

First Come, First Served: The Timing of Government Support and Its Impact on Firms*

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Abstract

We study the effects of deploying government capital to firms during crises. Using exogenous variation in the timing of disbursements in the Paycheck Protection Program (PPP), we find that firms receiving PPP loans later become more financially distressed and face reductions in credit supply. These effects are amplified for firms with heightened financial constraints. We also show that firms receiving loans later have lower economic activity using in-store activity and shutdowns. The results are consistent with a direct channel on firm operations and a financing channel. Overall, our findings highlight the role of timely and uninterrupted fiscal support during crises.

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1 Introduction

Governments deploy substantial capital through fiscal policy during crises. These policies target firms and households with the goal of stabilizing the economy, preventing spillovers across sectors, and dampening long-term negative effects. Policymakers face tradeoffs when responding to crises. Large fiscal stimulus enacted quickly can provide immediate support to the economy, though it could misallocate capital to sectors less affected by the crisis. Alternatively, a slow reaction by policymakers could provide flexibility as a crisis unfolds yet it could lead to a protracted recovery.

In this paper, we study the impact of timing of government capital injections on firms. First, what is the effect of a delay in providing government support on the financial distress of firms? Second, do delays produce long-term consequences for economic activity at firms? Understanding the answers to these questions is vital to inform the deployment of government resources and the speed of the response during crises. However, there is limited evidence on the timing of policies supporting firms due to the endogenous response by policymakers, the selection of firms into programs, and reduced information on recipients of particular policies.

Facing considerable uncertainty at the onset of the Covid-19 pandemic, the U.S. federal government injected trillions of dollars into the economy using several fiscal policies. The Paycheck Protection Program (PPP) was enacted through the Coronavirus Aid, Relief, and Economic Security (CARES) Act in March 2020 to support employment at small firms. The initial appropriation of \$349 billion was depleted in two weeks as demand exceeded supply. Policymakers debated extensions to the program and subsequently provided additional funding of \$320 billion. Through the second round of funding in 2020, the program disbursed a total of \$523 billion in government capital through 5.2 million forgivable loans.

We use firm credit risk data from Experian to evaluate the effect of timing of government capital on financial distress and credit outcomes. We observe detailed information on late payments, credit scores, and legal actions for 42.3 million firms from 2016 to the last quarter

of 2020. We link these data to the universe of PPP loans provided by the Small Business Administration (SBA). We incorporate supplemental data on firm employment from Your-economy Times Series (YTS), in-store firm activity using SafeGraph, and firm closures using Google Maps.

A key challenge in studying the impact of deploying government capital is that policies are not enacted randomly. Additionally, the ordering of capital distribution can be correlated with firm characteristics. We overcome these challenges by exploiting exogenous variation in the timing of PPP loans due to the depletion of funds at the end of the first round on April 16 until the beginning of the second round on April 27. We focus on a narrow window around the funding gap to mitigate selection concerns. We identify the effect of timing on financial distress and economic activity at firms using a difference-in-differences specification to compare the impact on firms receiving a PPP loan at the beginning of the second round to firms obtaining a PPP loan at the end of the first round.

We address two potential concerns about our identification strategy. First, a growing literature highlights that banking relationships play a role in the allocation of PPP loans. We link data on Call Reports of banks originating loans to our sample of firms around the funding gap. Focusing on the narrow window at the end of the first round to the beginning of the second round, we find that banks providing loans to firms in this window have similar assets and core deposits. This suggests that, while banking relationships are relevant at the beginning of the program, they do not relate to loan allocation around the funding gap. Second, we link PPP loan recipients to non-imputed employment data from YTS. We compare average and median employees by state for firms at the end of the first round to those firms at the beginning of the second round. We find that firm size is comparable around the funding gap. In sum, this provides evidence supporting the assumption that firms around the funding gap are similar.

We begin by examining the effect of timing of government support on financial distress. Using detailed data on firm credit risk, we construct two measures of financial distress to

evaluate the impact of timing along the extensive and intensive margins. First, we form an indicator variable equaling one if a firm is beyond terms on at least one of its credit lines. Second, we use the average number of days that a firm is beyond terms on its credit lines to measure financial distress on the intensive margin. In the short-run, we find that firms receiving PPP loans at the beginning of the second round are 4.6% more likely to face financial distress and are 5.4% later on payments to their creditors, both compared to the sample mean. These estimates are based on the response in the second quarter of 2020. We augment our sample to include the remaining quarters of 2020 and find that the effects are persistent. Firms receiving delayed capital injections remain significantly more likely to enter financial distress and pay creditors later. Importantly, these effects are relative to firms receiving PPP loans at the end of the first round in a narrow window around the funding gap.

