The Career Effects of Union Membership

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Abstract

We provide a comprehensive assessment of the margins along which unions impact workers' careers. To perform our analysis, we combine exogenous variation in union membership take-up with detailed administrative data and a novel field survey. In the survey, we investigate worker preferences over career amenities and their beliefs about the ability of unions to alter those amenities. In the administrative data, we causally estimate the channels through which unions influence worker outcomes, whether unions influence workers differently across their careers, and the overall longer-run effects of union membership. We find that the career effect of union membership differs greatly depending on the age at which workers enroll. In addition, we show that focusing on a restricted set of outcomes, such as wages and employment, generates a fractionalized understanding of the multidimensional career effect that union membership has on workers.

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1   Introduction

Modern labor unions represent one of the most powerful labor market institutions across the OECD, and they have played a pivotal role in shaping the dynamics of labor markets for more than 200 years. By possessing monopoly power over labor supply, unions can restrict labor supply to firms in order to improve workers' rights, work conditions, and compensation. However, despite a consensus on the role of unions - to maximize worker welfare - there is little agreement on union success in serving worker interests and shaping their careers. This shortcoming is particularly acute given the importance policymakers place on understanding the overall effect of unions for the economy.

This paper provides a comprehensive assessment of the margins along which unions impact workers' labor market careers. First, we examine the channels through which unions affect worker careers: monetary compensation, job security, work environment, career advancement, and welfare usage. Second, we study whether unions influence workers differently across their careers. Finally, we provide insights on the aggregate reduced-form impact of all these career effects on the longer-run labor market outcomes of individuals. For identification, we exploit government-induced changes in union due subsidies in Norway, which led to significant changes in the net price of union membership for some workers but not for others (Barth et al., 2020b). These changes impact workers of all ages and therefore provide an ideal setting for examining whether the career effects of unions differ across the life cycle of workers.

The core contribution of this paper is to move beyond the existing union literature and to demonstrate that the effect of union membership differs greatly depending on the age and career stage at which workers enroll. In addition, we show that focusing on a restricted set of outcomes, such as the contemporaneous union wage premium, generates a fractionalized understanding of the multidimensional career effects that union membership has on workers. Specifically, unions not only affect workers' monetary compensation but also their advancement opportunities, job security, work environment, and welfare utilization. As a consequence, the longer-run union wage premium likely is different from the short-run union premium.

To perform our analysis, we use linked employer-employee data from Norway, including information on union membership, union dues, and each worker's occupation. A unique personal identifier enables us to combine these data with information from various population-wide administrative registers, such as the central population register, the education register, the tax and income register, the social benefit registers, and the residency and workplace location registers. Consequently, we can construct an extensive panel covering the universe of Norwegian workers and much of their demographic, education, labor, welfare, and employer

information.

In addition to the rich register data, we conduct an extensive survey of more than 5,000 workers in Norway. The survey asks about workers' ranking of core career amenities, their perceptions of unions' ability to influence these amenities, and whether they believe individual union membership matters beyond the presence of a union at the workplace. Finally, the survey examines the price sensitivity of union membership through hypothetical scenario analyses, asking if workers would reconsider joining (leaving) the union if the union due decreased (increased) by a randomized amount.[1]

We first provide descriptive evidence on the dynamics of labor union membership in Norway, including the distribution of union member age, the persistence of union membership over time, trends across industries, and the union earnings premium. This helps us better understand who enrolls in and utilizes labor unions. Next, we present our survey results to document how workers value different types of work amenities, both overall and across the lifecycle. We also use these results to document workers' perceptions of the ability of unions to influence specific work amenities and the extent to which workers consider their own union membership important—above and beyond union presence at the firm—for enjoying union-provided benefits. Finally, we use the survey results to provide external validation of our first-stage effect for the price sensitivity of union membership.

After the descriptive results and survey evidence, we identify the causal effect of union membership on individuals' careers. The main challenge in the identification of causal union membership effects is that union membership is not randomly given to individuals, but represents an active choice made by individual workers. The empirical solution to this selection issue is to identify some variation in the treatment of interest (union membership) that is unrelated to other aspects of the individual that also impacts the outcomes of interest (e.g., wages). In this paper, we propose to overcome the selection issue by exploiting exogenous price reductions in the cost for workers to join labor unions. Assuming that union membership is a normal good, a drop in the price of union membership should generate an increase in the quantity demanded. Thus, individuals who were not union members will become more likely to join a union following these price changes as the monetary cost of enrolling has declined.

The price changes in union membership fees that we exploit come from a series of national government subsidy reforms that provide direct tax credits to individuals who choose to join labor unions. These tax deductions led to significant changes in the net price of union

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[1]We use the price sensitivity questions as a means to externally verify that changes in membership price are likely to generate shifts in membership probability – something that we also examine formally via the linked employer-employee data.

membership among workers whose union due subsidies were previously bounded by a tax deduction cap at their firm (Barth et al., 2020b). This generates variation in the incentive to join a union depending on the firm at which the worker is employed and, therefore, different union enrollment probabilities across individuals. Using an instrumented dose-response difference-in-differences design in which we compare individuals at high and low subsidy firms over time as a continuous function of the subsidy bite, we can recover the causal effect of union membership.

The thought experiment underlying our estimation approach is to consider two workers who are not currently union members, who are of the same age, who work in the same industry and occupation, who live in the same municipality, but who work at different firms (firm A and firm B) in the year prior to the policy change. At firm A, the union due subsidy is bounded by the existing deduction cap, while at firm B the union due subsidy is not bounded by the existing deduction cap. Following the change in the maximum tax deduction for union dues, the worker employed at firm A, therefore, experiences a substantial increase in the subsidy compared to the worker at firm B. As a consequence, the worker at firm A will become disproportionately more likely to join a union than the worker at firm B due to the change in the national union due subsidy policy. We use this differential policy-induced shift in union membership costs to identify the effect of union membership.

We present four sets of results. First, consistent with prior literature, we document a substantial wage premium associated with union membership. Specifically, for the average worker we find a union membership wage premium of approximately 0.08 log points, which is slightly smaller than the typical 0.1-0.2 log point effect that has been found in previous studies (e.g., Farber et al. (2021); Sojourner et al. (2015); Card et al. (2004)).[2] However, in contrast to prior literature, we show that the union wage premium varies greatly across a worker's career. While individuals enjoy large union wage premiums at the beginning of their working lives, this premium monotonically declines until age 45 at which point it ceases to be economically meaningful or statistically significant. Overall, union membership flattens the age-wage profile relative to non-union workers. We find that part of the differential wage effect across the life cycle is driven by the union's impact on individuals' work hours, an effect that also is slightly larger for young workers. The differential effects on hours and wages across the life cycle highlight the role of unions in shaping individual career advancements over the course of their working lives. It also showcases the role of unions in shaping overall wage inequality among workers across the age distribution.

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[2]While the 0.1-0.2 log point effect corresponds to the typical finding in the literature, there are also studies finding effects close to zero (e.g., DiNardo and Lee (2004)) and effects that are considerably larger than 0.2 (e.g., Fortin et al. (2023) find effects of around 0.35 log points).

Second, we uncover substantial heterogeneity in how union membership influences other key dimensions of a worker's career across the life cycle: job protection, advancement opportunities, and work environment. For job protection, we show that unions provide considerable security to older workers while there are smaller gains for workers at the beginning of their careers.[3] With respect to career advancement, which we measure through switches to better-paying within-firm occupations, we again find that unions provide considerable benefits to more senior workers while there are limited benefits accruing to young workers. At the same time, we find that unions reduce the probability of workers switching to other firms that are paying higher average wages. This lock-in effect makes the longer-run impact of unions on worker careers ambiguous since it may cause workers to miss out on beneficial outside opportunities. In terms of work environment, as measured by sick leave take-up, we identify a strong negative union membership effect among young workers. This implies that unions may offer protection to young workers from the hazardous and less-promotable tasks typically assigned to new labor market entrants. For older workers over age 55, the effect on sick leave take-up is positive, a plausible interpretation of which is that older workers feel more secure in their jobs to take (longer) sick leave at the end of their career without worrying about a potential layoff. However, it is important to note that this represents our interpretation of the work environment effect, and that we cannot offer conclusive evidence regarding the mechanisms responsible for the work environment effect we have identified. Taken together, the effect patterns uncovered in this paper suggest that unions play an important role at the hiring stage through monetary compensation and work environment and at the separating stage through promotion facilitation and job protection. We rationalize these effects through the lens of a simplified employee career lifecycle framework.

Third, by examining the effect of union membership on individuals' use of the national welfare system, we reveal that workers are considerably less dependent on short-term transfers from the government when unionized. This effect has a U-shape over worker age, with mid-career workers reducing their dependence on government transfers the most. Workers near retirement (age 60-64) see no net change in their use of safety net transfers. This result highlights another important dimension of the union debate that has previously been overlooked in the literature: not only may unions affect worker welfare through wages and work conditions, but they may also affect government welfare expenditures and workers' reliance on—and use of—the social insurance system. This has important implications for public finance.

Our final set of results revolves around the longer-term career implications of union membership, measured as the average wage premium and welfare usage over the first five

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[3]This result is consistent with the last-in-first-out principle of union employment protection.

years following the policy change. These results should be interpreted as the sum total of all the differential impacts discussed above (including those we cannot observe), and help us better understand the time pattern and permanency of the effects. We find that the longer-term average earnings effects of union membership are positive for all workers across the age distribution. This differs from the contemporaneous earnings effects in which senior workers had no statistically or economically meaningful wage premium. This result is consistent with the fact that senior workers benefit more from job protection and promotion facilitation relative to young workers. These are job characteristics that usually are associated with stable and permanent wage gains in the long run, and have been shown to be particularly important for longer-term wage growth in prior literature (e.g., Adda and Dustmann (2023); Cunha and Heckman (2007)). The finding, therefore, highlights the importance of accounting for the dynamics of union membership and its interaction with all aspects of a worker's career when evaluating its overall impact on individuals. Similar to the contemporaneous wage premium effects, however, young workers still enjoy the largest premiums even in the longer-run.

Regarding the longer-run effect on government transfers, we see a decline in the use of the social security system across all ages. This implies not only an increase in overall wages for workers who unionize but also a substantial reduction in welfare payments from the government due to union presence. Based on a simple back-of-the-envelop calculation, we estimate that the increase in union membership due to the national subsidy policy generated an increase in overall tax revenue of 1.37 to 2.39 billion Norwegian kroner (NOK) and a reduction of 1.79 billion NOK in safety net payments. At the same time, we calculate that the overall cost of the program amounts to 1.98 to 3.45 billion NOK, meaning that program benefits likely exceed program costs from a fiscal perspective.

The main contribution of our paper is to combine exogenous variation in union membership with rich register data to identify the career effect of union membership across the life cycle of workers on key career dimensions: monetary compensation, job protection, career advancement, work environment, and welfare usage. The paper breaks new ground in our understanding of unions and their impact on workers and helps advance three large strands of research within economics.

First, there is an impressive literature that causally identifies the union wage effect through quasi-experimental research designs, using anything from regression discontinuity designs and propensity score matching techniques (e.g., DiNardo and Lee (2004); Lee and Mas (2012); Frandsen (2021); Sojourner et al. (2015); Card and De La Rica (2006); Bryson (2002)) to instrumental variable methods based on Right-to-Work laws in the United States and changes in national union due subsidies in Norway (e.g., Fortin et al. (2023); Barth et al.

(2020b); Dodini et al. (2022)).

These studies provide important insights into the union wage premium, but they do not explore how the wage premium may vary for union members depending on where in their careers they are at the time of enrollment. In addition, they do not explore the channels through which these union wage effects may operate. Our contribution relative to this literature is to show that unions can have substantially different effects depending on the age of enrollment, both with respect to the magnitude of the wage premium as well as which career dimensions they influence. We see this paper as opening up a new avenue of research on the heterogeneity of union effects across the life cycle, and through which channels these effects may occur.

Second, there is an emerging literature exploring non-wage effects of unions on individual workers, including stable work hours (e.g., Finnigan and Hale (2018)), pensions (e.g., Frandsen and Webb (forthcoming)), health insurance (e.g., Hagedorn et al. (2016)), and maternity leave (e.g., Park et al. (2019)). These studies highlight that union membership may impact individual workers on multiple dimensions, all of which may feed into the reduced-form union wage effect that has been documented in prior work. We develop this literature by examining the impact of union membership on a large number of career outcomes for the same sample of workers using a unified empirical framework, including work environment, job protection, promotion potential, and welfare usage. In addition, we note that several of these non-wage benefits may matter differentially to workers depending on where in their careers they are, which we verify through the use of our survey results. For example, protection from job termination may matter more among individuals close to retirement and salary negotiations may be more important at the start of a work contract. By tracing the effect of union membership on a rich set of career outcomes across the life cycle of workers, we are able to provide a more nuanced understanding of labor unions and their impact on workers.

Third, there is a small literature exploring how labor market shocks and reforms differentially impact individuals across the life cycle, highlighting that a focus on mean impacts misses a great deal (e.g., Salvanes et al. (2022); Rinz (2022)). We contribute to this literature by demonstrating that the effects of worker interactions with established social institutions fundamentally differ across the life cycle.

In terms of policy implications, our results highlight that the effect of union membership differs greatly depending on the age at which workers enroll and that focusing on a restricted set of outcomes generates an incomplete accounting of the multidimensional career effect that union membership has on workers. This is of particular significance in light of policymakers' objectives of understanding the overall effect of unions on workers and the economy, especially given the recent surges in labor activity in the US (NLRB, 2022). While our focus in this

paper is on unions, these results also allude to a more general policy implication: that age-neutral labor market policies, institutions, and regulations, may affect individuals differently across their careers. Importantly for our context, marginal union membership appears to save the government a significant amount in welfare system payouts, particularly for mid-career workers and when considering the longer run. This implies that unions, as market actors, may reduce the need for more intensive transfers by increasing career stability and predictability. This matters to social planners when trying to design optimal labor market interventions.

2 Background

2.1 Unions in Norway

Labor unions in Norway date back to 1848 and the formation of the Drammen Labor Union for landless agricultural workers and crofters (Galenson, 1949). However, it was not until the late 19th century, during a period of rapid industrialization, that local unions gained prominence and the modern trade unions as we understand them today were established.[4] Today, unions have become an integral part of the employer-employee dynamics in the country and are considered one of the most powerful institutions that workers can use to advance their careers. Similar to other countries, the stated goals of Norwegian labor unions are to strengthen members' rights and work conditions, and they play an important role in contract negotiations.

The rights and regulations of employers, employees, and unions, are governed by the national *Working Environment Act* (WEA). This law was enacted in the early 1980s and codified previous agreements between the central union and the central employers' organization. According to the WEA, every worker has the legal right to unionize. However, this has to be on a voluntary basis; closed-shop union agreements are not allowed. On behalf of their members, unions can negotiate not only wages but also help settle legal disputes, push for better work conditions, provide counsel in the event of strategic career decisions, protect against unfair work conditions and dismissals, aid in the event of occupational injuries and poor health standards, provide individualized information about welfare programs, and provide non-work related non-pecuniary benefits (such as, for example, discounted insurance plans or better interest rates on mortgages).

Unions are organized by professional area or sector, and each local union is associated

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[4]An important milestone for unions took place in 1899 when the *Norwegian Federation of Labor* (LO) was established as a central union association through which local unions could be organized and coordinated. The next important step in the history of unions in Norway was a national agreement in 1935 between LO and the Employers' association in which the National Federation of Labor was recognized as a negotiating partner, and strict rules for employer-employee bargaining were established.

with a national federation of trade unions within that professional area or sector. Each federation is then linked to one of four national confederations of trade unions (of which LO is the largest). This structure is not unique to Norway and has much in common with the structure of unions in the US, for example, where the American Federal of Labor and Congress of Industrial Organizations (AFL-CIO) coordinates and supports union efforts across more than 50 individual unions.

The wage bargaining process in Norway can most easily be described as a two-step process. First, industry-wide collective bargaining agreements are established to set wage floors and guaranteed wage increases. Then, local negotiations take place in which unions and employers discuss not only firm-specific wage increases for union members but also individual-specific wage increases. Individual union membership is most likely to play a role at this stage. While the national and sectoral wage agreements have played a key role in setting worker wages in the past, local negotiations between local unions and firms now account for more than 70 percent of total negotiated wage increases (Bhuller et al. (2022)). Thus, even though the Norwegian labor market is characterized by a high coverage of collective bargaining agreements, the ability of firms and local unions to adjust individual wages is very high.[5]

Approximately half of Norway's workforce are members of trade unions. The unionization rate in Norway is not particularly high relative to other OECD countries and is lower than the unionization rate in other Nordic countries (such as Sweden and Denmark). In the private sector, union membership has been around 40 percent for the past several decades. In the public sector, union membership is approximately 79 percent. The union membership rate differs across sectors and industries, with almost 60 percent in the manufacturing sector and slightly less than 30 percent in the private services sector. More women than men are members of labor unions (57 percent versus 44 percent), partially reflecting women being more likely to sort into the public sector. There is also considerable heterogeneity in union membership rates as a function of worker age, with older workers being much more likely to be members of a union than young workers. We provide detailed descriptive evidence on this in the next section.

2.2 Union Tax Deductions

Similar to other countries, trade union membership in Norway is not free, and prospective members must make a monthly payment to the union to benefit from its services. These payments are used by the union to finance a wide variety of programs and activities, including (but not limited to) the salaries and benefits of the union leadership, the legal representation

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[5]For a more detailed discussion on the institutional details surrounding the wage bargaining process, see Dodini et al. (2021).

offered by the union, lobbying activities, the strike fund, and potential campaign programs.

Baseline union dues are commonly set during the union's annual national meeting. Some unions collect a percentage of each worker's pay, others allow the percentage to vary on a sliding scale, and others may set dues to a specific level. On average, dues typically range from 1 to 3.5 percent of a worker's pre-tax income. Most union payments are facilitated through a "dues checkoff" mechanism in which the employer agrees to deduct the union due from the worker's paycheck directly (provided the worker has decided to become a member) and transfer that amount to the union. These transfers are explicitly shown on the wage statement that the worker receives each month.

