UNIVERSITY OF COPENHAGEN

Preserving job matches during the COVID-19 pandemic

firm-level evidence on the role of government aid

Bennedsen, Morten; Larsen, Birthe; Schmutte, Ian; Scur, Daniela

Document version
Early version, also known as pre-print

Preserving job matches during the COVID-19 pandemic: firm-level evidence on the role of government aid[*]

Morten Bennedsen[†]   Birthe Larsen[‡]

Ian Schmutte[§]   Daniela Scur[¶]

June 15, 2020

Abstract

We analyze the impact of the COVID-19 pandemic and government policies on firms' aid take-up, layoff and furlough decisions using newly collected survey data for 10,642 small, medium and large Danish firms. This is the first representative sample of firms reporting the pandemic's impact on their revenue and labor choices, showing a steep decline in revenue and a strong reported effect of labor aid take-up on lower job separations. First, we document that relative to a normal year, a quarter more firms have experienced revenue declines exceeding 35 percent. Second, we characterize the firms that took up aid and the type of aid package they chose — labor-based aid, fixed cost support or fiscal-based tax delays. Third, we compare their actual layoff and furlough decisions with reported counterfactual decisions in the absence of aid.

Keywords: COVID-19, firm survey, aid packages

1   Introduction

A large part of the economic impact of the COVID-19 pandemic happens through firms and the labor-based decisions they make. Social distancing requires all but the most essential employees to either work from home or not go to work at all. Approximately 40% of workers in Denmark have jobs that allow them to work from home (Dingel and Neiman; 2020), a figure that is similar to other high-income European countries and the United States. Governments across the world have adopted emergency policies that focus on employment subsidy, cost subsidies and tax (VAT) delays. In particular, government support for furloughing employees of private firms has been a popular policy, as it facilitates public health by enabling social distancing and helps reduce firm costs.

We analyze the potential impact of three types of government aid on how firms manage their workforce in response to the pandemic collecting new survey data from 10,642 firms in Denmark. The Danish government has offered aid packages that share many similarities with the policy response in other countries, providing a lens to help understand the potential impact of government aid programs elsewhere. Our representative sample covers small, medium and large firms with 3 to 20,000 employees across all industries. We ask firms about pandemic-related disruptions to their normal operations, with a focus on alternative labour arrangements and government aid take-up. We also collect data on baseline firm employment, costs, and liquidity, as well as perceptions on the crisis and the recovery period.

We report three main findings. First, firms in Denmark, as elsewhere, were hit hard by the pandemic but there is significant heterogeneity of the impact. Second, we show that government programs in Denmark are likely to have had a strong and positive effect on labor retention. Third, we focus on the different types of aid policies and find that employment subsidies have the strongest correlation with the targeted labor choices, while we find a weaker correlation with cost subsidies. We find mixed evidence for tax subsidies with no clear impact on labor choices. Taken together, we interpret our results as strong evidence that targeted government policy can be successful in helping firms stay afloat and creating incentives for firms to retain their employees, thereby reducing the country's aggregate level of unemployment during the pandemic. Our estimates suggest that the aid policies in this context helped to reduce layoffs by approximately 81,000 jobs, and increased furloughs by 285,000.

To consider the impact of the COVID-19 pandemic on revenues, we compare reported changes in revenues with the distribution of changes in revenues in a normal year. We show that a quarter more firms in early 2020 are experiencing a negative revenue shock larger

than 35 percent (the threshold for aid eligibility), relative to 2016. We document that the impact was felt similarly across the firm size distribution, with the bulk of the variation attributed to industry differences. While at least half of the firms in almost all industries report decreases in revenue, some were hit much harder than others. As elsewhere in the world, industries in accommodation and food services were severely affected with an average of 73 percent decrease in revenues, as were arts/entertainment (69 percent decrease) and education (50 percent decrease). Retail and manufacturing were also badly affected, with nearly 70 percent of firms reporting decreases.[1] About 34 percent of firms report no impact or a positive impact on revenue. We find that firms that have taken up government support, however, tend to be those firms that report being in the highest levels of distress.

Our second main result is that there is a strong relationship between government aid and how firms manage their employment relationships. While we find that firms' primary response to the crisis has been to furlough a large share of their workforce, they report that without government support they would have expected to instead enact layoffs. The average firm taking aid furloughed 30 percent and laid off only 2 percent of workers. Without aid, they predict that they would have furloughed closer to 17 percent and laid off 25 percent of workers. We find a strong correlation between the magnitude of the revenue decrease and the share of workers that are furloughed and laid off, suggesting the policy was effective.

Our third main result focuses on the relative relationship between each of the three types of aid and firm choices. We find labor subsidies to have a strong and consistent relationship with more furloughs and fewer layoffs across specifications. Firms receiving cost aid tend to report fewer layoffs, though they only furlough more workers if the firm also takes labor aid. Firms taking on fiscal aid tend to be less worse-off, and the impact on labor outcomes is not as clear. We take this as evidence that firms taking on labor aid are primarily doing so for the intended reason of keeping workers on the payroll, though impact of other types of aid is less clear.

Related literature

Our study adds to the emerging rapid-response literature documenting the economic toll on firms and workers around the world. Bartik et al. (2020) surveyed approximately 5,800 small firms in the USA and found that almost half of the businesses temporarily closed with many cutting their labour forces by nearly half. Looking at start-ups, Sterk and Sedláček (2020) estimate a substantial loss in employment that is likely to extend beyond a decade, even under a "short slump" scenario. However, some firms are also doing better. For

---

[1]The average decrease in revenue in manufacturing and retail was 22 percent and 25 percent, respectively

example, Albuquerque et al. (2020) show that firms with high social ratings and advertising expenditure outperform others with higher returns and lower volatility. Similarly, Amore et al. (2020) show that firms with controlling family shareholders are more resilient and have fared better during the pandemic. Our data is the first representative sample including the full firm size distribution and industry composition, allowing for an economy-wide evaluation of the impact of aid programs on labor decisions.

Another strand of the literature focuses on the labor market effects of the pandemic. Barrero et al. (2020) estimate 42 percent of recent layoffs will become permanent job losses. Del Rio-Chanona et al. (2020) estimate that the shocks could cause a 22 percent drop in GDP, 24 percent job losses and 17 percent reduction in total wage income. Coibion et al. (2020) use a household survey from Nielsen in the US to document job losses as large as 20 million by early April, far surpassing official unemployment numbers. Alstadsæter et al. (2020) use real-time register data to report that close to 90 percent of layoffs in Norway are temporary, though suggest that some smaller, less productive firms may be enacting permanent layoffs. Some studies have started to document the characteristics of workers most affected. Montenovo et al. (2020) show that communication-related workers and female Hispanics with large families aging from 20 to 24 are more prone to lose jobs. Hensvik et al. (2020) use data on vacancy postings to document that the pandemic is shifting job-seekers' search behavior, moving their searches towards "less hit" jobs. While administrative datasets can provide evidence on actual outcomes, our survey elicits predictions for the counterfactual labor outcomes in the absence of government aid, allowing for a new type of evaluation.

Finally, our work also relates to the literature on the impact of government policy on real economic outcomes, though work on the microeconomic implications of government policy has not yet been prolific. Cororaton and Rosen (2020) look at the impact of US Paycheck Protection Program, reporting that while half of public firms were eligible to apply, only 13% ultimately became borrowers. They suggest additional eligibility requirements may help in targeting most financially constrained firms. There have also been notable contributions on the macroeconomic literature, including Faria-e Castro (2020); Caballero and Simsek (2020); Balajee et al. (2020) and Elgin et al. (2020). We evaluate firms responses to a set of popular government policies.

2 Institutional setting

The government policy packages in Denmark are similar to packages offered by other countries in Europe and around the world. They have focused on providing subsidies for retaining

employees, propping up businesses with fixed cost grants and allowing for deferral in tax obligations. We briefly describe each in turn, and provide a summary table of government programs in selected countries in the Appendix. The costs of the aid programs in Denmark are estimated to be close to 100 billion Danish kroner (14.7 billion US$, 13.4 billion Euro) and are expected to allow 100,000 jobs to be retained (Finansministerium; 2020).[2] This figure is within the margin of error of our estimates.

Labor-related support: furlough support and sick leave

The Danish government is subsidizing 75 percent of salary costs, subject to a cap, for employees that otherwise would have been fired as a result of financial stress caused by COVID-19.[3] The requirement for a company to be eligible is that it otherwise would have fired a minimum of 30 percent of its employees and that employees spend five days of holiday before becoming eligible.[4] Furloughed employees are not allowed to work, such that those working from home are not eligible for this policy.

Other countries have enacted similar policies. In Germany, Italy and the UK the government subsidizes up to 80 percent of the salary costs for furloughed workers. The Dutch government subsidizes 90 percent of wages if firm revenue is expected to decrease by 20 percent, and in France the compensation level is 70 percent subject to a cap. Sweden does not subsidize furloughs, but subsidizes a reduction in hours worked to 80 percent of capacity with workers receiving 90 percent of their salary. The United States has an additional direct payment to citizens, beyond unemployment insurance.

Cost-related support: fixed costs and cancelled events

To help firms survive and cover their immediate costs, governments have offered various non-salary cost subsidies, including 25 to 80 percent of fixed costs if the firm experiences between 35 to 100 percent reduced turnover. Firms facing lock-down are compensated for 100 percent of fixed costs. In Sweden, the government compensates up to 75 percent of costs for firms experiencing at least 30 percent reduction in turnover. In the Netherlands, firms in distress

---

[2]As of 18 May 2020, the government had committed around 1.5 billion US$ in employment subsidies for firms. As of 22 May, the government had received 31,000 applications of which 28,000 had been approved. These covered 211,000 jobs — equivalent to 161,000 full time jobs (Andersen et al.; 2020).

