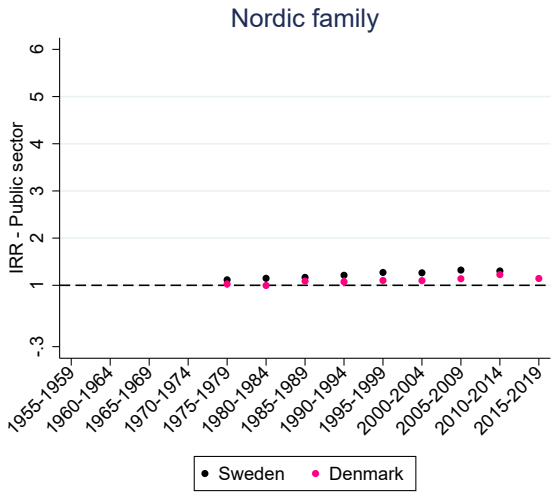
(a) Group 1: UK, US



(b) Group 2: France, Italy, West Germany



(c) Group 3: Sweden, Denmark

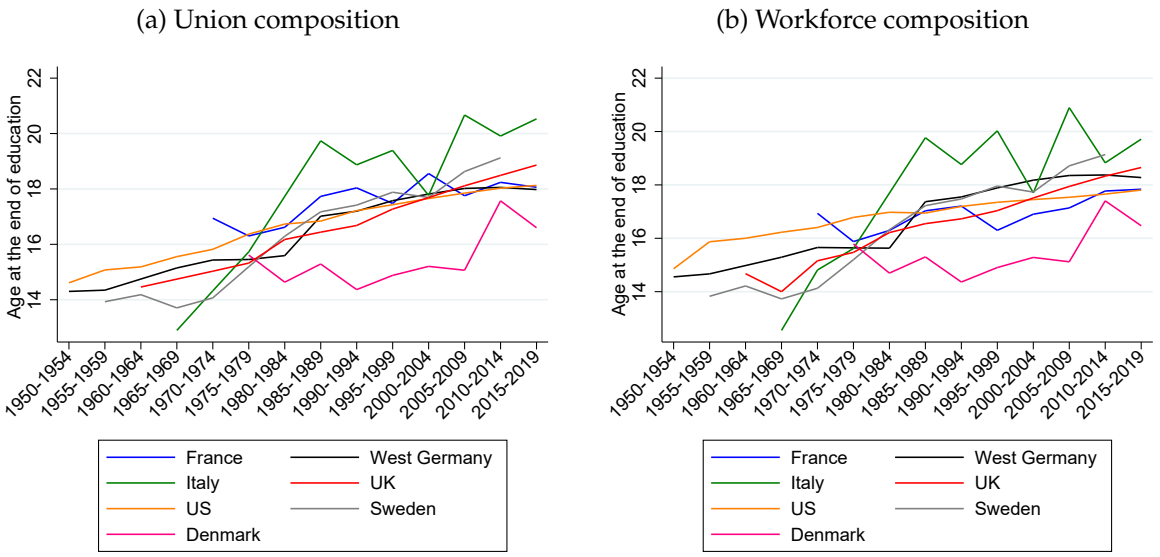


Note: Results from the estimation of equation (3.1) when the category variable is a binary variable equal to 1 when the individual is a public sector employee. We also provide the 95% confidence interval for all estimates. This represents the evolution of the ratio of union densities of employees in the public and private sector in our countries of interest.

3.5.4 Education: towards brahmin unions?

Looking at education, we observe that in the 1960s, unskilled workers were positively selected into unions in the UK, the US, but also in West Germany. This selection has disappeared over time as shown in figure 3.5.6(a) and 3.5.6(b). We can hence say that in the UK and in West Germany there was a brahmanization, i.e. an increase in the educational attainment, relative to the general population, of union members. This

Figure 3.5.5: Evolution of the average age at the end of full-time education among union members and among all employees



Reading: In the early 2000s, in France the average age at the end of education was 18 years for union members but less than 17 in the dependent workforce.

parallels the electoral brahmanization of the left documented by Piketty et al. (2018) and Kosse and Piketty (2020) in the same countries. This picture is also identical to the one of union membership in the US, as studied by Farber et al. (2021) (figures 3, A5-A8). However, an important difference exists between the two sides of the Atlantic: in the US, brahmanization went parallel to de-unionization, whereas in the UK and West Germany it started well before it, and even occurred at the time of rising union density. As it was the case for gender, in West Germany this trend stops earlier than in the UK and therefore a slightly positive selection of low skilled workers still remains nowadays, unlike in the UK[18]. Note that in the UK, the trend in the selection by education had already been described in Machin (1997), Addison and Siebert (2002) and Gosling and Lemieux (2004), but for the 1980s and the 1990s only. For Denmark and Sweden, we have a precisely estimated zero throughout the whole period, confirmed by the disaggregated densities in Appendix figures 3.F.6(c) and 3.F.6(b). This is in stark contrast with the very strong change in education selection shown for left wing parties in Gethin et al. (2022). Finally, in France and in Italy, unskilled workers are constantly

[18]In the UK, it is the rising selection of public sector workers that explains that more educated workers have been more likely to be union members since the 1990s, as shown in Appendix **??**, fig. **??**.

slightly underrepresented, with no clear trend. Over the same time period in France, union membership composition has not changed in parallel to that of the left electorate, as analyzed by Gethin et al. (2022). In Italy, the two are possibly more similar as the left electorates composition with respect to education fluctuates around no selection (Bauluz et al., 2021), as does union membership.

These results still hold when using a binary variable distinguishing employees who completed full secondary education from those who did not (Appendix 3.G). The different trajectories have something in common: in no country we do find a consistently falling selection of the skilled workers. As already noted by Farber et al. (2021) for the US case, this stands in contrast to the theory of Acemoglu et al. (2001), then developed by Kaymak and Acikgoz (2011), which explains de-unionization (at least in the US and the UK) by the exit of the high skilled. Quite on the contrary, we find that the decreasing selection is driven by lower-skilled workers leaving the unions at faster rates in the UK and the US (Appendix figures 3.F.5(a) and 3.F.5(b)) or even high-skilled workers massively joining the unions as in Germany (Appendix figure 3.F.6(a)).

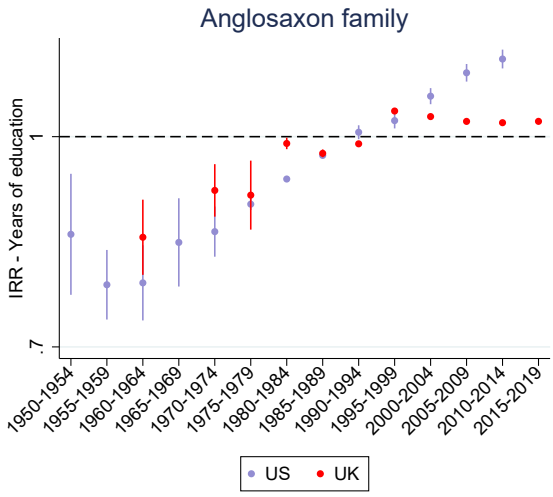
3.5.5 Blue collars

Finally, we turn to analyze occupational selection, distinguishing between blue collar, the supposedly archetypal union members, and white collar workers. The shrinking number of blue collar jobs in rich countries since the 1970s is a well known fact, reflected in figure 3.5.7(b). Therefore, de-industrialization, a structural factor, is often considered among the causes of aggregate de-unionization.

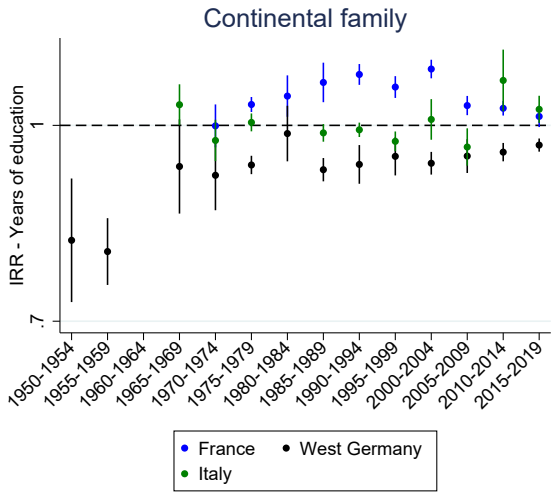
However, a more careful look at Figure 3.5.7(a) shows that union composition changed faster than workforce structure in the UK and the US. This implied a drastic falling selection of blue collar workers in these two countries, as illustrated in figure 3.5.8(a). In both countries, blue collar workers were strongly over represented in unions in the 1950s and 1960s. In the US, blue collar selection declined early, but remained positive. In the UK, the deselection continued unto the 2000s, and became negative. These evo-

Figure 3.5.6: How does length of education predict union membership?

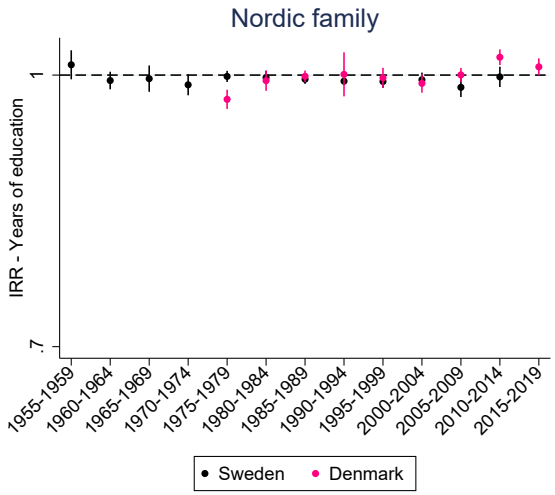
(a) Group 1: UK, US



(b) Group 2: France, Italy, West Germany



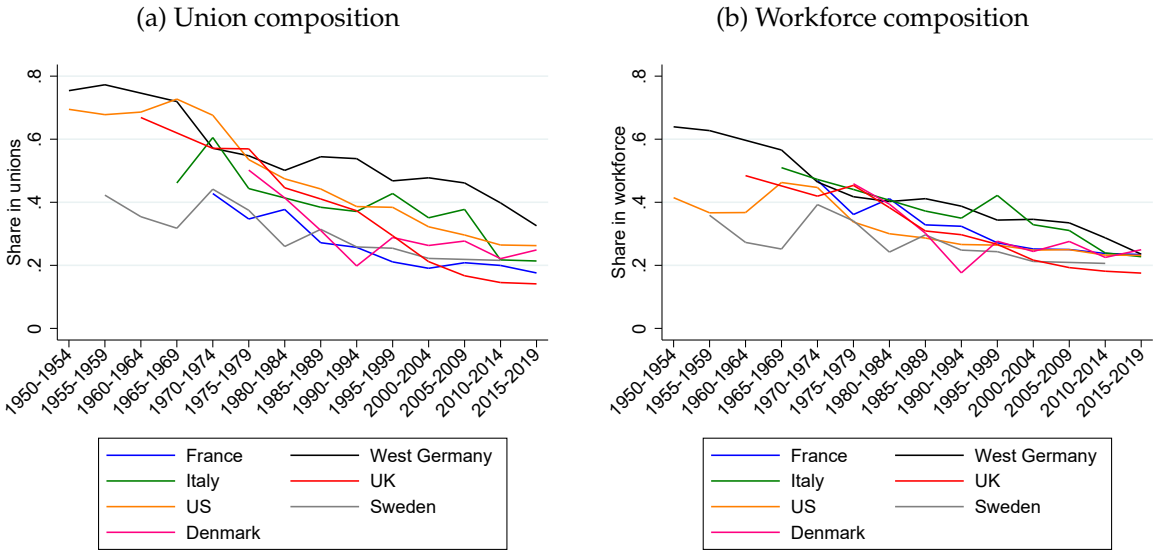
(c) Group 3: Sweden, Denmark



Note: Results from the estimation of equation (3.1) when the category variable is the duration in years of full-time education. We also provide the 95% confidence interval for all estimates. This represents the evolution of the ratio of union densities when you add one year of education in our four countries of interest. If the coefficient is lower than one then it means that the union density decreases as education increases.

lutions mimic quite closely those of gender (see section 3.5.2), probably because most blue collar workers tend to be men. West Germany too experienced a small drop in selection as shown in Figure 3.5.8(b). However, the drop was way more moderate and not driven by a dramatic de-unionisation of blue collar workers as in the UK and the US, but rather by a relative higher rise in unionization of white collar workers (Appendix figures 3.F.7(a), 3.F.7(b) and 3.F.8(a)). Similarly, but more moderately, in Den-

Figure 3.5.7: Evolution of the share of blue-collar workers in unions and among all employees



Reading: In 1965, blue collar workers represented around 60% of unionized workers while they were less only slightly more than 40% of the total dependent workforce.

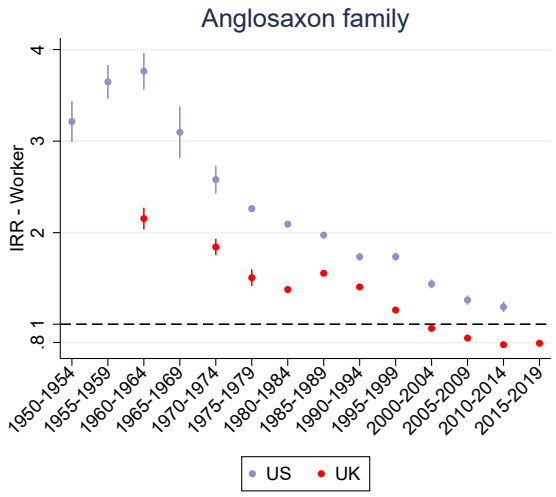
mark and Sweden there was a positive selection of blue collar workers that completely vanished by 1990. Here again, Nordic countries seem to be somewhat in advance with respect to Anglo-Saxon ones, though sharing similar trends as for the case of women. Note, moreover, that in these two countries the selection disappeared entirely because white collar workers massively joined the unions in the '70s and not because of a sharp decline in blue collar union memberships, that on the contrary remained quite stable until recently (Appendix figure 3.F.8(c) and 3.F.8(b)). In France and in Italy, instead, there never was a clear over-representation of blue collar workers, neither a clear trend in their selection since the 1970s. In France, blue collar workers are significantly *under*-represented, especially from the 1990s onward. In Italy, blue collar workers have always been as equally organized as other workers, going against the common idea of union members being uniquely blue collar workers in all countries.

3.5.6 Multivariate shiftshare analysis

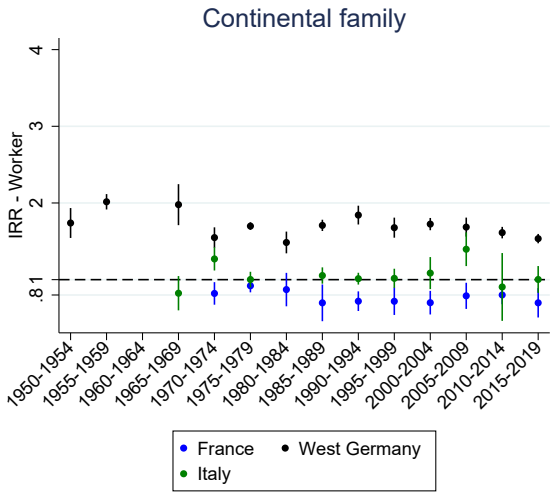
Following Green (1992) and Bryson and Gomez (2005), we can decompose the change in union membership using a shift-share analysis. Indeed, any change in union density

Figure 3.5.8: How does a blue collar occupation predict union membership?

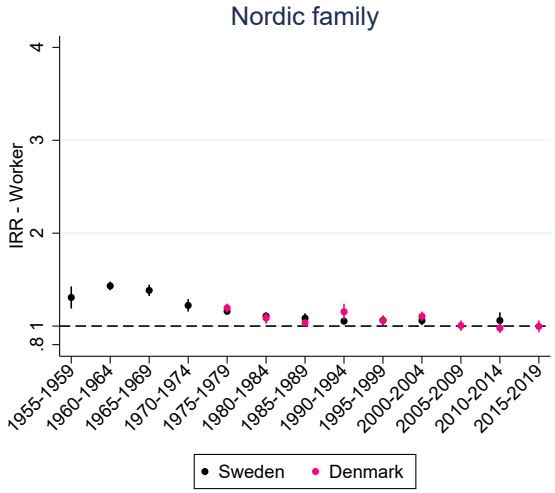
(a) Group 1: UK, US



(b) Group 2: France, Italy, West Germany



(c) Group 3: Sweden, Denmark



Note: Results from the estimation of equation (3.1) when the category variable is a binary variable equal to 1 when the individual is a blue collar worker. We also provide the 95% confidence interval for all estimates. This represents the evolution of the ratio of union densities of blue collar and other workers in our countries of interest.

between two time periods t and t_0 can be written as:

$$\Delta U = \sum_g n_g^t . p_g^t - \sum_g n_g^{t_0} . p_g^{t_0} \tag{3.2}$$

where n_g is the union density within group g and p_g is the share of all employees within group g. The principle of the shift share analysis is that the change in union density can be split into three elements:

$$\Delta U = \sum (n_g^t - n_g^{t_0}).p_g^{t_0} + \sum (p_g^t - p_g^{t_0}).n_g^{t_0} + \sum (p_g^t - p_g^{t_0}).(n_g^t - n_g^{t_0}) \tag{3.3}$$

The first element tells us what would have happened if the employee composition had stayed the same in t as in t_0, but only within-group densities had changed. The second element is the change that would have happened only as a result of a change in employee composition if within-group density had stayed at its original level. The third element is the interaction of the first two effects.