To encourage organized labor, the Norwegian government provides a tax deduction for union dues. This tax deduction acts as a subsidy for union membership and is automatically entered on an individual's tax return, making the price subsidy very salient to the worker. Beginning in the early 2000s, the Norwegian government increased the maximum allowable tax deduction for union dues multiple times, effectively quadrupling the maximum from 2001 through 2010. At the same time, average membership fees rose much more slowly, such that the subsidy value of total membership fee rose from 7 percent in 2001 to more than 20 percent in 2012 (Barth et al., 2020b).

For our empirical analysis, we exploit the changes in the union dues subsidy as an instrument for individual union membership. These changes reduce the cost of joining a union, but only for workers whose subsidies were previously bounded by the tax deduction cap. As such, workers employed at firms that had high union dues prior to the reform are more intensely treated by the changes in the deduction schedule relative to workers employed at firms with lower baseline dues. This generates variation in the predicted union membership probability of workers and allows us to recover the causal effect of union membership through an instrumented difference-in-differences design.

2.3 Conceptual Framework

This paper examines the interaction of union membership and individual career progression, and the extent to which the timing of membership matters for the impact unions have on workers. In the main analysis, we focus on five core career dimensions: monetary compensation (wages and hours), job protection, promotion facilitation (vertical moves within firms as well as across firms), work environment (proxied by sick leave), and overall use of the social security system. We highlight that this does not represent an exhaustive list of the career outcomes that may be influenced by union membership. However, they represent key aspects of work life that are commonly perceived to be influenced by unions.

We begin by noting that an individual worker would only join a union if the perceived benefits of union membership exceed the perceived costs. The benefits include improvements

on any of the dimensions highlighted above while the costs primarily include the union dues that have to be paid monthly. Crucially, the value of the benefits and the union's ability to help workers secure those benefits may vary across workers depending on their career stage.

For example, consider a simplified version of the employee life cycle model, in which a career can be divided into three distinct stages: recruitment, development, and separation. Workers may value promotion possibilities and the quality of the work environment more during the initial stages of employment, as promotions will ensure large and permanent career gains, while the quality of the work environment will protect them from the non-promotable and risky tasks that tend to load on new hires. At the separation stage, workers may value job protection more as skill depreciation and obsolescence pose an increasing threat of job termination. To examine the pattern of job preferences and perceived union benefits over the career life cycle—and to what extent this aligns with the suggested framework above—we have incorporated detailed questions on variation in job amenity preferences over the lifecycle in our survey. These results are presented in Section 3.3.

Even though workers may have differential amenity preferences across the life cycle, it is not certain that unions are able to act on those preferences. For example, unions may find it easier to secure monetary compensation to new workers—rather than promotion possibilities—as they simply can leverage a worker's outside option in the hiring market to push for higher entry wages. At the same time, it may be easier to provide promotion possibilities and work protection to older workers following the first-in-last-out principle and tenure reward system that unions usually pursue. Thus, workers' valuation of the work amenities and the union's ability to help workers secure those benefits may not always align and may vary across workers. The theoretical predictions in this context would be highly uncertain and ambiguous, as it would entail solving an optimization problem that relates heterogeneous worker amenity preferences over the life cycle to unions' bargaining ability with employers over these amenities across heterogeneous workers. This necessitates an empirical examination of this question, in which we can recover the reduced-form effect of union membership on multiple work dimensions across employee ages.

One way to quantify the sum total of the differential union career effects across the life cycle (including those we cannot observe) is to examine the longer-run career implications of union membership. Such effects will be driven by the direct impact of union membership on bargained wages and also by all the indirect effects operating through the other work dimensions discussed above. Identifying such aggregate reduced-form effects represents an important contribution to the existing literature on labor unions, and provides the first summary measure of how beneficial union membership is for individuals at different stages of their careers. We measure this longer-run effect in two ways, focusing on the average wage

premium and safety net payments over the first five years after unionization took place.

A priori, the extent to which the potential contemporaneous effects discussed above help or hinder the longer-run job prospects of individual workers is unclear. On the one hand, several of the potential effects are likely to improve workers' careers and boost their labor market payoffs. On the other hand, there are also indirect effects that could worsen the future career prospects of individual workers. For example, there may be a lock-in effect in a poorly matched occupation or a reduction in cross-establishment mobility.

Although we cannot decompose the longer-run effects on earnings and transfers into that driven by the specific career effects discussed above, we can provide a sum total effect of all these changes. We achieve this by exploiting the rich Norwegian administrative data and examining the average impact on wages and welfare payments over the first five years following unionization. We believe this provides sufficient time for each of the career effects to jointly influence these two outcomes.

3 Data and Descriptive Evidence

3.1 Data

We leverage population-wide administrative data on the universe of workers in Norway. A unique personal identifier allows us to follow individuals over time and across registers, such that we can build an extensive longitudinal panel covering all workers in the country and much of their demographic, education, and labor market information.

Our main data source is the linked employer-employee register of Norway. These data provide us with information on each worker's employer, work characteristics, work location, establishment, occupation, and contractual hours.[6]

We link the employer-employee data to the income tax register, which provides detailed information on earnings. Earnings are defined as pre-tax income (income from labor and self-employment) excluding any government transfers (such as parental leave, sick leave, and unemployment benefits). We also construct a measure of hourly wages, obtained by dividing labor earnings by hours worked. To calculate work hours, we note that we do not have information on the exact number of work hours before 2015. Rather, we have categories of work hours. To convert these to actual hours, we use the midpoint of each category except for the highest category (30+ hours) which we assign 37 hours. This assignment is based on the observed distributions of hours from the data on detailed work hours we have access to beginning in 2015.

In addition to earnings, wages, and hours, we use the employer-employee data to construct measures of promotions. First, we generate an indicator variable that takes the value of one

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[6]To ease computational constraints, we estimate our models on a 50% random subsample of workers.

if a worker shifts to an occupation located higher up on the wage distribution. Since we include firm fixed effects in the main specification, the outcome examines the impact on within-firm vertical occupation moves. Second, we construct a variable that takes the value of one if the worker shifts firm to one whose average earnings are higher than their current firm. While the first promotion variable captures vertical moves within the firm, the second captures vertical moves across firms.

Acknowledging that unions may impact workers' involvement with the country's social insurance system (through, for example, its effect on work environment and job protection), we also incorporate information from the tax and transfer registers in Norway. This allows us to collect information on the individual use of the most common short-term welfare programs in the country. These include sick leave, unemployment benefits, cash payments, and housing and education support. The combination of these programs is a summary measure of the total amount of short-term transfers an individual received from the government in any given year.

Finally, crucial to our analysis is the ability to observe individual-level union information over time. We obtain this data from a register-based union membership data set constructed by the national tax authority, which provides detailed information on how much they have paid in union dues each year.

The government changes to the maximum allowable tax deduction for union dues that we exploit occurred primarily between 2003 and 2010. We have complete data on individuals and their occupations going back to 2001, and we, therefore, restrict the main analysis to the years 2001 through 2015 (the last year for which we have data). However, some of our data is available as early as 1993, and therefore we also provide some descriptive evidence starting from the early 1990s.

In addition to the rich individual-level administrative data, we conduct a survey on a sample of workers in Norway. The survey provider screens workers on union membership, age, and work history, ensuring that we obtain a sample of approximately 300 union members and 300 nonunion members (all of whom are currently working) in each age bracket for which we conduct the analysis. In total, our survey sample consists of 5,200 workers. The full survey is provided in the Appendix.

In the survey, we collect information on the workers' ranking of core career amenities (monetary compensation, job protection, promotion facilitation, and work environment), their perception of unions' ability to influence these amenities, and whether workers believe that individual union membership matters above and beyond union presence at the firm (i.e., whether there are perceived private-good components to the union-provided benefits). Finally, we collect information on workers' price sensitivity to union membership by asking

whether workers would reconsider joining (leaving) the union if the net-of-subsidy union due decreased (increased) by a specific amount. We randomize this amount in 500 NOK intervals across workers, from 500 to 2500 NOK (approximately 50-100 USD). We use these responses to validate our first-stage effect for the price sensitivity of union membership and demonstrate that workers consider union-provided benefits across all these amenities to contain substantial private-good components. We also use these results to document age variation in career amenities and perception of unions' ability to influence these amenities across the life cycle.

3.2 Descriptive Evidence

To fully understand the career effects of union membership across the life cycle of workers, it is instructive to first understand who enrolls in and utilizes labor unions. This section provides a series of descriptive plots that help better communicate the key features of the unionized workforce in Norway related to our analysis.

We begin by describing the overall union membership rate and the age distribution of union members. As noted in Section 2, workers may value different aspects of the work environment differently across their careers, and a union's ability to aid a worker may differ depending on where in the career that worker is. Thus, the costs and benefits of union membership may differ across the life cycle, something that may generate variation in the share of workers who join unions across different ages.

The results from this exercise are shown in Figure 1. Four observations are worth noting. First, few workers join unions at the beginning of their careers, with only 15 percent of 20-year-old workers being members. Second, the probability of joining a union rapidly increases over the first ten years of a worker's career, with approximately 50 percent of the workforce being members of unions at age 30. Third, the union membership probability of a worker continues to increase beyond age 30, though the age gradient for union membership is considerably flatter after this age. Fourth, union membership peaks at age 60, with almost 70 percent of the workforce being members at that age. Interestingly, the peak unionization rate at age 60 has remained constant over the past 30 years. However, young workers have become less likely to unionize over time. For example, the unionization rates at ages 30 and 40 were approximately 10 percentage points lower in 2015 relative to 1995.

We next explore whether union membership represents a permanent state for a worker or if there is substantial fluctuation in union membership over workers' life cycles. This is a question that has been difficult to explore in the past, owing to the limited availability of large-scale, detailed longitudinal data on individual union status. However, from a policy perspective —and the perspective of our empirical method —it is important to understand the extent to which individuals appear marginal to union membership. To this end, Panel A

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of Figure 2 shows the cumulative share of workers that have spent X share of their working years as a member of a union using the sample from 1993 to 2017, and Panel B of Figure 2 shows the same conditional on ever having been a union member.

The results in Panel A demonstrate that about 40 percent of the workforce never joined a union during this sample period and that around 20 percent of the workforce spent 100 percent of their working lives during our sample period as members of labor unions. The remaining 40 percent of the workforce is distributed relatively equally across the intensive margin of the share distribution, revealing a substantial degree of inflows and outflows from unions over the course of workers' careers. The results in Panel B of Figure 2 reinforce this observation, demonstrating that only one-third of those who ever enroll in a union remain in a union for the duration of their working lives.

To further explore the union-switching behavior of individuals, Panels C and D of Figure 2 provide information on the share of workers switching into and out of unions each year by age. The figure illustrates that there is considerable movement into and out of unions across the entire age distribution. However, the flows are substantially larger among young and early career workers, and there are clear monotonic declines in these flows across the life cycle of the individuals.

Next, we examine whether certain industries and sectors are more represented among union members than others, and if there are significant trends in union density across industries over time. Consistent with existing literature, Figure 3 shows that the public sector represents the most unionized sector in the economy, with more than 70 percent of workers in the public sector belonging to a union. In the private sector, there is a considerable spread in union representation across industries. While manufacturing, mining, transportation, and finance, have union densities of more than 50 percent, wholesale trade, agriculture, and hotels have membership rates below 30 percent. While all industries have experienced a slight decline in union density over the past 30 years, the relative ranking of these industries as measured by union membership has remained relatively stable. Thus, the composition of industries covered by unions does not appear to have shifted dramatically since the early 1990s. Notably, the downward trend in union density after 1993 begins to level off for many industries (and in some cases even reverses) between 2003 and 2007, which coincided with the expansion of tax subsidies for union dues in Norway.

After having examined unionization trends across industries over time, we descriptively investigate the union wage premium across the life cycle of workers and whether we can eliminate any such premium by controlling for worker characteristics. The results from this exercise are shown in Panels A and B of Figure 4. Several observations are worth noting. First, young workers that are unionized have far higher earnings than those not in a union,

with a difference of nearly 40 percent. Second, while the age-wage profile for non-unionized workers is relatively steep during the first 20 years of their careers, the age-wage profile for unionized workers is much flatter. As a consequence, by the time individuals reach age 40, there is no longer a wage gap between unionized and non-unionized workers. Third, while the age-wage gradient slopes downwards for non-unionized workers after having peaked at age 45, the age-wage gradient remains flat for unionized workers.

Acknowledging that many of the correlations in Panel A are likely driven by endogenous worker selection into unions, we re-estimate the age-wage relationship but control for gender, immigration status, industry, education level, and year. The result, shown in Panel B, demonstrates that accounting for observable characteristics has a limited impact on the overall pattern shown in Panel A. Specifically, we still observe a meaningful union earnings premium among young workers (about 25 percent) and that this premium declines over the working lives of individuals. By the time individuals reach age 40, there is no longer an earnings premium for unionized workers. We emphasize that the results in Panels A and B of Figure 4 provide correlations between union status and earnings and that they cannot be interpreted as causal relationships. Nevertheless, we consider this a useful starting point for identifying the lifecycle effect of union membership on wages and a helpful benchmark with which we can compare the causal estimates that we present in the next section.

In addition to examining the descriptive wage pattern of union and non-union members over the life cycle, we also provide information on individuals' use of the public transfer system as a function of union status over the course of workers' careers. This includes government transfers related to unemployment, sick leave, housing, scholarships, and direct cash assistance. Panels C and D of Figure 4 suggest that union members receive less (nearly 4,000 NOK) in direct transfers from the government at the start of their careers relative to nonunion members. This gap narrows during their 30s and early 40s and closes entirely by age 50. These gaps persist after controlling for gender, immigration status, industry, education level, and year. These patterns suggest that the average worker, when unionized, is less dependent on short-term government transfers. This effect could potentially be attributed to factors such as job protection, work environment, and promotion possibilities. However, we reiterate that these figures are descriptive, and we cannot make causal statements based on these results alone. Nevertheless, we believe that this alludes to another potentially important dimension of the union debate that has previously been overlooked in the literature: not only may unions affect worker welfare through wages and work conditions, but they may also shift the magnitude of government spending that is directed towards welfare programs.

Next, we discuss our survey evidence after which we describe our empirical method and explain how we isolate the causal effects of union membership across the lifecycle.

3.3   Survey Evidence

Before estimating the causal effect of union membership on workers, it is helpful to examine workers' own perceptions of the influence unions have on their careers and how price-sensitive they are to union membership. To this end, this subsection provides a series of descriptive plots based on results from the survey we introduced in Section 2. These results help us to better understand key features of the workforce's perception of unions and what they do as it relates to our analysis. Overall, the survey provides four key results that help interpret the results from our analysis.

First, Figure 5 shows that workers are very price-sensitive to union membership. Specifically, nearly 60 percent of the surveyed union members under age 40 would consider leaving the union if the monthly net-of-tax union due increased by 500 to 1000 NOK (approximately 50-100 USD). A similar proportion of nonunion members would consider joining a union if the net-of-tax union due decreased by 500 to 1000 NOK. Even if we interpret these survey results as an upper bound of the true price sensitivity to union membership, this implies that the price elasticity of union membership is substantial.[7]

Unsurprisingly, Figure 5 also reveals that there is a steep age gradient associated with the price sensitivity of union membership. Specifically, young workers are more price-sensitive to union membership than older workers. For example, while 55 percent of unionized workers aged 25 through 29 would consider leaving the union if the price increased by 500 to 1000 NOK, only 20 percent of unionized workers aged 60 through 64 years old would do the same. This result also aligns well with the nonunion members' response to why they do not join unions: more than half of nonunion members state that the cost of union membership is too high (Figure 9). In addition to providing the first evidence on the price elasticity of union membership, this result suggests that using changes in union dues as an instrument for a worker's probability to unionize likely is associated with a strong first stage. Empirically, the age gradient of price sensitivity to union membership holds when we consider the costs of joining a union relative to the earnings of workers over the age distribution as well as the base rates of unionization over age, which we explore in Section 5.2.

Second, we elicited workers' relative amenity priorities by asking them to assign a budget of 100 "points" to different work amenities. Figure 6 shows that the average worker considers monetary compensation to be the most important career component of their jobs, followed by job security, work environment, and lastly promotion possibilities. There is also interesting

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[7]A change of 500 NOK per month coincides with a 6,000 NOK change per year. A rate of 50-60% reconsidering their union membership choice at a change of 6,000 NOK implies approximately 8-10% reconsidering at a 1,000 NOK change. In the first stage estimates for our instrument, a 1,000 NOK decrease in net union dues predicts an increase in union membership of approximately 11 percentage points, implying a notably similar sensitivity to these survey responses.

age heterogeneity in amenity rankings. Specifically, young workers assign a higher value to promotion possibilities than older workers, older workers assign a higher value to job security, and mid-career workers assign a higher value to the quality of the work environment. The differences across the lifecycle are economically meaningful in promotion possibilities and job security, while they are very small with respect to work environment. Perhaps somewhat surprisingly, older workers assign considerably more value to salaries than young workers. The ranking of amenities for union members and nonunion members is largely the same. These survey results strongly align with the conceptual framework discussion provided in Section 2.

Third, we asked workers to rate a union's ability to positively affect aspect X of their work life on a scale of 0-100. Figure 7 illustrates that the workers' perception of unions' ability to influence the four core career dimensions largely aligns with their individual ranking of these amenities. Specifically, the average worker believes that unions are best able to influence monetary compensation, closely followed by job security. Workers believe unions are slightly less able to influence the quality of the work environment, and even less able to affect the workers' promotion possibilities (though still meaningfully able to do so). Interestingly, there is very little evidence of differences in workers' perceptions of the unions' ability to influence these four work dimensions across age groups.

Finally, we elicited perceptions of the public-good components of union membership by asking what portion of the union-induced benefits related to work amenity X they believe can be obtained by non-members. Figure 8 demonstrates that union members perceive union-provided career benefits to contain a substantial private-good component across each of the four amenity bundles we examine: monetary compensation, job protection, promotion facilitation, and work environment. Interestingly, members perceive wages and salary to contain a higher public good component than the other three dimensions, but still attribute as much as 40 percent of any union-induced salary benefits to a worker's individual membership status. This perception does not vary significantly across the ages of workers with the exception of workers aged 25-29. In addition to providing the first evidence on how union members perceive individual membership relative to union presence, this result strongly supports our finding of an effect of union membership on worker careers even when we interact the membership status with lagged union density at the firm. We discuss that result in detail in Section 5.

Next, we turn to describing our empirical method and explaining how we isolate the causal effects of union membership across the lifecycle.

