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IZA DP No. 17704

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ABSTRACT

Why Firms Lay Off Workers Instead of Cutting Wages: Evidence from Linked Survey-Administrative Data*

We use a novel large-scale survey of firms, implemented in Denmark in 2021 and linked to administrative data, to study why firms lay off workers instead of cutting wages. Our questions on layoffs, wage cuts, and the link between them provide new insights into firms' strategies for adjusting labor in response to adverse shocks. We find that layoffs are more prevalent than wage cuts, but wage cuts are not rare in firms experiencing revenue reduction and were used by 15% of such firms. Employers are hesitant to cut wages in many instances because they see wage cuts as a poor substitute for layoffs. First, firms report that lowering wages triggers costs through the impact on morale and quits. Comparing these costs with potential savings from wage cuts, most employers in the survey agree that a wage reduction would not have saved jobs. Second, firms report that a crisis is an opportune time for layoffs because of lower opportunity costs of restructuring and because layoffs during a crisis are perceived by workers as more fair. We find that firms that report such opportunistic layoffs are less likely to implement wage cuts.

JEL Classification: D22, J30, J63, J23
Keywords: wage rigidity, layoffs

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1 Introduction

During economic crises, firms usually lay off many workers. The subsequent search and matching process is costly both for firms and workers. Why do firms not cut wages instead of laying off workers? Answering this question requires an analysis of cost-benefit considerations on both the pay cut and the layoff margins. However, the evidence from surveys that jointly accounts for pay cuts and layoffs is scarce. Much of the existing survey literature, with a notable exception of Bewley (1999), has emphasized why wages rarely fall, focusing on wage rigidity that is presumed to result in inefficient layoffs.[1]

In this paper, we study why firms do not cut wages instead of laying off workers. To do so, we design and implement a large-scale survey of firms in which we jointly study layoffs and pay cuts. We ask firms *how* they adjust their labor costs during an economic crisis—through layoffs or pay cuts— and *why*—the firms' considerations on the layoff and pay cut margins. We fielded our survey in summer 2021 to the entire population of Danish private firms and linked the survey to administrative data to assess how firm-specific characteristics and economic conditions correlate with labor cost adjustment strategies. Our resulting data set contains information on 3,013 firms and is a representative sample of the population of Danish firms with 5 or more employees. We limit our sample to the responses from the firms' representatives who are knowledgeable about the human resources policy of the firm.

To answer the question in the title of our paper—why layoffs instead of wage cuts—we find that most firms are able to cut wages but often choose not to. Wage cuts appear not to be a good strategy in many instances because there are costs associated with the cuts and because firms want to get rid of some workers or jobs.

Specifically, we find that, when faced with an adverse shock, more firms adjusted the number of employees than worker pay. However, pay cuts are not rare in firms that experience economic distress. Among the firms that experienced a revenue reduction in 2020, 29% used some form of pay cut (15% cut the wage, 19% cut bonuses or other pay). We confirm this finding in the administrative data, finding that approximately 20% of job-stayers experienced a nominal wage cut in 2020 at the worker-occupation-firm level.

To understand the costs and benefits of each adjustment margin, we asked firms about their considerations in choosing pay cut visa-vi layoffs. We find that the key considerations on the pay cut margin are the negative effect on morale and fear of quits. Furthermore, if a firm cuts pay, the pay cut is generally widespread, affecting more than 60% of workers in 55% of firms that implemented a pay cut. This suggests that a wage agreement between a

[1] See Blinder and Choi (1990), Levine (1993), Campbell and Kamlani (1997).

worker and a firm is of a multilateral nature, whereby the pay and incentives of the entire firm's workforce are interconnected.

In contrast, we find that firms agree that layoffs are implemented selectively and give better control over who leaves. Firms do not perceive that there are substantial negative consequences of layoffs on the remaining employees. We find that employers' key concerns on the layoff margin are overwhelmingly about avoiding workers' skill loss (90% firms agree) or being unable to hire a suitable replacement quickly (75% firms agree).

We conclude that the potential negative productivity effects of pay cuts on the entire firm workforce could outweigh savings from pay cuts. However, in the case of layoffs, any negative effects are tied to the workers who leave, and the broad firm workforce effects are much less of a concern.

Next, we provide some more direct evidence why firms lay off workers instead of cutting wages. First, when asked directly why lay off workers instead of cutting wages, firms strongly agree with the sentiments that (i) wage reductions would not have saved jobs, (ii) wage reductions hurt morale and productivity more, and (iii) layoffs save more money than wage reductions.

Second, we find that layoffs in a crisis occur for various reasons and are not necessarily due to contemporaneous financial difficulties. Specifically, 41% of firms in our survey reported reduced sales and financial difficulties as a reason for layoffs during the pandemic crisis. The rest of the firms indicated reorganization, efficiency improvements, or laying off employees who were highly paid relative to their productivity or low-performing employees. We find that recessions are an opportune time for layoffs: more than 50% of firms indicate that at least thirty percent of the layoffs would have occurred in the following two years even without the crisis, and 24% of firms indicate that all layoffs would have occurred. Layoffs occurring in recessions are consistent with reorganization theories in which the opportunity costs of reorganization are lower during recessions (Koenders and Rogerson (2005)). It is also consistent with the conclusions of the literature on fairness that finds that layoffs are easier justifiable, and, therefore, fairer, when there is a reduction in product demand, e.g., "bad times for all" (Charness and Levine (2000), Kuhn and Osaki (2022)).

More importantly, opportunistic layoffs in a crisis are less elastic to pay cuts. Specifically, we find that the firms that indicate other than the financial difficulties reasons for their permanent layoffs are less likely to implement pay cuts and more likely to agree with the statement that pay cut would not save jobs.

Finally, when asked directly what reduction in total pay cost could have prevented layoffs, 61% of firms was unable to provide a quantitative answer, suggesting that the pay cut is not

a consideration on the layoff margin for these firms. The fraction was higher among firms that implemented opportunistic layoffs or had positive revenue growth.

In summary, our study offers systematic evidence that pay cuts do occur in firms with negative revenue growth and that they are not more prevalent because costs from pay cuts outweigh savings from them or because layoffs have low elasticity to pay cuts.[2] Simply put, not observing wage cuts does not necessarily imply that wages cannot be cut or that layoffs are inefficient. Conceivably, some pay cuts might save some layoffs. More research is needed to quantify how and why firms adjust labor input, both in hiring and firing margins.

Our findings have implications for a central question in macroeconomics—the sources of employment fluctuations. Wage rigidity has long been considered a main source of employment fluctuations (Keynes (1936)). Our findings suggest that wage rigidity is unlikely the key reason behind employment fluctuations on the separation margin.[3]

To our knowledge, we are the first to conduct a large-scale survey of a representative sample of firms to study how and why firms adjust labor input and compensation. Our data collection procedure (the sampling frame, the sampling method and the survey scale) differs from previous surveys that tend to be small- or medium-scale and collected without systematic sampling. Our paper is related to the empirical literature on why wages do not fall cited above and throughout the paper as well as to the literature on how firms adjust labor input in response to shocks (Babeckỳ, Du Caju, Kosma, Lawless, Messina and Rõõm (2012), Bertola, Dabusinskas, Hoeberichts, Izquierdo, Kwapil, Montornès and Radowski (2012), Du Caju, Kosma, Lawless, Messina and Room (2015), Izquierdo, Jimeno, Kosma, Lamo, Millard, Room and Viviano (2017), Carlsson, Messina and Skans (2021), Maibom and Vejlin (2023)). In contrast to most existing work, we study both margins of labor adjustment —-pay cuts and layoffs. Such a dual focus allows recognizing that the observation that wages do not fall does not necessarily imply that wages are rigid.

Our findings that firms cut wages while in distress are consistent with Bewley (1999), the findings from administrative data reviewed by Elsby and Solon (2019), and our meta-analysis on wage cuts for job-stayers.

Our paper complements the evidence on understanding the seeming lack of wage adjustments by examining the employer's perspective. Davis and Krolikowski (2025) conduct an innovative survey of the unemployed workers and find that discussions about pay cuts in lieu

[2]Our findings reinforce the point made in Bewley (1999), "I believed that an individual firm could save a significant number of jobs by cutting pay, which is rarely true. The firms for which it is true are the most likely to cut pay." It is eloquently summarized by Elsby and Solon (2019) that short-term wage stickiness need not induce inefficient allocation decisions.

[3]See Bils (1985), Kudlyak (2014), Basu and House (2016) for empirical investigations of wage rigidity on the hiring margin.

of layoffs are rare, even though most of the laid off respondents express some willingness to accept a pay cut to save their jobs. Bewley (2007) finds that it is predominantly employers and not employees who oppose wage cuts.[4]

The remainder of the paper is structured as follows. Section 2 describes our survey and the resulting dataset. Section 3 documents how firms adjusted labor costs during the 2020 crisis. Section 4 studies employers' considerations on the pay cut margin and Section 5 studies employers' considerations on the layoff margin. Section 6 provides some more direct evidence why firms lay off workers instead of cutting wages. Section 7 concludes.

2 Linked Firm Survey-Administrative Data

This section describes the design and implementation of our firm survey, outlines the construction of the linked survey-administrative dataset, and provides a description of the data used in the analysis. We end by providing some background on the Danish labor market.

2.1 Our Survey

To conduct the survey, we recruited a consulting firm Ramboll that sent the survey invitation emails to the entire population of Danish firms in the database exported on May 2021 from Bisnode Denmark (see Figure A.1 for the invitation letter).[5] Ramboll used the firms' official email addresses on file (called *e-boks*), which are mandatory to receive digital mail from the authorities. The invitation letter stipulated an incentive for the respondents in the form of an anonymized bench-marked report. The survey closed at the beginning of August 2021. For context, the late spring and the beginning of summer 2021 was a period when the world and the Danish economy were on the recovery track from the pandemic crisis. The respondents were asked to complete the survey online.[6]

The questionnaire starts with background questions about the person who completes the survey on behalf of the firm and the characteristics of the firm. The main part of the questionnaire asks whether and how the firms adjusted workers' pay and the number of employees in 2020, and the reasons, perceptions, and attitudes towards layoffs and pay cuts.[7] Appendix A contains the questionnaire in English.

[4]Our findings are useful for an active theoretical literature on inefficient layoffs and (the lack of) wage adjustments (e.g., Gottfries (1992), Thomas and Worrall (1988), Elsby, Gottfries, Krolikowski and Solon (2024), Blanco, Drenik, Moser and Zaratiegui (2024)).

[5]Therefore, the firms that shut down before May 2021 (for example, in 2020) are not in our sample frame.

[6]Online surveys give respondents more flexibility to complete the survey (Stantcheva, 2023).

[7]In the analysis, we use responses to the first 35 questions to our survey. The entire questionnaire is longer, as it contains questions on the wage policy of the firms and the hiring policy that are analyzed in Bertheau and Hoeck (2023) and Bertheau, Larsen and Zhao (2023a).

We link the survey responses to the administrative data on firms' financial accounts from the General Firm Statistics (FIRM, *Generel firmastatistik*) from 2019, using firm-level identifiers and restrict the sample to firms with at least five employees in 2019. As a result, our target population is all firms with at least five employees in 2019.[8]

The response rate of the survey for the target population is 11.73%, which corresponds to 3,443 firms.[9] A frequent concern with surveys is whether respondents have knowledge about key issues in the survey and are able to provide informed responses to the questions. To ensure that the person who completed the survey on behalf of the firm had sufficient knowledge of the firm's layoff and pay policy, we ask "In the following questions, we ask about pay and employment practices. How close are you to such decisions?" We deleted from the analysis the responses where the respondent checked "I only know a little about pay and employment practices."[10] Additionally, we link the survey responses with administrative data on the size of the firm and the change in revenue between 2019 and 2020. We find that the responses to the survey are similar to the corresponding information in the administrative data for these questions (see Figures A.2 and A.3), suggesting that respondents know the economic situation of the firm well.

We remove firm observations with at least 10 missing answers to key questions on layoffs and pay cuts, or responses with straightforwardly contradictory information.[11] As a result of these restrictions, our sample shrinks from $3,443$ to $3,013$ firms (see Table A.1).

2.2 Administrative Data on Firms and Workers

We link our survey data to additional datasets using firm-level identifiers. Most of the data sets are administrative registers. The FIRM data set above contains annual financial statements for most firms. From FIRM, we use data on revenue, labor costs, capital stock (the value of fixed assets), and value added (defined as revenue minus intermediate costs), as well as non-financial information, such as the number of employees, the number of years in business, location, and industry codes.

We complement our survey data with the data on individual worker wages and hours from the administrative records from the worker-level data in the BFL (*Detaljeret lønmodtagerdata fra e-Indkomst*) and from the mandatory firm survey of worker earnings, hours and their components, LONN (*Lønstatistikken*).

[8] Consequently, the firms created after 2019 are excluded.

[9] Scur, Sadun, Van Reenen, Lemos and Bloom (2021) report the response rates in the recent surveys of 0.1-13%.

[10] Our results are similar without this sample restriction.

[11] An example is a reply "None of the above" combined with other options in response to questions that ask to "Check all that apply".

We also obtain a dataset on wage floors at the industry-occupation level from the employer association, Dansk Arbejdsgiverforening (DA), which we use to construct the firm-level indicator for the firm being subject to wage floors. The administrative data on vacancies and unemployment, which we use to construct the firm-level labor market tightness indicator, are from the Ministry of Employment (STAR). Appendix Table A.2 provides further information on the datasets and variables from Statistics Denmark, which we use in the analysis.

2.3 Sample Description and Data Quality Checks

Table 1 reports the means of the main variables. Panel "Firm characteristics", column 1 shows the statistics from the target population, and column 2 — from the survey sample ("Unweighted sample"). Although the means in columns 2 and 1 are similar, in column 3 we report the means of the variables in the re-weighted sample that we construct. We re-weigh our sample using weights that we construct from the administrative data to give more weight to firms that are underrepresented in the sample. We use entropy-balancing weighting to produce the weights (Hainmueller, 2012). The weights target the average size of a firm by the number of employees and the percentage of firms in the manufacturing, services and other sectors. We use these weights throughout our analysis.

Our unweighted sample somewhat overrepresents larger (47 vs 39 employees), older (19 vs 17) and more productive firms. The characteristics of the firms' workforce are mostly balanced. After we apply the weights, the differences between the variable means in columns 1 and 3 are small. The panel "Employee characteristics" in Table 1 summarizes the characteristics of the firm workforce. In total, Table 1 shows that our sample is a broadly representative sample of the population of Danish companies with at least 5 employees.

Some of our survey questions are conditional on negative revenue change in 2020, or on the use of a different labor adjustment approach. In our sample, 845 firms reported a revenue reduction in 2020; Table A.3 contains summary statistics for this sample. Furthermore, 1,129 firms reported layoffs (either permanent, temporary, or furloughs), 651 reported revenue reduction and no wage reductions, and 693 reported revenue reduction and no bonus cuts.

Comparing our survey data with existing surveys reveals that our study is the first to use a large-scale survey from a representative sample of firms to study both how and why firms adjust labor input and compensation. Table A.4 shows that our sample is much larger than the survey samples used in existing studies and the average firm size is closer to the average firm size in the economy. For example, Kaufman (1984) focuses on small firms, with a median size of 7 employees; Campbell and Kamlani (1997) analyze much larger firms, with a median of 3,800 employees and an average of 11,927 employees. Levine (1993) and Campbell and Kamlani (1997) drew their samples from the "Business Week 1,000" list, comprising the

Table 1: Sample Description of the Linked Survey-Administrative Data

	(1) Population	(2) Sample	(3) Weighted sample
Firm characteristics			
Number of employees	39.15	47.29	39.16
Age	16.59	19.13	18.80
Revenue growth in 2020 (%)	3.02	3.31	3.50
Value added per worker ('000 EUR)	85.76	92.16	91.79
Labor costs per worker ('000 EUR)	64.68	68.86	68.79
In the manufacturing sector (%)	13.84	17.13	13.84
In the services sector (%)	60.67	60.07	60.67
In other sectors (%)	25.49	22.80	25.49
Wage floors (%)	15.27	16.98	16.94
Employee characteristics			
Female (%)	28.68	29.01	28.85
Age	40.09	42.09	41.97
Unionized workers (%)	53.49	58.50	58.16
Labor market characteristics			
Tightness (vacancy/unemployment)	0.11	0.11	0.11
Observations	29349	3013	3013

Note: The table compares the means of firm characteristics from our sample of firms, linked to the administrative data, to the corresponding population of firms. All firms characteristics are from the administrative or other, than the survey, data sources. Column 1 reports means from the population, i.e., firms with at least five employees. Column 2 reports means from the raw sample and Column 3—from the sample weighted as described in Section 2.3.

American publicly traded firms with the highest market values. Industry coverage also differs, for example, Agell and Lundborg (1995) exclusively sample manufacturing firms. Perhaps the most comprehensive and cited empirical study is Bewley (1999), who interviewed 246 in the aftermath of the 1990-1991 recession.

2.4 Institutional Context of the Danish Labor Market

In a broad comparison, the institutional characteristics of the Danish labor market are closer to the United States than the continental European labor market (Kreiner and Svarer, 2022; Andersen, 2021). The Danish labor market is characterized by relatively high job mobility rates and has some of the most flexible employment protection laws among advanced economies (OECD, 2020). Unemployed workers are entitled to unemployment insurance payments if they are members of an unemployment insurance fund.

The Danish wage setting system is based on a two-tier structure–(i) industry bargaining, which sets an industry minimum wage in some industries (often referred to as a wage floor), and (ii) local bargaining at the firm level (Bhuller, Moene, Mogstad and Vestad, 2022). Due to the large percentage of workers for whom the wage is set at the firm level, it is commonly argued that Denmark is a good case study to study wage dynamics (Mortensen, 2003, p. 83). Data on mandatory industry minimum wages for all industries are not readily available. Instead, we use a dataset from the employer association DA that indicates, by broad occupational and industry category, which one of the four wage-setting practices is applied.[12] Using this dataset, we create a dummy variable indicating whether at least 50 percent of the firm's workforce have wages set following the *normallønssystemet* system.

An important point distinguishing Denmark from most European countries is the very high quality of labor relations. Aghion, Algan and Cahuc (2011) report executives survey responses to the question "Do you think that labor/employer relations are generally cooperative?" Denmark's score is the highest, and France's is the lowest. They empirically and theoretically show that the social dialogue affects the flexibility of wages.

During the 2020 pandemic, the Danish government implemented various aid packages in March 2020, the month of the lockdown announcement. Denmark implemented a furlough scheme (*Lønkompensationsordningen*).[13] Firms were allowed to cut base hourly pay or bonuses while using the furlough scheme. The take-up rate of the furlough scheme was lower than in other European countries (e.g., 10% in Denmark, while 50% in France) as the Danish scheme was less generous or flexible.[14]

To summarize, the linked survey-administrative dataset that we built contains a large and representative sample of firms with detailed information on firm and labor market characteristics. The relative flexibility of the institutional setting of the Danish labor market is relatively close to the US labor market setting.

[12]There are four different wage-setting systems. For 20 percent of workers in 2017, the wage is set according to the *normallønssystemet* system (Arbejdsgiverforening, 2018). In this system, wages typically follow the wage floors, and individual wage negotiation at the firm level is limited. For 59 percent of workers in 2017, firms must pay above the mandatory industry wage floor (*minimallønssystemet* and *mindstebetalingssystemet*), but these wage floors are very low. Hence, the wage floors only impact inexperienced workers. For the remaining 21 percent of workers, wages are set at the firm level without any industry minimum wages (*uden lønsats*).

[13]The following eligibility rules applied to firms. A firm that expected to lay off 30% of its workforce or more than 50 employees could apply for the furlough scheme. The firm was then able to furlough as many workers as needed for as long as needed until the end date of the scheme, June 2021 (the month when we fielded our survey). The government then paid workers up to 75 or 90 percent (depending on their job function) of their usual pay with a monthly cap of 30,000 DKK (4,033 EUR). The gross salary of most workers is above this threshold. The firm had to cover the remaining pay.

[14]The furlough scheme allowed only a 100% reduction of hours per employee, contrary to short-time work programs in other countries where employers could choose the percentage of hours reduced.

3 How Firms Adjusted Labor in the 2020 Crisis

We document how firms adjusted labor in the wake of the 2020 crisis. First, we find that more firms use layoffs than pay cuts. But, second, pay cuts are not rare in the firms that experience a revenue reduction; this holds true both in our survey and the administrative data. Third, wage reductions are more likely if firms expect the negative revenue shock to last for more than a year rather than a less persistent shock, and are less likely if firms are uncertain about the expected persistence of the shock. Finally, wage reductions are almost never implemented alone. Firms typically combine pay cuts with layoffs or some other labor input reduction strategy. In contrast, more than half of the layoffs are not accompanied by a pay cut at the firm level.

3.1 Reducing Worker Pay or the Number of Employees?

3.1.1 Full Sample

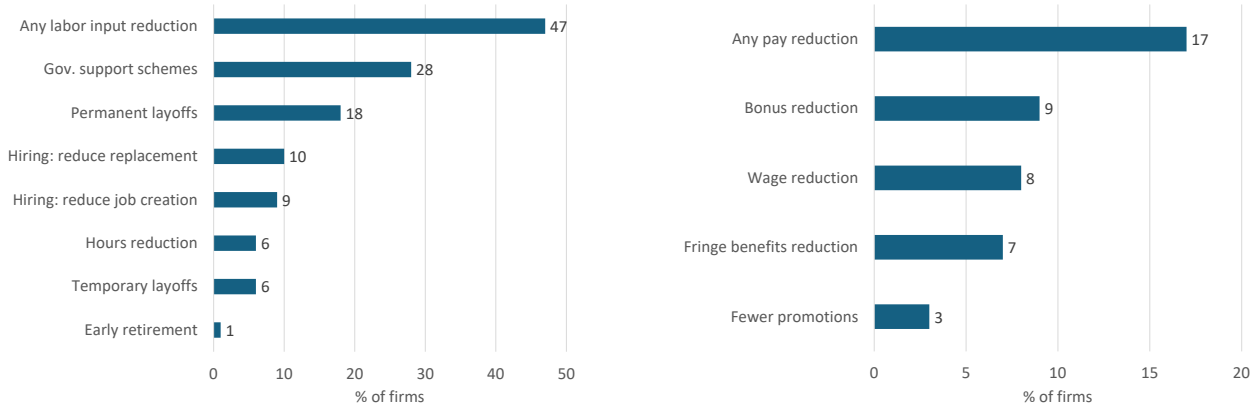
In the survey, we ask firms to specify all labor cost adjustment strategies that they used in 2020 from the list of possible reductions to the number of employees or hours (permanent layoffs, hiring reductions through reduced replacement hiring or reduced job creation, furloughs via government support schemes, early retirement plans, hours reductions, or temporary layoffs) and reductions to worker pay (wage reductions, bonus pay, fringe benefits, or promotions). Figure 1 shows the percent of firms reporting having used various strategies of reducing the number of employees or worker pay. The categories are non-mutually exclusive.

An overarching conclusion is that more firms reported layoffs or other ways of adjusting labor input than the firms that reported pay reductions. Among all firms, 47% made some downward adjustments to the number of employees, and 17% reduced pay.

Furthermore, layoffs occur even if government-sponsored furlough schemes are available and implemented. Specifically, among the firms with reduced revenue, layoffs were reported by 39% of those that did not use and by 22% of those that did use government-sponsored furlough schemes (Figure A.4).

Labor input reductions occur at both the separation and hiring margins. Hiring reductions take place through reduction in replacement hiring as well as new job creation. Hours reduction or temporary layoffs are less prevalent, perhaps because of the availability of the furlough schemes at that time in Denmark.

Eight percent of all firms reported wage reductions (which in the context of the specific survey question corresponds to the reductions in the contractual base and bonus pay), and nine percent reported variable pay reductions. The wage reductions are similar in the subsamples of firms that are subject to wage floors (7%) and those that are not (8%), indicating



(a) Number of workers or hours

(b) Worker pay

Figure 1: Labor Cost Adjustment Approaches in 2020, all firms

Note: Panels (a) and (b) show the percentage of firms that answered "yes" to questions about the corresponding labor adjustment method; the categories are not mutually exclusive. Temporary layoffs are defined in the questionnaire as layoffs with expected reemployment.

that wage floors are not binding and are not a constraint for wage cuts in most cases in Denmark. In the next subsection, we show that these pay reductions are much more prevalent in revenue-shrinking firms.

Examining the labor cost adjustment methods by firm size, we find that larger firms are more likely to use all adjustment approaches (permanent layoffs, wage and bonus reductions) (Figure A.5).

3.1.2 Adjustments by Firm Growth

The labor adjustment patterns described above also hold by firm revenue growth bin, with a higher percentage of firms implementing any reduction strategies if they experience greater revenue reduction.

In the survey, thirty six percent of firms reported revenue reduction between 2019 and 2020, while forty percent reported an increase, which aligns well with the information on these firms from the administrative data (Figure A.3). The main reason behind the decrease in revenue was a decrease in demand, as reported by two-thirds of the firms (Figure A.6).

Figure 2 shows how firms adjust the number of employees or worker pay, conditional on the 2019-2020 revenue growth in the administrative data from FIRM (Figure A.7 shows the underlying distribution of firms over the revenue growth bins). Panel (a) shows the share of

firms that adjusted the number of employees through permanent layoffs, hiring reductions for new or existing jobs, government support schemes, or any of the employee reduction approaches. Panel (b) shows the share of firms that reported wage reductions, fewer or lower bonuses, or any reductions in pay at all.

The conclusion that a higher share of firms reported layoffs or used other methods to adjust the number of employees than the share of firms that adjusted employee pay holds within each revenue-growth category. The reductions in the number of employees or worker pay were more prevalent among the firms that experienced a greater reduction in revenue. For example, among the firms that experienced a revenue reduction of more than thirty five percent, 81% reported some reductions in the number of employees, and 32% reported adjustments to worker pay; among the firms that experienced a revenue reduction between twenty and five percent, these numbers are 59 and 25, respectively; among the firms that were not particularly growing or shrinking (in the [-5%;5%] growth bin), 40% made some adjustments to the number of employees, while 12% cut pay in some way. The same patterns by revenue growth hold by firm size (Figure A.8). Similarly, we find the same pattern by the growth rate in value-added (measured by revenue minus intermediate input costs).

Importantly, pay reductions—bonus as well as wage reductions—in the firms with reduced revenue were not rare. Overall, 29% of firms with reduced revenue reported some pay cuts, with 15% reporting wage reductions. This is consistent with Grubener and Rozsypal (2021) who find large wage losses of stayers in revenue-shrinking firms.

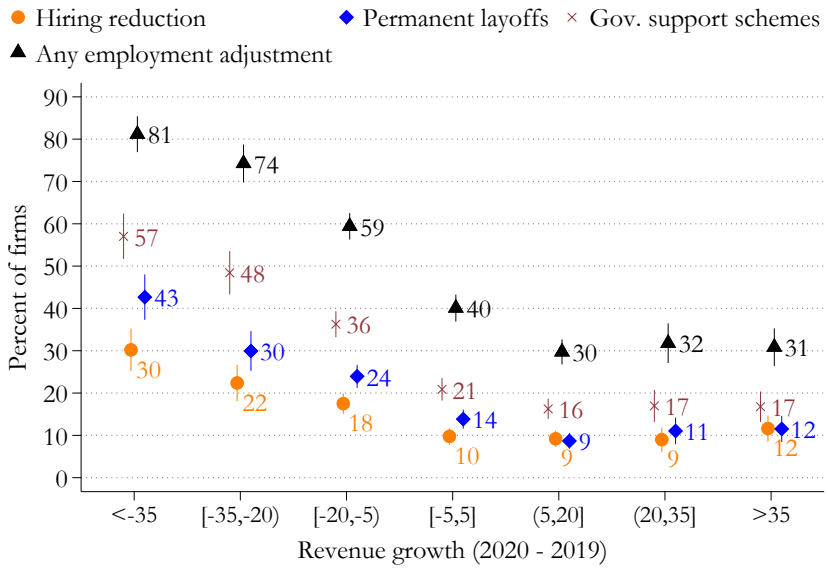
Firms that did not experience a reduction in revenue or those that experienced a positive revenue growth also reported some layoffs or pay cuts. Layoffs occurring in firms that do not contract is consistent with the findings of Davis, Faberman and Haltiwanger (2006).

