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Do Unions have a Role to play in Decreasing Earnings Inequality? Recent Evidence from Metropolitan Statistical Areas

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Abstract: One of the notable economic trends since the late 1980's is a dramatic rise in earnings inequality. Several researchers concluded that a significant source of earnings inequality is due to a large decrease in the unionized fraction of the labor force. The main focus of this paper is to investigate impact of union density, unemployment, and demographic characteristics on income inequality (*i.e.*, Gini index). Preliminary results, based on a panel of Metropolitan Statistical Areas in the United States between 2010 and 2023, indicate that the union membership rate has a countering effect on growing income inequality. Demographic controls also seem to affect income inequality. By disaggregating union density, we find the magnitude of its effect on income inequality is larger in the private sector relative to the public sector. The overall effect of union density on Gini is driven by the private sector due to its larger share of employment. Accordingly, the recent upswing in private sector union drives with the backdrop of a tight labor market may have an important role to play in reducing inequality in the coming years.

1. Introduction

"The only effective answer to organized greed is organized labor." – Thomas Donahue (President Emeritus of the American Federation of Labor and Congress of Industrial Organizations (1995).

"The entire history of labor relations demonstrates that unions are the strongest catalyst for better wages and working conditions." – Sherman E. Katz (Senior Associate in the Trade, Equity and Development project at the Carnegie Endowment for International Peace – (April 1, 2016).

For decades, labor unions and collective bargaining dominated the American labor landscape. Manufacturers, postal workers, and farmers alike relied upon their ability to organize to determine their working conditions and wages, creating a ripple effect throughout American society as union and non-union workers alike enjoyed the benefits. Increased globalization, an attack on unions by the federal government, and declining awareness are all factors that contributed to the massive fall in union membership rates in the U.S. labor force. The steady growth of income inequality then is no surprise as the protections offered by collective bargaining have diminished, enabling the wage distribution to widen year after year.

It has been well documented that the historic decline in unionization has contributed to the simultaneous increase in income inequality (Katz and Murphy, 1992; Freeman, 1991). Prior to the 1970s, labor unions strength in the American economy acted as a stabilizing force for workers, helping consolidate the overall wage dispersion and protect employment. Immediately following the sudden decrease in union membership "wage dispersion expanded within demographic and skill groups" and "the wages of individuals of the same age, education, and sex (and even those working in the same occupation and industry) were much more unequal in the mid-1990s than two decades earlier" (Katz and Autor, 1999). Without the wage protections offered by union membership it is no incident then that we have seen strong growth in the income share of top earners, leaving the middle and lower class behind and contributing to greater wage inequality (Picketty and Saez (2003)). While the last 50 years have demonstrated that the power and popularity of unions has continued to decline, it appears they're making a comeback.

In more recent years, the COVID-19 pandemic, a tight labor market, and renewed interest in collective bargaining has sparked a wave of support, opening the door for a route to lessen income inequality for workers of all race and gender.

In 2022 alone, corporate giants such as Starbucks, Amazon, and Apple have all seen successful union campaigns from their employees. In Buffalo, NY, 143 Starbucks baristas have unionized, empowering 120 other locations to petition for union membership (Greenhouse, 2022). Meanwhile, Apple retail workers in Maryland unionized at a location with 130 employees (Albergotti (2022)); REI employees succeeded in unionizing in NYC at a location with ~100 employees and a median age of 37 years old – 5 years younger than the US average (Scheiber, 2022); and, Google Fiber contractors became the first

members of the Alphabet Workers Union to successfully unionize with bargaining rights in March 2022 (Elias, 2022). While large union drives are occurring, such as those by Amazon warehouse employees in Staten Island and Alabama, it appears this new wave of unionization efforts are characterized by smaller retail outlets (O'Donovan, 2022). Given that retail workers in the U.S. are younger, more female, and more diverse than the rest of the workforce (Anderson, 2020), an intensified interest in union membership and collective bargaining is an opportunity to reduce the growth of income inequality across multiple levels in the U.S.

In congruence with the increased volume of localized union drives and a tight labor market, 2023 has seen two of the largest strikes and collective bargaining successes this century. The United Auto Workers Union (UAW) committed to work stoppages across the three largest plants in the U.S. for six weeks, resulting in contract negotiations that could raise wages over 30 percent over the life of the contract (Krisher and Bajak, 2023). Meanwhile, SAG-AFTRA and the WGA, representing Hollywood actors and screenwriters, went on strike for several months and won significant gains in wage increases and increased benefits (Wilkinson and Stewart, 2023).[1] While these major wins came for two of the largest unions in the country, they are indicative of the returning strength of union bargaining in the current labor market and political setting. With this demonstrated rise in bargaining power, it is expected that greater wage equality will follow growing union membership (Hyclak, 2023).

Given the literature discussing this subject has been a major topic for over 50 years, our paper aims to update earlier research findings. In this paper, we review historical trends, pertinent literature, and combine contemporary demographic data from the American Community Survey provided by the U.S. Census Bureau with union measurements from Hirsch, Macpherson, and Even's *Union Membership and Coverage Database* at the metropolitan statistical area (MSA) level to empirically assess the impacts of modern unions on income inequality.

2. Historical Trends

To contextualize the expected impact of changing union density one must understand the historic developments in income inequality, industry and sector mix, and union composition. What was once an instrument utilized by the bulk of the private manufacturing industry, dominated by white men, has since become more representative of the U.S. economy, driven by increased demographic diversity and the rise of the service sector.

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[1] At the time of writing, SAG-AFTRA is actively negotiating its contract with the expectation they will receive similar gains to WGA, who joined them on the picket line.