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4   Empirical Method

4.1   Identification Challenge

Union membership is not randomly given to workers but represents an active choice made by individuals. This choice may be correlated with other observed and unobserved characteristics of individuals that also affect their labor market outcomes. In other words, the selection mechanism into unions may not be independent from the outcomes of interest (e.g., wages). In such cases, it is not possible to say whether correlations between union membership and individual outcomes are causal effects or the result of union selection. This represents the most severe problem in the identification of causal union membership effects.

Historically, researchers have assumed that workers of lower unobserved quality select into unions to reap the benefits of collective bargaining. If true, then any raw union wage premium may be downward biased because those who choose union membership differ from those who do not choose union membership in ways that are negatively related to earnings.[8] However, this assumption may not be true during all periods of a worker's career (one of our objects of interest) and may depend on other individual, occupational, or firm factors. Therefore, it is incredibly difficult to sign this bias and to understand its true magnitude, making it hard to interpret and design policy based on descriptive union wage premium data.

4.2   Overcoming Selection Bias

The empirical solution to the selection issue is to identify some variation in the treatment of interest (union membership) that is unrelated to other aspects of the individual that also impact the outcomes of interest (e.g., wages). However, finding a source of variation that exogenously shifts workers into unions has proven difficult in the literature, and other than close union elections (which identify very specific parameters through regression discontinuity designs) there are few examples of exogenous variation in union membership status that can be used to identify the causal impact of membership.

In this paper, we propose to overcome the selection issue by exploiting exogenous price changes in the cost for workers to join labor unions. Assuming that union membership is a normal good, a drop in the price of union membership should generate an increase in the quantity demanded for that good. Thus, individuals who were not union members will become more likely to join a union following these price changes because the true cost of enrolling has declined. As long as the price change is unrelated to the unobserved individual characteristics of workers that also impact their earnings, and conditional on certain assumptions discussed in the next subsections, this gives us a way to overcome the selection issue

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[8]Very recent work suggests more direct evidence of this: workers with a lower individual fixed effect tend to sort into the unionized portion of their firm (Lemieux, 2023).

and directly identify the effect of union membership on worker career outcomes.

4.3 Details on Price Changes

The price changes in union membership fees that we exploit come from a series of national government subsidy reforms that provide direct tax credits to individuals who choose to join labor unions.

These changes in tax subsidies for union members in Norway led to significant changes in the net price of union membership for some workers but not for others (Barth et al., 2020b; Dodini et al., 2022). Specifically, the maximum tax deduction for union dues nearly quadrupled between 2003 and 2010. These changes significantly reduced the monetary cost of joining a union, but only for workers whose union-due subsidies were previously bounded by the deduction cap. In other words, individuals at firms subject to higher union dues in 2001 could expect a substantial increase in these subsidies compared to individuals at firms with lower union dues in 2001.

Figure A1 provides a simple example of the subsidy expansion over time. Panel A shows the maximum deduction for union dues over time, while Panel B compares pre-subsidy (base) dues (the x-axis) and net-of-subsidy dues (the y-axis). In 2002, the maximum deduction for union dues was capped at 900 NOK but increased in steps to 3,850 by 2014. For a worker whose base dues were 3,000 NOK, facing the top marginal tax rate of 42%, net dues would have changed from 2,600 NOK in 2002 to 1,750 in 2008 and would have remained stable afterward. At base dues of 4,000 NOK, net dues would move from 3,600 in 2002 to 2,675 in 2008 and to 2,380 in 2014. At this tax rate, this reduction of approximately a third of the cost of joining a union (about 1,200 NOK) represents a substantial decline.

The policy-induced variation in the incentive to join a labor union across workers depends on which firm they were employed at prior to the subsidy increases. This provides us with quasi-experimental, exogenous variation in the cost of union membership to these workers. Provided that individual workers respond to changes in union membership price, an assumption supported by the survey evidence presented above, we can use this as an instrument for union membership to identify the causal effect of union membership on worker careers.

The thought experiment underlying our estimation approach is to consider two workers who are not currently union members, who are of the same age, who work in the same industry and occupation, who live in the same municipality, but who work at different firms (firm A and firm B) in 2001. At firm A, the union due subsidies are bounded by the existing deduction cap (i.e. union dues are above the cap), while at firm B the union due subsidies are not bounded by the existing deduction cap (i.e. union dues are below the cap). Following the change in the maximum tax deduction for union dues after the 2003 change, the worker employed at firm A therefore experiences a substantial increase in the subsidy

compared to the worker at firm B. As a consequence, provided that union membership is a normal good, the worker at firm A will become disproportionately more likely to join a union than the worker at firm B due to the change in the national union due subsidy policy. We use this differential policy-induced shift in unionization cost to identify the effect of union membership.

One concern with utilizing the differential subsidy changes across firms driven by differences in baseline union dues may be that baseline union dues are not randomly assigned, and that there may be systematic differences across such firms at baseline. However, even if this were the case, it would not constitute a problem for our instrumented dose-response difference-in-differences design because we are examining the evolution of membership and the subsidy over time at ex-ante high- vs low subsidy firms. Identification comes through changes in the subsidy. Therefore, these firms need not be identical in their base year—they only need to trend similarly to each other absent the policy shift (Hudson et al., 2017). We explore this assumption through an examination of pre-treatment trends in the next subsection.

4.4 Technical Implementation

To implement our empirical design, we start by estimating the probability of union membership as a function of net union dues. For workers who are in a union, we abstract away from individual dues and instead impute the cost by calculating the mean union due paid by workers in their occupation-industry cell each year. This helps us rule out concerns about heterogeneous selection into differently-priced unions and individual determinants of union dues. For workers who are not union members, and for whom we therefore cannot observe any individual dues, we use the same imputation approach. We then roll these individual values up to the firm level and construct average firm-level effective union dues by taking the average of the imputed union dues across all the firm's workers in each year. Therefore, each firm's effective union dues are determined by their occupation-industry employment mix.

There are two types of endogenous responses to the change in maximum deductions to consider. First, it is possible that firms and unions endogenously respond to the subsidy legislation by altering the occupations they decide to employ or by changing the union dues directly. Second, union membership as induced by this policy change may induce differential sorting across firms.

To overcome both of these issues, we fix each worker's imputed "baseline" union due, $D^0_{f_b}$, as the effective due at the first firm in which they appear in the data at or after age 25.[9] For most people, this base year is 2001. We then adjust for inflation forward

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[9]We impose the age 25 condition because we want to characterize the career outcomes of workers after they are likely to have completed education and entered more permanent aspects of their work life. When

to nominal Norwegian Krone. This, therefore, represents what a worker would perceive as their "typical" pre-subsidy union due at entry into the data, adjusted for overall price levels. This is similar to what the original paper that used this instrument has done (Barth et al., 2020b), but we fix base dues to people rather than firms because our objective is to model the union membership choice and its consequences for individuals rather than generate more aggregated measures of union density at the firm. By fixing each worker's imputed "baseline" union due, we eliminate the possibility of these potential endogenous responses from breaking the exogeneity of our instrument.

Once we have obtained our imputed union due measure, we calculate the value of the base subsidy for all workers. This value is equal to the lesser of the legislated maximum deduction ($MaxDeduction_t$) and the worker's imputed base union due ($\overline{D^0_{f_b}}$), which we multiply by the country's base tax rate (28 percent from 2001 to 2013 and 27 percent from 2014 onward), or:

$$Subsidy_{f_bt} = T_t * (min\{\overline{D^0_{f_b}}, MaxDeduction_t\}) \ , \tag{1}$$

where T_t is the base tax rate in year t.

We apply the base tax rate to isolate changes in the guaranteed *statutory* subsidy from changes in the *realized* subsidy that may depend on marginal tax rates. Identifying variation in the subsidy across firms, therefore, comes from differences in the occupation-industry mix of the firm in each worker's base year combined with changes in the legislated maximum deduction over time.

We use the subsidy measure to calculate the net-of-subsidy union due by subtracting the value of the subsidy from the gross imputed baseline union due ($ND_{f_bt} = \overline{D^0_{f_b}} - Subsidy_{f_bt}$). This changes within a worker's base firm over time only through the subsidy channel and is represented by the vertical downward shift between the lines at a given x-axis value in Figure A1. This is our instrument. Using this instrument, we estimate the following equations (base year fixed effects suppressed for simplicity):

$$y_{iocaf,t+1} = \alpha + \beta\hat{U}_{it} + \gamma_t + \zeta_{a_b} + \eta_a + \iota_{oc_b} + \kappa_{oc} + \lambda_{f_b} + \phi_f + \delta_{i\bar{U}} + \epsilon_{itocaf}, \tag{2}$$

$$U_{itocaf} = \tau + \pi ND_{if_b} + \gamma_t + \zeta_{a_b} + \eta_a + \iota_{oc_b} + \kappa_{oc} + \lambda_{f_b} + \phi_f + \delta_{i\bar{U}} + \mu_{itocaf}, \tag{3}$$

where Equation 3 represents the first-stage and Equation 2 represents the second-stage.

In the first-stage equation, U_{itocaf} represents the union membership status of individual i in age group a at time t in occupation-industry cell oc and firm f. The instrument, ND_{if_b}, is

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we relax this assumption, our estimates are less precise but consistent.

assigned to individuals based on the first firm the person appears in, and we always include fixed effects for both current as well as baseline characteristics. Specifically, t captures year fixed effects, a (a_b) is age (at baseline) fixed effects, oc (oc_b) represents occupation-industry (at baseline) fixed effects, f (f_b) are firm (at baseline) fixed effects, and $\delta_{i\bar{U}}$ is an indicator for whether the person was an "always-taker" of union membership at any price. We account for always-taker status for two reasons. First, always-takers are employed in the same firms, occupations-industry cells, age groups, and years as marginal union members, so always-takers will contribute to variation in the fixed effects for all of these cells. Thus, their inclusion in the sample may be important. Second, while always-takers contribute to variation in the fixed effects, they contribute nothing to identification in the first stage because there is no variation in union membership among this group. Not accounting for always-takers means that the estimated first-stage coefficient of the instrument will be smaller because there is no variation in the union membership choice of always-takers, leading to proportionately larger second-stage estimates.[10]

In the second stage equation, $y_{iocaf,t+1}$ represents an outcome of interest for individual i at time $t+1$ and β measures the effect of union membership on that outcome using the net union due ND_{if_b} as an instrument. We use the outcome the next year to capture the effect of the union with a full year of membership, as individuals could choose to join a union partway through the year, leaving limited time to measure effects in the same year. All fixed effects included in Equation 2 are also included in Equation 3. We cluster the standard errors on the individual level, as this is the level of treatment assignment. However, our results are robust to clustering at the base firm level as well (see Table A3).[11] When implementing our estimation procedure with interactions for age group a to uncover heterogeneous treatment effects over age, we interact dummy variables for age group a with the instrument ND_{if_b} to serve as instruments for the interaction between union membership U_{itocaf} and a, resulting in eight combined instruments for eight endogenous interactions estimated separately (Wooldridge, 2010).

4.5 Identifying Variation and Threats to Identification

Identifying variation in the instrument comes from differences in the occupation-industry mix of each worker's base firm combined with changes in the tax policy over time. The base

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[10]Thus, not accounting for always-takers generates slightly larger labor market effects.

[11]Because treatment is at the individual level (Abadie et al., 2017) but the instrument is determined by a combination of individual and base firms, the level of clustering may be an arguable point. Clustering at the individual level is designed to account for heteroskedasticity and serial correlation within individuals over time. Nevertheless, Table A3 presents our basic wage regressions clustered at the base firm level. While the standard errors are marginally larger than clustering at the individual level, we still have precision to detect statistical differences from zero as well as across age groups. The level of clustering, therefore, does not strongly influence our conclusions.

industry and occupation composition of the firm determines which firms are bounded by the maximum deduction in the minimization function and by how much as the maximum deduction changes. Workers whose base firms have high imputed union dues are more intensely treated with the subsidy when the deduction caps are relaxed over time, so there is a larger relative decrease in their net union due, coinciding with the downward vertical shift in net dues in Figure A1. Changes in the net price of union membership are therefore exogenously loading on some workers and not others for reasons unrelated to labor market or firm conditions over time, and the variation is induced only through the tax policy. In addition, our instrument also rules out any endogenous firm transitions that may be correlated with unionization or the net price of union membership at their current firm because the instrument is constructed for the worker's base firm, and we nonparametrically control for both the base firm and current firm.

The key assumptions underlying our empirical method are that (1) workers respond to changes in union membership price (the relevance criterion), (2) the only channel through which the union due subsidies affect individual career outcomes is through their effect on membership probability (the exclusion restriction), and (3) there are no defiers (the monotonicity assumption).

In terms of (1), we directly verify the relevance assumption in the next section through our empirical first-stage estimation and demonstrate that workers are highly responsive to changes in union membership price. In terms of (2), although the exclusion restriction cannot be tested directly, we can think of no other pathway through which the union due subsidy may impact worker's outcomes given our setup, and we further note that previous papers using similar instruments have found no reason to suspect that the assumption is being violated (e.g., Barth et al. (2020b); Dodini et al. (2022)). In terms of (3), a violation of monotonicity in our setting could only occur if union membership is a Giffen good at certain prices, which is highly unlikely.

Overall, our estimates of the causal effects of union membership using this instrument will represent the local average treatment effect (LATE) among the "compliers," i.e. those that joined a union as a result of the subsidy-induced reduction in the costs of joining a union based on where people were working at the beginning of their time in the sample.

One concern with our research design may be that the instrument reflects workers at firms with high union dues and that high union dues are not randomly assigned: they may reflect factors relating to the underlying demand for union representation, the expected future benefits of union representation, and current and future working conditions at the firm.

However, a relationship between these factors and baseline outcomes does not threaten

the validity of our estimation approach. The reason is that our empirical design is akin to an instrumented difference-in-differences dosage design, in which we compare individuals at high and low subsidy firms over time as a continuous function of the subsidy bite. For our approach to be valid, firms need not be identical in the base year; rather, they must simply trend similarly to each other absent the policy shift, such that workers in low-exposure firms can be used as credible counterfactuals to workers at high-exposure firms in the absence of the subsidy changes because they have the same potential outcomes (Hudson et al., 2017).

To visualize the relationship between the instrument and union membership, Figure A2 shows how union membership (the first stage) and earnings (the second stage) evolved over time for workers whose base firm had larger reductions in their net union dues relative to smaller reductions in net dues, which we proxy using the top and bottom quartiles. The figure demonstrates parallel trends as a function of exposure to the instrument and that firms experiencing a higher exposure are not on a different trajectory either for the treatment (union membership) or the outcome of interest (earnings). Thus, prior to the subsidy expansion, low-exposure firms were trending similarly to high-exposure firms, suggesting that low-exposure firms can be used as post-expansion counterfactuals for high-exposure firms had those firms not been highly exposed to the union subsidy policies. These parallel trends lend support for a causal interpretation of the results we present in Section 5. When examining this figure, it is important to note that not all variables in our set of combined registers are available prior to 2001, so we cannot estimate a full event study model. Thus, these are raw trends that account only for base firm fixed effects. The fact that there is evidence of parallel trends despite not being able to fully saturate our model is encouraging and supports our identification strategy.

Examining Panels A and B of Figure A2, we also see preliminary raw evidence of a first-stage effect of the subsidy increases on union density, as well as a second stage effect on worker wages. Specifically, we see that the union density gap between high- and low-subsidy firms reaches approximately 3.5-4 percentage points by the end of 2010, while the earnings gap between the two is approximately 20,000 NOK, or about 4% of the 2010 mean earnings. This suggests earnings gains of approximately one percent for every one percentage point increase in union share. This comports closely to other estimates in the literature (Barth et al., 2020b; Dodini et al., 2022).

One of the reasons why we observe such clear parallel trends, even without including our rich set of fixed effects from our main model, is that these firms are very similar to each other at baseline (both with and without the fixed effects used in our main model; see Tables A1 and A2).[12]

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[12]Specifically, while there are a few statistically significant differences, these are very small, and with the

4.6 Alternative Identification

In an alternative estimation approach, we estimate an individual fixed effects model in which we examine the relationship between earnings and union membership with fixed effects for age, year, occupation by industry cells, and firms. We then use age-by-union membership status interactions to trace out union membership effects within each person over time. Identifying variation in the model comes from individual workers switching into and out of union status over their working lives. While the determinants of when or if a worker switches union status are likely endogenously related to other determinants of wages and work, this approach provides a separate check on the raw earnings outcome in Figure 4. We include this in Figure A4.

Looking at the estimates provided in Figure A4, we see a large union wage premium among young workers. This positive wage effect monotonically declines until age 35-40, at which point it flattens out completely. However, the effect is still positive for older workers. Overall, the individual fixed effects model thus aligns well with out raw descriptive plot and suggests significant earnings premiums associated with union membership that decline over age.

Before presenting the results from our empirical analysis, we note that certain union-provided benefits oftentimes are perceived as collective goods while others are perceived as private goods (e.g., Boeri et al. (2001)). Failing to take this important nuance into account could lead to an incomplete understanding of the role of unions in workers' careers. The presence of such spillovers also could generate a bias in our baseline estimates. At the same time, we note that the survey results strongly suggest that workers themselves perceive each of the amenity bundles (monetary compensation, job security, work environment, and promotion possibilities) to contain significant private-good components.

To examine the relative importance of the private and public components across our outcomes and assess the extent of spillovers to non-union members, we examine the effects of union membership interacted with union density. To this end, we estimate our baseline two-stage least squares model but include an interaction between individual union membership and union density from year $t-1$ at the worker's current firm on a 0-1 scale.

If the interaction between union density and union membership is negative, the marginal union member benefits less from membership when union density is high. This would imply

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inclusion of our controls they are not economically meaningful. For example, being a female is associated with an 11 NOK ($1.10) larger increase in the subsidy over the entire subsidy period, and being a high school graduate is associated with an 11 NOK smaller increase in the subsidy. However, we again emphasize that firms need not be identical in the base year; rather, they must simply trend similarly to each other absent the policy shift, such that workers in low-exposure firms can be used as credible counterfactuals to workers at high-exposure firms in the absence of the subsidy changes because they have the same potential outcomes (Hudson et al., 2017).

either that there is no crowding out of non-union labor by union labor and/or that union density is providing a public good to non-members. Then, if there is no predicted individual union effect at 100% union density, this would imply that the entirety of the effect of unions is a public good.

