The Incidence of Payroll Taxes on High-Wage Earners*

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November 2025

Abstract

This paper estimates the incidence of a Norwegian payroll tax reform that introduced a five–percentage point surcharge on employer payroll taxes for earnings above a specified threshold. We find no evidence that the surcharge was shifted onto high-income workers, despite these workers becoming more expensive to employ. Instead, firms that were more exposed to the surcharge—those employing a larger share of high-income earners—reduced their overall wage bill relative to less exposed firms following the reform. This reduction did not stem from lower wage growth in highly exposed firms. Rather, these firms adjusted primarily through changes in workforce composition, hiring fewer high-income employees and more low-income employees.

JEL-codes: H22, H32, J23, J31.

Key words: Payroll Taxes, tax incidence, labor supply.

*Data made available by Statistics Norway have been essential for the research project. Schreiner gratefully acknowledges funding from the Norwegian Research Council (grant number 335380)

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1 Introduction

Payroll taxes are levied on labor income and, in most countries, are statutorily shared between employers and employees. They constitute a major component of modern tax systems: within the OECD; payroll taxes generate roughly one-quarter of total tax revenues (Bozio et al., 2023) and account for more than half of the overall tax wedge on labor earnings (OECD, 2024).

Given their magnitude, payroll taxes have long attracted attention from economists seeking to understand their effects on labor market outcomes. A central question concerns their incidence—i.e., the extent to which these taxes raise firms' labor costs or reduce workers' wages. In standard competitive models, if labor supply is relatively inelastic while labor demand is highly elastic, as is often assumed, pre-tax wages adjust to absorb the tax, leaving firms' labor costs unchanged and shifting the burden onto workers.

In this paper, we estimate the incidence of a policy reform introducing a progressive element into the Norwegian payroll tax. In January 2023, the government implemented a five–percentage point surcharge on the employer payroll tax applied only to the portion of annual earnings above NOK 750,000 (USD 75,000), later raised to NOK 850,000 (USD 85,000) in 2024.[1] The reform thus raised the marginal payroll tax rate on high earnings without creating a notch in total labor costs. The policy was justified primarily as a revenue-raising measure but was also presented as a means of moderating wage growth at the top of the distribution. Although repealed in January 2025, the surcharge was initially enacted without a predefined sunset provision.

In the canonical competitive framework, one would expect the surcharge to be fully shifted onto affected high earners: firms' labor costs remain unchanged, and net-of-tax wages for employees above the threshold fall one-for-one. However, alternative models emphasize bargaining, rent sharing, fairness considerations, and internal pay structures. In such environments, firms may absorb part of the surcharge or spread it across a broader range of workers; moreover, high-wage employees may have more individualized wage setting, giving firms both greater flexibility and stronger incentives to adjust wages selectively.

The Norwegian context, therefore, makes the incidence of the surcharge an open empirical question. Although payroll taxes are legally employer contributions, they are not tied to individual benefits. Wage formation is characterized by highly coordinated collective bargaining, extensive agreement coverage, and strong internal pay-equity norms. At the same time, the surcharge targets earnings well above

[1] All monetary amounts are expressed in USD using the January 2023 exchange rate: 1 USD $\approx$ 10 NOK.

the median, where wage setting is more decentralized and firms may have greater discretion. Whether firms responded by reducing top wages, diffusing the burden across the workforce, or absorbing it through profits is ultimately an empirical matter.

To estimate the incidence of the payroll tax surcharge, we use comprehensive matched employer–employee administrative data. We assess how the increase in the payroll tax on high wages affected: (i) gross and net wages; (ii) firms' total labor costs; and (iii) the distribution of wages within firms. Our empirical strategy contrasts firms with high pre-reform shares of high-wage employees (highly exposed firms) with otherwise similar firms with fewer high earners. We complement this firm-level approach with worker-level analyses comparing employees just above and just below the threshold.

Our results indicate a distinctive pattern of incidence. First, using a worker-level design that compares the wage development of employees just above and just below the surcharge threshold, we find no evidence that the reform reduced wage growth for the high earners directly subject to the additional tax. Second, we observe that firms we define as highly exposed—because they had a large pre-reform share of workers above the threshold—experienced lower wage growth during the reform period relative to less exposed firms. This suggests that part of the burden of the surcharge was shifted to workers. Third, however, when we isolate within-worker wage growth for incumbents who remain continuously employed in the firm, we find no differences between treated and untreated firms. This rules out the possibility that exposed firms responded by cutting or disproportionately slowing the wage growth of their existing workforce, and instead points toward composition effects. Consistent with this, analyzes of hiring patterns suggest that highly exposed firms responded to the reform by hiring relatively more low-wage workers.

Taken together, these findings show that the incidence of the surcharge did not operate through direct reductions in the wages of targeted high earners, nor through broad wage compression among incumbent workers. Instead, the adjustment appears to have occurred primarily through changes in workforce composition. Treated firms likely responded to the increased marginal cost of high-wage labor by shifting hiring toward lower-paid workers or by slowing the expansion of high-wage positions, thereby reducing overall payroll growth without altering the wage trajectories of existing employees. We argue that this mechanism is consistent with wage-setting rigidities, coordinated bargaining, and internal pay-equity norms in the Norwegian labor market, and it underscores that payroll tax incidence may operate through hiring margins when incumbent wages remain rigid.

We supplement these empirical findings with evidence from a survey we conducted

among firms during the surcharge period. In the fall of 2023, we fielded a survey through the Confederation of Norwegian Enterprise (NHO) to gauge firms' expectations about the duration of the surcharge and their intended responses. The survey reveals substantial heterogeneity: firms differed both in how long they believed the surcharge would remain in place and in how they anticipated adjusting to it. Around 15% of firms expected to reduce wage growth at the top, while roughly 30% anticipated a slight negative wage effect across all workers. These stated intentions provide useful context for interpreting the observed adjustments, even if they do not materialize directly in the administrative data.

1.1 Contribution to the Literature on Payroll Tax Incidence

There is an extensive empirical literature on the incidence of payroll taxation. Early studies relied on cross-sectional variation in statutory payroll tax rates across countries, regions, or worker groups (Brittain, 1971). Because statutory rates may correlate with unobserved regional or institutional characteristics, these designs face challenges in identifying causal effects. A major methodological advance came with Gruber (1997), who exploited a quasi-experimental reform in Chile and showed near-complete pass-through of employer payroll tax changes to wages.

The full-shifting results of Gruber (1997) and, in a highly competitive setting, Kim et al. (2022), align with competitive labor market theory. Yet the broader literature reports more mixed evidence: many studies find only partial incidence on wages and significant employment effects. Several mechanisms may explain these deviations from full incidence.

First, when only a subset of firms is subject to a payroll tax (or to a tax increase), pass-through is limited by worker mobility. Employees can move to firms facing lower tax rates, constraining treated firms' ability to lower wages in response to higher labor costs (Benzarti and Harju, 2021; Ku et al., 2020; Guo, 2024). In this environment, the degree of competition between taxed and untaxed firms becomes central: even if firms wish to adjust wages downward, mobile workers may leave, reducing the feasibility of shifting the burden onto employees.

Second, when payroll taxes vary across worker groups—such as by age or cohort—institutional frictions and wage-setting rules may restrict adjustments. Saez et al. (2019) study a large employer payroll tax cut in Sweden that sharply reduced labor costs for workers aged 26 and under. Despite a substantial reduction in employers' costs, affected young workers experienced almost no wage gains relative to slightly older, untreated workers. Instead, the reform generated modest increases in youth employment and raised profits, sales, and investment in firms that employed many young workers. These results point to limited wage pass-through and highlight the

role of rent sharing, internal labor market rigidities, and other frictions, consistent with broader evidence in Saez et al. (2012).