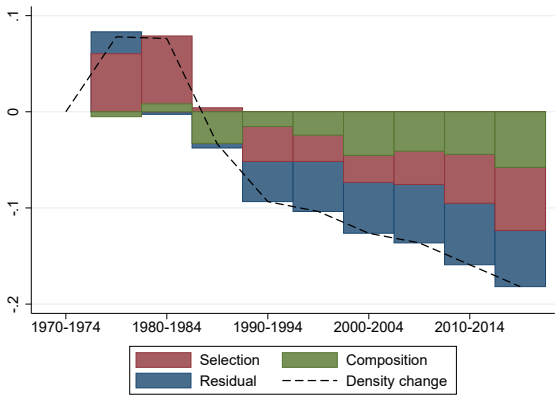
As in Bryson and Gomez (2005), we can use this identity to describe by how much the change in union density is attributable to changes in the composition of the workforce and how much is due to changes in the density within groups. Because these dimensions are not independent, we run a linear probability model to estimate the probability that an individual will be a union member for each lustrum for our seven countries: $U_i = \sum_g .\beta_g.G_i + \epsilon_i$ where U_i is a dummy variable equal to one if the individual i is unionized and G_i is a dummy variable equale to one if i is part of group g. The LPM estimation of β_g measures the ceteris paribus likelihood of individuals of group g to be unionized.

We can capture the contribution of one particular dimension to the change in union density, be it the share of blue collars within the workforce or the likelihood of women to unionize, by comparing the unrestricted prediction of the linear probability model with the prediction made keeping this particular dimension at its original value in t_0. To keep composition intact, we randomize the status so that the share of the group is always the same as in the first period. To keep selection intact, we reproduce the prediction keeping β_{g,t_0} the same for all period. The resulting contributions for our four dimensions of interest are presented in Figures 3.H.1 and 3.H.2 for our seven case countries. More disaggregated figures are available in the appendix in Section 3.H. It is important to keep in mind that all contributions presented in these figures do not add up to ΔU for they do not capture the interaction of composition and selection effects, as shown in equation 3.3. In the figures, we labeled the sum of all these interactions the

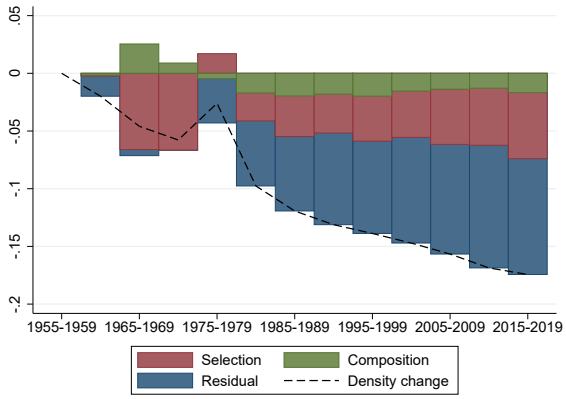
"residual", they are comparatively smaller. Moreover, it is important to note that we only conducted the multivariate shiftshare analysis for lustrum and surveys for which we had all of our variables of interest. From these figures, we can sketch several broad lessons. First of all, composition effects seem to play a minor role in the change of union density for most of our countries, except for Germany in the case of the share of blue collars in the workforce. Then, most of the change in union density is explained by change of selection into unions. On the one hand, Women and public sector workers increasingly got into unions in the UK, US, Italy, Germany, Sweden and Denmark and even limited the scope of de-unionization in the US and the UK. The main contributors to de-unionization on the other hand is that blue-collar and high-school graduate workers increasingly got out of unions in most of our case countries. France remain an odd duck here given that workers along all dimensions got out of unions: women, public sector workers, high school graduates and blue collar workers. Note, however, that the result of this exercise are strongly influenced by the first reference point taken and that, in our case, this vary across countries.

Figure 3.5.9: Multivariate shiftshare analysis

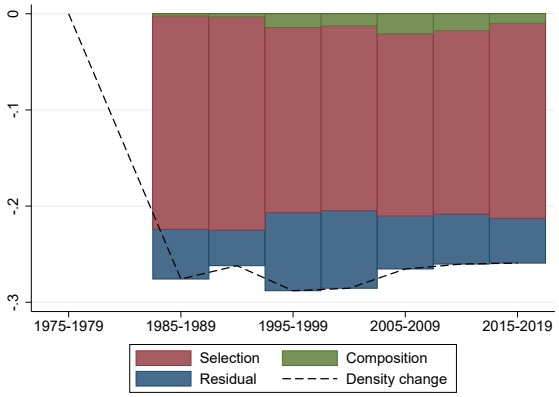
(a) United Kingdom



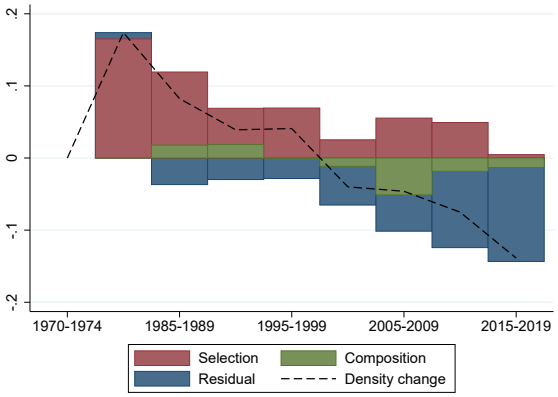
(b) United States



(c) France



(d) Italy



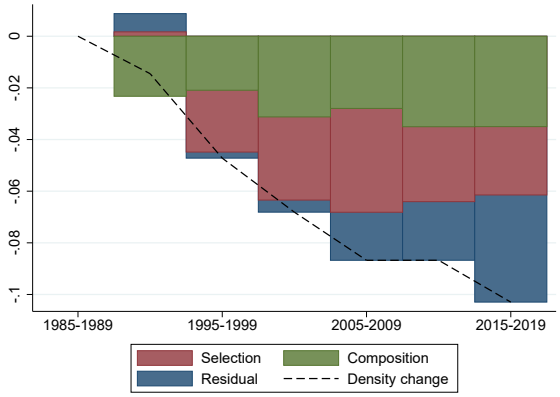
Note: These figures show the contributions of several dimensions to the change of union density in the United Kingdom, United States, France and Italy. Using our pooled micro-dataset, these contributions are measured by comparing an unrestricted prediction of union density with a prediction where one particular dimension is kept to its original value. Contributions are measured only when all variables are available so the scope of the analysis may differ from the other figures within the paper.

3.6 Discussion

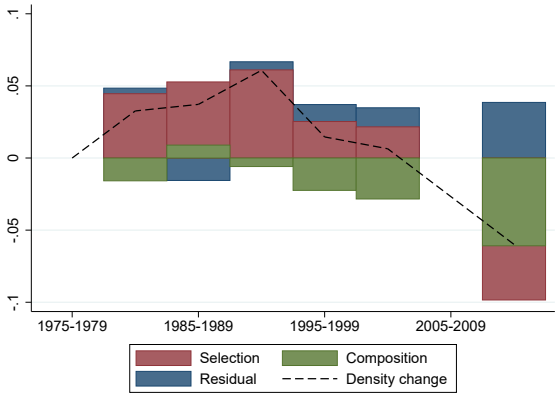
Table 3.6.1 summarizes the main characteristics concerning selection of the three families we classified according to their institutional settings. As already pointed out, West Germany lies in between the first two, also in terms of selection. Partly, this intermediate position comes from the shift from sectoral to firm level bargaining that started in the '90s and is growing over time (Dustmann et al., 2014; Jäger et al., 2022). Differently from the UK and the US, however, firms in West Germany can only opt-out from sectorial bargained contracts, that remains otherwise the default. Moreover, to do so they

Figure 3.5.10: Multivariate shiftshare analysis - Other countries

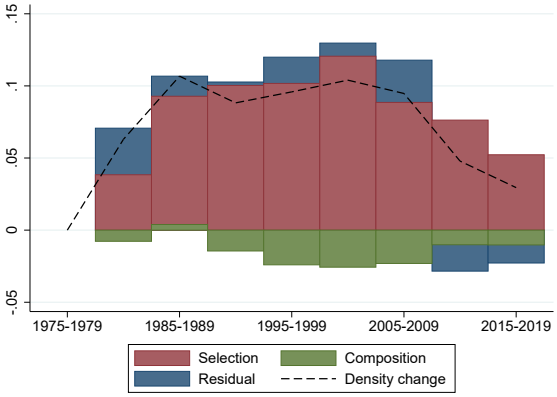
(a) West Germany



(b) Sweden



(c) Denmark



Note: These figures show the contributions of several dimensions to the change of union density in Germany, Sweden and Denmark. Using our pooled micro-dataset, these contributions are measured by comparing an unrestricted prediction of union density with a prediction where one particular dimension is kept to its original value. Contributions are measured only when all variables are available so the scope of the analysis may differ from the other figures within the paper.

need their workers' agreement.

Table 3.6.1: Unionization families

Selection of...	Liberal (UK, US)	Mediterranean (FR, IT)	Coordinated (DK, SE)
Men	High $\rightarrow 0$	Moderate, constant	Moderate $\rightarrow 0$
Public sector	Negative/Moderate $\rightarrow$ Very high	Moderate/High	0, modest rise
Skilled	Negative $\rightarrow$ Positive	Close to zero, constant	Close to zero, constant
Blue collar	High $\rightarrow 0$	Negative to zero, constant	Moderate $\rightarrow 0$

Quite remarkably, the only set of countries in which selections dramatically change are the UK and the US and, to a lower extent, West Germany. For the other groups, selection among workers was quite small since the beginning and has remained relatively constant. This does not come as a surprise as, for France and Italy, the close

to ideological enrollment in a trade union does not have any reason to be linked to specific groups in the labor market. Concerning the Nordic countries instead, the very high coverage make selection less likely per se. Moreover, the weakening of the Ghent system is an institutional change that has affected all workers alike. For these reasons, we next turn to discuss in dept only the changes in selection in the UK and the US.

Before turning to that, however, let us underline that there is an element common to all countries studied: when union density is falling, we observe a raising selection of public sector workers into unions. This means that as less workers are unionized, public sector workers become a larger share of total membership. We interpret this as evidence that the public sector protects union's power, possibly shielding it from adverse market events. This empirical regularity thus suggests to look at market-type explanations to explain de-unionization.

3.6.1 The evolution of selection in the UK and the US: economic forces

Institutional causes? Some have proposed that a shift in the political attitude towards unions, affecting the balance of power in favor of employers, is one of the causes of union density decline. This factor has certainly played a role in the fall of aggregate density in the US and the UK, but it is not clear how it has affected group-specific densities more than others hence changing selection. Indeed, the legal framework (e.g. union elections in the US, closed shops in the UK) is mostly homogeneous across genders, occupations, and skills. Possibly, management practices have become harsher in the private sector comparatively to the public one. Reagan's crush of PACTO's 1981 air traffic controllers strike though doesn't make it so clear McCartin (2011). That said, it can not be ruled out *a priori* that the underlying situations of the different groups or industries made them react differently to homogeneous changes in legislation. In particular, it could be investigated whether some groups of British workers were more concerned than others by closed shops, and hence more affected by the weakening of this institution under Thatcher. But we leave this for further inquiry.

Economic factors: beyond skill biased technical change There have been few explicit economic theories of union membership. The exception is the theory of union membership as determined by the returns to skill in the union vs non-union sector (Acemoglu et al. (2001), Kaymak and Acikgoz (2011), Dinlersoz and Greenwood (2016)). In these models, consistent with the findings of Card (1996) in the US context, of a union premium that declines with the skill level, unions not only appropriate some of the firm surplus but also redistribute it towards the less skilled, generating a more compressed pattern of returns to skill compared to the non union sector. Hence the incentives to join the union are different for the different skill levels, and they change when skill-biased technical change changes the outside option of the workers. This can potentially explain both the selection of different skill-groups and the change in selection over time we document.

However, the most crude version of that idea, proposed by Acemoglu et al. (2001), does not hold empirically, as it predicts de-unionization of the most skilled, directly opposed to the rising selection of skilled workers that we observe. This was already noted by Farber et al. (2021) for the US, and we show that it is also true in the UK. A more sophisticated version of the argument, as exposed by Açıkgöz and Kaymak (2014), is not necessarily inconsistent with our findings, as it predicts de-unionization both at the top (skilled workers leaving the unions because of more advantageous wages in the competitive sector) and at the bottom (union shops won't hire low skilled workers at union wages when their productivity declines because of technical change).

In any case, let us emphasize that the models mentioned above represent particular versions of a neoclassical theory of union membership. In such a theory, a worker joins a union if the cost from joining is less than the gain compared to the outside option. The models mentioned emphasize the role of the union wage compression and technical change in determining the wage differentials between unionized and non-unionized workers. A more general model would include other factors, in particular different levels of rents across firms or industries, in other words the different sizes of the surpluses to be shared, and hence the different incentives to unionize, as in Blanchard and

Giavazzi (2003). In the models mentioned above, all workers are also exposed to a single rate of (frictional) unemployment, whereas different levels of unemployment risk, both from frictions and from the business cycle, are a plausible explanation for different levels of bargaining power across different worker types, and hence for different incentives to unionization.

More concretely, the profitability crisis in manufacturing, especially because of international competition, and the rise in unemployment concentrated among the least skilled, may contribute to explain the fall in the selection of blue collars and unskilled workers in the US and the UK. According to this view, there would be nothing specific to the manufacturing sector per se to make it a strongholds of unionization. It simply used to have high rents given by the increasing returns to scale. With rents shrinking, union membership would have shrunken even keeping the share of blue collar workers stable.

3.7 Conclusion

In this paper, we look at the evolution of the composition of union membership in seven Western countries (Denmark, France, West Germany, Italy, Sweden, the UK, and the US) since the second half of the XXth century. We use new micro-data derived from various sources, ranging from post-electoral surveys to labor and household surveys, to provide novel evidence on union density and unions' membership composition over the long run. We study in particular what of the change in union memberships demographics can be attributed to the structural change of the workforce and what can be instead attributed to the evolving selection into unions. We focus on four main socio-economic characteristics, gender, occupation, education and sector of employment (public vs private), and show how they matter for the selection into unions in our countries of interest.

Our first finding is about the importance of unions and the evolution of union densities over time. Our new series for union density, built from micro-data and using a

unique definition, match closely the ICTWSS series based on administrative data for the UK, the US, Sweden, and West Germany; but not for France, Italy and Denmark. For France, we find that unionization was consistently higher at the end of the seventies and dropped dramatically in a decade or so from around 35% to 10%. For Italy, after 1993 union density is stable at around 33% in the ICTWSS while we find a steady decline and possibly a stabilization at 20% a decade later. In both cases, we believe the official sources misrepresent unionization rates due to the use of imputation methods to supplement the lack of credible data. In the case of Denmark, we find that after 1981 unionization kept rising and stabilized at around 85% little after, to then descend slightly as of 2000. While the trends are very similar, the levels are higher than those depicted by fiscal records (union dues tax rebate) and the ICTWSS data (unions self-declarations). The difference, a sizable 10pts, might come from Danish workers who wrongly declare (knowingly or not) to belong to a union while this is not the case. Because membership does matter as it reflects support for unions, we believe our series to capture the true power of danish unions if not their exact membership. We thus still use the series built from the polls to look at selection into unionism and leave to solve this inconsistency for future work.

The heart of our paper is about the change in membership composition of unions. We find that, as the workforce has become more feminized, less blue-collar and more educated, so have union members. This pattern is quite similar in all our seven countries of interest. Differences exist though in the evolution of which characteristics better predict the enrollment of an individual in a trade union. In Germany, the UK, and the US, the probability of being a union member was once strongly associated with being a male, a blue collar worker or a less educated one (and often the three together). It is not the case anymore. We do find similar, but milder selection patterns for Sweden and Denmark concerning male and blue collar workers, but not for education. Finally, we do not see any clear trend in France and Italy where all workers have been relatively equally selected into unions. We argue that these differences can be attributed to the different institutional settings in the three groups of countries. The main exception

to this binary distinction is in the selection into the public sector. In all countries, we find that union density is negatively associated with the probability of a public sector worker to be unionized. We interpret this regularity as evidence that public sector employment shields workers from at least some of the causes of de-unionization. This offers some guidance to address this latter phenomenon.