5   Results

In this section, we present our core findings of the effect of union membership on the career outcomes of individuals across the life cycle. Unless otherwise specified, all results are based on the estimation of Equations 2 and 3 as described above. We begin by showing the average effects of union membership on workers across the career dimensions discussed in Section 3: monetary compensation, job protection, promotion facilitation, work environment, and welfare usage. We then proceed to estimate age-specific union membership effects, dividing workers into 5-year age bins and interacting each with our instrument in the first stage and with predicted union membership in the second. Comparing the average effects with the age-specific effects allows us to build a more complete understanding of the role unions play in the career development of individuals. Finally, we estimate gender-specific longer-run union membership effects over age. Examining such heterogeneity is interesting as men and women differ in their career development and occupational choices (e.g., (Cortes and Pan, 2018; Napari, 2009; Blau and Kahn, 2017; Johnsen et al., 2022; Salvanes et al., 2022)), and may therefore experience differential gains from union membership during different career segments.

5.1   Average Effects Across Workers

Table 1 provides results from estimating the mean impact of union membership on a series of core career outcomes related to monetary compensation (Columns 1 and 2 of Panel A), job protection (Column 3 of Panel A), promotion facilitation (Columns 4 and 5 of Panel A), work environment (Column 1 of Panel B), and short-term transfer usage (Columns 2 through 3 of Panel B), using Equations 2 and 3 from Section 3.

We first note that our first stage estimates show that a 1,000 NOK reduction in the net cost of union membership increases the likelihood that a marginal union member joins by approximately 11 percentage points. This is remarkably similar to our survey evidence, which suggests approximately an 8-11 percentage point effect per 1,000 NOK. We discuss this in more detail when we turn to heterogeneous effects across the lifecycle, but highlight here that the first stage effect is not only economically meaningful, but also statistically very strong.

For monetary compensation, columns (1) and (2) of Panel A demonstrate that union membership generates a substantial wage premium as well as a considerable increase in

the number of hours worked. The union wage premium identified through our estimation approach, 0.08 log points, is slightly smaller but comparable to that which has been estimated in the prior literature based on a range of different empirical methods. For example, using novel data from the late 1930s to the early 2010s, Farber et al. (2021) provides descriptive evidence of a consistent union income premium of approximately 0.1-0.2 log points over time. The economically meaningful and statistically significant effect on hours worked that we uncover highlights that the effect of union membership on the overall take-home wage is even larger than that shown in column (1). The reason is that union membership does not only boost a worker's wage conditional on the number of hours worked, but also increases the total number of hours worked.[13]

With respect to job protection, the results in column (3) show that union membership generates a reduction in the intensity with which workers lose their jobs and receive unemployment benefits. Specifically, union members induced to join by our instrument receive an average of 14,600 NOK less in unemployment benefits a year. This suggests that union membership bestows a certain degree of job security to members, protecting them against layoffs at the workplace and/or reducing the length of an unemployment spell.

For promotion possibilities, columns (4) and (5) show results consistent with the idea that union membership facilitates vertical moves within the worker's existing firm, and discourages moves to other firms. In terms of magnitudes, the table shows that union membership increases the probability of a vertical move within the firm by approximately 8 percentage points, roughly double the non-union baseline value, and reduces the probability of a vertical move across firms with approximately 13 percentage points, which eliminates a substantial share of the baseline firm upgrading probability. In the next subsection, we will show that these average effects mask considerable heterogeneity across the life cycle of workers.

With respect to work environment, which we proxy by workers' use of Norway's generous sick leave system, we see a small and not statistically significant average reduction in sick benefit take-up as a consequence of joining a labor union. As we will show in the next section, the effects on sick leave take-up mask significant countervailing heterogeneity over age.

To summarize the impact of union membership on the average worker's use of the short-term transfer system in Norway, column (2) of Panel B shows the overall impact of union membership on the amount of money received from the central government through unemployment, sick leave, housing assistance, scholarships, and direct cash assistance. Column (3) shows the effect on the probability of receiving any of these social support transfers. In

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[13]The wage effects in column (1) may be imprecise as a result of the measurement of hours, which is rounded in the data; see the discussion in the data section for additional information.

response to union membership, these transfers are reduced by approximately 13,000 NOK (statistically significantly different from zero at the 95 percent level) and the probability of using the safety net system drops by 8 percentage points (not statistically significantly different from zero). The result in column (2) can be viewed as a combined intensive and extensive effect of union membership on safety net usage, while the result in column (3) can be interpreted as a pure extensive margin effect. The effects in Panel B demonstrate that labor unions may reduce individual workers' dependence on the welfare system through improved job protection and a higher-quality work environment.

Taken together, this section has examined the impact of union membership on the average worker in the labor market. While the results on wages are consistent with prior literature, the causal effects identified with respect to job security, promotion potential, work environment, and welfare usage, allow us to break new ground in understanding the overall role unions play in determining the career outcomes of individual workers. Relating these results to the survey responses discussed above, it is interesting to note that the magnitude and statistical significance of these effects appear to largely correspond to workers' ranking of career amenities shown in Figure 6. Specifically, the figure shows that the average worker considers monetary compensation to be the most important career component of their jobs, followed by job security, work environment, and lastly promotion possibilities. This pattern aligns strongly with the results presented in Table 1.

As demonstrated by the survey results in Figure 6, worker preferences for various career outcomes vary across their careers. In addition, a union's ability to bargain for a particular worker may also depend on which stage of the career a worker is in. As such, it is possible that there is substantial variation in the effect of union membership on the career outcomes of workers across their life cycles and that the mean impacts shown in this section mask significant heterogeneity. In the next section, we examine union membership effects on workers as a function of their age at the time of union enrollment.

5.2   Heterogeneous Effects Across the Life Cycle

To provide empirical support for the patterns of differential price sensitivity from our survey in Figure 5, we present the different first-stage responses in Table 2. After accounting for differences in baseline earnings and differences in base unionization rates over age, large differences emerge. Relative to their baseline propensities to unionize, workers ages 25-29 are more than 1.5 times more sensitive to a 1% change in the total earnings cost of joining a union than their counterparts over age 45. This follows closely the relative differences in Figure 5, where approximately 30% of non-union workers ages 45-49 would reconsider their choice compared to nearly 60% of those ages 25-29.

To examine variation in the causal effect of union membership across the life cycle, we

estimate versions of Equations 2 and 3 in which we interact dummy variables for age group a with the instrument ND_{if_b} to serve as instruments for the interaction between union membership U_{itocaf} and a, resulting in eight combined instruments for eight endogenous interactions estimated separately (Wooldridge, 2010). To facilitate the interpretation of the results, we then plot the relevant coefficients in figures together with 95 percent confidence intervals, providing us with a detailed overview of how the union membership effects change as a function of the worker's age.

Concerning monetary compensation, Panel A of Figure 10 provides estimates of the effect of union membership on wages as well as hours worked across the life cycle of workers. For wages, the results show that the union wage premium varies greatly across a worker's career. Specifically, while individuals enjoy large union wage premiums at the beginning of their working lives, this premium monotonically declines in size until age 45 at which point it ceases to be economically meaningful or statistically significant. This effect closely mirrors the descriptive patterns in Section 3.2. This finding helps advance prior literature on the union wage premium, which has documented substantial wage effect of union membership (e.g., (Card et al., 2004; Farber et al., 2021)) for the average worker without considering heterogeneous effects across their careers. Panel A also shows that the union membership effect on hours worked is slightly larger for the very young workers aged 25 through 29, suggesting that part of any differential earnings effect across the life cycle is driven by the union's impact on individuals' work hours. However, there is much less variation in the hours effect across the life cycle, and it is oftentimes not significantly different across the various age bins.

In terms of the magnitude of our wage premium estimates, our results for the very young workers are about 0.1 log points larger than the average effects among all workers identified in Farber et al. (2021) and Fortin et al. (2023), the effects for mid-career workers are more aligned with the average effects identified in Sojourner et al. (2015) and Card et al. (2004), and the lack of effects for old workers are similar to the average effects found in DiNardo and Lee (2004). Our results suggest that one reason for the mixed results found in the earlier literature, both with respect to magnitude and statistical significance, may be differences in the composition of workers that are being examined and not only due to differences in estimation methods.

With respect to job security and employment protection, Panel B provides estimates of the effect of union membership on the amount of unemployment benefits received. Two observations are worth noting. First, the union effect on job protection rapidly increases over the first ten years of a worker's career, with 40 through 44-year-olds experiencing a much larger reduction in their use of the unemployment insurance system than workers at

the beginning of their careers. Second, the union effect on work protection flattens beyond age 44. These effects are in line with the notion that job protection may matter more for individuals during the separation phase of their careers, as skill depreciation and obsolescence pose an increasing threat of job termination. The figure suggests substantial savings to the government through reduced unemployment benefits on the order of 16,000 NOK (USD 1,600) per union member per year for those over 44.

In terms of promotion probabilities, Panel C plots the effect of union membership on advancing to a higher-paying occupation and on transferring to a higher-paying firm. The figure illustrates that unions have little impact on workers' promotion possibilities at the beginning of their careers. However, as workers age, union membership is providing workers with an increasing probability of moving up the career ladder. Specifically, the union effect on job promotions rapidly increases over the first 20 years of a worker's career, with 45 through 49-year-olds being almost 15 percentage points more likely to experience an occupational advancement due to enrollment in labor unions. After age 49, the age gradient of the union effect on occupational advancements is flat. Combined with the negative effects on firm mobility we document below, much of the increase in occupational advancement is coming from within the same firm.

With respect to across-firm mobility, Panel C also paints a more nuanced picture. Specifically, union membership has a negative effect on the likelihood that a worker upgrades to a higher-paying firm the next year. This negative effect is much larger for young workers but is both economically meaningful and statistically significant among old workers as well. This result suggests that unions may generate a lock-in effect for workers, encouraging them to remain at the existing workplace to reap the benefits of the union membership rather than transferring to other firms.

Finally, in terms of work environment—an outcome which we proxy with the intensity of utilizing the sick leave system of Norway—Panel D shows the effect of union membership on the amount of sick leave taken as a function of the worker's age. The results reveal substantial effect heterogeneity over a worker's career, with relatively sizable negative effects on sick leave usage among young workers, and positive effects on sick leave usage among old workers. While speculative, we postulate that the negative usage effects among young workers are coming from an improved work environment and increased protection against non-promotable and risky tasks that disproportionately tend to fall on new workers, while the positive usage effects among old workers are coming from improved job protection such that fear of negative worker replacement effects in the event of sick leave are removed. Unfortunately, we are unable to test this empirically in the data, and we note this as a valuable area of future research. The average effect on transfer amounts from the national

government for sick leave suggests modest savings of approximately 2,500 NOK per marginal union member per year.

Given the identified union membership effects on wage, hours, promotion, job protection, and sick leave, how does union membership affect a worker's overall interaction with the public safety net system? Figure 11 shows that the marginal union membership leads to approximately 15,000 NOK less in transfers for those age 25-29 coming through the unemployment, sick leave, cash assistance, housing assistance, and scholarship programs. This amount grows to a peak of approximately 20,000 (approximately 2,000 USD) NOK by age 40 and then falls gradually. For those age 55-64, there is no reduction in these transfers to union members. This is primarily due to the increased sick leave usage we identify among these workers, which appears to offset much of the effect on unemployment benefits. Overall, the transfer results suggest the largest positive fiscal externalities for workers during their peak earnings periods in the labor force.

An interesting question to ask is how well these effects correspond to the belief workers have regarding the unions' ability to influence key work amenities across the life cycle. As shown in Figure 7, the average worker believes that unions are best able to influence monetary compensation, closely followed by job security. They believe unions are slightly less able to influence the quality of the work environment, and even less capable of affecting the workers' promotion possibilities, though they perceive unions are still meaningfully able to do so. Interestingly, there is very little evidence of differences in workers' perceptions of the unions' ability to influence these four work dimensions across age groups. This implies a substantial information imperfection regarding workers' understanding of the union's role in their careers. Alternatively, survey respondents may distinguish between short-run benefits from unions (the focus of our paper up until now) and the longer-run effects that unions may have on workers. In the next section, we will show evidence in favor of the second of these explanations.

When interpreting the results from this section, it is important to note that some of the goods and services that unions provide traditionally are believed to contain substantial collective goods components while others are considered to be pure private goods (e.g., (Boeri et al., 2001)). For example, while all individuals at the workplace may to some extent benefit from a union's collective bargaining over wages with the employer (the collective aspect of the union wage component), only union members would benefit from individual counseling and support for job security and promotions. Failing to take this important nuance into account could generate an attenuation bias of our baseline estimates.

To examine the relative importance of the private and public components across our outcomes and assess the extent of spillovers to non-union members, we examine the effects

of union membership interacted with union density. We estimate our baseline two-stage least squares model but include an interaction between individual union membership and union density from year $t-1$ at the worker's current firm on a 0-1 scale. The results are provided in Table A4 and show that as union density increases, the returns to individual union membership decrease but are still statistically and economically significant even at 100% predicted union density. At high levels of union density, those not in the union are likely to benefit from the public good aspect of union bargaining power and union membership may be less important on the margin. However, individual union membership still matters in these models, meaning that there is still a private-good component of membership even at high union density. It also is suggestive evidence that union density effects are not crowding out the wages and benefits of non-union workers at the same firm. This result is consistent with our findings from the survey and adds to a relatively sparse empirical literature on the public-private nature of union-provided goods. At the same time, we note that there are certain limitations associated with this analysis due to our IV estimation procedure, and see this as a promising topic for future research.[14]

We conclude that union membership in itself plays a crucial role in a worker's ability to reap the benefits of unions. This is an interesting result that contrasts with some of the previous literature (e.g., Barth et al. (2000)). However, prior work has not explored this particular question through the use of exogenous variation in individual membership, so comparisons across these studies require some caution.

In light of the above results, it is also important to note that the results from the survey in Figure 8 demonstrate that union members perceive union-provided career benefits to contain a substantial private-good component across each of the four amenity bundles we examine. Interestingly, members perceive wages to contain a smaller private good component than the other three dimensions, but still attribute approximately 40 percent of any union-induced wage benefit to a worker's individual membership status. While this aligns well with the wage bargaining process outlined in Section 2, the perceived importance of the private good component of wage bargaining in this paper is greater than traditionally believed. Combined with the above results, this helps us break new ground in understanding how union members perceive, and are influenced by, individual membership relative to union presence.

Taken together, the results presented in this section demonstrate that the value of a union membership varies substantially across a worker's career. It further demonstrates that unions do much more than influence wages and that they generate a net reduction in short-

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[14]We have also estimated our model controlling for the union density at the firm, an exercise akin to a conventional horse-race model. We present the result in Figure A3. The union membership effects generally become slightly larger relative to our baseline results, but the difference in point estimates is not statistically significant for wages, which is the margin that has been examined in the past.

term government welfare expenditures. More specifically, the results show that unions play an important role at the hiring stage via monetary compensation and work environment, and at the separating stage via promotions and job protection. The overall implication of this finding is that the role of unions varies greatly depending on where in the career workers are. This result is crucial for policymakers when considering the interaction of social institutions and market structures, and how such interactions influence both individual workers as well as society.

5.3 Longer-Term Career Impacts of Union Membership

So far, our results have shown that the career effects of union membership differ greatly depending on the age at which workers enroll. In addition, we have shown that focusing on a restricted set of outcomes, such as wages and employment, generates a fractionalized understanding of the multidimensional career effect that union membership has on workers. These two sets of results have important implications for how we should think about the overall longer-term effects of union membership on workers. While the relationship between union membership and contemporaneous career outcomes is of independent interest, these two sets of results also mean that the longer-term effects of union membership likely differ substantially from the short-run effects.

First, workers enjoy much larger contemporaneous union wage premiums at the beginning of their working lives, and after age 45 there appears to be no short-run wage benefit associated with union membership. To the extent that future wages depend on benchmarking against current wages, this finding implies that younger workers are likely to experience larger wage gains over time. Second, unions provide considerable job security and promotion opportunities to mid-career and senior workers while there is little gain for workers at the beginning of their careers outside a lock-in effect at the current employer. Given that promotions and job security are associated with increased work stability and higher pay, this finding suggests that mid-career and senior workers may benefit relatively more through longer-run wage gains. This hypothesis would also be consistent with Cunha and Heckman (2007) as well as Adda and Dustmann (2023), who find that job characteristics such as employment protection and experience are more important than short-run wage gains for determining longer-run labor market outcomes.[15] Third, unions provide considerable work environment benefits to both young and old workers, but in opposite directions. If work

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[15]It would also be consistent with the prior literature showing large and permanent wage penalties from involuntary displacements (e.g., Huttunen et al. (2011)), the literature showing that the loss of firm-specific wage premiums and human capital by switching firms and being laid off has a strong negative effect on wages (e.g., Fackler et al. (2021)), and the literature suggesting that sick leave take-up can have negative impacts on later earnings (e.g., Willén et al. (2022)). Together, these imply that union protection against these negative impacts should have significant effects on workers over time.

environment has a positive impact on productivity and ability, this may lead to differential long-run effects.

To explore how these differential contemporaneous effects impact the longer-run payoff of union membership, we estimate the career implications of union membership as the average effect of union membership on individual workers during the first five years after they were induced to join by our instrument. We focus on wages and social safety net transfers, two outcomes that help provide overall summaries of the effect of union membership on a worker's longer-term outcomes. These results should be interpreted as the sum total of all the differential impacts discussed above (including those we cannot observe).

The results from this exercise are provided in Figure 12. Panel A shows that the longer-term wage effects of union membership have a gradient over age, but it is not as steep as the short-run gains. This result aligns with the finding that senior workers benefit more from job protection and promotion possibilities relative to young workers. These types of amenities represent job characteristics that are usually associated with stable and permanent earnings gains in the long run but which may take longer than a single year to materialize. This is particularly interesting as it stands in contrast to the contemporaneous wage effects in which only the youngest workers benefit.

The average five-year wage effect for the youngest group—approximately 0.35 log points—is similar to the short-run earnings effects identified in the previous section. However, the accumulation of union wage premia over time for older workers is likely an implication of all the other career effects that union membership has on workers through job security, promotion potential, and work environment quality. This finding highlights the importance of accounting for the dynamics of union membership and its interaction with all aspects of a worker's career when evaluating its overall impact on individuals.

