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Three lessons from the Danish wage compensation scheme

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Three lessons from the Danish wage compensation scheme

Abstract

This memo aims to take the first steps in analysing the use of the wage compensation scheme in Denmark and its effectiveness to preserve job matches.

Our analysis highlights three main lessons: first, less educated workers have in general been more affected by the crisis. This is mainly driven by the type of firms that are affected by the crisis, and not the decisions of individual firms. Second, a firm's choice to keep, lay off or furlough workers is also driven by the worker's attachment to the workplace. Firms lay off workers with fewer hours and employees with short employment spells, while workers with high seniority are furloughed. Third, workers earning more than peers face a greater risk of being laid off, while firms furlough workers that are less expensive.

The Danish government introduced a broad range of relief packages to sustain Danish businesses and employment following the lockdown of the Danish economy due to the outbreak of covid-19 in March 2020.

One of these was the wage compensation scheme that gave firms the opportunity to send home employees on furlough instead of laying them off, see Box 1. While employees were sent home, the government would cover up to kr. 30,000 of their monthly pay while the employer covered the remainder.[1] At the same time, firms were obligated not to lay off any workers while being compensated. However, firms were allowed to lay off workers before entering the scheme.

This memo performs a preliminary analysis of the use of the wage compensation scheme. We use Danish administrative records in order to shed light on who has been affected and how firms have been using the scheme as an alternative to layoffs during the first lockdown of the Danish economy.

In a joint memorandum, the government and the trade unions emphasised the importance of the furlough agreement in saving at-risk workers from losing their jobs[2]. Our analysis finds that the effects of the programme are in line with that. In particular, we find that firms used the furlough programme extensively to save at-risk workers. However, the focus has been particularly on saving full-time workers and workers with more seniority.

[1] Wages of white-collar workers (Danish: funktionærer) were subsidised by the government at a different rate. However, the ceiling of kr. 30,000 was independent of the employment type.

[2] See *Trepartsaftale om midlertidig lønkompensation for lønmodtagere på det private arbejdsmarked, 14 March2020, Ministry of Finance.*

The Danish wage compensation scheme Box 1

Following the lockdown of the Danish economy in March 2020, the government and the social partners agreed on a wage compensation scheme for employees working in the private sector. Firms facing layoffs of minimum 30 per cent or 50 employees were eligible to apply for partial compensation of wage costs for employees sent home on furlough. The scheme covers 75 and 90 per cent of wage costs for salaried employees and non-salaried employees, but no more than kr. 30,000 per month. Firms were obligated to pay the remaining part of the employee's salary. But firms and workers could agree on a different salary for the furlough period. While firms receive compensation, they are not allowed to lay off employees, and employees sent home on furlough – with the exception of students – were not allowed to work for the firm. Firms were allowed to lay off employees before entering the scheme.

The scheme was originally phased out by the end of August 2020 but was re-implemented in December 2020 to support firms during a new hard lockdown.

Source: Ministry of Finance.

Industries with more layoffs have also furloughed more workers

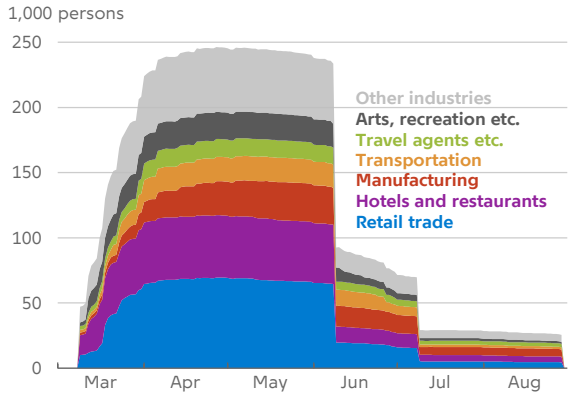
The main goal of the scheme was to protect workers who would otherwise have lost their jobs. By preserving job matches, firms could more easily adjust production, once restrictions were phased out and demand returned. If these matches were not preserved, there would be a high risk of a significantly more sluggish recovery of the Danish economy. On the negative side, the wage compensation scheme lowered workers' incentives to apply for new jobs. Therefore, the scheme reduced the flexibility of the Danish labour market, and less productive matches that should have been discontinued might have remained in place.