[3]In Denmark, social-security benefits are paid through general taxes. European countries have a minimum number of days for sick leave, which has to be covered by the firm. In Denmark, the government is covering the first month of sick leave that would have normally been the responsibility of the firm.

[4]Our survey elicits predictions of the share of employees that would be laid off, and we do not observe a discontinuity at 30 percent.

can apply for a EUR 4,000 lump-sum payment while in Germany firms with fewer than 10 employees can expect a direct payment of up to EUR 15,000. The French government also offers a lump sum transfer of up to EUR 1,500 for the self-employed or small businesses with a drop of 70 percent or more in revenue. The UK has a similar cash grant based on the prior three years profit, with a cap at GBP 2,500 per month and the Italian government has a regional fund set up to help small firms with redundancy payments. The Danish government is also offering compensation for cancelled events.

Fiscal-related support: tax deferral and loans

A number of countries are also delaying tax payments, such as value added tax (VAT) payments and payroll taxes. Denmark, Germany, Sweden, UK and the Netherlands all have corporate tax deferral schemes, and the United States has a 50 percent payroll tax reduction for affected firms that do not carry out layoffs and delayed corporate tax filings. France, similarly, has instituted early corporate tax repayments and postponed employers' social security contribution. In Italy, there is a six month suspension of loan repayment for small and medium sized firms.

To help firms cope with short term liquidity problems, many governments are offering loans or loan guarantees. The Danish government is offering a loan guarantee of 70% of new corporate loans if a firm's operating loses exceed a set threshold.[5] The Swedish government has instituted a similar policy, but without distinctions in firm size and cap. In Germany and Italy the loan guarantee is 100%, though Germany has a cap at 25 percent of firm revenue. France has a loan guarantee of 70-90 percent, with the maximum depending on firm size, while the UK has a guarantee with a cap for small and medium sized firms and 80 percent for large firms. The Netherlands offers a loan guarantee of 50 percent, while the United States is instead offering low-interest federal loans to affected small businesses.

3   Data and methodology

We developed a self-respondent survey that was sent out on 23 April 2020 to 44,374 firms; effectively the entire population of firms with more than 3 employees in Denmark. The survey is sent to a special email inbox for government mail, which yields a substantially higher response rate than regular email surveys. Participation was voluntary, and no financial

---

[5]For small and medium-sized firms, the threshold is 50 percent. For large firms, the threshold is 30percent.

compensation was offered to respondents.[6]

3.1 Methodology and characteristics

We received 10,642 responses by 1 June 2020 yielding a response rate of 24 percent. The responses were fairly balanced across firm size and industry, though there was a relatively stronger response rate from larger firms. We estimate that the survey respondents represent between 20 and 40 pct of the private labor market in Denmark.[7] Our industry mix is similar to the industry mix in the total population, highlighting that our final sample is representative at a firm size as well as industry level.[8]

The survey included a total of 23 questions, including basic firm characteristics (such as employment in January, revenue change between January and April, closure status, costs and liquidity) and a series of questions on government aid take-up and labor choices. The survey included a list of available aid packages and asked respondents to mark the packages they used. All firms were asked to report the number of employees they furloughed and laid off as a result of the pandemic, and firms that reported taking aid were also asked to report the number of furloughs and layoffs that they would have expected to enact if they had not taken aid. Our main results are based on survey data and the figures reported by the respondents.

3.2 Validation

There is an inherent trade-off in using administrative register data and survey data: register data are official and while the reports are verified by the government, data is not timely and still susceptible to biased responses as whatever firms report matters for administrative purposes.[9] Survey data, on the other hand, is more flexible on timing and can be responsive, though it relies on truthful reporting with no downside to misreporting. As such, the onus is on the researchers to validate the survey responses. We briefly outline the steps we took to verify our data.

---

[6]The survey was carried out by Epinion, a private survey firm in Denmark. The respondent managers will receive a special advance report with our findings after the completion of the survey. The report also provides a benchmarking of the individual firms' answers against a relevant group of other firms.

[7]See the Data Appendix for a thorough description of the data and response rates. Our firms self-reported 700,000 employees covering both part-time and full time employees. For some large firms, the response may also cover subsidiaries within and outside Denmark.

[8]We provide an online Data Appendix with details on the survey and its representative nature relative to the population.

[9]For example, when there are thresholds for reporting requirements (Garicano et al.; 2016).

First, the survey respondent is crucial in the quality of the data. In our survey, over 90 percent of the respondents were owner-managers or CEOs, and thus know (or make) the financial and labor choices in the firm.[10] Further, all firms have a unique firm identifier allowing for links to accounting register data up to 2019 and Danish Statistics data up to 2016, allowing for further verification.

Second, there are concerns regarding the quality of the reporting. In our context, the two main concerns are regarding truthfulness in reports of actual furloughs and layoffs, and accuracy in the predictions of the counterfactual figures. We can directly test the veracity of the reported actual furloughs against government register data on aid requests, but the veracity of the counterfactual predictions are inherently un-testable. We have to assume that these firm managers are in the best position to make these sorts of predictions for their own firms, and we can consider whether we see bunching at the aid threshold levels in the data. Bunching could suggest managers did not carefully answer the question and simply defaulted to the value they thought was the minimum acceptable, but we do not see evidence of this in the reports.

4   Results

The majority of firms — 66 percent — reported a negative impact of COVID-19 on their revenue, while about 26 percent report no change and about 8 percent report an increase in revenue. The median firm in our sample expects to face a 20 percent revenue decrease, while the median firm reporting a decrease expects a 35 percent decrease.

4.1   The reported impact of COVID-19 on firm revenue

Figure 1 plots the distribution of the reported revenue change in the shaded bars, and overlays the distribution of revenue change for the population of similar firms between 2015 and 2016 in the outlined bars.[11] While in any given year many firms experience decreases in revenue, including substantial decreases beyond 35 percent, the decline reported in April 2020 is unprecedented. In total, 40 percent more firms face declines in revenue relative to firms in 2016. The overlaid line plots the difference between the cumulative distribution functions of both distributions at each bin interval. It shows that 7 percent more firms face revenue declines of more than 90 percent, while 20 percent more firms have declines of more

---

[10]The remainder of the respondents were non-managing owners or other administrative staff.

[11]The "normal times" data is from 2016 as that is the latest available date in the register data. It includes the population of limited liability firms in Denmark with more than 3 employees.

than 50 percent, and over a quarter of firms face declines in revenue of more than 35 percent. This pattern is similar across firm size bands, though the magnitude of the reported impact is heterogeneous across industries. While nearly all industries have over half of the firms reporting expected decreases in revenue, some industries are particularly hard hit — such as accommodation and food services, arts and entertainment, education, manufacturing and retail.[12]

4.2   Government aid take-up

Our data suggest that the bulk of firms taking up government aid in Denmark are, in fact, those in the most need. The majority of firms reporting no expected change in revenues also report not being aid recipients.[13] Approximately 56 percent of firms in our survey reported taking advantage of one or more government aid programs, with nearly all firms experiencing revenue decreases beyond 50 percent taking some form of aid. Out of the remaining 44 percent that did not take aid, about half chose not to do so despite being eligible.

Figure 2 summarizes the aid take-up relationship with revenue change impact at the industry level. Each circle represents an industry at the 1-digit NACE level, and the size of the circle shows the relative share of firms accounted for by each industry. Firms in accommodation and food — the hardest-hit industry — are the firms most likely to take on aid. Retail and manufacturing report revenue declines that are at the median, and have approximately 60 percent of firms taking on aid.

Firms could take up all packages they are eligible for, and they were not mutually exclusive. Table 1 reports the set of firm characteristics that correlates with aid take-up of each type and combination of packages. We iterate across a set of indicators as the dependent variable and linear probability models starting with whether the firm took up any aid package, and subsequently iterating through the possible package combinations. Column (1) includes all firms in the sample, while the remaining columns include only the firms that took on any aid at all. The last rows in the table indicates the share of firms and employment that account for each of the policy types.

Column (1) reports that approximately 56 percent of firms took on aid, and they were less likely to do so if they reported no change, or an increase in revenues. Larger firms were slightly more likely to take up aid, and more affected industries were more likely to take up

---

[12]We provide a more thorough descriptive exercise of the firm size and industry differences in the Data Appendix.

[13]The median firm reporting not receiving any aid has an expected revenue change of zero.

aid. Column (2) shows that nearly 11 percent of all firms took on all three aid types (20 percent of aid-taking firms), relative to choosing only one or two bundles. This choice was more common for hard-hit sectors, but we find no relationship with firm size.

The outcome variables of Columns (3) through (5) take on a value of one if the firm took on only either labor, cost or fiscal aid, respectively. While a sizeable share of aid-takers chose only labor aid (about 19 percent) or only fiscal aid (22 percent), a much smaller share (4 percent) took on only cost aid. In general, industry characteristics predict take-up of labor-only and fiscal-only aid, while they fail to do so for cost-only aid. The direction of revenue change is not correlated with take-up of labor-only aid, but firms not experiencing a decrease are less likely to take up cost-only aid and more likely to take up fiscal-only aid. The most affected industries are also much less likely to take up fiscal-only aid. The patterns are relatively consistent when we consider the possible bundles including two types of aid in Columns (6) through (8).

In all, these correlations suggest that firms not experiencing distress are less likely to take up most types of aid (with the exception of fiscal aid), especially in bundles of two or three types. The relationship between firm size is economically small and mixed, and industry is most often the strongest predictor of taking a particular type of bundle.

