

Görtz, Christoph; McGowan, Danny; Yeromonahos, Mallory

Working Paper

Furlough and Household Financial Distress during the Covid-19 Pandemic

CESifo Working Paper, No. 9285

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Görtz, Christoph; McGowan, Danny; Yeromonahos, Mallory (2021) : Furlough and Household Financial Distress during the Covid-19 Pandemic, CESifo Working Paper, No. 9285, Center for Economic Studies and ifo Institute (CESifo), Munich

This Version is available at:

<https://hdl.handle.net/10419/245466>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Furlough and Household Financial Distress during the Covid-19 Pandemic

Christoph Görtz, Danny McGowan, Mallory Yeromonahos

Impressum:

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de

Editor: Clemens Fuest

<https://www.cesifo.org/en/wp>

An electronic version of the paper may be downloaded

- from the SSRN website: www.SSRN.com
- from the RePEc website: www.RePEc.org
- from the CESifo website: <https://www.cesifo.org/en/wp>

Furlough and Household Financial Distress during the Covid-19 Pandemic

Abstract

We study how furlough affects household financial distress during the COVID-19 pandemic. Furlough increases the probability of late housing and bill payments by 30% and 9%, respectively. The effects exist for individuals who rent their home, but not mortgagees who can mitigate financial distress by reducing expenditure during furlough by deferring mortgage payments through the Mortgage Holiday Scheme. Furloughed individuals significantly reduce expenditure and spend their savings to offset furlough-induced income reductions. This creates wealth inequality but lowers the probability a furloughed worker experiences financial distress after returning to work. Estimates show an 80% government contribution to furloughed workers' wages minimizes the incidence of financial distress at the lowest cost to taxpayers.

JEL-Codes: D140, D310, E240, G510, H240.

Keywords: furlough, short-time work, Coronavirus job retention scheme, Covid-19 pandemic, financial distress, automatic stabilizers, inequality.

Christoph Görtz
Department of Economics
University of Birmingham / United Kingdom
c.g.gortz@bham.ac.uk

Danny McGowan
Department of Economics
University of Birmingham / United Kingdom
d.mcgowan@bham.ac.uk

Mallory Yeromonahos
University of Westminster / United Kingdom
m.yeromonahos@westminster.ac.uk

August 2021

We thank David Dickinson, Hisham Farag, Aditya Goenka, Enrico Onali, Arisyi Raz, Anthony Savagar, Chrysovalantis Vasilakis, and Peter Zorn and participants at the Economic Response to Covid-19 Workshop for helpful comments and suggestions.

1 Introduction

Governments across the world have introduced Short-Time-Work (furlough) schemes to mitigate the economic damage of COVID-19. The policy attempts to safeguard jobs and incomes by allowing employers that are adversely affected by the pandemic to place workers on temporary leave rather than make them redundant. During a furlough spell, the government pays part of a worker's wages up to a maximum amount, and while in some countries employers have discretion to pay the remaining salary, many choose not to. Although furlough schemes have been effective in preventing mass unemployment, the reduction in income during a furlough spell can imply substantial financial difficulties for many households. At the same time, furlough schemes place heavy burdens on public finances. It is therefore crucial that they are effective in preventing widespread household default while remaining financially sustainable.

This paper is the first to establish whether a furlough scheme is effective in preventing household financial distress during the COVID-19 pandemic. We evaluate this relationship using novel data from the United Kingdom (UK). A benefit of the UK context is the availability of the established Understanding Society database that provides eight waves of individual-level microdata between 1 April 2020 and 30 April 2021.¹ The survey's complex survey design provides a representative sample of the UK adult population and its eight waves cover almost the entire time during which employees could be newly registered as furloughed workers through the Coronavirus Job Retention Scheme (between March 20, 2020, and June 10, 2021). The UK government pays 80% of furloughed workers' gross monthly wages up to a limit of £2,500 per month via the Coronavirus Job Retention Scheme (CJRS).² Most employers make no contribution to their employees' wages while on furlough, such that

¹The Understanding Society database is a household survey carried out by the Institute for Social and Economic Research. The database began collecting individual-level information in 1991 when it was called the British Household Panel Survey. Households are surveyed at annual frequency. We utilize a special high frequency COVID-19 survey of the Understanding Society database.

²From 10 June the furlough scheme is effectively closed for employees who had not been previously furloughed. Between March 2020 and June 30 2021, employers could furlough employees at will with no obligation to contribute to their wages. From July 1, 2021, the government gradually reduces their contributions, with the employer having to cover the remaining part, until the scheme is due to end in September 2021. For more details on the scheme see Section 2.

the average individual experiences a furloughed-induced income contraction of 17%.

We find that being furloughed substantially raises an individual’s probability of being in financial distress. To measure financial distress, we use indicators for whether an individual is late on housing or bill payments. While furloughed, an individual is 30% more likely to be late on housing payments and 9% more likely to be late on bill payments, relative to a non-furloughed individual. Despite these large relative effects, furlough has a modest effect on financial distress for the UK workforce. Furlough increases the aggregate incidence of financial distress by approximately 2.3 percentage points.³ In this sense, the design of the Coronavirus Job Retention Scheme (CJRS) has been successful in mitigating a strong rise in the number of households experiencing financial hardship.

Our estimates also provide insights into how financial distress would evolve if the government raised or lowered its contribution to furloughed workers’ wages. We find a highly non-linear relationship between the probability of financial distress and the furlough-induced decline in a worker’s wage. The probability of financial distress is essentially the same (3.5%) for furlough-induced income contractions of 20% or less. In contrast, we estimate that above this point, the probability of financial distress increases exponentially. At a 40% income reduction, which is similar to the government contribution under the Short-Term-Work scheme in Germany, the probability of financial distress is 200% higher relative to the incidence among non-furloughed individuals. The patterns in the data are consistent with evidence that shows individuals mostly default on their financial obligations when they suffer extremely large income reductions (Gerardi et al., 2017).

Since on average individual experiences a furlough-induced income reduction of 17%, increasing the UK governments’ payments under the Coronavirus Job Retention Scheme would therefore do little, on average, to limit financial hardship during furlough. A reduction in government’s furlough compensation payments would however have substantially increased individuals’ probability of experiencing financial distress. A government contribution of 80% of monthly wages therefore stabilizes household income while simultaneously minimizing

³Approximately 18.2% of furloughed workers are late on either housing or bill payments compared to 15.9% of non-furloughed individuals.

the incidence of financial distress and the burden of the scheme on public finances. This is important since the CJRS is a temporary complement to the existing set of automatic stabilizers that, to date, has cost £67.4 billion, equivalent to 7% of annual government expenditure.

Importantly, furlough has differential effects on financial distress according to whether an individual rents their home or is a mortgagee. Housing costs are typically a household's largest single expense item. Whereas furlough increases the probability that a renter experiences financial distress, it has no significant effects among mortgagees. This is likely because during furlough mortgagees can reduce expenditure and free up funds to remain current on bills by deferring mortgage payments through the Mortgage Holiday Scheme.

Further tests illustrate that households attempt to relax the tighter financial constraints of furlough by cutting expenditure. While furloughed, an individual is 20 percentage points more likely to cut spending relative to pre-pandemic levels than a person that has not been furloughed. This effect persists even after returning to work. Specifically, an individual that has previously been on the scheme is 7 percentage points more likely to have cut spending in comparison to pre-pandemic levels. Furlough thus leads to lasting changes in consumption patterns. This is an important finding because 24% of the workforce are furloughed at least once.

Similarly, furloughed workers draw down savings to stabilize their finances and mitigate furlough-induced income reductions. While on furlough, individuals are 7 percentage points more likely to cut savings in comparison to pre-pandemic levels and they do so even after having returned to work, albeit to a lesser extent (2 percentage points). Consistent with the documented adjustments in consumption and spending, we find that after returning to work, previously furloughed individuals are significantly less likely to experience financial distress compared to non-furloughed individuals.

We find evidence that furlough provokes inequality. Furlough increases the probability of being late on housing (bill) payments by 3.5 (4.9) percentage points for individuals in the lower half of the income distribution. In contrast, furlough has no significant effects on financial distress among individuals who earn above average income. We obtain similar

inferences depending on educational background. Furlough leads to a significantly higher probability of financial distress among those without a university degree, whereas degree holders avoid financial distress while furloughed. We also find that, regardless of an individual's pre-pandemic income, they significantly reduce spending and spend savings when furloughed. However, these effects are stronger for individuals earning below median incomes and without a university degree. Despite the positive effects of the CJRS in preventing mass unemployment, it has asymmetric effects as the adverse effects of the policy are concentrated among individuals with lower income and educational attainment.

Robustness tests show that the increase in financial distress during furlough is unlikely to be attributable to confounding factors. Placebo tests rule out that the effects are due to secular trends in financial distress during the pandemic. Specifically, financial distress does not increase in the months preceding a furlough spell, but rather only after a worker is furloughed. We further show that any effects from serial correlation of financial distress through time, indebtedness, and households' savings, do not confound the effects we report on furlough. Sensitivity checks indicate that the increase in financial distress remains after we account for agents' consumption and savings behavior, and when we account for the direct effects of the COVID-19 pandemic through clinical vulnerability, household composition, and local lockdowns on financial distress.

Our paper contributes to a rapidly evolving body of literature on the economic response to the COVID-19 pandemic. One line of research documents the evolution of consumption in response to COVID-19. Baker et al. (2020) find that during March 2020, as COVID-19 infections increased, Americans reduced consumption by between 25% and 30%. Finck and Tillmann (2021) report that household spending contracts as the number of pandemic deaths increases and that low-income households exhibit significantly larger drops in consumption than high-income households which exacerbates consumption inequality. Coibion et al. (2020) study the causal effects of local lockdowns on consumer spending in the US. Chronopoulos et al. (2020) examine the change in household spending in the UK using high-frequency data, demonstrating that discretionary consumption fell while groceries and stockpiles became prevalent. Coibion et al. (2021) evaluate how macroeconomic uncertainty

during the COVID-19 pandemic affects households' spending decisions on different type of items. Our results complement these findings by illustrating the consumption and savings effects of furlough schemes.

A parallel stream of research uses SIR models to understand how epidemics influence the aggregate economy.⁴ These models show strong feedback effects between the development of COVID-19 and economic decision making. In particular, agents endogenously respond to viral spread by reducing consumption and hours worked to a much larger degree than implied by purely epidemiological models that abstract from economic feedback mechanisms (Eichenbaum et al., 2020a). In a New-Keynesian model with input-output linkages, Lenoël and Young (2021) evaluate the effects of the furlough scheme on unemployment. While the macroeconomic effects of the COVID-19 crisis are well documented, evidence on its impact on household finances is much more limited. A unique contribution of our paper is to highlight the microeconomic implications of the strong reduction in economic activity during the pandemic. We emphasize that furlough has long lasting effects on consumption and savings behavior, even after workers return to their job. This result provides microeconomic support for the mechanisms present in macroeconomic SIR models, and emphasizes the importance for SIR models to account for the enduring effect of furlough on agents' behavior.