2.1. Income Inequality

Figure 1 illustrates the steady rise in the U.S. Gini index since the mid-1970s, starting at around 35. During the first half of the 1980s, in congruence with the "attack on unions" and subsequent decline of wage protections, Gini rose approximately three points. The rise during this five-year stretch makes up almost half of the overall spike in Gini during the entire time period. Following another spike in the first part of the 1990s, the U.S. Gini has hovered around 41 points. The steady climb in income inequality appear to follow an inverse relationship with union membership rates, coinciding directly with the over 50-percent decline in membership rates demonstrated in Figure 2. As such, the widening of the American wage distribution has led to the U.S. holding a higher Gini coefficient than the majority of global economic powers and developed countries like Germany, the United Kingdom, and China (World Population Review, 2023).

Figure 1: U.S. Gini Index (1974 – 2022)
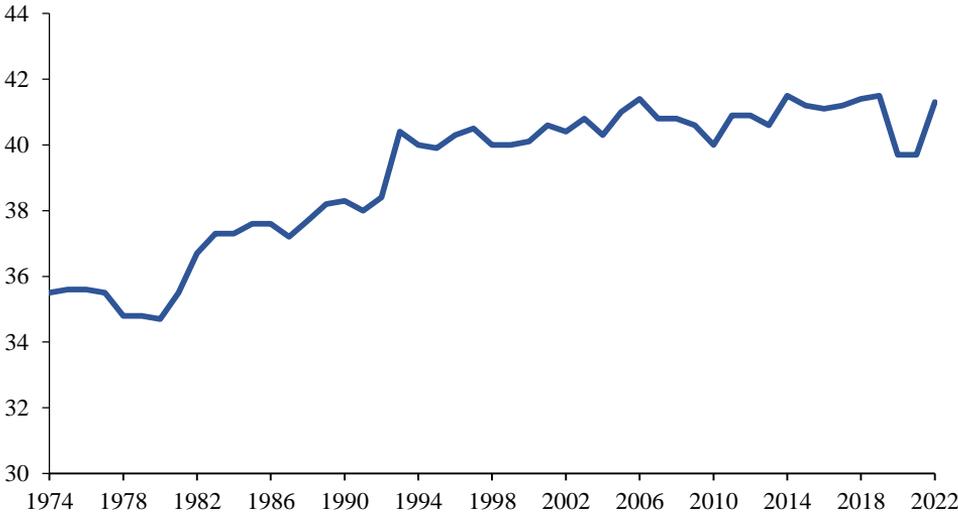
2.2. Industry

Figure 2 demonstrates the rapid change in the prototypical union member, from "blue collar" manufacturing jobs to the typically "white collar" service jobs – a space that today is a thriving part the economy. Manufacturing workers previously held union membership rates above 30 percent, between two and three times the rate at which service workers maintained union involvement. Whereas previously the weighted average of the two industry types of workers was carried by manufacturing workers, the trend has since

flipped such that the union density for service workers is now more representative of the union density for *all* wage and salary workers. Scholars have hypothesized that the combination of technological innovation in the form of automation and the effects of globalization have eroded demand for less skilled workers and domestic manufacturing jobs (Autor et al., 2003; Feenstra and Hanson, 1996), not only decreasing the volume of jobs but also workers ability to fight for wage and employment protections in the form of labor unions. Similar to other developed economies in the world, the U.S. has lost its title as a major manufacturing power and shifted towards an economy dominated by service jobs – a wide ranging sector covering occupations from hospitality to banking. As such, union membership for service workers has come to represent the majority of unionized wage and salary workers. As the service workers have come to represent 76.4 percent of the American economy, it's apparent this is the space where workers have the most to gain with increased labor organization (Statista, 2023).

Figure 2: Union Membership for All Wage and Salary Workers, Disaggregated by Industry (1973 – 2024)[2]
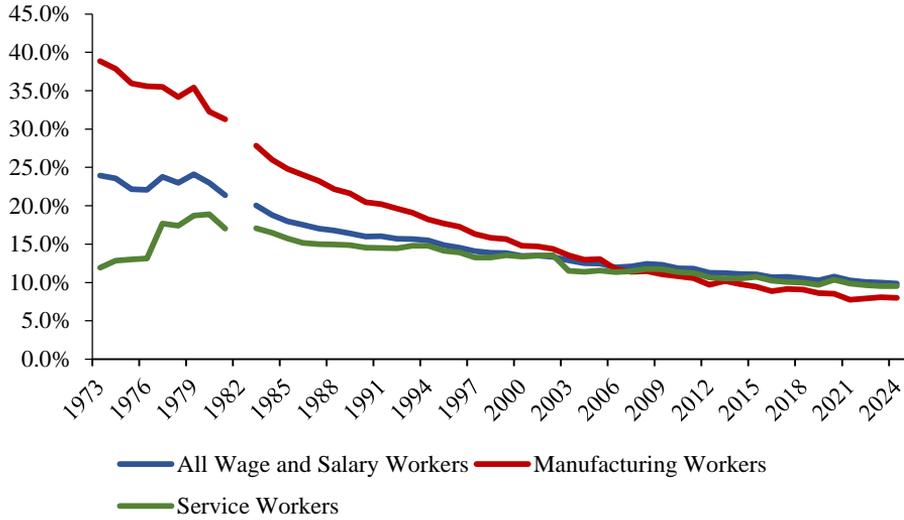
2.3. Sector

Similarly, we see a drastic difference in the rate of decline in private and public union membership and collective bargaining. As illustrated in Figure 3, this large decline in overall union density is driven by a significant decline in union strength in the private

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[2] For Figures 2-5, data for union membership and collective bargaining coverage is missing in 1982.

sector, which has fallen from 24.2% to 5.9%. The public sector on the other hand has witnessed a modest increase in union density and remained relatively stable around 35%. This asymmetric growth has resulted in a 50/50 split in overall union members between the two sectors, even though the private sector is more than 5-times the size of the public sector in terms of employment.