Third, the extent of payroll tax shifting depends critically on how closely contributions are tied to benefits. Bozio et al. (2025) shows that when payroll tax payments translate directly into individual entitlements—effectively functioning as deferred compensation—workers bear most of the tax burden, leading to near-complete pass-through. In contrast, when the link between contributions and benefits is weak or nonexistent, incidence becomes more sensitive to labor market structure, bargaining power, and institutional wage-setting constraints. In such cases, firms may absorb part of the tax or adjust along other margins, such as employment or the structure of compensation.

Finally, the broader institutional and competitive environment in which wages are set plays a key role. Lobel (2022) develops a framework in which firms possess market power in both labor and product markets and shows that payroll taxes are only partially shifted to workers. His theoretical and empirical results demonstrate that when wages are not set competitively—owing to monopsony power, imperfect product market competition, or binding wage-setting institutions such as collective bargaining or wage floors—the standard competitive prediction of full pass-through can break down. More generally, wage-setting systems characterized by collective bargaining, internal pay-equity norms, or rigid pay structures may further limit firms' ability to adjust wages for specific groups of workers, amplifying the role of firms' strategic behavior in determining tax incidence.

Our contributions to the empirical literature on the incidence of payroll taxes are threefold. First, we provide new evidence on the incidence of a payroll tax increase for a specific group of workers. Existing work focuses primarily on general payroll tax reductions or on reductions targeted at low earners. Much less is known about how firms and workers adjust to progressive increases—i.e., payroll taxes that apply only to high earnings.

Second, we study payroll tax incidence at the top of the wage distribution, where wage-setting institutions, internal pay-equity considerations, and individualized bargaining differ substantially from the environments examined in most prior studies. This perspective allows us to shed light on how incidence operates in a segment of the labor market where firms typically have greater discretion but may also face stronger equity norms.

Third, we highlight an adjustment channel that does not operate through direct wage responses for incumbent workers but instead through changes in workforce composition. By analysing wages among incumbent workers that stay in the exposed firms, we show that highly exposed firms did not reduce incumbent wages yet still

experienced lower payroll growth. This pattern points to adjustments on hiring margins. Our evidence suggests that firms responded to the surcharge by shifting toward lower-paid recruits or by slowing the expansion of high-wage positions. Such responses are consistent with wage rigidities and coordinated bargaining in the Norwegian labor market. This composition-based incidence mechanism, while featured in recent theoretical work, has not received empirical attention.

2 Background

2.1 Payroll taxes in Norway

Norway's social security system is financed through contributions from both employers and employees. Employers pay a payroll tax on gross wages, while employees pay a social security contribution that is collected as part of the personal income tax system. Together, these contributions form a major source of funding for the welfare state.

A distinctive feature of the employer payroll tax is its geographic differentiation, where the firm's tax rate is determined by the location of its plant(s). The country is divided into seven tax zones. In the most central areas, the rate is 14.1 percent, while reduced rates—varying from 0 to 10.6%—apply in more sparsely populated or remote areas. This system reflects longstanding regional policy objectives aimed at supporting employment outside the major urban centers.

The reform we study concerned only the employer payroll tax. The employee contribution remained unchanged. Importantly, the surcharge introduced in 2023 was applied uniformly across the country, on top of the existing geographically differentiated rates. Thus, while the baseline tax continues to vary regionally, the reform itself affected high earners in exactly the same way everywhere.

2.2 The 2023 Payroll Tax Surcharge Reform

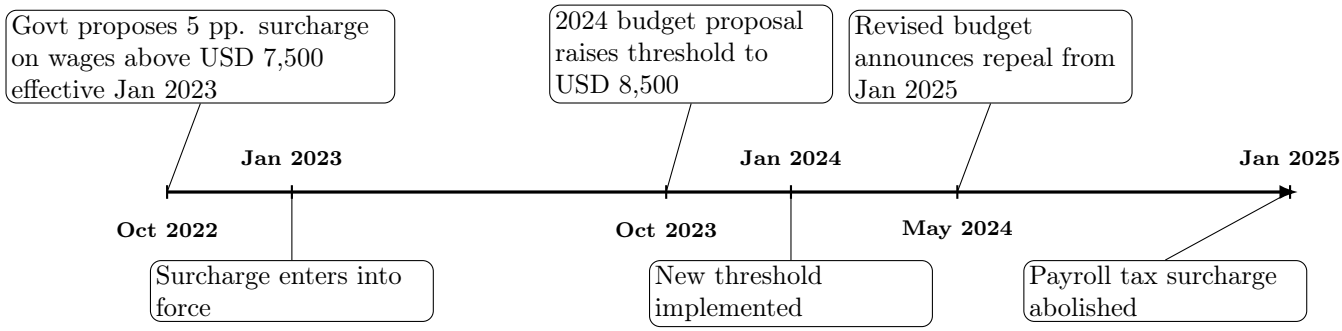
The payroll tax surcharge was first announced in autumn 2022 as part of the government's proposal for the 2023 National Budget. The primary motivation was fiscal: the government sought to raise revenue in response to rising expenditures following the pandemic and higher public-sector wage and energy costs. At the same time, policymakers suggested that the measure could help moderate wage growth among high earners and thereby reduce overall wage dispersion. The proposal attracted substantial attention both because of its narrow targeting of high-income earners and because it was introduced unexpectedly, without a prior impact assessment, reinforcing concerns about policy predictability and the stability of the Norwegian

tax system.

The reform imposed a 5-percentage-point surcharge on the employer payroll tax for high wages. In 2023, the surcharge applied to the portion of each employee's annual earnings above USD 75,000 within a given firm. Workers employed by more than one firm were not affected until their earnings within at least one firm exceeded the threshold, even if their total income across firms was higher. The surcharge was levied on top of the geographically differentiated baseline payroll tax but applied at a uniform rate across the country.

The reform was introduced as a temporary measure, although no explicit time limit was written into the legislation at the time. The proposal was presented to Parliament in October 2022 and adopted in December 2022, taking effect on 1 January 2023. During spring 2023, the Ministry of Finance issued clarifications on implementation for employees with multiple income sources. In October 2023, the government proposed raising the threshold to USD 85,000, effective from 1 January 2024. Finally, in autumn 2024, the government announced that the surcharge would be abolished from 1 January 2025. Figure 1 illustrates the chronology of the reform and the dissemination of information over this period.

Figure 1: Timeline of the Additional Employer Payroll Tax on High Wages



3 Data

Our empirical analysis combines Norwegian administrative register data with a survey of firms designed to elicit their expectations about the duration of the payroll tax surcharge.

3.1 Administrative Data

We start out with the employer-employee register for the years 2017-2024, covering all employment spells in Norway. The data set contains information on the duration of employment spells, workers' wages and contract type (full-time and part-time

status) within the firm, worker age, gender and location of residence, as well as the firms' municipality and sector (nace code). We also have information on worker education.

3.2 Survey Data

In the fall of 2023, we ran a survey on Norwegian firms through the Confederation of Norwegian Enterprise (NHO). The aim of the survey was to understand firms' beliefs about the duration of the surcharge payroll tax, as well as their planned responses. NHO is Norway's largest employers' organization, representing more than 30,000 firms employing more than 700,000 workers across the private sector. This corresponds to around 40% of private sector workers in 2024.[2] Member firms span all industries outside the public sector, including manufacturing, construction, services, trade, transport, and technology.

The NHO Member Survey is conducted several times per year and collects information on business sentiment, production expectations, labor demand, and cost developments among member firms. While coverage is broad, the sample is not designed to be fully representative of all Norwegian firms: participation is voluntary, and coverage is strongest among medium-sized and large enterprises, as well as in sectors with high NHO membership density. Nevertheless, the survey provides a timely and informative indicator of developments in the Norwegian business sector.

Questions about the surcharge were included in the member survey conducted between August and September 2023. A total of 2,846 firms responded to the survey.