A firm considering whether to lay off workers has to balance the cost of laying off, including the loss of firm-specific knowledge and productivity, but also costs of hiring a replacement once again needed, against the direct cost of keeping the worker, i.e. paying wages. In theory, the firm will choose to lay off the worker if the expected wage costs are higher than the costs of laying off. The compensation scheme reduces the expected cost of keeping the worker employed at the firm, securing, all else equal, that fewer workers were laid off during the crisis.

Firms in the service sector were the most intensive users of wage compensation – and layoffs

More than 70,000 workers lost their jobs and 250,000 persons were sent home on wage compensation in the spring of 2020. Most compensated jobs were found in some of the sectors which were affected worst by restrictions, including retail trade and hotels and restaurants, see Chart 1. In these two sectors, 69,000 and 47,500 employees, respectively, were on furlough by the end of April.

Most workers within retail trade were on furlough Chart 1

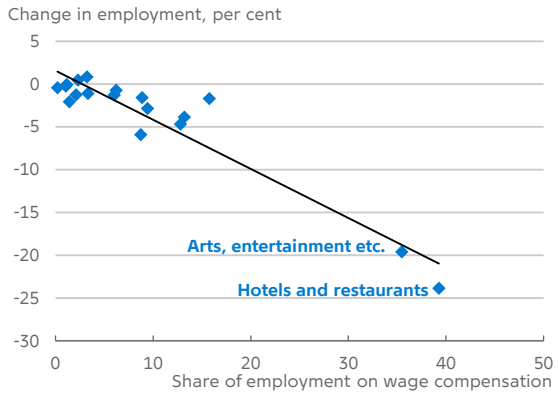


Note: Other industries include agriculture, forestry and fishing; mining and quarrying; electricity, gas, steam and air conditioning supply; water supply, sewerage and waste management; information and communication; financial and insurance; real estate activities; knowledge-based services; education; and human health and social work. Jumps in the number of workers on furlough might reflect that firms had to re-apply to be part of the scheme again.
Source: Danish Business Authority, Statistics Denmark and own calculations.

However, Chart 2 indicates a clear relationship between the number of workers furloughed in a given sector and the number of layoffs: Sectors with more layoffs also participated more in the furlough

scheme. It is commonly thought that the two sectors with highest layoffs, *Hotels and restaurants* and *Arts, recreation etc.* were particularly affected by the pandemic due to their inability to operate within social-distancing guidelines. It is reassuring that these sectors used the compensation scheme to a much larger extent than sectors that were less strongly affected: this suggests that the compensation scheme has been used to preserve some of the jobs in the most affected industries.

Sectors with more layoffs use the furlough programme more intensively Chart 2



Note: Change in employment from February to May 2020. Persons on furlough as of end of April 2020 relative to February.
Source: Danish Business Authority, Statistics Denmark and own calculations.

Nevertheless, since firms were able to send home any of their employees, it was not necessarily the case that all workers sent home would have been laid off in the absence of the scheme. However, there is broad consensus that the scheme has secured at least some workers' attachment to the labour market.[3]