We provide several extensions of these findings. First, we show that financial distress along the extensive and intensive margins does not precede the allocation of capital in the Paycheck Protection Program. There is no differential trend in financial distress for firms at the end of the first round compared to firms at the beginning of the second round, consistent with the parallel trends assumption. Second, we examine the robustness of the estimates in a more restrictive window of two days around the funding gap and report quantitatively similar effects. Third, we evaluate the role of financial constraints in the delayed deployment of government capital. Using Experian's proprietary credit score, we determine firms that are financially constrained in the year before the pandemic. We estimate a triple-differences model and find that ex-ante constrained firms are more negatively impacted when they receive delayed funding from PPP loans.

Next, we evaluate the impact of timing of fiscal support on credit supply to firms. Using the comprehensive data from Experian, we study the effect of delays on total credit supplied to firms and credit through trade lines. We find that funding delays for PPP loans substantially reduce credit supply. In the short-run, total credit is reduced by 12.7% for

firms receiving PPP loans at the beginning of the second round compared to firms obtaining these loans at the end of the first round. Credit extended using trade lines declines by 23.8% for firms receiving delayed government capital. We continue to find that these effects are persistent for the three quarters following the allocation of capital. Overall, these findings highlight that, when confronting a severe economy-wide shock, interruptions in government support adversely impact firms.

The weakening ability of firms to meet their financial obligations and the rise in financial distress might not translate into reductions in firm-level real activity. We incorporate data on in-store activity at firms using SafeGraph to capture the frequency of monthly visits linked to the locations of PPP recipients. Additionally, we collect data on firm exits using business status on Google Maps. Since there can be substantial lags in tracking firm activity in administrative data, information on Google is updated in real-time and was gathered in April 2021.

Last, we analyze the effect of timing of government support on economic activity at firms. We find that firms receiving delayed PPP loans experience a 4.5% decline of in-store activity based on data of store visits. This estimate is relative to firms at the end of the first round and indicates an immediate effect on firm revenue due to the delayed capital from the program. We also study the impact of delays on firm survival. We show that firms obtaining PPP loans in the second round are significantly more likely to close on a temporary or permanent basis. The likelihood of shutting down permanently for firms receiving delayed capital rises by 17.2% relative to the sample mean. These results demonstrate that delays in providing government capital to firms produces a real effect on firms by decreasing in-store visits and an increase in the likelihood of firm closure.

Our results are consistent with two channels. First, delays in receiving government funds can directly disrupt firm operations. These disruptions can include reductions in retaining employees, limited ability to pay suppliers, and a decrease in investment activity. Declines in the ability to invest could be particularly detrimental if firms are unable to adopt new

technologies for continuing operations during the pandemic. Second, timely government capital can support firm activity through a financing channel. Forgivable loans could aid firms in accessing additional funding. Anecdotal evidence also suggests that financial institutions were more willing to renegotiate with borrowers who received PPP loans. We examine the financing channel and find consistent evidence based on increases in legal actions for firms receiving delayed capital, in addition to the results on declines in credit supply.

Taken together, we provide evidence that the timely deployment of government capital is critical during crises. Exploiting exogenous variation in the funding gap of the Paycheck Protection Program, delays in disbursing loans lead to increases in financial distress for firms along the extensive and intensive margins. These effects are immediate and persistent. The delays also produce real effects, as firms receiving delayed PPP loans realize lower in-store activity and are more likely to shut down. The findings have broad, overarching implications for designing policy responses during crises.

Our paper contributes to several strands of the literature. First, we add to the growing literature on the impact of the Covid-19 pandemic on the economy and, more specifically, the role of the Paycheck Protection Program. Barrios et al. (2020) use a model to compare predicted requests for PPP funds to actual requests, assessing if funds were allocated according to the program design. Granja et al. (2020) highlight the role of banks in mediating PPP funds and find no evidence that capital flowed to areas more impacted by the pandemic. Several recent papers focus on the employment effects of PPP. Lutz et al. (2020) assess the efficacy of PPP in maintaining employment at small firms and show that PPP boosted employment at eligible firms by 2% to 4.5%. Hubbard and Strain (2020) also find modest employment effects, while Chetty et al. (2020) report insignificant changes in employment for PPP recipients. In contrast, Faulkender, Jackman, and Miran (2020) find employment effects larger in magnitude relative to prior studies.