Figure 3: Collective Bargaining and Union Membership by Sector (1973 – 2024)
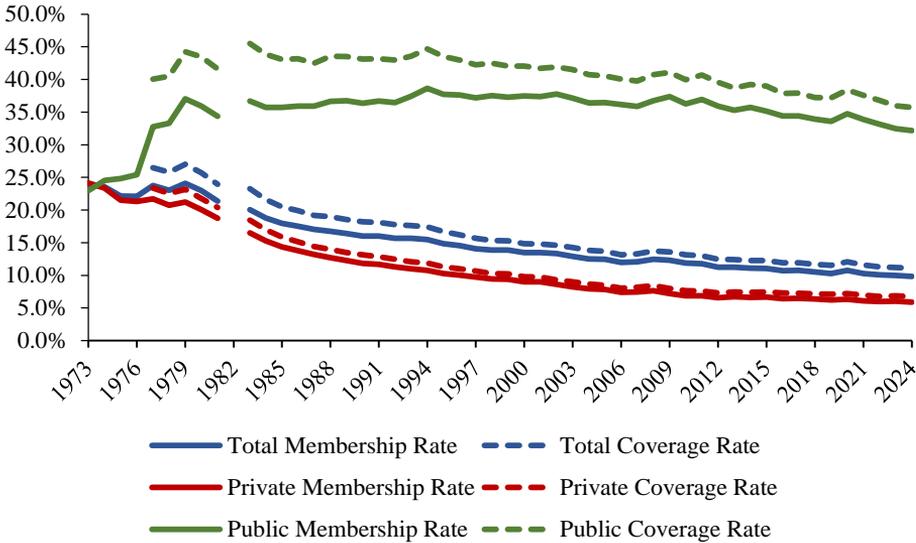
The combination of greater union strength and a comparatively more compressed wage distribution in the public sector has therefore acted as a safeguard against rising income inequality (Card, 2001). Card, Lemieux, and Riddell (2020) estimate modest economy-wide effects of unions on wage structure, around a 3.5% reduction in wage inequality for both males and females in the U.S. However, when disaggregated by sector, reductions in wage inequality in the public sector are approximately 10-time the reductions in the private sector.

The drastic difference in the equalizing effect of unions between the two sectors is likely driven by the differences in wage variance overall. The U.S. private sector has witnessed greater exposure to globalization resulting in a larger drop in the wage floor compared to the public sector. When combined with declining unionization rates and collective bargaining coverage, the private sector's wage distribution has widened relative to the public sector. This loss of wage protections in the much larger private sector appears to be driving U.S. income inequality. Therefore, it is expected that the equalizing effect of union

membership is greater in the private sector, where increased unionization's effect on raising the wage floor has a greater impact on compressing the wage structure and reducing income inequality (Lucifora et al., 2005; Katz and Autor, 1999).

2.4. Union Composition

Despite the historical barriers to entry that women and other minorities have faced to union membership, the composition of unions by race and gender has steadily grown to relatively equal representation over time. This change appears to be driven by a steady decline in union membership by men in tandem with a comparative stability of total membership by women. With overall union membership falling by over half since the early 1970s, this suggests that the barriers to entry faced by women have grown weaker over time due to the relative maintenance of their own membership status (Hirsch, Macpherson, and Even, 2021).

Between 1983- and 2008-women's representation in the total workforce rose 2.6 percentage points while their share of the total union workforce increased by 9.8 percentage points, demonstrating the interest of female laborers in union membership along with their success in surpassing barriers to entry (Schmitt and Warner, 2010). This notion is furthered by the comparative drop in membership between men and women – where women's overall unionization rate fell 6.1 percentage points, men's overall unionization rate fell 13.2 percentage points in the same period (Schmitt and Warner, 2010). The racial and ethnic composition of union members shifted as well, becoming less white and more diverse. White members' share dropped 9.1 percentage points, black members' share remained stable, Latino members' share increased 6.4 percentage points, and other groups' share rose 3.3 points (Schmitt and Warner, 2010). Zullo (2012) finds similar trends in the period between 2000 and 2011, attributing the increased share of black and Latino members to the groups' interests in the benefits of labor unions and the increased share of female members more to the group's ability to hold union jobs over time and the faster outflow of male members.

These changes in the racial and gender composition of unions are demonstrated in Figures 4 and 5. As illustrated in Figure 4, beginning in 1973, Hispanic women had the highest rate of female union membership at 23 percent and white women had the lowest membership rate at 13 percent. Through the 1970s all three demographic groups experienced a rise in union membership but have since followed the national trend and seen a decline in representation through today. In 2024, all three groups recorded membership rates around 10 percent, indicative of the increased diversity in modern union representation.