3.1.3 Firm Expectations and Investment Plans

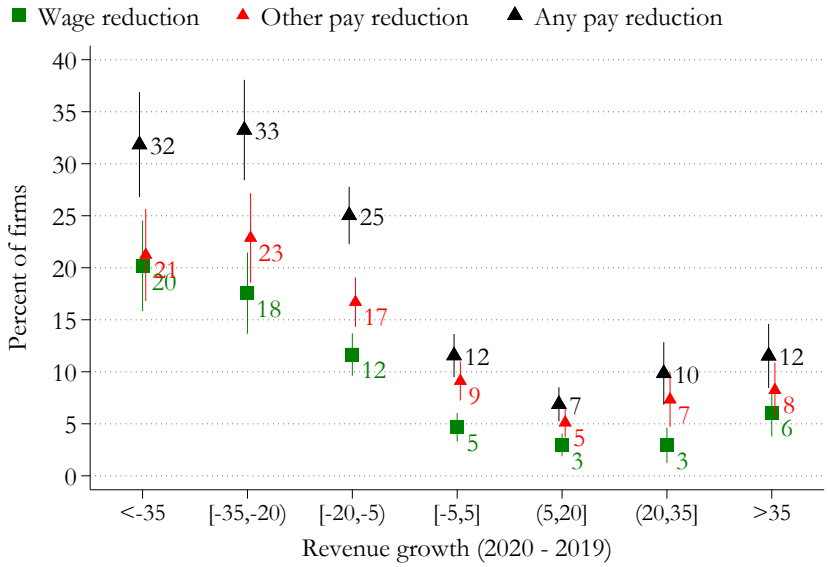
We find that firm's implementation of pay cuts or labor input cuts varies noticeably with firm's expectations about the persistence of the adverse shock and with investment plans.

We ask firms about their expectations regarding the persistence of the shock: "How long do you expect it to take before the revenue is back to its 2019 precrisis level?" The question is conditional on the firm reporting a decrease in revenue in 2020. The respondent could choose from the following time horizons: Our revenue has already surpassed the pre-crisis level; We are at the same level as before the crisis; Less than 3 months from today; 3-6 months from today; 6-12 months from today; 12-24 months from today; Do not know.

Two findings stand out (Figure 3, panel (a)). First, those firms that respond "Do not know" regarding the duration of the shock are noticeably less likely to implement wage reductions (but not less likely to implement other pay reductions) than those firms that are



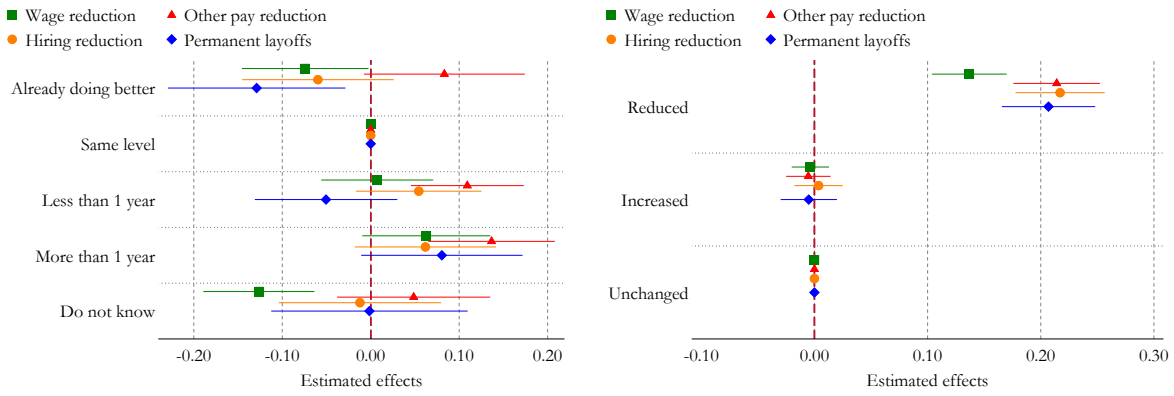
(a) Number of employees and hours



(b) Worker pay

Figure 2: Firm's Labor Cost Adjustment Approaches in 2020, by Revenue Growth

Note: Panels (a) and (b) show the percentage of firms that answered "yes" to questions about the corresponding labor adjustment method. The figure also shows the standard errors of the means. The x-axis is the firm revenue growth between 2019 and 2020 in the administrative data (FIRM).



(a) By expectations

(b) By investment plans

Figure 3: Labor Adjustment Approaches, by Expected Duration of the Revenue Reduction and by the Firm's Investment Plan

Note: Panel (a) reports coefficients from the regressions of using a specific labor adjustment method (e.g., wage reduction, etc.) on the dummies that capture firms' expectations. The question is, "How long do you expect it will take before the revenue is back to its 2019 pre-crisis level?" See text for details. The question is conditional on the firm reporting a decrease in revenue in 2020. Panel (b) reports coefficients from the regressions of using a specific labor adjustment method on the dummies that capture a firm's investment plan for the following year. Both specifications control for industry and local labor market fixed effects.

already doing the same as before the shock or expect a less persistent shock. However, their propensity to implement layoffs or reduce hiring is similar to those that are already doing the same as before the shock. That is, when uncertain about the persistence of the shock, firms tend to hold off cutting wages. Second, we find that wage reductions, other pay reductions, layoffs and reductions in hiring are more likely in the firms that expect a reduction in revenue to last more than a year than in those that expect a less persistent shock.

We also ask firms about their investment plans: "Compared to 2019, investments in 2021 will be...," with a list of possible answers of "Reduced", "Unchanged", or "Increased". We find that firms that report reduced investment plans are more likely to cut wages or any other pay, lay off, and reduce hiring, compared to those that report unchanged plans or increasing investments (Figure 3, panel (b)).

3.1.4 Firm Characteristics and Economic Conditions

To understand how firm characteristics and performance measures correlate with the use of layoffs or wage reductions, we regress an indicator for the use of the specific labor adjustment strategy from our survey on firm variables obtained from administrative and other data. Our main variables of interest are firm productivity, average wages, revenue growth,

number of employees, routine task index, percentage of unionized workers, and firm-specific labor market tightness. We construct firm-specific labor market tightness as the weighted average of the three-digit occupation-specific vacancy-unemployment ratios, with weights representing the share of the specific occupation in the firm in 2019, following Hoeck (2023). We construct a routine task index using composite measures from O*NET Work Activities and Work Context Importance scales, following Acemoglu and Autor (2011). All other covariates are from the administrative datasets and are measured at their 2019 levels (except for an indicator for worker representative, which is obtained from our survey).[15]

We find that a reduction in wages and layoffs are more likely in firms with lower productivity, higher average wages, fewer routine jobs, and firms facing less tight labor markets (Table 2). Firms with a higher unionization rate are less likely to implement wage reductions, but are more likely to lay off workers. Firms with a worker representative are more likely to implement wage reductions but there is no correlation with layoffs.

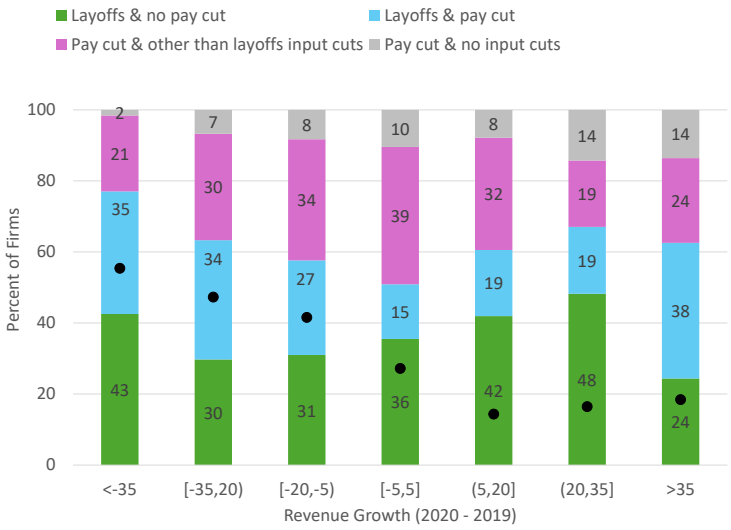
3.2 Co-Occurrence of Pay Cuts and Layoffs

To understand whether firms use pay cuts and layoffs as complimentary strategies rather than mutually exclusive alternative strategies, we examine whether firms tend to simultaneously implement pay cuts and layoffs, only pay cuts, or only layoffs.

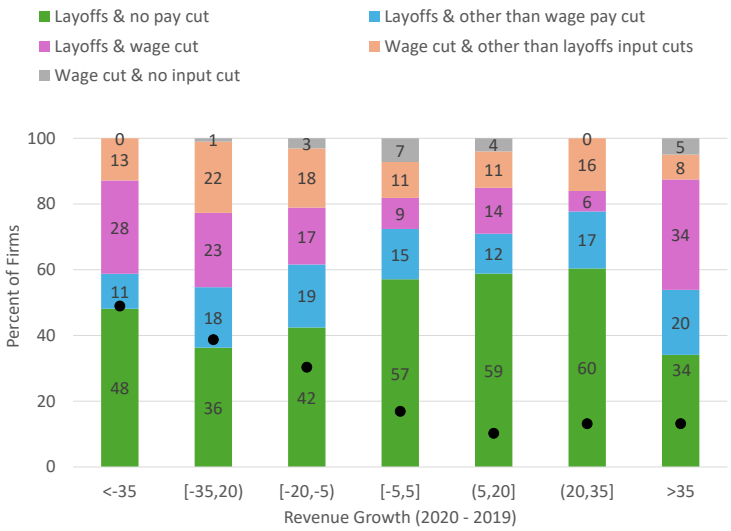
We focus on the subset of firms that report using permanent layoffs, or pay cuts (e.g., wage reduction, bonus reduction, fringe benefit reduction or fewer promotions), or both, and calculate the percentage of that subset that use (1) layoffs and no pay cuts, (2) layoffs with any pay cuts, (3) any pay cut with any other labor input reduction strategy except layoffs, and (4) any pay cut but no input reduction strategies. The percentages for each category (1)-(4) are plotted in Figure 4, panel (a) by the firm's 2019-2020 revenue growth. The black markers show the percentage of the firms in each revenue growth bin that reported using layoffs, or pay cut, or both.

We find that pay reductions were rarely used alone. Among the firms that reported any pay reductions, often some input reduction strategies were implemented, especially in the firms with a negative revenue growth. Approximately half of these firms used layoffs (blue bar) and the other half used other input reduction strategies (magenta bar). In contrast, among the firms that reported layoffs, more firms reported layoffs without pay cuts (green bars) than those with pay cuts (blue bars); this is especially true among the firms with non-negative revenue growth.

[15] We include as additional controls the number of employees, job function of the respondent who fills out the survey (i.e. owner or manager), the dummy for wages being set at the sectoral level for most workers, the ownership structure of the firm (i.e., family business) and the debt ratio.



(a) Permanent layoffs and pay cuts



(b) Permanent layoffs and wage reduction

Figure 4: Firm's Use of Layoff and Pay Cuts, by 2019-2020 Revenue Growth

Note: Panel (a) shows the proportions of firms that use permanent layoffs or any pay cuts in conjunction with other strategies among all firms that use either permanent layoffs or pay cuts, by revenue growth bin. The black circle correspond to the share of firms in the specific bin that use permanent layoffs or any pay cuts. Panel (b) focuses on the proportions of firms that use permanent layoffs or wage cuts.

Table 2: Firm Variables Related to The Use of Wage Reduction and Permanent Layoffs

	Wage reduction (1)	Permanent layoffs (2)
Productivity	-3.47***	-4.60***
	(0.63)	(0.98)
Average wages	2.41***	2.48**
	(0.83)	(1.07)
Revenue growth rate in 2020 (%)	-3.60***	-6.15***
	(0.80)	(1.05)
Routine task index	-1.51***	-1.58***
	(0.41)	(0.55)
Unionization (%)	-1.56***	1.81**
	(0.60)	(0.79)
Worker representative	2.71**	-0.05
	(1.21)	(1.64)
Tightness	-1.81***	-2.08***
	(0.37)	(0.62)
N	2771	2771
Mean Dep. Var.	8.30	18.77
Adj.R2	0.036	0.047
Additional controls	Yes	Yes

Note: The table reports the estimates from OLS regressions where the outcome takes a value of one if the respondent answers "yes" to questions about the corresponding labor adjustment method. Continuous variables are standardized to have mean zero and standard deviation of one. Additional controls are listed in the text. Asterisks report statistical significance at the 1, 5 and 10% level (***,**,* respectively). Standard errors are in parentheses.

Figure 4, panel (b) further focuses on the subset of firms that use layoffs, or wage reduction (versus any pay cuts), or both. Here, we tabulate the proportions of these firms that use (1) layoffs without any pay cuts, (2) layoffs and any other pay cuts, except wage reduction, (3) layoffs and wage reduction, (4) wage reduction and any other labor input reduction strategies except layoffs, (5) wage reduction and no input reduction strategies. It is more strikingly seen here that wage reductions were rarely implemented without input reductions.

To put some quantitative magnitudes on the firm's implementing both layoffs and pay cuts, using data from the full sample of our survey, we regress an indicator of the firm reporting using layoffs on an indicator for using a pay reduction. We find that firms that used wage reductions were 29% more likely to also use permanent layoffs, which is a large

effect given that the incidence of the use of permanent layoffs in our sample of firms is 19 percent (Table A.5).[16]

We conclude that firms rarely use pay cuts without any input reductions, especially cuts to the contractual wage (e.g., "wage reductions"). Instead, pay cuts at the firm level are typically accompanied by layoffs or other input reduction strategies.

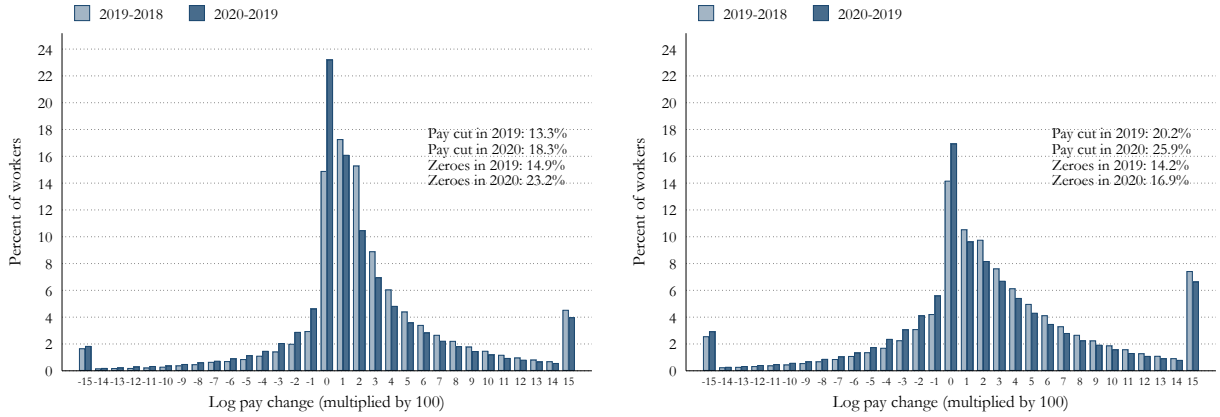
3.3 Evidence on Pay Cuts from Administrative Data

Given an abundant macroeconomics literature that relies on wage rigidity, our findings that pay cuts are not rare are perhaps surprising. In the following, we show that the findings from our survey are supported in the administrative data as well.

3.3.1 Pay Cuts in the Administrative Data

We examine the incidence and extent of pay cuts from two additional datasets. First, we use data from LONN—a mandatory annual employer survey on earnings components for all firms with at least 10 employees. The survey contains worker-level data with firm identifiers: the start and end date of the worker's employment period with the firm, their occupation, hours, annual contractual base wage, bonus, and overtime pay. In Denmark, in most cases, the contractual base wage is inclusive of the so-called "holiday payments" and consists of basic, qualification, and function allowances, as well as holiday and public holiday payments and other special holiday allowances. This wage does not include absence payments, overtime payments, staff benefits, irregular payments, or pension. The key advantage of the LONN dataset compared to the administrative wage dataset BFL, discussed below, is that LONN separately identifies the contractual base wage from other pay components. The dataset also contains an indicator for hourly versus salaried workers. Using data from LONN, we construct a sample of job stayers—all workers who remain in the same establishment within the same job function (using a 6-digit occupation code) for 24 consecutive months. We focus on full-time employees (i.e. those who work at least 1,820 hours per year) who have not been absent from work for more than a month and further restrict the sample to salaried workers employed in private sector firms, excluding hourly workers. Figure 5 shows the distribution of the annual growth in nominal hourly pay for 2018-2019 and 2019-2020, separately for the contractual base wage (panel (a)) and total pay (panel (b)).

[16]Figure A.9 plots the coefficients on the interactions of the use of wage reduction with a set of revenue growth bin dummies. The regression also includes the dummies for the revenue growth bins in levels and the dummies for a region, industry, and the respondent's role in the company. In all revenue growth bins, firms that use wage reductions are more likely to also use layoffs.



(a) Base hourly wage

(b) Total hourly pay

Figure 5: The Distribution of the Annual Growth of Nominal Hourly Pay

Note: The figure shows the annual nominal changes in logarithmic pay using data from the mandatory firm survey, LONN. The pay is the base hourly wage in Panel (a) and total hourly pay in Panel (b). See text for definition of the base wage in LONN. The sample is restricted to salaried workers who remain in the same establishment and within the same job function (6-digit occupation codes) from year $t-1$ to year t. The log pay change is computed as the log differences between year t minus year $t-1$, multiplied by 100. Each pay change value x includes log changes in the interval $x-0.5$ and $x+0.5$.

We find that nominal cuts to the contractual wage as well as to the total pay are not rare. During 2019-2020, 18. 3% of the workers received base wage cuts and, during 2018–2019, –13. 3%. A higher percentage of workers receive cuts to total hourly pay: 25. 9% in 2019-2020 and 20. 2% in 2018-2019. There were fewer pay increases between 2019 and 2020 than between 2018 and 2019. We also find more wage cuts for part-time versus full-time workers, for hourly versus salaried workers, in smaller firms, and in private versus public sector firms.[17]

Additional evidence on pay cuts comes from monthly administrative records of worker earnings and hours, the BFL (*Detaljeret lønmodtagerdata fra e-Indkomst*) dataset. The BFL covers all Danish firms and contains worker-level information on a monthly frequency, including earnings, which consists of total earnings (inclusive of bonus and overtime pay) that workers receive during the month, and paid hours worked. We use total earnings and hours to calculate total hourly pay. We find that 23. 2% of the workers experienced a reduction in total nominal hourly pay between 2019 and 2020 (Figure A.10).

Next, we link our firm-level survey data with the LONN data using firm-level identifiers. We then compare the firms' responses to pay cuts in the survey with the wage cuts reported

[17]These results are available upon request.

in LONN for those workers who are employed by the companies in the survey. As expected, in the LONN data, the share of workers who received base hourly wage cuts is higher in the firms that reported wage reductions in the survey.[18] The conclusions are similar from the linked survey-BFL data.

3.3.2 Pay Cuts by Revenue Growth in the Administrative Data

The finding that the greater the revenue reduction, the more likely is the firm to implement wage reduction also holds in the administrative data. Specifically, we link the LONN data to the firm's financial information (the FIRM dataset), and group the firms into the revenue growth bins as above. Then, for every job-stayer in the private sector in the administrative wage data, we construct a dummy variable equal to one if the worker experiences a negative hourly wage change of more than 5% between year $t-1$ to t. Figure 6 shows the relation between the percent of job stayers receiving a wage reduction and the firm's 2019-2020 revenue growth (by bin). The probability of receiving a wage reduction increases as firm's revenue declines.

3.3.3 Evidence from the Empirical Literature

Our findings that pay cuts are not rare are consistent with the existing empirical literature that uses survey and administrative data. Summarising the literature based on administrative data sources, Elsby and Solon (2019) conclude that nominal hourly pay cuts are common in the U.S. and Europe, typically affecting 15–25 percent of job stayers in periods of low inflation. The results of our own meta analysis are in Figure 7, which plots the estimates of the incidence of the nominal wage cuts from papers that use administrative data sources as well as our estimates of the incidence of total nominal hourly wage cuts for full-time job-stayers in private and public companies in Denmark from the LONN data, 2010-2020.

McLaughlin (1994), using the PSID, finds that 17 percent of workers experience nominal pay cuts. Kahn (1997), using the PSID from 1977 to 1988, finds that 24 percent of salary

[18] Specifically, for each linked firm, we use worker-level LONN data and calculate the average nominal base wage growth between 2019 and 2020 across all the workers in the firm. Figure A.11 Panel (a) plots the distribution of the average base wage growth between 2019 and 2020 in LONN for two sub-samples of firms: the sample of the firms that in our survey reported wage reductions in 2020 (red line), and the sample of the firms that in our survey reported no wage reductions in 2020 (blue line). The figure shows that the former distribution has a higher mass on observations with the negative growth. Figure A.11 Panel (b) shows the distribution of the firm-level share of workers affected by base wage cut in LONN data for two sub-samples of firms — those that reported wage cuts in our survey and those that report no pay cuts in our survey. To construct the figure, we use the LONN data and for each firm we calculate the share of workers whose nominal hourly base wage between 2019 and 2020 declined by more than 5%. We then plot the distribution of these shares separately for firms that in the survey reported a wage cut (red area) and those that report no cut (blue area). The figure shows that for firms that reported no wage cuts, there is a larger mass of the distribution close to zero than for firms that reported some wage cuts.

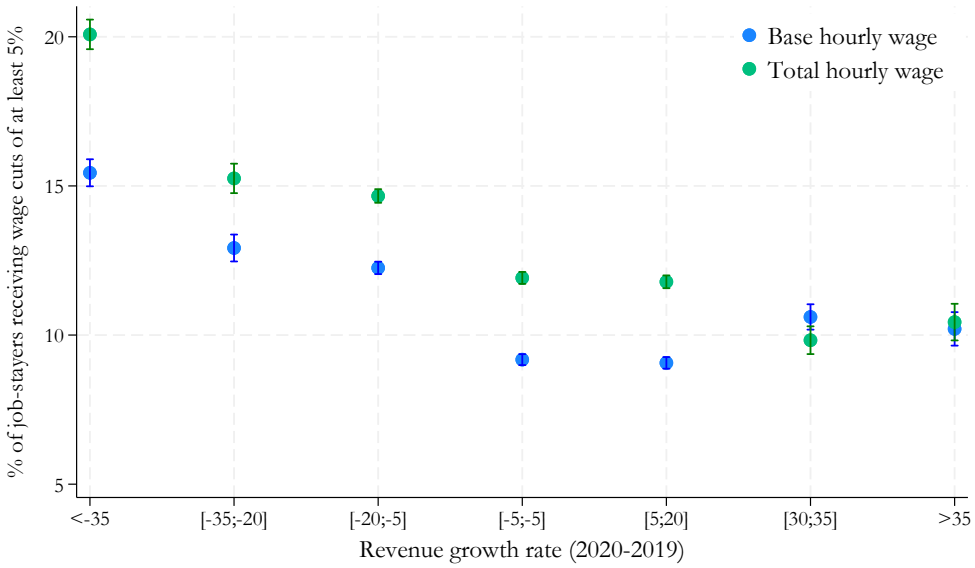


Figure 6: Percentage of Workers with Wage Reduction, by Firm Revenue Growth

Note: The figure shows the estimated probability of a job-stayer receiving a 5% wage reduction conditional on the firm's 2019-2020 revenue growth, using LONN wage data. See text for details.

earners received a nominal cut. Card and Hyslop (1997), using both the CPS and the PSID, find that 11 to 20 percent of hourly workers had a nominal pay cut between 1980 and 1993. In France, Le Bihan, Montornès and Heckel (2012) report the probability of a quarterly wage decrease of 6 percent. Kurmann and McEntarfer (2019) find that prior to the Great Recession, about 20 percent of job stayers experienced a wage cut; during the Great Recession, the incidence of wage cuts increased to 30 percent. They note that there is an inverse relationship between firm's employment growth and proportion of job stayers with wage freezes (see their Figure 4). Jardim et al. (2019), using data from the State of Washington over the period 2005-2015, find that at least 20 percent of job stayers experience nominal wage reductions. Grigsby, Hurst and Yildirmaz (2021), using proprietary data, find that 6 percent of job-stayers in their sample received nominal base wage cuts during the Great Recession, and more than 10 percent of workers in the industries that were hit hardest. Cajner, Crane, Decker, Grigsby, Hamins-Puertolas, Hurst, Kurz and Yildirmaz (2020) find that workers in the U.S. firms experienced base pay cuts during the pandemic. Funk and Kaufmann (2022) report that 21.4 percent of workers experienced a base pay decrease in 2014 in Switzerland. Fongoni et al. (2023) document that 18 percent of workers experienced cuts to their base hourly pay, and 26 percent to their gross hourly pay in the UK in 2003-2004. The findings of wage cuts are not universal, however; wage flexibility varies with the country institutional setting (see, Bewley (2007) for a summary of papers that find downwardly rigid

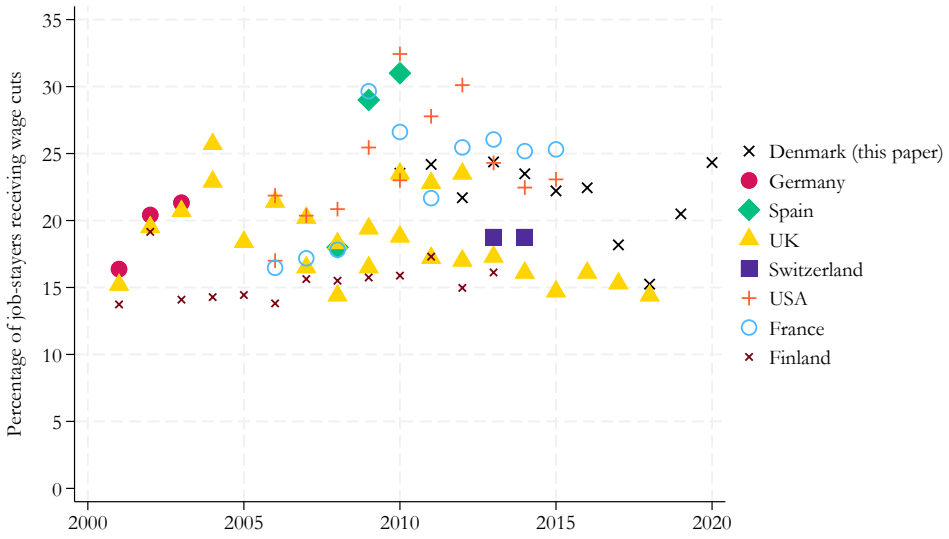


Figure 7: The Incidence of Hourly Nominal Wage Cuts in Administrative Data, This Paper and the Related Literature

Note: Denmark: this paper, evidence from LONN data. Germany: Ehrlich and Montes (2024). Finland: Vainiomäki (2020). France: Biscourp, Dessy and Fourcade (2005), Gautier et al. (2019). Switzerland: Funk and Kaufmann (2022). UK: OECD (2014), Fehr and Goette (2005), Elsby et al. (2016), Fongoni et al. (2023), Nickell and Quintini (2003), Schaefer and Singleton (2022). USA: Kurmann and McEntarfer (2019), Jardim et al. (2019).