Additional papers examine further dimensions of the program. Bartik et al. (2020) find that PPP loans led to a 13 to 30 percentage point increase in the expected survival of

firms. Bartlett and Morse (2020) examine the heterogeneous effects of PPP loans to firms in Oakland, California, and report an increase in the medium-run survival probabilities for micro-businesses. Hubbard and Strain (2020) use data from Dun & Bradstreet to estimate the economic effects of the PPP loan program. They find that the PPP had a substantial effect on employment, financial health, and survival of small businesses. Different from our paper, they compare effects for firms eligible for PPP loans versus ineligible firms, while we use within program variation in the timing of PPP loans. Relative to existing papers, we use firm-level data from a large credit reporting agency to study the impact of timing on financial distress and economic activity of firms.

We also contribute to the literature on the costs of financial distress. A set of influential studies have provided estimates for the costs of financial distress. Andrade and Kaplan (1998) examine a sample of 31 leveraged buyout firms during the late 1980s that subsequently became financially distressed. They estimate that distress costs are between 10% and 23% of firm value. Almeida and Philippon (2007) estimate distress costs using risk-adjusted default probabilities. They show that, for a BBB-rated firm, the NPV of distress is 4.5% of pre-distress value. Hortaçsu et al. (2013) show large indirect costs of financial distress for car manufacturers. Our paper broadly connects to this literature by showing that delays in accessing capital can lead to increases in financial distress and exacerbate distress costs.

2 Paycheck Protection Program

The Paycheck Protection Program (PPP) was enacted to support small businesses in response to the Covid-19 pandemic. It was established as a part of the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which was signed into law on March 27, 2020. The appropriation in the CARES Act for PPP was \$349 billion. The Paycheck Protection Program and Health Care Enhancement Act was signed into law on April 24 and provided an additional \$320 billion in funding for the PPP. The Paycheck Protection Program Flexibility Act was signed into law on June 5, providing an extension for using funds from PPP loans and increased the allowance for non-payroll expenses.

The program provided loans to small businesses of up to 2.5 times their average monthly payroll costs with a maximum loan of \$10 million. It was implemented by the Small Business Administration (SBA) and the Treasury Department. PPP loans were originated by banks and guaranteed by the federal government. Banks certified that a firm was eligible based on being in operation on February 15, 2020 and verifying its payroll. Financial intermediaries received a fee as a percent of a loan's principal. Borrowers attested that the loan is required to support their operations due to current economic conditions. PPP loans can be forgiven if certain criteria are met, including the loan amount spent on payroll, changes in firm employment, and employee wages.¹

The first round of the program began on April 3. Demand for loans quickly outpaced the initial appropriation and funding was exhausted on April 16. The Paycheck Protection Program resumed on April 27, within a few days of the second appropriation. The application deadline for PPP loans was initially set at June 30 and subsequently extended to August 8. The program reopened on January 11, 2021.

We gather data from the SBA on all PPP loans originated in 2020.² The Paycheck

¹The determination of loan forgiveness has been revised several times. Additional details about the Paycheck Protection Program are provided in Granja et al. (2020) and Hubbard and Strain (2020).

²The data are available at <https://www.sba.gov/funding-programs/loans/Covid-19-relief-options/paycheck-protection-program/ppp-data>. The data were downloaded on December 1, 2020 and provide information on PPP loans through November 24, 2020.

Protection Program provided \$523 billion in government capital through 5.2 million loans, with an average loan amount of \$100,409. When the program started on April 3 until May 7, \$487.8 billion in loans were originated to small firms. The remaining \$35.2 billion was disbursed between May 8 and August 8.

Table 1 provides summary statistics for PPP loan recipients for the beginning of the program. It highlights that uptake of PPP loans quickly accelerated in the first few days of the program, rising from \$6.9 billion on April 3 to \$30.6 billion on April 10. The initial appropriation was exhausted on April 16. The program restarted on April 27 and demand for PPP loans remained elevated until May 1. After this period, PPP loan activity substantially declined until the program closed in 2020 on August 8. Additionally, the average and median loan amount dropped throughout the program.

Figure 1 provides the daily total loan amount in billions of dollars from April 3 to May 7. It demonstrates that the deployment of PPP loans increased throughout the first round of PPP loans until April 16. From April 17 until April 26, there was no origination of PPP loans due to the lack of funding. With the second appropriation, lending resumed on April 27 and satisfied latent demand for PPP loans.

3 Data

It is challenging to study the effects of fiscal programs on small businesses due to limited firm-level data on the financial distress and real activity of these firms. We use data from a large credit-reporting firm in the United States and real-time data on firms during the pandemic to address this challenge.