Even before the pandemic, some countries have allowed firms experiencing economic difficulties to use Short-Term-Work (STW) schemes to temporarily reduce hours worked with the government providing income support to affected workers. Yet, the literature on the effects and effectiveness on STW schemes is limited. Kopp and Siegenthaler (2021) show that the Swiss STW scheme increases establishment survival rates and lowers unemployment in the aftermath of the Great Recession by preventing rather than postponing worker dismissals. Balleer et al. (2016) show that the German STW program acted as an effective job saver during the 2007 financial crisis. Christl et al. (2021) find that in Germany the STW program, in conjunction with one-off monetary payments to workers with children, almost entirely offset the adverse labor market effects of the COVID-19 pandemic. Adams-Prassl et al.

⁴See, for example, Goenka and Liu (2012), Goenka et al. (2014), Eichenbaum et al. (2020b) and Bodenstein et al. (2020). The acronym SIR denotes susceptible, infectious, or recovered.

(2020b) provide real time survey evidence on the labor market impacts of COVID-19 during March and April 2020. Non-salaried workers and those who are able to do fewer job tasks from home are more likely to be made unemployed. Using microsimulations, Brewer and Tasseva (2021) find that the CJRS wage subsidies provide the main insurance mechanism during April and May 2020. Our paper complements this literature by providing novel insights into how STW schemes influence financial distress and spending patterns among households. Our paper is the first to evaluate the CJRS’s design and its overall effectiveness in preventing household financial distress over the entire time of it being in place during the COVID-19 crisis.

The paper proceeds as follows. In Section 2 we provide background details about the furlough scheme in the UK. Section 3 describes the data set and econometric methods. We report results in Section 4 and robustness checks in Section 5. Section 6 draws conclusions.

2 Institutional Background

On March 23, 2020, the UK government implemented a national lockdown to curb the spread of COVID-19. These measures imposed a stay-at-home order banning all non-essential travel and contact with people outside one’s home and closed all non-essential businesses, almost all schools, and places where people may congregate.⁵ The police were given authority to enforce these measures.

Facing a sharp increase in unemployment as employers shut down their operations, the government announced the Coronavirus Job Retention Scheme (furlough) on March 20, 2020. The furlough scheme allows all UK employers with employees on a PAYE scheme to designate some or all employees as ‘furloughed workers’.⁶ Under the scheme, employers may place some or all workers on temporary leave while keeping them on the payroll without working. The government pays 80% of furloughed workers’ wages up to a maximum of £2,500 per month, as well as national insurance and certain pension contributions. Employers have discretion

⁵A small number of schools remained open for the children of key workers.

⁶PAYE is HM Revenue and Customs’ system to collect income tax and national insurance from payroll employment. The system is used by all employers.

about whether to pay the remaining 20%, although most chose not to. The government placed no limit on the amount of funding available through the scheme and pledged to support as many jobs as necessary.⁷

While the furlough scheme was initially due to run until June 30, 2020, the government made clear from the start it could be extended should the pandemic endure. After several extensions, from June 10, 2021, the furlough scheme was effectively closed to employees who had not been previously furloughed.⁸

The government reduced its contribution to 70%, and mandated employers contribute at least 10%, of a worker's monthly wage from July 1, 2021. From August 1, 2021, the government further reduced its contribution to 60%, with employers paying at least 20%, of furloughed workers' monthly wages.⁹ Since July 1, 2021, employers must pay the National Insurance and pension contributions that were previously paid by the government. The furlough scheme is due to end in September, 2021.

Our sample period spans April, 2020, to April, 2021. It therefore covers almost the entire time during which employees could be newly registered to participate in the furlough scheme, but it does not include the period of reduced government contributions.

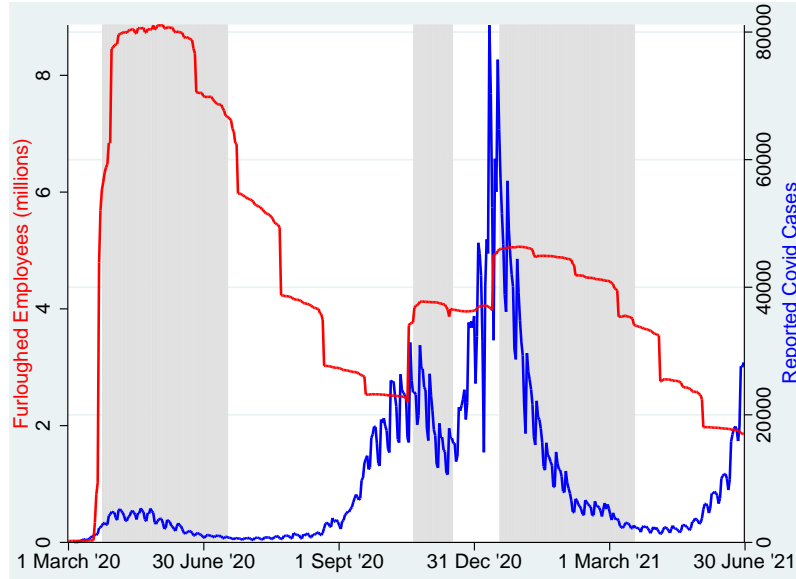
Figure 1 illustrates the daily incidence of furlough between 1 March 2020 and 30 April 2021. The three national lockdowns are indicated by the grey shaded areas. The number of furloughed workers peaks shortly after the introduction of the furlough scheme, coinciding with first national lockdown on 23 March 2020. Following the removal of lockdown restrictions in June, 2020, the number of furloughed workers falls from approximately 8.6 million to 2.3 million before increasing again during subsequent national lockdowns. While the number of furloughed workers steadily falls after the end of the third national lockdown, almost 2

⁷See the Chancellor of the Exchequer's speech announcing the furlough scheme <https://www.gov.uk/government/speeches/the-chancellor-rishi-sunak-provides-an-updated-statement-on-coronavirus>.

⁸The scheme was extended until the end of October 2020, March 2021, April 2021 and September 2021. A different Job Support Scheme was due to begin on 1 November 2020, but was postponed indefinitely in favor of the existing furlough scheme.

⁹Specifically, from July 1, 2021, until July 31, 2021, the government pays 70% of gross monthly wages up to a maximum of £2187.50. During this period employers must pay 10% of gross monthly wages up to a maximum of £312.50. From August 1, 2021, the government pays 60% of monthly wages up to £1,875 with employers paying 20% of wages up to a maximum of £625. For further details see <https://www.gov.uk/government/publications/changes-to-the-coronavirus-job-retention-scheme/changes-to-the-coronavirus-job-retention-scheme>.

Figure 1: Incidence of Furlough during the Pandemic



Notes: This figure plots the daily number of workers on furlough and the daily number of people testing positive for COVID-19 between March 1, 2020, and June 30, 2021. The gray bars indicate periods when national lockdown restrictions are in force. The data source for the number of furloughed employees is HM Revenue and Customs Coronavirus Job Retention Scheme statistics. The number of daily COVID-19 cases are taken from the government's coronavirus in the UK database.

million individuals remain on furlough on June 30, 2021. By May 14, 2021, total government spending on furlough was £64 billion, equivalent to 7% of annual government spending.¹⁰

3 Data and Methods

We retrieve individual-level panel data from the Understanding Society COVID-19 Survey. Approximately 16,000 respondents to the established Understanding Society Survey are asked to complete web-based questionnaires at regular intervals during the pandemic.¹¹ The Survey uses a complex survey design and participants are chosen to provide a representative sample of the UK in terms of regions, age, education, and social background. A participant

¹⁰Further information on uptake and usage of the Coronavirus Job Retention Scheme can be found e.g. in Tetlow et al. (2020b), Adams-Prassl et al. (2020a), Gardiner and Slaughter (2020) and Tomlinson (2021).

¹¹The Understanding Society Survey is also known as the UK Household Longitudinal Study. Understanding Society started in 2009 and builds on the British Household Panel Survey which ran from 1991 to 2009. In addition to the special COVID-19 survey, each year Understanding Society interviews approximately 40,000 households on issues about family life, income, wealth, expenditure, education, employment, health and wellbeing, and civic participation.

answers the survey on behalf of the household.¹² Participants are sent emails and/or SMS text invites asking them to complete an online survey.¹³

During the COVID-19 pandemic, respondents are surveyed at eight points in time. The eight survey waves take place in April, May, June, July to August, September to October, and November to December, 2020, and in January to February, and March to April, 2021. For each respondent, the data provides information on a range of issues including demographic, health, financial, and socioeconomic characteristics as well as pandemic-specific topics such as coronavirus illness, and furlough status. Importantly, the Survey contains weights for each individual that allow us to construct a sample that is representative of the UK adult population.

¹²For further details of the Understanding Society participants see <https://www.understandingsociety.ac.uk/about/who-are-our-participants>.

¹³The email/SMS text contains a link to a webpage where a participant completes the survey. Reminders are sent to participants who have yet to complete the survey that notifies them of the response deadline. Participants choose the method of communication through which Understanding Society may contact them. For further information on participant communication materials, see <https://www.understandingsociety.ac.uk/sites/default/files/downloads/documentation/covid-19/fieldwork-documents/covid-19-communication-materials.pdf>.