3.3 Sample Construction

We start out by creating a sample of private sector firms that are subject to the ordinary payroll tax rules in Norway.[3][4] We also drop firms in tax zone 5 (the northernmost region of Norway) where the firms are subject to a zero payroll tax.[5] Over the sample period 2017-2024, this gives a sample of 209,778 unique firms.

To estimate incidence at the individual level, we restrict the sample to full-time workers, in these firms, that are employed at least 300 days each year (since we look

[2]See Statistics Norway: https://www.ssb.no/statbank/table/13472/tableViewLayout1/

[3]We define private firms using the *Classification of Institutional sector* as defined by Statistics Norway (see https://www.ssb.no/klass/klassifikasjoner/39/koder) and include firms with institutional sector code 2100 and 2300.

[4]Firms in the following sectors are exempted from ordinary payroll tax rules: finance (2-digit nace codes 64-66), farming and fishery (2-digit nace codes 1-3) and road freight transport (3-digit nace codes 49.4)

[5]Firms in this region employing high-wage workers were subject to the surcharge. However, there are so few (affected) firm in this region that we exclude them from the sample.

at total annual wages). We further require each worker to be observed in every year since we use the years 2017-2019 to classify workers into different earnings groups (see Section 5 for details). This gives us a sample of 38,832 workers across the three earnings groups in 2019.

To estimate firm-level results, we start out with the same set of firms, but require in addition that the firm operates through out the period of study 2017-2024. This reduces the sample to 18,898 firms.[6] We further restrict the sample to firms that employ at least five workers every year during the pre tax-reform years period 2017-2019. This reduces the sample to 3,292 firms. We finally restrict the sample to firms that employ at least one high-wage worker every year, where high-wage workers are defined as workers earning more than USD 75,000 (the level above which the extraordinary payroll tax applies). The latter restriction is imposed to ensure that the control group is comparable to the group of treated firms (firms with a high share of high-wage workers). Moreover, including only firms with both types of workers allows us to study the development of hiring of high- and low-wage workers over time in treated relative to control firms. This leaves us with a sample of 2,864 firms that employ a total of 592,172 unique workers over the period 2017-2024.

4 Empirical Strategy

Both the baseline payroll tax and the surcharge payroll tax is levied on the firm, while the surcharge applies only to specific workers depending on their annual wage with a given employer. To estimate the incidence of the surcharge, we start by presenting individual-level results where we look at wage costs and wages for workers below and above the cut-off at which the surcharge applies. Next, we assess whether firms pass through the additional labor cost to some or all their workers by comparing affected firm's total and net wage costs to less affected firms.

4.1 Individual-level Specification

To estimate the incidence of the surcharge on directly and indirectly affected workers, we compare wage developments over time for individuals just below and above the income threshold at which the tax applies. Specifically, we classify workers into three groups based on their minimum annual earnings over the three pre-reform years 2017–2019. The first earnings group USD 65,000–75,000 falls just below the surcharge threshold, while the two other groups, USD 75,000-85,000 and USD

[6]Since balance the sample since we use pre-covid years 2017-2019 to define firms' exposure to the reform, and thereby need to observe them at least over the years 2017-2023 (see Section 4 for details.

85,000-95,000 are above the threshold. [7]

We start by plotting average annual wages in levels (following Saez et al. (2019)) for the three earnings groups, before and after the surcharge was implemented. Next, we run the following difference-in-difference regression at the individual level:

$$Y_{it} = \sum_{g \in \{2,3\}} \beta_g \big(\mathbf{1}\{g_i = g\} \times \mathbf{1}\{t \geq 2023\} \big) + \alpha_i + \gamma_t + \lambda_g + \varepsilon_{it}. \tag{1}$$

where $Y_{i,t}$ is either annual net-of-tax wages, or annual gross wages (wages including payroll taxes). g denotes earnings groups, and group $g = 1$ (650–750) serves as the omitted category. The coefficients β_g therefore capture the differential change in wages after 2023 for workers in groups $g = 2$ and $g = 3$ relative to the omitted group, conditional on group and year fixed effects (λ_g and γ_t) and age squared ($a_{i,t}^2$).

Firm-level Specification For the firm-level analysis, we construct a yearly measure of each firm's total average payroll tax rate. Specifically, we compute firm j's average tax rate in year t, holding fixed its 2019 worker–wage composition:

$$\bar{\tau}_{j,t} = \sum_{i=1}^{N_{j,2019}} \omega_{i,2019} \tau_{z(i,k),w(i,j),t}, \tag{2}$$

where i indexes workers, $\tau_{z(i,j),w(i,j),t}$ is the payroll tax rate for a worker employed in plant k in tax zone $z(i,k)$ with total annual wage within the firm of $w(i,j)$, and $\omega_{i,2019}$ is the worker's share of firm j's 2019 wage bill and $N_{j,2019}$ is the total number of workers in firm j in 2019. Even though the reform was implemented in 2023, we fixed each firms worker composition to 2019 (and not a later year) to avoid capturing temporary distortions to firm size and employment structure induced by the COVID-19 pandemic.

Next, we measure each firm's expected exposure to the reform as the change in its average tax rate between 2019 and 2023:

$$\Delta \bar{\tau}_j^{exp} = \bar{\tau}_{j,2023} - \bar{\tau}_{j,2019}, \tag{3}$$

We then classify firms as treated or control depending on whether the $\Delta \bar{\tau}_j^{exp}$ is

[7] Earnings are deflated to 2023-NOK using the Grunnbeløp (G), the base amount in the Norwegian social security system. The Grunnbeløp is adjusted annually in line with general wage growth and serves as a benchmark for determining various benefits, contributions, and thresholds. After deflating, earnings are converted to USD (see footnote 2)

above or below the 66th percentile in the exposure distribution:[8]

$$\text{Treated}_j = \begin{cases} 1, & \text{if } \Delta\bar{\tau}_j^{\text{exp}} \geq \text{p}_{66}\left(\Delta\bar{\tau}_j^{\text{exp}}\right), \\ 0, & \text{if } \Delta\bar{\tau}_j^{\text{exp}} < \text{p}_{66}\left(\Delta\bar{\tau}_j^{\text{exp}}\right). \end{cases} \tag{4}$$

Table 1 shows descriptive statistics comparing treated and control firms. Treated firm experience, on average, an increase in their expected average payroll tax rate of 1.4 and 0.4 percent from baseline average tax rates of 13.9 and 13.2 percent. Treated firms have on average slightly fewer employees than control firms, but they pay higher average wages (which follows directly from the classification on treated firms). They also have significant higher high-skilled employment shares, where high-skilled is defined as having a Master's university degree or higher. Treated firms operate mainly within professional services, wholesale and retail trade and IT and communication services.

Table 1: Treated and Control Firms in 2019

	Treated Firms	Control Firms
Avg. tax rate	0.139	0.133
	(0.010)	(0.022)
Imputed change in avg. tax rate	0.016	0.005
	(0.005)	(0.003)
Annual net-of-tax wage	90,148	52,559
	(22,422)	(16,793)
Payroll tax bill	13,158	7,156
	(6,029)	(2,599)
Workers	67	82
	(173)	(195)
Higher education	0.33	0.17
Female	0.36	0.39
Age	41	39
Sector affiliation		
Professional services	0.315	0.181
Wholesale and retail trade	0.134	0.146
Manufacturing	0.058	0.164
Construction	0.043	0.106
IT and communication	0.156	0.064
Other	0.294	0.339
Number of firms	1,085	1,779

Notes: The table shows descriptive statistics for the sample of 2,864 firms in 2019. Firms are classified into treated and control firms based on equation 4. values are averages for the two groups of firms, measured in 2019. Standard deviations in parenthesis.

[8]Our results are robust to instead splitting firms by the median in the distribution: this attenuates both the tax increase exposure and responses by treatment relative to control firms.