Microdata helps understand firms' decisions

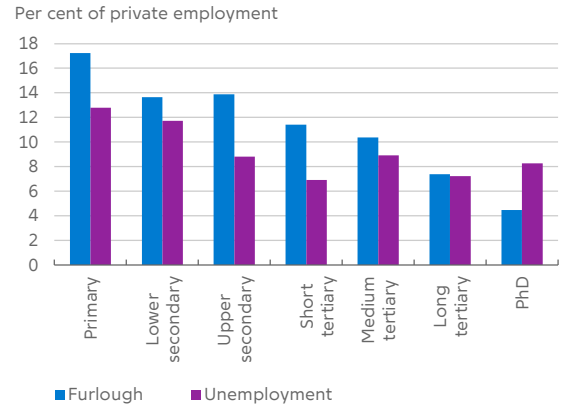
To shed light on how firms have been dealing with the choice of furloughing versus laying off workers, we take a close look at the Danish register data for employees (BFL). We match the register of Danish employees prior to the lockdown to the register of furloughed workers. In the data, we observe monthly wage payments and classify workers that stopped receiving wage payments as laid off.[4] We then compare workers who lost their jobs in the 2nd quarter of 2020 to those furloughed in the same months, see Box 2. [5] This enables us to see how the use of layoffs and furlough differs across various worker and firm characteristics. Below we summarise the three main lessons that we can learn from firms' furlough decisions.

Lesson 1: Less educated workers have been more affected by the lockdown because of sectorial differences rather than firms' choices

The incidences of layoffs and furlough have been significantly higher for less educated workers, see Chart 3. In the 2nd quarter of 2020, 17 per cent of workers employed in the private sector prior to the lockdown and with primary/lower secondary school as the highest educational level were sent home on wage compensation, while 12 per cent were laid off. In contrast, only 4 per cent of workers with a PhD were furloughed and 8 per cent were laid off.

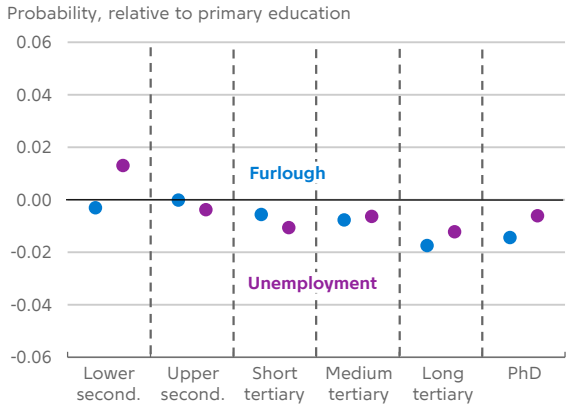
[3] See e.g. Danmarks Nationalbank, *Outlook for the Danish Economy*, September 2020 or *Rapport fra den økonomiske ekspertgruppe vedrørende udfasning af hjælpepakker II*, 3 May 2021.
[4] An important caveat is that some workers might have longer notice periods and continue to receive wage payments in that period. We cannot classify these workers as laid off.
[5] In the following, unemployment is defined as persons who stopped having any wage income during the 2nd quarter. Workers with long notice periods might not be captured. However, we did not see any indications of further decreases in employment after the first months since the lockdown, so we suspect this to be of less concern.

Less educated workers were more affected by the lockdown… Chart 3



Note: Share of furloughed or new unemployed during first lockdown relative to number of private-sector employees with the relevant education level in February.
Source: Danish Business Authority, Statistics Denmark and own calculations.

… but the risk of being affected vanishes when looking at firms' choices Chart 4



Note: Highest finished level of education.
Source: Danish Business Authority, Statistics Denmark and own calculations.

Chart 3 clearly shows that the compensation scheme has sustained less educated workers' attachment to the labour market. The welfare implications are mixed: On the one hand, less educated workers might have larger difficulties in finding a new workplace, which makes extensive use of furlough beneficial. On the other hand, they might have less firm-specific knowledge and human capital that makes saving these job matches less valuable.

Now, we turn from the average incidence of unemployment and furlough in the economy to individual firms' decision-making: are less educated workers more at risk of being laid off because employers prefer to lay them off and keep workers with higher education employed instead? Chart 4 shows the estimated marginal probability of a worker being furloughed or leaving employment, relative to workers with a primary/lower secondary education level. The estimation uses workers with varying levels of education *within the same firm* as a control group.