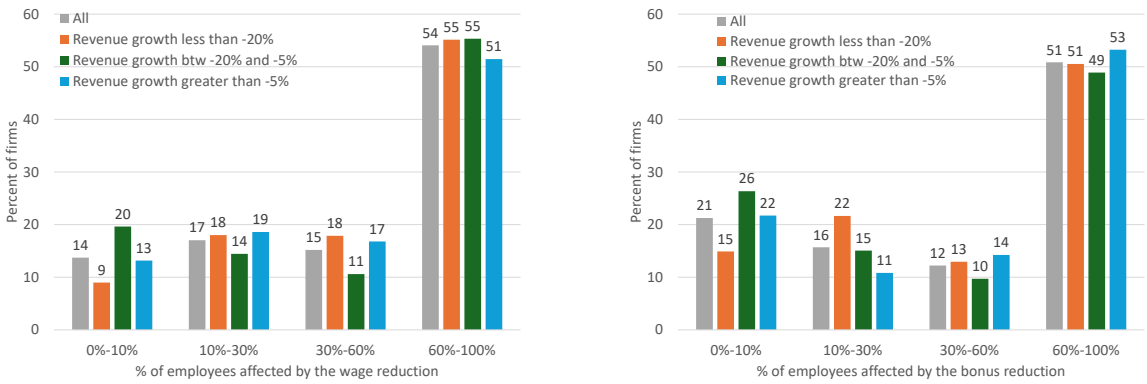
wages; Dickens, Goette, Groshen, Holden, Messina, Schweitzer, Turunen and Ward (2007) for variation of wage rigidity across countries; Adamopoulou, Diez-Catalan and Villanueva (2022) for wages in Spain).

4 On Pay Cuts

Next, we analyze the incidence of pay cuts and firm's considerations on the pay cut margin to understand the potential costs and savings associated with pay cuts.

4.1 Wide-Spread Nature of Firm's Pay Cuts

Using our survey, we find that if pay cuts happen in a firm—either wage or bonus reductions—they are rather wide-spread across the firm's workforce. Figure 8 shows the prevalence of firm's pay cuts, with the percentage of firm's employees affected by a cut on the x-axis and the share of firms that experienced such an impact on their workforce on the y-axis, conditional on firms reporting any pay cuts. Almost 55% of firms experienced wage reductions that



(a) Wage reductions

(b) Fewer/lower bonuses

Figure 8: Distribution of Firms by the Percent of Employees Affected by Pay Cuts, Conditional on Firm Implementing Pay Cuts

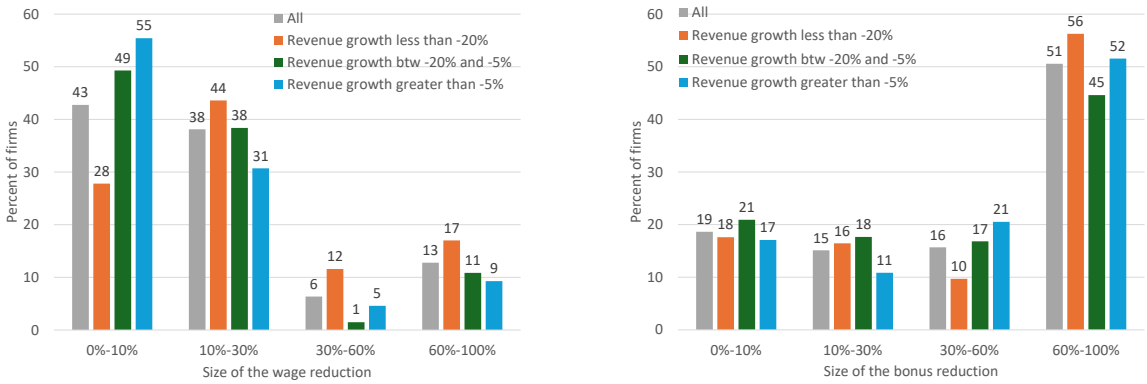
Note: The results in the figure are conditional on firms that answer "yes" to questions about using wage reductions, panel (a), and bonus reductions, panel (b).

affected more than 60% employees (panel (a)) and more than 50% of firms experienced reductions to bonuses that affected more than 60% employees (panel (b)).

The wide-spread nature of firm pay cuts holds across all firm revenue growth bins. Specifically, more than fifty percent of the firm workforce was affected in 59% of wage-reducing firms with revenue growth lower than -20%, in 57% of firms with revenue growth between -20% and -5%, and in 53% of firms with revenue growth higher than -5%. The average percent of workers affected by wage reduction is 64% in the full sample, 67% in the sample of firms with revenue growth less than -20%, 62% in the sample of firms with revenue growth between -20 and -5%, and 63% in the sample of firms with revenue growth above -5%. The numbers are comparable for bonus reductions.[19]

The average size of the reported wage reduction is 26%, with the firms with greater revenue reduction reporting larger wage reductions (Figure 9): 33% in the sample of firms with revenue growth less than -20%, 23% in the sample of firms with revenue growth between -20 and -5%, 21% in the sample of firms with revenue growth above -5%. Most firms implemented wage reductions under 30% (eighty percent of firms); however, thirteen percent of firms reported wage reductions of 60% or larger. In contrast, the average size of the bonus

[19]The average percent of workers affected by bonus reduction in the full sample and the three revenue growth groups are 60%, 62%, 57%, and 62%, respectively.



(a) Wage reductions

(b) Fewer/lower bonuses

Figure 9: Distribution of Firms by the Reported Size of Pay Cut, Conditional on Implementing Pay Cuts

Note: The results in the figure are conditional on firms that answer "yes" to questions about using wage reductions, panel (a), and bonus reductions, panel (b).

reduction is larger (61.5%), and more than half of the firms implemented bonus reductions above 60%.

Figure 10 shows a scatter plot of the percent of employees affected by and the reported size of the wage reduction (by bin). The takeaway remains that wage reductions are widespread, affecting a large percentage of workers in the firm. There is no apparent correlation between the size of the wage reduction and the percentage of firm workforce affected by the reduction. There is some tendency for very large reductions (those above 60%) to affect a larger fraction of employees (above seventy percent of workers). Smaller wage reductions tend to cover a wide range of the firm's workforce—from 30% to up to 100%.

4.2 Employer Considerations on the Pay Cut Margin

We next examine employer considerations on the pay cut margin. Figure 11, panel (a) reports the responses to the question "What are the main reasons for not lowering the base pay?" We offered respondents the following options to choose from: It would be illegal or almost impossible to change pay; The firm sees pay as a promise to its employees; Pay cuts damage productivity because employees do not work so hard; Pay cuts would lead employees to quit; Pay cuts damage morale and it is demotivating for employees in general; Trade unions/employee representatives are against pay reduction; Pay reduction would not save jobs. Respondents were instructed to rate their attitude toward each reason as "Strongly

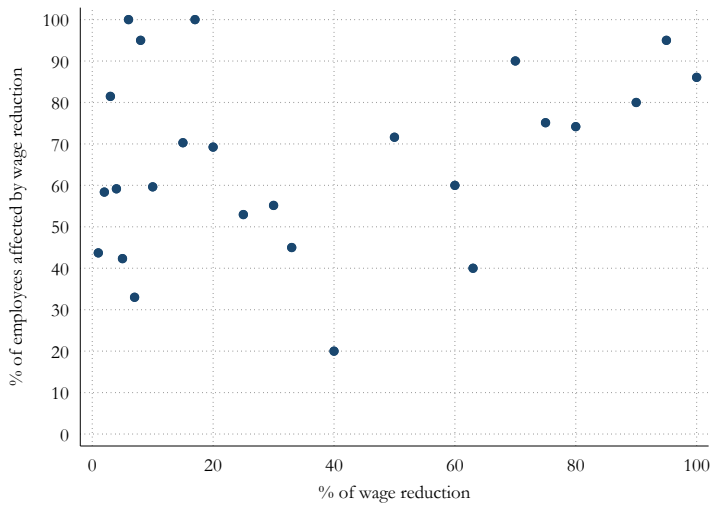


Figure 10: Extent of Firm Wage Reduction by the Reported Size of the Wage Reduction

Note: The results in the figure are conditional on firms that answer "yes" to questions about using wage reductions, (panel (a), and bonus reductions, panel (b).

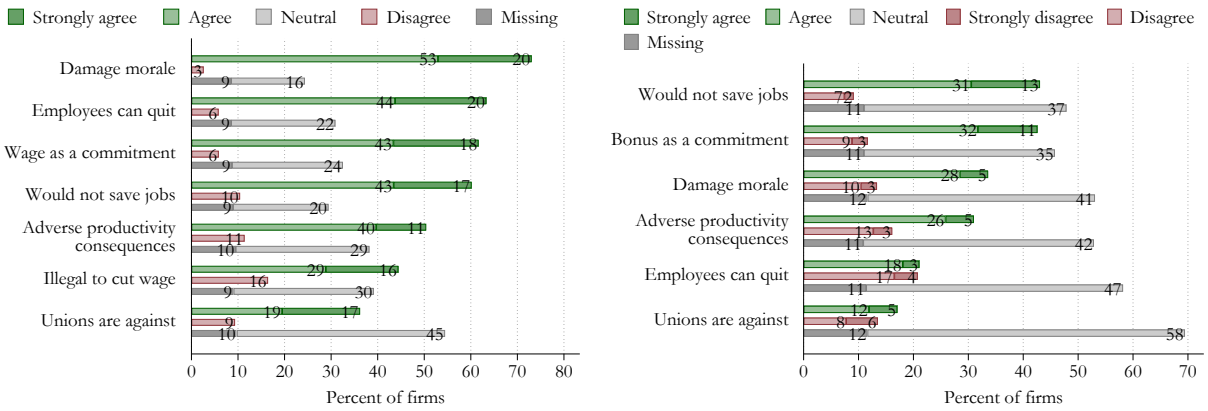
agree", "Agree", "Neutral", "Disagree", or "Strongly disagree". We asked the question of firms that experienced revenue reduction and reported no base pay cuts.

We find that 73% of the respondents are concerned about a negative impact on employee morale and motivation; 64% agree that it would lead employees to quit; 60% agree that base pay is seen as a commitment to employees; and 60% of employers agree that base pay cuts would not save jobs.

The concept of morale appears broader or potentially different from productivity. Specifically, we offered respondents the option to choose separately options "Damage morale" and "Adverse productivity consequences." Although 73% agree with the former statement, only 51% agree with the latter.[20]

Firms with very negative revenue growth are slightly less likely to agree with morale concerns. When we split the firms by the sales growth into three groups—those with a very negative growth (less than -20%), those with negative growth (between -20% and -5%), and the rest (-5% and greater), we find that the following percentages agree versus disagree with the statement that wage cuts hurt morale (conditional on non-missing responses): 76% versus 4% in the first group, 82% versus 3% in the second group, and 81% versus 2% in the third group.

[20]Bewley (1999) writes that morale has three components: identification with the firm, trust in an implicit exchange, and a mood conducive to work. In Bewley's view, good morale is associated with voluntary willingness to make sacrifices for a firm (which is valuable because supervision is expensive); and productivity is not necessarily a linear function of morale.



(a) Base pay

(b) Bonus pay

Figure 11: Reasons for Not Lowering Pay

Note: The figure reports responses to the question: "What are the main reasons for not lowering the contractual base pay?" The question is conditional on revenue reduction and not doing wage reductions (panel (a)), which pertains to 651 firms, or bonus reduction (panel (b)), 693 firms.

Notably, the feasibility of a pay cut does not appear as a main concern of why firms do not cut base pay. More than half of the respondents disagree or are neutral with the statements "Trade unions or employee representatives are against pay reduction" or "It would be illegal or almost impossible to change the base pay" (Figure 11).

To associate the reasons for not cutting the base pay with firm characteristics, we estimate a regression where the dependent variable is an indicator of whether the firm agrees or strongly agrees with a specific reason on the set of firm-specific controls described above (Table A.6). We find that larger firms are more concerned with morale, while no other firm characteristic correlates with morale concern. We find that firms that are less productive, larger, with higher revenue growth, or those facing higher labor market tightness tend to be more concerned with quits. We do not find any specific association of firm characteristics with the firm's tendency to agree with the statement that the base wage is a commitment to the employee or that pay cut would not save jobs. We also do not find that, conditional on other controls, the revenue growth has an association with all the concerns, except for the quits concern.

The impact on employee morale and the probability of quits are two central concerns for employers. Our findings are consistent with Bewley (1999), Campbell and Kamlani (1997), Du Caju et al. (2015). In terms of magnitudes, we find that a concern about quits is reported by a relatively higher share of firms than found in the previous literature: specifically, in our survey, 73% of firms with reduced revenue agreed with the morale concerns and 63% agreed

with quit concerns, while in Bewley (1999) these concerns are reported by 69% versus 41% percent of firms, respectively (Table 11.2, page 174). Blinder and Choi (1990) also find that the fear of an employee quitting is a greater concern for firms than the fear of an employee working less, consistent with our evidence. The concern about quits is also in line with the literature that uses worker death events to show that new hires cannot easily replace incumbent workers (Jäger and Hening (2023)).

While morale and quits considerations are most important on the base pay cut margin, they play a smaller role in bonus cuts (Figure 11, panel (b)). Instead, we find that the largest share of firms agree that reducing bonuses would not save jobs. This is consistent with Kahneman, Knetsch and Thaler (1986) who argue that losses are more aversive than objectively equivalent foregone gains. They suggest that firms that frame a portion of their compensation package as bonuses or profit sharing will encounter relatively little resistance to reductions of compensation during slack periods.

The concerns behind not lowering pay are similar if we separately examine sub-samples of firms in which majority of workforce is covered and not covered by wage floor, and also sub-samples by firm size, revenue growth, or reason for layoffs (Figures A.12 and A.13).

4.3 Discussion of Costs and Benefits of Pay Cuts

The firm implements pay cuts based on the cost-benefit analysis of such action. Although a quantitative analysis is beyond the scope of this paper, we can discuss the potential costs and savings from the pay cuts that result from our survey data. Importantly, as we show above, the consideration that cutting wages is illegal does not play the main role in our data.

The savings from pay cut are evaluated against the total, variable and fixed, costs per employee. We find that 60% of the firms agree that base pay cut would not save jobs (Figure 11), suggesting that for these firms, the savings are not substantial enough to save layoffs.

On the costs side, our results suggest that the costs of pay cuts might be substantial. We find that if pay cuts occur in a firm, they affect a large number of employees. It is conceivable that both low- and high-performers are affected: specifically, morale effects pertain to both kinds of workers, and the firm's fear of quits pertains to high-performing employees with good outside options.

Among firms with large reduction in revenue, our results show that pay cuts are not rare. This suggests that the benefits of pay cuts outweigh the costs when the firm experiences a substantial economic distress. We find some evidence that morale effects are less acute in such situations. Relatedly, using telephone surveys, Kahneman et al. (1986) find that "nominal wage cuts by a firm that is losing money or threatened with bankruptcy do not

violate community standards of fairness." Bewley (1999) finds that many of the pay cuts in his sample were made in the firms that were in danger of closing.

More generally, the wide-spread nature of firm pay cuts suggests that wage setting involved multilateral, rather than bilateral, considerations. This is consistent with the conclusions of Davis and Krolikowski (2025) that there is a need for theories of compensation policies at the organizational level rather than bilateral matches. It is also consistent with the analysis of Carry and Schoefer (2024) on separation modes in France. Bewley (1998) proposes that considerations of pay equity dictate a wide-spread nature of pay cuts in a firm. Bewley writes that the standards of internal equity do not necessarily specify that pay is proportional to productivity; instead, the standards fix pay differentials on the basis of experience, training, tenure with the firm, and productivity. Using these standards in a firm is conducive to a general sense of fairness, which, in turn, is conducive to good morale.

5 On Layoffs

Next, we study firms considerations on the layoff margin, the perceived impact of layoffs on the remaining employees, and provide evidence of the selective nature of layoffs.

5.1 Employer Considerations on the Layoff Margin

To understand employer considerations on the layoff margin, we ask firms the key reasons why they do not lay off workers despite a reduction in sales or other cost pressures. We gave the survey respondents the following list of reasons to choose from: (1) We want to keep current employees to avoid loss of skills and knowledge; (2) We may not be able to find and hire again quickly when needed during recovery; (3) The employees work in teams, and we cannot lay off some of them; (4) Layoffs will be detrimental to morale among the remaining employees; (5) We can use government aid packages; (6) Instead of layoffs, we can reduce pay; and (7) Layoffs will be detrimental to the firm's reputation. The question was asked of firms who reported a reduction in revenue in 2020, which applies to 845 respondents. Figure 12 tabulates the responses.

We find that the main reason for keeping employees when faced with a reduction in revenue is to avoid skill loss: 91% of the respondents agree with this statement, including 64% who strongly agree. This suggests that firm-specific human capital is a predominant concern for firms (see Lazear (2009)).

The second most important consideration on the layoff margin is the concern of being unable to hire quickly during recovery: 76% of the respondents agree with this statement, including 42% that strongly agree. That is, future search and matching costs are an impor-

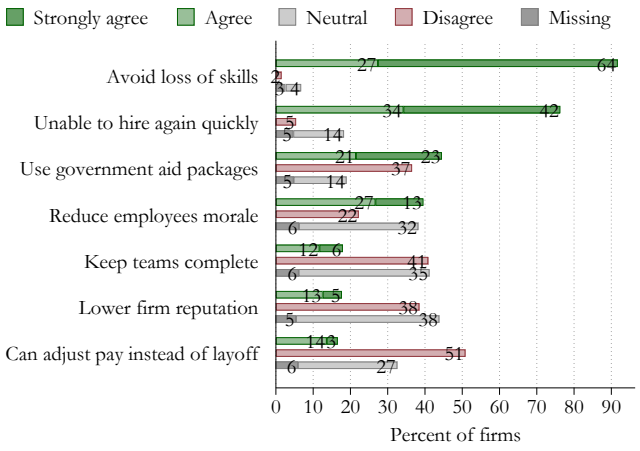


Figure 12: Reasons for Retaining Employees despite Reduced Revenue

Note: The figure reports responses to the question, "What were the main reasons for retaining employees despite a reduction in sales and other cost pressures? Even if you have laid off some employees, consider why you have not laid off more." The question is conditional on reporting a reduction in revenue in 2020. The exact statements that the respondent could choose from are in the text.

tant consideration in the layoff decision. Relatedly, Bewley (1999) discusses the retention of employees despite bad economic times and also finds that retaining skills is an important concern for employers (p.239).

Morale concerns are not first-order concerns in the layoff decision: 40% agree that layoffs have detrimental effects on the morale of the remaining employees, while 22% disagree. Firms with negative revenue growth are much less concerned about morale effects than firms with positive revenue growth (Figure A.14, panel (c)).

Access to government aid packages, keeping teams complete, or reducing firm's reputation are not important reasons for not laying off employees. The least support among firms received the statement that "Instead of layoffs, we can reduce pay"—17%; more than 50% of the respondents disagree with the statement. We do not find much variation in the reasons for retaining employees according to firm characteristics (see Table A.7).

5.2 Perceived Consequences of Layoffs for Employees

Figure 13 reports responses to the question "How have layoffs affected the remaining employees?" This question was put to all firms that reported any layoffs in 2020. Most of the respondents do not agree that layoffs hurt morale of the remaining workers: only 19% agree that layoffs hurt morale, 37% disagree, and the rest are either neutral on the issue or did

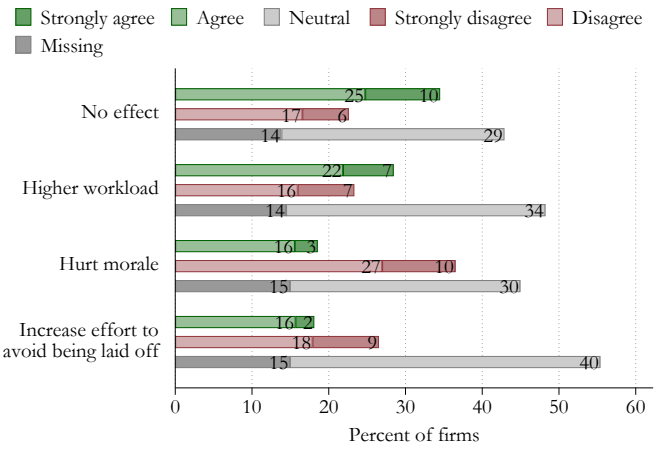


Figure 13: The Perceived Consequences of Layoffs on the Remaining Employees

Note: The figure shows responses to the question, "How have layoffs affected the remaining employees?" The question was put to firms that reported having laid off employees in 2020. The statements are: Employees have a higher workload as there are fewer; Employees work harder to avoid being laid off; Layoffs hurt morale and work ethics among the remaining employees; There is no effect on the remaining employees.

not respond to the question. This supports our finding above that morale considerations are not of first-order importance for layoff decisions.

Twenty-nine percent of firms perceive that layoffs lead to a higher workload on other employees. Eighteen percent agree that layoffs lead to an increased work effort of the remaining workers. If labor market conditions are more favorable to employees (e.g., when labor market tightness is high), even fewer firms agree that the remaining employees would exert a greater effort to avoid being laid off (Table A.8).

We find similar responses when we separately examine sub-samples by firm size or revenue growth (Figure A.15). However, we find that the effects of layoffs on remaining employees vary by the type and reason for the layoffs (Figure A.15, panel (b)). Focusing on permanent layoffs, the remaining employees have a higher workload and there is a less detrimental effect on morale when layoffs are due to low-performance.

Finally, the presence of worker or union representatives does not seem to substantially affect the number of laid off workers or who gets laid off. Specifically, 15% agree, 28% disagree and 57% are neutral to the statement "A union representative helps reduce the number of layoffs by finding alternative solutions to reduce wage costs (reorganization, wage reduction, etc.)" (Figure A.16).

In general, we do not find a strong sentiment that supports the negative effect of layoffs on the remaining employees.

5.3 Selective Nature of Layoffs

We find that layoffs give better control of who leaves. Specifically, 60% of the firms agree that layoffs give better control over who leaves the firm (see Figure 14). In the subsample of firms that list "Laying of low-performing employees" as a reason for layoff, the percentage of firms agreeing minus the percentage of firms disagreeing with the statement "Layoffs given better control over who leave the firm" is 77; while in the full sample, it is 55 (Figure A.17).

5.4 Discussion of Costs and Benefits of Layoffs

Our findings show that firms strongly agree with the sentiment that layoffs give better control of who leaves. Firms do not perceive that there is a strong negative effect of layoffs on the productivity of the remaining employees. This is consistent with Bewley (1999) that "the advantage of layoffs over pay reduction was that they "get the misery out the door.""[p. 16] This suggests that the negative effect of layoffs on the firm productivity is likely low. However, the savings from layoffs can be substantial since a firm can selectively lay off low-productivity workers and save the variable and fixed costs.

6 Why Firms Lay Off instead of Cutting Wages

In this section, we provide more direct evidence why pay cuts are not substituted for layoffs in many cases.

6.1 Why Not Lower Pay instead of Laying Off Workers

We ask firms directly "Why did not you lower pay instead of laying off employees?" We ask this question of all firms that reported having laid off workers in 2020.

We find strong support for statements that for many firms, cost-benefit analysis tilts away from pay cuts towards layoffs. Specifically, firms overwhelmingly agree that (i) wage reduction would not have saved jobs (73% agree, 10% disagree, and the rest are neutral (here and in the rest of this paragraph, the numbers are conditional on non-missing responses in Figure 14)), (ii) layoffs give better control of who leaves (73% agree, 5% disagree, and the rest are neutral), (iii) wage reductions hurt morale and productivity more (69% agree, 6% disagree, and the rest are neutral), (iv) layoffs save more money than wage reductions (59% agree, 7% disagree, and the rest are neutral).[21]

At the same time, we find evidence that some firms do cut wages to save layoffs. Specifically, 10% of the firms responded that they disagree that a wage reduction would not have

[21]Figure A.17 tabulates this question by firm size, revenue growth, and type of layoff.

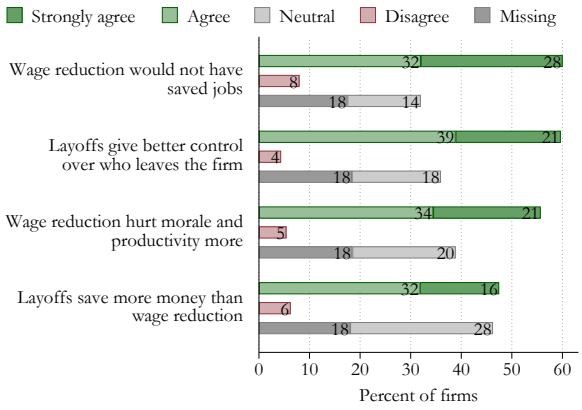


Figure 14: Reasons for Layoffs instead of Pay Cuts

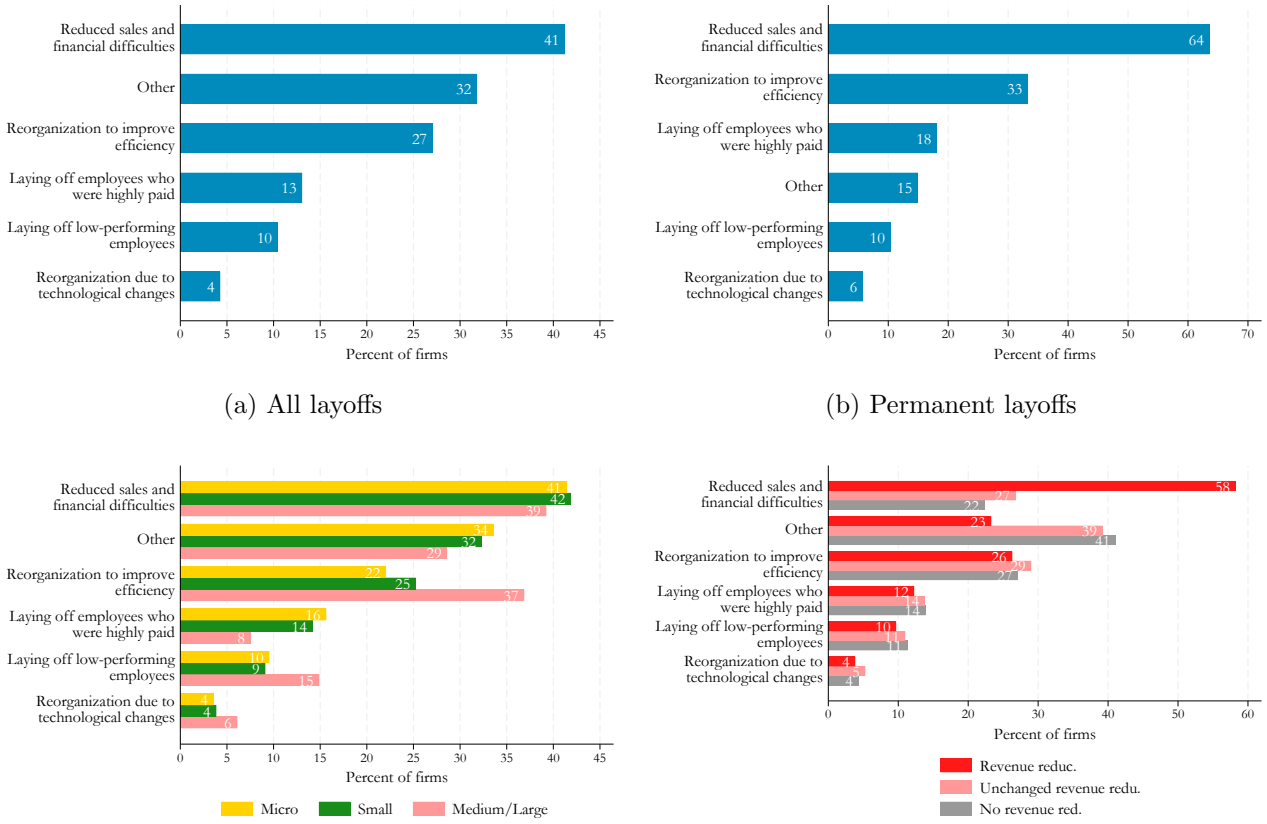
Note: The figure reports responses to the question: "Why didn't you lower pay instead of laying off employees?" The question was put to firms that reported having laid off employees in 2020.

saved layoffs. Investigating the firms that disagree versus those that agree that wage reduction would not have saved layoffs, we find that those that disagree are (i) more likely to report wage reductions (35% versus 14%) and (ii) more likely to provide a hypothetical amount of pay cut to save layoffs versus answer "do not know" (72% versus 36%) (see Section 6.3 for more details). That is, the firms that disagree with the statement that wage reduction would not have saved layoffs appear to be those that, in fact, implemented pay cuts and likely saved layoffs in such a way.