Another aspect alluded to in Figure 2 is that union membership is more persistent among older workers. The persistence of union membership may be another aspect of the accumulation of longer-run benefits for older workers despite lower short-run wage effects. It is also particularly interesting to note that the longer-run wage premium effect pattern shown in Figure 12 is closely aligned with the workers' own perception of union-induced wage benefits across the life cycle, shown in Figure 7. In other words, when asked if unions are able to affect salary, respondents may be thinking about the long-term effects of unions rather than the short-term effects.

In terms of the longer-run effect on safety net transfers, in Panel B, we see a decline in the longer-run use of the social security system across all ages, though the effects are smaller for workers close to retirement, consistent with their increased use of sick leave in the short run. This implies a substantial reduction in welfare payments from the government due to union

presence, primarily driven by the union's effect on job protection and work environment quality. In total, the marginal union member saves the government approximately 30,000 Norwegian crowns (approximately 3,000 US dollars) combined annually through this channel during the five years following union enrollment.

5.4 Effects by Gender

As discussed in Section 2, there is a growing literature documenting that men and women differ in occupational choice, career wage growth, promotions and career progressions, and responses to labor market shocks. It is therefore possible that the impact of union membership varies across genders. We estimate the effect of union membership separately for men and women across their life cycles with respect to their longer-run wage gains. The results from our gender analysis are provided in Figure 13.[16]

Figure shows that men and women display a very similar pattern in terms of union membership wage effects during the subsequent five years across ages. However, the figure also illustrates that women benefit more than men at all ages of enrollment, but especially during later ages. This implies that the marginal female union member is better off relative to the marginal male union member if enrollment takes place at a later age, and that union membership contributes to a narrowing of the gender wage gap, particularly among more senior members. This is an interesting and important result that helps us better understand how existing social structures interact with the labor market to affect wage parity in society. To the best of our knowledge, we are among the first to document the causal role of unions in narrowing the gender wage gap among members.[17]

6 Discussion

In this paper, we exploit exogenous variation in union membership to provide the first comprehensive empirical analysis of the career effects of unions across the life cycle of workers. Specifically, we examine through which channels unions influence worker outcomes, whether unions influence workers differently across their careers, and the overall effects of union membership over time.

From a theoretical perspective, it is hard to identify the effect of unions on worker careers as a function of worker age. Even though workers may have differential amenity preferences across the life cycle, it is not certain that unions are able to act on those preferences. Obtaining theoretical predictions would entail solving an optimization problem that relates

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[16]Like the interactions with age categories, we use interactions between the net union due and age-by-gender cells as instruments for age-by-gender interacted union membership status, meaning that this exercise is particularly computationally complex in using 16 instruments. We also include a gender dummy in order to control for baseline differences across men and women.

[17]These patterns follow the raw trends for women quite closely. See Figure A5.

heterogeneous worker amenity preferences over the life cycle to unions' bargaining ability with employers over these amenities across heterogeneous workers. Such models quickly become intractable, especially if there is incomplete information available to prospective union members regarding what unions can do. This necessitates an empirical examination of the question in which we trace the reduced-form effect of union membership on all work dimensions across heterogeneous employee ages. Our empirical exercise may guide the theoretical literature by highlighting a set of important parameters to use in future work and encourage future empirical work to better understand the disconnects between worker preferences and what unions are able to do across the career life cycle.

To perform our analysis, we leverage government-induced changes in the price of union membership, which affects the incentive of workers to organize. These changes affect workers of all ages and therefore provide an ideal setting for examining whether the career effects of unions differ across the life cycle of workers and the sum total of all these effects in the longer-run.

We present four sets of results. First, we show that the contemporaneous union wage premium varies greatly across a worker's career. While individuals enjoy large union wage premiums at the beginning of their working lives, this premium declines in size until age 45 at which point it ceases to be economically meaningful or statistically significant. We find that part of the differential wage effect across the life cycle is driven by the union's impact on individuals' work hours, an effect that also is slightly larger for young workers.

Second, we uncover substantial heterogeneity in how union membership influences other key dimensions of a worker's career across the life cycle: job protection, promotion facilitation, and work environment. Specifically, while unions play an important role at the hiring stage with respect to monetary compensation and work environment, they matter much more with respect to promotions and job protection for more senior workers.

Third, by examining the effect of union membership on individuals' overall use of the welfare system in the short-term, we reveal that young workers are considerably less dependent on transfers from the government when unionized. This effect declines over the worker's careers until just before retirement at which point the effect is small and no longer statistically significant.

Our final set of results revolves around the career implications of union membership during the subsequent five years, focusing on wages and government safety net payments. We find that the longer-term earnings effects of union membership accrue to older workers over time, which gradually flattens the age gradient of union wage effects. This result is consistent with the fact that more senior workers benefit disproportionately from job protection and promotion possibilities relative to young workers (who instead experience a

larger lock-in effect at their current employer). These are job characteristics that are usually associated with stable and permanent wage gains in the long run. This finding highlights the importance of accounting for the dynamics of union membership and its interaction with all aspects of a worker's career when evaluating its overall impact on individuals.

In terms of the long-run effect on safety net transfers, we see a decline in the longer-run use of the benefits system across all ages. This implies a substantial reduction in welfare payments from the government due to union presence, primarily driven by the union's effect on job protection and work environment quality. This result highlights another important dimension of the union debate that has previously been overlooked in the literature: not only may unions affect worker welfare through wages and work conditions, but they may also affect government welfare expenditures and workers' dependence on the social security system.

To the best of our knowledge, this is the first paper to trace the impact of union membership across the life cycle and examine how it affects workers' careers in terms of monetary compensation, job security, career advancement, work environment, and welfare usage. It is also one of the first papers in the literature to explore the longer-run career effects of union membership, examining the impact over the first five years after enrollment. While the relationship between union membership and contemporaneous career outcomes is of independent interest, it is also of great value to understand the aggregate effect on labor market outcomes in the longer run and to what extent the contemporaneous effects represent permanent or transitory labor market effects.

On an aggregate societal level, the union subsidy program is estimated to have generated an overall increase in union membership of approximately 5 percentage points (Barth et al., 2020a), or approximately 137,500 workers by the end of our sample. Using this number coupled with our baseline estimates in Table 1, we can perform back-of-the-envelope calculations of the overall impact of union membership on the Norwegian economy. In this exercise, we take conservative estimates of the short-run benefits on wages and safety net transfers and compare them to a range of what we believe are the largest possible program costs. Abstracting away from spillovers to non-union members at the firm as well as firm owners, we calculate that the government-induced union membership increase generated approximately 5 billion NOK in extra taxable income annually (mean earnings of 460,000 NOK * 8% * 137,500 marginal members). It also generated a reduction of 1.79 billion NOK in safety net payments (137,500*13,000). Assuming base tax rates of 27% or top marginal rates of 47.2% in 2014, this translates into revenue gains of between 1.37 billion and 2.39 billion NOK, for a gross fiscal gain via these channels of between 3.16 billion and 4.18 billion NOK.

With respect to costs, approximately 1,900,000 individual workers are members of trade

unions in Norway. Under the liberal assumption that all union members take the maximum deduction in 2014 (3,850), and assuming base and top marginal tax rates as above, the program costs, at most, 1.98 to 3.45 billion NOK annually (since the subsidy applies to all members, new and current). This means that the program benefits through these channels exceed the program's direct fiscal costs.

In terms of policy implications, our results highlight that the effect of union membership differs greatly depending on the age at which workers enroll and that focusing on average impacts masks important heterogeneity. We view this as an important finding for helping policymakers understand the overall effect of unions on the economy, a result that is particularly relevant now given the recent surges in labor activity in the US (NLRB 2022). While our focus in this paper is on unions, these results allude to a more general policy implication: that age-neutral labor market policies, institutions, and regulations, may affect individuals differently across their careers. Importantly for our context, marginal union membership appears to save the government a significant amount in welfare system payouts, particularly for mid-career workers and when considering the longer run. This suggests that unions, as market actors, may reduce the need for more intensive transfers by increasing career stability and predictability. This matters to social planners when trying to design optimal labor market interventions, highlighting the importance of taking into account age and career heterogeneity across the life cycle and illustrating how that may shape the overall effects of proposed interventions.

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Tables

Table 1: Average Effects of Union Membership

	Panel A				
	(1)	(2)	(3)	(4)	(5)
	Compensation		Job Protections	Advancement	
VARIABLES	Log(Hourly Wage)	Log Hours	Unemployment Benefits	Pr(Advancement)	Pr(Firm Upgrade)
Union Effect	0.0822*	0.0925**	-14,634***	0.0798***	-0.127***
	(0.0495)	(0.0362)	(1,884)	(0.0244)	(0.0256)
1st Stage (1,000 NOK)	-0.114***	-0.114***	-0.116***	-0.114***	-0.114***
	(0.0058)	(0.0058)	(0.0052)	(0.0051)	(0.0051)
Non-Union Mean (| > 0)	5.62	3.47	50,344	0.0671	0.1168
Observations	10,745,934	10,751,060	12,538,920	12,596,786	12,596,786
Kleibergen-Paap F stat	387.39	386.45	490.73	510.59	510.59

	Panel B		
	(1)	(2)	(3)
	Work Environ-ment	Transfer System	
VARIABLES	Sick Pay	Social Support Payments	Pr(Social Support)
Union Effect	-2,012	-13,282**	-0.0865
	(5,220)	(5,560)	(0.0543)
1st Stage (1,000 NOK)	-0.116***	-0.116***	-0.116***
	(0.0052)	(0.0052)	(0.0052)
Non-Union Mean (| > 0)	54,595	56,155	0.3202
Observations	12,555,423	12,240,286	12,555,423
Kleibergen-Paap F stat	513.64	490.73	490.01

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Measured Price Elasticities by Age

| Age Group	Percent Change|1% Change Income Cost, Base Rates
25-29	-0.0667
30-34	-0.0467
35-39	-0.0504
40-44	-0.0543
45-49	-0.0394
50-54	-0.0393
55-59	-0.0382
60-64	-0.0361

Source: Authors' calculations of Norwegian registry data for 2001-2015.

Notes: Estimates divide the relevant first stage coefficients for each age group in Equation 3 by age-group mean annual earnings and age-group mean unionization rates.

Figures

Figure 1: Union Membership Rates by Age
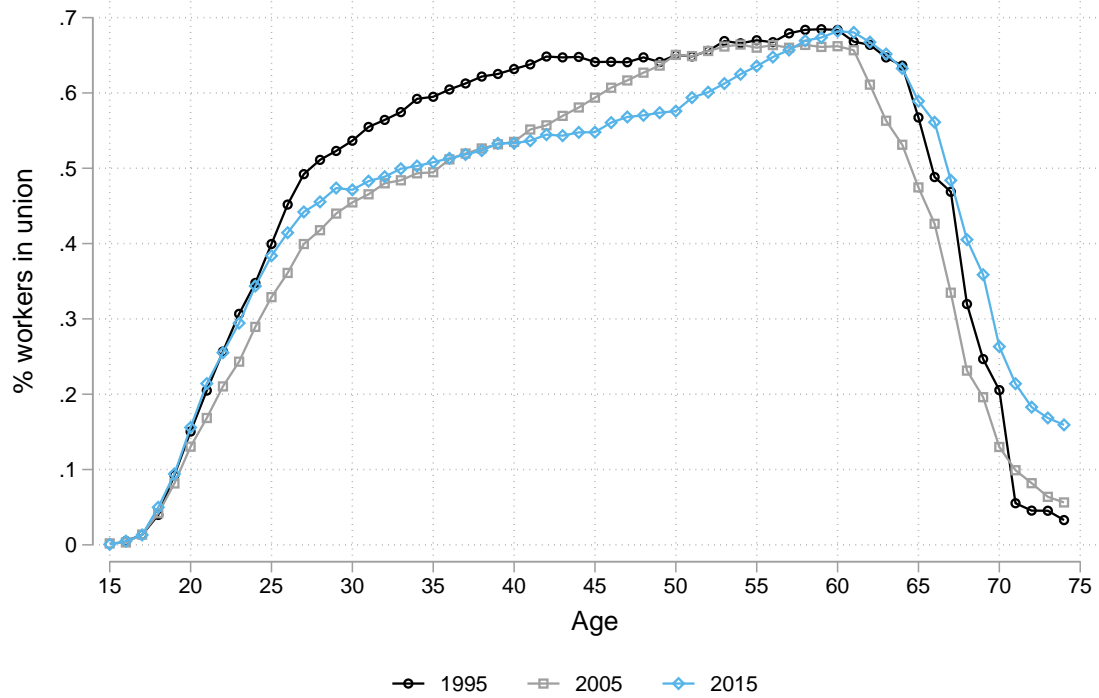
Source: Authors' calculations of Norwegian registry data.
Notes: Shares reflect raw shares of workers in unions by age as of the years 1995, 2005, and 2015. Union membership is defined by having taken a union deduction in the tax register for that year.

Figure 2: Share of Working Years in a Union and Union Switching Rates

Share of Years in Union

Panel A: All Workers
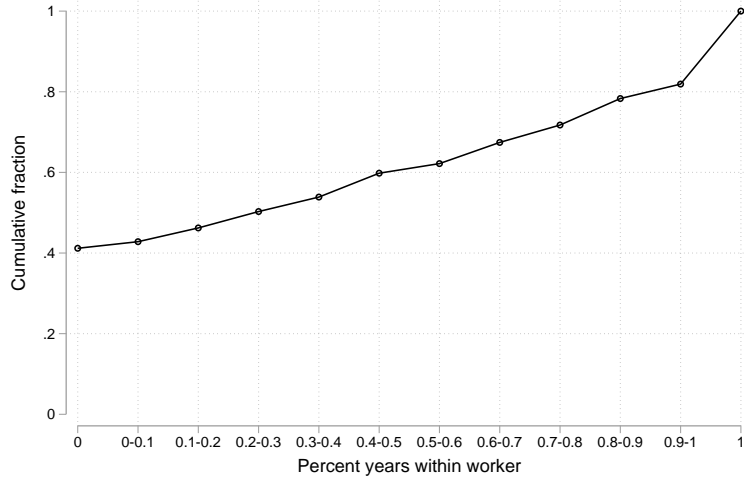
Panel B: Conditional on Ever Being in a Union
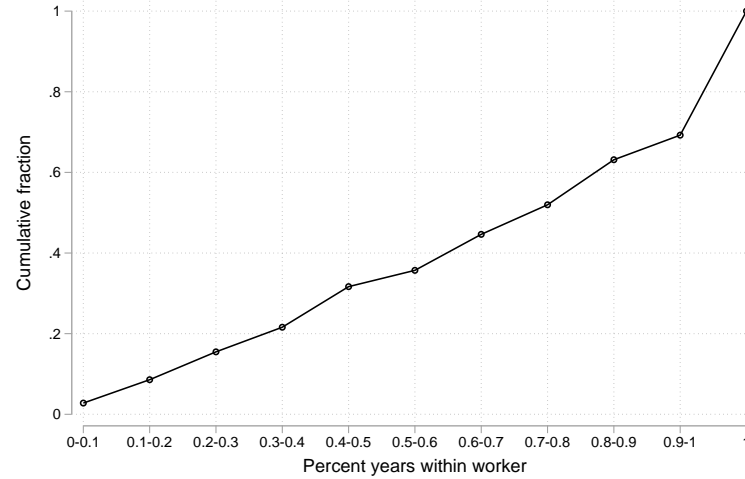
Share Switching Into (Out of) Union

Panel C: Switching into Union
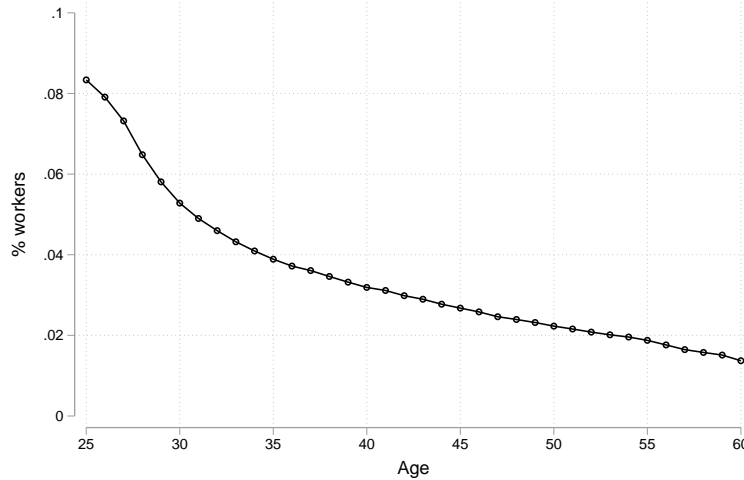
Panel D: Switching out of Union
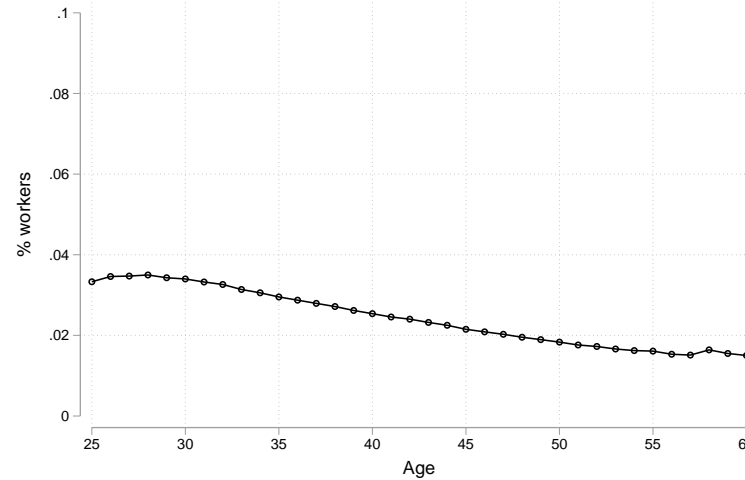
Source: Authors' calculations of Norwegian registry data from 1993 to 2017.
Notes: In Panel A, the Y axis represents the cumulative share of workers that spent X share of their working years as a member of a labor union during our sample period. In Panel B, the Y axis is the share of workers switching into (out of) a union by age.