3.1 Experian Credit Risk Dataset

Our main dataset is the Commercial Credit Risk Database provided by Experian, which is one of the largest credit-reporting agencies in the United States. We use data on all private and public U.S. firms with at least one trade line covered by Experian from 2016 to 2020, including quarterly coverage for the last year in our sample. The data provide detailed firm-level credit risk information in each period, including late payments, credit supply, legal actions, and credit scores, and consists of 42.3 million firms. Additionally, the data include information on the name and geographical location of firms, which allows us to use a matching algorithm and link data from the Paycheck Protection Program to Experian. We match 2.4 million PPP loan recipients to firms in Experian.³ We construct measures of financial distress for small businesses using comprehensive information from the Experian firm credit risk data.

3.2 Your-Economy Times Series (YTS) Data

We use panel data on firm employment from the Your-economy Times Series (YTS) database, which is provided by the Business Dynamics Research Consortium. The YTS database contains comprehensive data at the firm-year level on location, employment, and sales for both private and public firms by compiling information from Infogroup’s Business Historical

³We restrict firm type to corporations, limited liability companies, and partnerships since coverage is more complete for these firms. We also focus on firms with recent activity to remove businesses that are no longer operating or covered in the data.

databases. We match PPP loan recipients to YTS data using a fuzzy matching algorithm based on firm name and location. We restrict our attention to non-imputed employment.⁴

3.3 SafeGraph Data

We collect data on firm visits using from SafeGraph. SafeGraph aggregates anonymized information on the location of mobile device users. The locations are mapped by SafeGraph to nearly six million points-of-interest using satellite images and machine-learning algorithms. We use firm visits to measure in-store activity by month from January 2018 to December 2020. We match PPP loan recipients to SafeGraph using a fuzzy matching algorithm based on firm name and location. In a four-day window around the PPP funding gap, we match 75,756 firms receiving PPP loans to SafeGraph.

3.4 Google Maps Data

To examine firm closures, we incorporate data on business status from Google Maps. Google Maps provides real-time information about whether a business is temporarily or permanently closed. Temporarily closed indicates that a firm is not currently operating, but it intends to reopen. Permanently closed denotes a firm that no longer exists, or is shut down. In April 2021, we gathered data using firm name and location on 400,703 firms receiving PPP loans within four days of the funding gap for the program.

3.5 Summary Statistics

Table 3 provides summary statistics for the variables in our analyses. The median firm in our sample has about \$2,700 in total credit in a year, with the majority of credit originating from trade lines. In terms of financial distress, firms are late on their payments in 19.7%

⁴The data source for YTS is similar to the National Establishment Time-Series (NETS) database. We focus on cross-sectional variation of non-imputed employment to address concerns about these data (Crane and Decker (2020)).

of the firm-year observations and the average number of days beyond terms is almost four days, which is calculated as 30 days beyond the invoice date. Last, 2.2% of firms receiving PPP loans are subsequently shut down since the enactment of the program.

4 Empirical Design

4.1 Identification Strategy

We study the effect of when government capital is deployed during crises on the financial distress and economic activity of firms. A key challenge to understanding the role of timing of government support is that the order of capital allocated to firms may be correlated with firm characteristics.⁵ Section 2 details that the first round of the Paycheck Protection Program abruptly ended as funding from the initial appropriation was exhausted and the second round only resumed when Congress passed legislation to provide additional program funding. We exploit the end of the first round of PPP as a plausibly exogenous shock to the timing of capital allocation to firms. Specifically, we compare financial distress and economic activity for firms at the beginning of the second round to those firms at the end of the first round of PPP.

Our identification strategy estimates the following difference-in-differences specification:

$$Y_{it} = \alpha_i + \alpha_t + \beta \cdot \text{Second Round}_{it} + \varepsilon_{it}, \quad (1)$$

where Y_{it} is the outcome variable of interest for firm i in period t . Second Round_{it} is an indicator variable equal to one if firm i receives a PPP loan at the beginning of the second round in period t . It is set to zero prior to the start of the PPP. We include firm fixed effects to capture time-invariant firm heterogeneity and time fixed effects to absorb nationwide time

⁵Neilson, Humphries, and Ulyssea (2020) provide survey evidence that information frictions and the “first-come, first-served” design of PPP disproportionately hindered small firms with fewer than five employees from accessing government support during the first round of the program.

trends. Standard errors are clustered at the firm level. The coefficient of interest is β , which estimates the marginal effect of a delay in receiving a PPP loan.

The identifying assumption for our empirical design is that, without a delay between the first and second rounds, firms receiving PPP loans at the beginning of the second round would follow parallel trends compared to firms obtaining PPP loans at the end of the first round. We implement the following dynamic difference-in-differences specification to examine this parallel trends assumption:

$$Y_{it} = \alpha_i + \alpha_t + \delta \cdot \sum_{n=-4}^3 \text{Second Round}_{i,t+n} + \varepsilon_{it}, \quad (2)$$

where $\text{Second Round}_{i,t+n}$ are indicator variables in the four years before and three quarters after the enactment of the PPP. The base year for this specification is 2019, which is the year before the PPP and normalized to zero.