Furthermore, when we ask firms why they do not lay off workers despite a reduction in sales or other cost pressures, 17% agree with the statement "Instead of layoffs, we can reduce pay", while more than 50% disagree (as reported in Figure 12). In further investigation of these firms, we find that those who agree versus those that disagree are (i) more likely to implement wage reductions (51% versus 6%) and (ii) more likely to provide a hypothetical amount of pay cut to save layoffs versus answer "do not know" (70% versus 45%). That is, some firms implement pay cuts to save layoffs.

6.2 Opportunistic Layoffs in Recessions

In this section, we show that layoffs during recessions occur for various reasons. An economic crisis is a time when (1) it is more efficient to divert managerial resources from production to reorganization, and (2) it is more acceptable to lay off workers from the fairness perspective. We call the layoffs in a recession that happen due to reasons other than a temporary contemporaneous negative shock—"opportunistic layoffs." We find some evidence that firms that report such layoffs are less likely to consider pay cuts to be an alternative to the layoffs.



(a) All layoffs

(b) Permanent layoffs

(c) By firm size

(d) By revenue growth

Figure 15: Reasons for Layoffs

Note: The figure shows responses to the question, "What were the main reasons for the company's layoffs in 2020? Check as many as apply." The possible reply options are reported in the text.

6.2.1 Reasons for Layoffs

Figure 15 tabulates firms' reported reasons for layoffs in 2020. The question in the survey is: "What were the main reasons for the company's layoffs in 2020?" The question did not specify the type of layoffs (permanent, temporary or furloughs). The respondents could choose among the following options: (1) Our company did not experience layoffs in 2020 (not shown in the figure); (2) Reduced sales and financial difficulties; (3) Reorganization due to technological changes; (4) Reorganization to improve efficiency (eliminate unnecessary labor); (5) Laying off employees who were highly paid relative to their productivity; (6) Laying off low-performing employees (for example, employees with outdated skills and knowledge); (7) Other.

Forty one percent of firms that implemented any layoffs (permanent or other) and sixty four percent of firms that implemented permanent layoffs marked "Reduced sales and financial difficulties". The rest of the respondents marked other reasons, such as reorganization due to technological changes or to improve efficiency, laying off employees who were highly paid relative to their productivity, laying off low-performing employees, or other reasons. Firms that experienced nonnegative growth were more likely to mark other reasons than reduced sales and financial difficulties. Large firms were more likely to indicate reasons, such as reorganization to improve efficiency or laying off low-performing employees.

6.2.2 Crisis as an Opportune Time for Layoffs

It appears that a crisis is an opportune time for layoffs, in addition to being the time when firms experience reductions in sales or financial difficulties. Next, we try to understand why. We asked the firms to express their agreement or disagreement towards statements, which we designed based on existing theories of layoffs in recessions. For example, there exists a class of theories that postulate that organizational restructuring is countercyclical because the opportunity costs of managerial time are lower during recessions and resources can be efficiently diverted to reorganization (Caballero and Hammour (1994), Koenders and Rogerson (2005), Berger (2018)). A complementary view from the behavioral economic literature is that workers like fairness. Layoffs during a crisis might be seen by workers as more fair. Specifically, Kuhn and Osaki (2022) write that people's reactions to the same action vary dramatically with the reasons the action was taken. Charness and Levine (2000) write that "[p]revious research suggests that people consider it fairer for an employer to react to an exogenous shock than to take the initiative and cause harm." (p. 386). They find that layoffs are largely perceived as fair when they result from lower product demand. During a crisis, firms are experiencing a distress; and so workers can view layoffs as sharing the burden of the economic pain with the firms. However, from a social planner's perspective, layoffs in recessions for reorganizational or other reasons, not related to the negative recessionary shock reasons, might not be optimal. In addition, recessions are not good times to be laid off (Davis and Wachter (2011); Schmieder, von Wachter and Bender (2022); Bertheau, Acabbi, Barcelo, Gulyas, Lombardi and Saggio (2023b)).

We ask the firms to indicate the degree of their agreement with the following statements: (1) Management has less focus on efficiency and cost reductions during good times, and, therefore, the firm reorganizes itself during times of bad economic conditions; (2) It is more acceptable to lay off the less able employees in bad times; (3) It is more acceptable to lay off employees who are highly paid relative to their productivity in bad times; and (4) It is easier to ask employees to change their tasks / increase their work effort in bad times as employees

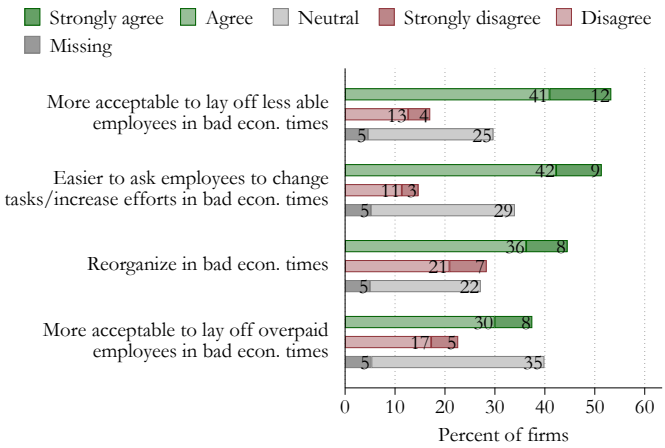


Figure 16: Is Crisis an Opportune Time for Layoffs?

Note: The figure shows responses to the question "Do you agree with the following statements? Note: Even if you have laid off some employees, consider why you have not laid off more." The question is asked of respondents who reported a reduction in revenue in 2020.

are less likely to quit. We asked these questions of respondents who reported a reduction in revenue. Figure 16 shows the responses.

We find firms' support for the statements indicating that recessions are opportune times for layoffs. The statement that received the most support is that it is more acceptable to lay off less able employees in recessions —- 53% percent of firms agree. More than 50% percent also agree that it is easier to implement a change in the content of job tasks in a recession because employees are less likely to quit. That is, employers implement changes when the workers' outside option is low. Forty-four percent agree that firms tend to reorganize during bad economic times rather than during good times. Attitudes towards statement "It is more acceptable to lay off employees who are highly paid relative to their productivity during bad economic conditions" are mixed: 38% of firms agree, 40% are neutral, and the rest disagree with this statement. However, focusing on the subsample of firms that listed "Laying off highly paid employees" as a reason for layoffs, we find that 71% of firms agree that it is more acceptable to lay off overpaid employees in bad economic times (Figure A.18). This provides some support for evidence in Mueller (2017) and Barreto Otazú and Merkl (2024), which find a larger share of high-wage displaced workers during recessions than during booms.

Associating firm characteristics with the firm's reported attitudes toward layoffs in bad times, we find that higher-wage, less productive, and smaller firms tend to agree with the statement that it is more acceptable to lay off overpaid employees in bad economic times. Higher-unionized firms, firms facing higher labor market tightness, tend to agree with the

statement that it is more acceptable to lay off less capable employees in bad economic times (Table A.9).

In addition, evidence that a crisis is an opportune time for layoffs comes from the observation that many firms reported permanent layoffs, despite the availability of government-sponsored furlough schemes (Figure 2).

The firms' agreement with the theories that a crisis is an opportune time for layoffs suggests that some layoffs are not caused by the crisis per se. Instead, organizational inefficiencies build up over time, and layoffs are postponed until a crisis. Alternatively, a crisis pulls forward some layoffs. Figure 17 reports the response to the hypothetical question, "How many of these layoffs would have taken place in 2020 or over the next two years if there had not been a pandemic?", which was asked of firms that provided any reason for layoffs. Firms could choose any number between 0 and 100% in increments of 10%. Forty-four percent of firms state that 10% or fewer of the layoffs would have occurred, implying that fifty-six percent of firms state that more than 10% of the layoffs would have taken place even without the crisis. In fact, 24% of the companies state that all the layoffs would have occurred even in the absence of the crisis. On average, 34% of the layoffs would have occurred in the next two years without the recession.[22]

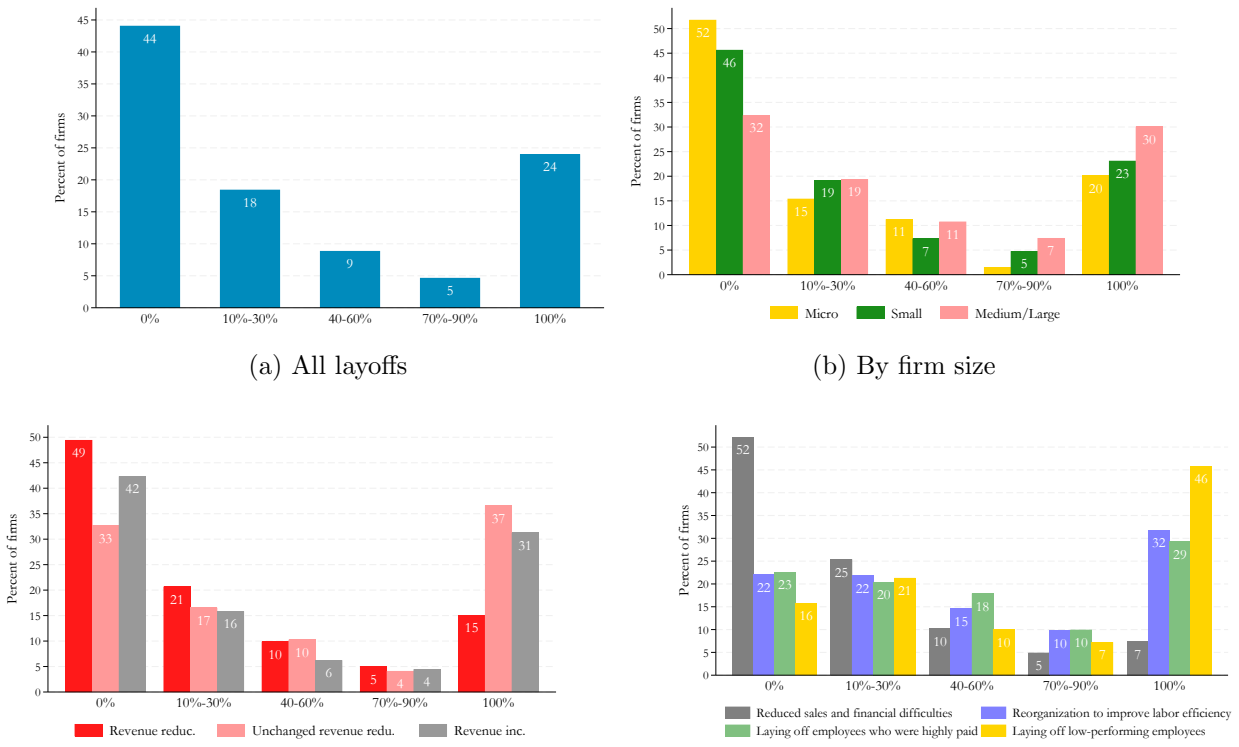
We then examine how the share of the layoffs pulled forward by the crisis is associated with the reason for layoffs. The share is larger if the layoffs are not due to the contemporaneous reduced sales but due to other reasons (Table 3). Also, firms that have experienced an increase in revenue growth report a larger share of layoffs pulled forward. The share of layoffs pulled forward by the crisis is larger for large firms (30% of medium or large firms responded that all layoffs would have happened anyway) and for firms that experienced unchanged or increased revenue (36% and 31%, respectively, responded that all layoffs would have happened anyway).

Summarizing, while reduced sales is a modal reason behind layoffs, majority of the firms specified other reasons. The majority agree that a crisis is an opportune time to lay off less-productive workers or reorganize. Fifty-six percent of firms respond that some or all of layoffs would have occurred even in the absence of the crisis.

6.2.3 Pay Cut Is Less of an Alternative to Opportunistic Layoffs

We find that the firms that choose other than the financial difficulties reasons for their permanent layoffs are less likely to implement pay cuts. Specifically, we divide the firms into three groups by the reported reason for the layoff: (1) reduced sales and no other reason,

[22]Focusing on permanent layoffs, the distribution of firms is as follows; 0 layoffs: 42%; 10-30% layoffs: 23%; 40-60% layoffs: 12%; 70-90% layoffs: 6%; 100% layoffs: 16%.



(a) All layoffs

(b) By firm size

(c) By revenue growth

(d) By reason for layoffs

Figure 17: Share of Layoffs that Would Have Occurred Even without the Pandemic Recession

Note: The figure reports responses to the question, "How many of these layoffs would have taken place in 2020 or over the next two years if there had not been a pandemic?". The question was put to firms that reported having laid off employees in 2020.

(2) reduced sales combined with any other reason, and (3) any other reason except for the reduced sales one. We hypothesize that pay cuts are less of an alternative if layoff occurs for reasons other than reduced sales (e.g., group 3), and, therefore, firms in group 3 are less likely to implement pay cuts as compared to firms in group 1, ceteris paribus. Indeed, examining the firms that implemented permanent layoffs in each of these groups, we find that in group 1, 50% of these firms also implemented some pay cuts; in group 2, 48% of these firms also implemented some pay cuts; and, in group 3, 29% of these firms also implemented some pay cuts.

We then use the same three groups of firms by reason for layoffs and tabulate responses to the question of why retain workers despite reduced revenue (see Figure 12). We find that the firms in group 3 are more likely to disagree with the statement that instead of layoffs they can reduce pay compared to the firms in group 1. Specifically, the difference between the share of firms that disagree (or strongly disagree) and the share of firms that agree (or strongly

Table 3: How Many Layoffs Would Have Occurred Even without the Pandemic Recession

	(1)	(2)	(3)
Productivity	1.09	0.11	-0.94
	(2.01)	(2.02)	(1.83)
Average wages	1.63	1.19	0.11
	(1.88)	(1.89)	(1.58)
Revenue growth rate in 2020 (%)	4.82***	5.14***	2.54**
	(1.51)	(1.52)	(1.24)
Routine task index	-1.11	-1.64	-0.68
	(1.05)	(1.04)	(0.93)
Unionization (%)	3.12**	2.31	2.39*
	(1.51)	(1.57)	(1.38)
Worker representative	-0.55	-3.18	-1.06
	(2.95)	(3.17)	(2.94)
Tightness	-1.60	-2.17	-2.30
	(1.78)	(1.86)	(1.82)
Layoff: Reduced Sales			-25.57***
			(3.62)
Layoff: Technological change			11.65*
			(6.63)
Layoff: Improve efficiency			13.11***
			(3.40)
Layoff: Highly paid			2.54
			(4.14)
Layoff: Low-performing			15.14***
			(4.70)
Layoff: Other			-15.09***
			(4.37)
N	771	771	771
Mean Dep. Var.	30.92	30.92	30.92
Adj.R2	0.025	0.034	0.207
Additional controls	No	Yes	Yes

Note: The dependent variable is the reported share of the layoffs that would have occurred in 2020 or the next 2 years if not for the pandemic. The mean of the dependent variable is 34%.

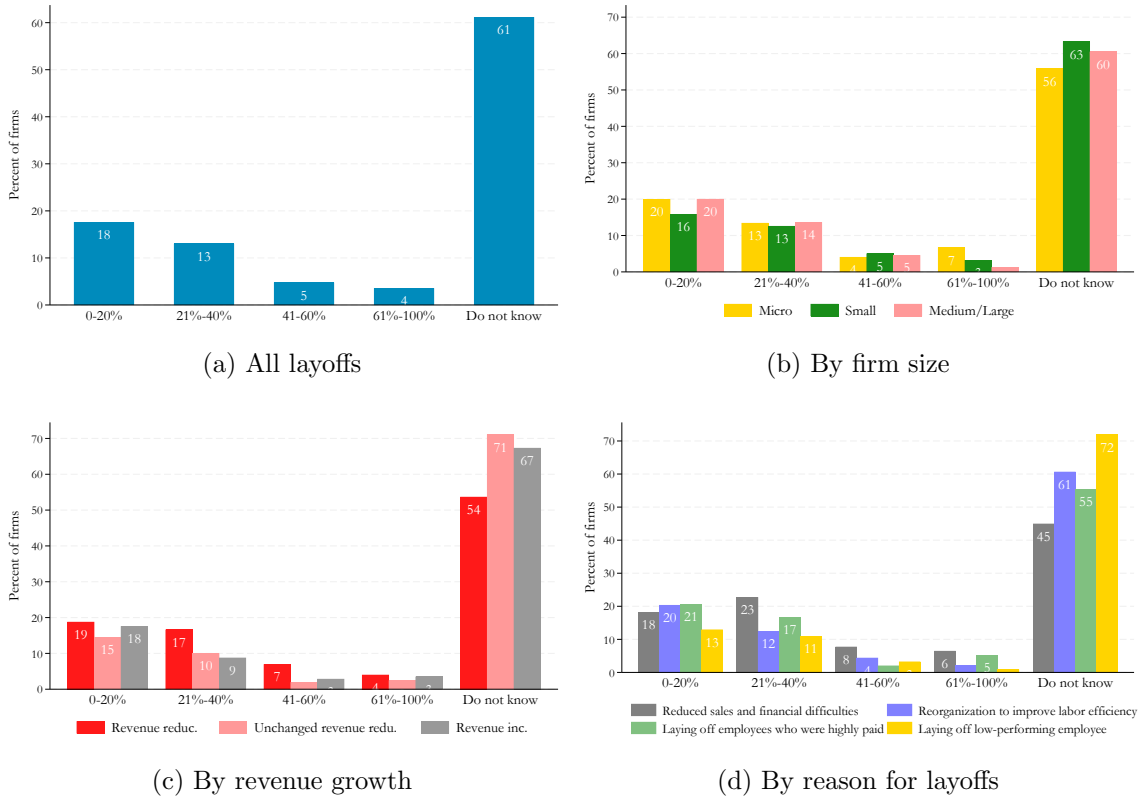
agree) with the statement is 24%, 42%, 40%, for groups 1, 2, 3, respectively. Although suggestive, this evidence points towards lower substitutability between opportunistic layoffs and pay cuts.

Finally, we use the three groups of firms by reason for layoffs and, focusing on the firms that implemented permanent layoffs, tabulate responses to the question of why retain

employees despite reduced revenue, shown in Figure 14. We find that the firms in group 3 are more likely to agree with the statement that pay cut would not save jobs than firms in group 1. Specifically, in group 3, 82% agree and 6% disagree, while in group 1, these shares are 71% and 14%, respectively. We conclude that, in contrast to layoffs due to reduced sales, opportunistic layoffs are likely to be less elastic to pay cuts within the firm.

6.3 The Size of a Hypothetical Pay Cut to Save Layoffs

Finally, we ask firms what reduction in the total pay cost could have prevented layoffs. We ask the question of firms that laid off workers in 2020.



(a) All layoffs

(b) By firm size

(c) By revenue growth

(d) By reason for layoffs

Figure 18: What Reduction in the Total Wage Costs Could Have Prevented Layoffs?

Note: The figure reports responses to "What reduction in the total salary cost (base pay and bonuses) could have prevented layoffs?" The question is put to respondents that laid off workers in 2020. The options are: 0-20 percent; 21-40 percent; 41-60 percent; 61-80 percent; more than 80 percent; Do not know.

Sixty-one percent of the companies responded "Do not know" to the question of what reduction of the total pay cost could have prevented layoffs. One way to interpret this response is to assume that there is an answer, but that the respondents are not privy to the

firm's decision-making process. Since we screened the respondents for the role in the firm and deleted responses from the respondents who are not privy to the firm decision-making process, we can interpret the response at face value — that the firms do not consider a pay cut as a way to save layoffs and that these adjustment margins are not treated as viable alternatives. In the regression analysis, we find that firms are more likely to respond "Do not know" if they implemented opportunistic layoffs (Table 4). Also, firms that experienced unchanged or positive revenue growth are more likely to answer "Do not know." (Figure 18, panel (c)).

Table 4: The Probability of "Do Not Know" Answer to the Question about the Reduction in the Total Wage Costs Could Have Prevented Layoffs

	(1)	(2)	(3)
Productivity	0.06**	0.05**	0.04*
	(0.02)	(0.02)	(0.02)
Average wages	-0.02	-0.02	-0.03
	(0.02)	(0.02)	(0.02)
Revenue growth rate in 2020 (%)	0.01	0.02	0.00
	(0.02)	(0.02)	(0.02)
Routine task index	0.00	-0.00	0.00
	(0.01)	(0.01)	(0.01)
Unionization (%)	0.03	0.02	0.02
	(0.02)	(0.02)	(0.02)
Worker representative	-0.15***	-0.15***	-0.14***
	(0.04)	(0.04)	(0.04)
Tightness	-0.01	-0.02	-0.02
	(0.02)	(0.02)	(0.02)
Layoff: Reduced Sales			-0.19***
			(0.05)
Layoff: Technological change			0.08
			(0.09)
Layoff: Improve efficiency			-0.01
			(0.04)
Layoff: Highly paid			-0.05
			(0.05)
Layoff: Low-performing			0.10*
			(0.06)
Layoff: Other			0.09
			(0.06)
N	751	748	748
Mean Dep. Var.	.54	.54	.54
Adj.R2	0.017	0.023	0.072
Additional controls	No	Yes	Yes

Note: The dependent variable is the indicator for responding "Do not know" to the question about a hypothetical reduction in the total pay cost that could have prevented layoffs. Additional controls are included. The mean of the dependent variable is 61 percent. Sample of firms that implemented any layoffs.

Thirty-nine percent of the firms provided a numerical response to the reduction question (Figure 18, panel (a)). Among them, about half suggested a reduction of less than 20%, and another half—a reduction of 21-60%. In the regression analysis, we find that firms are more likely to report a larger pay cut if they laid off due to reduced sales versus due to other reasons (Table A.11).

We further examine whether the firms that provided a numerical answer to a wage cut reported any cuts. Among the firms that chose a pay cut of 20%, 16% reported a wage reduction, with an average size of 23%, and 32% reported any pay reduction; among the firms that chose a pay cut of 20-100%, 34% reported a wage reduction, with an average size of 30%, and 55% reported any pay reduction; and among the firms that chose "Do not know", 10% reported a wage reduction, with an average size of 27%, and 20% reported any pay reduction. That is, firms that reported a greater hypothetical reduction were more likely to implement wage reductions, and their average size was larger. Interestingly, some of the firms that reported a wage reduction of 20% cut wages with an average size of the cut greater than 20%. Therefore, some of these firms have implemented wage reductions and saved some layoffs.

7 Conclusions

Understanding how and why firms adjust their labor in response to adverse economic shocks is a key economic question for researchers and policymakers. Using a large-scale novel survey of firms, we study how firms adjust their labor costs — via layoffs or pay cuts — and why. We link survey responses to administrative data in Denmark using firm-level identifiers and study the association between firm characteristics and labor market conditions and the different adjustment methods.

We find that layoffs are more prevalent than pay cuts, but pay cuts are not rare in the firms that experience a reduction in revenue. However, a pay cut does not appear to be an alternative to layoffs in many cases. First, not observing the pay cut does not imply that firms cannot lower wages. Lowering wages triggers costs in terms of productivity of the entire firm workforce via impact on morale and quits. In contrast to pay cuts, layoffs do not appear to trigger costs via a potential negative impact on the productivity of the workforce. The key firm's concern on the layoff margin is a loss of employee's skill.

Second, we provide some more direct evidence that the pay cut is not an alternative to layoffs in many instances. When asked why firms did not lower pay instead of layoff employees, 73% of firms agree with the statement that wage cuts would not have saved layoffs and those 10% who disagree were more likely to implement wage reductions. In addition,

layoffs occur for various reasons. An economic crisis or, more generally, recessions appear an opportune time to lay off some workers due to lower opportunity costs of such actions in terms of (1) managerial resources devoted to restructuring versus production, as well as (2) due to minimizing any potential negative effects on productivity of the workforce via fairness considerations. We find that pay cuts are less of a substitute to such opportunistic layoffs in recessions. Finally, a large fraction of firms were not able to provide a quantitative answer regarding what size of pay cut would save layoffs, the fraction was larger among the firms that implemented opportunistic layoffs or had positive revenue growth.

Some pay cuts might save layoffs. This might depend on the phase of the business cycle, legal constraints, wage setting, labor relations, firms, and workers' views. These are fruitful avenues for future research.

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Online Appendix
Why Firms Lay Off Workers Instead of Cutting Wages: Evidence from Linked Survey-Administrative Data

By Antoine Bertheau, Marianna Kudlyak, Birthe Larsen and Morten Bennedsen

A The Survey Questionnaire

This section reports the first 35 questions of the questionnaire. While some phrases can seem uncommon in English, they are perfectly understandable in Danish. Key phrases and Danish words are reported in parenthesis in Danish for Danish speakers.

A.0.1 Background Questions

1. What is your role in the company?
    - Owner manager
    - Director without ownership
    - Board member without ownership
    - Owner without being a board member
    - Other _____
2. Does a person or family have 50% or more of the ownership?
    - Yes
    - No
    - Do not know
3. Do you consider the company to be a family business?
    - Yes
    - No
    - Do not know
4. How many employees were there in the company on May 1, 2021? Note: Include all employees, including full-time, part-time, furloughed and employees on apprenticeship and parental leave. Give your best estimate.
    - _____
5. How much did revenue (*omsætningen*) change in 2020 compared to 2019? Note: If you do not know the exact change, give your best estimate.
    - Decreased by 100 percent
    - Decreased (indicate the percentage): _____
    - Unchanged
    - Increased (indicate the percentage): _____
    - Increased by 100 percent or more

6. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)". The revenue decreased because...

    - Declining demand for goods and services
    - The administrative challenges due to COVID made it difficult to work
    - Challenges of buying supplies for the company
    - Challenges of obtaining external funding
    - Challenges of buying and selling across borders
    - Other reasons

7. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)". How long do you expect it to take before revenue reaches its 2019 precrisis level?

    - Our revenue has already passed the precrisis level
    - We are at the same level as before the crisis
    - Less than 3 months from today
    - 3-6 months from today
    - 6-12 months from today
    - 12-24 months from today
    - Other/Do not know

8. Compared to 2019, investments in 2021 will be ...

    - Reduced (indicate percentage reduction): _____
    - Unchanged
    - Increased (indicate percentage increase): _____

9. In the last 12 months we have been negotiating with the bank about bank credit.

    - Yes, and the negotiations have been normal
    - Yes, and the negotiations have been more accommodating than normal
    - Yes, and the negotiations have been more restrictive than normal
    - No, because we do not use bank credits
    - No, we did not need further bank credits
    - No, due to 'other'.