Figure 3: Unionization by Major Industry by Year
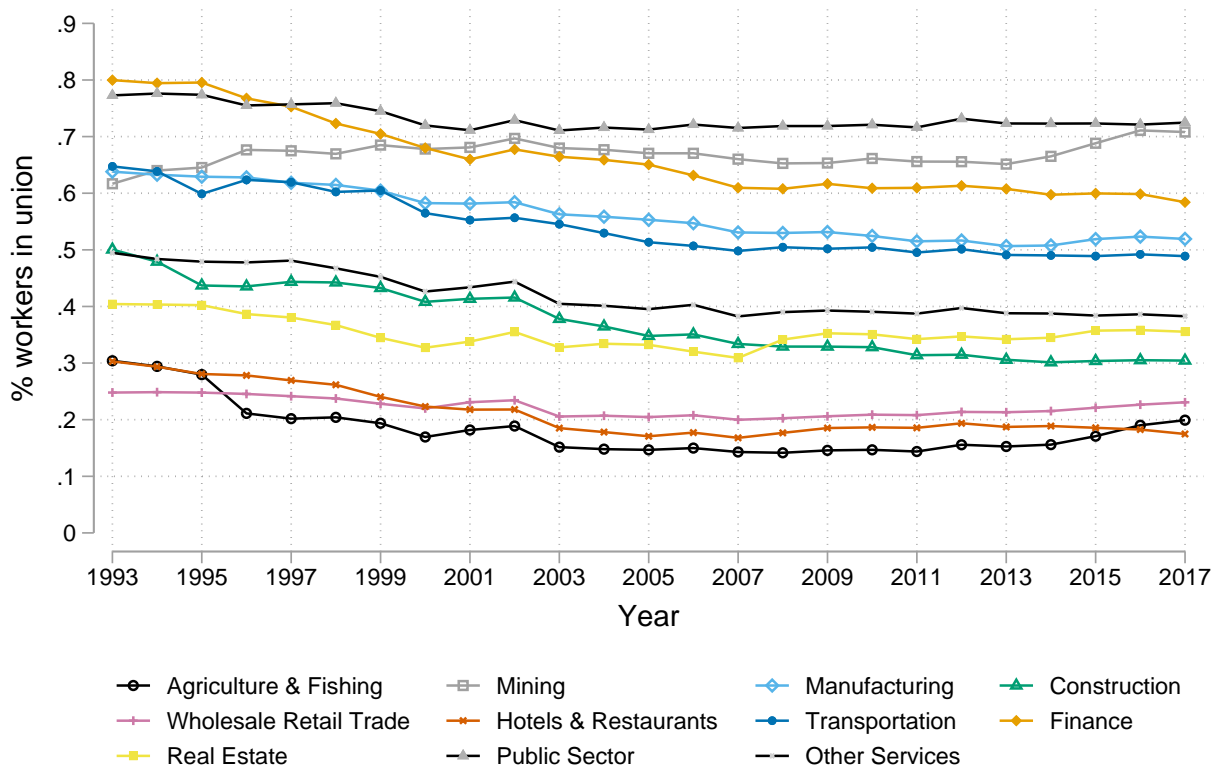
Source: Authors' calculations of Norwegian registry data from 1993 to 2017.

Figure 4: Union Membership, Earnings, and Selected Transfers by Age

Panel A: Annual Earnings by Age, Union Status

Panel B: Annual Earnings by Age, Union Status, with Controls

Panel C: Social Support Payments

Panel D: Social Support Payments, with Controls
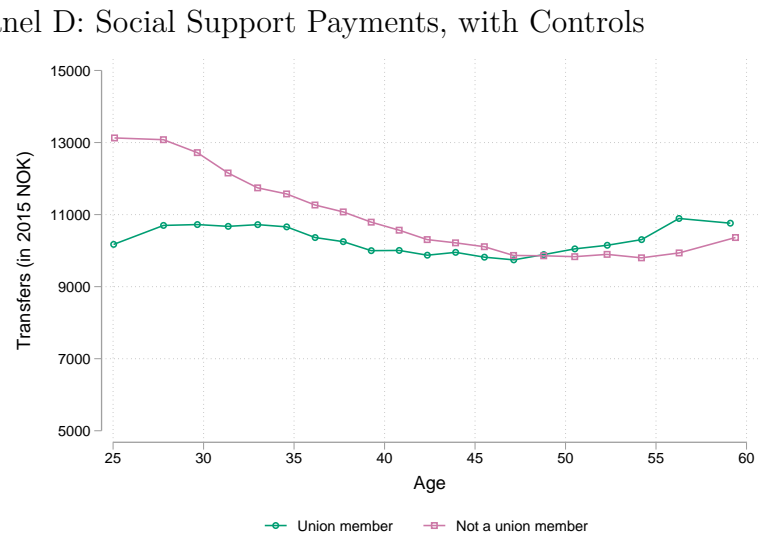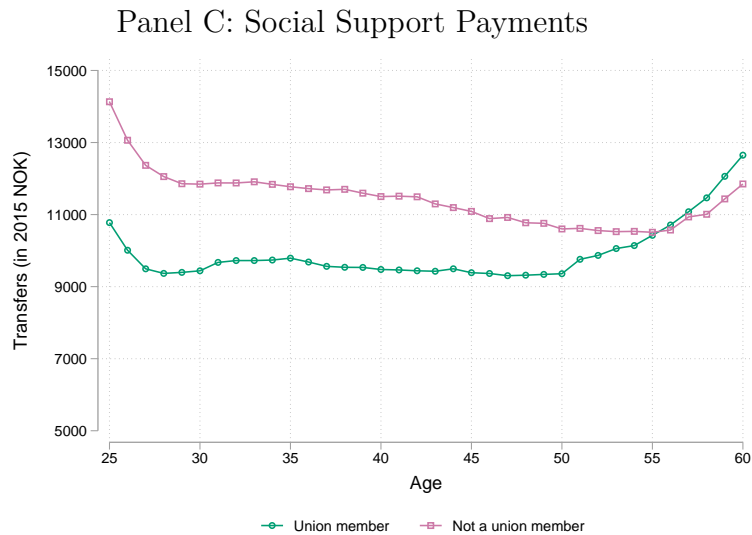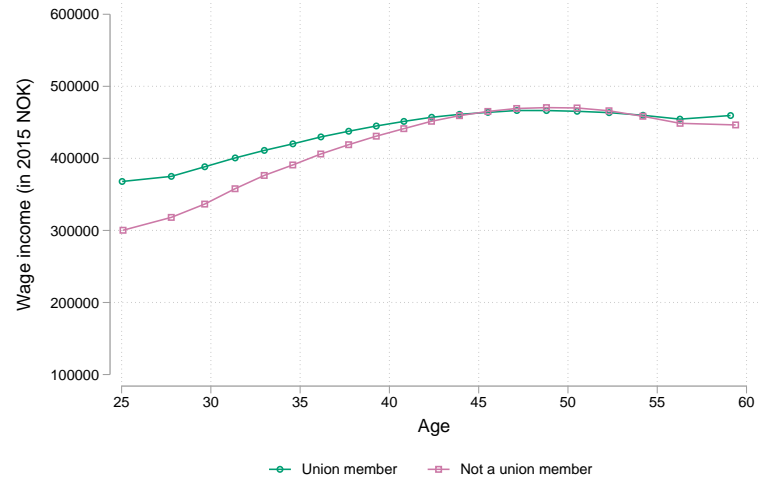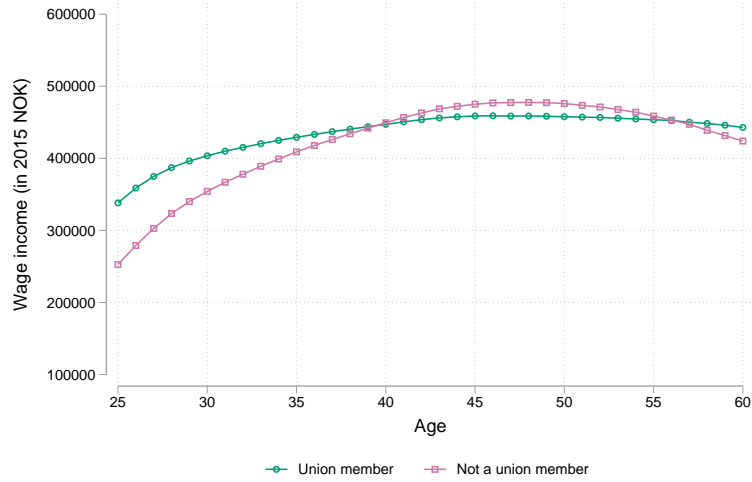
Source: Authors' calculations of Norwegian registry data from 1993 to 2017.
Notes: Panel B and D include fixed effect controls for gender, immigration status, industry, education (program and level), and year. Social support payments include unemployment benefits, sick leave, housing allowance, scholarships, and financial assistance.

Figure 5: Price Sensitivity to Union Membership
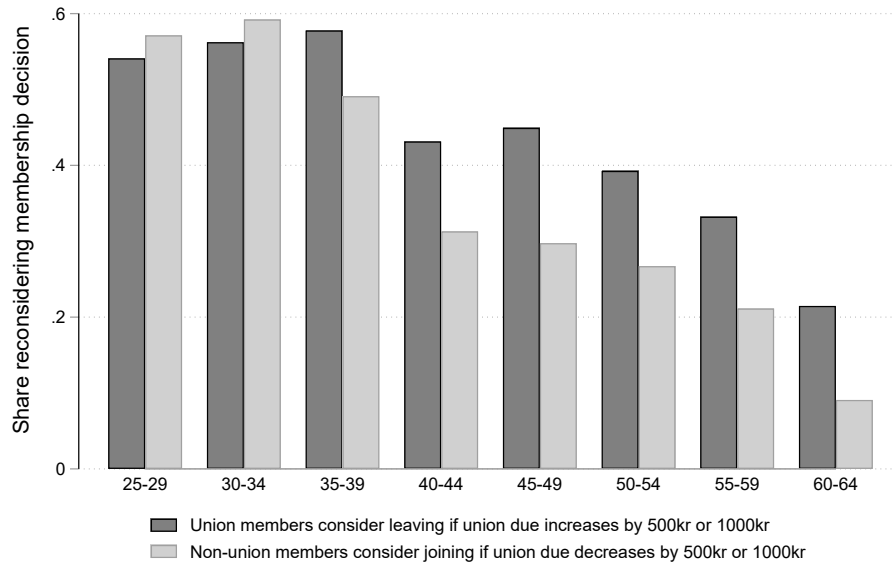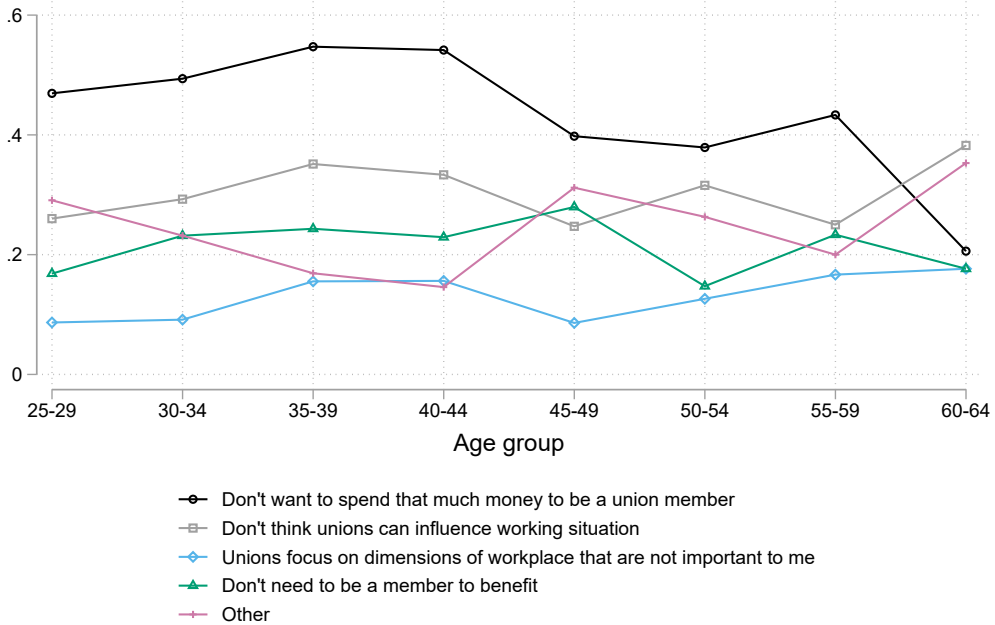

Source: Authors' calculations based on survey data collected by NORSTAT on behalf of the authors.
Notes: The question on the survey asked, "If your after-tax dues for union membership were reduced [increased] by [XYZ] NOK, would you reconsider your decision to join a union?"

Figure 6: Worker Valuation of Career Amenities
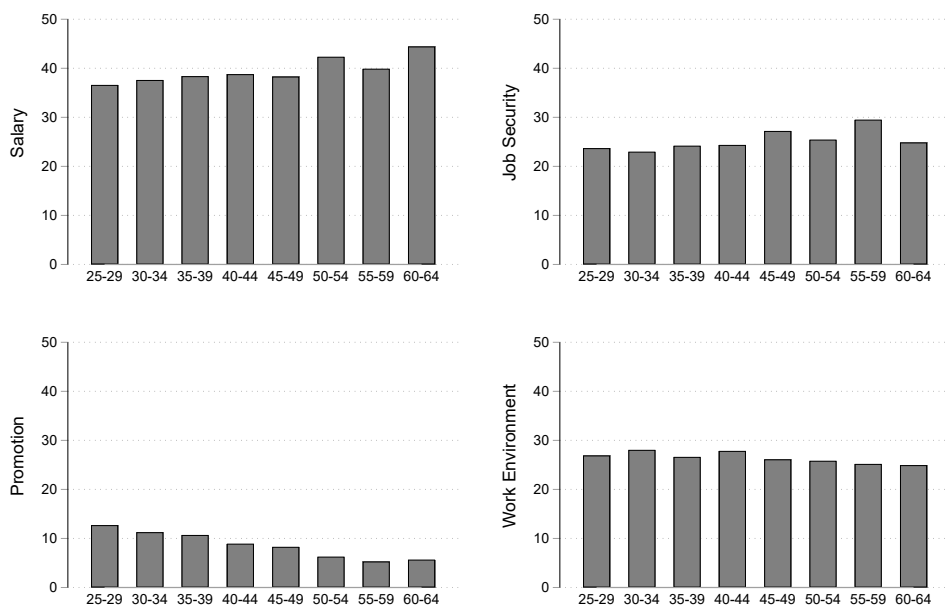
Source: Authors' calculations based on survey data collected by NORSTAT on behalf of the authors.
Notes: The question on the survey asked, "Rank the following job characteristics based on importance to your future career and well-being: Salary, Job Safety, Promotion Potential and Work Environment Quality. Here we ask you to award 100 points across the four categories. You can assign anything between 0 and 100 to any of the categories, as long as the total amount of points for all four categories is 100."

Figure 7: Worker Perception of Union Influence Over Career Outcomes
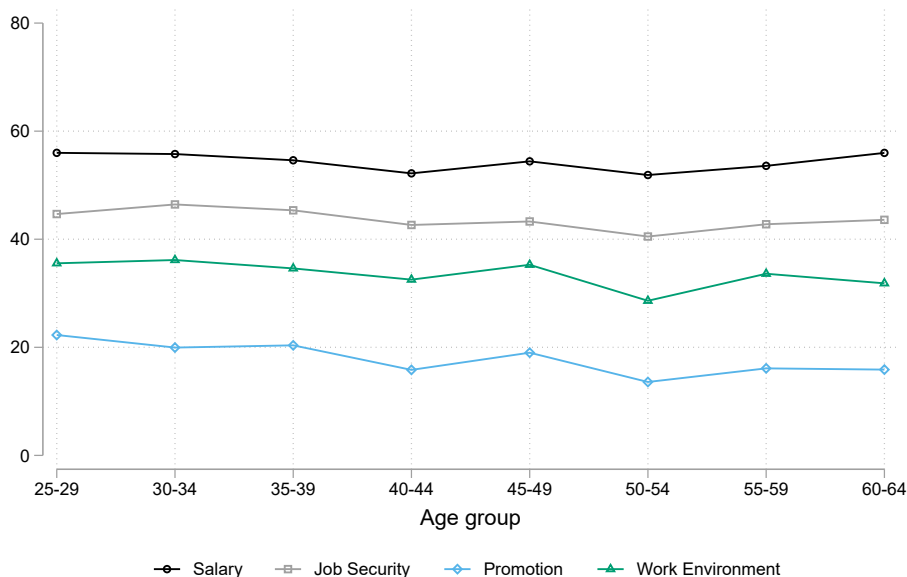
Source: Authors' calculations based on survey data collected by NORSTAT on behalf of the authors.
Notes: The question on the survey asked, "How important do you think the union is to improving your pay, job security, promotion potential and work environment quality? 0 means 'not at all' and 100 means 'completely.' The total for all four need NOT be 100."

Figure 8: Perceived Public Good Component of Union Membership
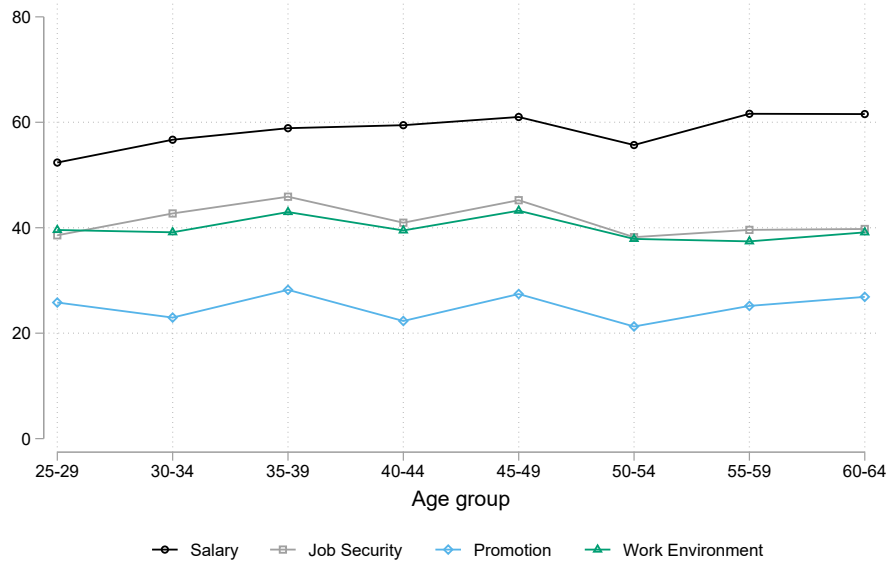
Source: Authors' calculations based on survey data collected by NORSTAT on behalf of the authors. "Compared to members, to what extent do you think nonmembers in your workplace can benefit from the presence of unions along these four dimensions? 0 means 'not at all' and 100 means 'completely.'"