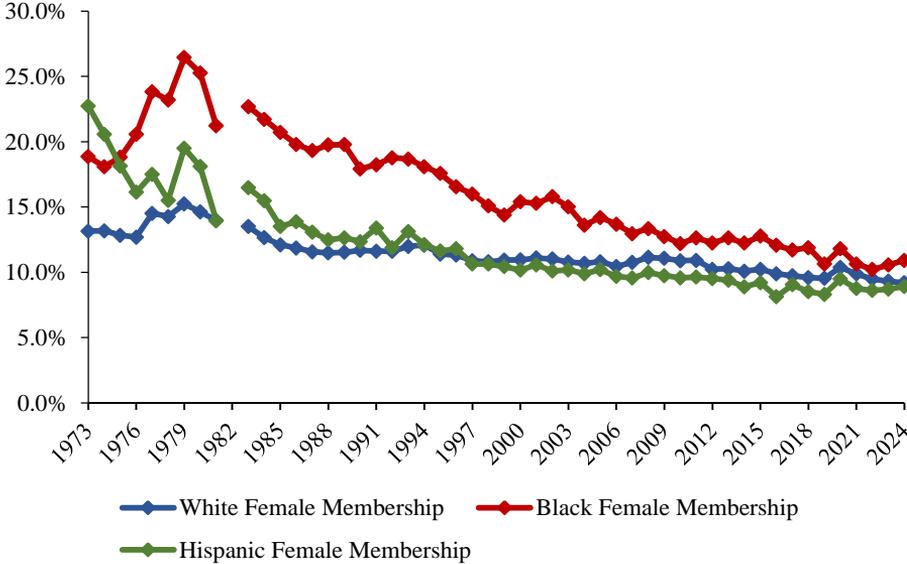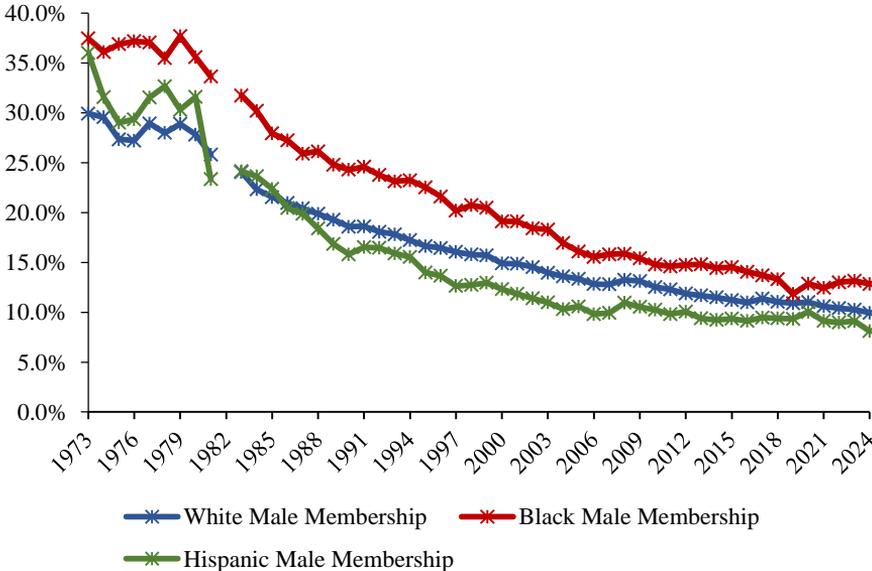**Figure 4: Female Union Membership Rate by Race (1973 – 2024)**

Figure 5: Male Union Membership by Race (1973 – 2024)

Demonstrated in Figure 5, in 1973 Black men had the highest rate of male union membership at 37 percent while white men maintained the lowest rate at 30 percent. Over the ensuing fifty-year period, the demographic representation of male union members has shifted slightly such that Hispanic men now have the lowest level of representation at around 10 percent. Black men still maintain the highest rate of union membership around 15 percent. While the spread amongst the groups is slightly larger than the spread amongst female demographic groups, the margin over the last decade is at the lowest it has been throughout the period and continues to demonstrate the expansion of diversified membership in modern labor unions.

3. Related Literature

To understand the potential impact of labor union membership in the modern United States it's important to contextualize the breadth of unions' impact. While, at a high-level, unions condense the wage structure and reduce overall income inequality, the disaggregated effect demonstrates similar outcomes. When considering the diversity of the American labor force, the magnitude of these effects can be quite telling. Similarly, when assessing the overall effects of increased union density, the adjacent impacts of overall collective bargaining coverage and work stoppages need to be considered.

3.1. Equalizing/Levelling Effects of Unions

It is broadly understood that the steady decline in overall union membership can explain a modest portion of rising wage inequality among both men and women (DiNardo et al. (1996); Card (2001)). Labor unions' equalizing effects on the wage distribution are well documented, such that decreased representation has corresponded with increased variance in wages overall (Freeman, 1993; Machin, 1997; Karoly and Klerman, 1994)). Utilizing a dataset going back to the 1930s, Farber et al. (2021) empirically demonstrates the important role unions had in the mid-20th century as a powerful force for equalizing the income distribution. More recently, Piketty and Saez (2003) demonstrated that top earners' income share increased during the period of deunionization, further propelling the widening of the wage distribution and fomenting rising income inequality.

Freeman (1991) finds that earnings distributions are more compact among union workers that nonunion workers. Upon disaggregating the union wage premium by industry, he finds that declining unionism widened the wage premium, in line with increasing inequality during the same period. Looking at the period from 1973 to 2007, Western and Rosenfield (2011) attribute a fifth to a third of the growth in inequality to the simultaneous decline of organized labor. As inequality in hourly wages raised 40 percent during this time, a maintenance of previous union membership rates could have had a large effect on slowing this rise.

3.2. Race/Gender

While the disaggregated effects of unionism on inequality by race and gender are less understood, it is apparent that they have differing magnitudes (Wunnava and Peled, 1999; Flaherty and Caniglia, 1992). Unions help raise the wages of women and black and Hispanic workers – whose wages have historically lagged behind those of white men – by establishing pay "transparency" (workers know what other workers are making), correcting salary discrepancies, establishing clearer terms for internal processes such as raises and promotions, and helping workers who have been discriminated against achieve equity (Bivens et al., 2017).