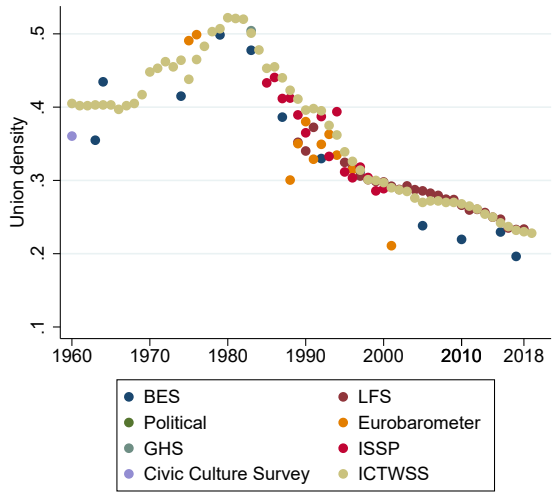
To our knowledge, despite our strictly descriptive approach, we are the first paper to systematically exploit some of our databases to study unionization in a long-run, comparative perspective. Thus, our paper contributes to the literature on the changing composition of unions and their history since World War II. We are far from having fully dissected the rise and fall of union memberships in our seven countries as many factors, not only public-sectorization and white collarization, might explain their changing composition. More research is needed on this question, especially to recover the interactions between the crisis of the manufacturing sector, shared at different degrees by all our countries, and our three unionization families. Finally, we believe an important work would be to extend our analysis to other countries to i) check the official data and possibly correct them, ii) uncover similarities and differences between institutional systems and thus generalize our findings.

Appendix

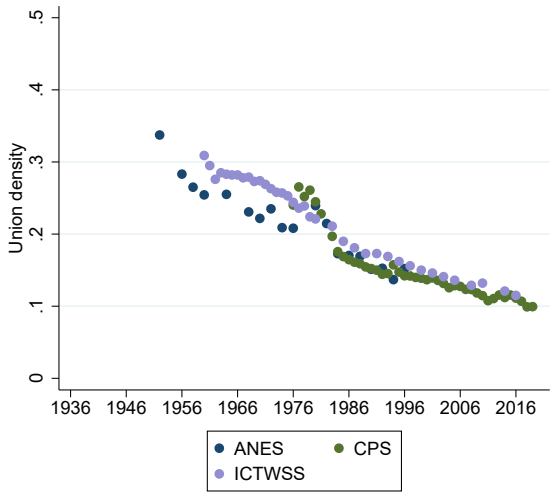
3.A Density, disagreggated by survey

Figure 3.A.1: Union density

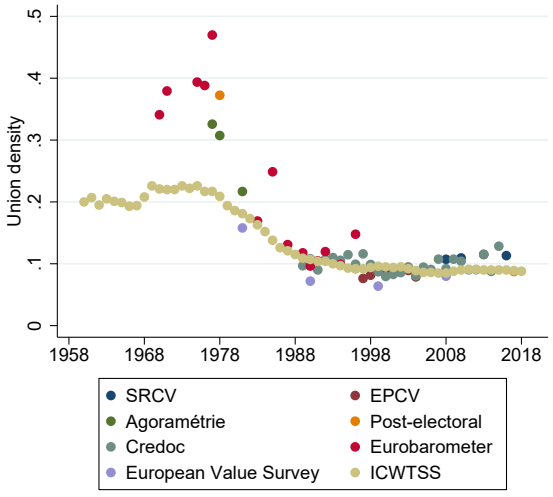
(a) UK



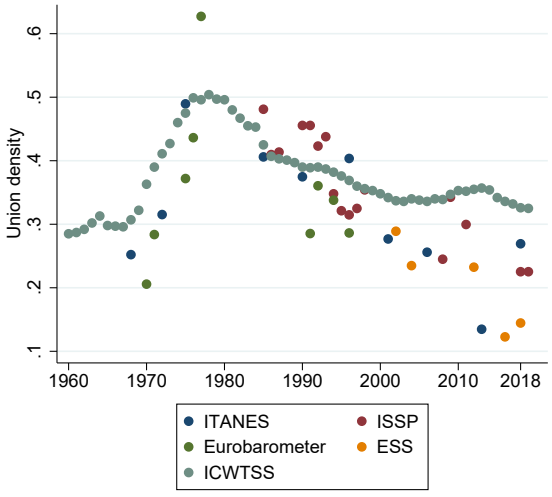
(b) US



(c) France



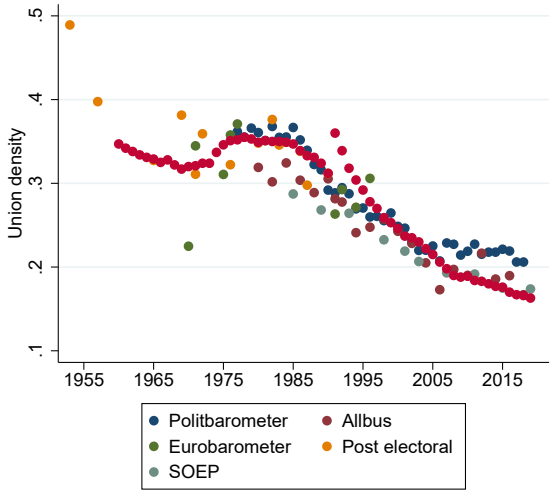
(d) Italy



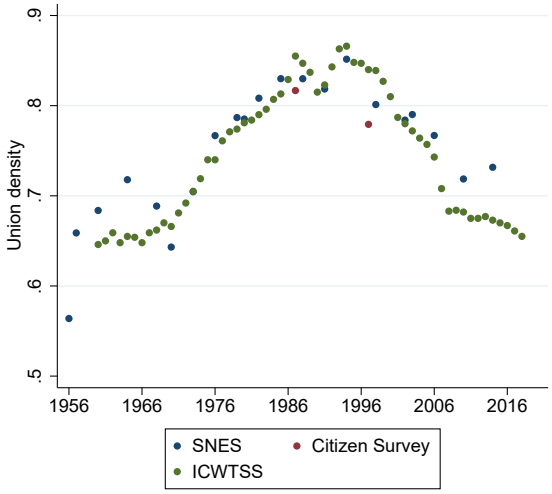
Note: The figure presents the evolution of union density as measured in our different micro-data sources for our four countries of interest and compare them with the time series from the ICTWSS dataset.

Figure 3.A.2: Union density - Other countries

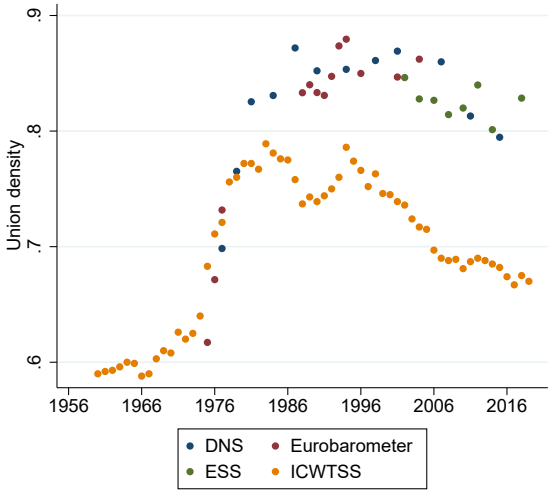
(a) West Germany



(b) Sweden



(c) Denmark



Note: The figure presents the evolution of union density as measured in our different micro-data sources for our four countries of interest and compare them with the time series from the ICTWSS dataset.

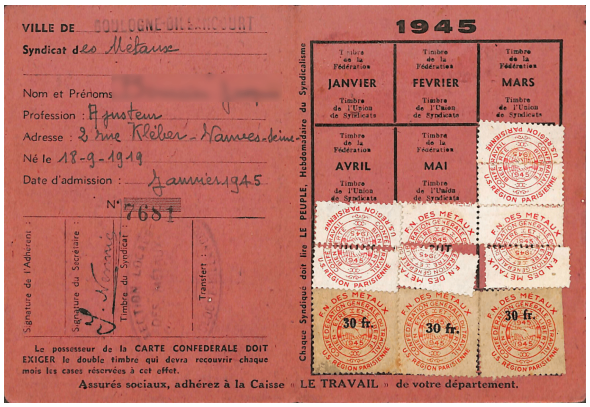
3.B Density in France

3.B.1 Explaining the gap

Before the start of the EPCV in 1996, the ICTWSS density series are built from financial data from the two major unions, CGT and CFDT, through two steps. The first step is

Figure 3.B.1: Union membership in France

(a) Union card of a CGT member from 1949 with eight stamps. Source : eBay



(b) Comparison of Labbé and survey data.

	Total density		CGT + CFDT density	
Year	Labbé	microdata	Labbé	microdata
1970	23%	34%	15%	16%
1971	23%	38%	15%	20%
1972	23%	–	15%	–
1973	23%	–	14%	–
1974	23%	–	14%	–
1975	23%	39%	15%	–
1976	22%	39%	14%	22%
1977	22%	33%*; 46%	14%	18%*
1978	22%	31%*; 37%	13%	17%*; 23%

The sources for the table are: Eurobarometer 1970, 1971, 1975, 1976, 1977; Post-electoral survey 1978; Agoramétrie 1977, 1978 (marked by an asterisk (*) for disambiguation).

to convert these financial data into membership data. Until the 1980s, union members paid their dues by buying supposedly monthly 'stamps' to stick on their union cards (see fig. 3.B.1(a)). So to obtain membership, the first step is to divide the yearly number of stamps sold by the confederation, by an estimate of the average number of stamps paid by each member each year. The second step is to extrapolate membership from these unions to all other unions. We can indeed write the following identity :

$$\text{Union density}_t = \frac{\text{CGT \& CFDT stamps}_t}{\text{Stamps per member}_t.\text{Share of CGDT \& CFDT}_t.|\text{Employees}|_t} \tag{3.4}$$

The first step of the conversion was originally performed by Bevort (1995), who assumes that the average number of stamps bought per union member per year is constant, equal to 9. The second step was performed by Labbé (1995), under the assumption that the relative membership of the various unions is the same as their relative success in the professionnal elections. In that paper, Labbé uses Bevort's figures for the membership of the two major unions, but also tests the hypothesis of 8 stamps per year.

To see where the gap between our estimations and the ones from Labbé (1995) comes from, we compare our results with the computations of Labbé in Table 3.B.1(b).

We see that each survey in the 1970s estimates a higher aggregate density than Labbé, to various degrees, but consistently above 30%. We can track the source of this gap because some surveys, in addition to the binary question on union membership, asked to which union confederation the respondent belongs. We see that the microdata also yield consistently higher estimates for the density of CGT and CFDT members only.

Therefore we have good reason to believe that Bevort and Labbé overestimate the average number of stamps paid per year in the second half of the 1970s. If we suppose that the true combined density of CGT and CFDT was at 19% (the average of our various estimates from micro-data), versus 14% on average in Labbé's estimate, this means that the average number of stamps per member per year was not 9 but rather $9 \times 14/19$, i.e. between 6 and 7 stamps per year. This is supported by two facts. First, Bevort acknowledges that there is some uncertainty around his variable. Between 1945 and 1957, the CGT gave the figure and it was not constant, but fluctuated between 7,0 and 8,5. Bevort suggests that they could have ceased to publish the figure because of its decline. Second, it is likely that with time, confederations began to collect dues in a more systematic way, in particular with the introduction of the automatic deduction from the banking accounts of the members, which makes the number of stamps automatically 12 for the workers who choose this system. This would explain that our series cease to diverge from Labbé's from the 1990s onwards.

However, this revision upwards accounts only for part of the estimated density gap. If we apply the correction of $19/14$ to the estimated density of 23%, we reach 31%, which goes only a half of the way to 37%, which is the average of densities from our microdata. This remaining gap can not be explained by an error on the total number of employees, as Labbé uses the figures of the French census and the Enquête emploi, which were still used by compilations of time series such as Bordes and Guillemot (1994). Therefore, we conjecture that Labbé's method based on electoral results overestimates the share of CGT and CFDT in union membership for this period. It is possible that the intense leftist activity characteristic of the 1970s and the creation in 1968 of the *sections d'entreprise* (unions at the firm level which were not required anymore to

be affiliated with a confederation) resulted in a rise, in terms of membership, of small unions which did not participate in professional elections or were not successful at them.

Finally, independently of the explanations of the gap between ours and Labbé (1995)'s estimates, a more indirect confirmation of our density estimate lies in the series for the number of days striked in the private sector, which is published annually by the DARES and compiled, e.g. by Merlier (2000) or Camard (2002). Camard (2002) shows the limitation of these data, but does not suggest that the trend over time is biased. The volatility of strikes is higher than that of union membership, but the trends are strikingly similar : the total number of days striked fluctuated around 4 millions between 1972 and 1977, then declined abruptly and fell below 1 million for the first time in 1985.

To conclude, for the reasons detailed above, we can give 30% as our lower estimate of union density during the period 1970-78, and 35-40% as our range of most likely estimation, which might however include 'atypical union members' who paid their dues on an irregular basis or who belonged to small unions uninvolved in professional elections.

3.C Density in Italy

As noted in the main text, in the absence of large scale labor surveys measuring union density, we can not have a definitive proof that the unionization rates we estimate are the ones closer to reality. Luckily, the first large scale data on unions are expected to be released in 2021 and, despite still collected by the unions themselves, we hope to have a clearer picture of union membership rates in the present. Some official sources do however already exist. For instance, in the sample of firms belonging to *Confindustria*[19], typically representing the larger firms in the country, the share of union membership is estimated at 25% by Italian social security institute (INPS)[20], contrary to 40 % as

[19] Largest firm owners' confederation
[20] Boeri (2017)

reported by the union accounts for the same sample of firms.

Concerning the measurement of union density, the official data are built using self reported membership from the three largest union confederations (CGIL, CISL and UIL) adding a percentage (between 10 and 20 %) to account for independent unionism[21]. These numbers are likely inflated, as unions have incentives to over-report their membership to increase their influence and political leverage. This leads to two possible sources of inconsistencies: the data reported by the main organizations might be upwardly inflated, and, henceforth, the estimates of independent unionism might be overstated. Our estimates are instead base on multiple, different surveys, that are commonly used in all countries to measure union participation.

Unfortunately, the estimations for Italy are based on relative few observations and hence tend to be a bit volatile. Note, however, that desegregating the 5-year bins in our year-survey data as in figure (3.A.1(d)), we find that in each and every point[22] after 1995 our estimates consistently lie below the official sources, despite the different samples and methodologies used to compute them. This was not the case before the divergence of the two series, when, even if not exactly identical, the evolution of union density was very similar. So, why unions should have started to lie more about their membership starting from the mid nineties?

Here again we do not have a conclusive answer, but the incentive to misreport membership might have increased after the introduction in 1993 of a new union representative organ, the Unitary Union Representatives (RSU)[23], and the elections with which they are elected. To appoint new representatives at the firm, local or national level, workers are in fact asked since 1993 to vote in democratic elections for their candidates. 1/3 of the available seats are still attributed only to the main union confederations, based on the vote share they receive, but the other 2/3 can be won by outsiders too. It is hence possible that, in order to show consistency between the votes

[21] See https://www.oecd.org for more details

[22] Note, in particular, that the "weird" low estimate for 2013 can be attributed to a wording issue in the question asked in that year by ITANES, and that for equally low results for the European Social Survey in 2016 and 2018 to a sample bias towards unemployed individuals in the sampling process.

[23] Rappresentanze Sindacali Unitarie

received in RSU elections and union membership, some union might have adjusted its membership to match the results in the RSU elections. This phenomenon might have been encouraged by the fact that around the same years the project of a unique unitary confederation that had more or less be in place until then had failed, opening the door to union competition. In other words, relative strength might have started to matter more for each confederation and thus the incentive to over-report membership might have changed with competition as famously happened in the US between AFL and CIO before reunification[24]. Note, moreover, that union financing had started to shift, starting from the mid-nineties, from union membership dues to a system of paying services open to all workers. Today, this new service system accounts for more than 3/4 of unions' resources with the remaining 1/4 made of members' dues. In addition to provide a high quality service at a low price to workers, this change has addressed the free rider problem, as any individual has to pay a low, but positive cost to benefit from the service. It is possible that non-member workers benefiting from these below market-price services show their support to the union provider by voting for it in the RSU elections.

To give an idea of this possible issue and hence to better understand the difference between our series and the official one, we look in detail, when possible, to the membership affiliation of each confederation. Free rider might be a greater issue for less politically engaged individuals (see for instance in Abramitzky (2018)) and hence we expect to see larger members' differences for less politically radical unions. In the Italian context, the more radical confederation is the CGIL, while CISL and UIL are roughly identical in ideological bias[25]. Before the nineties, as recalled above, it is hard to measure the weight of each confederation as many important industry-union, notably the metal workers union, were shared among the tree. However, starting with the failure of the new unitary project, this exercise becomes meaningful. Table 3.C.1 reports the relative share of workers belonging to a union in the three larger confeder-

[24] Farber et al. (2021)

[25] More precisely, the CGIL was historically linked to the Communist party, the CISL with the Socialist party, and the UIL with the Democristian party.

ations and a catch all category labelled "Others" for the ICTWSS and our micro data. As expected, both CISL and UIL have a lower relative weight in our sample than the one reported in the official statistics. This is not the case for the CGIL. Our interpretation is that the number of workers declared by the CISL and UIL is probably over-estimated. This finding is consistent with anecdotal evidence according to which the CISL might practice some inflation on the number of union cards sold[26].