4.3   The effects of aid on employment decisions

Firms that took aid were more likely to furlough and less likely to layoff workers relative to non-aid takers. Figure 3 shows that, among firms receiving aid, the share of workers furloughed is increasing with the firm's revenue losses, suggesting the policy is having the intended effect. The layoff shares for aid-taking firms seems largely independent of the size of the revenue loss. Firms that did not take aid enact more layoffs than furloughs if they experience a revenue decrease of more than 50 percent, but at lower distress levels the difference is not statistically significant.

However, we cannot draw conclusions about the effectiveness of aid policies from a simple comparison between aid takers and non-takers, as taking aid is naturally a choice and not a random assignment.[14] If firms taking aid were more likely to furlough workers in response to a revenue shock instead of laying them off, the observed differences in employment decisions could overstate the policy's effects.

---

[14]In time we may be able to observe identifying thresholds of eligibility, but our data suggests that 53 percent of firms that were eligible to take aid chose not to do so.

Estimates based on stated counterfactuals

In an effort to address the self-selection of firms into the different aid packages, we asked respondents to report their expected counterfactual choices. Among firms that took aid, we asked what share of workers they would have laid off and furloughed in the absence of aid. Under the assumption that firms report counterfactual outcomes accurately, we can identify the average effect of treatment on the treated for each of the policy options. Furthermore, we can also observe how firm's adoption of different aid packages is correlated with their outcomes in the absence of treatment.

Our analysis requires an assumption that the reported counterfactuals are correct. While this may seem strong, in the absence of clear experimental variation in aid packages our alternative is to assume that selection of these aid packages is random (conditional on observable covariates in the data). A simple comparison between aid takers and non-takers would imply an assumption that the counterfactual outcomes for a firm that took aid can be proxied by the outcomes of a firm with similar characteristics that did not take aid. Economic models of selection are predicated on the notion that firms know their business, and as such should be able to foresee immediate alternative outcomes. In this sense, our approach could be superior to a quasi-experimental designs. The primary concern in this scenario is that firms may not report their counterfactuals carefully, even if they are capable of doing so. In this section, we consider evidence about the validity of the counterfactual reports and alternative estimates based on more conventional assumptions about selection on observables.

Table 2 reports estimates of the effects of the effects of labor aid, cost aid, and fiscal aid on the share of workers furloughed and laid off. Columns (1) and (2) focus only on aid-takers, and the dataset includes two observations for each firm: one corresponding to their actual furloughs and layoffs, and one that reports their counterfactual furloughs and layoffs they say they would have chosen in the absence of aid. Using these data, we estimate a model:

$$Y_{jT} = \alpha + \beta_0^L L_j + \beta_0^C C_j + \beta_0^F F_j + T \times \left(\beta_1^L L_j + \beta_1^C C_j + \beta_1^F F_j \right) + X_j \gamma + \varepsilon_{js} \qquad (1)$$

where firms are indexed by j, and $T = 0$ if the observation measures the firm's reported outcomes in the absence of aid, and $T = 1$ if it measures the firm's actual outcomes. The key variables are binary indicators for whether the firm took labor aid (L_j), cost aid (C_j), or fiscal aid (F_j). Recall that these aid packages are not mutually exclusive; firms can take up any combination of the three. The coefficients $\beta_0^L, \beta_0^C, \beta_0^F$ measure differences in counterfactual outcomes for firms that took up particular aid packages. The coefficients $\beta_1^L, \beta_1^C, \beta_1^F$ measure the difference in observed outcomes, relative to counterfactuals, for a

given aid package. Firm-specific controls, X_j, include log of January employment, the size of the revenue change, and industry at the 2-digit NACE level. The term ε_{jT} captures idiosyncratic reporting error and other factors that affect layoff and furlough decisions.

We interpret $\beta_1^L, \beta_1^C, \beta_1^F$ as effects of treatment on the treated — that is, the average effect of each policy on the firms that take them up.[15] Firms that took labor aid increase the share of furloughs by 25.6 percentage points; a magnitude consistent with the evidence in Figure 3. The reduction in layoffs from taking labor aid is -6.0 percentage points. Cost aid also increases the furlough share, but by a smaller margin: 3.9 percentage points.[16] Cost aid also reduces layoffs by 6.8 percentage points. For labor aid and cost aid, the effects have the signs that would be predicted by theory, and intended by policymakers. Fiscal aid, however, is estimated to increase layoffs by 1.1 percentage points, and we cannot rule out negative effects on furloughs. While unclear, this could be simply reflecting selection into this type of aid.

Our estimates of $\beta_0^L, \beta_0^C, \beta_0^F$ measure selection into treatment on the basis of counterfactual outcomes. The coefficients suggest that firms choosing labor aid expected 4.8 percentage points more furloughs, and 13.5 percentage points more layoffs, relative to firms that also took aid but chose different packages. Hence, the firms that took labor aid are those that also had expected to enact relatively high layoffs and furloughs. Firms that took cost aid had expected significantly higher layoffs, but not furloughs. Firms taking fiscal aid also expected slightly higher furlough share (1.6 pp) and layoff share (2.4 pp).

Estimates based on selection on observables

Columns (3) and (4) in Table 2 are based on comparisons of actual reported outcomes between firms that took aid and firms that did not. These are identified under the assumption that firms' counterfactual outcomes in the absence of aid are well-proxied by the actual outcomes of the firms that did not take aid. This assumption, albeit implausible, is a useful benchmark model to compare against our analysis based on stated counterfactuals.

For this analysis, we are estimating a standard cross-sectional model:

$$Y_j = \alpha + \beta^L L_j + \beta^C C_j + \beta^F F_j + X_j \gamma + \varepsilon_j \tag{2}$$

where the variables and parameters have interpretations analogous to equation (1). We assume $E[\varepsilon_j | L_j, C_j, F_j, X_j] = 0$.

---

[15]Under the aforementioned assumption that firms accurately report counterfactuals.

[16]Firms that want to furlough workers can pair cost aid and labor aid.

12

Under these modeling assumptions, the estimated effects of the different aid packages on the share of workers furloughed and laid off are, in fact, similar to those estimated based on stated counterfactuals in Columns (1) and (2). Comparing the two sets of estimates is useful to help us understand the nature of the selection bias introduced by firms' choice of aid packages. Under both models, labor aid leads to large increases in the share of workers furloughed and substantial reductions in the share of workers laid off, albeit smaller. This is what the policy is intended to do: firms that take labor aid would have laid off more workers without aid, but they cut layoffs roughly in half and substantially increased furloughs. If the counterfactuals are accurate, firms furloughed significantly more workers than they had planned to lay off, suggesting that the policy not only saved employment matches, it also encouraged firms to put workers on leave who might have otherwise stayed on the job. While under normal circumstances inducing furloughs would be undesirable, it is certainly not so in the context of the pandemic, where a key goal is to encourage social distancing.

With regard to cost aid, the picture is somewhat less clear. Both models indicate that cost aid increases the furlough share by 3.9 to 5.7 percentage points, but the models disagree about the effect on layoffs. In the model based on stated counterfactuals (Columns 1 and 2), cost aid is estimated to reduce layoffs by 6.8 percentage points. In the model of selection on observables (Columns 3 and 4), cost aid has no discernible effect on layoffs.

This difference could arise if firms taking cost aid would have higher layoffs in the absence of aid than firms that did not take aid. The evidence on selection in Column (2) suggests this could be the case. Focusing on the results for cost aid in Columns (1) and (2), we would conclude that cost aid encourages reduced layoffs and increased furloughs. Unlike the case for labor aid, cost aid seems to reduce layoffs by more than it increases furloughs. One interpretation is that taking cost aid encouraged firms to keep workers on the job that they might otherwise have been forced to lay off. When firms can offset payments of rent or other fixed costs, they may redirect funds to keeping workers employed who might have been laid off. To be sure, less than 1 percent of workers are employed in firms that only take cost aid, as most firms that take cost aid bundle it with another policy (see Table 1).

The results for fiscal aid consistently indicate that it has no effect on furloughs, and a small, but statistically significant positive effect on layoffs. Firms that take only fiscal aid employ around 16 percent of all workers, so even this small increase in layoffs could have a significant impact on the total number of workers who lose their jobs. Furthermore, taking fiscal aid alone is more likely among firms who did not experience revenue declines, and that are not in the most affected industries (see Table 1, Column 5). Still, the mechanism through which increased fiscal aid would lead firms to lay off a larger share of their workforce is not

clear. Perhaps firms that defer tax payments or take government-backed loans lay workers off to restructure in anticipation of future loan payments. As the goal of fiscal-type aid is targeted at non-labor outcomes — such as, for example, firm survival and longevity — we will only be able to evaluate these relationships with additional data in due time.[17]

5   Conclusion

The COVID-19 pandemic has caused widespread disruption to lives and livelihoods across the world. We analyzed its reported impact on firm outcomes and the likely effect of firm-based aid programs. Our survey sample covers approximately 24 percent of firms in Denmark with more than 3 employees, and it is representative for the population with respect to size and industries.

The crisis was hard hitting for nearly 70 percent of firms, with the median firm experiencing a decline of 20 percent of revenue. Over one quarter more firms reported revenue declines in this period relative to firms in 2016. Firms experiencing declines in revenue were the primary takers of government aid, standing is in stark contrast to the reports of aid take-up in other countries, such as the United States.[18] The most common aid package taken up included support for labor furloughs and delays in VAT payments, with a non-trivial share of firms also taking on aid to cover fixed costs.