Table 1: Variable Descriptions

Variable	Description
Late on housing	A dummy variable equal to 1 if an individual is late on housing payments, 0 otherwise
Late on bills	A dummy variable equal to 1 if an individual is late on bill payments, 0 otherwise
Furlough	A dummy variable equal to 1 if an individual is furloughed, 0 otherwise
Furlough ended	A dummy variable equal to 1 in the waves after an individual who was furloughed returns to work, 0 otherwise
Age	Age, in years
Pay	Net monthly pay (in £2020)
No university degree	A dummy variable equal to 1 if an individual's highest educational qualification is below a bachelor's degree (or equivalent), 0 otherwise
Managerial job	A dummy variable equal to 1 if an individual works in a managerial role, 0 if they work in an intermediate or routine role
Minority	A dummy variable equal to 1 if an individual is from a minority ethnic background, 0 otherwise
Male	A dummy variable equal to 1 if an individual is male, 0 otherwise
Cut spending	A dummy variable equal to 1 if an individual reports cutting spending relative to pre-pandemic levels, 0 otherwise
Spent savings	A dummy variable equal to 1 if an individual reports spending savings relative to pre-pandemic levels, 0 otherwise
Late on housing ₂₀₁₉	A dummy variable equal to 1 if an individual was late on housing payments during 2019, 0 otherwise
Late on housing ₂₀₁₈	A dummy variable equal to 1 if an individual was late on housing payments during 2018, 0 otherwise
Late on housing ₂₀₁₇	A dummy variable equal to 1 if an individual was late on housing payments during 2017, 0 otherwise
Late on bills ₂₀₁₉	A dummy variable equal to 1 if an individual was late on bill payments during 2019, 0 otherwise
Late on bills ₂₀₁₈	A dummy variable equal to 1 if an individual was late on bill payments during 2018, 0 otherwise
Late on bills ₂₀₁₇	A dummy variable equal to 1 if an individual was late on bill payments during 2017, 0 otherwise
Non-mortgage debt	Total pre-COVID-19 debt balance (excluding mortgage debt), in natural logarithms
Monthly savings	Average monthly savings during 2019, in natural logarithms
Grocery bill	Average weekly grocery bill 2019, in natural logarithms
NHS shielding	A dummy variable equal to 1 if an individual has received a letter from the National Health Service telling them to shield during the pandemic, 0 otherwise
Clinically vulnerable	A dummy variable equal to 1 if an individual receives notification from the National Health Service they are clinically vulnerable to COVID-19, 0 otherwise
Positive test	A dummy variable equal to 1 if an individual tests positive for COVID-19, 0 otherwise
Children	The number of children living in the house
Adults	The number of adults living in the house
COVID-19 infections	The mean number of COVID-19 positive tests in the region during each wave

Notes: This table provides a description of each variable in the data set and its source. The Understanding Society COVID-19 Survey is the source of all variables except 1) the COVID-19 infections variable that is provided by the UK government's Coronavirus in the UK database, and 2) the Late on housing₂₀₁₉, Late on housing₂₀₁₈, Late on housing₂₀₁₇, Late on bills₂₀₁₉, Late on bills₂₀₁₈, and Late on bills₂₀₁₇ that are taken from the 2017 to 2019 vintages of the UK Household Longitudinal Survey Study (Understanding Society).

Only individuals in employment may be furloughed. To ensure a homogeneous unit of observation, we exclude observations of retirees, and people who are self-employed or unemployed.¹⁴ These screens leave only employees in the sample.

Financial distress is the outcome we model in the econometric tests. Owing to its broad nature, we capture financial distress using two measures. First, a dummy variable that equals 1 if an individual is late on housing (either rent or mortgage) payments, 0 otherwise. Second, a dummy variable that equals 1 if an individual is late on bill payments, 0 otherwise. Housing payments tend to be households' largest single monthly expense item while bills constitute a sizeable share of the average household's expenditure. Falling behind on either housing or bill payments indicates financial distress as a household cannot fulfill its most important financial obligations (Kuhnen and Melzer, 2018; McGowan and Nguyen, 2021).

Furlough status is the key independent variable in the regression equations. We observe whether an individual is on furlough during each wave of the Understanding Society COVID-19 Survey. We thus generate a dummy variable that equals 1 if an individual who is in employment reports they have been furloughed, 0 otherwise.

The data set contains several additional variables that we use as controls in the regressions. Information is available on an individual's age, net monthly pay (i.e. take home pay after paying personal income tax and national insurance), whether their top educational qualification is at least a bachelor's degree, whether they work in a managerial, intermediate, or routine job, minority ethnicity status, gender, the number of adults and children living in the household, the pre-COVID-19 amount of non-mortgage debt, and the region in which they live.¹⁵ The data also reports whether an individual has cut spending or spent their savings relative to pre-pandemic levels. For each individual, the data show whether they rent or own their home using a mortgage and if a mortgagee is deferring mortgage payments using the Mortgage Holiday Scheme.

¹⁴Self-employed individuals are not eligible for furlough under the Coronavirus Job Retention Scheme. Instead, they may apply for support through the Self-Employment Income Support Scheme (SEISS). The furlough and SEISS schemes differ in their design. We thus exclude self-employed individuals from the sample.

¹⁵There are 12 regions in the data set: East England, London, North East England, North West England, Northern Ireland, the East Midlands, the West Midlands, Scotland, South East England, South West England, and Wales.

To capture the progress of the COVID-19 pandemic, we rely on data from two sources. The Understanding Society COVID-19 Survey details whether a person has received a letter from the National Health Service (NHS) advising them to shield during the pandemic by remaining at home and avoiding social interaction where possible, whether they are clinically vulnerable to COVID-19, and if they have tested positive for COVID-19. To measure the COVID-19 infection rate in a region during each wave, we retrieve data from the UK government’s coronavirus in the UK database. Table 1 provides detailed definitions of the variables we consider in our data set.

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. dev	p1	p99
Late on housing	35,566	0.0381	0.1913	0	1
Late on bills	35,566	0.1622	0.3686	0	1
Furlough	35,566	0.1341	0.3408	0	1
Furlough ended	35,566	0.1372	0.3441	0	1
Age	35,566	42.9904	13.1556	19	68
Pay	35,566	1.6096	1.4192	0.4040	6.2500
No university degree	35,566	0.5063	0.5000	0	1
Managerial job	35,566	0.1558	0.3627	0	1
Minority	35,566	0.0692	0.2538	0	1
Male	35,566	0.4704	0.4991	0	1
Cut spending	35,566	0.1828	0.3865	0	1
Spent savings	35,566	0.0642	0.2451	0	1
Late on housing ₂₀₁₉	35,566	0.0231	0.1503	0	1
Late on housing ₂₀₁₈	35,566	0.0570	0.2319	0	1
Late on housing ₂₀₁₇	35,566	0.0718	0.2582	0	1
Late on bills ₂₀₁₉	35,566	0.0539	0.2258	0	1
Late on bills ₂₀₁₈	35,566	0.1133	0.3170	0	1
Late on bills ₂₀₁₇	35,566	0.1153	0.3194	0	1
Non-mortgage debt (ln)	35,566	0.1465	1.2276	0	9.9523
Monthly savings (ln)	35,566	1.1166	2.1983	0	6.9088
Grocery bill (ln)	35,566	5.5666	0.6283	3.6889	6.6846
NHS shielding	35,566	0.0308	0.1729	0	1
Clinically vulnerable	35,566	0.2731	0.4455	0	1
Positive test	35,566	0.0088	0.0934	0	1
Children	35,566	0.6276	0.9003	0	5
Adults	35,566	1.2941	0.9289	0	5

Notes: This table reports descriptive statistics for the variables in the data set. Monthly pay is reported in thousands of pounds (in £2020). ‘ln’ indicates a variable is measured in natural logarithms. p1 indicates the first percentile of the distribution. p99 indicates the ninety ninth percentile of the distribution. Table 1 provides a description of each variable.

Table 2 provides summary statistics for the variables in the data set. Approximately 2.5%

of respondents report being late on housing payments and 13.2% are late on bill payments. Furlough is common during the pandemic. Within the sample, 10.1% of individual-wave observations are of a person on furlough. However, 23.8% of employees experience furlough at least once during the sample period.

To obtain insights into the characteristics of furloughed workers over the COVID-19 pandemic, Table 3 provides a broad overview of the average furloughed individual during each sample wave. Between April and October, 2020, the average age of furloughed workers is approximately 43 years. However, as the pandemic progresses young workers constitute a larger share of those on furlough. The average age of furloughed workers is 40.61 years in November-December, 2020, and falls to 40.06 years in March-April, 2021.

We observe similar dynamics in the evolution of the average furloughed worker's net monthly pay during the pandemic. The average furloughed worker's net monthly pay is £1,385 in April, 2020. Through time there is a tendency for lower-income individuals to account for a greater share of furloughed workers, such that by March 2021 the value is £1,220. In contrast, Table 3 shows the educational attainment of furloughed workers remains fairly constant during the sample period: between 57% and 69% have a qualification below a university degree. Workers in managerial jobs account for less than 10% of furloughed workers during all waves. This is consistent with furlough being most prevalent in sectors with a large number of routine and intermediate workers such as retail, hospitality and manufacturing. Individuals from an ethnic minority background account for between 4.5% and 8.21% of workers on furlough. During most of the sample there is a fairly even split in the gender of furloughed workers.

Table 3: Characteristics of Furloughed Workers during the Pandemic

Wave	April	May	June	2020			2021		
				July-August	Sept-Oct	Nov-Dec	Jan-Feb	March-April	
Age (in years)	42.91	42.64	42.86	42.93	43.07	40.61	40.37	40.06	
Pay (in £2020)	1,385	1,379	1,340	1,301	1,363	1,227	1,253	1,220	
No university degree (in %)	65.48	63.92	62.20	62.01	57.34	66.63	64.62	69.16	
Managerial job (in %)	6.89	9.13	9.12	7.10	9.78	5.90	5.55	3.63	
Minority (in %)	4.58	8.21	7.87	7.23	7.48	6.18	4.50	4.68	
Male (in %)	50.76	47.96	46.12	45.53	50.74	43.69	48.39	50.55	

Notes: This table reports the mean of each variable for furloughed workers during each sample wave. Variable descriptions are provided in Table 1.

3.1 Empirical Methodology

To establish the relationship between furlough and financial distress, we estimate

$$y_{irt} = \alpha + \beta F_{irt} + \gamma X_{irt} + \delta_i + \delta_r + \delta_t + \varepsilon_{irt}, \quad (1)$$

where y_{irt} is a dependent variable measuring financial distress (either the late housing or late bill payments dummy variables) for individual i in region r during wave t ; F_{irt} is a dummy variable if the individual is on furlough, 0 otherwise; X_{irt} is a vector of control variables; δ_i , δ_r and δ_t denote individual, region and year fixed effects, respectively; ε_{irt} is the error term.¹⁶

To establish associations between furlough status and financial distress, our baseline approach is to estimate equation (1) using a probit model. The decision to furlough a worker is taken by their employer to optimize business operations and survival during the COVID-19 pandemic. Simultaneity bias is therefore unlikely to exist in equation (1). However, furlough status may correlate with difficult-to-observe determinants of financial distress. We thus also estimate equation (1) using propensity score matching with replacement, a 0.05 caliper, and four nearest neighbors.

Similar to other major survey programs, the Understanding Society COVID-19 Survey follows a multistage/complex design survey. The sample incorporates special design features such as stratification, clustering and differential selection probabilities to ensure the sample is representative of the UK population. These features must be taken into account when estimating the standard errors of regression estimators, as well as the sampling errors of descriptive statistics.

In standard statistical analysis, the assumptions of random sampling and independence of observations imply that estimators are linear functions of the observed data, making the calculation of estimators' standard deviations straightforward. Neither assumption holds in the Understanding Society COVID-19 Survey because of its complex survey design (e.g.