Our final explanation is political. As described in the historical account, in 1994 there was a large resurgence of demonstrations, mainly against the project of reform of the pension system led by the center-right government of Silvio Berlusconi. This moment is usually pointed out as the halt in the drop in union membership. According to our desegregated data (see figure 3.A.1(d)), there might indeed have been a union resurgence between 1994 and 1998, as claimed by the main unions. The raise, however, seems to have been followed by a new drop. We speculate that this new drop might have been caused by a sense of failure and disappointment as the main unions had eventually signed a very similar pension reform few years later. For all these reasons, and despite the volatility of our estimates, we believe that our series is closer to the "true" level of union membership in the country.

Table 3.C.1: Comparison of the ICTWSS and our micro data from surveys

	CGIL		CISL		UIL		Others	
Year	ICTWSS	microdata	ICTWSS	microdata	ICTWSS	microdata	ICTWSS	microdata
2001	42%	47.5%	32%	27%	13%	11%	13%	14.5%
2006	42%	50.5%	32%	25.5%	13%	9%	13%	15%
2018	42%	43%	31%	21%	15%	13%	12%	23%

Note: For the ICTWSS data, the figures for 2018 are actually those for 2017.

Post-electoral survey (ITANES): 2001, 2006, 2018

[26]See the episode of *Report* of the 14/12/2020 at https://www.raiplay.it

3.D Some historical context

3.D.1 UK

In the UK, our micro-data track closely the ICTWSS estimates. The common trajectory is one of rising unionization in the 1970s and then a deep and long fall continuing until today. Some historical context may help to understand this curve. The electoral victory of the Conservative party led by Margaret Thatcher in 1979 is commonly understood as a backlash against a series of successful strikes (Winter of discontent) led by the unions (powerful after a decade of rising membership) against the wage moderation policies of the previous Labour government. The Conservatives then voted two laws restricting union activity (esp. closed shops): the Employment Acts 1980 and 1982. Remarkably, the large decline in union density started as of 1983. 1984 was the year of a major miners' strike, repressed by the Thatcher government. Another law restricting strike activity, the Trade Union Act, was voted the same year. (See Freeman and Pelletier (1990), Machin (1997), Addison and Siebert (2002) or Pencavel (2004) for a detailed account of the legislative changes and their effect on de-unionisation.)

3.D.2 US

For the United States, our micro-data tracks well the ICTWSS series. Note that these data are the same, but at the individual level, than a subset of those used by Farber et al. (2021), from which we took them. During the period of our analysis, two main institutional changes have impacted the evolution of union density and its composition. First, in 1962 J.F. Kennedy officially recognized the right to organize to Federal public sector workers (Executive Order 10988). Subsequently, the Civil Service Reform Act of 1978 reinforced this right, leading to an unprecedented boost in public sector unionism that passed to be less than 10% in 1955 to around 40% in 1990, as depicted in Figure 3.F.3(b). Second, the electoral victory of the Republicans in 1980 led Ronald Reagan to power. An anti-union campaign immediately started with the nomination of anti-union members to the National Labor Relation Board (NLRB), the organ in charge of

supervising the relationship between workers and firms, and the crush of the Airline-traffic controllers strike in 1981 (see McCartin (2011) for an historical account). As a result, private sector unionism dramatically fell, again as depicted in Figure 3.F.3(b). Overall, union density fell, as public sector members could not make up for the significant losses in the private sector. In addition, while declining, the composition of union membership dramatically changed: from being made primarily of private sector workers to mainly public sector ones.

3.D.3 France

The brutal french deunionization was reflected in the public perceptions of the time. The ten years after 1968 were a period of intense “workers’ insubordination" (Vigna, 2007). But at the turn to the 1980s, the most visible labor struggle were now defensive actions against layoffs, and they were unsuccessful : Lip (1973-1977, see Reid (2018)), Denain and Longwy (1978-1984, see Noiriel (1984), chap. 8 and Vigna (2004)), Citroen and Talbot (1982-1984, see Hatzfeld and Loubet (2004)). In the following years, despite important strikes such as the railworkers strike in 1987 and the big public sector strike in 1995, it had become clear that collective action was durably weakened, as illustrated by the study of Beaud and Pialoux (1999) on a car factory in the 1990s.

Interestingly, such a shift can not be easily explained by a direct institutional weakening of unions. The beginning of the decline in the end of the 1970s does not follow any institutional change in the status of unions or the rules of bargaining. Such a change happened with the lois Auroux in 1982 under the socialist Mitterand government, but it enlarged rather than restricted the prerogatives of the unions, and that did not seem to slow their collapse.

Therefore, we believe that France is an interesting case study to comparative theories of deunionization, because a large deunionization happened with no direct political attack on their role in bargaining (as opposed to the US and the UK), and in a too short time span to make structural explanations alone (globalization, automation, shift of the workforce to services) convincing. An alternative, and competitive in our opin-

ion, explanation would focus more on the change in the macroeconomic environment, with the rise of the unemployment rate and the austerity measures of the Plan Barre (1976-1981), and after a brief period of expansionary policy in the first two years of Mitterrand in power, the "tournant de la rigueur" (1983-1986).

3.D.4 Italy

Italian union history in the second half of the 20th century is characterized by two periods: a first period of intense unionisation burst and a second period of long lasting decline, with possibly a stabilisation in the last two decades. Union membership started to grow massively after 1968 and its ideological outbreak, helped by the extremely favourable economic conditions of that period. In 1970, a worker chart[27] was approved, finally translating into practice the right of workers to organize and to strike granted by the constitution of 1948. Protected, and to some extent even encouraged, by the state, unions grow exponentially to reach, at the end of seventies, 50 % of the dependent employment, an all time height. The high inflation and the rise of unemployment at the beginning of the '80s, however, started to erode their power. During a bit more than a decade, the fracture within the dependent labor force between blue and white collars, the accusation of being the responsible of the hyper-inflation through the clause of automatic indexation of salaries[28], and the loss of power of the major political allies (the Communist and Socialist parties), consistently reduced the influence of unions and their numbers (Loreto (2017)). This crisis culminated in 1992 with the fall of the soviet union, the definitive abolition of the *Scala Mobile*, and the failure of the project of re-unification of the three major confederations. In the early nineties, a new system of industrial relations was introduced with the creation of the Unitary Union Representatives (RSU), a democratically elected organ in charge of representing workers' interests in firms with at least 15 employees. This new system of workers' representation reserved to the main unions some uncontested seats based on their vote shares in the elections. From this moment, firms elections' votes will comple-

[27] The *Statuto dei lavoratori*
[28] The so called *Scala Mobile*

ment membership to measure the relative strength of each confederation. In 1994, the first Berlusconi government attempts to reform the pension system without seeking the collaboration of social partners. This will lead to a new upsurge in union mobilization culminating in the largest strike ever organized in post-war Italy[29]. After this display of strength, however, the main unions were included in the negotiations by the subsequent government[30] and ended up signing a very similar pension reform to the one they had opposed. While some important clauses were added, this and subsequent reforms might have been perceived as a failure of the major unions to effectively oppose unwanted legislation by a part of the workforce. Possibly for this reason, starting with the end of the '80s, a new type of independent unionism had risen. These new unions were not joint in a confederation and focused their attention on specific type of workers resembling more to Anglo-Saxon unions. One of the most famous example of this new form of unionism is the teacher union COBAS. In the last decades, many governments have attempted to transform the Italian labor market reducing workers' employment protection with the idea that a more flexible labour market would boost employment. The symbol of this reform effort was the abolition of the article 18 of the the Worker Chart of 1970, i.e. the compulsory reinstatement in the workplace of unfairly dismissed workers. In 2015, the center-left government led by Matteo Renzi managed to abolish this piece of legislation shifting the balance of power in favor of large employers. Unions failed to stop this change in industrial relations partly because a grandfathering clause was introduced in the new law that kept under the old protection employed workers, de facto dividing the workforce into two groups. Unfortunately, due to the lack of administrative data, we are not in the position to evaluate the effect of this reform on the participation of workers in trade unions, although from our data it seems that a further decline might have occurred.

[29] General strike in Rome, 14th October 1994
[30] The government led by Lamberto Dini

3.D.5 West Germany

In Germany, our micro-data closely track the ICTWSS estimates[31], and administrative data as compiled by Schnabel and Pege (1992) or Greef (2014): a high union density in the early 1950s, followed by a sharp decline, then a significant rise in the 1970s. Then a long and deep de-unionization happened, but with two specific characteristics when compared to other European countries. First, it started later, not in the late 1970s as in France or in the early 1980s as in Italy or in the UK, but in the late 1980s, and receded under the level of the 1970s only after the unification shock of 1990. Second, West German density stabilized above 20 % in the 2000s, whereas it continued to decline in Italy, in the UK and in the US.

3.D.6 Sweden

Sweden applies the Ghent system since 1934, i.e. unemployment insurance is primarily managed by the unions, which creates a massive incentive for workers to join the unions, and explains the high density which is common to all Ghent countries (Belgium, Denmark, Finland, Sweden) – for a precise study of this mechanism and the role of the state subsidies to the union managed insurance funds, see Rasmussen and Pontusson (2018). Over the period considered, the density level is very high in international comparison, but does vary significantly. The rise in the 1970s coincides, as in some other countries, with a period of intense workers' militancy, starting with the wildcat strikes in the Kiruna mines in 1969 and at Volvo in 1970, followed by another strike wave in 1974 (Swenson (2018)). That period culminated in the implementation of pro-worker policies like the introduction of codetermination in 1976 (Schnyder (2012)).

The fall in unionization started in the 1990s. It accelerated in 2007 because of a reform in the unemployment system (Kjellberg (2011))

[31] The apparent gap after 1990 is easily explained by the fact that the ICTWSS estimate covers unified Germany after this date, whereas we focus on West Germany for the sake of consistency of our time series. East German density was much higher than the western one in the early 1990s, and is much lower today, which explains the gaps.

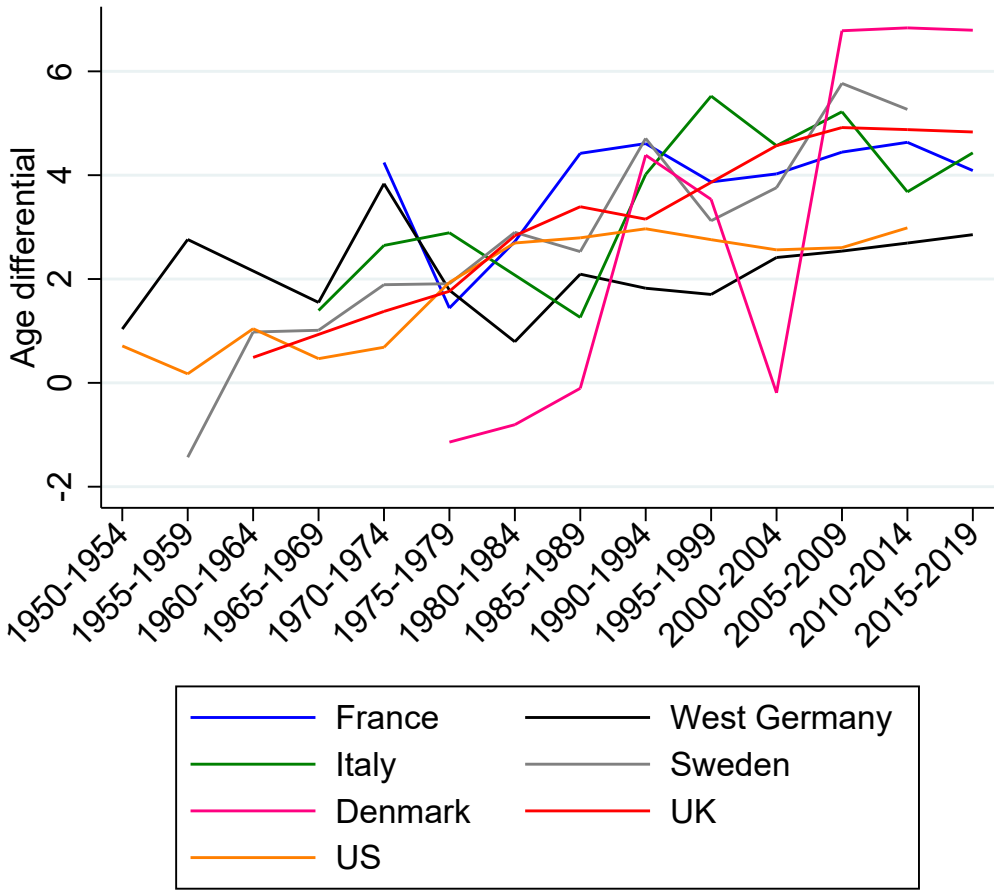
3.D.7 Denmark

Denmark, as well as Belgium, Finland and Sweden, has a specific unemployment system, the so called Ghent system. This system means that trade unions, instead of the central state, are in charge of administering the unemployment insurance thought insurance funds. When the state is strongly subsidizing these funds (Rasmussen and Pontusson, 2018), workers have strong incentives to enroll and, since the unions and their unemployment funds are historically very tightly linked, union membership tend to be very high in Ghent countries. An additional peculiar feature of this system is that unemployment tend to rise union membership rather than decreasing it as is normally the case in other institutional frameworks. After the rise in union density of the sixties, driven jointly by an increase in the government subsidy of the unemployment funds and the political turmoil of this period common to all the West World, union density reached 80% in 1981. Since then, there has been a slow, but long-lasting decline with the mid-nineties being the only exception due to the rise of unemployment. There are two main institutional features that can explain the decline. First, in the early '80s the traditional unions, the only ones that were and still are allowed to sign collective agreements, did accept a wage freeze in order to fight unemployment. This culminated with the signature in 1987 of a Common Declaration to keep the labour cost in line with the one of main competitors Ibsen (2012). The failure to protect wages against foreigner competition might have led some workers to abandon the union. Indeed, it was the craft and blue collar workers union LO the organization that lost most membership. In the same years, a new type of unionism, that did not organize specific occupations or industries, but all workers indistinctly, emerged to compete with the traditional unions. This new unionism, called *Yellow* unions, offered cheaper union membership dues, but was (and still is) not allowed to bargain with the employers and the state. Having less ties with political parties and specific ideologies and introducing competition where there was a monopoly, Yellow unions might have reduced the social pressure to become a union member that was previously exercised by the unique union. The second institutional shift that occurred in Denmark, as well as in

the other Nordic countries, is a weakening of the Ghent system and its ties to specific unions. The Liberal-Conservative government elected in 2001 tried to establish a universal, union-independent unemployment fund. After failing, they still managed to weaken the links between the unemployment funds and each specific union by allowing each fund to enroll workers from all jobs and not only those organized by the related unions. This has de facto created many universal funds and lowered union membership subscription as argued by Lind (2009).