This controls for the average unemployment risk at a given firm, and informs us whether employers on average preferred to lay off one type of workers over another. We will repeatedly use this approach in the rest of the analysis to study the decision-making of individual firms, in contrast to the economy-wide averages that may be due to the types of firms affected by the pandemic. Box 2 provides more information on this approach.

We find that employers still had some tendency to lay off less educated workers, but the relative probability of being laid off between workers with a primary/lower secondary education level and those with a PhD is much smaller than found solely by

looking at layoff rates as in Chart 3. We see that workers with a long tertiary education have a 1.2 percentage point smaller chance of being laid off than people with a primary/lower secondary education, *within the same firm*[6].

The probability of being on furlough also decreases with the level of education within the same firm, however to a smaller extent. This might reflect that highly educated workers are more vital to the firm, hence more necessary to keep at work and not be sent home as long as at least some production is ongoing.

The smaller difference in the educational effect when controling for characteristics might be explained by which industries were mostly affected by the crisis: some of the most affected industries, such as hotels and restaurants, have a high concentration of less educated workers.[7]

Lesson 2: Firms lay off workers with fewer hours and employees with short employment spells, while workers with high seniority are furloughed

We find that working fewer hours raises the risk of being unemployed significantly within the firm, see Chart 5. Working full time, i.e. working 160 hours or more per month, reduces the probability of being laid off by 24 percentage points relative to employees working 0-25 hours per month.

On the other hand, working full time increases the risk of being furloughed: working 100 to 200 hours per month increases the probability of being furloughed by 10 percentage points, relative to workers working 0-25 hours.[8] However, there is no statistical difference in the probability of being furloughed between employees working 100-150 hours and those working 150 or more hours per month.

Our empirical approach

Box 2

Our starting point of the analysis is data on wage payments (BFL) that matches workers to firms during the 1st quarter of 2020. We match this with sociodemographic backgrounds and the furlough registry.

The last month with positive wage payments in a given worker-firm pair is identified as a separation, and for our purposes we use layoff and separation interchangeably. We have performed a robustness analysis where we identify layoffs using social security data from DREAM, and the results are similar.

With this approach, we can detect layoffs until and including May 2020. The firm's response to the pandemic might be slightly delayed, and last wage payments might occur after a match has ended. Therefore, we include any layoff between March and May 2020 in our analysis. Similarly, we define as "furlough" any worker-firm pair that registered for the wage compensation scheme at any time between March and May 2020.

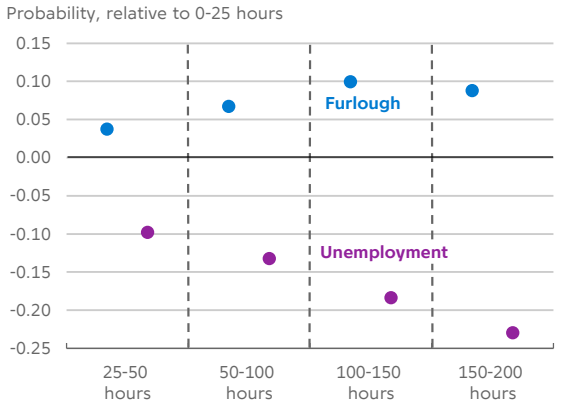
For this memo, we use two approaches to study the variation of furlough and layoff in the data. First, we examine the unconditional average incidence of furlough and layoff across workers. The descriptive analysis may find that workers of a specific type, e.g. less educated, were more likely to be laid off. Such findings may be due to two reasons: First, firms may decide to disproportionally lay off less educated workers. Second, firms that employ less educated workers may be more affected by the pandemic – for example because restaurants employ disproportionately more less educated workers and could not operate in that period.
To separate these two channels, we employ a regression-control framework where we employ firm-fixed effects to isolate within-firm variation. Let us denote by y the outcome of interest (the binary variable indicating furlough or layoff). Furthermore, let i denote workers and j firms. Then, we can describe this regression as

$$y_i = \alpha + \beta x + F\{j(i)\} + \varepsilon_i,$$

where $F\{j(i)\}$ denotes the firm-specific effect of the firm that employs worker i. It will capture all the variation in the outcome variable that is due to the heterogeneous impact of the pandemic on firms by worker type. β captures the remaining variation in the outcome variable that is caused by the firm's type-dependent layoff/furlough rules. We will consistently focus on reporting β as the coefficient that highlights the firm's choices.