Ashraf (1990) used pooled microdata to assess the union wage premium across disaggregated subgroups, finding that nonwhite workers have more to gain from wage setting institutions. Similarly, using data from the CPS between 1973 and 2007, Rosenfield and Kleykamp (2012) find that black-white weekly wage gaps would be between 13% and 30% lower if union representation remained at their previously higher levels. Kerrissey and Meyers (2022) demonstrate that unions have a pronounced equalizing effect on minority groups, suggesting union membership boosts average earnings an additional 3% for Black men and Black women and 2% for White women on top of the direct union wage premium. Given the findings of Naidu (2022), who empirically demonstrates the increased propensity to vote for union membership amongst women and non-white workers, the additional premia may have a larger impact on inequality when combined with increased interest in membership.

3.3. Collective Bargaining and Spillover Effects

At its core collective bargaining is simply the negotiation of wages by one group with an employer – one of the core purposes of labor unions. However, workers adjacent to unions in their working environment often still receive the benefits of collective bargaining coverage in the form of spillover effects. This can occur when employers extend terms of a collective bargaining agreement to nonunion employees in a firm, a far more common process in European countries than in the United States (Flanagan, 1999). The other avenue in which union benefits are spread to nonunion members occurs in the form of threat effects, where nearby employers make concessions to employees in the form of higher wages and improved benefits to reduce the likelihood of labor organization within the firm (Bronars and Deere, 1994; Farber, 2005; Rosen, 1969).

Despite the relative similarity in magnitude in union density and collective bargaining in the U.S., unions still maintain an ability to raise wages sector-wide. A modern example is the hospitality industry in Orlando, Florida. Negotiations between six local affiliates of the Services Trade Council Union (STCU) and Disney World in 2014 led to wage increases

for union members to at least $10 an hour starting in 2016. These local affiliates represent housekeepers, lifeguards, cast members, and other service workers. Disney then extended the raises to all its 70,000 Orlando employees, including nonunion employees. These benefits created a ripple effect in the local industry, prompting much of Orlando's hospitality and retail sector to follow suit and raise wages for their employees (Bivens et al., 2017).

3.4. Work Stoppages

Some opponents argue that work stoppages caused by unions create harm by slowing production and the receipt of wages. While there are some negative effects on the economy created by strikes, the association between strike activity, duration, and outcomes are unclear overall (Card, 1990). In previous decades, Gramm (1987) and McConnel (1989) estimated that contract negotiations with 1000 workers or more had an average strike probability of 13 percent. However, increased strike incidence is skewed towards the manufacturing industry (Card, 1990). This suggests a decline in manufacturing and rise in service jobs may result in less strike activity in modern labor unions.

Despite the historic regularity of work stoppages, strike duration is actually quite short. The median duration of labor strikes in manufacturing contract negotiations range from 25 to 40 days, equating to losses of around 5 percent of working time, conditional on a strike, and 0.5 to 10.0 percent, conditional on a contract negotiation (Card, 1988; Card, 1990).

Figure 6: Annual Work Stoppages involving 1,000 or More Workers (1947 – 2024)
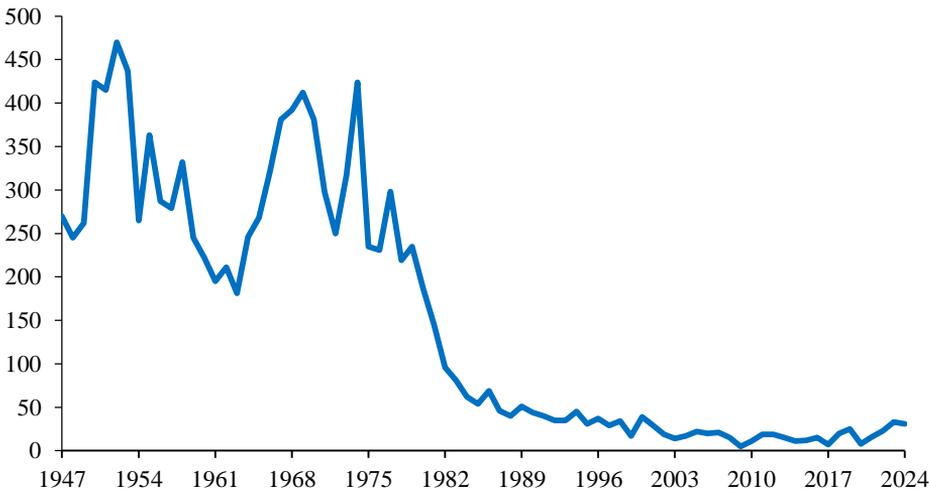
Figure 7: Percent of Total Working Time Spent Idle (1947 – 2023)[3]
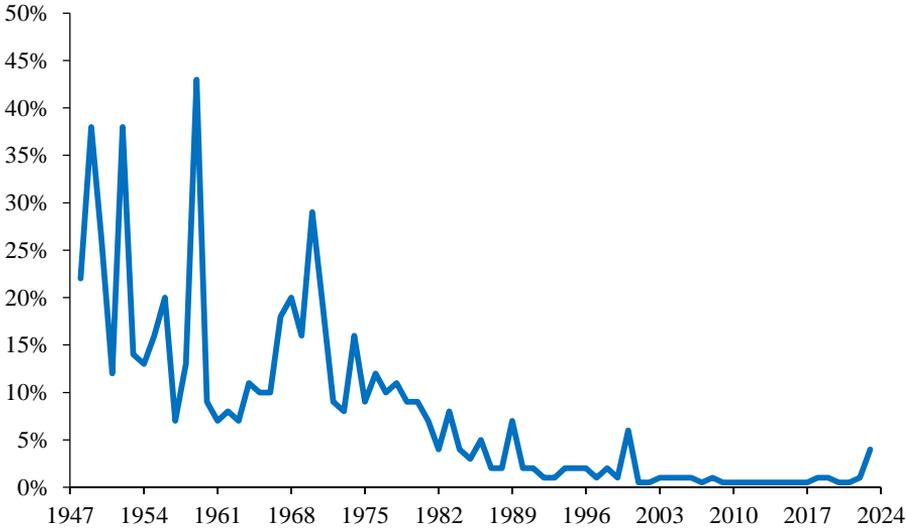
As demonstrated in Figure 6 the volume of major work stoppages has decreased substantially over the past several decades. While the number of strikes in a given year maintained some volatility from the 1950s through the 1970s, there is a clear downward trend beginning in the 1980s – directly in line with the decline of union membership. What once posed a serious threat to economic output has declined such that the number of work stoppages has fallen from over 450 active strikes in a year to less than 25. Likewise, Figure 7 illustrates how idle working time has declined from a peak of over 40% to less than 1% in recent years. While this enormous decline is likely driven by the decreased volume of strike activity overall, it's also suggestive of shorter work stoppages than historic norms. Although this decrease of work stoppages and idle working time appears to be primarily driven by the lack of overall union representation in the modern economy, the fall suggests that the negative economic effects of work stoppages are far less serious than they once were. As such, there is increased likelihood that increased union representation's equalizing effects may outweigh the perceived negatives of strike activity that accompanies labor organization.