Using the treatment indicator defined in equation 4, we run the following event study regression for the years 2017-2024:

$$\ln Y_{j,t} = \delta_0 \; + \sum_{t \neq 2022} \beta_t \left(\mathbf{1}\{t\} \times \text{Treated}_j \right) + \gamma_{s(j),r(j),t} + \Phi_{\mathbf{g}(j,2019),\,t} + \varepsilon_{j,t}, \qquad (5)$$

where $Y_{i,t}$ denotes the different outcomes of interest, including the firms average wage costs, net-of-tax wage costs, daily wage rate and employment. The indicator $Treated_j$ is defined in equation 4, $\gamma_{s(j),r(j),t}$ are fully interacted sector, region and year fixed effects.[9] Finally, $\Phi_{\mathbf{g}(j,2019),\,t}$ includes interactions of workforce-composition measures (share female, share with tertiary education, and average age — all measured in 2019) with year fixed effects to absorb differential time trends across firms with different workforce characteristics.[10] This is important because gender, education, and age composition are strongly correlated with both exposure to high-wage workers (and thus the tax change) and with wage and employment dynamics during the Covid-19 period. These controls ensure that the estimated effects are not driven by composition-specific trends, but by within-group variation in tax exposure.

The coefficients of interest, β_t, captures the development in the outcome in treated relative to control firms in year t relative to the base year 2019. Potential reform effect will be revealed by significant differences in β between treated and control firms in the post-reform years 2023 and 2024 and non-significant differences prior to the reform. All regressions are weighted by the number of workers in the firm in 2019.[11] Standard errors are clustered at the 2-digit Nace code times region level.

We additionally estimate the following difference-in-difference regression equation at the firm level:

$$\ln Y_{j,t} = \varphi_0 \; + \; \beta \; I(t \geq 2023) \times \text{Treated}_j + \gamma_{s(j),r(j),t} + \Phi_{\mathbf{g}(j,2019),\,t} + v_{j,t}, \qquad (6)$$

[9] We classify firms' sector by 2-digit Nace codes and region refers to 9-digit areas (landsdel) defined by Statistic Norway (see https://www.ssb.no/klass/klassifikasjoner/106).

[10] More specifically, we include deciles of the distributions 9 of firms' share of high educated workers, share of women, as well as mean worker age (all measured in 2019) and interact these deciles with year fixed effects.

[11] We winsorize the weighting variable at the 99th percentile to prevent placing too much weight on extremely large firms.

5 Results

Before turning to the individual-level results, it is useful to consider how firms reported they planned to respond to the surcharge. The survey reveals that only about 13 percent of firms believed it would apply to 2023 only, while roughly 35 percent expected it to remain in place for one to five years and around 18 percent anticipated a duration exceeding five years (see Appendix Figure A.2). Firms also varied in their responses on how they planned to adjust to the higher payroll tax. Appendix Figure A.3 shows that around 15% indicated they would reduce the wage growth of high-wage workers specifically, twice as many reported that they would adjust wage growth more broadly within the firm. Around 18% reported that they would not adjust wages. The survey responses should be interpreted with the caveat that firms may have answered strategically, as the survey was conducted while the future of the surcharge was still under political debate, creating an incentive for respondents to signal adjustments that could affect the reform's duration. Nevertheless, these stated plans provide useful background for interpreting the incidence results that follow.

5.1 Individual-Level Results

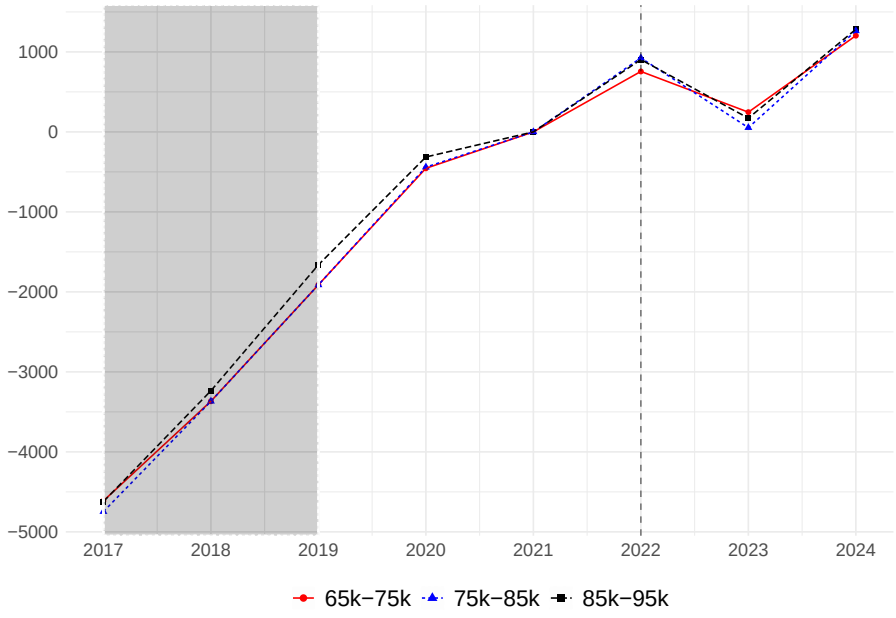
Figure 2 shows the development in earnings for workers just below and above the surcharge threshold. Panel A plots net-of-tax annual earnings for the three pre-reform wage groups, while Panel B shows the corresponding developments in gross annual earnings (including payroll taxes).

Before the reform, earnings evolve in a nearly parallel manner across the three groups. Between 2022 and 2023, when the surcharge came into effect, all groups experience a drop in real net earnings, consistent with the aggregate fall in real wages documented for this period.[12] Importantly, there is no visible divergence in wage growth around the USD 75,000 threshold. Workers in the two groups directly affected by the surcharge (USD 75k–85k and USD 85k–95k) do not exhibit sharper declines than those just below the threshold. Gross earnings display a similar pattern: all three groups follow parallel pre-trends, and there is no clear discontinuity at the point where the surcharge applies.

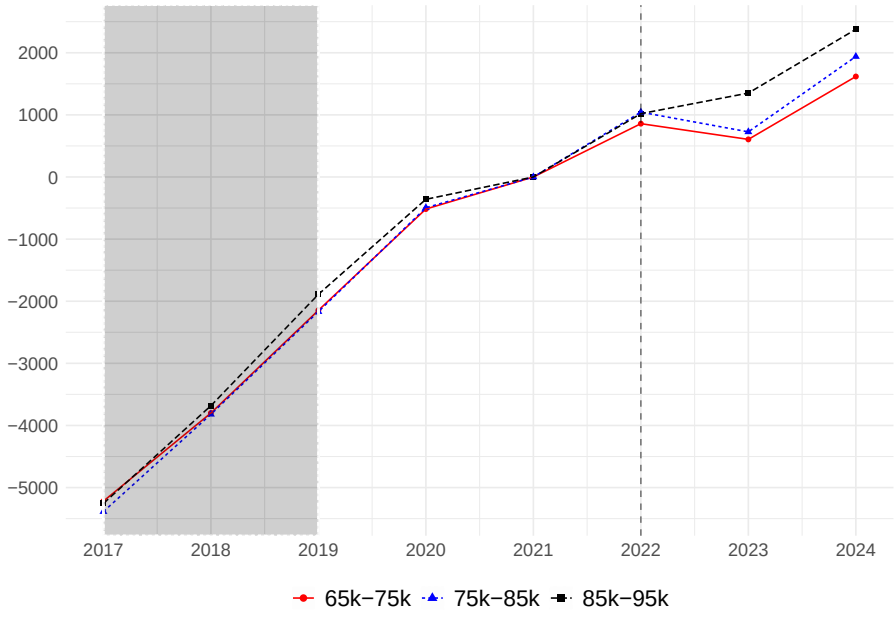
[12] Consumer prices rose faster than nominal wages in 2023, and the *Grunnbeløp* (used to deflate wages) increased by 6.4 percent compared with an estimated nominal wage growth of about 5.2 percent. Real wages therefore fell slightly on average, with the decline being more pronounced among high-income groups. See Statistics Norway (2024), "Venter reallønnsvekst i 2024" [Expecting real wage growth in 2024], available at: https://www.ssb.no/nasjonalregnskap-og-konjunkturer/konjunkturer/statistikk/konjunkturtendensene/artikler/venter-reallonnsvekst-i-2024

Figure 2: Net-of-Tax and Gross Annual Earnings by Earnings Group

(A) Net-of-Tax Annual Earnings



(B) Gross Annual Earnings



Notes: The figure plots average annual earnings for three baseline wage groups (USD 65,000–75,000; USD 75,000–85,000; and USD 85,000–95,000) defined by a worker's minimum earnings during the years 2017-2019 (gray shaded area). The sample consists of full-time workers employed at least 300 days in the year (see Section 3). Earnings are deflated and converted to USD. Net earnings are after employee tax; gross earnings include employer payroll taxes.