4.2 Threats to Identification

We examine two concerns about the empirical design. First, a potential threat is that banking relationships differ for firms receiving PPP loans at the end of the first round compared to those obtaining PPP loans at the beginning of the second round. To address this concern, we link data on PPP loan recipients to their lenders using Call Report data. We use two outcomes to measure banking relationships (Li and Strahan (2020)). First, we proxy for size based on the log of bank assets. Second, we measure deposit intensity using the core deposit ratio, which is defined as transaction and insured time deposits relative to assets. Each variable is constructed in the fourth quarter of 2019, which is before the pandemic starts. We estimate the following cross-sectional specification:

$$Y_{i,2019Q4} = \alpha_s + \alpha_j + \beta \cdot \text{Second Round}_i + \varepsilon_i, \quad (3)$$

where $Second\ Round_i$ is an indicator variable equal to one if firm i in state s and industry j receives a PPP loan in the second round.

Panel A of Table 2 reports the association between bank size and receiving a PPP loan in the second round. In column 1, we find that the relationship is economically negligible and statistically insignificant. Column 2 shows that bank size remains similar when we include state fixed effects to absorb state heterogeneity. Additionally, we augment the specification with industry fixed effects in column 3 and continue to find no association. In Panel B of Table 2, we repeat the analysis using the core deposit ratio of banks. We continue to find no evidence of differences in banking relationships around the funding gap in the program. Taken together, these estimates suggest that banks originating loans to firms at the end of the first round and beginning of the second round do not appear to differ.

Second, we evaluate differences in firm characteristics for PPP recipients at the end of the first round compared to those at the beginning of the second round. In Figure 2, Panel A plots average employees for firms by state and Panel B shows median firm employees by state. This figure highlights that employment at firms receiving PPP loans is quite small. Additionally, it provides evidence that firms at the end of the first round and beginning of the second round employ a comparable number of workers.

We also explore industry composition for firms receiving PPP loans around the funding gap. We determine the proportion of loans allocated to two-digit NAICS sectors at the end of the first round and the beginning of the second round. In Figure 3, Panel A plots the proportion based on loan amounts and Panel B provides the share using loan counts. The figure shows that the proportions are strikingly comparable across sectors. Further, it highlights that there is substantial variation in industries receiving support, with construction, health and social care, and professional services as the sectors that are allocated the most support.

5 Financial Distress and Credit Supply

This section studies the role of timing in the deployment of government capital on the financial distress and credit supply of firms. Section 5.1 presents the baseline results. Section 5.2 determines the robustness of these estimates. Section 5.3 evaluates heterogeneity in pre-pandemic financial constraints. Section 5.4 examines credit supply.

5.1 Effect of Timing on Financial Distress

We start by studying the impact of delays in government support on the financial distress of firms. Deployment of government capital during crises is critical to stimulate short-term economic activity, in addition to preventing spillover across sectors of the economy. Our identification approach compares financial distress at firms receiving Paycheck Protection Program loans at the end of the first round to firms that are PPP loan recipients at the beginning of the second round. By using a narrow window of four days around the PPP rounds, we focus on similar firms and evaluate the effect of the delay on financial distress.

We use comprehensive data from the Experian Commercial Credit Risk Database to construct two measures of financial distress. First, we define *Late payments* as an indicator variable equaling one if a firm is beyond terms on at least one of its trade lines. This measures whether firms are financially distressed along the extensive margin. Second, we construct *Number of days late* as the average number of days that a firm is beyond terms on its trade lines. This variable captures financial distress along the intensive margin.

In Table 4, Panel A reports the short-run effects of the timing of government support on firms in the second quarter of 2020 using the difference-in-differences specification in equation (1). The variable of interest is *Second Round*, which is an indicator variable equal to one for firms that received a PPP loan at the beginning of the second round and after the program started. In column 1, we find that the likelihood of a firm being late on its payments increases by 0.9 percentage points if a firm receives a PPP loan at the beginning

of the second round. The effect is statistically significant at the 1% level and represents a 4.6% increase relative to the sample mean. In column 2, we report that firms receiving PPP loans in the second round are significantly later on their payments to creditors by 0.2 days. The estimate is similar in significance and economic magnitude, representing a 5.4% increase relative to the sample mean. Overall, these findings suggest that there is an immediate impact on financial distress due to the delay in receiving government capital.