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[3] The Bureau of Labor statistics stopped reporting "days of idleness (as % of total estimated working time from work stoppages" after 2023.

4. Methodology and Empirics

While visually it appears obvious that declining union membership maintains some responsibility for the steady growth of the U.S. Gini index it's necessary to quantify this effect to understand potential policy implications – the larger the impact, the greater the likelihood that union organization can be used as a tool to fight earnings inequality. By using disaggregated data at the MSA level, we demonstrate that unions' equalizing effects are still strong in the modern labor system and should be viewed with increased attention.

4.1. Linking Inequality with Union Membership

We utilize the following specification to investigate the potential *negative* relationship between income inequality and union density for each sector:

$$Gini_{mrt} = \beta_0 + \beta_1 uniondensity_{mrt} + \beta_2 unemployment_{mrt}$$

$$+ X\delta + \Phi_t + \boldsymbol{\alpha}_r + \varepsilon_{mrt} \tag{1}$$

where the dependent variable $Gini_{mrt}$ = Gini coefficient, where 0 represents perfect equality and 100 perfect inequality in a society, in MSA m, census region r, in year t.

The explanatory variables of interest in this equation are $uniondensity_{mrt}$ which accounts for the union density, based on union membership,[4] in MSA m, census region r, in year t, $unemployment_{mrt}$ which accounts for the unemployment rate in MSA m, census region r, in year t, and the vector $\boldsymbol{X}$ which includes a set of demographic controls for race, ethnicity, and gender. $\boldsymbol{\alpha}_r$ is a set of geographic fixed effects, defined as the census region in which the relevant MSA is located, and $\boldsymbol{\Phi}_t$ is a set of year fixed effects, which control for time-varying factors that affect all MSAs in the same manner.

Based on the inverse relationship between union density and Gini, we expect β_1 to have a negative value, reflecting a condensing of the wage structure and unions' equalizing effect on wages. The public sector's greater union density and collective bargaining coverage indicates less wage variance amongst public sector workers due to the equalizing effect of unions. As such, we expect the union density's effect on income inequality to be greater in the private sector than the public sector, where wage variance is larger. β_2 could be positive, where a lower unemployment rate reflects a tight labor market, giving more power to workers to demand higher wages. The demographic controls include the percentage of the population of each MSA that is female, white, black, Asian, and Hispanic. Due to the inter-group inequality between these groups and white men, we

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[4] Union membership rate is the estimate of U.S. wage and salary employees who are identified members of a union within the total employed labor force whereas union coverage estimates U.S. wage and salary employees who are covered by collective bargaining.

expect the estimated coefficient for female, black, Asian, and Hispanic to be positive. Due to the range of inequality that exists within the white demographic group, the estimated coefficient may take a positive or negative value. We expect the coefficients for the year fixed effects to all be positive, reflecting the year over year growth in income inequality.

4.2. Data Particulars

Data was gathered from *two* main sources: the American Community Survey (ACS) provided by the U.S. Census Bureau and Hirsch, Macpherson, and Even's disaggregated breakdown of union densities. The American Community Survey collects demographic and economic information and provides 1- and 5-year estimates at the state, region, place, county, zip code, and metro/micropolitan statistical area (United States Census Bureau 2023). We use annual estimates to create the cross-sections within our sample.[5] Hirsch, Macpherson, and Even's *Union Membership and Coverage Database* provides historical and current compilations of Current Population Survey (CPS) estimates of unionization based on data and methods identical to those used by the Bureau of Labor Statistics (Hirsch and Macpherson (2003)).For the purpose of our analysis, we utilize demographic, Gini, unemployment, and unionization estimates at the metropolitan statistical area (MSA) level as it provides the most disaggregated level for which we can match Census data to unionization data. Given the localized effects of unions on workers, the granularity provided by MSA data allows us to capture heterogeneity across local economies that may be obscured at a state or regional level. We also include geographic controls based on which division, defined by the U.S. Census Bureau, each MSA is located within to account for broader regional conditions.[6] We use the ACS annual data on Gini, unemployment rate, and demographic breakdown for each MSA between 2010 and 2021.[7] The demographic breakdown is broken up into five distinct variables based on sex, race, and ethnicity. *Female* is defined as the percentage of the population in the MSA that are female according to the ACS. Similarly, *White*, *Black*, and *Asian*, are defined as the percentage of the overall population of the MSA that identify as White, Black, or Asian.