Table 2 reports the regression estimates from equation 1. We find no statistically significant difference in net-of-tax wage growth between workers just above and just below the surcharge threshold. In contrast, gross wages increase for the two higher-income groups relative to the group below the threshold in the two years following the implementation of the surcharge. The point estimate for the highest group implies that gross wages rose by roughly USD 700, meaning that high-wage individuals became more expensive to employ.

This pattern rejects the prediction of the canonical competitive model, which would imply a kink or discrete drop in wage growth exactly at the threshold where the surcharge applies. Instead, the results suggest that firms did not adjust wages selectively at the individual margin. Rather, firms may have shifted the additional tax burden broadly across workers or adjusted along other margins. These worker-level findings motivate the firm-level analysis in the next section, where we examine whether the incidence of the surcharge is borne by all workers in the affected firms, or if firms adjust in other ways.

Table 2: Worker-Level Incidence Around the Surcharge Threshold

	(1) Net Wages	(2) Gross Wages
Group (USD 75k–85k) × Post	-52.6	248.2*
	(127.4)	(148.6)
Group (USD 85k–95k) × Post	-59.2	701.6***
	(137.4)	(160.3)
Observations	310,656	310,656

Notes: The table reports estimates from equation (1) for the sample of full-time workers employed at least 300 days in the year. Effects are reported for workers with baseline earnings USD 75,000–85,000 and USD 85,000–95,000 relative to workers with baseline earnings of USD 65,000–75,000 (defined by a worker's minimum earnings during the years 2017-2019). Earnings are deflated to 2023 NOK using the Norwegian Social Security base amount (Grunnbeløpet). Net wages are after employee tax; gross wages include employer payroll taxes. Standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$

5.2 Firm-Level Results

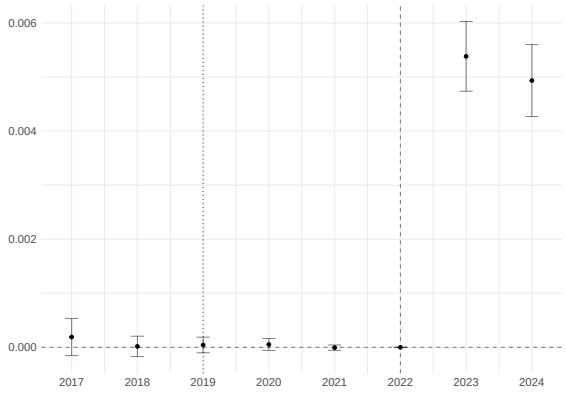
Our individual level results contradict the predictions from a the standard competitive incidence model. The payroll tax surcharge does not lead to decreased wages among the directly affected high-wage workers relative to lower-wage workers. Instead the surcharge leads to increased labor costs to firms, which may either be passed onto

all the workers in the firm, or lead to a reduction in the hiring of high-wage workers.

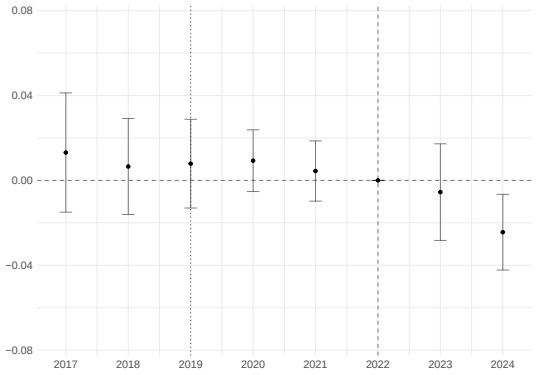
Figures 3–4 show how firms adjusted wages and employment following the introduction of the surcharge by reporting the estimates of β_t from regression equation 4. Panel A of Figure 3 shows the increase in the average payroll tax rate in treated relative to control firms over time. Following the reform, the average tax increased by around half a percentage point in the treated firms. Panels B and C show the average net-of-tax annual earnings and gross annual earnings (earnings inclusive of the payroll tax) in treated relative to control firms over time. Before the reform, the treated and control firms follow nearly parallel trends, while following the surcharge, average net-of-tax earnings falls by around 2.5% in treated relative to control firms. Gross annual earnings (earnings inclusive of the payroll tax) also falls slightly, indicating that firms adjust wages or their workforce composition such a way that total labor costs does not increase–or even decreases slightly.

Figure 3: Firm Level Effects on the Average Payroll Tax Rate Over Time

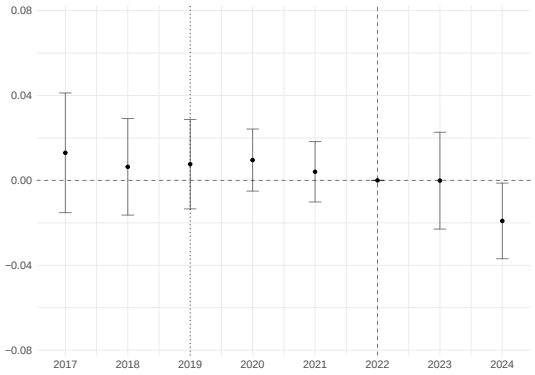
(A) Average Payroll Tax Rate



(B) Net-of-Tax Annual Earnings



(C) Gross Annual Earnings



Notes: The figure plots difference-in-differences estimates of β_t from equation 5, capturing the effect of the surcharge on the firms' average payroll tax rate (panel A), average net-of-tax earnings (panel B) and average gross annual earnings (panel C). Net earnings are after the employer payroll tax; gross earnings include employer payroll taxes. All outcome variables are in logs. Treated firms are defined in equation 3. The regression include firm fixed effects, sector–region–year fixed effects, and interactions of 2019 workforce composition with year fixed effects. Standard errors are clustered at the interacted 2-digit sector and region level.

Table 3 shows the regression estimates of equation 6 for the outcomes reported in Figure 3. The reported coefficient is the interaction between the treatment and the post-reform indicator. Results are estimated for the years 2019-2024.[13] The table confirms the results Figure 3: firms adjust wages or workforce composition in such a way that average labor costs (gross wages) fall.

[13]Results are robust to include two further pre-reform years 2017-2018.