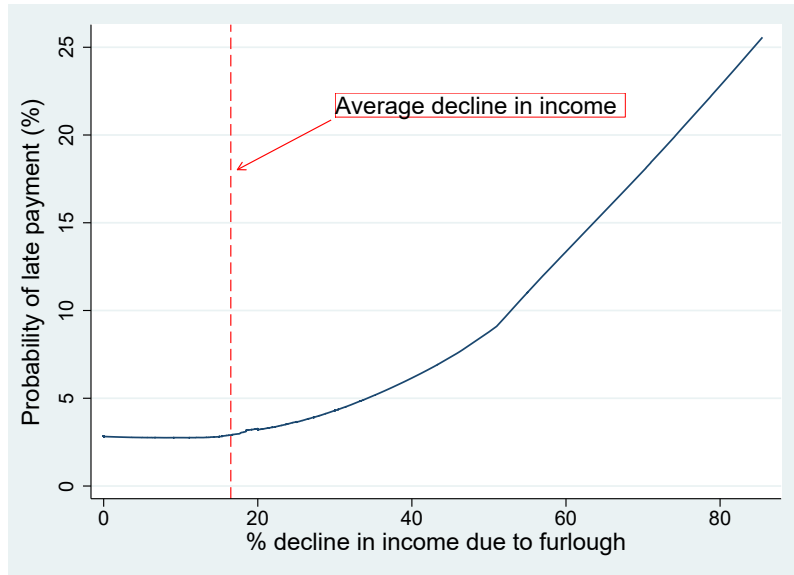
¹⁶Owing to the Understanding Society COVID-19 Survey's complex survey design, we are not able to include individual fixed effects when estimating equation (1). Including individual fixed effects prevents estimation of the Taylor Series linearized estimation of the estimators.

clustering and stratification). Estimators are therefore not linear functions of the observed data. A naive calculation of their variances would underestimate their standard errors and result in too narrow confidence intervals. For this reason, we follow Rust (1985) and Wolter (1985) and use Taylor Series linearization of the estimators and calculate the corresponding approximation of their variances.

4 Results

Table 4 presents estimates of the link between furlough and financial distress. Column 1 of the table reports estimates relating furlough to the probability that an individual is late on housing payments. The furlough coefficient is statistically significant at the 1% level. Economically, it implies that furlough increases the probability of late housing payments by 2.13 percentage points. While the effect size is small in absolute terms, it implies a 85% increase in the probability of financial distress relative to individuals who are not furloughed.¹⁷ Overall, furlough increases the aggregate incidence of housing-related financial distress by 1.3 percentage points.

Figure 2: Financial Distress and Furlough-Induced Income Falls



Among the control variables, we find significant associations between being late on hous-

¹⁷The incidence of late housing payments among non-furloughed workers is 2.50%. Furlough thus raises the probability of late housing payments by $(2.13/2.50) \times 100\% = 85.20\%$.

Table 4: Financial Distress during Furlough

Dependent variable	1	2	3	4	5	6
	Late on housing			Late on bills		
Sample	All	Renters	Mortgagees	All	Renters	Mortgagees
Furlough	0.0213*** (2.58)	0.0294*** (2.62)	0.0116 (0.89)	0.0417** (2.53)	0.0510** (2.18)	0.0195 (0.99)
Age	-0.0004 (-1.38)	-0.0007 (-1.53)	-0.0000 (-0.13)	-0.0006 (-1.31)	-0.0011** (-1.98)	0.0001 (0.36)
Pay	-0.0045** (-2.04)	-0.0058*** (-2.82)	-0.0031 (-1.10)	-0.0022 (-0.74)	0.0021 (0.80)	-0.0035 (-1.01)
No university degree	0.0192** (2.33)	0.0261** (2.50)	0.0076 (0.62)	0.0143 (1.15)	0.0116 (0.86)	0.0059 (0.34)
Managerial job	-0.0124 (-1.31)	-0.0187 (-0.90)	-0.0046 (-0.48)	-0.0337*** (-3.73)	-0.0679*** (-4.57)	-0.0095 (-0.85)
Minority	0.0294*** (2.94)	0.0350* (1.80)	0.0194** (2.25)	0.0522*** (3.35)	0.0885*** (3.50)	0.0099 (1.24)
Male	0.0098 (1.28)	0.0056 (0.67)	0.0128 (0.99)	-0.0050 (-0.39)	-0.0211 (-1.54)	0.0117 (0.68)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,566	15,858	17,722	35,566	15,858	17,722

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

ing payments and monthly pay, education, and minority ethnicity status. We estimate that increasing monthly pay by £1,000 reduces the probability of late housing payments by 0.45 percentage points. Individuals whose top educational qualification is below a university degree are 1.92 percentage points more likely to be behind on housing payments whereas the probability of financial distress is 2.94 percentage points higher for people from minority ethnicity backgrounds relative to white individuals. The age, managerial job, and male variables' coefficient estimates are statistically insignificant.

An explanation for why furlough correlates with a higher probability of financial distress is that the furlough-induced cut to workers' income prevents them from meeting their financial obligations. We therefore study how the probability of late housing or bill payments relates to the furlough-induced decline in a person's wage. Figure 2 illustrates the predicted probability of financial distress across the distribution of furlough-induced decline in income. Where an employer decides not to contribute to a furloughed worker's wages during furlough, they experience a 20% fall in monthly income up to a maximum of £2,500. Within the sample, the average decline in monthly net pay is 17%. Online Appendix D shows the distribution

of furloughed workers’ income reduction due to the furlough scheme.

Interestingly, the predicted probabilities curve in Figure 2 is highly non-linear. For income declines between 0% and 20%, the curve is essentially flat. In this region, the probability of financial distress is invariant to the furlough-induced decline in income. An implication of this result is that increasing the extent of government support from 80% to 90% of monthly wages would have little effect on reducing the incidence of financial distress.

In contrast, the probability of late housing payments increases rapidly for furlough-induced income declines above 20%. For example, the probability of being late on housing payments is 6.5% for a 40% decline in income, but almost 25% for an 80% income decline. Most individuals who experience such large declines in income tend to be those with high pre-pandemic earnings whose income falls to £2,500 per month.

The evidence suggests that the furlough scheme is well designed in the sense that an increase in government’s furlough payments beyond 80% of income and the cap of £2,500 — which places a heavier burden on public finances — would not have lowered the probability of late payments. On the other hand, while a reduction in the government’s contribution to furloughed workers’ wages would have reduced strain on the government’s budget, it would have implied a substantial increase of the number of households in financial distress that may exacerbate other social and economic costs.

This is an important insight. Policymakers in several developed countries have adopted furlough schemes to mitigate the economic damage of COVID-19. However, these policies differ substantially in the size and rules for government contributions, in the flexibility for workers to be furloughed, and employers’ eligibility to utilize the scheme. While extrapolating the findings across countries is difficult due to institutional differences, our results suggest that a government contribution as designed under the UK Coronavirus Job Retention Scheme minimizes financial distress and the burden on public finances.¹⁸

¹⁸The 80% government wage contributions in the UK are relatively high in comparison to other countries. In Germany, for example, where a successful STW scheme was effective in offsetting the effects of the financial crisis, the government wage contribution amounts to 67% (60%) for workers with (without) children. Employers must also furlough at least 10% of the workforce to be eligible. We provide an overview about STW schemes in selected countries in Appendix B. An account of the different effects of STW schemes in five countries during the first three months of the pandemic is provided in e.g. Tetlow et al. (2020a).

Next, we ask whether furlough has differential effects on financial distress according to whether a person rents or owns their home through a mortgage. The estimates in columns 2 and 3 of Table 4 show that furlough is only associated with a significantly higher probability of late housing payments for renters. Renters who are furloughed are 2.94 percentage points more likely to be behind on housing payments relative to non-furloughed renters. However, furloughed mortgagees are not significantly more likely to be behind on housing payments compared to non-furloughed mortgagees. One reason for this result could be that mortgagees make use of the Mortgage Holiday Scheme. This policy introduced by the government and lenders in response to the pandemic that aims to grant mortgagees time to stabilize their finances by deferring housing payments for up to six month.¹⁹

To ensure the findings are not specific to measuring financial distress using late housing payments, as a validation check we investigate how furlough affects the probability that an individual is behind on bill payments. In the remainder of Table 4, we find a similar pattern of results to before. Estimates in column 4 show that furlough is associated with a 4.17 percentage point increase in the probability of late bill payments. This is equivalent to a 31% increase relative to non-furloughed workers.²⁰ The coefficient estimate is statistically significant at the 5% level. Furlough thus increases the incidence of bill-related financial distress by 1.1 percentage points.

As before, we continue to find that furlough mainly provokes financial distress among individuals who rent their homes. In column 5 of Table 4 the furlough coefficient estimate implies a statistically significant 5.10 percentage point increase in the probability that a furloughed renter is late on bill payments. In contrast, when the sample contains mortgagees

¹⁹The Mortgage Holiday Scheme allows mortgagees adversely affected by the COVID-19 pandemic to defer mortgage payments until future periods. This does not reduce the outstanding balance of their mortgage. Interest continues to accrue during a mortgage holiday such that the overall cost of the mortgage is higher in future. Mortgagees are allowed to self-certify that they have been affected by the pandemic without providing evidence to either the government or their lender. The Financial Conduct Authority mandates that mortgage holidays do not affect borrowers' credit scores and prohibits deferred payments during a mortgage holiday from appearing as a missed payment on a borrower's credit history. The scheme ended in the first half of 2021 where 31 March 2021 was the last day to select into the scheme and all payment deferrals needed to end by 31 July 2021. Approximately 1.9 million mortgagees took a mortgage holiday during the pandemic.

²⁰13.45% of non-furloughed workers are late on bill payments during the sample period. The furlough coefficient thus implies a $(4.17/13.45) \times 100\% = 31.00\%$ increase in the probability of late bill payments relative to the mean incidence among non-furloughed workers.

in column 6 of the table the furlough coefficient estimate is statistically insignificant.

Some of the individuals in the sample own their home but do not have a mortgage. Online Appendix Table C presents estimates of equation (1) for these owner occupiers. For this group, we find that furlough significantly increases the probability of late bill payments.²¹ This is consistent with furlough reducing owner occupiers' income and their ineligibility to reduce expenditure through the Mortgage Holiday Scheme.

So far, our econometric strategy revolves around probit estimates that provide correlative evidence on the link between furlough and financial distress. To mitigate omitted variable bias and provide plausibly causal evidence, we turn to propensity score matching. To generate propensity scores, we use a probit model to estimate

$$F_{irt} = \alpha + \beta X_{irt} + u_{irt}, \quad (2)$$

where F_{irt} is the furlough dummy variable; X_{irt} is a vector containing age, monthly pay, the dummy variables that capture degree status, managerial job, minority status, and male gender, as well as the number of children and adults in the household, and the average number of daily COVID-19 infections in the region during the month of the survey wave. u_{irt} is the error term.