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[5] The ACS is missing complete 1-year cross sections for MSAs within "ACS Demographic and Housing Estimates" and "Selected Economic Characteristics" (demographics and unemployment rate) in the years 2011, 2013, and 2020. Because the 1- and 5-year estimates did not see any drastic changes in the surrounding years, we utilized the 5-year estimate for those data in 2011, 2013, and 2020. Likewise, we used the 5-year estimate for Gini Index in 2013 for the same reasons.

[6] The U.S. Census Bureau defines 9 distinct divisions, each made up of 3-8 states: Pacific, Mountain, West North Central, East North Central, West South Central, East South Central, South Atlantic, Middle Atlantic, and New England.

[7] We obtained these from the following series: "Gini Index of Income Inequality," "ACS Demographic and Housing Estimates," and "Selected Economic Characteristics." Links to these data sources are identified in the references.

Hispanic is the percentage of the MSA population that identify as ethnically Hispanic.[8] We use Hirsch, Macpherson, and Even's annual estimates of union membership and coverage density for each MSA provided for the same period.

Demographic statistics and Gini index for each MSA were then matched with the corresponding union density measurements for all eleven years. As of July 2023, there were 387 metropolitan statistical areas in the United States. (United States Census Bureau (2023)). Due to the changing MSA designations by the U.S. Census during the time period, not all MSAs are included in the entire sample. Hirsch, Macpherson, and Even report weighted union densities based on three sectors (Private, Public, and Total).[9]

4.3. Key Findings

Utilizing our model specification stated above, we estimate the effect of union density on Gini coefficient for three sectors: the public sector, the private sector, and the weighted density of both sectors combined (total). As the private sector is nearly six times larger than the public sector in terms of overall employment, the estimated effect of union strength for the "total" sector will be weighted more towards the private sector. The regression results are reported in Table 1, and the sample characteristics of the variables can be found in the Appendix (Table 2).

Estimating the effects of union membership on Gini provides strong results. The estimated coefficients across all three sectors are negative and statistically significant, demonstrating an equalizing effect on earnings inequality with increased union membership. Utilizing our baselines regression, a one percentage point increase in union density in the private sector is expected to decrease Gini by **0.093** points (Column [2]), suggesting that a return to the private sector's union density seen in the 1970s could eliminate some of the growth in U.S. earnings inequality. As expected, the coefficient for Total Membership is weighted more heavily towards the Private Membership estimate due to the comparative size difference in overall public and private sector union representation.

The estimated effect of an increase in the union membership rate has the strongest negative effect on Gini index in the private sector. A one-percentage point increase in union density in the private sector is expected to decrease the Gini by **0.060** points (Column [5]). Our estimates are in line with the estimated differences in magnitude

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[8] Table 2 in the Appendix shows that the combined weight of these demographic groups may exceed 100 percent. This occurs because the Hispanic identifier, defined as an ethnicity, is not mutually exclusive from racial identifiers (*i.e*., White, Black, or Asian).

[9] We are unable to disaggregate demographic, Gini, or unemployment data by sector. As such, each sector maintains the same demographic characteristics, Gini, and unemployment rate as the entirety of the MSA it belongs to.

between the public and private sectors due to the wider wage variance and comparatively low union membership rate in the private sector. As such, an increase in membership relative to employment in the private sector is expected to have a much larger impact than it does in the public sector.

Table 1: MSA Summary Statistics by Sector

	Private				
	N	**Mean**	**SD**	**Min**	**Max**
Membership	3,241	5.96	4.93	0	39
Coverage	3,241	6.68	5.16	0	39.90
	Public				
Membership	3,240	32.26	21.75	0	100
Coverage	3,240	35.89	21.90	0	100
	Total				
Membership	3,241	10.20	7.15	0	42.30
Coverage	3,241	11.39	7.34	0	47.70
Gini	3,241	45.76	2.54	37.87	55.85
Female	3,241	50.72	1.00	44.40	54.00
White	3,238	75.49	13.78	17.50	96.40
Black	3,238	11.51	10.79	0	53.70
Hispanic	3,241	14.58	16.90	0.40	95.70
Unemployment	3,241	6.44	2.70	1.60	21.00
New England	3,241	0.05	0.21	0	1
Middle Atlantic	3,241	0.10	0.30	0	1
East North Central	3,241	0.19	0.39	0	1
West North Central	3,241	0.05	0.23	0	1
South Atlantic	3,241	0.21	0.41	0	1
East South Central	3,241	0.07	0.26	0	1
West South Central	3,241	0.13	0.34	0	1
Mountain	3,241	0.08	0.28	0	1
Pacific	3,241	0.12	0.33	0	1

The estimated effect of an increase in the union membership rate has the strongest negative effect on Gini index in the private sector. A one-percentage point increase in union density in the private sector is expected to decrease the Gini by **0.060** points (Column [5]). Our estimates are in line with the estimated differences in magnitude between the public and private sectors due to the wider wage variance and comparatively low union membership rate in the private sector. As such, an increase in membership relative to employment in the private sector is expected to have a much larger impact than it does in the public sector.