[Insert Table 4 Here]

Panel B examines the long-run impact of the delay in receiving government capital on financial distress. We augment our sample with data from the third and fourth quarters of 2020. Column 1 finds that the probability of financial distress remains elevated at 0.8 percentage points, representing a 4.1% increase relative to the sample mean. Similarly, column 2 reports that firms are later on their payments if they receive PPP loans at the beginning of the second round. This estimate is a 3.8% increase relative to the sample mean and statistically significant at the 1% level. The results highlight that the delay in obtaining a PPP loan has persistent effects for three quarters after the launch of the program.

A crucial identifying assumption for our empirical design is that, without the delay in receiving government support, firms receiving PPP loans at the beginning of the second round would have followed parallel trends relative to firms obtaining PPP loans at the end of the first round. We estimate dynamic difference-in-differences specifications to evaluate this assumption using equation (2). For these specifications, we use data from 2016 to 2020Q4 to examine the dynamics throughout our sample period.

We provide these estimates in Figure 4 and Table 5. In Figure 4, Panel A reports the dynamics for the extensive margin and Panel B shows the dynamics for the intensive margin. The coefficients are reported in column 1 and 2 of Table 5 for the extensive and intensive margin, respectively. We find that there are no substantial differences before the program started in the trajectory of the financial distress measures for firms that obtained

PPP loans around the funding gap of the program. All estimates except one are statistically insignificant at conventional levels and they are economically negligible prior to receiving a PPP loan. The effects appear only when the PPP program starts in 2020Q2 and persist throughout the three quarters in the treatment period. The economic magnitude is the largest in the period when the PPP is introduced, though it remains elevated until the end of 2020.

[Insert Figure 4 Here]

[Insert Table 5 Here]

Taken together, there are substantial costs borne by firms for delayed fiscal support. Exploiting the exogenous variation in timing of PPP loans due to the funding shortages, we find that firms receiving PPP loans at the beginning of the second round are more likely to become financially distressed and are farther behind on payments to their creditors. The effects are persistent and last for several quarters beyond the delay in PPP loans. These results highlight the importance of timely dispersal of government support during crises, in addition to the impact on firms for time spent in distress.

5.2 Robustness

In this subsection, we explore the robustness of the effect of the delayed receipt of government support on financial distress. Our main analyses focus on a narrow window of four days before the end of the first round until four days after the beginning of the second round. Figure 1 shows the total loan amount (in billions of dollars) around the funding gap in the Paycheck Protection Program. An underlying assumption in our empirical design is that the delay in receiving a PPP loan at the end of the first and beginning of the second rounds is only due to the funding shortage and not related to firm characteristics. To mitigate a concern that there are unobservable differences between firms around the funding gap, we focus on a narrower window surrounding the delay in the program.

[Insert Table 6 Here]

Table 6 provides the robustness results for our baseline estimates. We restrict our sample only to include firms receiving PPP loans two days before the suspension and two days after the resumption of the program. In Panel A, we report the short-run effects. We find that firms receiving delayed PPP loans experience a 0.7 percentage point increase in the likelihood of a late payment and there is a 5.2% increase in the days behind on payments to creditors compared to the sample mean. These estimates are quite similar in statistical significance and economic magnitude relative to the baseline results in Panel A of Table 4. In Panel B, we examine the long-run effects and continue to find comparable results along the extensive and intensive margins. Overall, these estimates show that the results are similar for an alternative window around the funding gap in the program.

5.3 Financial Constraints

Next, we examine the role of firm heterogeneity in the effect of delayed capital deployment on financial distress. Are financially constrained firms differentially impacted by the timing of PPP loans? We expect that the effects are amplified for firms facing substantial financial constraints in the pre-pandemic period. While the Paycheck Protection Program was broadly available to small firms, it is informative to evaluate if the effects vary for particular firms in determining the design of future policies during crises.

We construct an ex-ante measure of financial constraints using *Intelliscore Plus*, which is Experian's proprietary credit score. We define *Financial constraints* is an indicator variable equaling one if a firm has a below median *Intelliscore Plus* in 2019, which is the year before the pandemic begins. We extend the baseline specification in equation (1) by estimating a triple-difference model. We report the coefficients on the triple interaction (*Second round* \times *Financial constraints*) and the baseline term (*Second round*), focusing on the immediate impact by using the sample from 2016 to 2020Q2.

[Insert Table 7 Here]

Table 7 details the results for the role of financial constraints in the effect of timing on financial distress. We find that the impact of the timing of government support is larger for firms facing relatively larger financial constraints. In Panel A, we find that financially-constrained firms are significantly more likely to be late on their payments to creditors and delayed in these payments. The effect along the extensive margin is an increase of about 38%. The economic magnitude along the intensive margin is a substantial amplification for financially constrained firms. These results highlight that ex-ante constrained firms are in dire need of government capital and, when facing delays in receiving PPP loans, are more negatively impacted.