Table 3: Firm-Level Effects on Net and Gross Wages

	(1) Net-of-tax Earnings	(2) Gross Earnings
$Post \times Treat$	-0.020***	-0.015**
	(0.008)	(0.008)
Observations	17,184	17,184

Notes: The table reports estimates of equation 6 for average net-of-tax earnings and gross earnings at the firm level. The reported coefficient is the interaction between the treatment and the post-reform indicator. Net earnings are after the employer payroll tax; gross earnings include employer payroll taxes. Results are estimated on a balanced sample of firms for the years 2019-2024. Standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$

To assess whether firms changed their hiring strategy in response to the increased tax burden, Figure 4 present results on employment and hiring in treated relative to control firms over time. Panel A shows that treated and control firms display relatively similar trends in employment leading up to the reform. After the reform, however, the treated firms seem to increase employment relative to control firms: By 2024, employment increases by around 3% in treated relative to control firms (although the effect is imprecisely estimated). Panels B-C further decomposes the change in employment into changes in hiring and hiring of low-wage workers as a share of firms' total employment. Low-wage workers are defined as workers with total annual earnings below the threshold at which the surcharge applies in 2023; USD 75,000. The results show that treated firms decrease their hiring by around 2.8% (as a share of total employment). Hiring of low-wage workers increase by around 3%, indicating a slight reduction in the hiring of high-wage workers. Corresponding regression estimates of regression equation 6 are reported in Table A.1 in the Appendix.

Overall, we find that average gross wages in the treated firms fall by 1.5% (3, column 2), while employment increases by 1.2% (Table A.1, column 2) , indicating that firms adjust such that total labor costs are unaffected by the tax reform.

Figure 4: Firm Level Effects on Employment and Hiring Over Time



Notes: The figure plots difference-in-differences estimates of β_t from equation 5, capturing the effect of the surcharge on the firms employment (panel A), and hiring of high- and low-wage workers (panels B and C). High- and low wage workers are defined as workers with total annual earnings above/below the threshold at which the surcharge applies in 2023; USD 75,000. Hiring is measured as a share of total employment in the firm. Treated firms are defined in equation 3. The regression include firm fixed effects, sector–region–year fixed effects, and interactions of 2019 workforce composition with year fixed effects. Standard errors are clustered at the interacted 2-digit sector and region level.

5.3 Individual-Level Wage Responses to Firms' Increased Tax Burden

Section 5.2 shows a reduction in both net and gross average earnings at the treated relative to control firms following the reform. This results is accompanied by a change in the composition of the treated firms' work force relative to that of control firms: they hire to a larger extend low-wage workers and to a lesser extent high-wage workers. This change in firm composition may explain the reduction in average

earnings in the treated firms following the reform. To confirm this, we do an individual level analysis that traces earnings among workers in the treated and control firms that stay in the firm into the post-reform period.

We create a sample of workers employed in the balanced firm-level sample of treated and control firms (as in Figures 3-4). We consider workers that were employed by the same firm throughout the sample period (stayers), and further restrict the sample to full-time workers employed at least 300 days of the years. By only considering earnings among these workers, we are able to isolate a firm's shifting of the increased tax burden onto workers' earnings from changes in average firm earnings due to compositional changes in the firm's work force.

The results are presented in Table 4, and with corresponding event studies presented in Appendix figure A.4. Column (1) reveals that net-of-tax earnings of stayers are unaffected following the reform. Gross earnings of stayers, on the other hand, increase by around 1%, indicating that the labor costs of incumbent (staying) workers increased in the treated firms. These findings confirm the findings from section 5.2 that the increased payroll tax burden is born by the affected firms, and that they adjust by substituting away from high-wage and towards low-wage workers.

Table 4: Earnings Responses Among Stayers to Firms' Increased Tax Burden

	(1) Net-of-Tax Earnings	(2) Gross Earnings
$Post \times Treat$	0.002	0.009***
	(0.004)	(0.004)
Observations	246,408	246,408

Notes: The table reports estimates of equation 6 for individual net-of-tax earnings (Column (1)) and gross earnings (Column (2)). Net earnings are after the employer payroll tax tax; gross earnings include employer payroll taxes. The reported coefficient is the interaction between the treatment and the post-reform indicators. We augment the regression with worker fixed effects and a quadratic function of age. The sample consists of workers employed in the balanced sample of treated and control firms (as in Figures 3-4). We consider workers that were employed by the same firm throughout the sample period (stayers), and further restrict the sample to full-time workers employed at least 300 days of the years. Estimates are reported for the time period 2019-2024. Standard errors, clustered at the interacted 2-digit sector and region level, in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$

6 A Theoretical Interpretation of the Results

To help interpret our empirical findings, we outline a simple framework that captures two central features of the Norwegian labor market: (i) coordinated wage setting and internal pay-equity norms, which make incumbent wages downward rigid, and (ii) flexible adjustment on hiring margins. The framework clarifies why we observe no wage effects for incumbents but clear composition effects in firms' hiring behavior.

Environment

Let w denote the contract wage (net-of-payroll tax wage). Workers with $w \leq w_s$ are classified as low-wage labor (L_L), and those with $w > w_s$ as high-wage labor (L_H). Output is produced according to

$$Y = F(L_H, L_L),$$

where F is neoclassical, and the elasticity of substitution σ governs how easily firms can substitute between high- and low-wage labor.

Before the reform, all labor is taxed at rate τ. After the reform, wages above w_s face an additional surcharge s, so labor costs become

$$(1+\tau)w \quad \text{for } w \leq w_s,$$

$$(1+\tau)w_s + (1+\tau+s)(w-w_s) \quad \text{for } w > w_s.$$

The surcharge, therefore, raises the relative price of employing high-wage labor.

Benchmark with Fully Flexible Wages

In a standard competitive model with fully flexible wages, the incidence of a payroll tax depends on the elasticity of labor demand and supply. Because σ determines how easily firms can substitute between L_H and L_L, it directly affects the demand elasticity for high-wage labor and, therefore, the pass-through of the surcharge. The share of a small tax increase shifted onto high-wage workers is

$$\theta_H = \frac{|\varepsilon_H^D|}{|\varepsilon_H^D| + \varepsilon_H^S},$$

where $|\varepsilon_H^D|$ is increasing in σ. With flexible wages, the surcharge would therefore reduce the wages of all high-wage workers in proportion to θ_H—a prediction that is strongly rejected by our empirical results.

Wage Rigidity and Hiring Flexibility

Consider two periods: pre-reform ($t = 0$) and post-reform ($t = 1$). Let $\bar{L}_H$ and $\bar{L}_L$ denote the high- and low-wage workers who remain in the firm after the reform (incumbents). In line with coordinated bargaining, incumbent wages are downwardly rigid:

$$w_H^I = \bar{w}_H, \qquad w_L^I = \bar{w}_L.$$

To maintain production, the firm hires new workers:

$$L_H = \bar{L}_H + M_H, \qquad L_L = \bar{L}_L + M_L,$$

where (M_H, M_L) are high- and low-wage hires whose wages adjust flexibly.

Because the surcharge raises the relative cost of high-wage labor, firms substitute toward low-wage labor. With incumbent labor fixed, substitution occurs entirely through hiring decisions:

$$M_H \downarrow, \qquad M_L \uparrow .$$

Here, the elasticity of substitution σ plays a different role than in the flexible-wage benchmark: instead of determining wage incidence, it determines how easily firms can replace high-wage workers with low-wage workers when relative labor costs change.

This simple framework matches the empirical patterns we document. When the institutional environment makes downward wage adjustments difficult, firms respond to a payroll surcharge on the hiring margin, substituting toward lower-wage labor as the relative cost of high-wage labor increases.

7 Conclusion

This paper examines the incidence of a temporary five percentage points surcharge on the Norwegian employer payroll tax applied to earnings above an income threshold. Using comprehensive employer–employee data, we provide new evidence on how payroll tax incidence operates in a labor market characterized by coordinated wage setting, strong pay-equity norms, and limited downward wage flexibility.

We employ different empirical designs, and a consistent pattern emerges. First, Earnings of the workers directly targeted by the surcharge did not fall relative to those just below the threshold, even though these workers became more expensive to employ. Both graphical evidence and regression estimates show no reduction in net-of-tax earnings for high earners, contradicting the predictions of the standard competitive incidence model.