Table 2: The Effect of Union Density on Gini (Inequality) by Sector[^]

	Baseline Regression			Regression with Controls		
	Total	Private	Public	Total	Private	Public
	[1]	[2]	[3]	[4]	[5]	[6]
Membership	-0.064***	-0.093***	-0.017***	-0.041***	-0.060***	-0.008***
Female				0.737***	0.744***	0.744***
White				0.036***	0.035***	0.038***
Black				0.074***	0.072***	0.075***
Asian				0.148***	0.149***	0.150***
Hispanic				0.036***	0.035***	0.037***
Unemployment				0.159***	0.157***	0.150***
2011				0.776***	0.776***	0.760***
2012				0.615***	0.609***	0.623***
2013				0.673***	0.685***	0.674***
2014				1.322***	1.328***	1.320***
2015				1.653***	1.668***	1.645***
2016				1.686***	1.694***	1.681***
2017				1.791***	1.803***	1.796***
2018				2.054***	2.075***	2.053***
2019				1.674***	1.689***	1.659***
2020				1.745***	1.742***	1.725***
2021				2.361***	2.375***	2.374***
2022				2.804***	2.818***	2.798***
2023				2.411***	2.422***	2.417***
Constant	46.40***	46.31***	46.29***	2.190	1.855	1.623
F-test for joint significance						
Fixed (region) effects				12.35***	13.24***	12.61***
				$F_{(8, 3209)}$	$F_{(8, 3209)}$	$F_{(8, 3209)}$
Observations	3,241	3,241	3,240	3,238	3,238	3,237
R-squared	0.032	0.032	0.021	0.274	0.276	0.270
*** $p<0.01$, ** $p<0.05$, * $p<0.1$						

Notably, the estimated coefficients for our demographic controls are all positive and statistically significant. The estimated values associated with the unemployment rate are both positive and statistically significant, in line with our belief that a tight labor market may reduce income inequality. The estimated coefficients of our year fixed effects are positive, reflecting the continuing rise in income inequality over time.

[^]: The reported union density is based on union membership. We also estimated the models based on collective bargaining coverage and the results are comparable. These results have been reported in Appendix 1.

5. Conclusion

This paper's purpose is to understand the impact of union density, unemployment, and demographic characteristics on income inequality. Results, based on a panel of Metropolitan Statistical Areas in the United States between 2010 and 2021, indicate that the union membership rate has an equalizing effect on income inequality. Demographic controls also affect income inequality. Likewise, a tighter labor market reduces income inequality.

By disaggregating union density, we find the magnitude of its effect on income inequality is larger in the private sector relative to the public sector. The aggregate effect of union density on Gini is driven by the private sector, due to its larger share of employment. Accordingly, the recent upswing in private sector union drives with the backdrop of tight labor market may have a major role to play in reducing inequality in the coming years. This has already been evidenced through significant drives and victories by groups such as United Auto Workers, Starbucks Workers United, and the Amazon Labor Union. The victories by these three groups serve as a powerful example for American laborers. Auto manufacturers, national food and beverage workers, and employees of one of the largest firms in the world all successfully petitioned for union membership, garnered wage gains, and improved working conditions, demonstrating to others the benefits and improved possibility of union representation in their firm.

The growing interest in increased union representation, as evidenced by Kochan et al.'s (2019) findings that nearly 50 percent of non-union laborers say they would vote for a union, is further opening an avenue for greater income equality for women and minority groups. These groups have the most to gain from union membership and ought to place themselves at the forefront of this modern wave to help consolidate the inter-group wage variance that they have experienced for decades. While we continue to show the overall beneficial impacts of higher membership rates on income inequality, the demonstrated diversity of modern labor unions should contribute to a larger impact across all demographic groups as overall representation increases.

In the future, we aim to construct a demographic and sector specific Gini variable to increase the precision of our current estimates. With a disaggregated outcome variable, we can assess the usefulness of increasing union membership as a tool to decrease income inequality across certain groups with greater confidence. Likewise, as time progresses, the measured impacts of contemporary union drives will become more apparent and further our understanding of their potential equalizing effect.

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Appendix 1: The Effect of Collective Bargaining Coverage on Gini (Inequality) by Sector

	Baseline Regression			Regression with Controls		
	Total	Private	Public	Total	Private	Public
	[1]	[2]	[3]	[4]	[5]	[6]
Coverage	-0.064***	-0.085***	-0.020***	-0.042***	-0.055***	-0.012***
Female				0.734***	0.742***	0.746***
White				0.036***	0.035***	0.038***
Black				0.074***	0.073***	0.074***
Asian				0.148***	0.149***	0.150***
Hispanic				0.036***	0.035***	0.037***
Unemployment				0.159***	0.157***	0.154***
2011				0.775***	0.762***	0.783***
2012				0.616***	0.606***	0.633***
2013				0.671***	0.680***	0.682***
2014				1.328***	1.327***	1.347***
2015				1.655***	1.668***	1.666***
2016				1.688***	1.696***	1.701***
2017				1.792***	1.803***	1.821***
2018				2.052***	2.070***	2.073***
2019				1.679***	1.694***	1.681***
2020				1.746***	1.739***	1.748***
2021				2.363***	2.380***	2.390***
2022				2.807***	2.822***	2.823***
2023				2.412***	2.426***	2.432***
Constant	46.49***	46.33***	46.46***	2.439	1.940	1.730
F-test for joint significance						
Fixed (region) effects				12.26***	13.22***	12.40***
				$F_{(8, 3209)}$	$F_{(8, 3209)}$	$F_{(8, 3209)}$
Observations	3,241	3,241	3,240	3,238	3,238	3,237
R-squared	0.035	0.030	0.028	0.275	0.276	0.272
*** $p<0.01$, ** $p<0.05$, * $p<0.1$						