We have documented that receiving government aid has a strong impact on reported labor choices: firms that took up aid report furloughing more and laying off fewer workers than they would have, absent government aid. However, the relationship varies with the kind of aid that firms take-up: we find a strong and clear relationship between taking up labor aid and reporting lower layoffs and more furloughs, while the relationship for firms taking up cost aid is mixed, with lower layoffs but lower furloughs contingent on also taking on labor aid. While we do not find the same relationship for firms taking up fiscal aid, the most expensive aid program, the effect is hard to cleanly identify. We report that financial distress is not correlated with higher take-up of fiscal aid, nor is being in a hard-hit industry. Further, while it is not clear that take-up of fiscal aid is correlated with furloughs, it is too early to detect the potential impact on liquidity, costs and survival. These outcomes are more likely to be the goal of the fiscal aid subsidy, and we leave the effect of these policies

---

[17]Our survey included questions on cost changes, cost shares and firm liquidity. However, these questions had much lower response rates relative to the rest of the survey. As such, we leave exploring this type of outcome to future work including register data and leave some exploratory basic descriptive statistics in our Data Appendix.

[18]Reports such as Silver-Greenberg et al. (2020) are widespread in the US news media.

as important questions for future work.

Our analysis is important and, we hope, useful for policymakers in this turbulent time. As our survey response rate was high and yielded a highly representative sample across firm size and industry, we have one of the best datasets available today to examine the impact of COVID-19 pandemic on firms and their responses to government policy. The policy program implemented in Denmark is quite similar to policy programs in many other countries, including Germany, the United Kingdom and Sweden. Further, some portions of the program are similar to others beyond Europe across the world. As such, our results can be helpful as economists consider the potential effects of such programs across countries with different institutional contexts.

References

Albuquerque, R. A., Koskinen, Y., Yang, S. and Zhang, C. (2020). Love in the time of covid-19: The resiliency of environmental and social stocks.

Alstadsæter, A., Bratsberg, B., Eielsen, G., Kopczuk, W., Markussen, S., Raaum, O. and Røed, K. (2020). The first weeks of the coronavirus crisis: Who got hit, when and why? evidence from norway, *Technical report*, National Bureau of Economic Research.

Amore, M. D., Quarato, F. and Pelucco, V. (2020). Family ownership during the covid-19 pandemic, *Available at SSRN 3598256* .

Andersen, T., Svarer, M. and Schrøder, P. (2020). Rapport fra den økonomiske ekspertgruppe vedrørende udfasning af hjælpepakker, *Technical report*, Aarhus University.

Balajee, A., Tomar, S. and Udupa, G. (2020). Covid-19, fiscal stimulus, and credit ratings, *Fiscal Stimulus, and Credit Ratings (April 15, 2020)* .

Barrero, J. M., Bloom, N. and Davis, S. J. (2020). Covid-19 is also a reallocation shock, *Technical report*, National Bureau of Economic Research.

Bartik, A. W., Bertrand, M., Cullen, Z. B., Glaeser, E. L., Luca, M. and Stanton, C. T. (2020). How are small businesses adjusting to covid-19? early evidence from a survey, *Working Paper 26989*, National Bureau of Economic Research.

Caballero, R. J. and Simsek, A. (2020). A model of asset price spirals and aggregate demand amplification of a" covid-19" shock, *Technical report*, National Bureau of Economic Research.

Coibion, O., Gorodnichenko, Y. and Weber, M. (2020). Labor markets during the covid-19 crisis: A preliminary view, *Working Paper 27017*, National Bureau of Economic Research.

Cororaton, A. and Rosen, S. (2020). Public firm borrowers of the us paycheck protection program, *Available at SSRN 3590913* .

Del Rio-Chanona, R. M., Mealy, P., Pichler, A., Lafond, F. and Farmer, D. (2020). Supply and demand shocks in the covid-19 pandemic: An industry and occupation perspective, *arXiv preprint arXiv:2004.06759* .

Dingel, J. I. and Neiman, B. (2020). How many jobs can be done at home?, *Working Paper 26948*, National Bureau of Economic Research.

Elgin, C., Basbug, G. and Yalaman, A. (2020). Economic policy responses to a pandemic: Developing the covid-19 economic stimulus index, *Columbia University* .

Faria-e Castro, M. (2020). Fiscal policy during a pandemic, *FRB St. Louis Working Paper* (2020-006).

Finansministerium, D. (2020). Danmarks konvergensprogram 2020.
URL: *http://fm.dk/media/17913/danmarks-konvergensprogram-2020.pdf*

Garicano, L., Lelarge, C. and Van Reenen, J. (2016). Firm size distortions and the productivity distribution: Evidence from france, *American Economic Review* **106**(11): 3439–79.

Hensvik, L., Le Barbanchon, T. and Rathelot, R. (2020). Job search during the covid-19 crisis, *Available at SSRN 3598126* .

Ministeriet, B. (2020). Tripartite agreements.
URL: *https://bm.dk/arbejdsomraader/politiske-aftaler-reformer/politiske-aftaler/trepartsaftaler/*

Montenovo, L., Jiang, X., Rojas, F. L., Schmutte, I. M., Simon, K. I., Weinberg, B. A. and Wing, C. (2020). Determinants of disparities in covid-19 job losses, *Technical report*, National Bureau of Economic Research.

Regeringen (2020). Enige om at justere og udvide hjælpepakker til dansk økonomi.
URL: *www.regeringen.dk/nyheder/2020/regeringen-og-alle-folketingets-partier-er-enige-om-at-justere-og-udvide-hjaelpepakker-til-dansk-oekonomi/*

Sterk, V. and Sedláček, P. (2020). Startups and employment following the covid-19 pandemic: A calculator.

Exhibits

Figure 1: Density Distribution of Actual and Expected Changes in Revenue
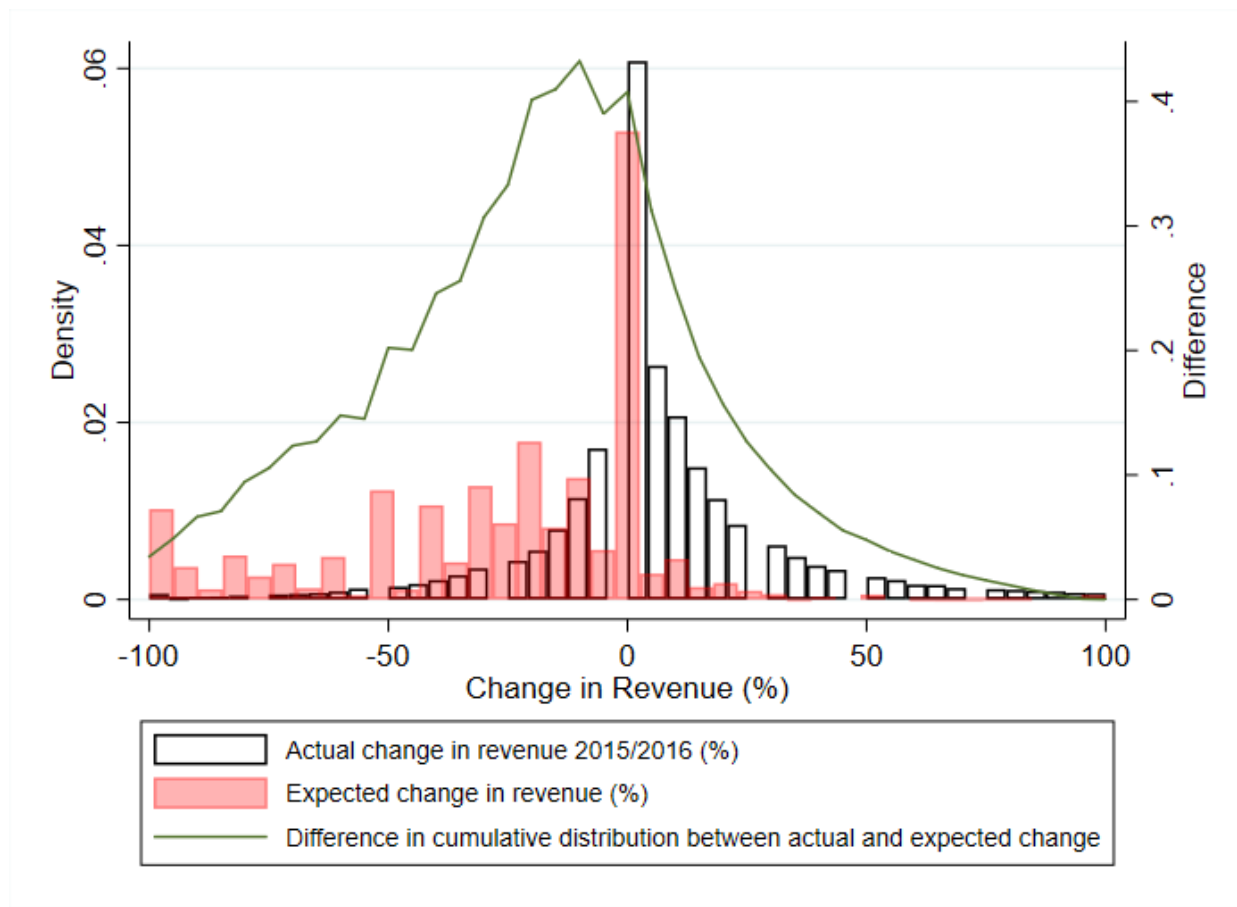
Notes: The outlined bars plot the distribution of the value of the actual change in revenue between 2015 and 2016, using Danish register data for the universe of firms with more than 3 employees (N = 73,498). The shaded bars plot the distribution of the reported revenue change from the authors' survey of firm managers responding to the effect of COVID-19 on their firms (N = 10,642). The COVID-19 survey was sent to over 44,000 firms with more than 3 employees, had a 24 percent response rate and yielded a representative sample along firm size and industry categories.