Second, at the firm level, we observe that wage growth in highly exposed firms is lower than in firms with a low share of high-wage workers. This may indicate some degree of tax shifting from firms to workers on a more general basis—that is, affecting both low- and high-paid workers. Such a finding would be in line with the findings in Saez et al. (2019). However, when we track earnings of individual incumbent workers that stay in the highly exposed firms into the post-reform period, we find no indications of lower wage growth compared to among similar workers in the less exposed firms. This indicates that the negative effect on wage growth in treated firms originates from hiring margins rather than from wage adjustments for incumbents.

In line with this finding, we confirm that highly exposed firms modestly increase total employment while shifting their recruitment toward lower-wage workers, thereby reducing their payroll tax exposure through workforce composition rather than through wage-setting responses. We argue that this mechanism is consistent with the institutional environment: coordinated bargaining and internal equity norms constrain wage reductions for incumbent workers, while hiring decisions allow firms to substitute away from high-cost labor when relative prices change.

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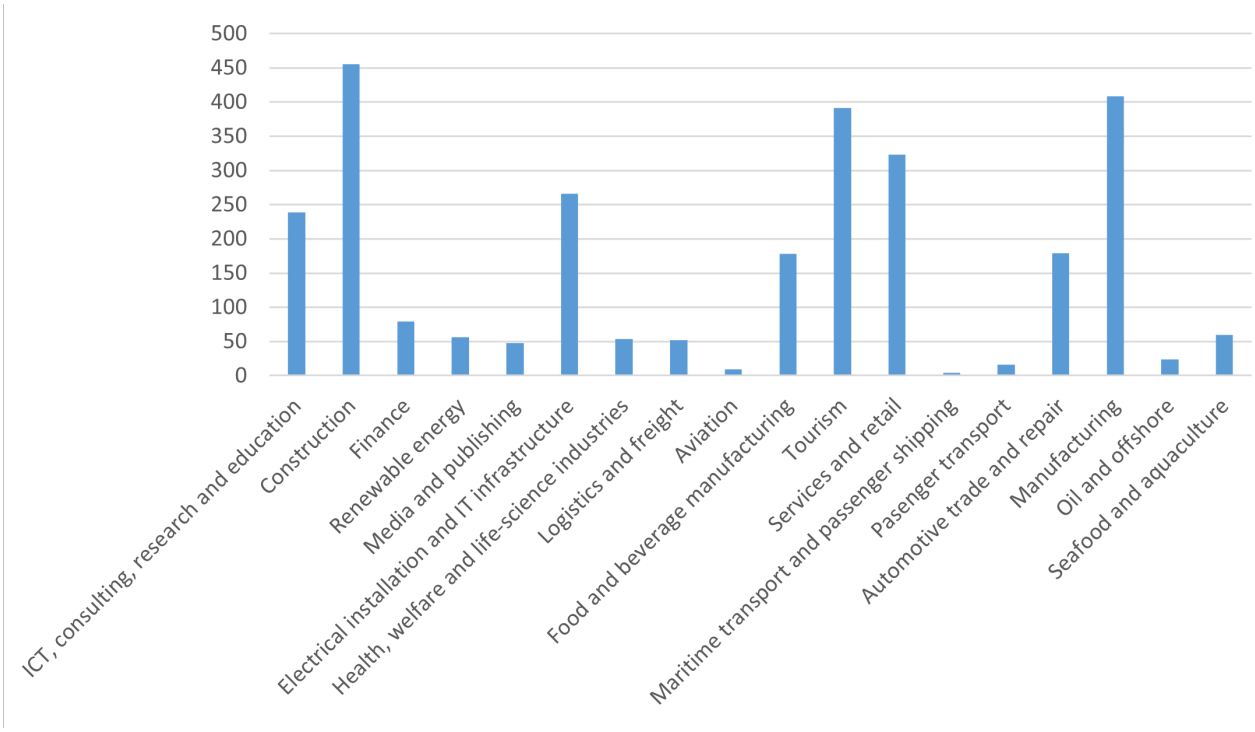
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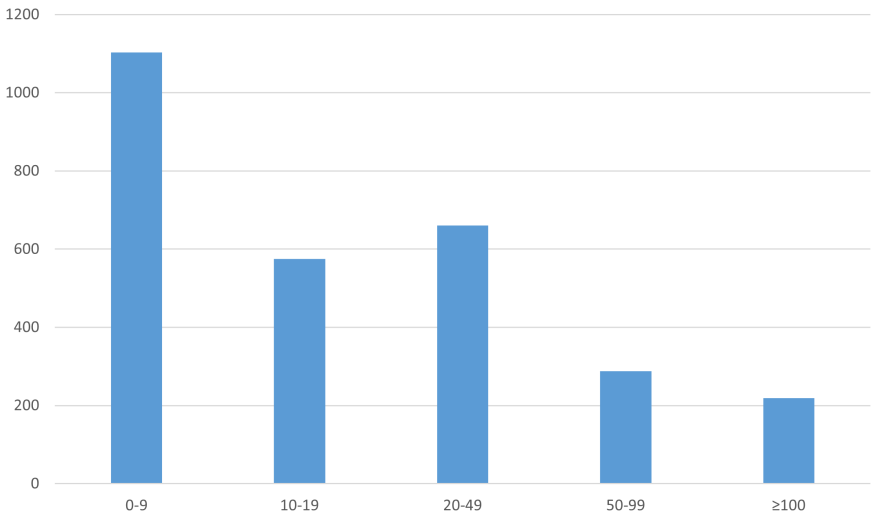
Appendix A Additional Tables and Figures

Figure A.1: Survey Sample Descriptive Statistics

Panel A: Sector composition



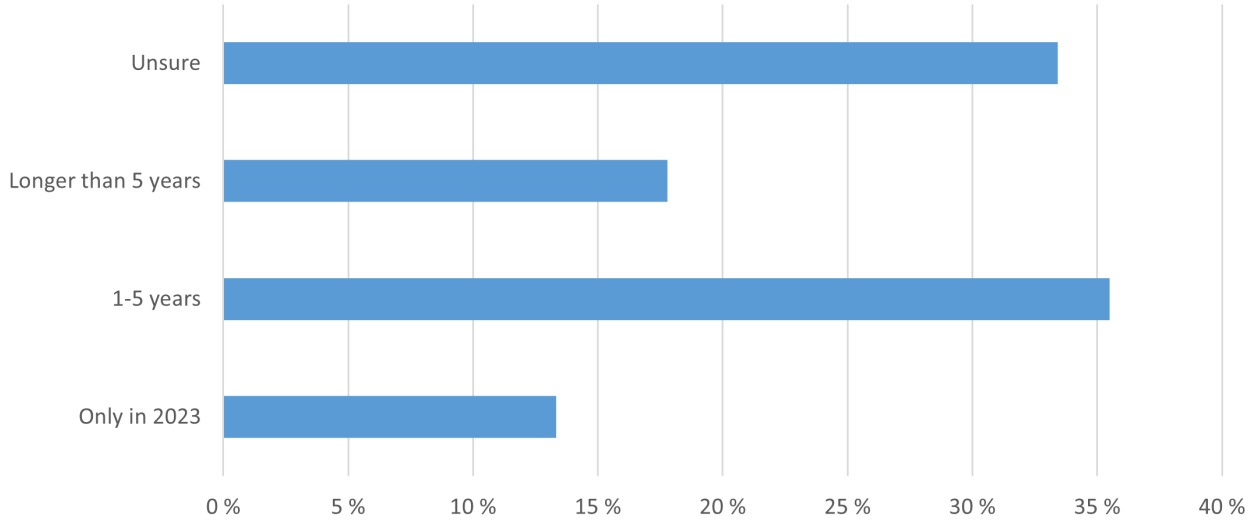
Panel B: Firm Size



Notes: The figure shows results form the survey conducted jointly with NHO in August-September 2023 with 2,846 firm respondents.