Figure 9: Nonunionized Workers Reason For Not Unionizing

Source: Authors' calculations based on survey data collected by NORSTAT on behalf of the authors. Notes: The question on the survey asked, "The purpose of this question is to understand the reason why you do not join a union. Check all the boxes that apply."

Figure 10: Union Membership Effects

Panel A: Monetary Compensation
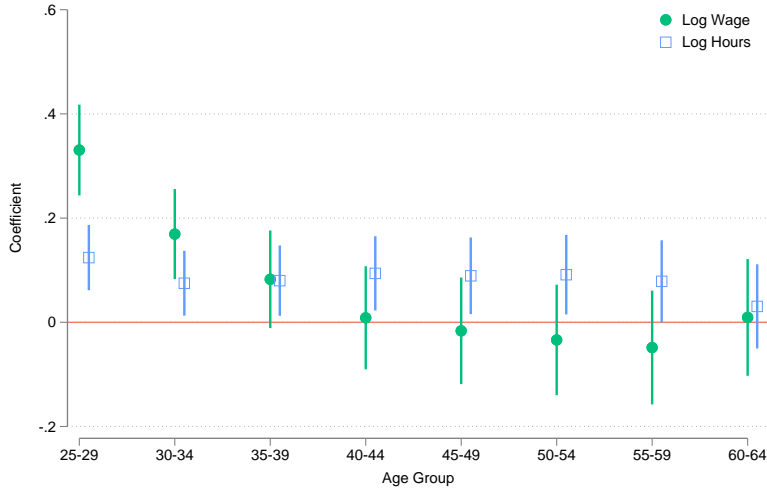
Panel B: Job Protection (Unemployment Benefits)
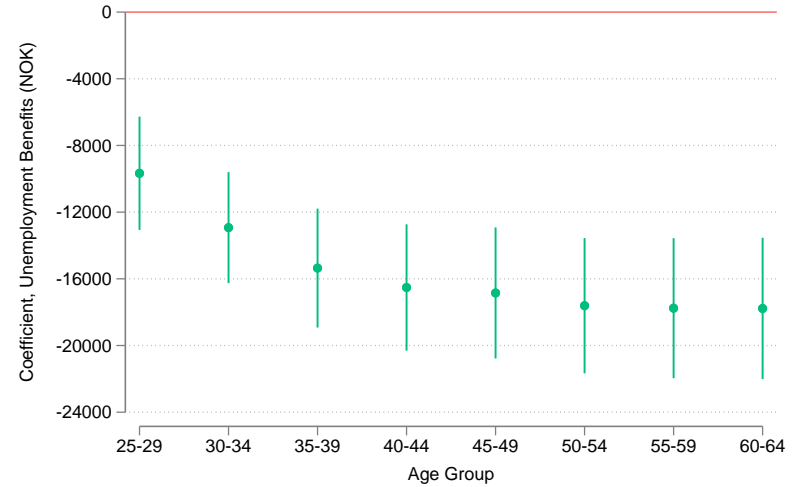
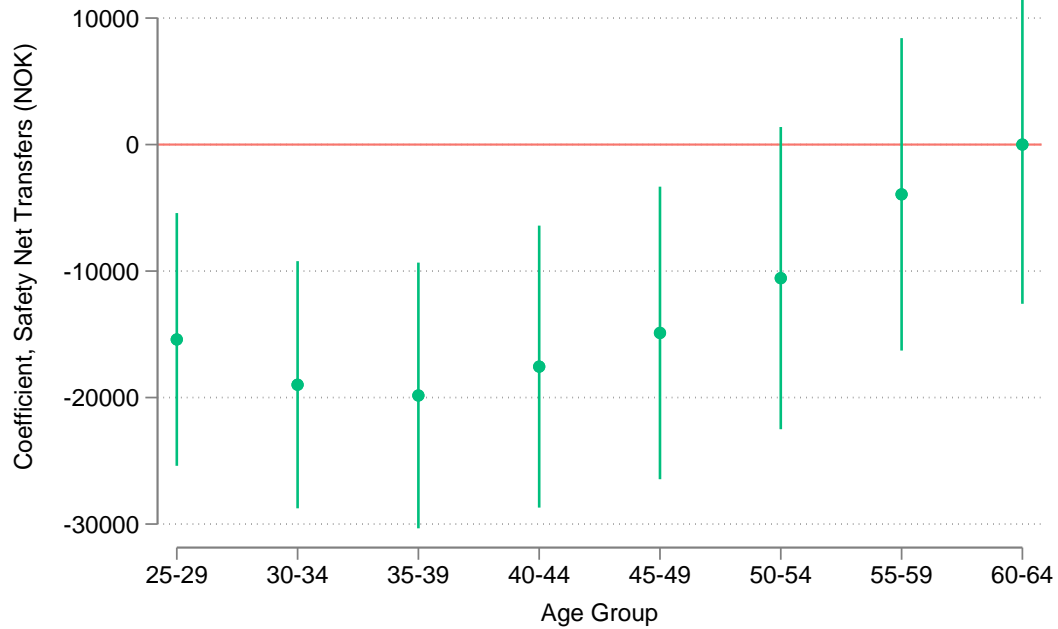
Panel C: Promotion Facilitation
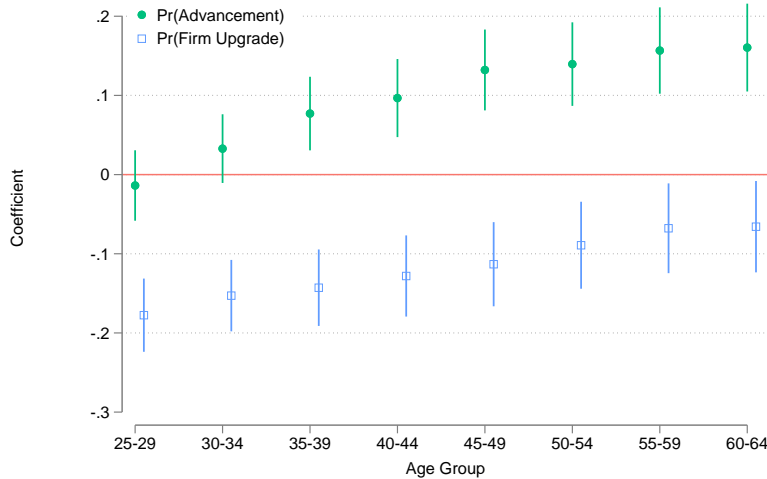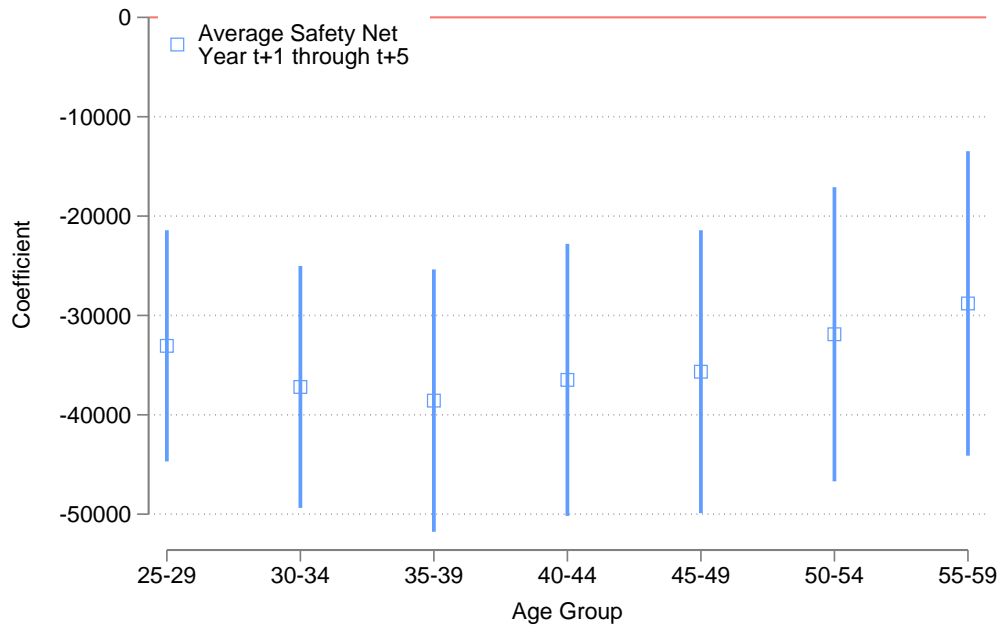

Panel D: Work Environment (Sick Leave)
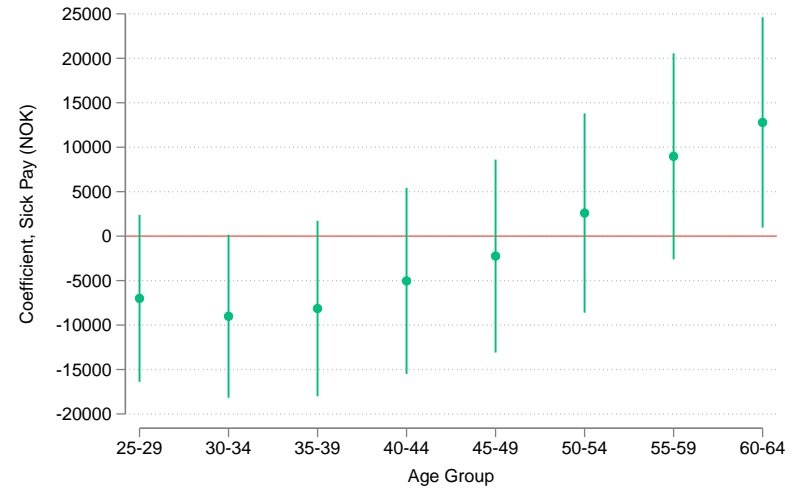
Source: Authors' calculations of Norwegian registry data from 2001 to 2015.

Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with interactions for 5-year age bins. 95% confidence intervals are derived from standard errors clustered at the individual level. Outcomes are measured in year $t+1$. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always union status. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax policy.

Figure 11: Union Membership Effects on Social Support Payments

Source: Authors' calculations of Norwegian registry data from 2001 to 2015.
Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with inter-
actions for 5-year age bins. 95% confidence intervals are derived from standard errors clustered at the
individual level. Outcomes are measured in year *t+1*. The model includes fixed effects for year, base and
current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always
union status. Current union status is instrumented by the base firm's net union due after subtracting the
subsidies introduced through Norwegian tax policy. Safety net transfers include unemployment benefits,
sick leave, housing allowance, scholarships, and financial assistance.

Figure 12: Average Union Membership Effects Over Five Years
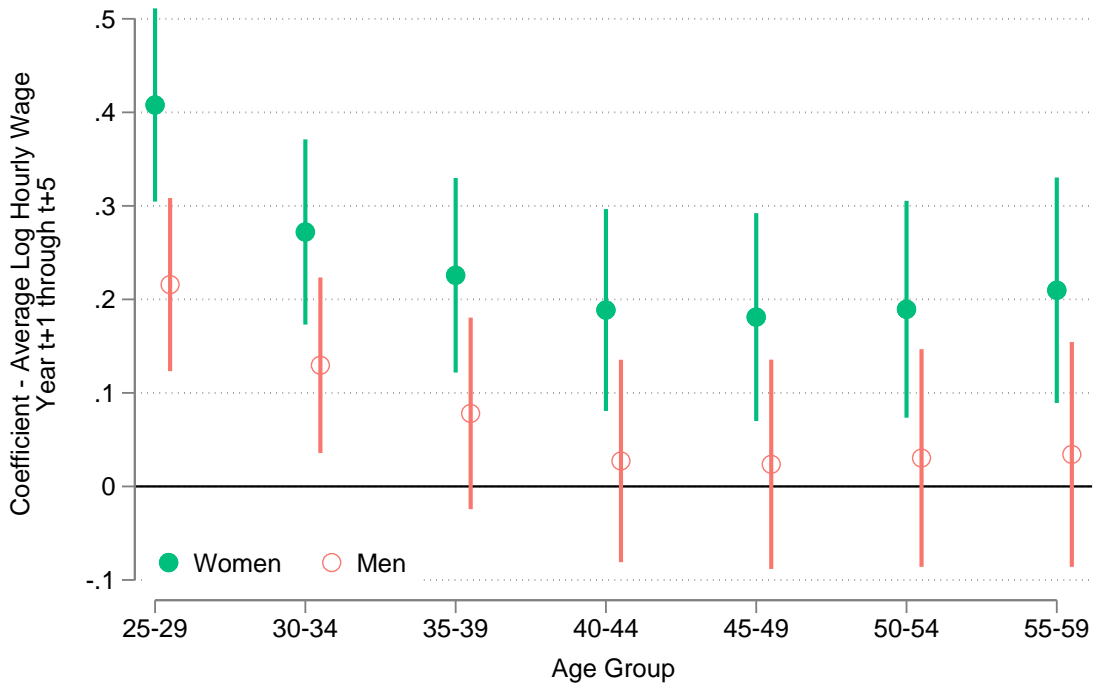Panel A: Average Log Hourly Wage

Panel B: Average Safety Net Transfers

Source: Authors' calculations of Norwegian registry data from 2001 to 2015.
Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with inter-actions for 5-year age bins. 95% confidence intervals are derived from standard errors clustered at the individual level. Outcomes are the average of annual outcomes measured in periods $t+1$ through $t+5$. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always union status. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax pol-icy. Safety net transfers include unemployment benefits, sick leave, housing allowance, scholarships, and financial assistance. Age on the x-axis refers to the age at which the worker joined the union as a result of the tax policy.

Figure 13: Average Union Membership Effects Over Five Years, by Gender

Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with union interactions for 5-year age bins by gender. 95% confidence intervals are derived from standard errors clustered at the individual level. Outcomes are the average of annual outcomes measured in periods $t+1$ through $t+5$. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, always union status, and gender. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax policy. Age on the x-axis refers to the age at which the worker joined the union as a result of the tax policy.

A   Figures and Tables Appendix

Table A1: Instrument Intensity and Baseline Characteristics, Regressions

VARIABLES	(1) Reduction in Net Dues, 1000s	(2) Reduction in Net Dues, 1000s
Log Real Earnings	-0.00687***	-8.59e-05
	(0.00133)	(0.000399)
Female	0.0184***	0.00110***
	(0.00101)	(0.000271)
Age	8.39e-05**	-8.55e-07
	(3.62e-05)	(2.12e-05)
High School Diploma	-0.00532***	-0.00122***
	(0.000650)	(0.000233)
Bachelors Degree +	0.00387**	0.000233
	(0.00192)	(0.000541)
Constant	0.247***	0.171***
	(0.0164)	(0.00461)
Observations	3,181,575	3,179,728
R-squared	0.042	0.701
Occ by Ind FE		X
Age Group FE		X
Always Union Dummy		X

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations of Norwegian registry data from 2002 to 2010.
Notes: Estimates come from a regression of the reduction in net dues within a worker's base firm in the data between 2002 and 2010 on a set of baseline characteristics for each worker in the base firm. Standard errors are clustered at the base firm level.

Table A2: Instrument Intensity and Baseline Characteristics, Correlations

VARIABLES	(1) Raw Correlation with Reduction in Net Dues	(2) Conditional Correlation with Reduction in Net Dues
Log Real Earnings	-0.109	-0.00282
Female	0.189	0.0101
Age	0.00475	-0.0000116
Less than High School	0.0224	0.0104
High School Diploma	-0.0738	-0.0158
Bachelors Degree +	0.0580	0.00799
Observations	3,241,835	3,241,835

Source: Authors' calculations of Norwegian registry data from 2002 to 2010.
Notes: Correlations are between the reduction in net dues within a worker's base firm in the data between 2002 and 2010 and a set of baseline characteristics for each worker in the base firm. Conditional correlations are for the reduction in net dues after residualizing on controls for occupation by industry cell, age group, and "always union" status.

Table A3: Two-Stage Least Squares Estimates Clustering at Base Firm Level

VARIABLES	(1) Log(Hourly Wage)
Age 25-29	0.331**
	(0.141)
Age 30-34 (Relative to 25-29)	-0.161***
	(0.0186)
Age 35-39 (Relative to 25-29)	-0.248***
	(0.0277)
Age 40-44 (Relative to 25-29)	-0.322***
	(0.0351)
Age 45-49 (Relative to 25-29)	-0.347***
	(0.0400)
Age 50-54 (Relative to 25-29)	-0.365***
	(0.0445)
Age 55-59 (Relative to 25-29)	-0.379***
	(0.0480)
Age 60-64 (Relative to 25-29)	-0.321***
	(0.0518)
Observations	10,745,934

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations of Norwegian registry data from 2001 to 2015.
Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with interactions for 5-year age bins. Standard errors are clustered at the base firm level. Outcomes are measured in year *t+1*. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always union status. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax policy.
This level of clustering still allows enough precision to detect differences from zero as well as differences across age groups such that the level of clustering does not alter our conclusions.

Table A4: Two-Stage Least Squares with Interactions for Lagged Union Density

VARIABLES	(1) Log(Earnings)	(2) Unemployment Benefits	(3) Sick Pay
Union Member	0.259*	-20,591***	423.1
	(0.141)	(5,399)	(9,906)
Union Member x Union Density (t-1)	-0.0786	6,762***	2,044
	(0.0543)	(2,123)	(3,904)
Observations	10,390,662	11,172,313	11,186,783
Kleiberage-Paap F stat	40.63	42.21	42.11

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations of Norwegian registry data from 2001 to 2015.
Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with interactions for union density (on a 0-1 scale) in the prior year at the worker's current firm. Standard errors are clustered at the individual level. Outcomes are measured in year *t+1*. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always union status. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax policy.