Online Appendix F reports estimates of equation (2). The key determinants of furlough status are monthly pay, education, and the number of COVID-19 infections in the region. Low-income workers face a higher probability of furlough. A £1,000 increase in monthly pay lowers the probability that an individual is furloughed by 1.26 percentage points. In addition, we estimate that individuals without a university degree face a 3.90 percentage point higher probability of furlough relative to degree holders. Furlough is significantly more likely in regions with higher levels of COVID-19 infection, consistent with viral spread provoking a contraction in economic activity and increases in furloughing. The remaining independent variables' coefficient estimates are statistically insignificant.

Using the estimates of equation (2), we compute propensity scores. We then use a caliper

²¹Owner occupiers have zero housing costs because they have paid off their mortgage.

of 0.05 and match observations of furloughed individuals to their four nearest neighbors within this range, with replacement. To assess the quality of the matching procedure, we compare the characteristics of furloughed and non-furloughed workers in the unmatched and matched samples. Panel A of Table 5 shows significant differences between furloughed and non-furloughed individuals in several dimensions. For example, relative to non-furloughed individuals, those on furlough tend to be younger, paid less, have educational qualifications below a university degree, and are less likely to work in a managerial role. Minorities tend to be under-represented and households contain fewer children and more adults. There are also significant differences in the geographical location of furloughed workers.

While these differences exist in the unmatched sample, they are absent from the matched sample. *t*-tests show there are no statistically significant differences between the characteristics of furloughed and non-furloughed workers, even at the 10% level. Moreover, the bias percentage statistics are less than 5% in every instance. This suggests the matching algorithm achieves balance in the characteristics of furloughed and non-furloughed workers, thereby obviating confounding differences.

Critical to obtaining valid matching estimates is overlap in the range of propensity scores across the treatment and comparison groups. Inferences about the effect of furlough cannot be made for a furloughed individual for whom there is no comparison individual with a similar propensity score. Moreover, the propensity score should have a similar distribution in the two groups. Figure 4.E illustrates the distributions of propensity scores among furloughed and non-furloughed individuals. The overlap in the distribution of the propensity score across the furloughed and non-furloughed groups shows they are balanced and that the common support assumption holds in the data. Together the diagnostic checks suggest that the match quality is high, as it balances the characteristics of the two groups, and achieves common support.

Panel B of Table 5 presents estimates of the average treatment effect on the treated (ATT) for both financial distress measures.²² We find that furlough significantly increases

²²The ATT is appropriate because it calculates the treatment effect for individuals for whom the furlough program is actually intended. In contrast, the population average treatment effect (ATE) provides inferences into what is the expected effect on financial distress if individuals in the population are randomly assigned to

the probability of being late on housing payments by 0.74 percentage points. This equates to a 29.6% increase relative to non-furloughed individuals. Furlough continues to increase the probability that an individual is late on bill payments. The ATT implies a 1.20 percentage point increase in the probability of being behind on bills while furloughed, or an 8.92% increase compared to non-furloughed workers. The estimate is statistically significant at the 10% level.

Overall, the matching results show furlough has economically smaller effects on financial distress when compared to the baseline estimates. However, the effects remain sizable and significant at conventional levels.

furlough. Heckman (1997) highlights this estimate may be irrelevant to policy evaluations because it includes the effect on persons for whom the furlough scheme was never intended. Examples of such individuals in our settings are those who can work remotely or are able to socially distance at work and are thus unlikely to be furloughed.

Table 5: Matching Results

Variable	1	2	3	4	5	6	7	8	9	10
	Unmatched sample					Matched sample				
	Furloughed	Non-furloughed	Diff	t-stat	p-value	Furloughed	Non-furloughed	Bias (%)	t-stat	p-value
Age	45.30	46.49	1.19***	6.39	0.00	46.98	47.38	-3.1	-1.36	0.17
Pay	1.13	1.75	0.62***	29.13	0.00	1.19	1.19	-0.5	-0.27	0.78
Below university degree	0.59	0.41	-0.18***	-24.13	0.00	0.58	0.58	-1.7	-0.75	0.45
Managerial job	0.08	0.18	0.10***	16.51	0.00	0.08	0.08	0.4	0.2	0.84
Minority ethnicity	0.09	0.11	0.02***	4.38	0.00	0.08	0.08	-0.0	-0.01	0.99
Male	0.39	0.40	0.00	0.57	0.57	0.40	0.40	-0.8	-0.37	0.71
Children	0.63	0.68	0.05***	3.62	0.00	0.61	0.62	-0.4	-0.17	0.86
Adults	1.32	1.22	-0.10***	-7.59	0.00	1.25	1.26	-1.2	-0.53	0.60
COVID-19 infections	9.41	9.75	0.33***	14.28	0.00	9.43	9.42	0.1	0.06	0.95
Scotland	0.08	0.08	0.00	0.58	0.56	0.08	0.08	-0.1	-0.05	0.96
N Ireland	0.04	0.04	0.01***	3.07	0.00	0.03	0.03	0.5	0.25	0.80
Wales	0.06	0.06	-0.00	-1.11	0.27	0.06	0.05	0.6	0.27	0.79
North east	0.03	0.04	0.01**	2.23	0.03	0.03	0.03	-0.4	-0.17	0.87
North west	0.08	0.10	0.02***	4.67	0.00	0.08	0.07	0.7	0.32	0.75
Yorkshire	0.09	0.08	-0.01***	-3.17	0.00	0.10	0.10	-0.4	-0.16	0.88
E Midlands	0.09	0.08	-0.01***	-3.19	0.00	.09	0.09	-0.8	-0.33	0.74
W Midlands	0.09	0.08	-0.00	-0.97	0.33	0.09	0.09	-0.1	-0.04	0.97
East	0.12	0.10	-0.01	-3.14	0.00	0.11	0.11	0.3	0.14	0.89
South east	0.14	0.14	0.00	0.15	0.88	0.14	0.15	-1.5	-0.68	0.50
South west	0.10	0.09	-0.00	-0.89	0.37	0.10	0.10	-0.2	-0.08	0.93
Panel B: Matching estimates										
Dependent variable	ATT		Std. error		z-stat		Caliper			
Late housing payment	0.0074**		0.0034		2.15		0.05			
Late on bills	0.0120*		0.0066		1.80		0.05			

Notes: In Panel A Furloughed (Non-furloughed) denotes the mean value of a variable for furloughed (non-furloughed) workers within either the unmatched or matched sample; Diff is the difference in means between furloughed and non-furloughed in the unmatched sample; Bias (%) is the standardized percentage bias which is the difference of the sample means between the furloughed and non-furloughed sub-samples as a percentage of the square root of the average of the sample variances in the furloughed and non-furloughed groups; t-stat is the t-statistic from a t-test for equality of means between Furloughed and Non-furloughed and p-value is the associated p-value. In Panel B ATT denotes the average treatment effect on the treated and Std. Error is the corresponding standard error; z-stat denotes the z-statistic from a hypothesis test that ATT equals 0; Neighbors denotes the number of neighbors used in the calculation of ATT. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

4.1 Expenditure and Savings Decisions, and Financial Distress after Furlough

How does Furlough affect Consumption and Savings Decisions? Do individuals adjust their expenditure in the face of a substantial reduction in monthly income due to furlough? Alternatively, do furloughed workers use their savings to smooth consumption? Do these effects exist while furloughed, or do they endure after a furloughed individual returns to work?

To test these conjectures, we first estimate equation (1) using the cut spending dummy variable that equals 1 if a respondent reports they cut spending relative to their pre-pandemic spending levels, 0 otherwise. To capture post-furlough behavior, we also include a dummy variable that is equal to 1 during the period after a furlough spell ends, 0 otherwise. The estimates in column 1 of Table 6 show that furlough provokes a significant 19.70 percentage point increase in the probability that an individuals cuts spending. This is an economically large effect and is not simply due to a secular reduction in consumption during the pandemic: 14.78% of non-furloughed workers report cutting spending during the sample period. Hence, while furlough individuals are approximately 133% more likely to cut spending compared to those not on furlough.²³

The data also show that furloughed workers are significantly more likely to reduce spending even after they return to work. In column 1 of Table 6 the Post furlough coefficient estimate implies that after furlough a person is approximately 7.04 percentage points more likely to cut spending relative to pre-pandemic levels. The result is significant at the 1% level. Hence, individuals permanently cut their expenditure after being furloughed and while consumption recovers when they return to work, it does not reach its pre-furlough level.

These effects hold across both renters and mortgagees. Columns 2 and 3 in Table 6 shows that furlough increases the probability that a renter (mortgagee) cuts spending by 19.73 (19.14) percentage points. In addition, both groups are significantly more likely to cut spending after their furlough spell ends compared to those that are not furloughed.

²³We are unable to observe respondents' total spending in the data, only whether they report cutting spending.

Table 6: Household Expenditure and Savings

Dependent variable Sample	1	2	3	4	5	6
	All	Cut spending Renters	Mortgagees	All	Spent savings Renters	Mortgagees
Furlough	0.1970*** (15.21)	0.1973*** (9.61)	0.1914*** (12.15)	0.0692*** (7.74)	0.0705*** (5.15)	0.0608*** (5.53)
Post furlough	0.0704*** (4.45)	0.0604** (2.46)	0.0786*** (4.08)	0.0230** (2.30)	0.0119 (0.81)	0.0327*** (3.74)
Age	-0.0007 (-1.38)	-0.0014** (-2.02)	0.0004 (0.46)	-0.0002 (-0.61)	-0.0006 (-1.22)	0.0004 (1.00)
Pay	-0.0174*** (-3.60)	-0.0259*** (-3.34)	-0.0119** (-2.13)	-0.0133*** (-3.22)	-0.0197*** (-2.70)	-0.0078** (-2.23)
No university degree	-0.0094 (-0.71)	-0.0190 (-1.07)	-0.0005 (-0.02)	-0.0112 (-1.41)	-0.0174 (-1.27)	-0.0072 (-0.87)
Managerial job	-0.0185 (-1.19)	-0.0341 (-1.20)	-0.0100 (-0.53)	0.0057 (0.53)	0.0083 (0.48)	0.0040 (0.46)
Minority	0.0427* (1.93)	0.0128 (0.32)	0.0638*** (2.76)	0.0368*** (3.14)	0.0528*** (2.71)	0.0254** (1.98)
Male	-0.0031 (-0.23)	0.0089 (0.46)	-0.0161 (-0.80)	-0.0018 (-0.21)	0.0021 (0.14)	-0.0070 (-0.79)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,566	15,858	17,722	35,566	15,858	17,722

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively. respectively.

An alternative way to cope with furlough-induced income declines is to draw down savings. In column 4 of Table 6 we find that furlough provokes a significant 6.92 percentage point increase in the probability that an individual spends savings. This effect persists after a furlough spell ends, although the economic magnitude is somewhat smaller. Columns 5 and 6 of the table show that furlough is associated with a 7.05 and 6.08 percentage point increase in the probability that renters and mortgagees spend their savings, respectively. Each coefficient is statistically significant at the 1% level. However, we find that it is only mortgagees who are significantly more likely to spend savings after furlough ends.