Figure 2: Share of firms taking up aid programs on industry and expected change in revenue.
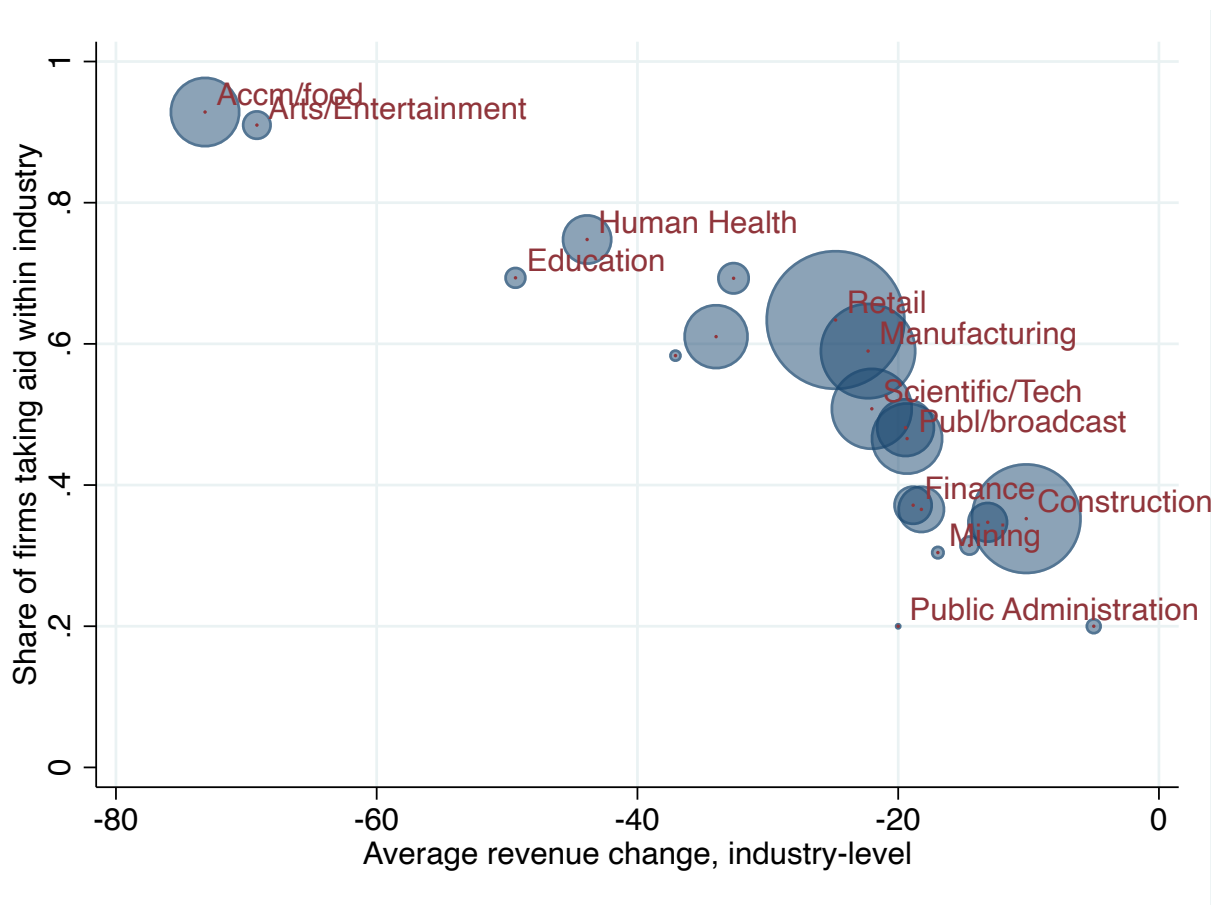
Notes: Data from author's COVID-19 survey. This graph reports the industry-level average revenue change (x-axis) and the industry-level average aid take-up (y-axis), weighted by industry size. Each circle represents an industry at the 1-digit NACE level, and the size of the circle shows the relative share of the economy accounted for by each industry.

Table 1: Regression results: policy choice

	All types		Only one type			2 types		
	(1) Any aid	(2) All three	(3) Labor	(4) Cost	(5) Fiscal	(6) Labor+Cost	(7) Labor+Fiscal	(8) Cost+Fiscal
Revenue change								
Increase	-0.459***	-0.181***	0.042	-0.030***	0.336***	-0.123***	0.002	-0.046***
	(0.016)	(0.011)	(0.030)	(0.008)	(0.035)	(0.006)	(0.029)	(0.008)
No change	-0.420***	-0.164***	0.018	-0.045***	0.369***	-0.115***	-0.009	-0.053***
	(0.011)	(0.007)	(0.018)	(0.004)	(0.020)	(0.006)	(0.016)	(0.004)
Firm characteristics								
Ln(employment)	0.022***	0.005	0.007*	-0.015***	0.003	-0.030***	0.044***	-0.014***
	(0.003)	(0.004)	(0.004)	(0.002)	(0.004)	(0.003)	(0.004)	(0.002)
Industry								
Manufacturing	0.128***	0.048	0.100***	0.006	-0.237***	0.053**	0.108***	-0.079**
	(0.033)	(0.033)	(0.036)	(0.023)	(0.058)	(0.025)	(0.034)	(0.039)
Construction	0.015	-0.018	0.180***	0.008	-0.175***	0.025	0.078**	-0.098**
	(0.033)	(0.033)	(0.039)	(0.024)	(0.060)	(0.025)	(0.035)	(0.039)
Retail	0.178***	0.100***	0.121***	-0.013	-0.308***	0.087***	0.104***	-0.092**
	(0.032)	(0.032)	(0.035)	(0.023)	(0.057)	(0.024)	(0.033)	(0.039)
Accm/Food	0.366***	0.373***	-0.040	0.017	-0.441***	0.222***	-0.050	-0.081**
	(0.033)	(0.039)	(0.035)	(0.025)	(0.057)	(0.032)	(0.033)	(0.040)
Professional	0.086***	0.048	0.069*	-0.004	-0.199***	0.075***	0.070**	-0.059
	(0.033)	(0.034)	(0.037)	(0.024)	(0.059)	(0.027)	(0.035)	(0.040)
Education	0.267***	0.234***	0.111***	-0.013	-0.458***	0.242***	0.006	-0.123***
	(0.036)	(0.043)	(0.042)	(0.025)	(0.057)	(0.036)	(0.036)	(0.040)
Arts	0.228***	0.091*	0.098*	0.009	-0.359***	0.215***	0.066	-0.120***
	(0.046)	(0.053)	(0.054)	(0.034)	(0.066)	(0.053)	(0.048)	(0.042)
Observations	10505	5868	5868	5868	5868	5868	5868	5868
Share of firms (total)	0.555	0.107	0.106	0.023	0.124	0.077	0.092	0.027
Share of empl (total)	0.569	0.101	0.141	0.006	0.159	0.028	0.127	0.007
Share of firms (aid)	1.000	0.193	0.190	0.041	0.223	0.138	0.165	0.049
Share of empl (aid)	1.000	0.177	0.248	0.010	0.280	0.049	0.223	0.012

Notes: ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels. Standard errors in parentheses. All columns are linear probability models, estimated with OLS. Each outcome variable is an indicator for each type of aid. The omitted category from revenue impact is "experienced a decrease in revenue". Log of employment is calculated based on reported employment in January. Regressions include industry dummies at the 1-digit NACE level, reporting only selected industries based on relevance (share of the economy) and relative impact.

20

Figure 3: Labor Response to Revenue Change by firms aid taker status
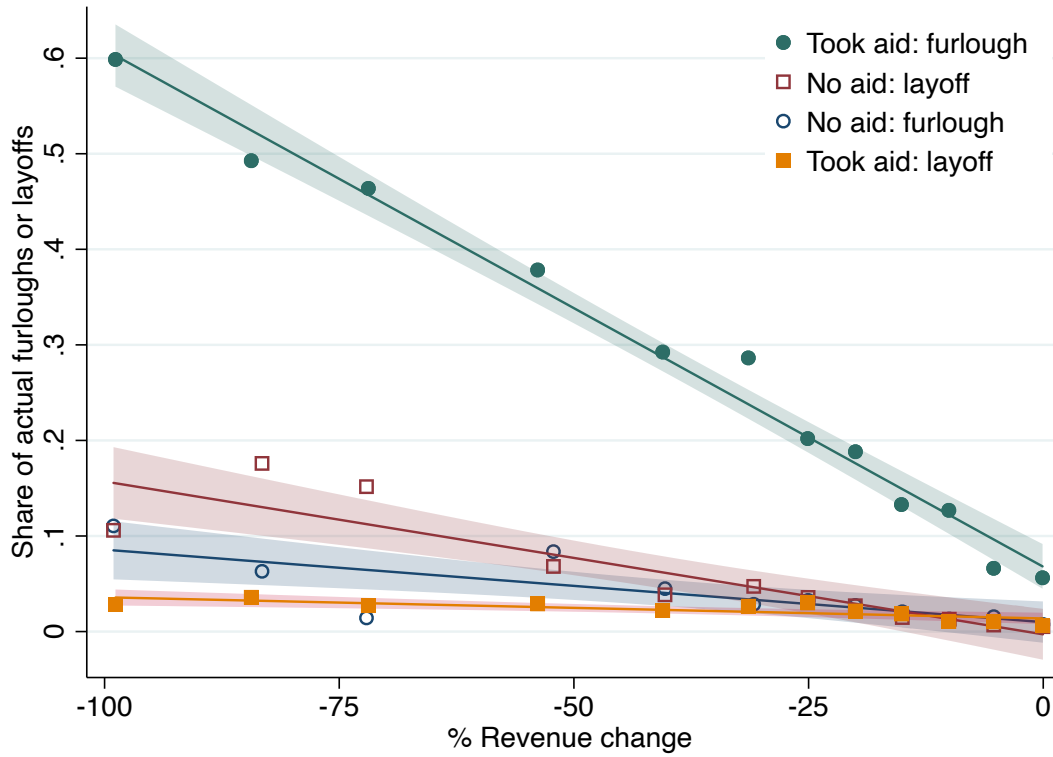
Notes: This graph shows the binned scatterplot of the simple relationship between the percentage revenue change in firms and the share of employees that they report actually furloughing or laying off. Squares show the relationships for the outcome of actual layoffs. Solid squares represent firms that took at least one type of aid, while hollow squares represent firms that did not take aid. Circles show the relationships for the outcome of actual furloughs. Solid circles represent firms that took at least one type of aid, while hollow circles represent firms that did not take aid.