10. Is the company primarily a subcontractor (*underlerverandør*) to other companies?

    - Yes, for 90 percent or more of the revenue
    - Yes, for 50 percent to 89 percent of the revenue
    - Yes, for 25 percent to 49 percent of the revenue
    - Yes, for 10 percent to 24 percent of the revenue
    - Yes, for less than 10 percent of the revenue
    - No
    - Do not know

11. In the following questions, we ask about wage (*løn*)[23] and employment practices (*ansættelsespraksis*) in the firm. How close are you to such decisions?

    - I am responsible for wage and employment conditions
    - I am not responsible, but I know about wage and employment conditions
    - I only know a little about wage and employment conditions

A.0.2 The Adjustment of Worker Pay and the Number of Employees in 2020

12. Did your company use the following practices in 2020? Check as many as apply.

    - Wage reduction *(lønnedgang)*
    - Fewer/lower bonuses
    - Fewer/lower fringe benefits
    - Fewer promotions
    - None of the above

13. If the answer to the Question 12 is different from "None of the above". Respondents were asked to indicate the percentage of and the percentage of employees affected for each practice that they indicated to have used:

    - The percentage of the [wage reduction;fewer/lower bonuses;fewer/lower fringe benefits;fewer promotions]: ————————
    - The percentage of the employees affected by [wage reduction;fewer/lower bonuses;fewer/lower fringe benefits;fewer promotions]: ————————

14. Did your company use the following practices in 2020? Check as many as apply.

    - Freezing or reducing new hires - for existing jobs
    - Freezing or reducing new hires - for new jobs
    - Permanent layoffs
    - Temporary layoffs (expects reemployment)
    - Furloughs with support from the government COVID-19 aid packages
    - Negotiated separations via pensions or early retirement plans (efterløn)
    - Reduction in hours without the use of government aid packages
    - None of the above

15. If the answer to the Question 14 is different from "None of the above". Indicate to what extent (in number of affected employees) the following practices were used:

    - Freezing or reducing new hires - for existing jobs: ————————
    - Freezing or reducing new hires - for new jobs: ————————
    - Permanent layoffs: ————————
    - Temporary layoffs (expects reemployment): ————————
    - Furloughs with support from the government COVID-19 aid packages: ————————
    - Negotiated separations via pensions or early retirement plans: ————————
    - Reduction in hours without the use of government aid packages: ————————

[23] In Danish, the word løn is usually translated as salary, pay or wages. The definition in the dictionary ordnet.dk is "payment that an employee receives for working".

A.0.3 Perceptions, Attitudes and Reasoning Regarding Layoffs

16. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)". What were the main reasons for retaining employees despite a reduction in sales and other cost pressures? Note: Even if you have laid off some employees, consider why you have not laid off more. Please express your opinion on the following statements. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

- We want to keep current employees to avoid loss of skills and knowledge
- We may not be able to find and hire workers again quickly when needed during the recovery
- Employees work in teams and we cannot lay off some of them
- Layoffs will be detrimental to morale among the remaining employees
- We can use government aid packages
- Instead of layoffs, we can reduce pay
- Laying off will be detrimental for the company's reputation

17. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)". Do you agree with the following? Note: Even if you have laid off some employees, consider why you have not laid off more. Please express your opinion on the following statements. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

- Management has less focus on efficiency and cost reductions during good times and therefore the company reorganizes itself during bad times (*dårlige tider*)
- It is more acceptable to lay off the less-good employees (*mindre gode*) during bad times
- It is more acceptable to lay off employees who are highly paid relative to their productivity during bad times
- It is easier to ask employees to change their tasks or to increase their work effort in bad times, as employees are less likely to quit

18. What were the main reasons for the firm's layoffs in 2020? Check as many as apply.

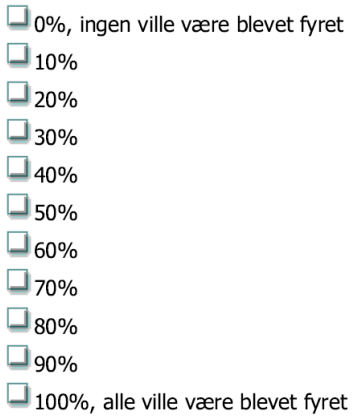
- Our company did not experience layoffs in 2020
- Reduced sales and financial difficulties
- Reorganization due to technological changes
- Reorganization to improve efficiency (eliminate unnecessary labor)
- Laying off employees who were highly paid relative to their productivity
- Laying off low-performing employees (for example, employees with outdated skills and knowledge)

- Other. Please provide details

19. If the answer to Question 18 is not "Our company did not experience layoffs in 2020"- How have layoffs affected the remaining employees of the company? Please state your opinion on the following statement. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - Employees have a higher workload as there are fewer
    - Employees work harder and make a greater effort to avoid being laid off
    - Layoffs hurt morale and work ethics among the remaining employees
    - There is no effect on the remaining employees

20. If the answer to Question 18 is not "Our company did not experience layoffs in 2020". How many of these layoffs would have taken place in 2020 or over the next two years if there had not been a pandemic? If you are uncertain, give your best estimate. Please choose between 0% (no one would have been laid off) and 100% (everyone would have been laid off). See the screenshot below.



A.0.4 Institutional Setting

21. Are you using / have used in 2020 you used at least one of the government's aid packages mentioned below? The government's aid packages include: Furlough scheme, work distribution scheme, compensation for fixed costs.

    - Yes
    - No
    - Do not know

22. If the answer to Question 21 is "Yes". Do you think the company would have survived the pandemic crisis without government aid packages? Even if you are not sure, provide your best estimate.

    - No, we would not have survived
    - Yes, we would have survived. Enter the probability in percent (1 = least likely, 100 = we would have survived with certainty).

23. Which of the following forms of employee representation currently exist in the firm? List as many as apply.

- Trade union representative for the entire company without professional divisions, TR (*Tillis-repræsentant*)
- Trade union representatives divided into professional groups and with an overall joint shop steward
- Employee representative at the board-level (*Medarbejderrepræsentanter*)
- Cooperation Committee, SU (*Samarbejdsudvalg*)
- None of the above

24. If the answer to Question 23 is "Trade union representative [...], TR". For the year 2020, what is your position on the following statements? Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - Union representative (s) help reduce the number of redundancies by finding alternative solutions to reduce wage costs (reorganization, wage reduction, etc.)
    - Union representative (s) help implement firing strategies by identifying low / high performing employees or setting criteria for who can be fired.

25. If the answer to Question 23 is "Trade union representative [...], TR". Other, please write
26. If the answer to Question 23 is "Employee representative at the board-level". For the year 2020, what is your position on the following statements? Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - Employees on the board help to reduce the number of redundancies by finding alternative solutions to reduce wage costs (reorganization, wage reduction, etc.)
    - Employees on the board help to implement layoff strategies by identifying low / high performance or setting criteria for who can be laid off
    - Has no employees on the board
    - Other, please write.

27. Open-ended question put to all respondents. In general, what are the main considerations that come to mind when thinking about reducing the number of employees? Please use the text box below and write as much as you like. Your opinion and thoughts are very important to us. There is no right or wrong answer. If you do not want to share your views, then skip this question.

A.0.5 Perceptions, Attitudes and Reasoning Regarding Adjustment of Worker Pay

28. Do you think that this company offers lower or higher salaries than competing companies in your industry? Competing companies are other employers that hire people with the same skills in your region. If you are not sure, please come up with an estimate. Respondents have five options (much lower, lower, about the same, higher, much higher).
29. If the answer to Question 28 is "higher" or "much higher". Why do you offer higher salaries than others in your industry? Please state your position on the following statement.

    - We want to compensate for negative aspects of the job (job insecurity, working conditions, etc.)

- We want to attract the best candidates
- We want to hire quickly
- We want to ensure stable employees who do not change jobs often (avoid employees switching to competitors)
- We want to increase employee morale
- We want to reduce the need to control and monitor employees
- We want to share the high earnings we generate with the employees.

30. If the answer to Question 28 is "lower" or "much lower". Why do you offer lower salaries than others in your industry? Please state your position on the following statement.

    - We cannot pay higher wages (low demand for our products / service or high level of competition)
    - We do not need to pay high wages as there are few competing employers
    - We do not have to pay too high wages as we can offer a lot of valuable facilities that compensate for higher wages (job security, work environment etc)
    - We need to keep wages low in order to invest the earnings we generate in other strategic priorities (e.g. research and development, marketing).

31. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)" AND the answer to Question 12 is not "wage reduction". What are the main reasons for not lowering the contractual base pay (*basislønn*)? Please state your position on the following statements. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - It would be illegal or almost impossible to change the base pay and contractual allowances
    - The company thinks of the base pay as a commitment to its employees
    - Pay reduction can damage productivity because employees do not work as hard
    - Pay reduction would lead employees to quit
    - Pay reduction damages morale and is demotivating for employees in general
    - Unions/employee representatives are against pay reductions
    - Pay reduction would not save jobs

32. If the answer to Question 5 is "Decreased by 100 percent" OR "Decreased (indicate the percentage)" AND the answer to Question 12 is not "Fewer/lower bonuses". What are the main reasons for not lowering noncontractual supplements and / or bonuses? Please state your position on the following statement. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - The company thinks of bonuses as a commitment to its employees
    - Bonus reduction can damage productivity because employees do not work as hard
    - Bonus reduction would lead employees to quit
    - Bonus reduction damages morale and is demotivating for employees in general
    - Unions / employee representatives are against bonus reductions
    - Bonus reduction would not save jobs

33. If the answer to Question 18 is not "Our company did not experience layoffs in 2020". Which reduction in the total salary cost (salary plus allowances and bonuses) could have prevented layoffs? The options are listed in the screenshot.

- ☐ 0-20%
- ☐ 21-40%
- ☐ 41-60%
- ☐ 61-80%
- ☐ >80%
- ☐ Ved ikke

34. If the answer to Question 18 is not "Our company did not experience layoffs in 2020". Why not lowering wage instead of laying off employees? Please express your opinions on the following statements. Respondents have five options (strongly agree, agree, neutral, disagree, and strongly disagree).

    - Wage reduction would not have saved jobs
    - Wage reduction would hurt morale and productivity more than layoffs
    - Layoffs give better control over who leaves the company
    - Layoffs save more money than wage reduction

35. Open-ended question put to all respondents. Do you think that the company's wage policy will help your business strategy in bad times? Please use the text box below and write as much as you like. Your opinion and thoughts are very important to us! There is no right and wrong answer. If you do not want to share your views, then skip this.

KØBENHAVNS UNIVERSITET

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Att.: Den administrerende direktør

Hvordan kommer dit firma styrket ud af krisen?

Rambøll gennemfører på vegne af Københavns Universitet en spørgeskemaundersøgelse, der skal belyse, hvordan virksomheder kan komme styrket ud af Covid19-krisen. Vi spørger om hvad du/I har gjort for at komme igennem krisen og hvilke overvejelser du gør om tiden efter Covid19.

Projektet gennemføres under ledelsen af Niels Bohr Professor Morten Bennedsen, Økonomisk Institut, og er støttet af blandt andet Industriens Fond og det Samfundsvidenskabelige Forskningsråd.

Hvis du ønsker det, vil du efter undersøgelsens afslutning modtage en anonymiseret benchmarkingsrapport, hvor du kan se dine besvarelser op mod fordelingen af andre besvarelser. Vi overholder naturligvis alle databeskyttelsesreglerne.

Det tager ca. 20 minutter at udfylde spørgeskemaet. Undervejs kan du lukke skemaet og senere genoptage besvarelsen via linket, som du har modtaget her. Husk derfor at gemme denne invitation, til du har afsluttet din besvarelse.

Sådan gør du
Spørgeskemaet besvares elektronisk via internettet. Du kan svare på alle computere, tablets (f.eks. iPad m.m.) og smartphones. Du får adgang til dit personlige spørgeskema ved at klikke på nedenstående link:
https://surveys.ramboll.com/answer?key=ZNEVCQ9MSJ1Y

Vi vil bede dig besvare spørgeskemaet senest **den 27. juni 2021.**

Du er sikret fortrolighed
Dine svar behandles fortroligt af Rambøll og vil kun fremgå i anonymiseret form. Du kan få mere information om behandling af personoplysninger i forbindelse med undersøgelsen på forsiden at spørgeskemaet.

Kontakt
Hvis du har yderligere spørgsmål, er du velkommen til at kontakte Rambøll på e-mail: skemasupport@ramboll.com eller tlf. 6915 8076 på hverdage i tidsrummet kl. 8.00-16.00.

På forhånd tak for din deltagelse!

Med venlig hilsen
Rambøll og
Københavns Universitet

Note: The figure shows the survey invitation letter that firms received in an email. The letter is designed to provide information to recruit as many respondents as possible and minimize selection bias. It contains the following information: the deadline for completion of the survey; that the survey could be completed on any device, including tablets and smart phones; that all information provided was anonymous and the survey complied with all data protection regulations; and it explained the reward system for respondents. The letter was purposely vague about the actual research topic, it used a simple language, and it displayed the logo of the University of Copenhagen. See an English translation of the letter below.

Att: The Administrative Director

On behalf of the University of Copenhagen, Rambøll is carrying out a survey to study how companies can emerge stronger from the COVID19 crisis. We ask what you and others have done to get through the crisis and what thoughts you have about the time after COVID19. The project is carried out under the leadership of Niels Bohr Professor Morten Bennedsen, Department of Economics, University of Copenhagen, and is supported by, among others, Industriens Fond and the Social Science Research Council. If you participate in the survey, we will offer you an anonymized benchmarked report that shows your responses against the distribution of the other responses. We naturally comply with all data protection regulations. It takes approximately 20 minutes to complete the questionnaire. You can close the form and resume it later by again clicking on the link below. Therefore, please remember to save this invitation until you have completed the survey.

Here's how you do it. The questionnaire is answered electronically via the Internet. You can complete the questionnaire on any computer, tablet (e.g. iPad, etc.) or smartphone. To access your personal questionnaire, click on the link below: LINK

We ask that you complete the questionnaire no later than 27 June 2021. You are guaranteed confidentiality

Your answers are treated confidentially by Rambøll and will only appear in an anonymized form. You can find more information about the treatment of personal data in connection with the survey on the front page of the questionnaire. Contact

If you have further questions, please feel free to contact Rambøll by e-mail: skemasupport@ramboll.com or tel. 6915 8076 on weekdays between 8.00-16.00. Thank you in advance for your participation

Yours sincerely

Rambøll and University of Copenhagen

Figure A.1: Invitation Letter to Participate in the Survey

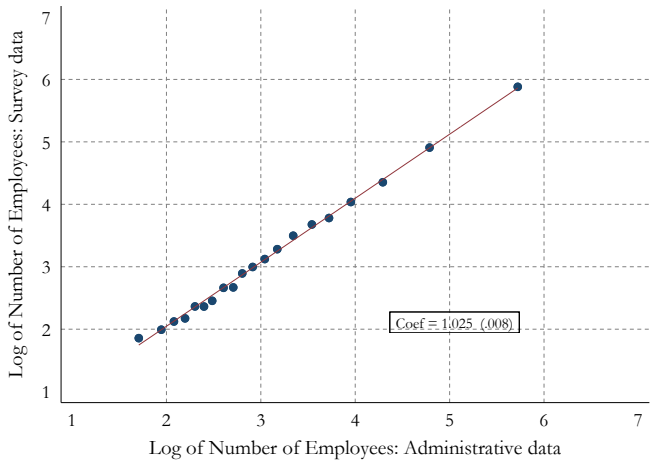


Figure A.2: Comparing Survey and Administrative Data: Number of Employees

Note: The figure compares the responses to the survey question "How many employees were in the company on May 1, 2021?" with the information from the administrative data in the BFL.

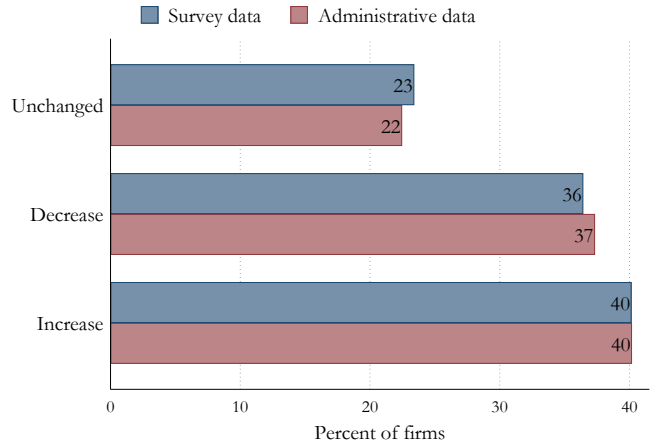


Figure A.3: Comparing Survey and Administrative Data: Revenue Change

Note: This figure compares the responses to the survey question "How much did revenue change in 2020 compared to 2019?" with the administrative data from FIRM. The category "Unchanged" is defined as a revenue growth rate between -5% and +5%. The percentage calculation excludes 27 missing responses for this question (out of 3013 firms).

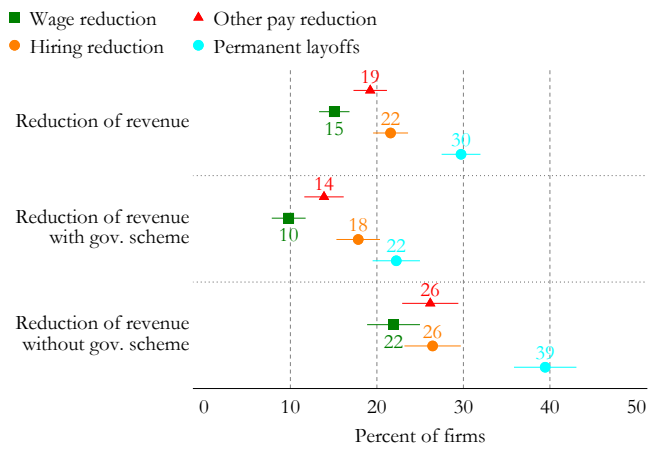
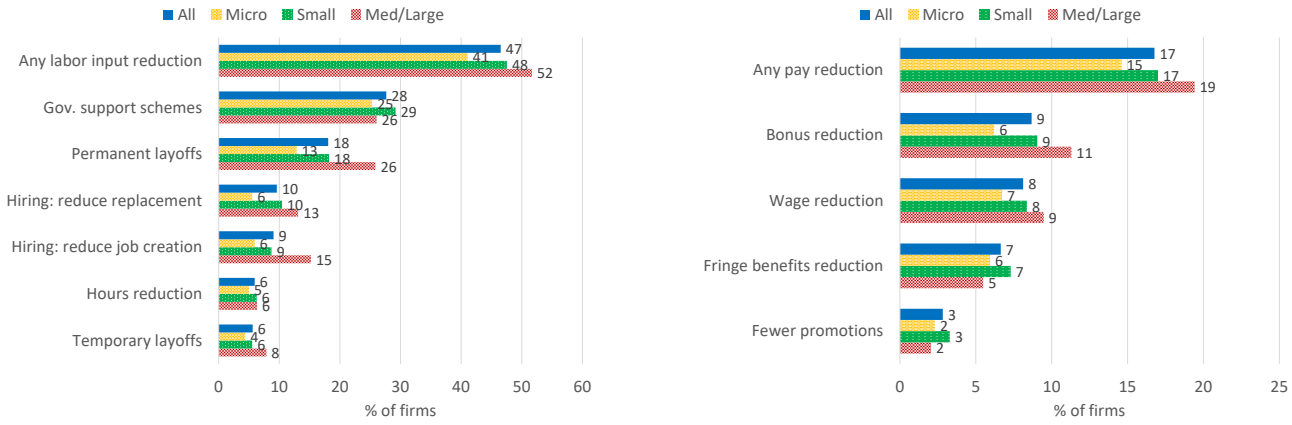


Figure A.4: Labor Adjustment Approaches Conditional on the Reported Use of the Government-Sponsored Furloughs

Note: The figure shows the share of firms reporting various labor adjustment approaches in 2020 conditional on the firm reporting the use or not of the government-sponsored furloughs.



(a) Number of workers or hours

(b) Worker pay

Figure A.5: Labor Cost Adjustment Approaches in 2020, by firm size

Note: Panels (a) and (b) show the percentage of firms that answered "yes" to questions about the corresponding labor adjustment method; the categories are not mutually exclusive. Temporary layoffs are defined in the questionnaire as layoffs with expected reemployment.

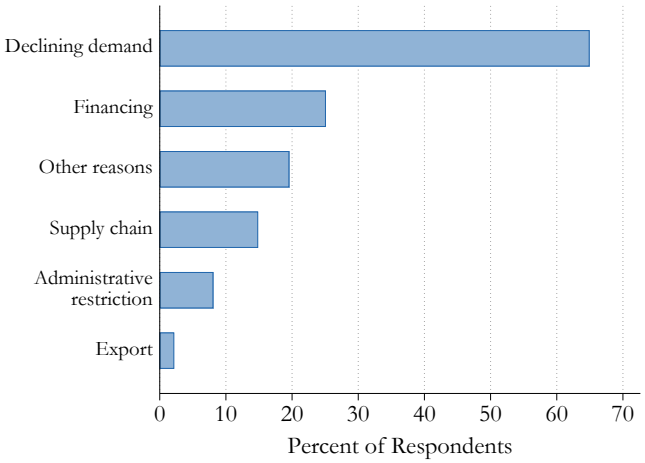


Figure A.6: Reasons for Declining Revenue in 2020

Note: The figure reports responses to the question, "The revenue decreased because..." The question was put to firms that declare having a reduction in revenue in 2020 as compared to 2019.

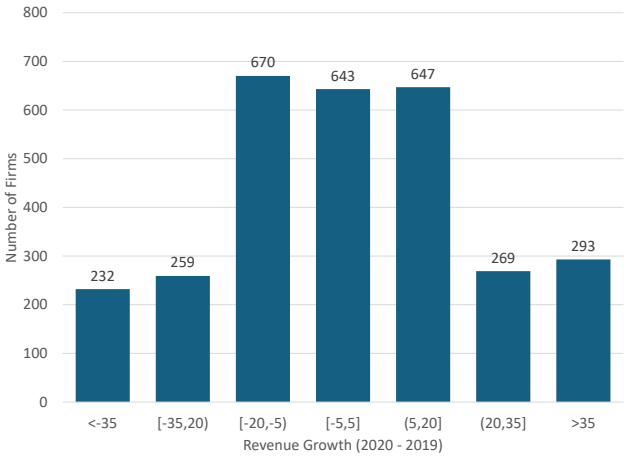
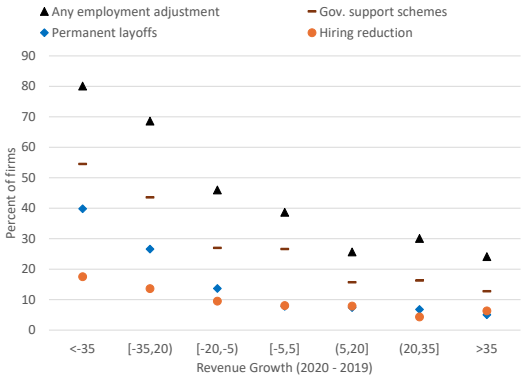
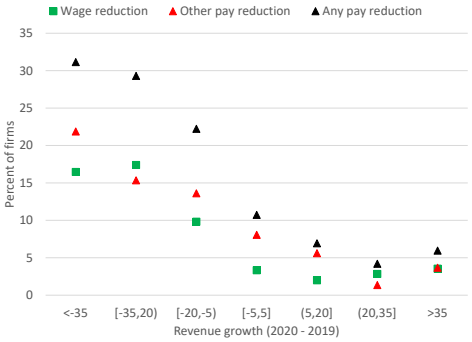


Figure A.7: Distribution of Firms by Revenue Growth between 2019 and 2020

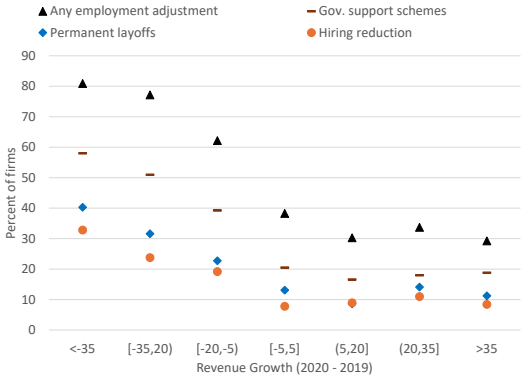
Note: The x-axis is the firm revenue growth between 2019 and 2020 in the administrative data (FIRM).



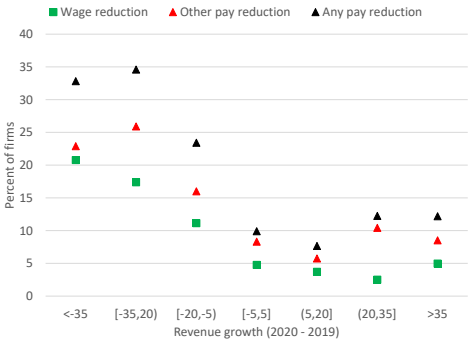
(a) Micro firms: Number of workers



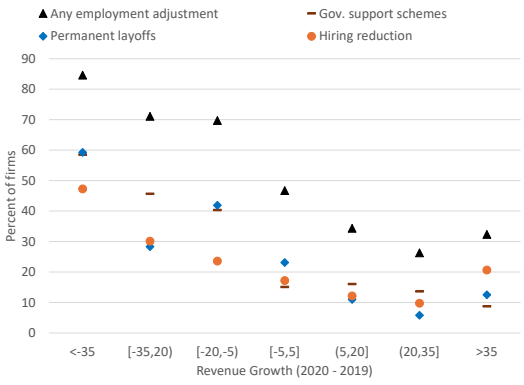
(b) Micro firms: Worker pay



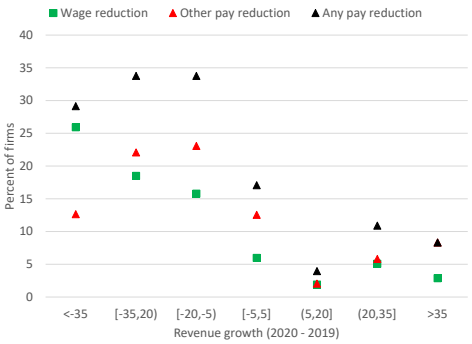
(c) Small firms: Number of workers



(d) Small firms: Worker pay



(e) Med/Large firms: Number of workers



(f) Med/Large firms: Worker pay

Figure A.8: Labor Cost Adjustment Approaches in 2020 by Revenue Growth, by Firm Size

Note: Panels (a) and (b) show the percentage of firms that answered "yes" to questions about the corresponding labor adjustment method. The x-axis is the firm's 2019-2020 revenue growth from the administrative data (FIRM). Firms are split by their employment size: micro: less than 10 persons employed; small enterprises: 10-49 persons employed; and medium-large: more than 50 persons employed.

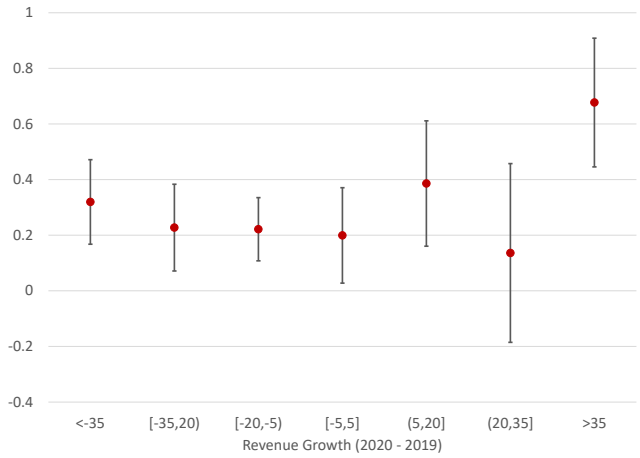


Figure A.9: The Probability of Using Permanent Layoffs, Conditional on Using Wage Reductions, by Revenue Growth Bins

Note: The figure shows the estimated coefficients and the associated 95% confidence intervals from a linear regression of the reported use of permanent layoffs on an indicator for implementing wage reduction interacted with the firm's revenue growth bin dummy. See text for additional controls.