3.E The aging of union members

Figure 3.E.1: Aging differential of union members with respect to other workers

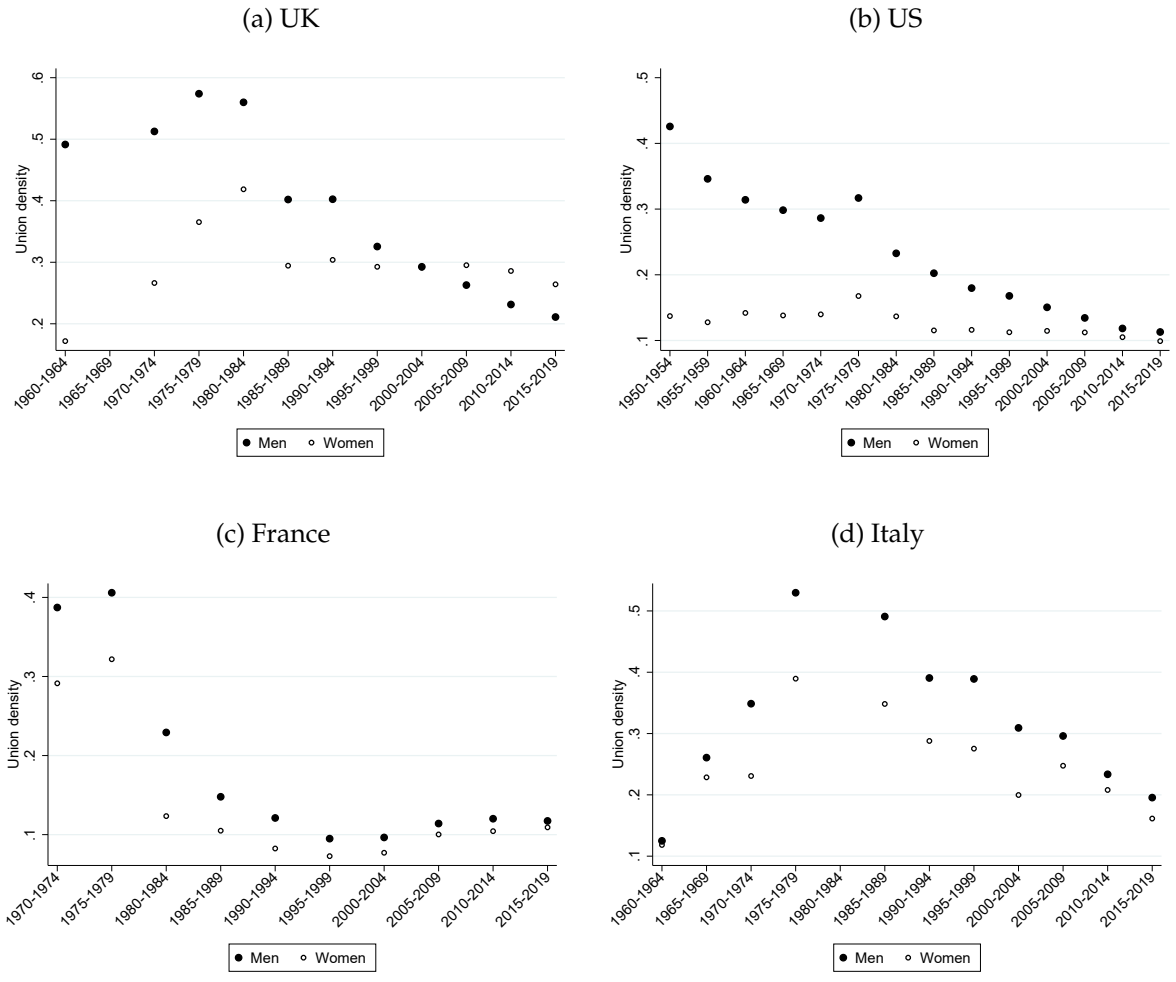


The aging of union members parallel to de-unionization is a commonly shared perception, and our data confirm it for Italy and the UK. The natural interpretation is that

the fall in density was due to a fall in the flow of entry rather than a rise in the flow of exit. In the UK, this is consistent with the result of Bryson and Gomez (2002, 2005) who show that de-unionization is explained by the rise in 'never-membership' rather than the exit of union members. For results on the age profile of union members in many countries, see Blanchflower (2006) and Blanchflower and Bryson (2020).

3.F Union density by subgroup

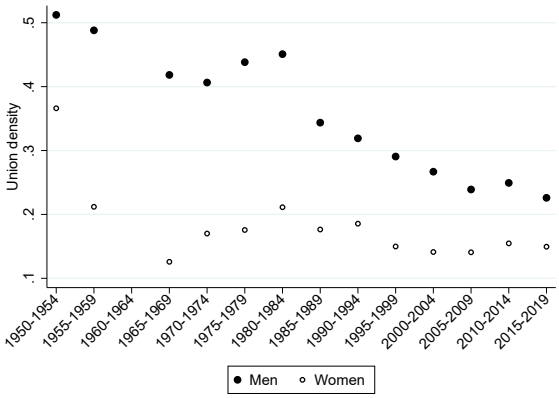
Figure 3.F.1: Union density for men and women



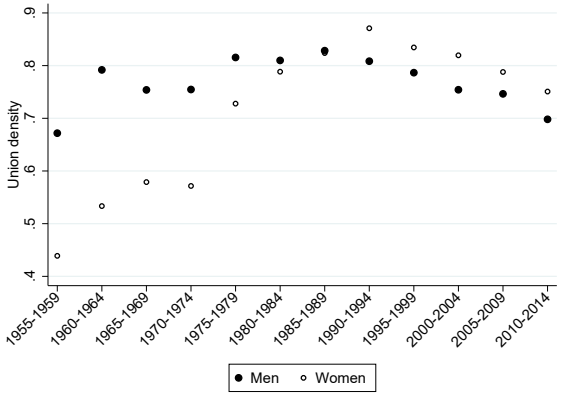
Note: Union density of male and female wage workers. - *Reading:* In the first half of the 1990s in the UK, around 40% of male and 30 % of female wage workers were union members.

Figure 3.F.2: Union density for men and women - Other countries

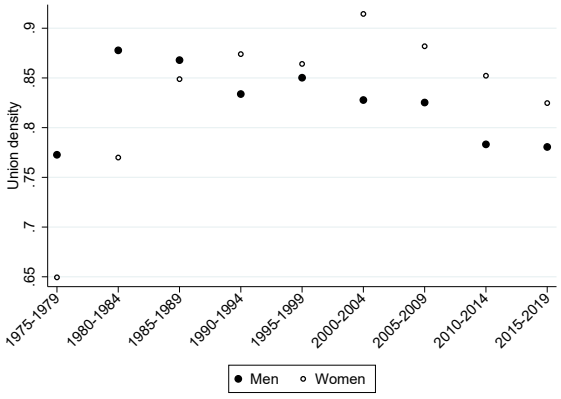
(a) West Germany



(b) Sweden

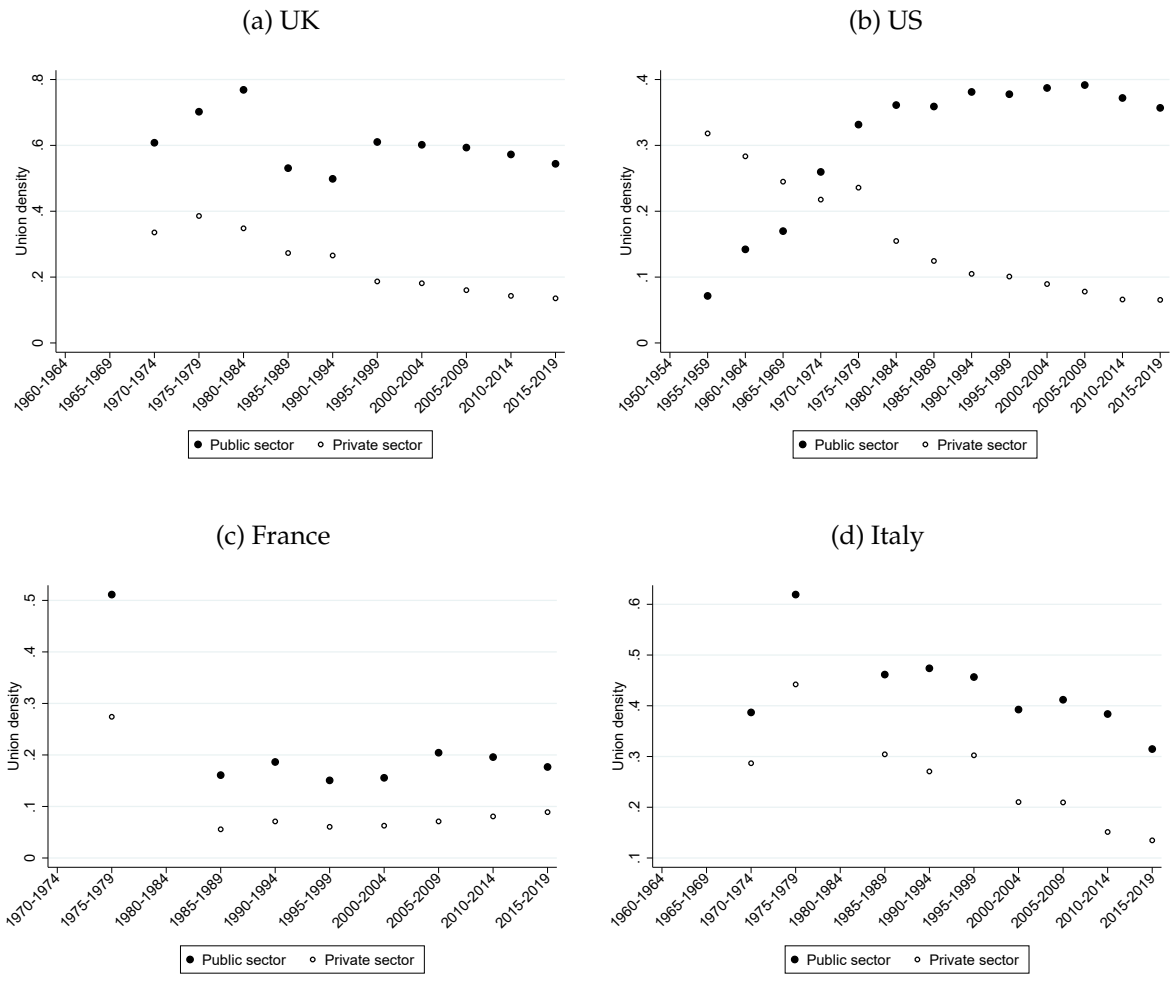


(c) Denmark



Note: Union density of male and female wage workers. - *Reading:* In the first half of the 1990s in the UK, around 40% of male and 30 % of female wage workers were union members.

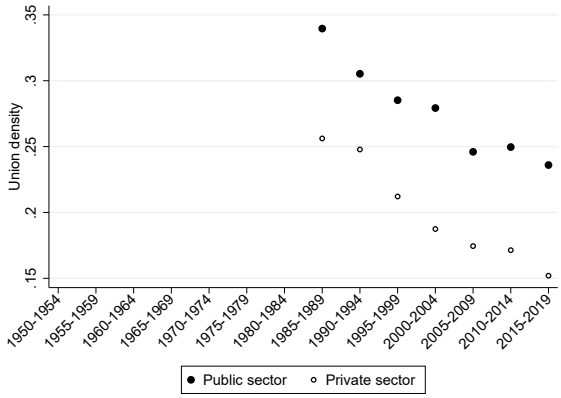
Figure 3.F.3: Union density in the private and the public sector



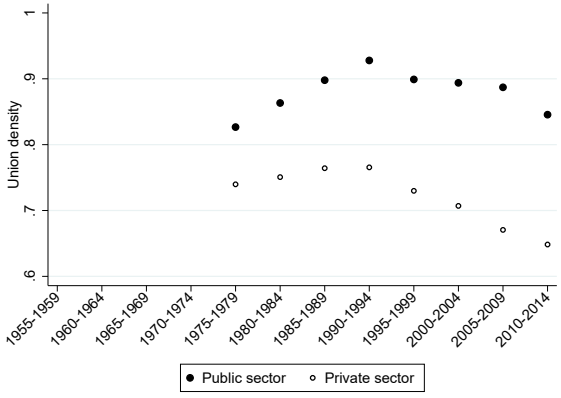
Note: Union density of wage workers in the private and the public sector. - *Reading:* In the second half of the 1990s in the UK, around 60% of workers were union members in the public sector, and 20 % in the private sector.

Figure 3.F.4: Union density for public and private sector - Other countries

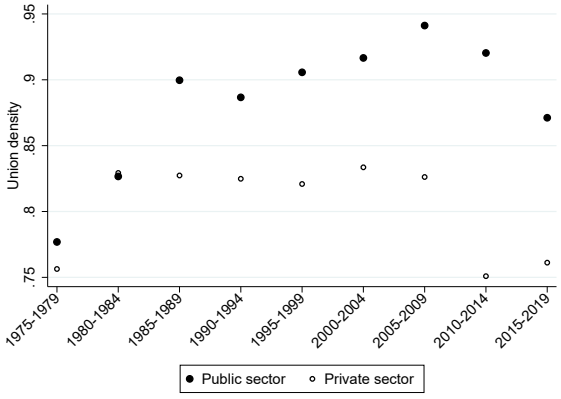
(a) West Germany



(b) Sweden

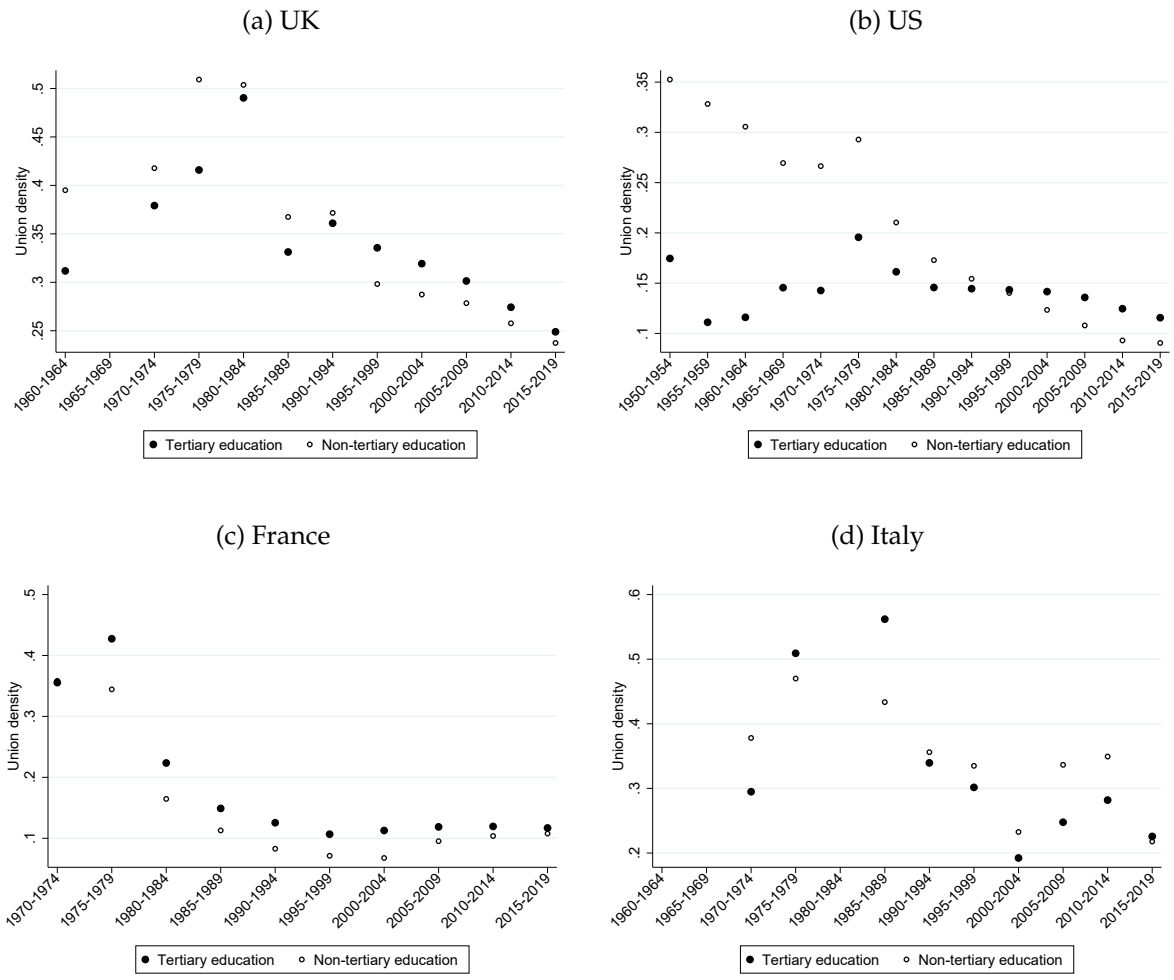


(c) Denmark



Note: Union density in public and private sector.

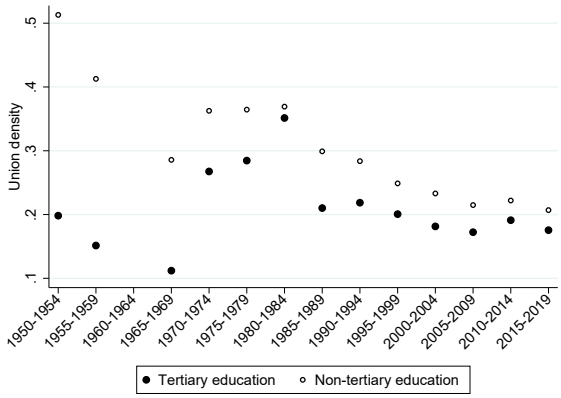
Figure 3.F.5: Union density for skilled and unskilled workers



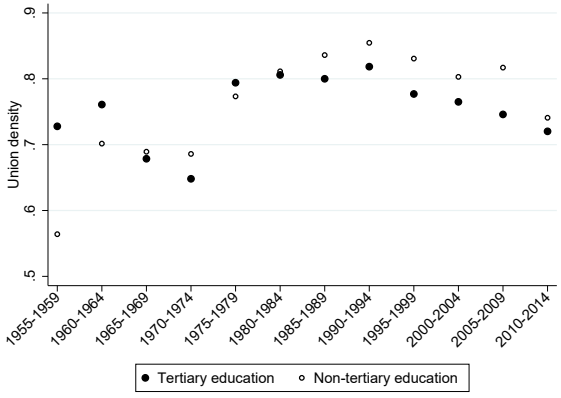
Note: Union density of wage workers who did and did not complete a full secondary education (see Appendix 3.G). - *Reading:* In the second half of the 1970s in the UK, around 50% of secondary-educated and 45% of less educated wage workers were union members.