Table 2: Regression results: aid takers and non aid takers

	Only Aid Takers		All firms	
	(1)	(2)	(3)	(4)
	Furlough	Layoff	Furlough	Layoff
Aid eligible			-0.020***	0.014***
			(0.004)	(0.002)
Observed outcomes				
Labor aid	0.256***	-0.060***	0.269***	-0.044***
	(0.008)	(0.005)	(0.006)	(0.003)
Cost aid	0.039***	-0.068***	0.057***	-0.001
	(0.010)	(0.005)	(0.009)	(0.004)
Fiscal aid	-0.011	0.011***	-0.008	0.007***
	(0.007)	(0.004)	(0.006)	(0.002)
Reported counterfactuals				
Labor aid	0.048***	0.135***		
	(0.008)	(0.007)		
Cost aid	-0.000	0.122***		
	(0.010)	(0.008)		
Fiscal aid	0.016**	0.024***		
	(0.008)	(0.006)		
Firm controls	✓	✓	✓	✓
Industry	✓	✓	✓	✓
Observations	10540	10678	9267	9267
# Firms	5270	5339	9267	9267

Notes: ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels. Standard errors in parentheses. Columns (1) and (2) are estimated on a sample that only includes workers who actually took aid. Each firm has two observations: one with its actual outcomes, and one with the outcome in the absence of aid, as reported in the survey. The coefficient estimates for labor, cost, and fiscal aid in the top panel correspond to actual firm outcomes. The bottom panel corresponds to counterfactual outcomes, as described in equation (1). Columns (3) and (4) use data on observed outcomes for all firms. All models also include: revenue loss, log of January employment, and unrestricted industry effects at the 1-digit NACE level.

"Preserving job matches during the COVID-19 pandemic: firm-level evidence on the role of government aid," June 15, 2020

A   Data Appendix

A.1   Sample characteristics

The Danish COVID-19 survey was sent to 44,374 firms; effectively the entire population of firms with more than 3 Track changes is off Track changes for everyone Track changes for daniela.scur Track changes for holmog Track changes for mobe Track changes for ian schmutte Track changes for Malte Jacob Rattenborg Track changes for You Track changes for Frederik Plum Hauschultz Track changes for jwe Track changes for guests Current file Overview Recompile 13 employees in Denmark. The survey was sent out on 23 April 2020, and by 1 June 2020 we had received 10,642 responses, yielding an overall response rate of 24 percent. This Data Appendix provides details on the sample characteristics and how representative the sample is relative to the Danish population of firms with more than 3 employees.

Table A.1 shows the number of respondents within each employment size band, the response rate and the proportion of each set of firms in our sample and in the population. While we had a higher response rate among larger firms relative to small firms, the final share of firms sampled from each size band is not vastly different from the share of firms in the total population. Figure A.1 shows the cumulative distribution function for our sample and the population firm size. In all, approximately 45 percent of the firms in our sample have fewer than 10 employees, while 40 percent have between 10 and 50, and 15 percent have more than 50 employees.

Similarly, the industry mix in our sample is relatively similar to the industry mix in the total population, and with fairly similar response rates across industries. The bottom panel of Table A.1 reports the response rates, sample and population shares for the largest industries in the sample. The representative nature of our sample in terms of industry composition is depicted in Figure A.2, where we plot the share of firms within each of the NACE 1-digit industries in our sample and in the population. Some industries were slightly over-sampled (like manufacturing and professional/technical services) while others were slightly under-sampled (like construction), but all are quite close to the 45-degree line.

A.2   Response rates

The overall response rate we received was relatively high for this type of non-incentivized, voluntary survey. As all questions were voluntary, not all survey questions had the same response rate. Table A.2 reports the response rates by firm size and industry for our main variables. Effectively all respondents provided answers to the establishment employment size, share of furloughed workers and share of laid off workers. Less than half, however, responded to the labor cost share, fixed cost share and liquidity questions. If there was

Table A.1: Distribution of Survey Responses

|	Resp N	Popn N	Response rate	Share in sample	Share in popn
Firm size					
3-5 emp	3202	15768	0.20	0.30	0.36
6-9 emp	2283	10488	0.22	0.22	0.24
10-25 emp	2817	10860	0.26	0.27	0.24
26-50 emp	1063	3801	0.28	0.10	0.09
51+ emp	1200	3457	0.35	0.11	0.08
Industry					
Accommodation/Food	472	2840	0.17	0.04	0.06
Construction	1477	7182	0.21	0.14	0.16
Manufacturing	1561	5416	0.29	0.15	0.12
Other	2406	10497	0.23	0.23	0.24
Professional/Technical	1116	3892	0.29	0.11	0.09
Publishing/Broadcasting	788	3001	0.26	0.07	0.07
Wholesale/Retail	2745	11546	0.24	0.26	0.26
Total	10565	44374	0.24	1.00	1.00

Notes: This table reports the sample counts and response rate for our COVID-19 impact survey. The top panel reports the respondent numbers across firm size bands, and the bottom panel reports the respondent numbers across different industries. Column "Resp N" reports the total number of survey respondents. Column "Popn N" reports the total number of firms in the population. Column "Response rate" reports the response rate as the difference between the number of respondents and the population within the firm size band or industry. Column "Share in sample" reports the share of firms represented in each size band or industry relative to the entire sample — the number of respondents divided by the total sample. Column "Share in popn" reports the share of firms represented in each size band or industry relative to the entire population of firms — the number of respondents divided by the total population count.

Figure A.1: Cumulative Distribution Function of Firm Employment
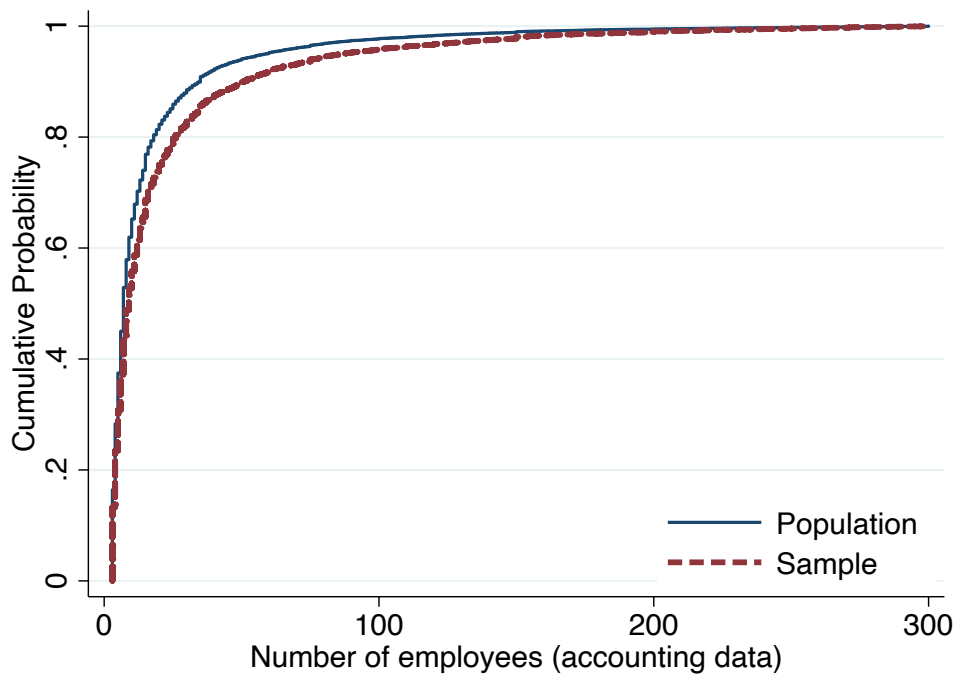
Notes: The red line represents the cumulative distribution function of firm employment in our survey sample. The blue line represents the cumulative distribution function of the remainder of the population of firms in Denmark with more than 3 employees. Employment truncated at 99th percentile (300 employees) for exposition. Population N = 33,513. Sample N = 10,642.