[6] The result is statistically different from zero.
[7] In 2019, workers with at most an upper secondary education level accounted for 62 per cent of all employed within hotels and restaurant. For the whole economy, the educational group accounts for 29 per cent of employment in 2019 (Statistics Denmark, RAS310)
[8] Working at least 166 hours per month is usually considered working full-time.

Working full time reduces the risk of being laid off Chart 5



Note: Working hours per month.
Source: Danish Business Authority, Statistics Denmark and own calculations.

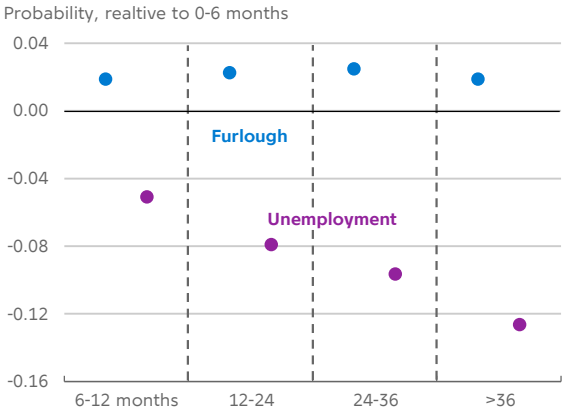
Workers' tenure at the firm also plays a significant role in the firm's decision whether to lay off or furlough a worker. Firms choose to keep workers which have been employed at the firm for a long time: the probability of being laid off for workers with seniority of more than 3 years is 12 percentage points lower than for workers who started at the firm within the last 6 months, see Chart 6.

In contrast to hours of work, there does not seem to be a relation between seniority and a firm's use of furlough.

Thus, an employee's attachment to their workplace might be a significant factor when the employer has to choose who to lay off, send home or keep at work. Consider for example the case of two workers that have the same abilities and experience, but differ only in their tenure at the firm: the employee that has been employed at the firm for many years might be more vital to the firm than their recently employed counterpart, so the cost of letting the senior employee go would be significantly higher.

Similarly, working full time might be indicative of a worker's importance to the firm. Our findings indicate that firms have to some extent used the furlough scheme in order to save more vital job matches while laying off less valuable matches. This, at least, indicates that firms might have better conditions for adjusting to higher production levels once the restrictions are phased out compared to a scenario without the compensation scheme. This is in line with the objective of the furlough programme.

The time of employment at the same firm decreases the probability of being laid off Chart 6



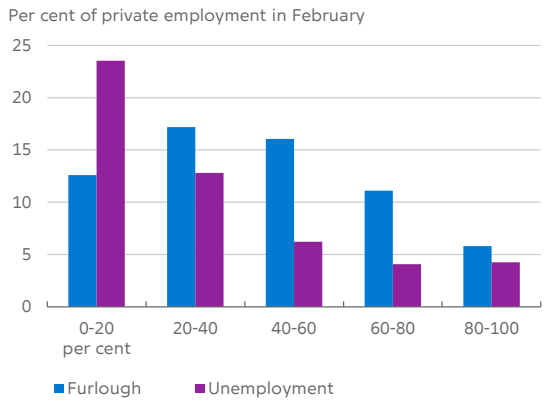
Note: Time of employment at the same firm, months.
Source: Danish Business Authority, Statistics Denmark and own calculations.

Lesson 3: Workers earning more than peers face a greater risk of being laid off

Especially low-income workers have been directly affected by the lockdown. More than 20 per cent of workers in the bottom 20 per cent earnings group lost their job, see Chart 7. For the top 20 per cent, only about 5 per cent were furloughed or laid off, respectively.