Figure 3.F.6: Union density for skilled and unskilled workers - Other countries

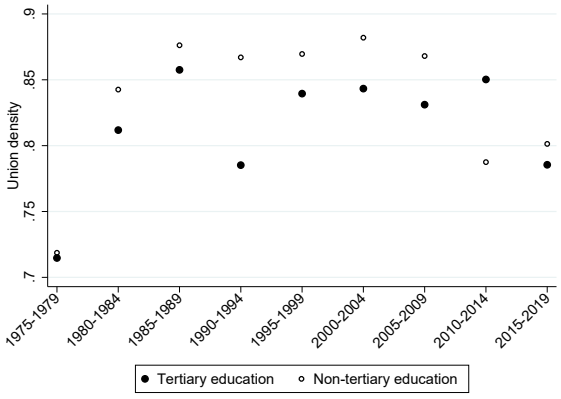
(a) West Germany



(b) Sweden

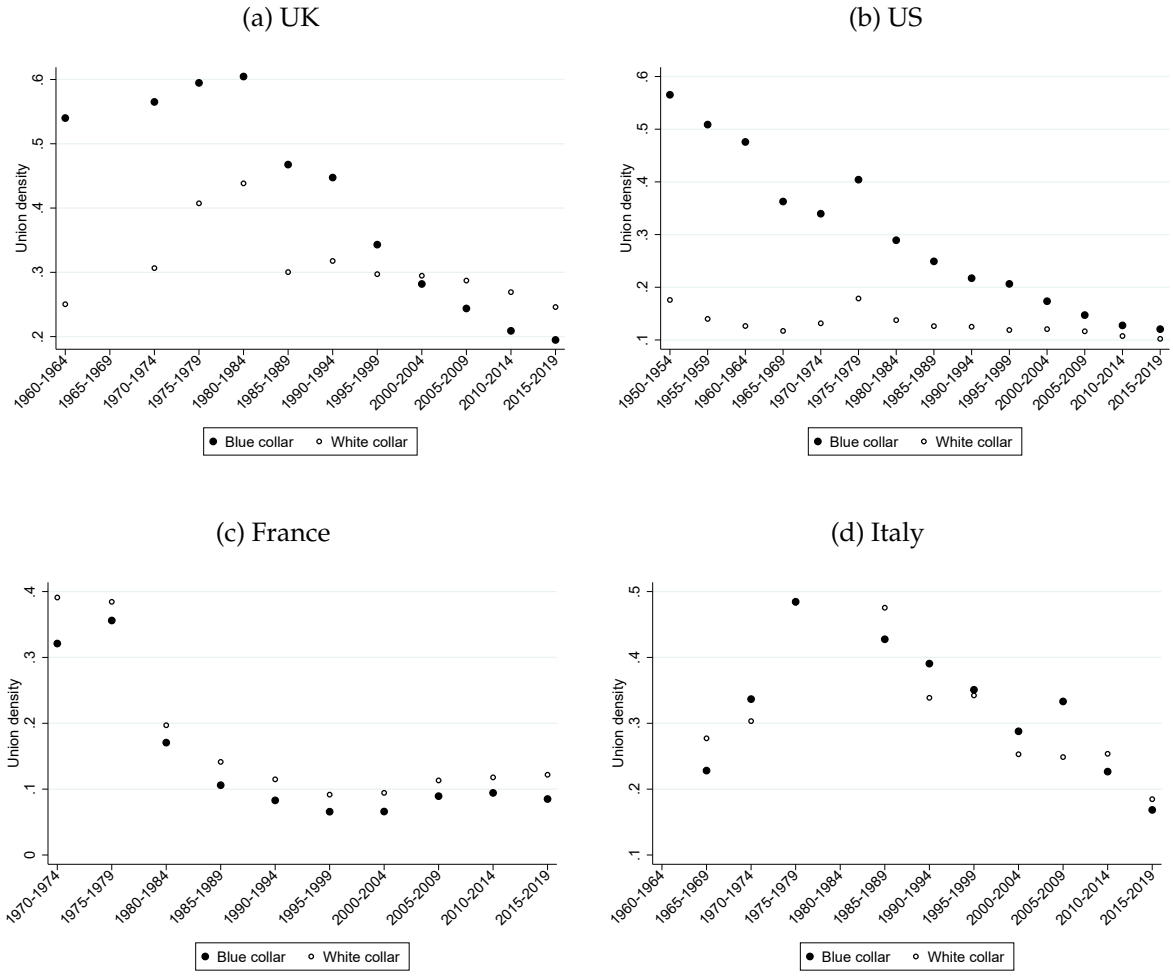


(c) Denmark



Note: Union density of skilled and unskilled workers.

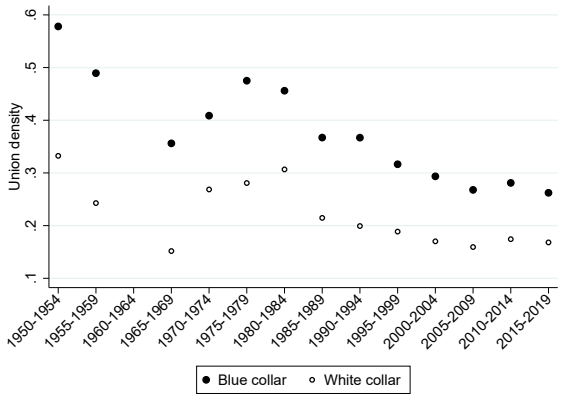
Figure 3.F.7: Union density for blue collar and other workers



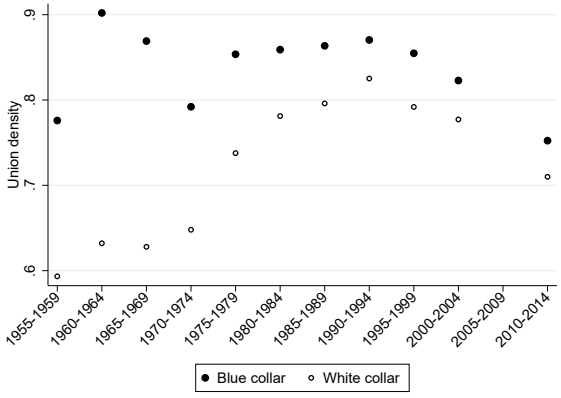
Note: Union density of blue collar and other wage workers. - *Reading:* In the second half of the 1970s in the UK, around 60% of blue collar, and 40% of other wage workers were union members.

Figure 3.F.8: Union density for blue collar and other workers - Other countries

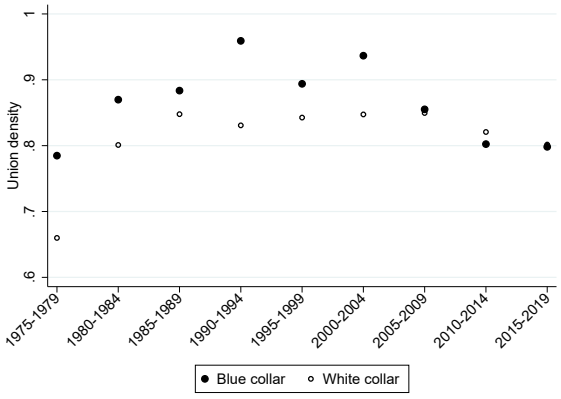
(a) West Germany



(b) Sweden



(c) Denmark

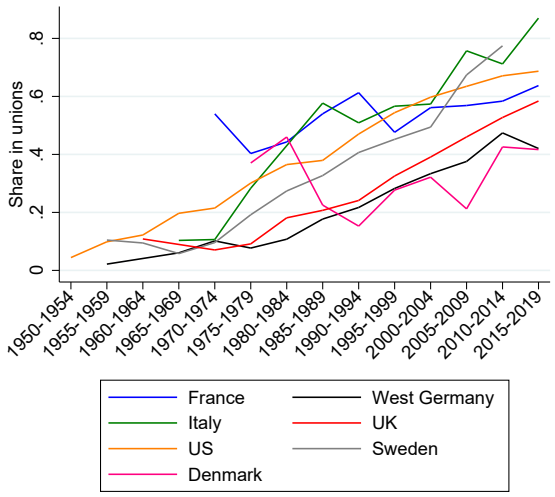


Note: Union density of blue collar workers and other workers.

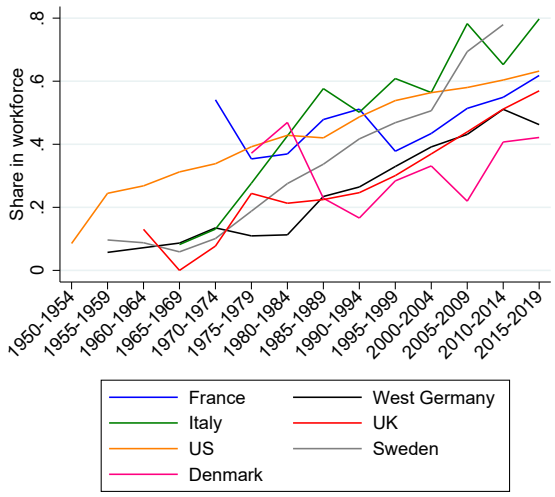
3.G Binary variable for education

Figure 3.G.1: X = Completed secondary education

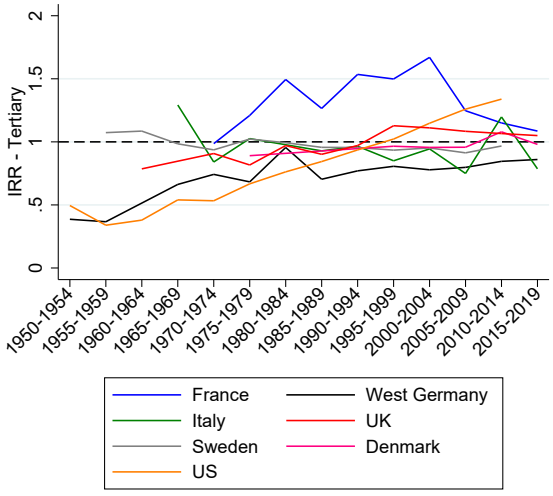
(a) Composition of unions



(b) Composition of the workforce



(c) Selection into unions

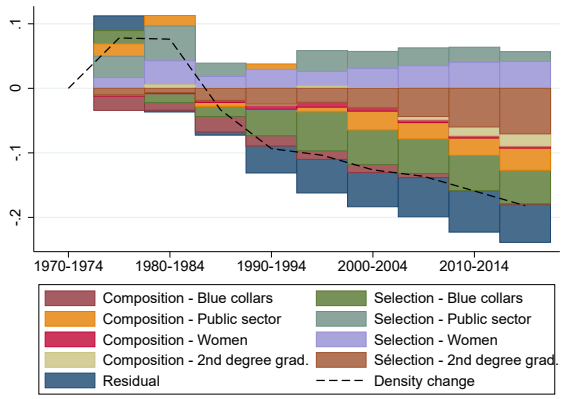


Note: X is the group of employees who completed secondary education. The graphs above show the share of X among union members, in the workforce, and the selection of X members into unions.

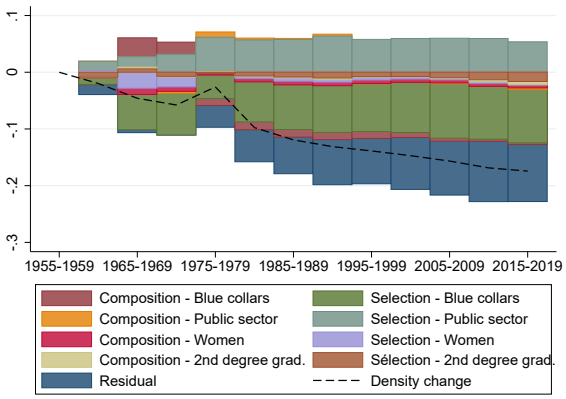
3.H Disaggregated shift-share analysis

Figure 3.H.1: Multivariate shiftshare analysis

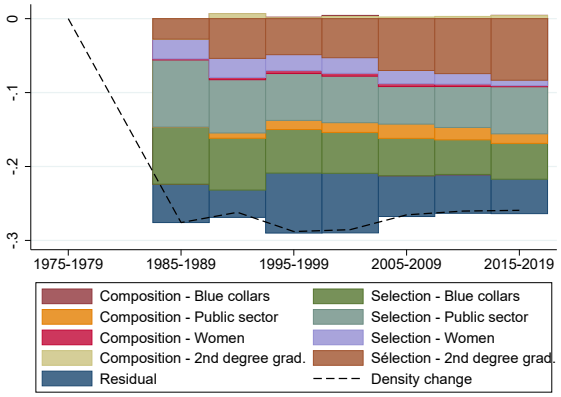
(a) UK



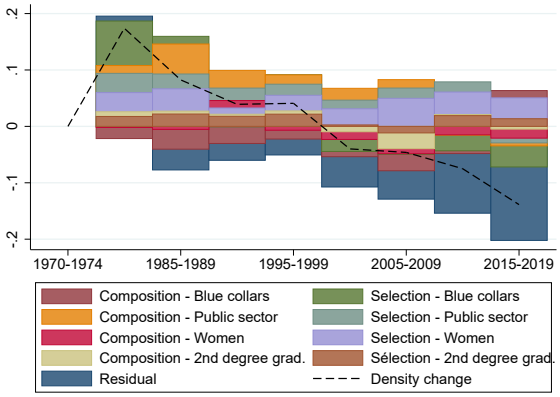
(b) US



(c) France



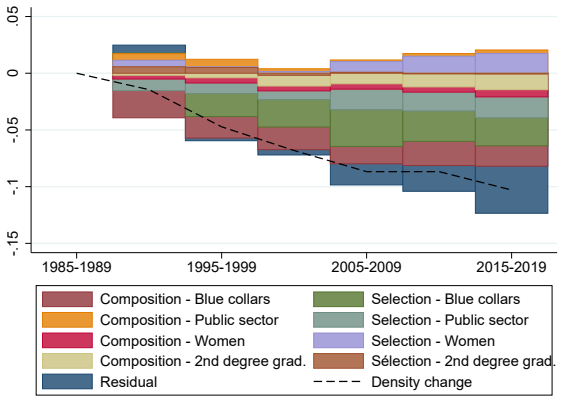
(d) Italy



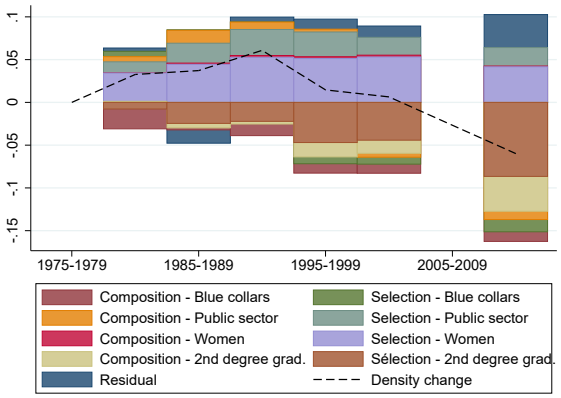
Note: These figures show the contributions of several dimensions to the change of union density in the United Kingdom, United States, France and Italy. Using our pooled micro-dataset, these contributions are measured by comparing an unrestricted prediction of union density with a prediction where one particular dimension is kept to its original value. Contributions are measured only when all variables are available so the scope of the analysis may differ from the other figures within the paper.

Figure 3.H.2: Multivariate shiftshare analysis - Other countries

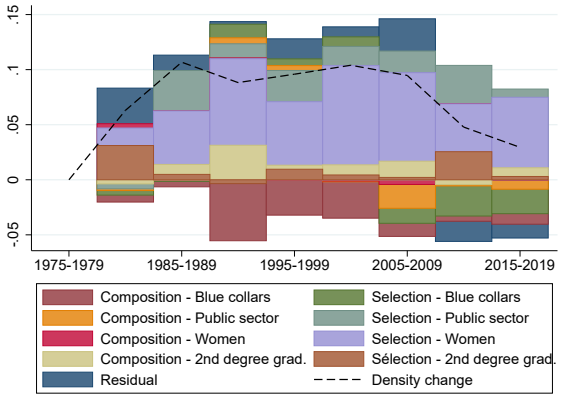
(a) West Germany



(b) Sweden



(c) Denmark



Note: These figures show the contributions of several dimensions to the change of union density in Germany, Sweden and Denmark. Using our pooled micro-dataset, these contributions are measured by comparing an unrestricted prediction of union density with a prediction where one particular dimension is kept to its original value. Contributions are measured only when all variables are available so the scope of the analysis may differ from the other figures within the paper.