Figure A.2: Industry Composition of Sample Firms
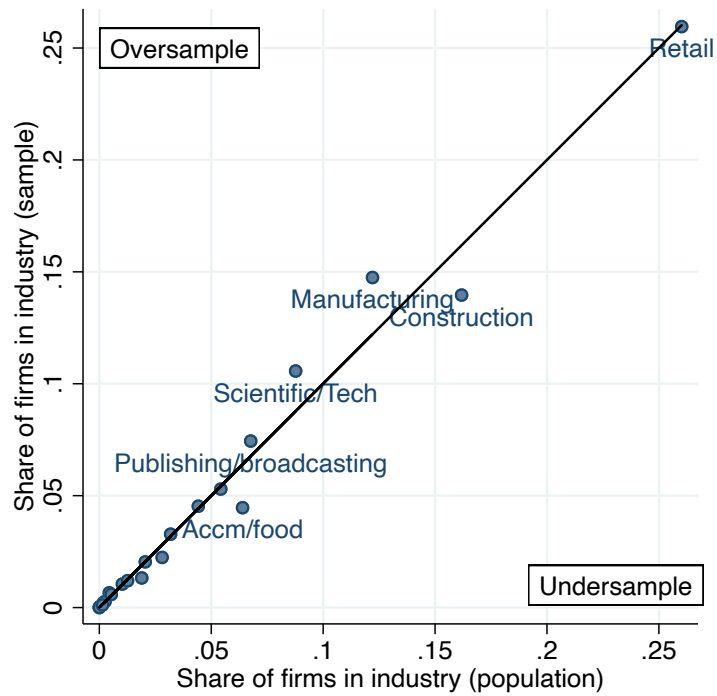
Notes: Each circle marker in the graph represents an industry-level share of firms, as they appear in the sample and in the full population. Industry markers above 45-degree line means industry is over-sampled. Industry markers below the 45-degree line means the industry is under-sampled. Population N = 33,513. Sample N = 10,642.

Figure A.3: Firm size distribution within industry, population

(a) Population
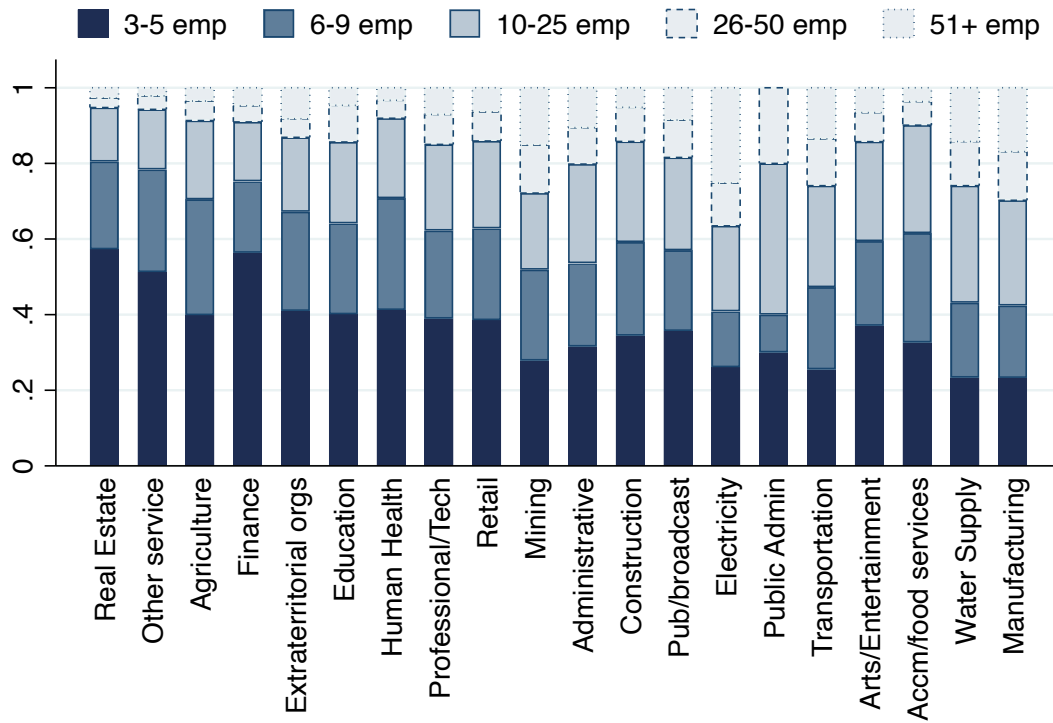
(b) COVID-19 Survey Sample

App. 5
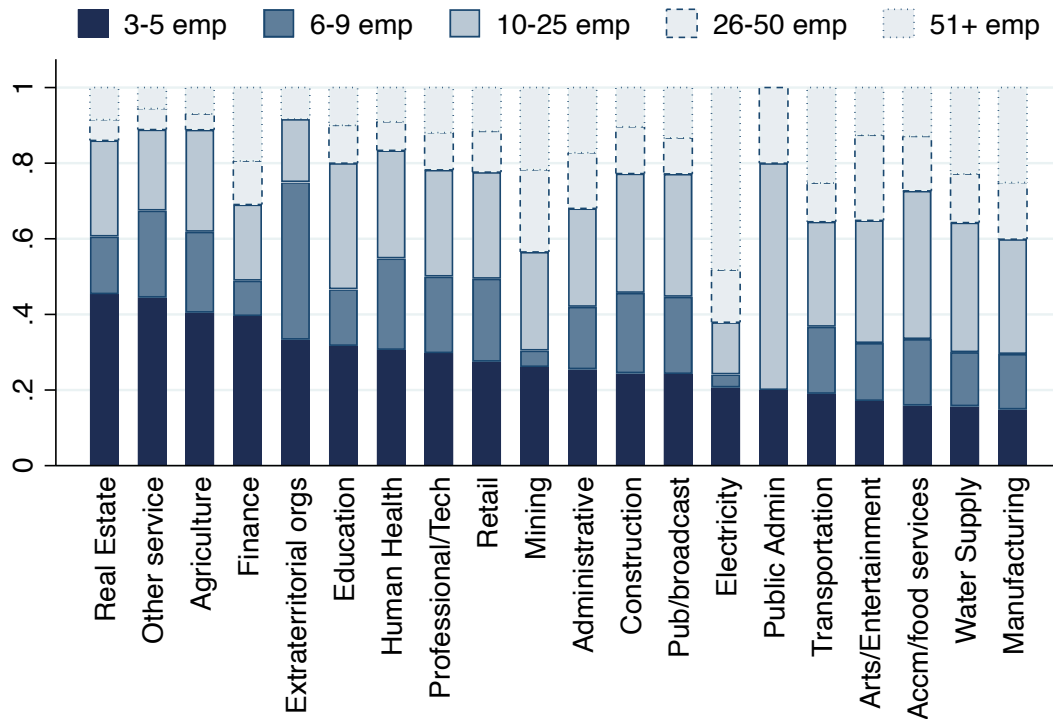
Notes: Population N = 33,513. Sample N = 10,642. Industry defined by 1-digit NACE codes. Graph shows the distribution of firm size (number of employees) in the population and in the sample for each industry.

selection in the type of firm that chose to respond to these questions, it does not seem to have been across firm size and industry. The share of respondents across the various size bands and industry categories is relatively similar.

Table A.2: Survey Response Rates

|	N	Empl	Furlough	Layoff	Labor Costs	Fixed Costs	Liq
Firm size							
3-5 emp	2652	1.00	0.99	0.99	0.39	0.38	0.38
6-9 emp	2039	1.00	0.99	0.99	0.40	0.39	0.41
10-25 emp	3110	1.00	1.00	1.00	0.39	0.38	0.37
26-50 emp	1217	1.00	0.99	0.99	0.40	0.39	0.40
51+ emp	1534	1.00	1.00	1.00	0.37	0.36	0.35
By industry							
Accommodation/Food	472	0.99	0.98	0.98	0.51	0.51	0.44
Construction	1477	0.99	1.00	1.00	0.27	0.26	0.31
Manufacturing	1560	0.99	1.00	1.00	0.33	0.32	0.37
Other	2419	0.99	0.99	0.99	0.39	0.38	0.36
Professional/Technical	1118	0.99	0.99	0.99	0.50	0.48	0.43
Publishing/Broadcasting	787	1.00	1.00	1.00	0.54	0.52	0.47
Wholesale/Retail	2746	0.99	1.00	1.00	0.38	0.36	0.38
Total	1511	0.99	0.99	0.99	0.42	0.41	0.40

Notes: As survey questions cannot be mandatory, the response rates of individual questions vary. This table reports the response rates of the main variables in our analysis for each size band and industry group. Column "N" reports the number of observations in each group. "Empl" reports the share of firms that responded to the question on the number of employees question. "Furlough" reports the share of firms that responded to the question on the share of employees that were furloughed. "Layoff" reports the share of firms that responded to question on the share of employees that were laid off. "Labor costs" reports the share of firms that responded the question on labor cost shares. "Fixed costs" reports the share of firms that responded the question on fixed cost shares. "Liq" reports the share of firms that responded the question on liquidity availability.

A.3   Direction of revenue change

We document that, in general, the direction of the revenue change is relatively similar across firm size bands, and the majority of the variation is driven by industry. Figure A.4a shows the expected change in revenue across the firm size bands, and Figure A.4b shows the same data across industries.