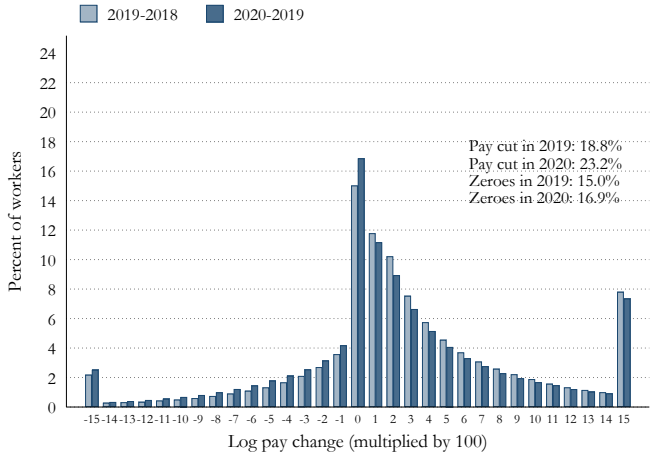
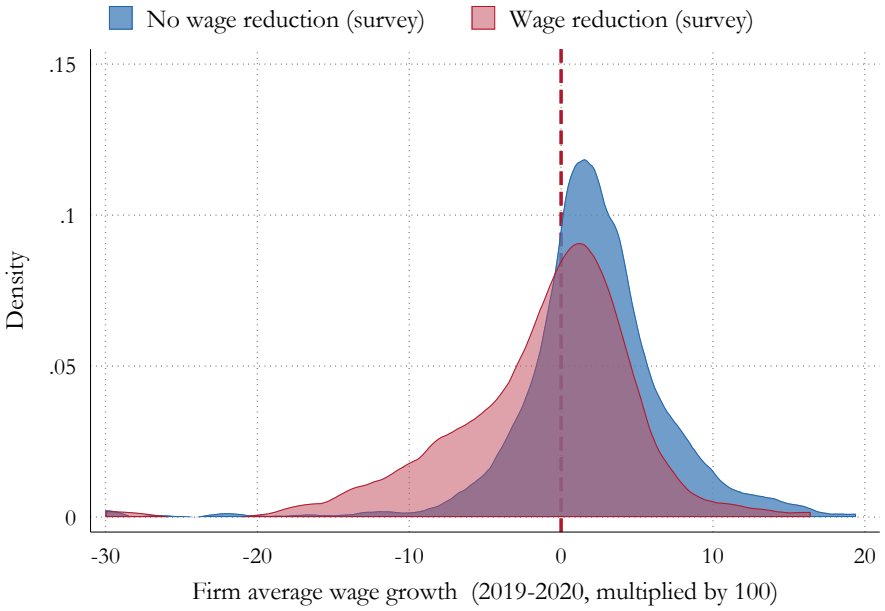
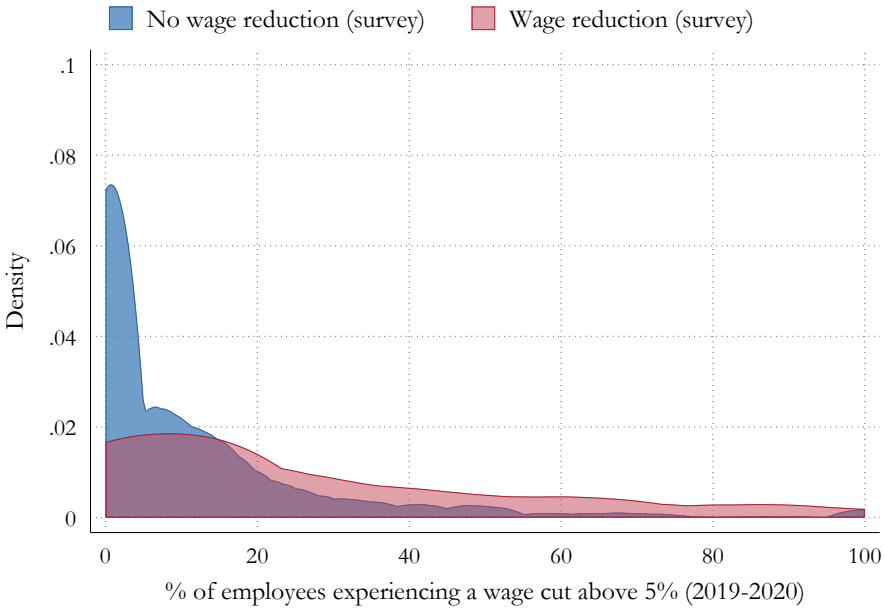


Figure A.10: Growth of Nominal Total Hourly Pay in the Administrative Data, Year-over-Year

The figure shows the annual growth in total nominal hourly pay in the administrative data from BFL. The log pay change is computed as the log differences between year t minus year $t-1$, multiplied by 100. Each pay change value x includes log changes in the interval x-0.5 and x+0.5. The sample consists of the salaried employees continuously employed for 24 months in private sector firms, at the same establishment, and in the sample occupation.



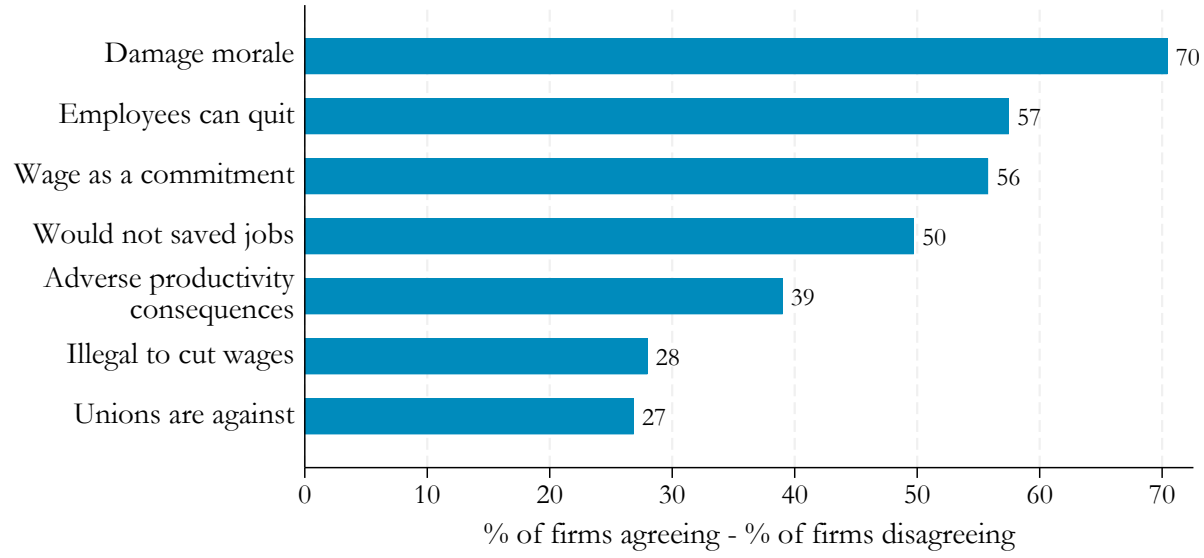
(a) Distribution of the average firm base wage growth



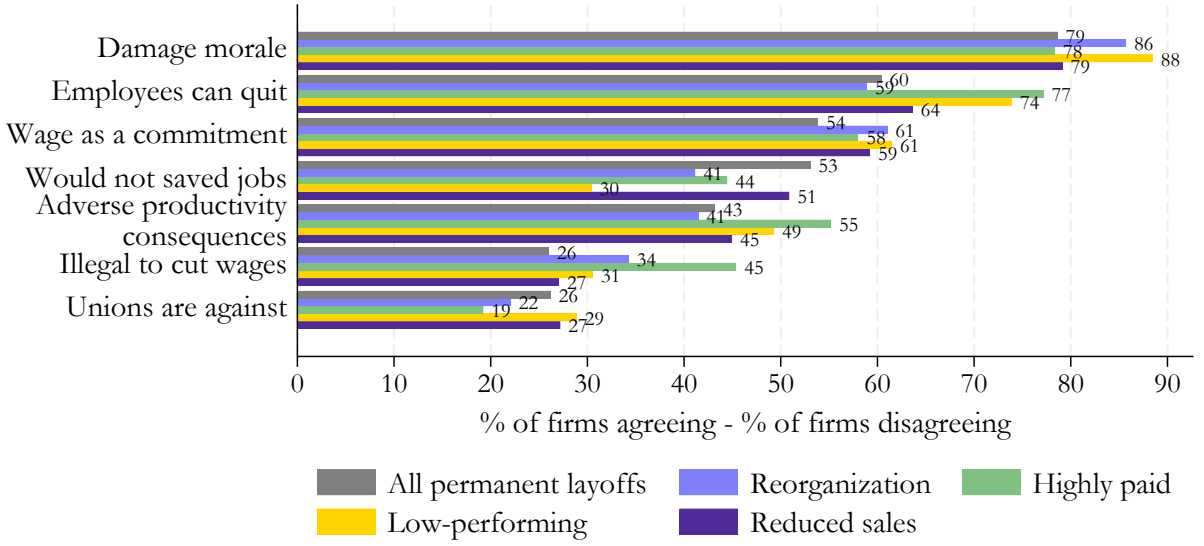
(b) Distribution of the firm's share of workers affected by base wage cut

Figure A.11: Nominal Wage Cuts Reported in Our Survey and in the Mandatory Survey of Firms

Note: Panel (a) shows distributions of the average firm nominal base wage growth 2019-2020 from the LONN data linked to our survey data, by the reported wage reductions at the firm level in our survey. Panel (b) shows the distribution of the firm-level share of workers affected by base wage cut in the LONN data, linked to our survey data.



(a) Full sample

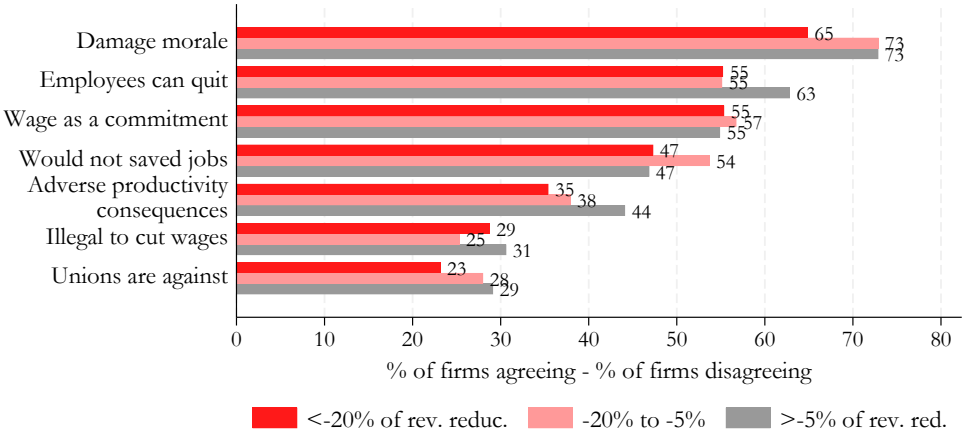


(b) By reason for permanent layoff

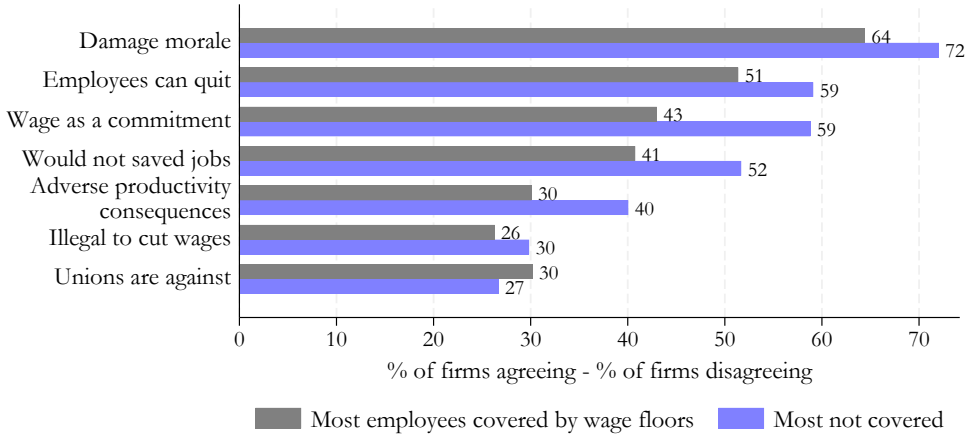
Figure A.12: Reasons for Not Lowering Base Pay

Note: The figure reports responses to the question: "What are the main reasons for not lowering the contractual base pay?" The question is conditional on revenue reduction and not doing wage reductions.

(c) By firm size



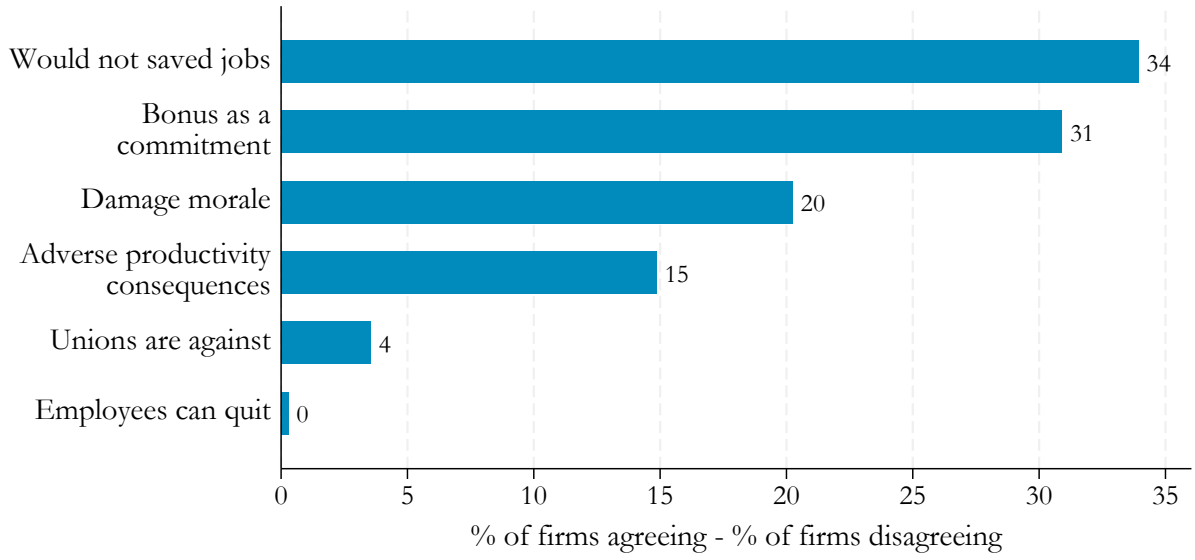
(d) By revenue growth



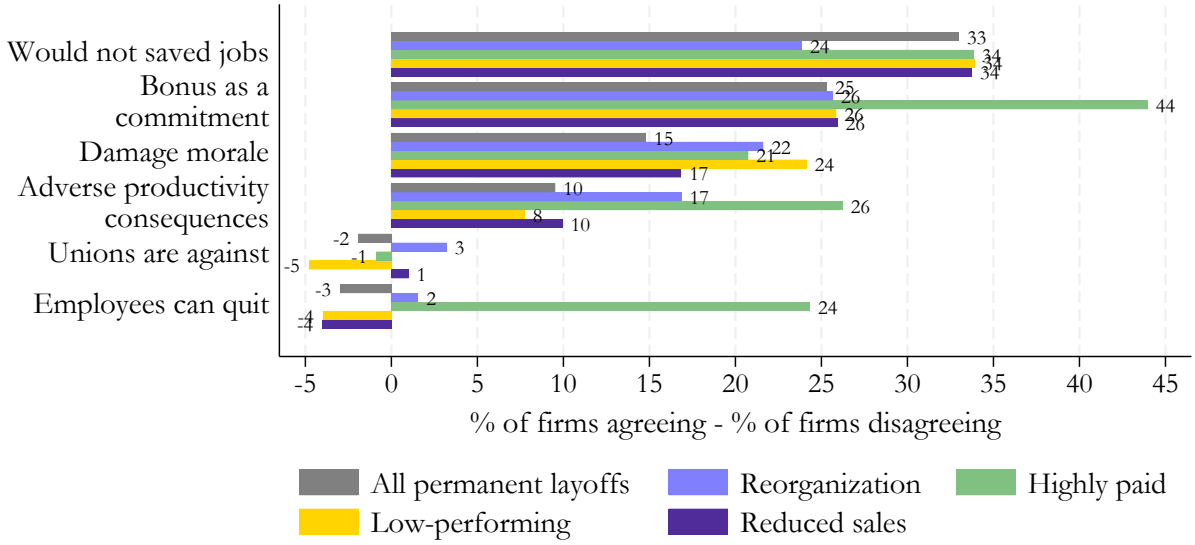
(e) By wage-setting

Figure A.12: Reasons for Not Lowering Base Pay (continued)

Note: The figure reports responses to the question: "What are the main reasons for not lowering the contractual base pay?" The question is conditional on revenue reduction and not doing wage reductions.



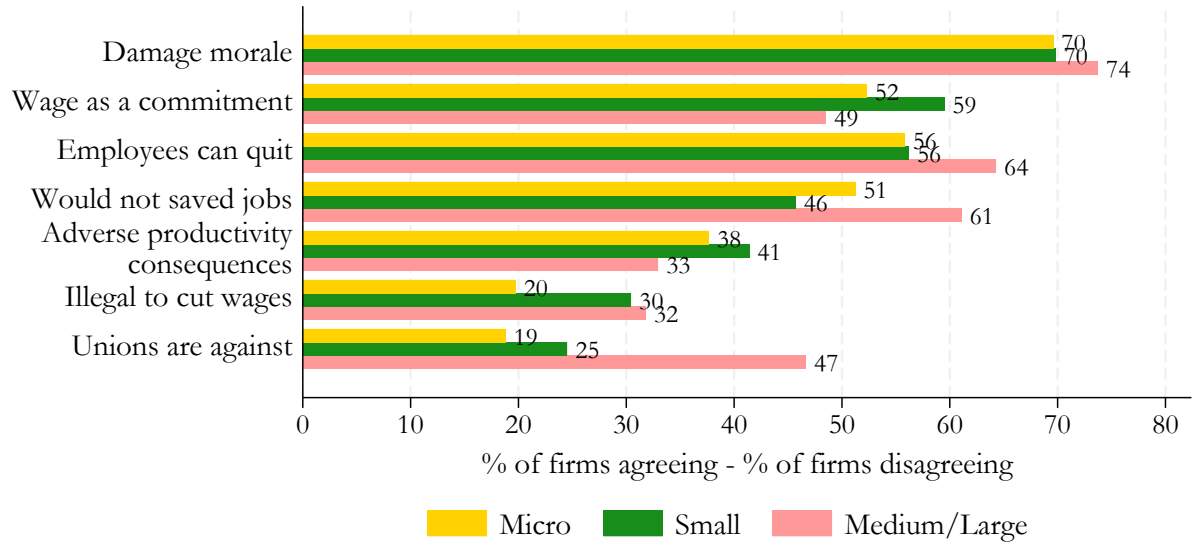
(a) Full sample



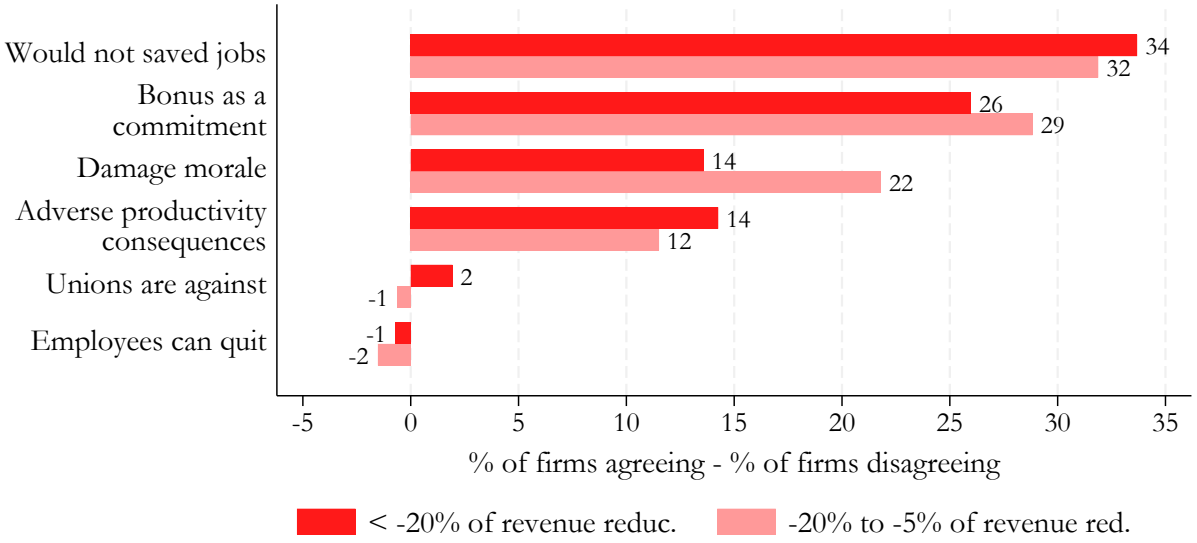
(b) By reason for permanent layoff

Figure A.13: Reasons for Not Lowering Bonus Pay

Note: The figure reports responses to the question: "What are the main reasons for not lowering non-contractual supplements and or supplements?" The question is conditional on revenue reduction and not doing"fewer/lower bonus".



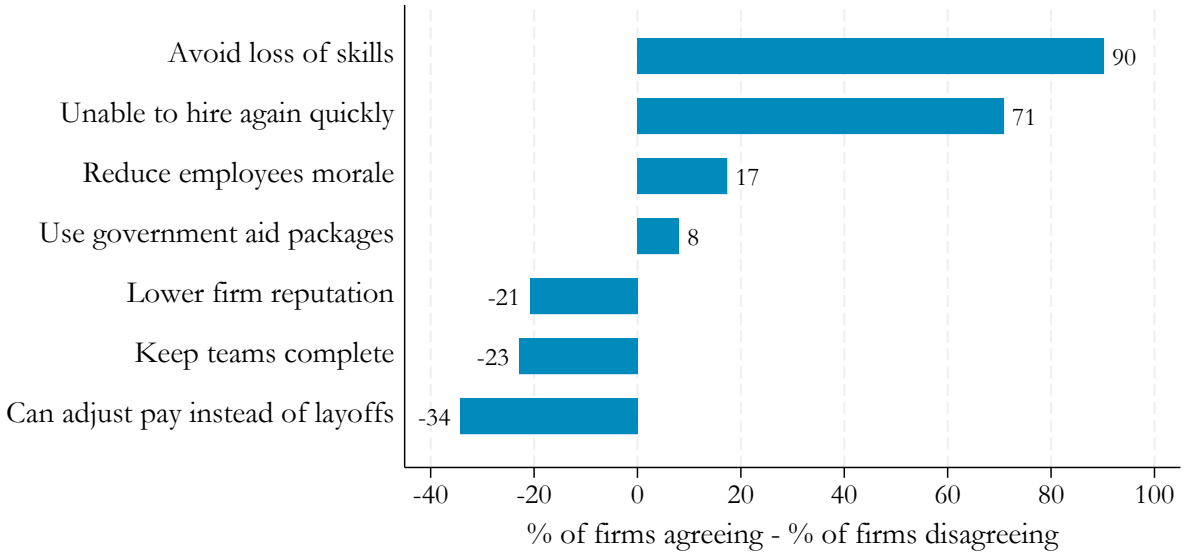
(c) By firm size



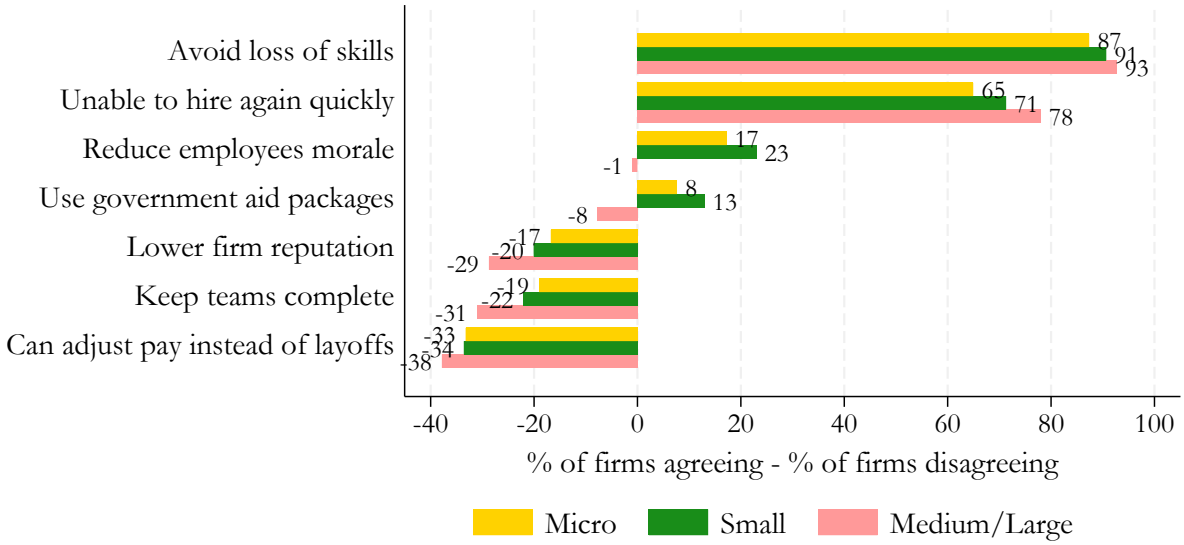
(d) By revenue growth

Figure A.13: Reasons for Not Lowering Bonus Pay (continued)

Note: The figure reports responses to the question: "What are the main reasons for not lowering non-contractual supplements and or supplements?" The question is conditional on revenue reduction and not doing"fewer/lower bonus".