3.I Detailed Sources

Table 3.I.1: Detailed Sources - Denmark

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Eurobarometer	International Survey	1975	1975-79	431	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1976	1975-79	417	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1977	1975-79	757	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1977	1975-79	451	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1979	1975-79	903	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1981	1980-84	443	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1984	1980-84	483	>18	Are you a member of a trade union under LO or another trade union?
Post-Electoral	Post-Electoral Survey	1987	1985-89	1971	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1988	1985-89	488	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1989	1985-89	1573	>18	Are you a member of a trade union?
Post-Electoral	Opinion Survey	1990	1990-94	535	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1990	1990-94	1571	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1991	1990-94	4224	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1992	1990-94	4039	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1993	1990-94	1487	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1994	1990-94	447	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1994	1990-94	1973	>18	Are you a member of a trade union?
Eurobarometer	International Survey	1996	1995-99	503	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	1998	1995-99	805	>18	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	2001	2000-04	844	>18	Are you a member of a trade union?
Eurobarometer	International Survey	2001	2000-04	505	>18	Are you a member of a trade union?
ESS	International Survey	2002	2000-04	873	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2004	2000-04	803	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Eurobarometer	International Survey	2004	2000-04	480	>15	Are you a member of a trade union?
Post-Electoral	Post-Electoral Survey	2005	2005-09	910	>15	Are you a member of a trade union?
ESS	International Survey	2006	2005-09	810	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2007	2005-09	1361	>18	Are you a member of a trade union?
ESS	International Survey	2008	2005-09	899	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2010	2010-14	799	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2011	2010-14	1007	>18	Are you a member of a trade union?
ESS	International Survey	2012	2010-14	807	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2014	2010-14	767	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2015	2015-19	1074	>18	Are you a member of a trade union?
ESS	International Survey	2018	2015-19	798	>15	Are you a member of any labor union or professional organization? If yes, now or in the past?

Table 3.I.2: Detailed Sources - France

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Post-electoral	Post-Electoral Survey	1958	1955-59	697	>21	Right now, are you a union member? If yes, of which one?
Post-electoral	Post-Electoral Survey	1962	1960-64	693	>21	Right now, are you a union member? If yes, of which one?
Eurobarometer	International Survey	1970	1970-74	742	>18	Do you belong to a union?
Eurobarometer	International Survey	1971	1970-74	572	>18	Have you paid this year dues to a labor union? and if yes, which?
Eurobarometer	International Survey	1975	1975-79	447	>18	If the R belongs to an organization: Q.253 Trade union, friendly society
Eurobarometer	International Survey	1976	1975-79	510	>18	Are you currently a member of a trade union? Which union is that?
Agoramétrie	Opinion Survey	1977	1975-79	442	>18	Do you personally belong to a trade union?
Eurobarometer	International Survey	1977	1975-79	414	>18	Do you subscribe to any clubs or societies of any kind? Q.221_A Trade unions or professional societies
Agoramétrie	Opinion Survey	1978	1975-79	488	>18	Do you personally belong to a trade union?
Post-electoral	Post-Electoral Survey	1978	1975-79	1759	>18	Right now, are you a union member? If yes, of which one?
Agoramétrie	Opinion Survey	1981	1980-84	687	>18	Do you personally belong to a trade union?
Eurobarometer	International Survey	1983	1980-84	712	>18	Which, if any, of the following groups or associations do you belong to? Q.128D Trade union or professional associations
Eurobarometer	International Survey	1985	1985-89	715	>18	As far as trade union are concerned, are you... A trade union member?
Eurobarometer	International Survey	1987	1985-89	710	>18	Which, if any, of the following groups or associations do you belong to? Q.146_D Unions or professional associations
Credoc	Opinion Survey	1989	1985-89	831	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1989	1985-89	1278	>18	Are you yourself or is anyone else in your household a member of a trade union?
Credoc	Opinion Survey	1990	1990-94	813	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1990	1990-94	1714	>18	Which, if any, of the following groups or associations do you belong to? Q.11_4 Trade unions or professional association
Credoc	Opinion Survey	1991	1990-94	808	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1991	1990-94	2305	>18	Are you a member of a trade union?
Credoc	Opinion Survey	1992	1990-94	810	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1992	1990-94	2214	>18	Are you a member of a trade union?
Credoc	Opinion Survey	1993	1990-94	817	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	1994	1990-94	797	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1994	1990-94	943	>18	Are you a member of a trade union?
Credoc	Opinion Survey	1995	1995-99	811	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	1996	1995-99	784	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Eurobarometer	International Survey	1996	1995-99	526	>18	Are you a member of a trade union?
EPCV	Public Survey	1996	1995-99	1816	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	1997	1995-99	775	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	1997	1995-99	1779	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	1998	1995-99	780	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	1998	1995-99	2399	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	1999	1995-99	854	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	1999	1995-99	2454	>18	Number of memberships in union or professional groups

Detailed Sources - France **Continued**

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Credoc	Opinion Survey	2000	2000-04	849	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	2000	2000-04	2379	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	2001	2000-04	847	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	2001	2000-04	2434	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	2002	2000-04	886	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	2002	2000-04	2557	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	2003	2000-04	842	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	2003	2000-04	4665	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	2004	2000-04	874	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
EPCV	Public Survey	2004	2000-04	2504	>18	Number of memberships in union or professional groups
Credoc	Opinion Survey	2005	2005-09	885	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2006	2005-09	891	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2007	2005-09	886	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2008	2005-09	896	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
SRCV	Public Survey	2008	2005-09	9334	>18	Are you a member of a trade union?
Credoc	Opinion Survey	2009	2005-09	850	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2010	2010-14	842	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
SRCV	Public Survey	2010	2010-14	9477	>18	Are you a member of a trade union?
Credoc	Opinion Survey	2011	2010-14	837	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2012	2010-14	851	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2013	2010-14	842	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
SRCV	Public Survey	2013	2010-14	9146	>18	Are you a member of a trade union?
Credoc	Opinion Survey	2014	2010-14	1855	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
Credoc	Opinion Survey	2015	2015-19	1373	>18	Do you belong or participate to the activities of an association or a group? (a trade union)
SRCV	Public Survey	2016	2015-19	9176	>18	Are you a member of a trade union?
Post-electoral	Post-Electoral Survey	2017	2015-19	1280	>18	Right now, are you a union member? If yes, of which one?

Table 3.I.3: Detailed Sources - Italy

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
ICPSR	Post-electoral Survey	1960	1960-64	995	>18 & <99	Types of organizations of which you are a member: 01 labor unions
ITANES	Post-electoral Survey	1968	1965-69	2500	>21 & <99	Are you a member of any labor union or professional organization? Which one?
Eurobarometer	International Survey	1970	1970-74	562	>18 & <99	Do you belong to a union?
Eurobarometer	International Survey	1971	1970-74	945	>18 & <99	Have you paid this year dues to a labor union? If yes, which?
ITANES	Post-electoral Survey	1972	1970-74	1841	>21 & <99	Are you a member of any labor union or professional organization? Which one?
ITANES	Post-electoral Survey	1975	1975-79	1657	>18 & <75	Are you a member of any labor union or professional organization? (among the list)
Eurobarometer	International Survey	1975	1975-79	371	>18 & <99	If the R belongs to an organization: Q.253 Trade union, friendly society
Eurobarometer	International Survey	1976	1975-79	354	>18 & <99	Are you currently a member of a trade union? Which union is that?
Eurobarometer	International Survey	1977	1975-79	389	>18 & <99	Do you subscribe to any clubs or societies of any kind? Q.221_A Trade unions or professional societies
ISSP	International Survey	1985	1985-89	~ 1500	>18 & <75	Are you now a member of a trade union or staff association (at present)?
ITANES	Post-electoral Survey	1985	1985-89	2074	>18 & <99	Are you a member of any labor union or professional organization? (among the list)
ISSP	International Survey	1986	1985-89	1027	>18 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1987	1985-89	1027	>18 & <99	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1988	1985-89	1028	>18 & <99	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1989	1985-89	1028	>18 & <99	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1990	1990-94	983	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ITANES	Post-electoral Survey	1990	1990-94	1500	>18 & <99	Are you a member of any labor union or professional organization? (yes/no)
ISSP	International Survey	1991	1990-94	983	>14 & <75	Are you now a member of a trade union or staff association (at present)?
Eurobarometer	International Survey	1991	1990-94	1731	>18 & <99	Are you a member of a trade union?
ISSP	International Survey	1992	1990-94	996	>14 & <75	Are you now a member of a trade union or staff association (at present)?
Eurobarometer	International Survey	1992	1990-94	1581	>18 & <99	Are you a member of a trade union?
ISSP	International Survey	1993	1990-94	1000	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1994	1990-94	1021	>14 & <75	Are you now a member of a trade union or staff association (at present)?
Eurobarometer	International Survey	1994	1990-94	683	>18 & <99	Are you a member of a trade union?
ISSP	International Survey	1995	1995-99	1094	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1996	1995-99	1104	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ITANES	Post-electoral Survey	1996	1995-99	2502	>18 & <99	Have you ever been enrolled in a trade union (yes, now)?
Eurobarometer	International Survey	1996	1995-99	358	>18 & <99	Are you a member of a trade union?
ISSP	International Survey	1997	1995-99	1017	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	1998	1995-99	1008	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	2001	2000-04	999	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ITANES	Post-electoral Survey	2001	2000-04	3209	>18 & <99	Have you ever been enrolled in a trade union (yes, now)?
ESS	International Survey	2002	2000-04	1207	>15 & <99	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2004	2000-04	1529	>15 & <99	Are you a member of any labor union or professional organization? If yes, now or in the past?
ITANES	Post-electoral Survey	2006	2005-09	4016	>18 & <99	Are you or have you been enrolled in a trade union (yes, now)? Which one?
ISSP	International Survey	2008	2005-09	1078	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ISSP	International Survey	2011	2010-14	1186	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ESS	International Survey	2012	2010-14	960	>15 & <99	Are you a member of any labor union or professional organization? If yes, now or in the past?
ITANES	Post-electoral Survey	2013	2010-14	1508	>18 & <99	Types of organizations of which you are a member: 07 labor unions, professionals or of category
ESS	International Survey	2016	2015-19	2626	>15 & <99	Are you a member of any labor union or professional organization? If yes, now or in the past?
ISSP	International Survey	2018	2015-19	1215	>14 & <75	Are you now a member of a trade union or staff association (at present)?
ESS	International Survey	2018	2015-19	2745	>15 & <99	Are you a member of any labor union or professional organization? If yes, now or in the past?
ITANES	Post-electoral Survey	2018	2015-19	2573	>18 & <99	Are you or have you been enrolled in a trade union (yes/No)? Which one?

Table 3.I.4: Detailed Sources - UK

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
ICPSR	Post-electoral survey	1960	1960-64	995	>21	Types of organizations of which you are a member: 01 labor unions
Political	Electoral survey	1963	1960-64	~ 1000	>21	Does anyone in this household belong in a trade union? Who is it who belongs to a trade union?
Political	Electoral survey	1964	1960-64	~ 1000	>21	Does anyone in this household belong in a trade union? Who is it who belongs to a trade union?
BES	Electoral survey	1974	1970-74	2700	>18	Respondent's trade union
Eurobarometer	International Survey	1975	1975-79	603	>18	If the R belongs to an organization: Q.253 Trade union, friendly society
Eurobarometer	International Survey	1976	1975-79	537	>18	Are you currently a member of a trade union? Which union is that?
Eurobarometer	International Survey	1977	1975-79	565	>18	Do you subscribe to any clubs or societies of any kind? Q.221_A Trade unions or professional societies
BES	Electoral survey	1979	1975-79	1000	>18	Respondent's trade union in the codebook. Asked to name the union
BES	Electoral survey	1983	1980-84	1900	>18	Are you now a member of a trade union or staff association?
GHS	public survey	1983	1980-84	9000	>16	Current trade union member
ISSP	International Survey	1985	1985-89	~ 1500	>18	Are you now a member of a trade union or staff association?
ISSP	International Survey	1986	1985-89	1416	>18	Are you now a member of a trade union or staff association?
ISSP	International Survey	1987	1985-89	1212	>18	Are you now a member of a trade union or staff association?
BES	Electoral survey	1987	1985-89	1800	>18	Are you now a member of a trade union or staff association?
ISSP	International Survey	1988	1985-89	1307	>18	Are you now a member of a trade union or staff association?
ISSP	International Survey	1989	1985-89	1297	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1989	1985-89	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	1990	1990-94	1197	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1990	1990-94	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	1991	1990-94	1257	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1991	1990-94	>35000	>16	whether a member of a trade union or staff association
Eurobarometer	International Survey	1991	1990-94	2346	>18	Are you a member of a trade union?
ISSP	International Survey	1992	1990-94	1066	>18	Are you now a member of a trade union or staff association?
BES	Electoral survey	1992	1990-94	1700	>18	Are you now a member of a trade union or staff association?
Eurobarometer	International Survey	1992	1990-94	2317	>18	Are you a member of a trade union?
ISSP	International Survey	1993	1990-94	1261	>18	Are you now a member of a trade union or staff association?
ISSP	International Survey	1994	1990-94	993	>18	Are you now a member of a trade union or staff association?
Eurobarometer	International Survey	1994	1990-94	1017	>18	Are you a member of a trade union?
ISSP	International Survey	1995	1995-99	1058	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1995	1995-99	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	1996	1995-99	989	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1996	1995-99	>35000	>16	whether a member of a trade union or staff association
Eurobarometer	International Survey	1996	1995-99	479	>18	Are you a member of a trade union?
ISSP	International Survey	1997	1995-99	1080	>18	Are you now a member of a trade union or staff association?
BES	Electoral survey	1997	1995-99	1500	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1997	1995-99	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	1998	1995-99	804	>18	Are you now a member of a trade union or staff association?
LFS	public survey	1998	1995-99	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	1999	1995-99	>35000	>16	whether a member of a trade union or staff association

Detailed Sources - UK **Continued**

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
ISSP	International Survey	2000	2000-04	972	>18	Are you now a member of a trade union or staff association?
LFS	public survey	2000	2000-04	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	2001	2000-04	912	>18	Are you now a member of a trade union or staff association?
BES	Electoral survey	2001	2000-04	1400	>18	Do you belong to a trade union?
LFS	public survey	2001	2000-04	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2002	2000-04	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2003	2000-04	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2004	2000-04	>35000	>16	whether a member of a trade union or staff association
BES	Electoral survey	2005	2005-09	1700	>18	Trade union member
LFS	public survey	2005	2005-09	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2006	2005-09	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2007	2005-09	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	2008	2005-09	1986	>18	Are you now a member of a trade union or staff association?
LFS	public survey	2008	2005-09	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2009	2005-09	>35000	>16	whether a member of a trade union or staff association
BES	Electoral survey	2010	2010-14	900	>18	Are you now a member of a trade union or staff association?
LFS	public survey	2010	2010-14	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	2011	2010-14	928	>18	Are you now a member of a trade union or staff association?
LFS	public survey	2011	2010-14	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2012	2010-14	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2013	2010-14	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2014	2010-14	>35000	>16	whether a member of a trade union or staff association
BES	Electoral survey	2015	2015-19	1300	>18	Are you a member of a trade union or staff association?
LFS	public survey	2015	2015-19	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2016	2015-19	>35000	>16	whether a member of a trade union or staff association
LFS	public survey	2016	2015-19	>35000	>16	whether a member of a trade union or staff association
BES	Electoral survey	2017	2015-19	1000	>18	Are you a member of a trade union or staff association?
LFS	public survey	2017	2015-19	>35000	>16	whether a member of a trade union or staff association
ISSP	International Survey	2018	2015-19	1552	>18	Are you now a member of a trade union or staff association?
LFS	public survey	2018	2015-19	>35000	>16	whether a member of a trade union or staff association