Figure A.2: Expected Duration of the Surcharge Payroll Tax

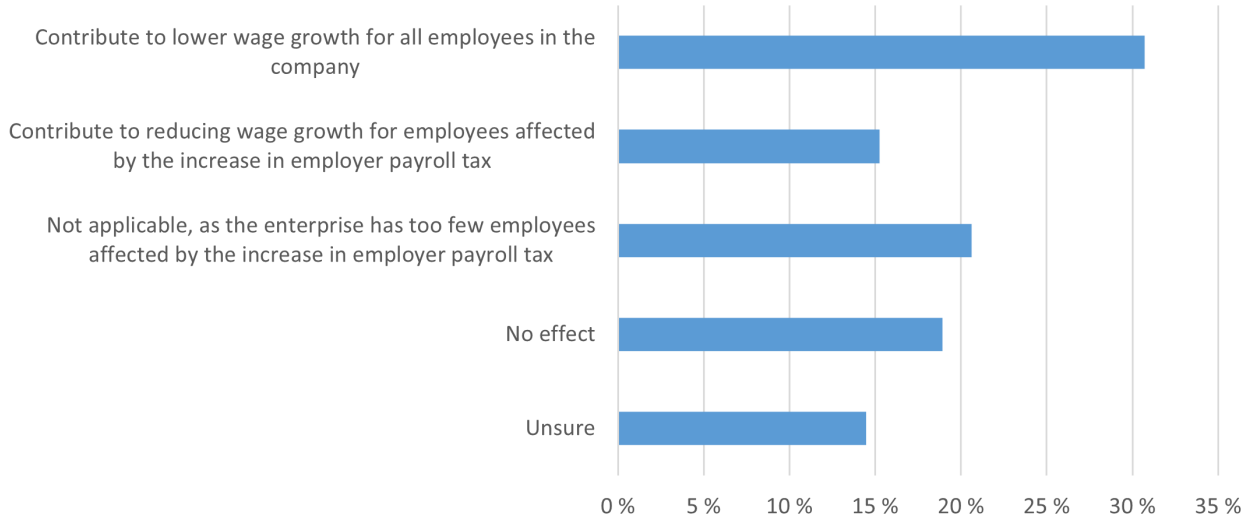
Q1: As of January 1, 2023, an additional employer payroll tax of 5 percent must be paid on income exceeding NOK 750,000. How long do you think this increased employer payroll tax will remain in effect?



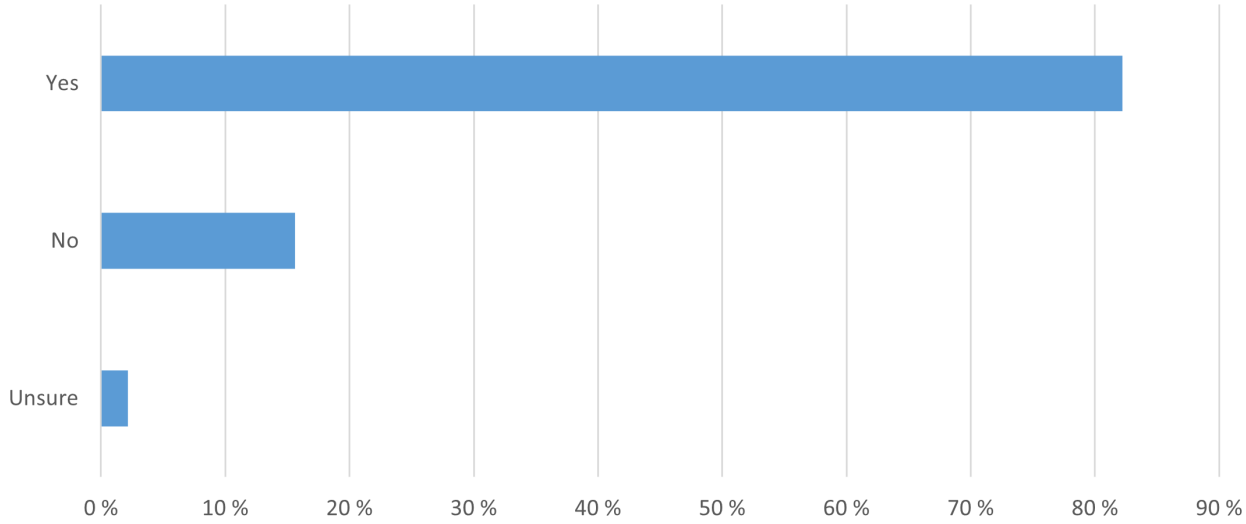
Notes: The figure shows results form the survey conducted jointly with NHO. 2,846 firms responded to Q2 and 2,259 responded to Q2.

Figure A.3: Incidence and Relevance

Q2: How will the increase in employer payroll tax affect wage setting in the company?



Q3: Do you have employees with salaries above NOK 750,000 that result in your company having to pay the increased employer payroll tax?



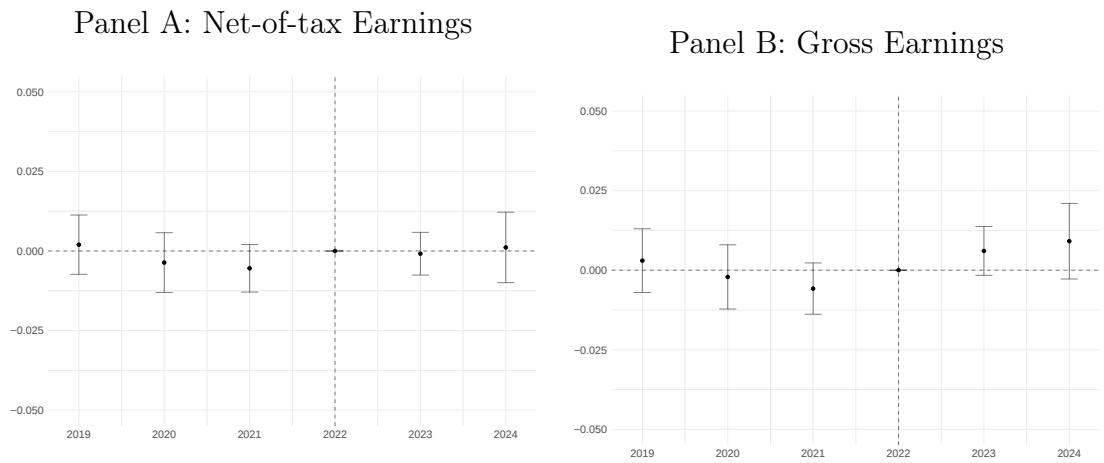
Notes: The figure shows results form the survey conducted jointly with NHO in August-September 2023. 2,846 firms responded to Q2 and 2,259 responded to Q3.

Table A.1: Firm-Level Effects on Employment and Hiring

	(1) Employment	(2) Hires	(3) Low Wage hires
$Post \times Treat$	0.012	0.012	0.015*
	(0.025)	(0.008)	(0.008)
Observations	17,184	17,184	17,184

Notes: The table reports estimates of equation 6 for average net-of-tax wage and gross wage at the firm level. The reported coefficient is the interaction between the treatment and the post-reform indicator. Net wages are after employee tax; gross wages include employer payroll taxes. Results are estimated on a balanced sample of firms for the years 2019-2024. Standard errors in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$

Figure A.4: Wage Responses Among Stayers to Firms' Increased Tax Burden over Time



Notes: The table reports estimates of β_t in equation 5 for net-of-tax earnings and gross earnings estimated at the worker level. Net earnings are after the employer payroll tax tax; gross earnings include employer payroll taxes. We augment the regression with worker fixed effects and a quadratic function of age. The sample consists of workers employed in the balanced sample of treated and control firms (as in Figures 3-4). We consider workers that were employed by the same firm throughout the sample period (stayers), and further restrict the sample to full-time workers employed at least 300 days of the years. Estimates are reported for the time period 2019-2024. Standard errors are clustered at the interacted 2-digit sector and region level.