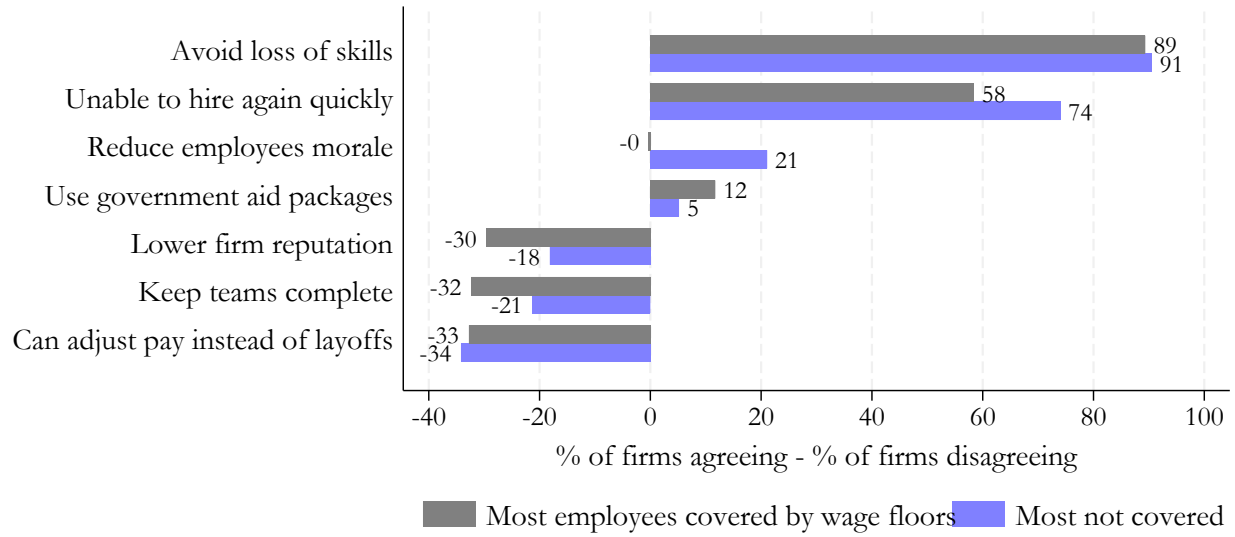
(a) Full sample



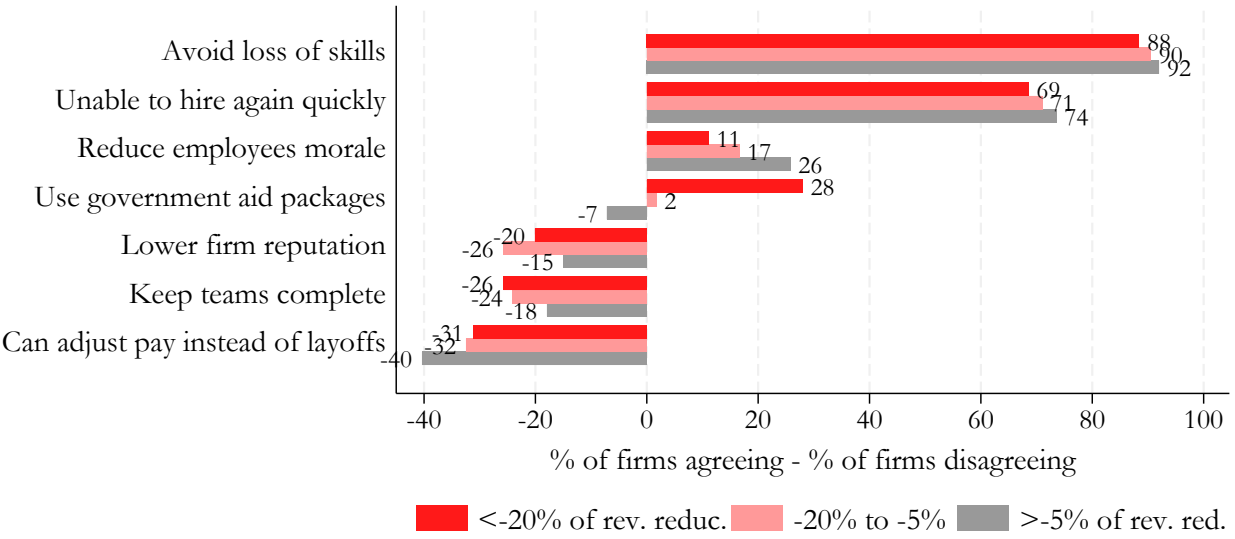
(b) By reason for permanent layoff

Figure A.14: Reasons for Retaining Employees despite Reduced Revenue

Note: The figure reports responses to the question, "What were the main reasons for retaining employees despite a reduction in sales and other cost pressures? Even if you have laid off some employees, consider why you have not laid off more." The question is conditional on reporting a reduction in revenue in 2020. The exact statements that the respondent could choose from are: We want to keep current employees to avoid loss of skills and knowledge; We may not be able to find and hire again quickly when needed during recovery; The employees work in teams, and we cannot lay off some of them; Layoffs will be detrimental to morale among the remaining employees; We can use government aid packages; Instead of layoffs, we can reduce pay; Layoffs will be detrimental to the firm's reputation.



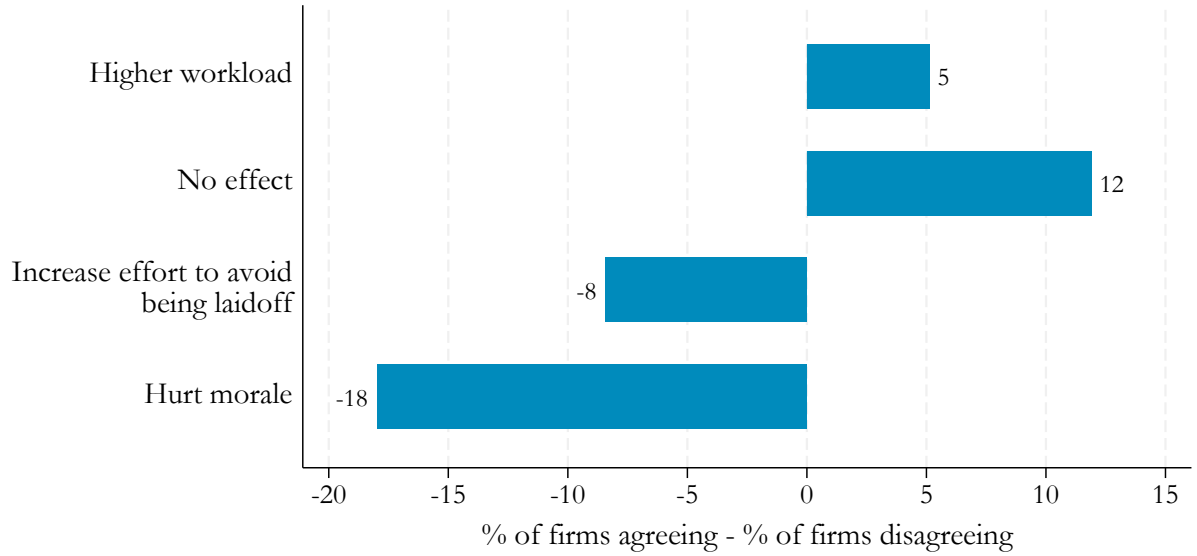
(c) By wage-setting



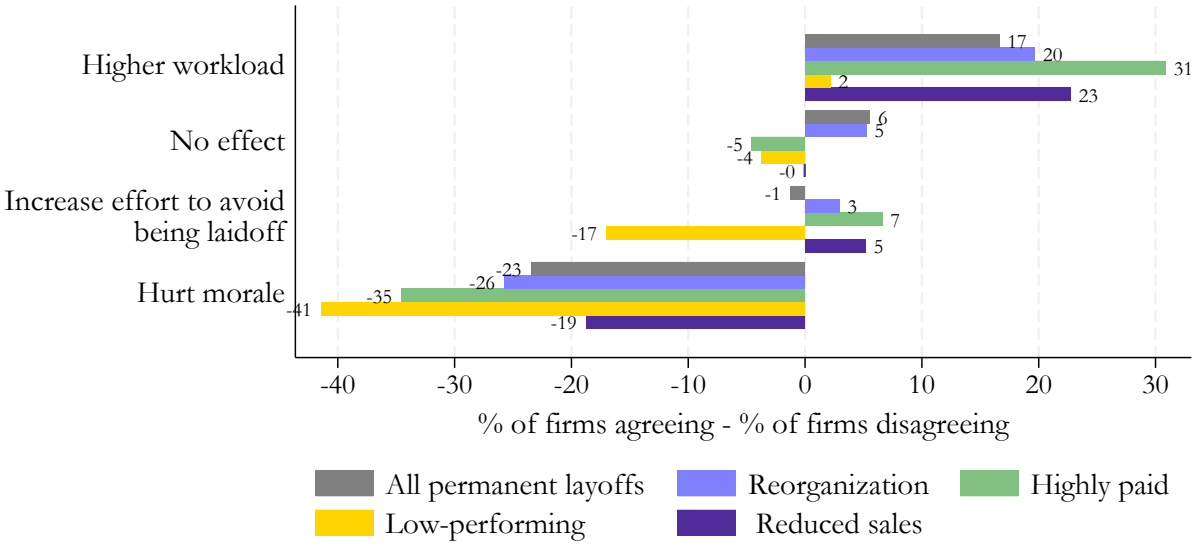
(d) By revenue growth

Figure A.14: Reasons for Retaining Employees despite Reduced Revenue (continued)

Note: The figure reports responses to the question, "What were the main reasons for retaining employees despite a reduction in sales and other cost pressures? Even if you have laid off some employees, consider why you have not laid off more." The question is conditional on reporting a reduction in revenue in 2020. The exact statements that the respondent could choose from are: We want to keep current employees to avoid loss of skills and knowledge; We may not be able to find and hire again quickly when needed during recovery; The employees work in teams, and we cannot lay off some of them; Layoffs will be detrimental to morale among the remaining employees; We can use government aid packages; Instead of layoffs, we can reduce pay; Layoffs will be detrimental to the firm's reputation.



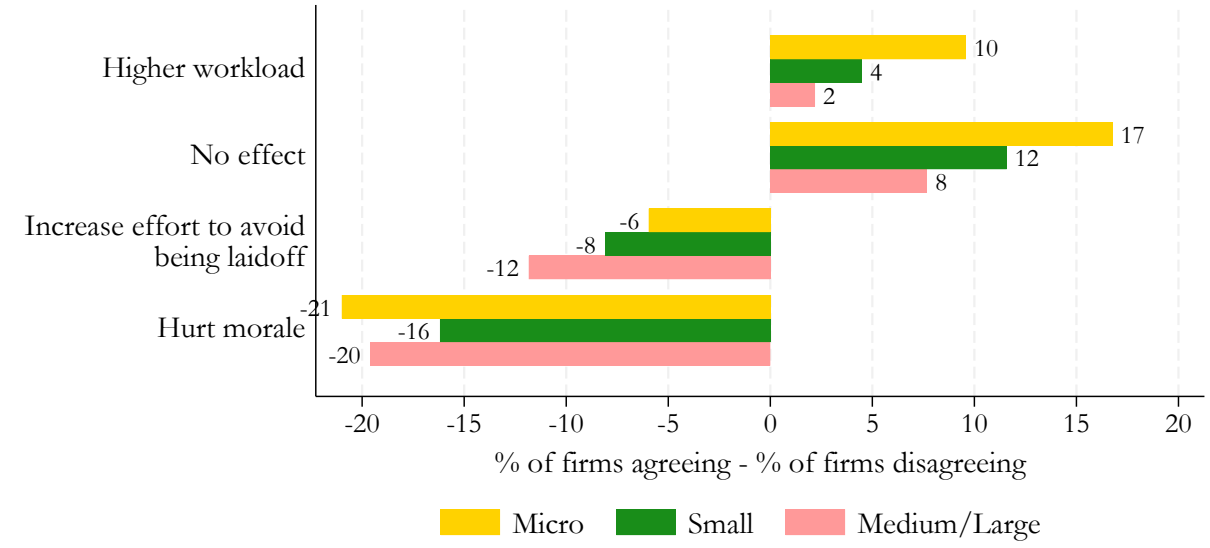
(a) Full sample



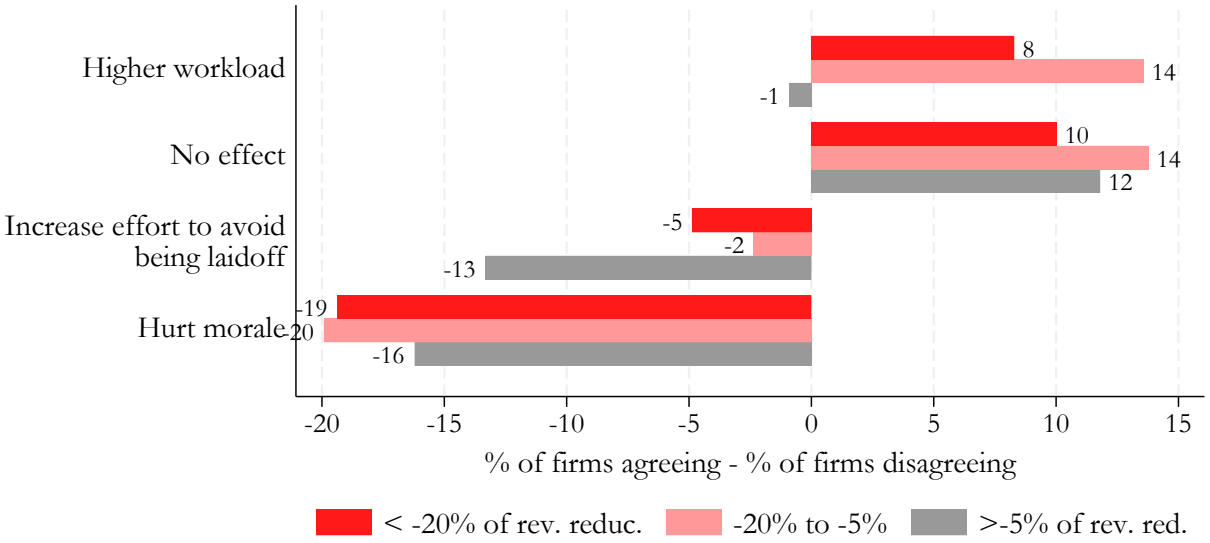
(b) By reason for permanent layoff

Figure A.15: The Perceived Consequences of Layoffs on the Remaining Employees

Note: The figure shows responses to the question, "How have layoffs affected the remaining employees?" The question was put to firms that reported having laid off employees in 2020. The statements are: Employees have a higher workload as there are fewer; Employees work harder to avoid being laid off; Layoffs hurt morale and work ethics among the remaining employees. There is no effect on the remaining employees.



(c) By firm size



(d) By revenue growth

Figure A.15: The Perceived Consequences of Layoffs on the Remaining Employees (continued)

Note: The figure shows responses to the question, "How have layoffs affected the remaining employees?" The question was put to firms that reported having laid off employees in 2020. The statements are: Employees have a higher workload as there are fewer; Employees work harder to avoid being laid off; Layoffs hurt morale and work ethics among the remaining employees. There is no effect on the remaining employees.

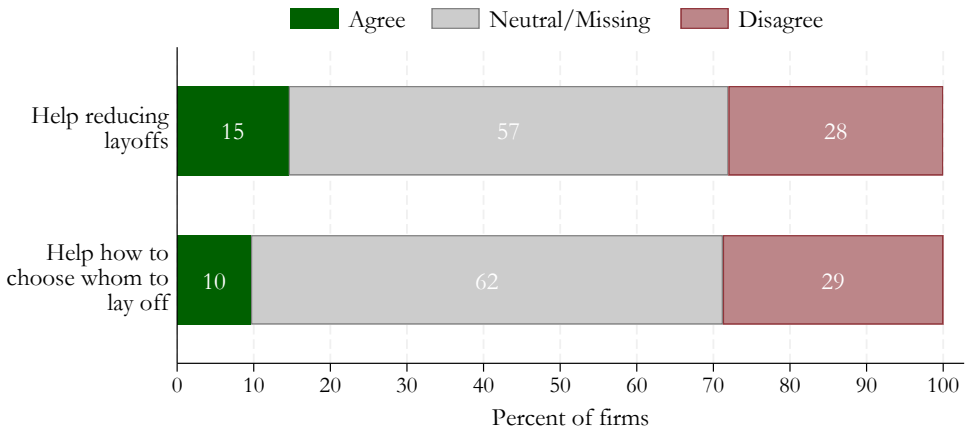
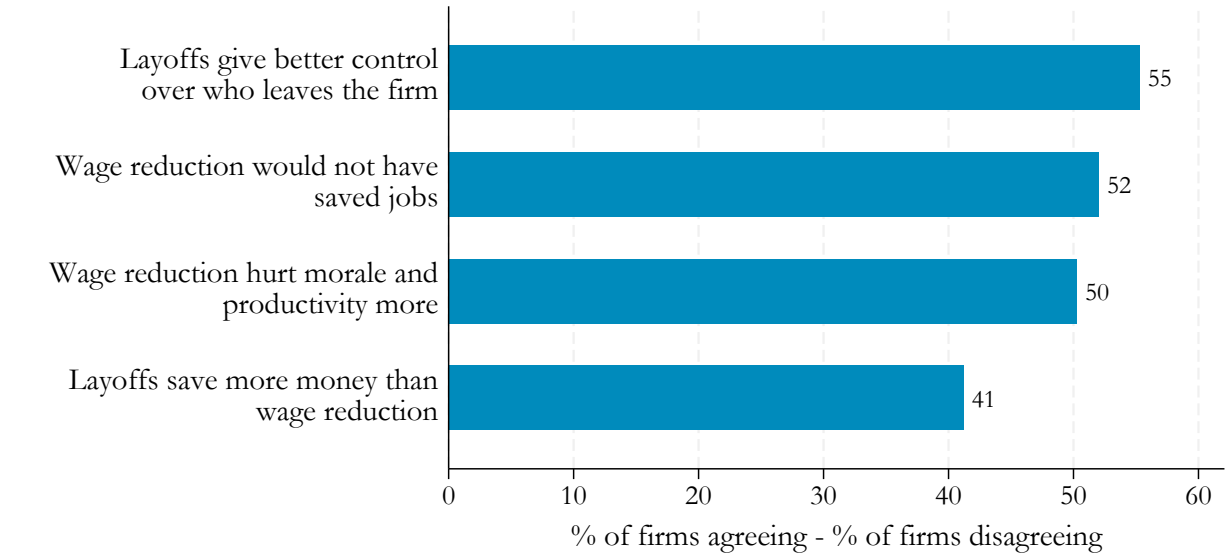
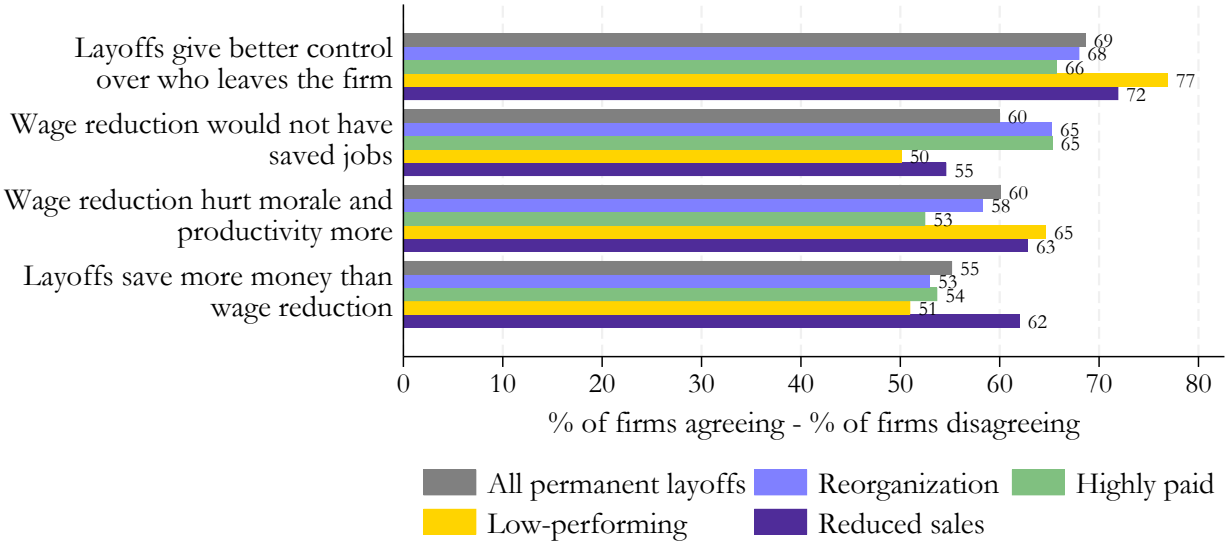


Figure A.16: The Role of Worker Representative in Layoff Decisions

Note: The figure reports responses to the question, "What is your position on the following statements? Union representatives help reduce the number of layoffs by finding alternative solutions to reduce wage costs (reorganization, wage reduction, etc.). Union representatives help implement layoff by identifying low/high-performing employees or setting criteria for who can be laid off.



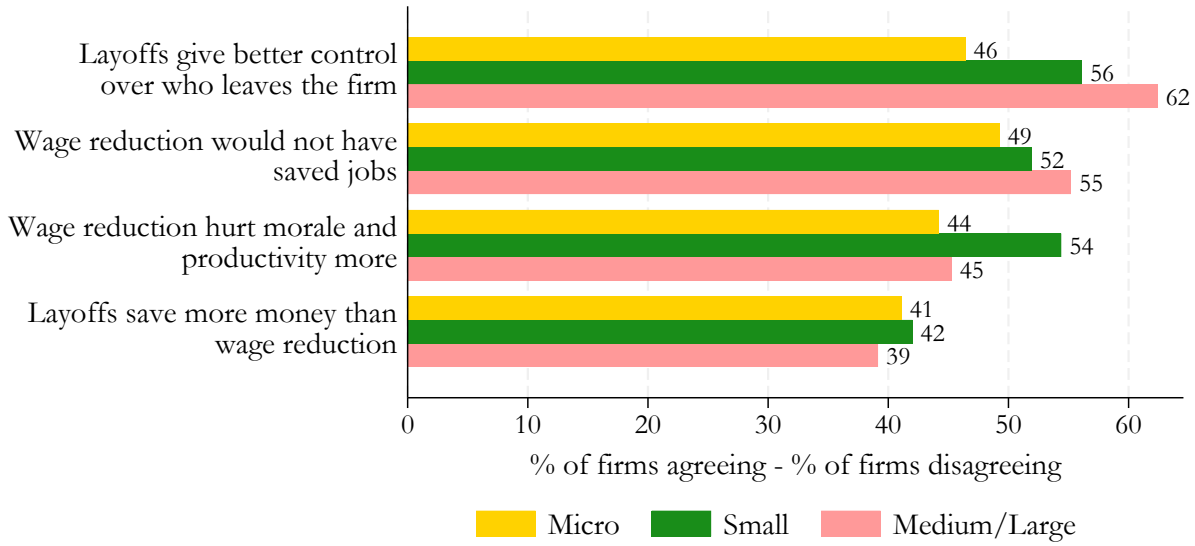
(a) Full sample



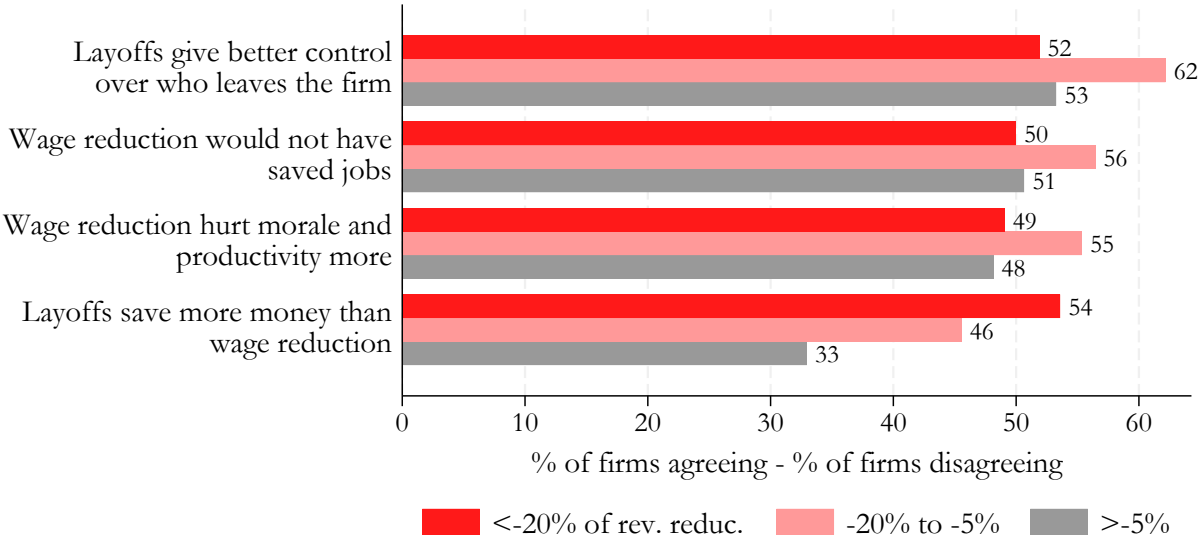
(b) By reason for permanent layoff

Figure A.17: Reasons for Layoffs instead of Pay Cuts

Note: The figure reports responses to the question: "Why didn't you lower pay instead of laying off employees?" The question was put to firms that reported having laid off employees in 2020, which pertains to 1229 firms. The statements are: Pay cuts would not have saved jobs; Pay cuts would hurt morale and productivity more than layoffs; Layoffs give better control over who leaves the firm; Layoffs save more money than pay cuts do.



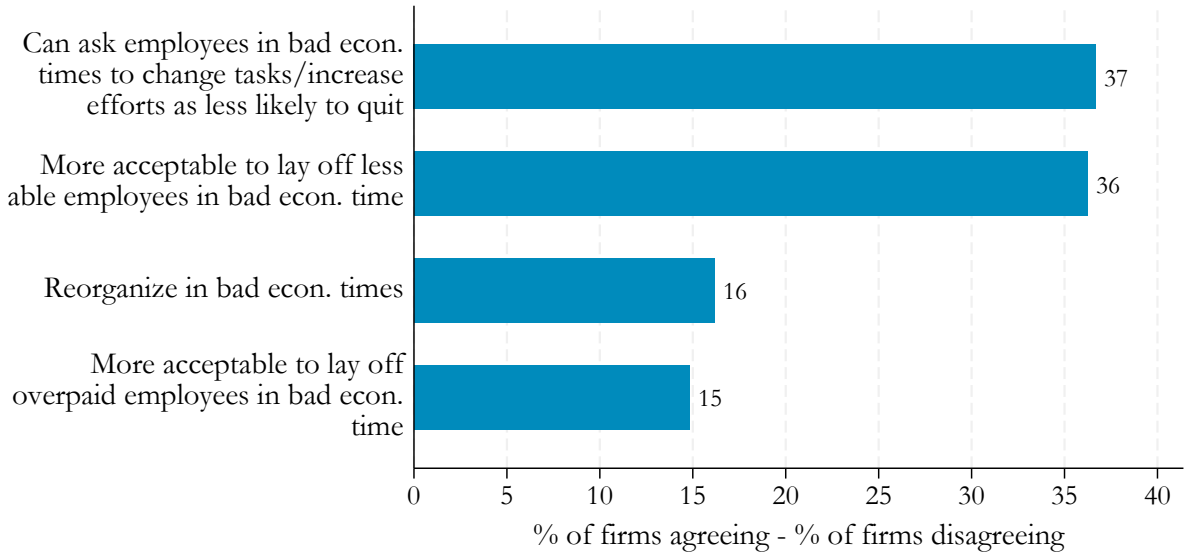
(c) By firm size



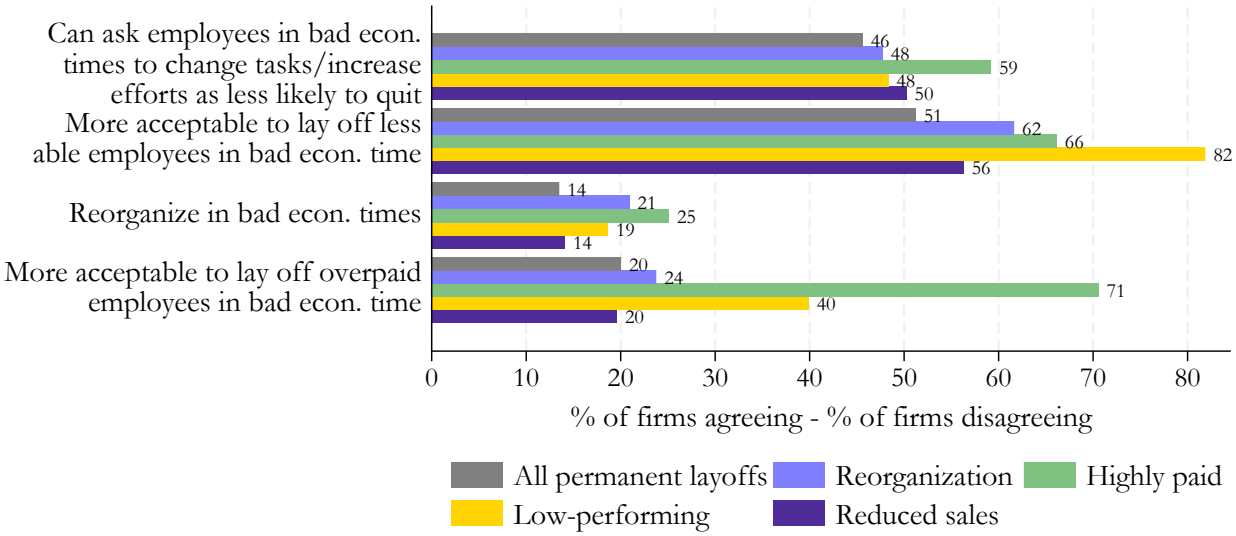
(d) By revenue growth

Figure A.17: Reasons for Layoffs instead of Pay Cuts (continued)

Note: The figure reports responses to the question: "Why didn't you lower pay instead of laying off employees?" The question was put to firms that reported having laid off employees in 2020, which pertains to 1229 firms. The statements are: Pay cuts would not have saved jobs; Pay cuts would hurt morale and productivity more than layoffs; Layoffs give better control over who leaves the firm; Layoffs save more money than pay cuts do.