Table 3.I.5: Detailed Sources - West Germany

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
UNESCO-Institut für Sozialwissenschaften	Electoral survey	1953	1950-54	1061	>18 & <75	Member of any association or union? If yes: member of a trade union?
Institut für Demoskopie, Allensbach	Electoral survey	1957	1955-59	3836	>16	Are you in a trade union?
Universität Mannheim	Electoral survey	1965	1965-69	1224	>21 (excl West Berlin)	Are you a member of one of the following organizations ? Item 1: Trade union
Universität Mannheim	Electoral survey	1969	1965-69	1157	>21 (excl West Berlin)	Choice in a list of organizations, with each trade union presented separately
Eurobarometer	International Survey	1970	1970-74	992	>18	Do you belong to a union?
Konrad-Adenauer-Stiftung	Electoral survey	1971	1970-74	2960	>18 (excl WBerlin)	Choice in a list of organizations
Eurobarometer	International Survey	1971	1970-74	961	>18	Have you paid this year dues to a labor union? and if yes, which?
Universität Mannheim	Electoral survey	1972	1970-74	761	>18 (excl WBerlin)	Are you, or is someone else in the family member of a trade union? 1. I am.
Konrad-Adenauer-Stiftung	Electoral survey	1973	1970-74	2448	?	Are you a member of a trade union ?
Eurobarometer	International Survey	1975	1975-79	396	>18	If the R belongs to an organization: Q.253 Trade union, friendly society
Institut für politische Wissenschaft, Kiel	Electoral survey	1976	1975-79	4181	?	Are you, or is someone else in the family member of a trade union ? 1. I am.
Universität Mannheim	Electoral survey	1976	1975-79	833	>18	?
Eurobarometer	International Survey	1976	1975-79	395	>18	Are you currently a member of a trade union? Which union is that?
Politbarometer	Opinion survey	1977	1975-79	4290	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Eurobarometer	International Survey	1977	1975-79	364	>18	Do you subscribe to any clubs or societies of any kind? Q.221_A Trade unions or professional societies
Politbarometer	Opinion survey	1978	1975-79	4429	>19	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1979	1975-79	4554	>20	Are you, or is someone else in the family member of a trade union ? 1. I am.
Institut für politische Wissenschaft, Kiel	Electoral survey	1980	1980-84	711	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Universität Mannheim	Electoral survey	1980	1980-84	5226	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Konrad-Adenauer-Stiftung	Electoral survey	1980	1980-84	2685	>14	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1980	1980-84	1224	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1980	1980-84	5226	>21	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1981	1980-84	4994	>22	Are you, or is someone else in the family member of a trade union ? 1. I am.
Universität Mannheim	Electoral survey	1982	1980-84	1264	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1982	1980-84	1264	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1982	1980-84	4045	>23	Are you, or is someone else in the family member of a trade union ? 1. I am.
Institut für politische Wissenschaft, Kiel	Electoral survey	1983	1980-84	746	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Universität Mannheim	Electoral survey	1983	1980-84	2007	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1983	1980-84	4041	>24	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1984	1980-84	1148	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1984	1980-84	4461	>25	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1985	1985-89	4712	>26	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	1985	1985-89	5429	Residents	Are you a member of one of the following organisations or unions?
Universität Mannheim	Electoral survey	1986	1985-89	819	>18 (excl WBerlin)	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1986	1985-89	1321	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1986	1985-89	4781	>27	Are you, or is someone else in the family member of a trade union ? 1. I am.
Institut für politische Wissenschaft, Kiel	Electoral survey	1987	1985-89	569	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Konrad-Adenauer-Stiftung	Electoral survey	1987	1985-89	948	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1987	1985-89	4835	>28	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1988	1985-89	1196	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1988	1985-89	5358	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1989	1985-89	5674	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	1989	1985-89	4910	Residents	Are you a member of one of the following organisations or unions?
Institut für politische Wissenschaft, Kiel	Electoral survey	1990	1990-94	611	>18	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1990	1990-94	1309	German citizens	Are you a member of the following organizations? unions as distinct items
Politbarometer	Opinion survey	1990	1990-94	5660	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	1991	1990-94	5648	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Eurobarometer	International Survey	1991	1990-94	2508	>18	Are you a member of a trade union?
Allbus	Public survey	1992	1990-94	1616	Residents in Germany	Are you a member of the following organizations? unions as distinct items

Detailed Sources - West Germany **Continued**

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Politbarometer	Opinion survey	1993	1990-94	5651	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	1993	1990-94	4707	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	1994	1990-94	1663	Residents in Germany	Are you a member of the following organizations? Trade union as an item
Politbarometer	Opinion survey	1994	1990-94	6023	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Eurobarometer	International Survey	1994	1990-94	1244	>18	Do you belong to an association or a group? (a trade union)
Politbarometer	Opinion survey	1995	1995-99	5627	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1996	1995-99	1695	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	1996	1995-99	5490	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Eurobarometer	International Survey	1996	1995-99	418	>18	Are you a member of a trade union?
Politbarometer	Opinion survey	1997	1995-99	5558	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	1998	1995-99	1307	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	1998	1995-99	7014	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	1998	1995-99	5065	Residents	Are you a member of one of the following organisations or unions?
Politbarometer	Opinion survey	1999	1995-99	5748	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	2000	2000-04	1693	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2000	2000-04	5661	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2001	2000-04	5652	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2001	2000-04	7775	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	2002	2000-04	1266	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2002	2000-04	6385	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2003	2000-04	9004	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2003	2000-04	7831	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	2004	2000-04	1202	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2004	2000-04	9096	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2005	2005-09	11938	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	2006	2005-09	1379	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2006	2005-09	8539	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2007	2005-09	8486	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2007	2005-09	7064	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	2008	2005-09	1397	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2008	2005-09	8233	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2009	2005-09	11286	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	2010	2010-14	1277	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2010	2010-14	9149	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2011	2010-14	9148	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2011	2010-14	10371	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	2012	2010-14	1618	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2012	2010-14	8483	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2013	2010-14	11797	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	2014	2010-14	1701	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2014	2010-14	8815	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.

Detailed Sources - West Germany **Continued**

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Politbarometer	Opinion survey	2015	2015-19	8673	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2015	2015-19	10398	Residents	Are you a member of one of the following organisations or unions?
Allbus	Public survey	2016	2015-19	1698	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2016	2015-19	9072	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Politbarometer	Opinion survey	2017	2015-19	11201	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
Allbus	Public survey	2018	2015-19	1734	Residents in Germany	Are you a member of the following organizations?Trade union as an item
Politbarometer	Opinion survey	2018	2015-19	9553	>18 & with a phone	Are you, or is someone else in the family member of a trade union ? 1. I am.
GSOEP	Public panel survey	2019	2015-19	10543	Residents	Are you a member of one of the following organisations or unions?

Detailed Sources - United States

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
ANES	Post-Electoral Survey	1952	1950-54	738	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1956	1955-59	784	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1958	1955-59	615	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1960	1960-64	515	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1964	1960-64	835	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1968	1965-69	858	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1970	1970-74	789	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1972	1970-74	1251	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1974	1970-74	694	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
ANES	Post-Electoral Survey	1976	1975-79	884	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1976	1975-79	9938	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1977	1975-79	11715	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1978	1975-79	11764	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1979	1975-79	11876	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1980	1980-84	689	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1980	1980-84	14054	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1981	1980-84	12987	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1982	1980-84	601	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1983	1980-84	161402	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1984	1980-84	1134	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1984	1980-84	168437	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1985	1985-89	170557	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1986	1985-89	1227	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1986	1985-89	168869	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1987	1985-89	169064	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1988	1985-89	1135	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1988	1985-89	161361	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1989	1985-89	164879	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1990	1990-94	1091	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1990	1990-94	14437	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1991	1990-94	14082	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1992	1990-94	1350	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1992	1990-94	14069	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1993	1990-94	14058	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1994	1990-94	979	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1994	1990-94	13129	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1995	1995-99	12855	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
ANES	Post-Electoral Survey	1996	1995-99	999	>21 & <65	Does anyone in this household belong to a labor union. (if yes) Who is that ?
CPS	Public Survey	1996	1995-99	11107	>21 & <65	Are you a member of a labor union or employee association similar to a union ?

Detailed Sources - United States **Continued**

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
CPS	Public Survey	1997	1995-99	11353	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1998	1995-99	11571	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	1999	1995-99	11692	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2000	2000-04	11871	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2001	2000-04	11182	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2002	2000-04	13489	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2003	2000-04	13201	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2004	2000-04	12892	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2005	2005-09	12423	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2006	2005-09	12261	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2007	2005-09	12160	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2008	2005-09	12140	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2009	2005-09	11972	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2010	2010-14	11824	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2011	2010-14	11813	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2012	2010-14	11710	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2013	2010-14	11505	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2014	2010-14	11440	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2015	2015-19	11129	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2016	2015-19	11219	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2017	2015-19	11290	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2018	2015-19	9689	>21 & <65	Are you a member of a labor union or employee association similar to a union ?
CPS	Public Survey	2019	2015-19	10249	>21 & <65	Are you a member of a labor union or employee association similar to a union ?

Detailed Sources - Sweden

Source	Type of Source	Year	Lustrum	N	Perimeter	Question on union membership
Post-Electoral	Post-Electoral Survey	1956	1955-59		>21 & <65	Are you a member of a trade union for workers or white-collar workers?
Post-Electoral	Post-Electoral Survey	1957	1955-59		>21 & <65	Are you a member of any of the following trade unions or associations? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1960	1960-64		>22 & <65	Are you a member of any union for workers / union for white collars?
Post-Electoral	Post-Electoral Survey	1964	1960-64		>21 & <65	Are you a member of any such trade union or professional association that exists on this card? [1. TCO, SACO or SR. 2. LO]
Post-Electoral	Post-Electoral Survey	1968	1965-69		>21 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1970	1970-74		>20 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1973	1970-74		>20 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1976	1975-79		>21 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1979	1975-79		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1980	1980-84		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1982	1980-84		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1985	1985-89		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1988	1985-89		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1991	1990-94		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1994	1990-94		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1994	1990-94		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	1998	1995-99		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
Post-Electoral	Post-Electoral Survey	2002	2000-04		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
ESS	International Survey	2002	2000-04		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2003	2000-04		>18 & <65	Are you a member of any such trade union or professional association which is on this card? [1. LO 2. TCO 3. SACO, SR]
ESS	International Survey	2004	2000-04		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2006	2005-10		>18 & <65	Are you a member of any trade union or organization for entrepreneurs or any other professional organization?
ESS	International Survey	2006	2005-10		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2008	2005-10		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2010	2010-14		>18 & <65	Are you a member of any trade union or organization for entrepreneurs or any other professional organization?
ESS	International Survey	2010	2010-14		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2012	2010-14		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
Post-Electoral	Post-Electoral Survey	2014	2010-14		>18 & <65	Are you a member of any trade union or organization for entrepreneurs or any other professional organization?
ESS	International Survey	2014	2010-14		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?
ESS	International Survey	2018	2015-19		>15	Are you a member of any labor union or professional organization? If yes, now or in the past?

General conclusions

What do unions look like? In particular, how are unions internally organized and who are their members? In this thesis I bring several new empirical findings on these topics to gain a new perspective on the labor movement and how to revitalize it. To do so, I rely on a large collection of unexploited sources, ranging from newly digitized administrative data to underused opinion surveys, and a variety of research designs, from event analysis to case study. The result is an inside picture of the union movement in the US and other major Western countries over more than 60 years. With these data and framework in mind, I have studied three precise research questions: What is the inequality level within trade unions? Are women represented among the union staff as they are among their members? How have the characteristics of union membership evolved across time and space? Each question is answered in a different chapter. In Chapter 1 I show that unions do pay egalitarian wages to their employees. They do so by paying high salaries to low and middle position workers and particularly low ones to high position officers. I document that they do so for several reasons, but at least in part to maintain a good reputation so to attract new members and avoid loosing old ones. In Chapter 2, I show that unions did and still do fare better than the private sector in terms of gender representation and equity, but that they still have some time ahead to reach full parity. I find that some unions are lagging behind others for historical ideological heritages. This underlines how corporate culture is important in shaping the functioning of firms, even concerning gender inequalities. Finally, in Chapter 3 I re-construct, using micro-data, macro union density series for 7 Western countries. I so correct unionization rates in 3 of them (Denmark, France, and Italy).

Also, I document different selection patterns of workers into unions making a clear connection between these patterns and the industrial relations systems governing the labor market in each country. Additionally, I show that changes in the socio-economic composition of a country's workforce, while non-negligible, are not the main drivers of de-unionization, that would have occurred even in the absence of them.
Given this set of results, I believe there are several lessons that can be drawn from this thesis concerning the labor movement, some of which might be extended beyond it.

One clear conclusion is that reputation does matter for labor unions. It is indeed not a coincidence that major US corporations such as Amazon try to dampen unionization campaigns by damaging the reputation of union leaders by advertising their salaries. How is it possible to escape these criticisms? The easiest way concerning salaries is to pay union leaders low amounts. In other words, to counter the image of a greedy "big" labor that is given to workers with opposite hard facts. This has somehow been the strategy of the newly created Amazon Labor, that chose to run as an independent, grass-root organization to win the first union recognition in a US Amazon facility[32]. But declining unions need to attract good managers: decent salaries might be a necessity. This thesis describes another way to make workers feel more connected to their unions and particularly to their leaders, at least in the Anglo-Saxon world: allow them to directly participate in the decision making process of the respective organizations. The most straightforward way studied in Chapter 1 is to allow union members to directly vote for their national president. Direct election of the union national president has several advantages. First, the general president is the most mediatic figure of the union and at the same time the one giving the overall direction to its agenda. Having campaigns for the union presidency should make workers feel more involved in the union while having an impact on its direction. Second, members' voting should increase competition and the emergence of reformist groups. With newcomers being

[32] *[...] they wouldn't be able to do it against this type of campaign, the way we organize, the way we are, pretty much, I guess, you could say strategizing against Amazon. Reported in The Economists, Money talks: state of the union, Apr. 6th 2022.*

more likely to win, unions' strategies are likely to become more dynamic and the union leadership more aggressive at the bargaining table (Strauss, 2000).

Another interesting conclusion concerning norms and reputation that we can derive from the analysis in Chapter 1 is how these forces are able to strongly influence the pay setting. While I show that this mechanism works well limited to labor unions, it might well extend beyond them, for instance to the non-profit sector in general. Standard neoclassical theory predicts that an equilibrium salary will emerge in the intersection between offer and demand of labor. At this equilibrium, it will be offered a salary that is equal to the marginal productivity of the quantity of labor hired. However, if norms and reputation concerns are able to influence the pay setting, it is clear that the marginal productivity assumption is violated. While this possibility is not knew in economics (see for instance Frank (1984)), my work brings norms and reputation concerns as additional sources of pay determination and possible deviation from the marginal productivity axiom. To the best of my knowledge, this was explicitly proposed only by Mas (2017), that looked at the compensation of Californian city managers after that their salaries were made public. If the marginalist theories may constitute a clear and interesting benchmark for comparison, I believe these findings point towards the urge for better understanding of the non-economic determinants of compensations.

A third conclusion refers to the importance of the characteristics of workers both within the union and outside it, in the general labor market. Among the different changing patterns, Chapter 3 highlights how women are becoming more and more present within the workforce, but also among union members. For these reasons, they are likely to constitute the future of unionism. Attracting women is thus crucial for the labor movement. In Chapter 2, however, I show how women are still a minority among American union officers[33]. To attract and better represent workers, unions should put more effort to have leaders representative of their workforce composition at all levels of

[33]Other countries, such as France, do remarkably better (Mourlot and Pignoni, 2018), but still miss women in middle ranked positions (Guillaume, 2018)

power (i.e. from organizers to national leaders). Aside from women in fact, many other sub-groups of workers might lack representation in the union. Black and other people of color might be one of these group, migrants another[34]. In all these cases, a more representative leadership will ensure that specific interests are better taken into account and, partly as a consequence, that more workers from these groups enter in the ranks of the unions as members and, possibly, as officers. Many other changes are occurring on the side of union members. In addition to the divergence between the characteristics of members and union leaders, there has been a divergence also between the characteristics of union members and the average worker. For instance, in 3 I reaffirmed that union members are older, and constantly more so, than the average worker on the market. First, this means that the future of the unions doesn't look bright. Second, it means that something specific need to be done concerning the less unionised groups. Note that these important challenges are also possible great prospects of success. Identifying these groups is a first important step, but action must follow afterwards. How will unions be able to better address the needs of misrepresented workers' will likely determine their chances to survive. In this thesis I document that workers' characteristics within the unions are changing and that, at least concerning women, unions are lagging behind their membership evolution. Addressing this gap might be a simple, yet potentially powerful way to attract new people.

As some questions find their answers, several additional ones open up for future research. Future work should first test if the benefits derived from making the union more open and democratic are important and worth the effort of going against an established practice. As already mentioned, not many unions have switched their national presidential election mode from indirect to direct. However, quite recently the UAW (United Auto Workers)[35] has embraced this election mechanism under the pressure of its members. One empirical challenge for this study is that some of the pos-

[34]I believe that testing for the presence of mis-representation for these additional groups constitute an important venue for future research.

[35]December, 21 2021

itive effects might take time to materialize. Others, however, such as the satisfaction of members with their union and union leaders, might be easier to measure. In this line, A second venue of research should focus exclusively on members. As members are declining, particularly among some groups of workers, it would be interesting to directly ask them what unions should be doing in terms of management to convince them to unionize. I see this as particularly important for young workers, and all the other under-represented categories. Optimistically, some of the answers given might be easier to implement than we now think. Looking at the differences in characteristics between sub-groups of workers opens up also new possibilities concerning the effects of unions on the labor market. First, it would be interesting to test if indeed women bargains more women-suited contracts at the firm level. This would make a strong case for equal representation of all workers types in the union as it would prove that group-specific interests are better defended from someone belonging to that group. Second, in light of the important changes in union membership composition, and the revision of union density series found in Chapter 3, future research should also further test if, and what conditions, and how much unions reduce inequality.

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