Overall, we find that being furloughed has effects on households' spending behavior that persist beyond the time off work. A key insight from these tests is that furlough has a more pronounced effect on individuals' decisions to reduce spending rather than use their savings. This may be due to the fact that individuals have greater discretion over consumption than savings decisions. Indeed, 46% of furloughed workers had no savings ahead of the pandemic. In the face of falling income during furlough, they may therefore have little option but to

cut spending to remain within their budget.

Financial Distress when Returning to Work after Furlough. How does financial distress evolve after a furlough spell ends and an individual returns to work? To examine this question, we estimate equation (1) using the *post furlough* dummy variable in place of the *furlough* dummy variable. We report the estimates of these tests in Table 7. Throughout columns 1 to 3 of the table the post furlough coefficient estimate is statistically insignificant and economically close to zero when late housing payments is the dependent variable. However, we find that after a furlough spell ends, an individual is significantly less likely to be late on bill payments. In column 4 the furlough ended coefficient is -0.0230 and is significant at the 5% level. The results in the remainder of Table 7 show that while this negative relationship exists for both renters and mortgagees, it is only significant at conventional levels for renters. The estimate in column 5 of the table indicates that a previously furloughed renter is 3.35 percentage points less likely to be late on bill payments after their furlough spell ends compared to a non-furloughed renter.

Table 7: Household Finances after Furlough

Dependent variable Sample	1	2	3	4	5	6
	All	Late on housing Renters	Mortgagees	All	Late on bills Renters	Mortgagees
Furlough ended	0.0069 (0.96)	0.0151 (1.43)	-0.0098 (-0.93)	-0.0230** (-2.42)	-0.0335** (-2.28)	-0.0209 (-1.54)
Age	-0.0004 (-1.42)	-0.0007 (-1.59)	-0.0000 (-0.08)	-0.0006 (-1.43)	-0.0012** (-2.21)	0.0002 (0.40)
Pay	-0.0052** (-2.19)	-0.0065*** (-2.70)	-0.0037 (-1.20)	-0.0039 (-1.34)	0.0001 (0.04)	-0.0044 (-1.24)
No university degree	0.0198** (2.40)	0.0262** (2.48)	0.0085 (0.69)	0.0182 (1.52)	0.0170 (1.31)	0.0078 (0.46)
Managerial job	-0.0130 (-1.39)	-0.0183 (-0.95)	-0.0052 (-0.56)	-0.0361*** (-4.03)	-0.0710*** (-5.15)	-0.0104 (-0.96)
Minority	0.0286*** (3.08)	0.0328* (1.90)	0.0205** (2.44)	0.0546*** (3.31)	0.0924*** (3.23)	0.0116 (1.60)
Male	0.0095 (1.19)	0.0044 (0.50)	0.0127 (0.98)	-0.0032 (-0.26)	-0.0175 (-1.31)	0.0123 (0.70)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,566	15,858	17,722	35,566	15,858	17,722

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding *t*-statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Furlough-induced changes in household expenditure are a potential explanation for why the probability of financial distress decreases after an individual returns to work. The previous results show that individuals reduce spending even after furlough ends. Reducing expenditure provides additional funds that may be used for bill payments and to build a savings buffer that lowers the odds a household experiences financial distress.

4.2 Sub-Sample Analysis: Does Furlough Provoke Inequality?

Does furlough have heterogeneous effects on financial distress across different types of individuals? If so, it may provoke inequality. To understand this question, we use sub-samples of the data according to income and educational qualifications.

Panel A of Table 8 reports estimates of equation (1) using late on housing as the dependent variable. We first split the sample at the median level of pre-pandemic monthly pay. Column 1 of Panel A reports estimates for individuals with below median monthly pay. We find that for this group, furlough increases the probability of being late on housing payments by 3.48 percentage points. In contrast, in column 2 of Panel A, we find that furlough has no significant effect on late housing payments among individuals with above median monthly pay. A potential explanation for this difference is that these groups differ in their pre-pandemic savings levels. Individuals earning above-median incomes may accumulate savings that act as a buffer against financial distress during the COVID-19 period. Indeed, the data show that average pre-pandemic monthly savings were £114 for individuals earning above the median income versus £34 per month for those on below median incomes.

Next, we split the sample according to whether an individual has a university degree. Column 3 of Panel A shows that furlough increases the probability of late housing payments by 3.25 percentage points for individuals without a university degree. In contrast, in column 4 of the panel, the furlough coefficient estimate is statistically insignificant when the sample contains individuals with a degree. We find a quantitatively and qualitatively similar pattern of results in Panel B of Table 8 when using late on bill payments as the dependent variable.

The remaining panels of Table 8 illustrate how consumption and savings decisions vary

Table 8: Sub-Sample Analysis

Sample split	1	2	3	4
	Median pay		Education	
	< p50	\geq p50	No univ. degree	Univ. degree
Panel A: Dependent variable - Late on housing				
Furlough	0.0348*** (3.17)	-0.0091 (-0.68)	0.0325*** (2.66)	0.0138 (1.02)
Control variables	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	19,061	16,505	15,890	19,676
Panel B: Dependent variable - Late on bills				
Furlough	0.0493*** (3.17)	0.0175 (0.38)	0.0440*** (2.67)	0.0519 (1.43)
Control variables	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	19,061	16,505	15,890	19,676
Panel C: Dependent variable - Cut spending				
Furlough	0.1910*** (12.30)	0.1704*** (9.21)	0.1964*** (10.86)	0.1652*** (11.09)
Control variables	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	19,061	16,505	15,890	19,676
Panel D: Dependent variable - Spent savings				
Furlough	0.0780*** (6.96)	0.0344*** (2.79)	0.0667*** (6.03)	0.0544*** (4.87)
Control variables	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	19,061	16,505	15,890	19,676

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. The unreported control variables are age, pay, no university degree, managerial job, minority, and male. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

across the groups while on furlough. Columns 1 and 2 in Panel C show that regardless of an individual's pre-pandemic monthly income, they significantly reduce spending when furloughed. However, the economic magnitude of the furlough coefficient estimate is larger for individuals earning below median income. The contraction in consumption is also more pronounced for individuals without a university degree relative to degree holders.

Estimates in Panel D show furlough provokes a significant increase in the probability an individual spends savings irrespective of their pre-pandemic earnings and educational background. As before, however, the size of the response is larger among individuals earning below median incomes and without a university degree.

Together these pieces of evidence paint a consistent picture showing that furlough leads to inequality in wealth, consumption, and ultimately financial distress. The adverse effects of furlough are most severe among lower income individuals with educational qualifications below a university degree. Despite cutting consumption and spending savings, this group remains significantly more likely to experience financial distress during the COVID-19 pandemic. While furlough elicits reductions in consumption and savings among individuals who earn above median income and hold a university degree, this does not translate into financial distress.

5 Robustness Tests

In this section, we test the robustness of the findings to rule out alternative explanations. To bias the estimates of furlough on financial distress, an omitted variable must correlate with financial distress and furlough. The decision of whether and when to furlough a worker is made by their employer. Employers' furloughing decisions are taken to optimize business performance in the face of the pandemic, and are unlikely to hinge upon their employees' contemporaneous or future levels of financial distress.

5.1 Placebo Tests

Placebo tests provide a window into whether the effects we attribute to furlough are due to the policy rather than confounding factors. Specifically, we should find that financial distress responds to being on furlough but not before an individual is furloughed. If there is pre-furlough anticipation behavior, the effects we attribute to furlough may instead reflect secular trends in financial distress during the COVID-19 pandemic.

We conduct the placebo tests by estimating

$$y_{irt} = \alpha + \beta Placebo_{irt} + \gamma X_{irt} + \delta_i + \delta_r + \delta_t + \varepsilon_{irt}, \quad (3)$$

where all variables are defined as previously except $Placebo_{irt}$ which is a dummy variable equal to 1 during the survey wave before an individual is furloughed, 0 otherwise. During the pre-furlough period, we know that the individual was in employment and not furloughed. Estimates of β should therefore be statistically insignificant, consistent with financial distress only increasing once an individual is actually furloughed. β will only be significantly different from zero if anticipatory behavior is present.

Column 1 in Table 9 presents estimates of equation (3) using late on housing payments as the dependent variable. The placebo coefficient estimate is economically small and insignificant. We obtain similar inferences in column 2 of the table when using late on bills as the dependent variable in equation (3). It is therefore unlikely that our main finding reflects individuals anticipating furlough and defaulting on their financial obligations, or a general upward trend in financial distress during the COVID-19 pandemic. Rather financial distress only increases once an individual is furloughed which makes it less likely that confounding factors drive the results.

5.2 Economic Hardship

A potential threat to identification is an individual's history of financial distress. If financial distress is serially correlated through time, those who are late on housing and bill

Table 9: Placebo Tests

Dependent variable:	1 Late on housing	2 Late on bills
Placebo	0.0126 (0.74)	0.0095 (0.53)
Age	-0.0005 (-1.61)	-0.0005 (-1.04)
Pay	-0.0061** (-2.47)	-0.0025 (-0.97)
No university degree	0.0195** (2.48)	0.0063 (0.56)
Managerial job	-0.0184** (-2.08)	-0.0310*** (-3.11)
Minority	0.0274*** (4.08)	0.0403*** (2.64)
Male	0.0085 (1.13)	-0.0048 (-0.41)
Region FE	Yes	Yes
Year FE	Yes	Yes
Observations	29,545	29,545

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. *Placebo* is a dummy variable equal to 1 in the wave before individual i is furloughed, 0 otherwise. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

payments before the COVID-19 crisis may also experience financial distress during the crisis. We therefore append equation (1) with controls for whether an individual was late on housing or bill payments in 2017, 2018, and 2019. Column 1 of Table 10 shows that individuals who were late on housing payments between 2017 and 2019 significantly more likely to be late on housing payments during the sample period. However, this does not confound the effect of furlough. Rather, the furlough coefficient remains similar in economic and statistical magnitude as in the baseline specification. We repeat the exercise in column 2 using late on bills as the dependent variable. Historical financial distress continues to correlate with contemporary late bill payments, but the furlough coefficient is robust.

Prior research shows that financial distress correlates with indebtedness (Georgarakos et al., 2010). To rule out this channel, we control for the level of non-mortgage debt in equation (1). The results of these tests for late housing and bill payments are shown in columns 3 and 4 of Table 10. Our main finding is robust to this change.