Figure A.4: Expected Direction Change in Revenue

(a) By firm size

Expected direction of revenue change, by firm size

(b) By industry
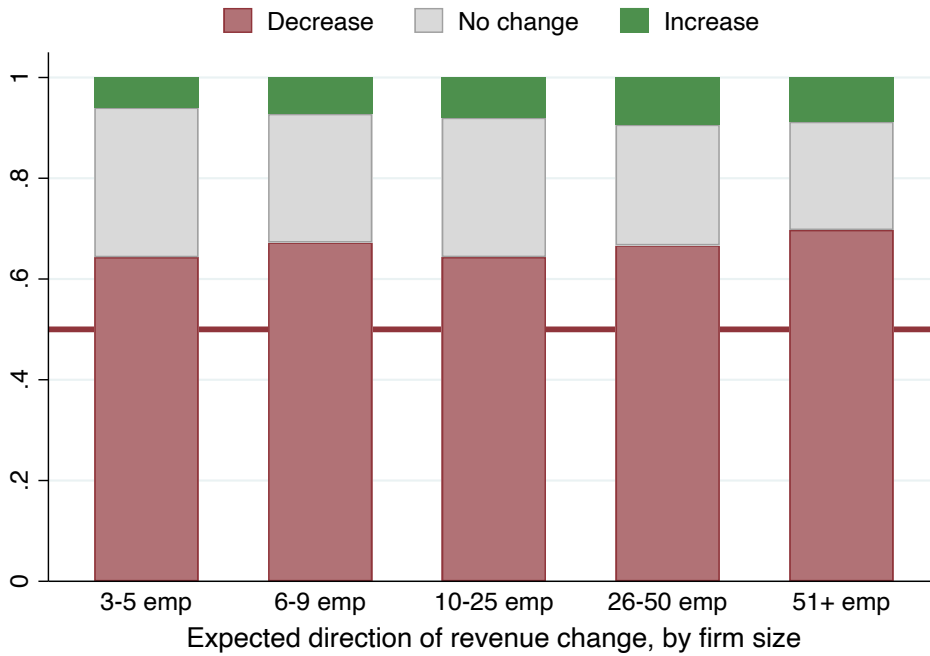
Expected direction of revenue change, by industry
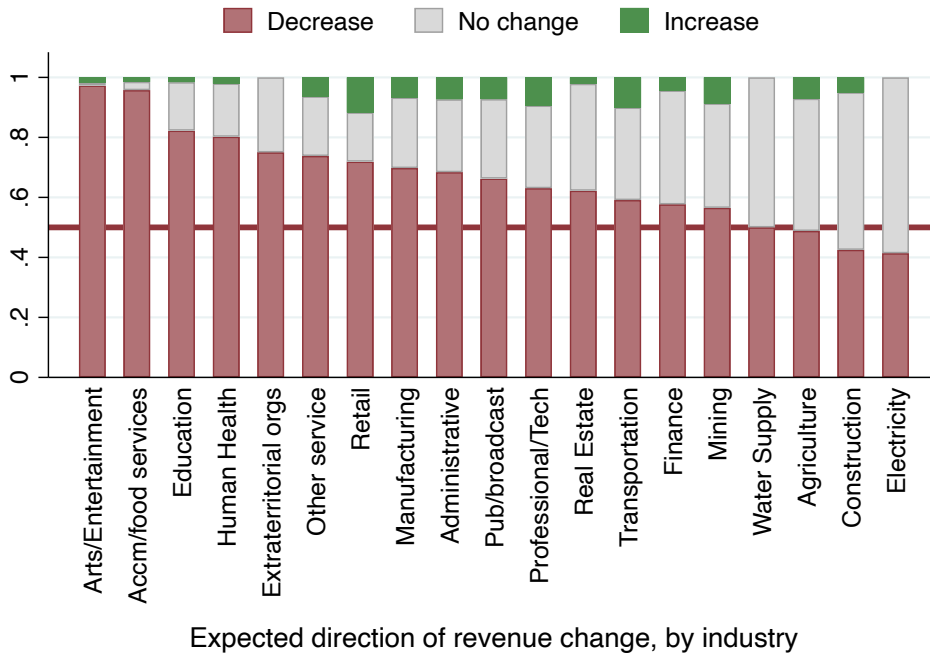
Notes: See Table A.1 for the sample size of each industry and size band in the sample. The figure shows the share of firms reporting an expected decrease, increase or no change in revenue as a result of the pandemic. Panel (A) shows the distribution across firm size bands, and Panel (B) shows the distribution across industries.

A.4 Other outcomes: costs, liquidity and survival expectations

Cost and liquidity

Approximately 40 percent of the respondents chose to report their monthly costs in January and April, as well as the share of their costs accounted for by labor and fixed costs, and their available liquidity (including cash-on-hand and available loans). Table B.3 reports the average value of these responses by three different types of firms: firms experiencing different levels of revenue change, by their aid recipient status, and by firm size.

All firms reported lower costs in April relative to January, though the share of costs taken up by labor or fixed expenses remained relatively similar. Likewise, liquidity remained stable across the two months.

B Policy Appendix

On 14 March 2020, the Danish government, labour unions and employer organizations reached an agreement that included temporary salary compensation for employees at risk of losing their jobs, effective for the period from 9 March 2020 to 9 June 2020 (Ministeriet; 2020). On 18 April 2020 the government aid packages were extended to 8 July 2020 and also substantially expanded (Regeringen; 2020).

Table B.3: Costs and liquidity, averages

	Mo. costs (Jan)	Mo. costs (April)	Lab. share cost (Jan)	Lab. share cost (Apr)	Fix share cost (Jan)	Fix share cost (Apr)	Liq (Jan) 100k Kr.	Liq (Apr) 100k Kr.
Decrease	31.43	21.98	0.58	0.59	0.31	0.35	45.87	44.12
Increase	40.68	28.75	0.56	0.58	0.29	0.30	50.06	52.32
No change	31.96	24.20	0.57	0.59	0.29	0.31	50.05	51.20
By aid recipient								
Did not take aid	37.02	26.22	0.58	0.60	0.29	0.31	52.21	52.46
Took aid	29.49	21.06	0.58	0.58	0.31	0.35	43.95	42.49
By firm size								
3-5 emp	4.85	2.89	0.58	0.59	0.32	0.35	19.06	18.22
6-9 emp	8.09	5.58	0.59	0.60	0.30	0.33	22.10	21.70
10-25 emp	17.89	12.83	0.59	0.60	0.30	0.33	38.85	38.01
26-50 emp	39.78	27.10	0.57	0.58	0.29	0.33	67.66	66.73
51+ emp	140.22	106.08	0.54	0.55	0.30	0.33	139.10	138.00
Total N	4225	3971	4017	3897	3894	3782	4083	4039

Notes: The table reports financial indicators of surveyed firms in terms of monthly cost in January(column 1), monthly cost in April (column 2), labor cost shares in January (column 3), labor cost shares in April(column 4), fixed cost shares in January(column 5), fix cost shares in April (column 6), liquidity in January (column 7) and liquidity in April (column 8) across groups with different revenue change expectations, aid recipients and firm size. Last row of the table reports number of total observations for each indicator.

Table B.4: Summary of firm aid government programs.

Country	Furlough support	Loan and grant	Cost subsidy	Others
Denmark	- 75% of employee salaries are covered by the government, up to DKK30,000 per employee per month. Eligibility: firm would layoff at least 30% of its workers. Firm covers the remaining 25% of the salaries.	Loan guarantee on 70% of new corporate loans related to COVID-19. Eligibility: SMEs with losses of 50% or more. Large: revenue losses of 30% or more.	Between 25% and 80% of fixed costs for firms experiencing between 35 and 100% decreases in turnover, but remaining open. 100% of fixed costs are compensated for firms forced to close.	Employers are paid sickness reimbursement for salaries and benefits from to first day of absence instead of the 30th. 30 day VAT payments delay.
Germany	- Govt covers up to 80% (87 if family) of salaries and 100 % of the social-security contributions for reduced working hours. Working hours can be reduced with reduced wages. Eligibility: at least 10 % of workers affected	100% - loan guarantee up to 25% of the revenue of 2019. Max EUR 500k in loans for firms with 10-50 employees and 800k for > 50 employees.	Direct payment to self-employed and firms with 10 employees or less, up to EUR 15,000.	Reduced VAT rate to 7% for restaurants for 12 months
Sweden	- Employers can cut the working hours by 80%. Government covers most of the salary, workers receive 90%.	- Loan guarantee of 70% to companies, up to SEK 75 million in loans per company. No legal company size limit	Between 22.5% and 75% of fixed costs for firms with min SEK 250k in turnover and a decrease of at least 30% this year.	VAT by sole proprietors might be postponed.
Netherlands	Up to 90% of wages are compensated. If: At least 20% decreases in revenue in March to May compared to 2019 and the workers are not laid off.	- Loan guarantee of 50%, min EUR 1.5m and max EUR 150m per company.	Firms forced to close can apply for EUR 4000 lump-sum payment	VAT, income, corporate and turnover taxes might be deferred.
France	70% of wages, up to EUR 45.68 per hour not worked, are compensated, if a business is forced to close or reduce activities due to COVID-19.	- 70 % to 90% of loans might be guaranteed by the State. - Different percentages of guarantees apply to different sizes of firms	Lump-sum transfer of up to EUR 1500. For: Very small businesses, self-employed etc., if decreases of 70% in revenue or forced to closure	Early corporate tax repayment, postponed employers social security contribution
Italy	- 80% of salaries covered, with a maximum of EUR 1.200 for a maximum of 9 weeks.	Fee-free loan guarantee for SMEs, EUR 5m max guarantee	regional fund to assist firms with redundancy payments for 9 weeks of suspension for a max of 5 employees	6 months suspension of loan repayment for SMEs
UK	Up to 80% of salaries with a maximum of 2,500 GBP are paid for the next three months for retained workers. All employers are eligible to apply	- Guarantee of loan repayments up to GBP 5m for SMEs. Loan guarantee of 80% for loans up to GBP 25m for large firms, between GBP 45m - GBP 500m in turnover	Cash grant between GBP 10,000 and GBP 25,000, if firm uses properties for retail, hospitality or leisure and a property value of maximimum GBP 51,000.	VAT deferral for the second quarter of 2020
USA	Unemployment insurance payments plus USD 600 per month, under it the majority of workers get a replacement rate over 100	Low interest federal loans to affected small businesses	50% payroll tax reduction for affected firms that do not layoff workers	Tax payments deferred