Even though low-income workers have been most affected by the crisis, we do not find that earnings directly affect the firm's decision whether to lay off or furlough a worker. Instead we find some evidence that the worker's pay relative to peers plays a role.

Workers with low earnings have lost their jobs Chart 7



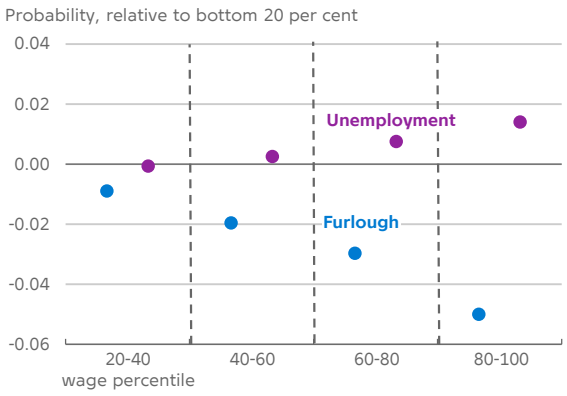
Note: Share of furloughed or new unemployed during first lockdown relative to number of private-sector employees at the relevant total earnings level in February. 0-20 relates to workers with the bottom 20 per cent of earnings of all private-sector employees.
Source: Danish Business Authority, Statistics Denmark and own calculations.

A worker's pay relative to that of peers is often referred to as the Mincer residual and can be interpreted in two ways. Traditionally, the Mincer residual has been used as a proxy for productivity: if labour markets are competitive, workers' pay would reflect their productivity. Under that condition, different wages for comparable workers could be explained by differences in productivity. In recent years, many have argued that the labour markets are in fact not that competitive: Many other factors than productivity may affect a worker's pay, such as bargaining position and outside options. In this view, workers that earn more than peers, i.e. a large Mincer residual, are not more productive but simply overpaid. These two arguments are not mutually exclusive: it is likely that wages are both driven by productivity and other factors.

By looking at its association with furlough and layoffs, we can get some suggestive evidence on whether *on average* it captures more differences in productivity or overpay.

Chart 8 plots the relative probability of being furloughed or laid off relative to the 20 per cent of workers with the lowest Mincer residual.[9] Here we see that firms are more likely to lay off workers with high comparative pay, and less likely to furlough them. In the traditional interpretation of the Mincer residual, this would suggest that firms are laying off and not saving more productive workers. They may be required to do so due to financial constraints. If we consider that the Mincer residual is instead capturing overpay, it would instead suggest that firms cut ties to workers that cost too much, and furlough workers that are less expensive.

Firms lay off overpaid workers rather than furloughing them Chart 8



Note: Wage income per month.
Source: Danish Business Authority, Statistics Denmark and own calculations.

Conclusion

We have documented three findings. First, the pandemic particularly affected less educated workers, and the furlough programme was used

[9] We compute the Mincer residual prior to the pandemic using monthly earnings by controlling for hours, fixed effects for seven education groups, municipalities, gender, and a squared term in age. We then compute an average residual by worker-firm pair. The results are robust to excluding part-time workers, outliers in firm size, using the last observation instead of the average Mincer residual by worker-firm pair, and other alternative specifications.

especially to save the employment of these workers. Second, workers that were more marginally attached to the firm – in terms of tenure or hours worked – were more likely to be laid off instead of furloughed. Third, firms were less likely to furlough workers that earned more than comparable workers.

These empirical regularities suggest that the furlough programme was used as intended: firms did retain job matches by furloughing workers, particularly vulnerable less educated workers. Even though we are not able to directly conclude whether furloughed workers would have been laid off in the absence of the scheme, our findings suggest that firms had incentives to save the more valuable job matches.

The medium-run implications of the furlough programme remain to be seen. The Danish economy did not witness a significant increase in the unemployment rate when the furlough programme was temporarily paused by the end of August 2020, suggesting that many of these valuable matches remained operational afterwards and ultimately contributed to a faster recovery of the Danish economy.

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