Individuals with savings buffers may avoid financial distress during furlough by using their savings to offset the furlough-induced income decline. We therefore include a control for each individual’s monthly savings during 2019 to proxy the stock of savings they can rely on during the crisis. Higher pre-COVID-19 savings levels correlate significantly and negatively with late housing and bill payments during the sample period in columns 5 and 6 of Table 10, respectively. However, the furlough coefficient remains positive and significant.

Table 10: Household Financial Hardship

Dependent variable:	1	2	3	4	5	6	7	8
	housing	bills	housing	bills	housing	bills	housing	bills
Furlough	0.0219** (2.22)	0.0477*** (2.88)	0.0215*** (2.61)	0.0420** (2.55)	0.0212*** (2.60)	0.0407** (2.49)	0.0124** (1.97)	0.0305** (2.55)
Late on housing ₂₀₁₉	0.0659*** (3.01)							
Late on housing ₂₀₁₈	0.0379** (2.26)							
Late on housing ₂₀₁₇	0.0322** (2.04)							
Late on bills ₂₀₁₉		0.1986*** (7.43)						
Late on bills ₂₀₁₈		0.0617*** (4.63)						
Late on bills ₂₀₁₇		0.0101 (0.84)						
Non-mortgage debt			-0.0045** (-2.01)	-0.0021 (-1.14)				
Monthly savings					-0.0041** (-2.47)	-0.0074*** (-4.23)		
Grocery bill							-0.0043 (-0.83)	-0.0245*** (-3.29)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,165	35,566	35,566	35,566	35,566	35,566	35,566	35,566

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. The unreported control variables are age, pay, no university degree, managerial job, minority, and male. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Households with high grocery bills may have the greatest incentive to become late on their financial obligations during the pandemic as they require funds for essential goods. We therefore proxy for grocery expenditure during the COVID-19 period using an individual’s average weekly grocery bill in 2019. Despite this change, the estimates in columns 7 and 8 of Table 10 continue to show that furlough leads to a higher probability of late housing and bill payments, respectively.

5.3 Sensitivity Checks

In the previous section, we found evidence that while furloughed individuals reduce spending and draw down their savings. These actions may mitigate financial distress by freeing up funds to remain current on housing and bill payments. If so, the baseline estimates may understate the full extent of furlough on financial distress.

To address this issue, we account for changing spending and savings behavior during furlough. First, we interact the furlough and cut spending variables and include this and the cut spending variable as additional control variables in equation (1). We report the results of this test for the two financial distress outcomes in columns 1 and 2 of Table 11. The coefficient estimates show that cutting spending is associated with a significantly higher probability that an individual is late on bill but not housing payments. The interaction term shows that cutting spending during furlough is significantly negatively correlated with late bill payments. Despite this change, the furlough coefficient remains a positive and significant determinant of both forms of financial distress.

Next, we repeat this exercise, but study how changing savings patterns during furlough affects the inferences. We include spent savings and a furlough-spent savings interaction term as additional control variables in equation (1). In columns 3 and 4 we find that spending savings correlates with a significantly higher probability of late housing payments but not late bill payments. The interaction term’s coefficient estimate is only significant at conventional levels when late on bills is the dependent variable. Specifically, during furlough individuals who spend savings are 8.80 percentage points less likely to be late on bill payments. Despite

this change, furlough remains positively and significantly related to financial distress.

The pandemic may directly influence financial distress by preventing an individual from working. At the start of the crisis, the National Health Service (NHS) wrote to people with underlying health conditions warning them to shield for a period of time by remaining at home where possible. Individuals who are clinically vulnerable to COVID-19 may also take steps such as avoiding work to avoid coming into contact with the disease. Contracting COVID-19 requires that an individual isolates at home. All of these factors may influence financial distress by restricting an individual's earnings ability. We therefore append equation (1) with controls for NHS shielding status, whether someone is clinically vulnerable to COVID-19, and if they have tested positive for COVID-19 during the sample wave. Our key finding endures in columns 5 and 6 of Table 11.

Following the removal of national lockdown restrictions, some areas of the UK experienced local lockdowns to curb localized COVID-19 outbreaks. To ensure the effects of furlough are not driven by local lockdowns, we remove observations from regions where local lockdowns are present. In columns 7 and 8 of Table 11, we continue to find that furlough provokes a significant increase in the probability of financial distress.

Household composition may influence financial distress during furlough. A larger number of children in the household may impose a greater financial burden. In contrast, having more than one adult in the household may alleviate financial distress as multiple earners diversify a household's exposure to the adverse consequences of furlough-induced income declines. The estimates in columns 9 and 10 show the number of children and adults in the household are insignificantly related to late housing and bill payments, respectively. Including these controls has no effect on our key finding: the furlough coefficient estimate remains robust in both specifications.

Table 11: Sensitivity Tests

Sample:	Remove local lockdowns									
	1	2	3	4	5	6	7	8	9	10
Dependent variable:	All			Late on						
	housing	bills	housing	housing	housing	bills	housing	bills	housing	bills
Furlough	0.0412** (2.17)	0.0477** (2.54)	0.0156* (1.87)	0.0516*** (2.99)	0.0211** (2.55)	0.0429*** (2.58)	0.0259*** (3.24)	0.0509*** (3.13)	0.0220*** (2.69)	0.0419** (2.53)
Cut spending	0.0339 (1.61)	0.0627*** (3.30)								
Furlough \times <i>Cutspending</i>	-0.0393 (-1.36)	-0.0582** (-2.23)								
Spent savings			0.0239* (1.92)	0.0380 (1.60)						
Furlough \times <i>Spentsavings</i>			0.0136 (0.52)	-0.0880* (-1.71)						
NHS shielding					-0.0060 (-0.58)	-0.0166 (-0.71)				
Vulnerable					0.0041 (0.64)	0.0176 (1.40)				
Positive test					-0.0474*** (-3.96)	0.1527*** (4.68)				
Adults									-0.0031 (-0.89)	0.0016 (0.21)
Children									0.0030 (0.78)	0.0041 (0.62)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,546	22,546	35,566	35,566	35,511	35,511	32,522	32,522	35,566	35,566

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. The unreported control variables are age, pay, no university degree, managerial job, minority, and male. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

6 Conclusions

Using novel survey data from the UK, this paper reports first evidence on the link between the furlough scheme and household financial distress during the COVID-19 pandemic. While furlough preserves a worker’s job during the COVID-19 pandemic, it provokes substantial declines their monthly income that may trigger financial distress. We find evidence that this mechanism is operative and economically meaningful. During a furlough spell, an individual is 30% more likely to be late on housing payments and 9% more likely to be late on bill payments, relative to a non-furloughed individual.

The results have important policy implications and provide insights into how effectively the CJRS prevented household financial distress over the first 18 months of the pandemic. The UK government contributes 80% of furloughed individual’s wages up to a maximum payment of £2,500 per month. An important insight from our study is that the probability of household financial distress is non-linearly related to the furlough-induced decline in income. There is essentially no difference in the probability of financial distress between individuals who experience an income decline of between 0% and 20%. However, above this level the probability of financial distress rapidly increases. In this sense, the CJRS is well designed as the government’s furlough payments minimize the incidence of households in financial distress at the lowest cost to taxpayers.

Furlough potentially increases inequality. We find that furloughed individuals substantially reduce consumption expenditures and draw down savings to offset the furlough-induced income reduction. Changes in consumption patterns last beyond the furlough spell, and persist even once an individual has returned to their regular employment. This is important as 24% of the workforce are furloughed at least once during the COVID-19 pandemic. While the furlough scheme is effective in preventing mass unemployment and retains employer-employee relationships, the furlough-induced adjustments in households’ savings potentially increase wealth inequality as workers exit furlough with lower savings relative to non-furloughed individuals. Moreover, the increase in financial distress during furlough is concentrated among workers earning low pre-pandemic incomes and with lower educational attainment.

References

- Adams-Prassl, A., Boneva, T., Golin, M., and Rauh, C. (2020a). Furloughing. *Fiscal Studies*, 41(3):591–622.
- Adams-Prassl, A., Boneva, T., Golin, M., and Rauh, C. (2020b). Inequality in the impact of the coronavirus shock: Evidence from real time surveys. *Journal of Public Economics*, 189(C):1042–1075.
- Baker, S., Farrokhnia, R., Meyer, S., Pagel, M., and Yannelis, C. (2020). How does household spending respond to an epidemic? consumption during the covid-19 pandemic. *Review of Asset Pricing Studies*, 10(4):834–862.
- Balleer, A., Gehrke, B., Lechthaler, W., and Merkl, C. (2016). Does short-time work save jobs? a business cycle analysis. *European Economic Review*, 84:99–122. European Labor Market Issues.
- Bodenstein, M., Corsetti, G., and Guerrieri, L. (2020). Social distancing and supply disruptions in a pandemic. *Finance and Economics Discussion Series*, 2020.
- Brewer, M. and Tasseva, I. (2021). Did the UK policy response to Covid-19 protect household incomes? *Journal of Economic Inequality*.
- Christl, M., Poli, S. D., Hufkens, T., Peichl, A., and Ricci, M. (2021). The Role of Short-Time Work and Discretionary Policy Measures in Mitigating the Effects of the Covid-19 Crisis in Germany. CESifo Working Paper Series 9072, CESifo.
- Chronopoulos, D., Lukas, M., and Wilson, J. (2020). Consumer spending responses to the covid-19 pandemic: an assessment of great britain. *Working Paper, University of St. Andrews*.
- Coibion, O., Georgarakos, D., Gorodnichenko, Y., Kenny, G., and Weber, M. (2021). The effect of macroeconomic uncertainty on household spending. Working Paper 28625, National Bureau of Economic Research.

- Coibion, O., Gorodnichenko, Y., and Weber, M. (2020). The cost of the covid-19 crisis: lockdowns, macroeconomic expectations, and consumer spending. *NBER Working Paper 27141*.
- Eichenbaum, M. S., Rebelo, S., and Trabandt, M. (2020a). The Macroeconomics of Epidemics. NBER Working Papers 26882, National Bureau of Economic Research, Inc.
- Eichenbaum, M. S., Rebelo, S., and Trabandt, M. (2020b). The Macroeconomics of Testing and Quarantining. NBER Working Papers 27104, National Bureau of Economic Research, Inc.
- Finck, D. and Tillmann, P. (2021). Pandemic shocks and household spending. *Oxford Bulletin of Economics and Statistics*, forthcoming.
- Gardiner, L. and Slaughter, H. (2020). The effects of the coronavirus crisis on workers. Working paper, Resolution Foundation.
- Georgarakos, D., Lojschova, A., and Ward-Warmedinger, M. (2010). Mortgage Indebtedness and Household Financial Distress. *ECB Working Paper 1156*.
- Gerardi, K., Herkenhoff, K., Ohanian, L., and Willen, P. (2017). Can't pay or won't pay? unemployment, negative equity, and strategic default. *Review of Financial Studies*, 31(3):1098–1131.
- Goenka, A. and Liu, L. (2012). Infectious diseases and endogenous fluctuations. *Economic Theory*, 50(1):125–149.
- Goenka, A., Liu, L., and Nguyen, M.-H. (2014). Infectious diseases and economic growth. *Journal of Mathematical Economics*, 50:34–53.
- Heckman, J. (1997). Instrumental variables - a study of the implicit behavioral assumptions used in making program evaluations. *Journal of Human Resources*, 32(3):441–462.
- Kopp, D. and Siegenthaler, M. (2021). Short-Time Work and Unemployment in and after the Great Recession. *Journal of the European Economic Association*, 19(4):2283–2321.