Figure A1: Maximum Deductions and Net Union Dues After Subsidy vs Base Dues Over Time

Panel A: Maximum Deductions by Year
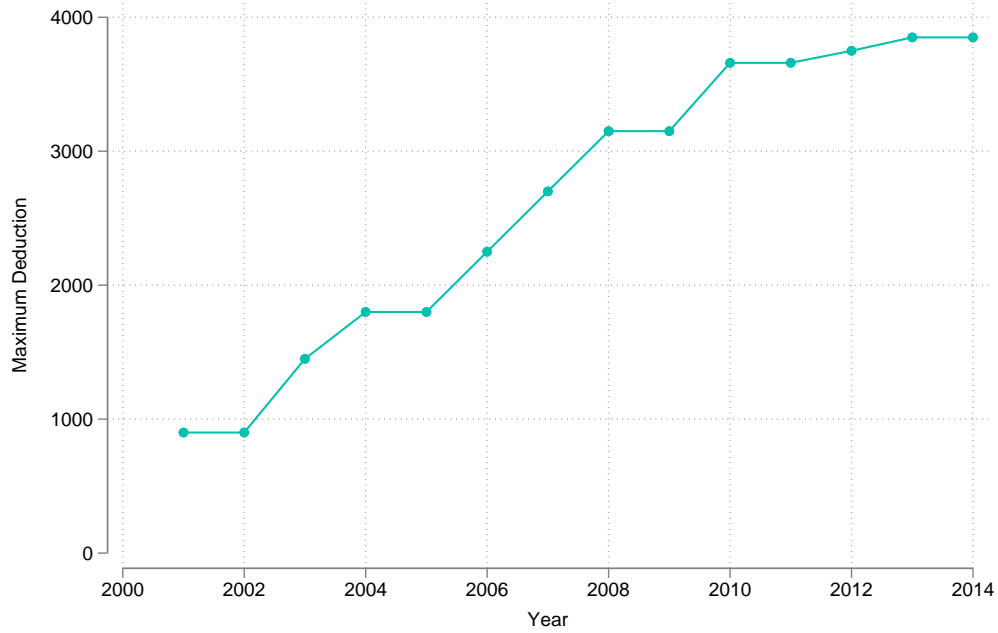
Panel B: Net Union Dues After Subsidy vs Base Dues Over Time
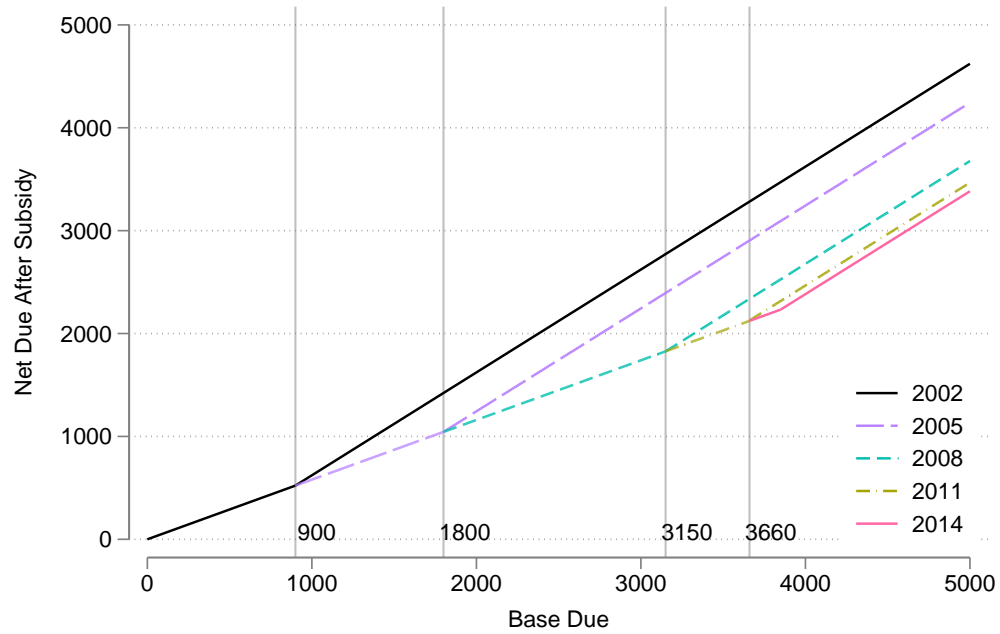
Source: Authors' illustration of the legislated maximum union due deductions and net-of-subsidy union dues in Norway over time.

Notes: Figure assumes a marginal tax rate of 42%, which is the typical top marginal rate over the 2001-2014 sample period. Vertical lines mark the maximum deductions over time.

Figure A2: Union Membership and Earnings by Base Firm Reduction in Net Dues

Panel A: Trends in Firm Union Density   Panel B: Trends in Annual Earnings
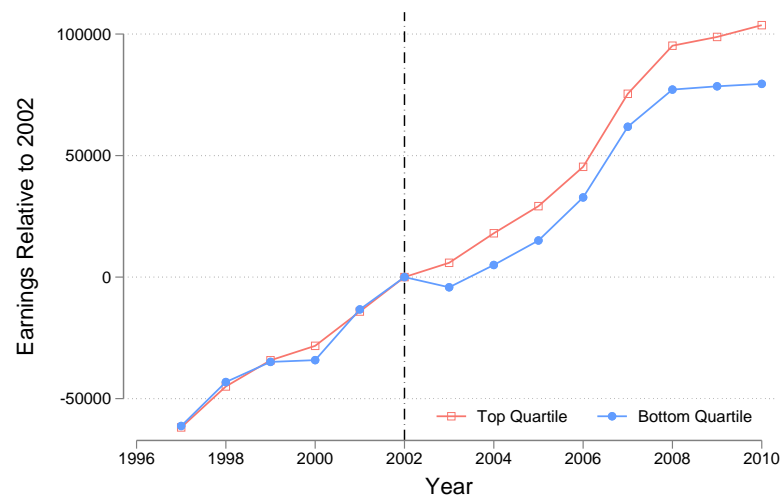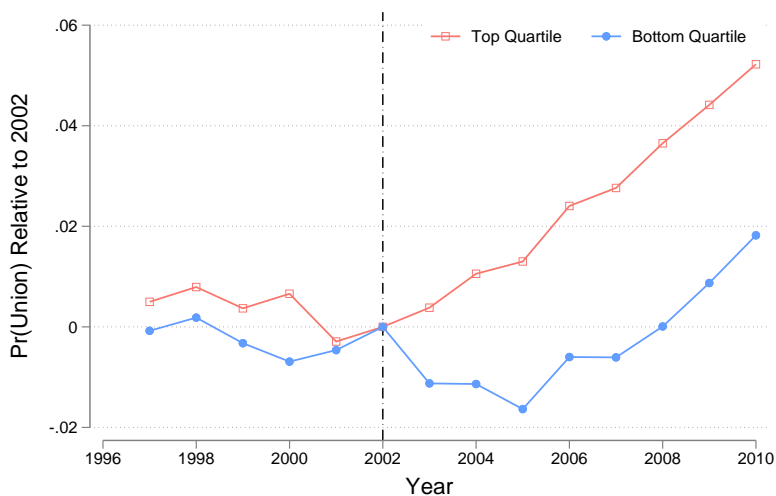
Source: Authors' calculations of Norwegian registry data.

Notes: Changes in net dues are calculated within each worker's base firm from 2003 to 2010 during the period in which the maximum tax deduction or union dues changed significantly, after which we compare the top and bottom quartiles of this reduction. The figure accounts for base firm fixed effects, so these are comparing the evolution of union membership and earnings for people with the same base firm over time.

Figure A3: Union Membership Effects on Wages and Hours by Age, by Model
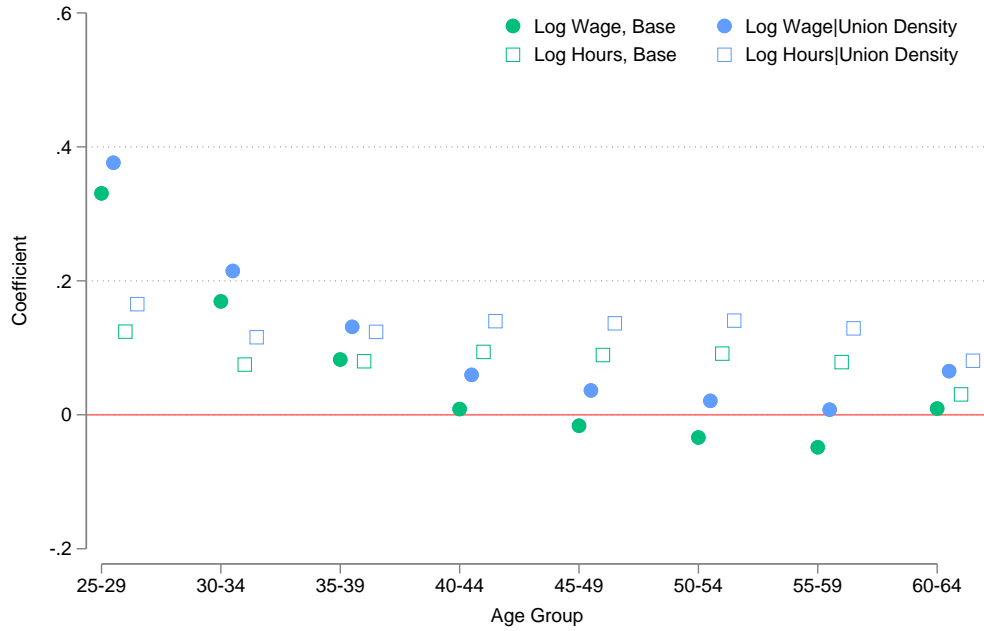
Source: Authors' calculations of Norwegian registry data from 2001 to 2015.
Notes: Estimates come from the two-stage least squares specification in Equations 2 and 3 with interactions for 5-year age bins and an additional control in both stages for firm union density. Outcomes are measured in year $t+1$. The model includes fixed effects for year, base and current 5-year age bin, base and current occupation-by-industry cell, base and current firm, and always union status. Current union status is instrumented by the base firm's net union due after subtracting the subsidies introduced through Norwegian tax policy.

Figure A4: Union Membership and Earnings by Age, Individual Fixed Effects Model
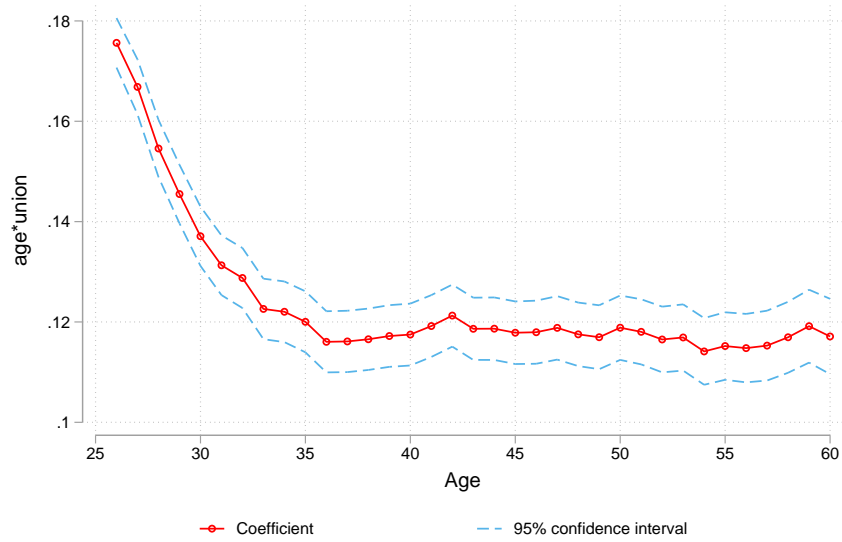
Source: Authors' calculations of Norwegian registry data.
Notes: All coefficients are for age interacted with an indicator for union membership status. 95% confidence intervals are derived from standard errors clustered at the individual level. The model includes fixed effects for individuals, age, year, occupation by industry cell, and firm. Estimates correspond to the IV estimates in Panel A of Figures 4 and 10, respectively.

Figure A5: Raw Annual Earnings for Women
Annual Earnings
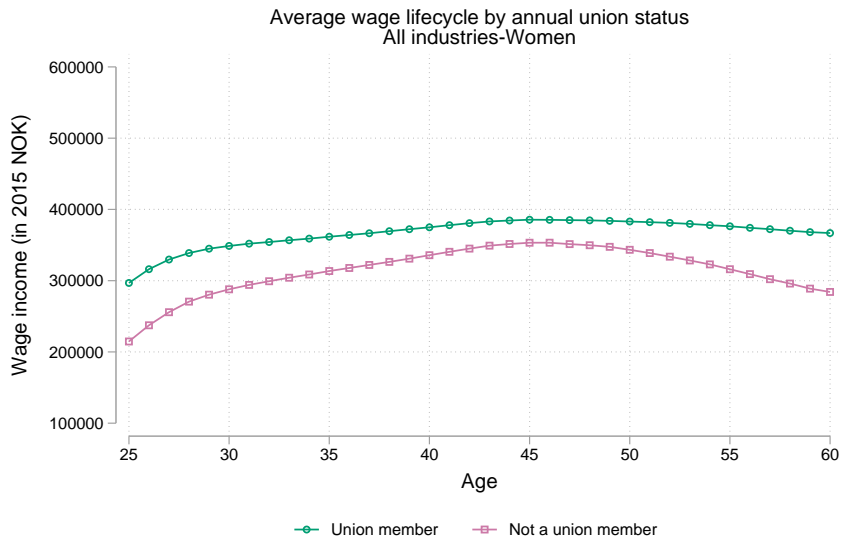
Source: Authors' calculations of Norwegian registry data from 1993 to 2017 for employed women.

Survey Instrument

[INTRO1] This is a survey that Norstat conducts on behalf of the Norwegian School of Economics and Business Administration. The results will be used in a research project.

All information collected through the survey is anonymized and will not be disclosed to any third party. As part of scientific publishing, anonymised data may be shared in open scientific repositories.

If you want more information about the project, you can choose the option below. If you want to start the survey, you choose it.

[R1] I want more information
[R2] I want to start the survey

[R1] Information and declaration of consent

Purpose of the project

We want to understand how individuals in Norway value their work environment and how they view unions. The results of the study will increase our understanding of workplace preferences and their relative importance.

Who is responsible for the project?

The Norwegian School of Economics (NHH) is the responsible institution for the project. Alexander Willen, professor at NHH, is the project manager. The other project members are Kjell G. Salvanes, professor at NHH, Samuel Dodini, postdoctoral fellow vid NHH, and Julia Zhu, postdoctoral fellow at NHH. If you have any questions about the project, you can contact NHH via Alexander Willen (alexander.willen@nhh.no).

What does participation mean for you?

If you choose to participate in the project, you will be asked to answer a survey by completing an online questionnaire. It takes about 7 minutes. The survey includes questions about your work situation, union status, and your job preferences. In addition, we will ask some basic demographic questions about, for example, age and gender. Participation in the survey is voluntary and you can withdraw your consent at any time without giving any reason. All information collected through the survey is anonymized and will not be disclosed to any third party. As part of scientific publishing, anonymised data may be shared in open scientific repositories. There will be no negative consequences if you choose not to participate or decide to withdraw at a later date.

Declaration of consent

I have received and understood information about the survey and hereby consent:

• to participate in the online survey.
• to enable researchers to process my anonymised data and use them for publications in scientific journals and other scientific dissemination.

[R2] Survey

[Age] What is your age?
[Gender] Are you male or female?
[Zip code] What is your zip code?
[Fylke] Which county do you live in?

What is your highest completed education?
[R1] Primary school/primary school
[R2] Upper secondary school (incl. former vocational school)
[R3] Vocational school, trade certificate/journeyman's certificate and other 1-2 year education after upper secondary school
[R4] University/college up to 3 years (Bachelor's degree)
[R5] University/college 4 years or more (Master's degree and higher)
[R98] Other

Where were you born?
[R1] Norway
[R2] Outside Norway
[R3] Don't want to answer

Can you state which country you were born in?

At what age did you move to Norway?

How many years of full-time work experience do you have?

Are you currently in part-time or full-time work?
[R1] Part-time (less than 30 hours per week)
[R2] Full-time (at least 30 hours per week)
[R3] Not working

What industry is your main job in?

Do you work in the public or private sector?
[R1] Public sector
[R2] Private sector

How many people work at your workplace?
Row:
[R1] 1-5
[R2] 6-10
[R3] 11-50
[R4] 51-100
[R5] More than 100
[R6] Don't want to answer

Rank the following job characteristics based on importance to your future career and well-being: Salary, Job Safety, Promotion Potential and Work Environment Quality.
Here we ask you to award 100 points across the four categories. You can assign anything between 0 and 100 to any of the categories, as long as the total amount of points for all four categories is 100.
Row:
[R1] Salary: Everything associated with the financial payment of your work (base salary, bonuses, overtime pay, generosity with retirement plans, etc.)
[R2] Job security: Protection and support (legal and otherwise) against being laid off and fired, both in the event of mass closures and individual layoffs (wrongful or not)
[R3] Promotion potential: Potential to move up the career ladder in the company
[R4] Work environment quality: The day-to-day quality of your work environment, including physical environment (e.g. equipment and facilities), company culture (e.g. support, feedback, collaboration, potential to influence) and working conditions (e.g. workplace safety, conditions employment, work-life balance)

Are you a member of a trade union?
[R1] Yes
[R2] No
[R3] Don't want to answer

For how many years have you been a member?

Have you been a member continuously during that time, or have you changed in and out of membership over the years?
[R1] Continuous
[R2] Not continuously

How important do you think the union is to improving your pay, job security, promotion potential and work environment quality?
0 means "not at all" and 100 means "entirely". The total for all four need NOT be 100.
[R1] Monetary compensation
[R2] Job security
[R3] Promotion potential
[R4] Working environment quality

Compared to members, the extent to which do you think nonmembers in your workplace can benefit from the presence of unions along these four dimensions
0 means "not at all" and 100 means "complete". The total for all four need NOT be 100.
[R1] Monetary compensation
[R2] Job security
[R3] Promotion potential
[R4] Working environment quality

Have you found a union membership useful for receiving non-work benefits such as lower mortgage rates, access to cheaper/better insurance, etc.?

How important has this been for your decision to join a union?

If your after-tax dues for union membership increased by [XYZ] dollars, would you reconsider the decision to join a union?
Row:
[R1] Yes
[R2] No

The purpose of this question is to understand the reason why you do not join a union. Check all the boxes that apply.
Row:
[R1] I don't want to spend so much money being a union member
[R2] I don't think unions can affect my work situation
[R3] I find that unions focus on dimensions of the workplace that are not important to me.
[R4] I don't think I need to be a member of a union to take advantage of the influence unions have on my work situation and well-being
[R5] Other reason, note:

If your after-tax dues for union membership were reduced by [XYZ] NOK, would you reconsider your decision to join a union?
Row:
[R1] Yes
[R2] No