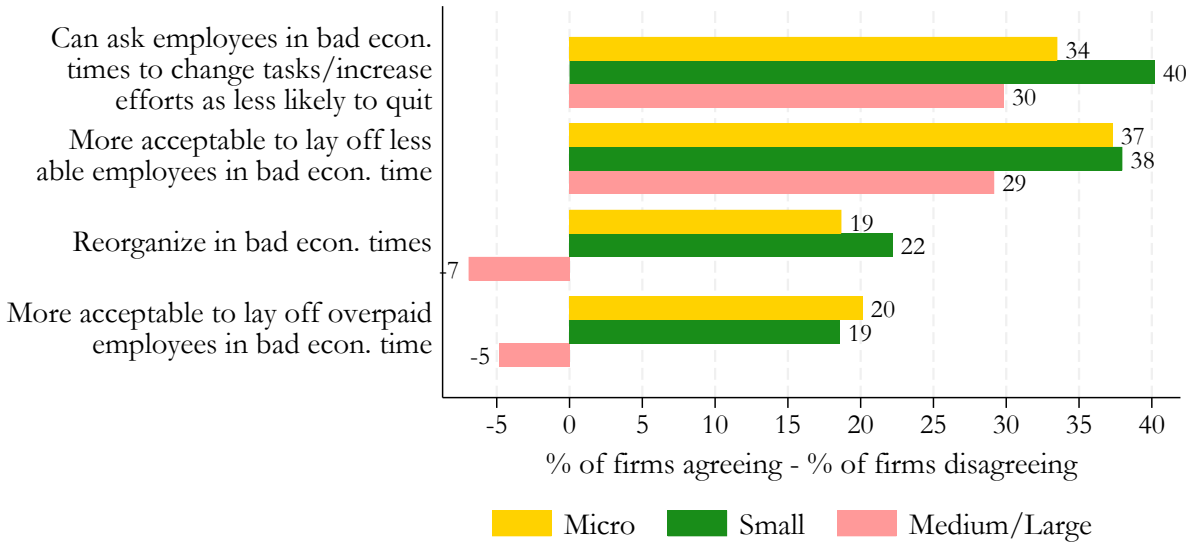
(a) Full sample



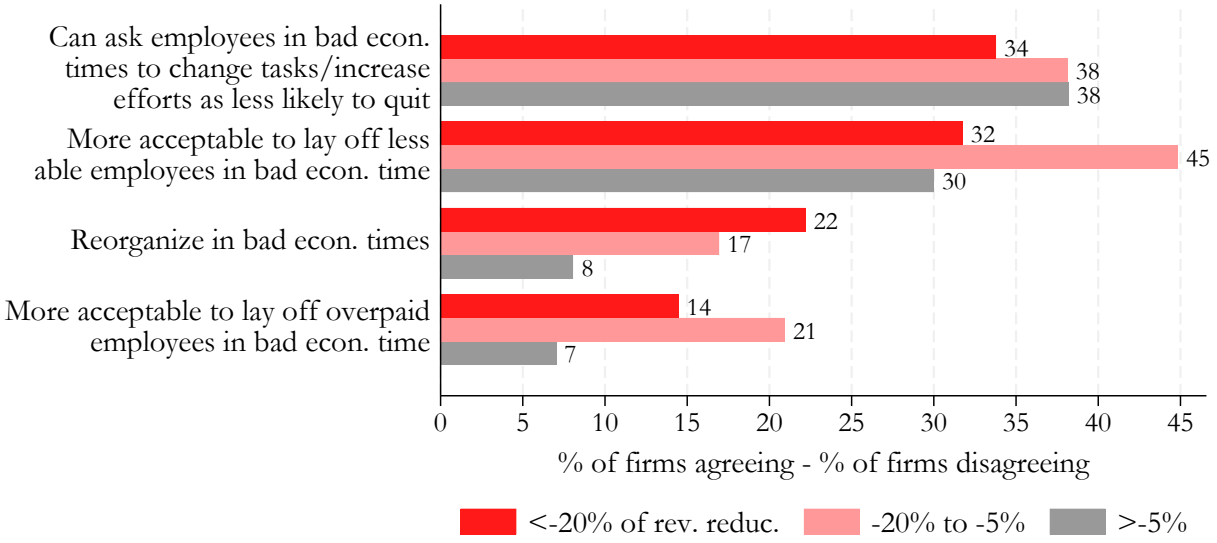
(b) By reason for permanent layoff

Figure A.18: Is Crisis an Opportune Time for Layoffs?

Note: The figure shows responses to the question "Do you agree with the following statements? Note: Even if you have laid off some employees, consider why you have not laid off more." The question is asked of respondents who reported a reduction in revenue in 2020.



(c) By firm size



(d) By revenue growth

Figure A.18: Is Crisis an Opportune Time for Layoffs? (continued)

Note: The figure shows responses to the question "Do you agree with the following statements? Note: Even if you have laid off some employees, consider why you have not laid off more." The question is asked of respondents who reported a reduction in revenue in 2020.

Table A.1: Response Rate in the Survey and in the Target Population

	Number of observations
Response rate after sample restriction from administrative datasets:	
Response rate to the survey	14.19% (4164/29349)
1) Refuse to participate	17.32% (721/4164)
2) Missing responses to some questions	14.87% (619/4164)
3) All questions answered	67.82% (2824/4164)
Participation rate adjusted for non-response (1)	11.73% (3443/29349)
Sample Restriction:	
1) Little human resources policies knowledge	9.58% (330/3443)
2) Missing answers to key questions	5.26% (181/3443)
3) Incoherent answers to key questions	1.60% (55/3443)
Restriction 1) 2) and 3)	11.18% (385/3443)
Number of observations after sample restriction 1), 2), and 3) is 3013.	

Note: 29,349 firms represent the population of private and public limited firms (ApS and A/S) that were invited by email by Ramboll to participate in the survey, and also they had at least employees in 2019. Firms in the agricultural and mining sectors are not in Ramboll's sample frame. The row "Little human resources policies knowledge" refers to the number of respondents that chose the answer "I know only a little about pay and employment conditions." or "Do not know" to the question, "In the following questions, we ask about pay and employment practices. How close are you to such decisions?" We deleted the responses from such respondents from our analysis. The row "Missing answers" refers to the number of respondents who do not answer at least 10 questions out of the first 34 questions in our survey. The row "Incoherent answers" refers to the number of respondents with contradictory responses.

Table A.2: Data Sources and Variables

Name	Description	Dataset name	Variable used in dataset
Firm demographics in 2019:			
Age	Number of years in business in 2019	FIRM	JUR_FRA_DATO
Firm size in FTE	Number of employees in full-time equivalent (FTE) in 2019, calculated as annual total hours / 1924	BFL	AJO_LOENTTIMER
Firm size	Number of employees in in 2019	FIRM	GF_ANSATTE
Industry	10 Industry categories	FIRM	GF_GR019_DB07
Wage floors	=1 if 50% of employees are subject to the normallønssystemet wage-setting (i.e wages are mainly set at the industry level)	—	——
Firm financial characteristics in 2019:			
Revenue growth	Revenue growth from 2019 to 2020	FIRM	GF_OMS
Productivity	Value added over firm size	FIRM	GF_VTV
Labor costs	Compensation including social security costs	FIRM	GF_LGAGMV
Average wages	Labor costs / Firm size (FTE)		
Workforce characteristics in 2019:			
Female	Percent of female in 2019	IDAP	KON
Unionization	Percent of unionized workers	IND	FAGFKD
Education	Average educational attainment	UDDA	HFAUDD
Age	Average age	IDAP	ALDERNOV
Analysis of earnings and hours worked at the individual-level:			
Hours	Annual total hours paid	BFL	AJO_LOENTIMER
Earnings	Annual total earnings	BFL	AJO_BREDT_LOENBELOEB
Hourly wage	Earnings / hours	BFL	
Base pay	Annual base pay	LONN	BASIS_STAND
Total pay	Annual total pay	LONN	FORTJ_STAND
Aggregate conditions:			
Tightness	Firm-specific labor market tightness	—	——
Location	11 regions (NUTS3)	FIRM	JUR_BEL_REGION_KODE

Table A.3: Sample Description: Subsample of Firms that Report Revenue Reduction

	(1) Population	(2) Sample	(3) Weighted Sample
Firm characteristics			
Number of employees (FTE)	40.90	48.66	41.16
Age	17.18	19.31	18.89
Revenue growth in 2020 (%)	-21.50	-12.67	-12.59
Value added per worker ('000 EUR)	85.27	87.98	87.60
Labor costs per worker ('000 EUR)	64.29	66.57	66.52
In the manufacturing sector (%)	14.83	19.05	15.52
In the services sector (%)	63.51	64.26	65.64
In other sectors (%)	21.66	16.69	18.84
Wage floors (%)	14.90	17.15	17.18
Employee characteristics			
Female (%)	30.47	31.73	31.68
Age	40.12	41.80	41.71
Furloughed workers in 2020 (%)	23.89	29.92	29.72
Unionized workers (%)	52.21	57.18	56.69
Labor market characteristics			
Tightness (vacancy/unemployment)	0.11	0.10	0.10
Observations	14680	845	845

Note: The table compares the mean of firm characteristics from the sample to the corresponding population of firms. Column 1 reports means from the population, i.e., firms with at least 5 full-time employees. Column 2 reports means from the raw sample and Column 3 from the sample weighted by entropy balancing as described in Section 2.

Table A.4: Our Survey and Existing Survey Studies on Why Firms Avoid Cutting Wages

Study:	Context:		Sample:		Others:	
	Country	Year	N	Firm size	Survey topic	Survey type
Kaufman	UK	1982	26	7	Pay	Interview
Blinder and Choi	USA	1988	19	5 767	Pay	Interview
Levine	USA	1991	139	$\simeq$ 11 000	Pay	Questionnaire
Agell and Lundborg	Sweden	1991	179	1 154	Pay	Questionnaire
Campbell and Kamlani	USA	1993	184	11 927	Pay	Both
Bewley	USA (CT)	1992	246	$\simeq$ 500	Pay & Layoff	Interview
This paper	Denmark	2021	3013	39	Pay & Layoff	Questionnaire

Note: This table compares our study with the research conducted by Kaufman (1984), Blinder and Choi (1990), Levine (1993), Agell and Lundborg (1995), Campbell and Kamlani (1997), and Bewley (1999). Year: year in which each survey was conducted. N: number of firms that were either surveyed or interviewed. Firm Size: The average number of employees in the firms surveyed. (If the mean is not available, the median is provided.) Survey topic: Indicates whether the focus of the survey was solely on pay or if it also covered layoffs. Survey type: Specifies whether a questionnaire was used to collect data for the study.

Table A.5: The Probability of Using Permanent Layoffs, Conditional on Using Pay Cuts

Dependent variable:	An indicator for use of permanent layoffs in 2020			
	(1)	(2)	(3)	(4)
Wage reduction	0.29***	0.25***	0.36***	0.30***
	(0.03)	(0.03)	(0.03)	(0.03)
Fewer/Lower bonus		0.21***		0.26***
		(0.03)		(0.03)
N	2815	2815	2900	2900
Other controls	Yes	Yes	No	No

Note: The table shows the estimated coefficients from a linear regression of the reported use of permanent layoffs on an indicator for implementing wage reduction or an indicator for fewer/lower bonuses. The reported incidence of the use of permanent layoffs in the sample is 0.19.

Table A.6: Firm Characteristics Associated with Reasons for Not Lowering Base Pay

	Commitment to employees (1)	Productivity (shirking) (2)	Quit concern (3)	Morale concern (4)	Union is against (5)	Pay cut would not saved jobs (6)
Productivity	1.53	-0.70	-4.59**	-0.54	6.63**	0.13
	(2.50)	(2.40)	(2.25)	(2.11)	(2.70)	(2.61)
Average wages	1.07	-0.14	4.82*	5.26*	-9.17***	0.35
	(2.48)	(2.36)	(2.53)	(2.97)	(2.50)	(2.74)
Revenue growth rate in 2020 (%)	2.22	1.63	4.05*	2.12	-0.47	1.19
	(2.29)	(2.33)	(2.13)	(1.85)	(2.26)	(2.30)
Routine task index	1.35	3.41**	2.16	0.61	6.61***	2.50*
	(1.49)	(1.56)	(1.42)	(1.20)	(1.50)	(1.47)
Unionization (%)	-1.75	-0.01	0.30	0.24	1.69	2.25
	(2.00)	(2.05)	(1.95)	(1.83)	(2.05)	(1.95)
Worker representative	-4.91	8.74*	-2.59	1.60	10.88**	-3.17
	(4.30)	(4.68)	(4.23)	(3.52)	(4.67)	(4.31)
Tightness	-0.15	-0.65	5.15**	0.14	4.47*	-0.27
	(2.05)	(2.25)	(2.15)	(2.05)	(2.41)	(2.10)
Number of employees	-0.24	-4.10	0.67	3.54	3.50	0.43
	(2.62)	(2.94)	(2.70)	(2.34)	(3.39)	(2.57)
Firm age	-1.11	-3.40*	-2.47	0.09	2.37	-0.19
	(2.03)	(2.05)	(1.92)	(1.66)	(2.02)	(1.95)
Debt ratio	1.95	3.71	3.13	-0.93	-2.17	-1.76
	(2.90)	(2.63)	(2.29)	(2.25)	(2.90)	(2.70)
N	580	575	581	581	573	579
Mean Dep. Var.	3.62	3.43	3.63	3.78	3.31	3.56
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table reports marginal effects of the probability of agreeing or strongly agreeing from ordered probit models where covariates are evaluated at their means. Additional controls are a dummy for the family firm, the job of the respondent. Asterisks report statistical significance at the 1, 5 and 10% (***,**,* respectively). Standard errors are reported in parentheses. The question is, "What are the main reasons for not lowering the contractual base pay? Please state your position on the following statement." The company sees the base pay as a commitment to its employees; Pay cuts can damage productivity because employees do not work as hard; Pay reduction would lead employees to quits; Pay reduction damages morale and is demotivating for employees in general; Trade unions/employee representatives are against pay cuts; Pay reductions would not save jobs.

Table A.7: Firm Characteristics Associated with Reasons to Retain Employees Despite Reduced Revenue

Question: What were the reasons for retaining employees despite a reduction in revenue? Statement:	Lose skills (1)	Unable to re-hire (2)	Team concern (3)	Morale concern (4)	Use gov. aid package (5)	Can reduce pay instead (6)	Reputation concern (7)
Productivity	-0.63	-2.14	2.53	0.47	-4.36	-2.05	1.41
	(1.02)	(1.89)	(1.65)	(2.26)	(2.67)	(1.72)	(1.62)
Average wages	1.32	1.55	-1.38	1.51	-6.58**	1.98	-1.25
	(1.50)	(1.73)	(1.70)	(2.52)	(3.01)	(1.62)	(1.69)
Revenue growth rate in 2020 (%)	1.72*	0.94	1.38	2.83	-4.21*	1.33	0.07
	(0.89)	(1.83)	(1.46)	(2.12)	(2.26)	(1.21)	(1.11)
Routine task index	-1.19**	0.67	-0.73	-4.16***	-1.07	-1.40	-0.60
	(0.55)	(1.09)	(0.87)	(1.30)	(1.30)	(0.88)	(0.88)
Unionization (%)	-0.15	-0.26	-0.09	-2.93	-3.88**	0.25	1.07
	(0.85)	(1.52)	(1.25)	(1.80)	(1.94)	(1.18)	(1.20)
Worker representative	0.74	4.66	0.28	0.05	-6.40	1.29	4.56*
	(1.60)	(3.26)	(2.61)	(3.91)	(4.06)	(2.58)	(2.56)
Tightness	-0.56	1.74	-0.32	-1.16	-2.53	-2.26*	-1.95
	(0.95)	(1.62)	(1.27)	(2.03)	(2.17)	(1.29)	(1.33)
Number of employees	0.69	0.34	-1.81	-3.39	-2.93	-0.98	-1.07
	(1.02)	(1.82)	(1.47)	(2.27)	(2.36)	(1.70)	(1.47)
Firm age	2.11**	3.80**	-0.62	1.08	2.26	-0.34	-0.87
	(0.89)	(1.56)	(1.23)	(1.81)	(1.79)	(1.25)	(1.18)
Debt ratio	-1.86**	-2.59*	-0.82	-2.45	5.35**	1.09	-1.49
	(0.85)	(1.40)	(1.34)	(1.72)	(2.13)	(1.48)	(1.37)
N	752	738	725	724	736	727	731
Mean Dep. Var.	3.93	3.75	2.74	3.18	3.07	2.64	2.78
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table reports marginal effects of the probability of agreeing (or strongly agreeing) from ordered probit models where covariates are evaluated at their means. Figure 12 in the main text reports the histogram of this question. Additional controls are a dummy for the family firm, the job of the respondent. Asterisks report statistical significance at the 1, 5 and 10% (***,**,* respectively). Standard errors are reported in parentheses. The survey question is "What were the main reasons for retaining employees despite a reduction in sales and other cost pressures? Even if you have laid off some employees, consider why you have not laid off more." The question was asked of those firms that reported a reduction in revenue in 2020. Possible statements are: We want to keep current employees to avoid loss of skills and knowledge (1); We may be unable to find and hire again quickly when needed during the recovery (2); The employees work in teams and we cannot lay off some of them (3); Layoffs will be detrimental to morale among the remaining employees (4); We can use government aid packages (5); Instead of layoffs, we can reduce pay (6); Layoffs will be detrimental for the firm's reputation (7).

Table A.8: Firm Characteristics Associated with Perceptions of the Effects of Layoffs on the Remaining Employees

Question: How have layoffs affected the remaining employees of the firm?				
Statement:	Higher workload (as fewer employees)	Greater effort (to avoid layoffs)	Hurt morale	No effect
	(1)	(2)	(3)	(4)
Productivity	-0.16	-1.66	-0.53	3.23
	(1.79)	(1.39)	(1.55)	(2.05)
Average wages	-1.09	1.61	0.10	0.62
	(2.02)	(1.47)	(1.73)	(2.21)
Revenue growth rate in 2020 (%)	-0.47	-1.44	1.31	-0.23
	(1.47)	(1.13)	(1.19)	(1.48)
Routine task index	-0.45	0.35	0.18	1.62
	(0.99)	(0.80)	(0.83)	(1.09)
Unionization (%)	-0.27	0.88	-0.78	-2.29
	(1.51)	(1.20)	(1.26)	(1.56)
Worker representative	1.89	3.65	2.99	-6.72**
	(3.01)	(2.35)	(2.43)	(3.20)
Tightness	-2.08	-2.41**	1.03	-1.71
	(1.47)	(1.16)	(1.10)	(1.54)
Number of employees	-1.91	-1.45	-0.56	1.25
	(1.63)	(1.14)	(1.37)	(1.70)
Firm age	2.11	0.04	-0.13	-0.55
	(1.31)	(1.07)	(1.10)	(1.42)
Debt ratio	1.93	0.69	-0.57	-2.48*
	(1.52)	(1.02)	(1.31)	(1.48)
N	977	972	971	984
Mean Dep. Var.	3.06	2.9	2.8	3.12
Additional controls	Yes	Yes	Yes	Yes

Note: The table reports marginal effects of the probability of agreeing (or strongly agreeing) from ordered probit models where covariates are evaluated at their means. Figure 13 in the main text reports the histogram of this question. Additional controls are a dummy for the family firm, the job of the respondent. Asterisks report statistical significance at the 1, 5 and 10% (***,**,* respectively). Standard errors are reported in parentheses. The question is, "How have layoffs affected the remaining employees of the firm? Please state your opinion on the following statement." The question was asked for firms that reported having laid off workers in 2020 (with or without a reduction in revenue). The statements are: Employees have higher workload as there are fewer (1); Employees work harder to avoid being laid off (2); Layoffs hurt morale and work ethics among the remaining employees (3); There is no effect on the remaining employees (4).

Table A.9: Firm Characteristics Associated with Attitudes towards Crisis as an Opportune Time for Layoffs

	Reorganize	More acceptable to lay off		Easier to change tasks
		less able workers	overpaid worker	as workers less likely to quit
	(1)	(2)	(3)	(4)
Productivity	-2.25	-0.70	-4.29*	-0.66
	(2.41)	(2.28)	(2.33)	(2.29)
Average wages	0.47	-0.18	4.39**	2.07
	(2.56)	(2.43)	(2.20)	(2.27)
Revenue growth rate in 2020 (%)	-2.63	-0.74	-1.41	2.27
	(1.93)	(1.73)	(1.66)	(1.98)
Routine task index	-2.03	-1.79	-0.46	1.53
	(1.27)	(1.40)	(1.31)	(1.41)
Unionization (%)	0.00	3.54*	1.29	0.66
	(1.85)	(1.85)	(1.73)	(1.86)
Worker representative	-0.87	1.32	3.80	-1.99
	(3.88)	(4.03)	(3.76)	(3.98)
Tightness	2.00	4.86**	0.16	-1.05
	(2.20)	(2.23)	(1.90)	(2.08)
Number of employees	-5.32**	-3.31	-5.81***	-1.45
	(2.44)	(2.04)	(2.20)	(2.36)
Firm age	-0.29	2.46	-1.29	0.27
	(1.92)	(1.83)	(1.69)	(1.79)
Debt ratio	1.51	-1.13	2.27	-1.25
	(2.63)	(2.09)	(1.94)	(2.29)
N	733	736	730	732
Mean Dep. Var.	3.16	3.38	3.13	3.37
Additional controls	Yes	Yes	Yes	Yes

Note: The table reports marginal effects of the probability of agreeing (or strongly agreeing) from ordered probit models where covariates are evaluated at their means. Additional controls are a dummy for the family firm, the job of the respondent. Asterisks report statistical significance at the 1, 5 and 10% (***,**,* respectively). Standard errors are reported in parentheses. The question is: "Do you agree with the following statements? Note: Even if you have laid off some employees, consider why you have not laid off more." The statements are: (1) Management has less focus on efficiency and cost reductions during good times and therefore the firm reorganizes during bad economic conditions; (2) It is more acceptable to lay off the less able employees during bad economic conditions; (3) It is more acceptable to lay off employees who are highly paid relative to their productivity during bad economic conditions; (4) It is easier to ask employees to change their tasks / increase their work effort in bad times, as employees are less likely to quit during bad economic conditions.

Table A.10: Firm Characteristics Associated with Reasons for Layoffs Instead of Pay Cuts

Question: Why didn't you lower pay instead of laying off employees?				
Statement:	Pay reduction would		Layoffs	
	not have saved jobs	hurt morale and productivity more than layoffs	give better control over who leaves	save more money than pay cuts
	(1)	(2)	(3)	(4)
Productivity	-2.69	0.23	3.59*	-0.71
	(2.01)	(2.00)	(2.18)	(2.26)
Average wages	2.15	2.98	-1.61	-2.06
	(2.04)	(2.14)	(2.05)	(2.27)
Revenue growth rate in 2020 (%)	-0.29	2.40	1.87	-1.36
	(1.45)	(1.65)	(1.55)	(1.54)
Routine task index	-0.19	1.61	1.11	3.04***
	(1.04)	(1.12)	(1.04)	(1.13)
Unionization (%)	0.07	1.78	3.52**	1.40
	(1.55)	(1.67)	(1.61)	(1.78)
Worker representative	2.15	1.82	2.14	-5.40
	(3.25)	(3.48)	(3.24)	(3.49)
Tightness	-2.21	0.03	-3.06**	-1.57
	(1.44)	(1.56)	(1.47)	(1.76)
Number of employees	0.45	-0.19	0.86	-1.97
	(1.88)	(2.06)	(2.04)	(1.94)
Firm age	1.36	0.97	3.31**	0.07
	(1.53)	(1.57)	(1.60)	(1.56)
Debt ratio	2.01	1.68	4.37**	3.53*
	(1.92)	(2.26)	(1.96)	(1.95)
N	943	933	932	938
Mean Dep. Var.	3.63	3.62	3.68	3.51
Additional controls	Yes	Yes	Yes	Yes

Note: The table reports marginal effects of the probability of agreeing (or strongly agreeing) from ordered probit models where covariates are evaluated at their means. Figure 14 presents the histogram of this question. Additional controls are a dummy for the family firm, the job of the respondent. Asterisks report statistical significance at the 1, 5 and 10% (***,**,* respectively). Standard errors are reported in parentheses. The survey question is "Why didn't you lower pay instead of laying off employees?" The statements are: Pay reduction would not have saved jobs; Pay reduction would hurt morale and productivity more than layoffs; Layoffs give better control over who leaves the company; Layoffs save more money than pay cuts do. Figure 14 presents the histogram.

Table A.11: What Reduction in the Total Pay Cost Could Have Prevented Layoffs?

	(1)	(2)	(3)
Productivity	-0.04	-0.04	-0.03
	(0.03)	(0.04)	(0.03)
Average wages	-0.01	-0.01	-0.00
	(0.04)	(0.04)	(0.04)
Revenue growth rate in 2020 (%)	-0.03	-0.03	-0.01
	(0.02)	(0.02)	(0.02)
Routine task index	0.02	0.03	0.02
	(0.02)	(0.02)	(0.02)
Unionization (%)	-0.02	-0.01	-0.01
	(0.03)	(0.03)	(0.03)
Worker representative	-0.06	-0.03	-0.04
	(0.05)	(0.06)	(0.05)
Tightness	-0.06**	-0.06**	-0.05*
	(0.03)	(0.03)	(0.03)
Layoff: Reduced Sales			0.31***
			(0.05)
Layoff: Improve efficiency			0.00
			(0.06)
Layoff: Highly paid			0.05
			(0.07)
Layoff: Low-performing			0.01
			(0.08)
N	382	382	382
Mean Dep. Var.	.54	.54	.54
Adj.R2	0.022	0.025	0.104
Additional controls	No	Yes	Yes

Note: The dependent variable is the indicator for the hypothetical reduction in the total pay cost of 21-100%, conditional on the firms that reported a reduction. Additional controls are included.