- Kuhnen, C. and Melzer, B. (2018). Noncognitive Abilities and Financial Delinquency: The Role of Self-Efficacy in Avoiding Financial Distress. *Journal of Finance*, 73(6):2837–2869.
- Lenoël, C. and Young, G. (2021). Modelling the impact of covid-19 on the UK economy: an application of a disaggregated New-Keynesian model. NIESR Discussion Paper 531, National Institute of Economic and Social Research.
- McGowan, D. and Nguyen, H. (2021). To Price or to Securitize Credit Risk? *Journal of Financial and Quantitative Analysis*, forthcoming.
- Rust, K. (1985). Variance estimation for complex estimators in sample surveys. *Journal of Official Statistics*, 1(4):381–397.
- Tetlow, G., Pope, T., and Dalton, G. (2020a). Coronavirus and unemployment: a five nation comparison. Working paper, Institute for Government.
- Tetlow, G., Pope, T., and Dalton, G. (2020b). The coronavirus job retention scheme – how has it been used and what will happen when it ends? Working paper, Institute for Government.
- Tomlinson, D. (2021). The beginning of the end. Working paper, Resolution Foundation.
- Wolter, K. (1985). *Introduction to Variance Estimation*. New York: Springer-Verlag.

Online Appendix

A Survey Details

Figure 1.A depicts an example for an email invite that survey participants would receive. Figure 2.A provides an example for an invite via SMS. Similar emails and SMS are sent inviting respondents to participate in subsequent waves. Participants indicate their preferred form of communication.

Figure 1.A: Example of an Email Invite

2 EMAIL INVITES
2.1 Month 1 (April 2020)
Subject: *Understanding Society* Coronavirus Study

Dear <Title, First name, Surname>,

We recently wrote to you to let you know about taking part in a short survey each month about the coronavirus and how it is affecting your life.

The information you can give us, together with information from thousands of people across the country, will allow researchers to see how the coronavirus is affecting all parts of our lives, at work and at home.

By completing the questionnaire each month, you will earn £2 for your reward account. You will see information on how to claim your reward after you have finished the survey. Please click the link below to get started.

<UNIQUE LINK>

For more information about this part of the study, please click here:
<https://www.understandingsociety.ac.uk/participants/coronastudy>

With many thanks,

Professor Michaela Benzeval – Director, *Understanding Society*

Understanding Society is being conducted in accordance with the Data Protection Act. This means your personal details will be kept strictly confidential and you and your household will not be identifiable from the data. To view our privacy policy, see <https://www.understandingsociety.ac.uk/participants/coronastudy>

To unsubscribe from the monthly Coronavirus Study, click here [link to unsubscribe page].

Figure 2.A: Example of an Email Invite

3 SMS INVITES

3.1 Months 1-3 (April / May / June 2020) and month 4 (July 2021) – Incentive control group

Please take part in our monthly Coronavirus Study at {LINK} to earn a £2 voucher. Query: Call us on 0800 141 3656

3.2 Month 4 (July 2020) – Incentive treatment group

Please take part in our monthly Coronavirus Study at {LINK} to earn a £2+£10 voucher. Query: Call us on 0800 141 3656

3.3 Months 5-7 (September 2020 / November 2020 / January 2021)

Please take part in our Coronavirus Study at {LINK} to earn a £2 voucher. Query: Call us on 0800 141 3656

3.4 Month 8 (March 2021) – Higher incentive groups

Please take part in our Coronavirus Study at {LINK} to earn a £{7/12/17} voucher. Query: Call us on 0800 141 3656

3.5 Month 8 (March 2021) – Incentive plus bonus groups

Please take part in our Coronavirus Study at {LINK} to earn a £{2/5/12} voucher. Query: Call us on 0800 141 3656

B Furlough Schemes in Different Countries

Table 1.B provides broad details of the characteristics of different countries' furlough schemes.

Table 1.B: Furlough Schemes around the World

Country	Business eligibility requirements	Government wage contribution (%)	Maximum payment per employee
Australia	30% turnover fall, or 50% for large businesses, 15% for charities	Uniform AU\$1,500 per fortnight (£410 per week) per employee all of which must go to the employee regardless of their previous earnings or current hours	AS\$1,500 per fortnight (£410 per week)
Canada	15% turnover fall for first month, 30% for subsequent months	75% (gross), if hours are cut pay is the lower of 100% of new wage or 75% of previous wage	CA\$847 per week (£500 per week)
Denmark	>30% of workforce or >50 are under threat of redundancy, no employees are fired during claim period	75% (gross) for workers paid monthly, 90% (gross) if paid hourly. Employers are required to top up to 100% of previous salary	DKK 30,000 per month (£830 per week)
France	Employees' work must be stopped by COVID-19	70% (gross) or €8 (£7) per hour whichever is higher	€6,927 per month (£1,423 per week)
Germany	Employers must put 10% of workforce on the scheme, must be temporary, unavoidable loss of work	60% (gross), 67% (gross) for workers with children	Only available to those paid <€6,900 (£6,130) per month
Ireland	25% turnover fall and must be unable to pay normal wages and outgoings	85% (net) for lowest earners, 70% for others	€410 (£360) per week
Sweden	Company suffering 'temporary and significant financial difficulties' due to COVID-19	75% (gross) of wages for hours cut.	44,000 SEK per month (£870 per week)
UK	None	80% (gross)	£2,500 per month (£580 per week)

Notes: This table provides broad details of the characteristics of different countries' furlough schemes. To aid comparison of the generosity of maximum payments we provide an approximate value in pounds sterling.

C Financial Distress among Owner Occupiers

Table 2.C: Financial Distress among Owner Occupiers

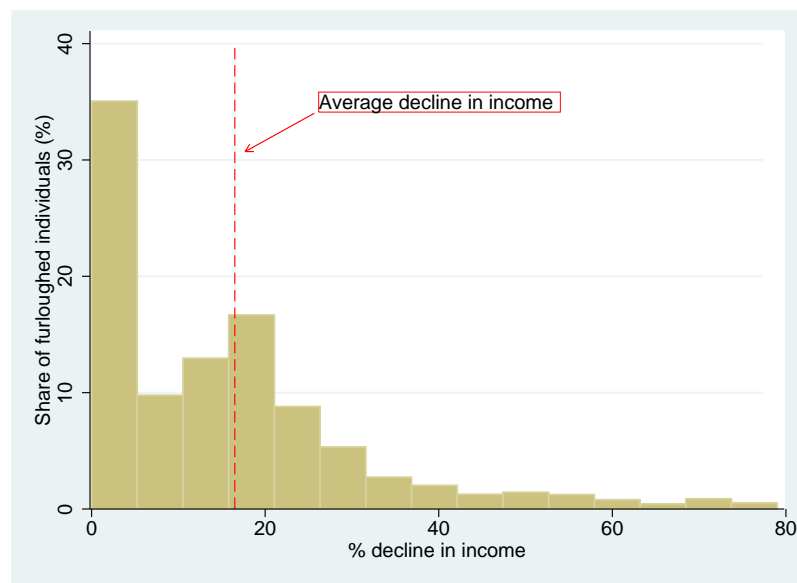
Dependent variable	1 Late on bills
Sample: Owner occupiers	
Furlough	0.0321** (2.28)
Age	0.0002 (0.83)
Pay	-0.0038 (-1.14)
No univ. degree	-0.0118 (-1.05)
Managerial job	-0.0050 (-0.35)
Minority	0.0859*** (10.57)
Male	0.0030 (0.33)
Region FE	Yes
Year FE	Yes
Observations 1,986	

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

D Furlough-Induced Income Declines

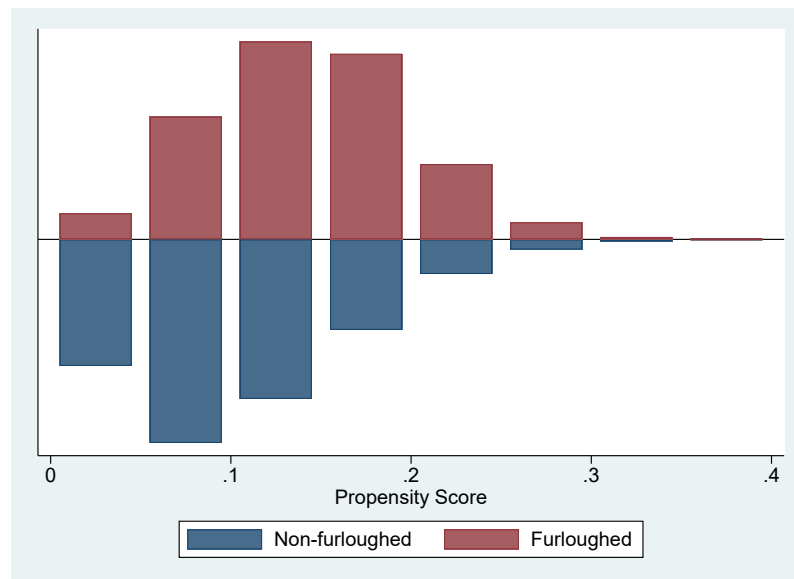
Figure 3.D shows the distribution of furloughed workers and their furlough-implied income reduction.

Figure 3.D: Distribution of Furloughed Workers and their Income Reduction due to being Furloughed



E Propensity Score Matching Diagnostic Tests

Figure 4.E: Test for Common Support



Notes: This figure plots the propensity score distribution for furloughed and non-furloughed workers.

F Furlough Determinants

Table 3.F reports estimates of equation (2) in the main body.

Table 3.F: Determinants of Furlough

Dependent variable:	1 Furlough
Age	-0.0009 (-1.41)
Pay	-0.0126*** (-2.89)
No univ. degree	0.0390*** (3.25)
Managerial job	-0.0347 (-1.22)
Minority	-0.0143 (-0.85)
Male	-0.0021 (-0.15)
Children	-0.0042 (-0.63)
Adults	0.0104 (1.43)
COVID-19 infections	0.0139*** (6.24)
Region FE	Yes
Year FE	Yes
Observations	35,566

Notes: This table presents estimates of equation (1). Table 1 provides a description of each variable. We calculate robust standard errors from the Taylor-linearized estimators, and report the corresponding t -statistics in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.