5.4 Credit Supply

This subsection studies the impact of timing of fiscal support on credit supply to firms. While we find that firms receiving capital later are more likely to face financial distress, it is unclear whether there is an additional effect on the credit supplied to these firms. We form two measures of credit supply using data from Experian. First, we define *Total credit* as the log of all credit reported in Experian for a firm in a particular period. Second, we construct *Trade credit* as the log of trade credit reported in Experian for a firm in a particular period. We estimate the effect of delayed government capital on credit supply using equation (1).

[Insert Table 8 Here]

Table 8 reports the impact of funding delays on credit supply for firms. Panel A provides the short-run estimates using 2020Q2 as the treatment period. In column 1, we find that total credit for firms receiving PPP loans at the beginning of the second round declines by 12.7%.⁶ Column 2 shows that trade credit drops by 23.8%. In Panel B, the results are similar in the long-run for total credit (column 1) and trade credit (column 2) when expanding the

⁶When the outcome is a natural logarithm, we report the exponentiated coefficient minus one.

sample to include three quarters in the treatment period. These results highlight that credit supply contracts when firms face delays in receiving government support.

Overall, our results highlight that, in the presence of a severe economy-wide shock, delays in providing government capital adversely impact firms. Using exogenous variation in the timing of PPP loans and detailed data on firm credit risk, we show that firms are less likely to meet their financial obligations and become financially distressed. These effects are amplified for firms entering the pandemic with heightened financial constraints. Additionally, credit supply contracts when fiscal support is delayed. The findings suggest that the timely deployment of government capital is crucial during crises and provide evidence on the consequences of funding gaps.

6 Economic Activity

This section studies the real effects of delays in government funding. Though delays in government support increase financial distress at firms (Section 5), it is not clear that there is an impact on economic activity at firms. On the one hand, firms facing financial distress might not be able to meet their financial obligations, consequently reducing firm activity or shutting down. On the other hand, creditors may have been less strict in enforcing contracts, mitigating the effect of delayed government capital.⁷ Section 6.1 presents the results on in-store activity at firms and Section 6.2 examines firm closures and shutdowns.

6.1 Firm Visits

We begin by examining the impact of timing of government capital on in-store activity at firms. We form a monthly panel from January 2018 to December 2020, omitting the month that the pandemic started in March 2020. We estimate equation (1) using this panel. This

⁷While particular creditors might have been less strict, we extensively search for government policies related to firm credit during the pandemic and do not find any evidence of mandating forbearance or credit moratoriums. Cherry et al. (2021) study debt forbearance for households during the pandemic.

approach allows us to compare in-store activity at firms receiving loans from the Paycheck Protection Program at the end of the first round to firms receiving PPP loans at the beginning of the second round.

We use data from SafeGraph to measure in-store activity at firms. The data provider aggregates anonymized location information from mobile devices. We construct the number of monthly visits to a firm, which is frequently used as a proxy of firm activity and revenues (Bartlett and Morse, 2020). We use two measures of firm visits. First, for interpretation, we standardize this measure by subtracting the mean and dividing by the standard deviation. Second, we use the log of the number of monthly visits.

[Insert Table 9 Here]

Table 9 reports the effect of delayed government support on in-store activity. In column 1, we find that firm visits decline for PPP recipients receiving government capital at the beginning of the second round relative to firms obtaining PPP loans at the end of the first round. This estimate is statistically significant and, since activity is measured over a month, economically meaningful. Column 2 reports the estimate using the log of monthly visits and shows that firms receiving delayed PPP loans experience a 4.5% decline in firm visits. These results suggest that delayed government support negatively impacted firms through a reduction in firm activity.

6.2 Firm Closures

Next, we seek to understand the effect of delays in deploying government capital on firm exits. Although government interventions in crises often provide short-term support, a key goal of fiscal policy is to prevent or limit the long-term negative impact on the economy. The Paycheck Protection Program aimed to provide immediate relief to small businesses to reduce the loss of human capital stemming from layoffs. We evaluate the long-run effects of the program using firm closures about a year after the program started.

It is challenging to observe firm closures for several reasons. First, firms might shut down through liquidation, which cannot be observed in court filings, rather than bankruptcy. Second, administrative data tracking firm exit are updated with a lag. Third, data often include permanent shutdowns and do not capture any temporary suspension of firm activity. To provide timely evidence on the effect of the program on firm exit, we use the status of PPP recipients on Google Maps. We define *Closed* as an indicator variable equaling one if a firm is listed as temporarily or permanently closed on Google Maps. To measure exit, we construct *Shutdown* as an indicator variable equaling one if a firm is listed as permanently closed on Google Maps.

[Insert Table 10 Here]

Table 10 provides the results for firm exit. Since a firm's status is observed at one point, we estimate a cross-sectional regression of equation (1). Panel A provides the results for firm closures. In column 1, we find that firms receiving PPP loans at the beginning of the second round are substantially more likely to be closed compared to PPP recipients at the end of the first round. The estimate is significant at the 1% level and represents a 17.2% increase relative to the sample mean. Column 2 includes state fixed effects to capture time-invariant state heterogeneity and column 3 augments the specification with industry fixed effects to absorb differences between industries. We continue to report statistically and economically similar effects of delayed government support on firm closures. Panel B highlights the estimates for firm shutdown, or permanent closure. We find that firms receiving delayed PPP loans are 15.0% to 17.2% more likely to shutdown. These effects are statistically significant and hold after including state and industry fixed effects.

In sum, our results provide evidence that financial distress induced by delays in the disbursement of government support negatively impact real activity at firms. We find that in-store activity at firms declines. Additionally, we show that firms are more likely to be closed or shutdown. These findings highlight the importance of timely disbursement of

government capital during crises and the long-term effect of delays.

7 Discussion

Our results highlight that, in the presence of a severe economy-wide shock, delays in distributing government capital negatively impact firms. First, we find that the interruption in support exacerbates financial distress at firms and leads to a reduction in credit supply. Second, we show that economic activity declines at firms receiving loans after the interruption in funding for the Paycheck Protection Program. In this section, we discuss two potential explanations for these findings: the business operations channel and the financing channel.

For the business operations channel, there are several reasons why a delay in receiving funding and the corresponding increase in financial distress may disrupt the ongoing operating activity at a firm. First, these firms might not be able to retain employees who can shift to other employers. Second, firms obtaining delayed loans might be unable to pay their suppliers, potentially reducing revenues, interrupting expected shipments, and forcing temporary or permanent closures. Third, since the pandemic imposes significant restrictions on the provision of goods and services, firms may be deprived of capital to invest in upgrading their equipment or adopting practices that could contribute to their survival during the pandemic.

For the financing channel, government capital could relax financial constraints at firms. Financial intermediaries and suppliers providing trade credit may be less strict in enforcing contract terms when firms receive government support. These institutions might also be more willing to renegotiate or allow debt forbearance for borrowers obtaining PPP loans. Further, government capital could provide firms with access to additional credit, either from their current capital providers or new financial intermediaries. Consequently, delays in receiving government funds might exacerbate the impact of the shock and harm real activity for firms.

Our evidence is consistent with both of these channels. Although we cannot directly

observe business operations, our results provide indirect evidence that the operations at firms receiving delayed PPP loans are negatively impacted using measures of in-store activity and firm closures. For the financing channel, we show that credit supply declines for firms receiving PPP loans at the beginning of the second round compared to those at the end of the first round in Table 8.

Last, we examine the likelihood of legal action by creditors, which is referred to as derogatory filings. Experian firm credit risk data detail whether there is a legal liability for a borrower and its amount. We construct *Derogatory filing* as an indicator variable equaling one if a firm has any derogatory public records, including tax liens, judgments, bankruptcy, or any collections. We also define *Derogatory amount* as the log of the total dollar amount of a firm’s legal liability. We estimate equation (1) and report the results in Table 11. In column 1, we find that there is a significant increase in derogatory filings of 0.7% relative to the sample mean. Column 2 shows that the amount in the derogatory filings rises by 0.6%. Though the magnitudes are relatively small, this indicates that firms receiving PPP loans later are more likely to face legal actions by creditors. These findings provide additional evidence consistent with the financing channel.

8 Conclusion

At the onset of a crisis, governments use fiscal policy to stabilize the economy. Government support can face delays due to a slow reaction by policymakers or depletion of available funds. Exploiting exogenous variation in timing of Paycheck Protection Program loans stemming from funding shortages, we find that firms receiving capital at the beginning of the second round are more likely to be financially distressed compared to firms at the end of the first round. These effects are persistent, lasting for several quarters after the disbursement of the PPP funds. Additionally, the adverse impact is amplified for firms entering the pandemic with heightened financial constraints. Finally, we show that in-store activity declines and

the likelihood of closure increases for firms obtaining delayed government support.

Our findings are consistent with two channels. First, delays in receiving government funds can directly disrupt businesses operations. These disruptions might include reductions in retaining employees, limited ability to pay suppliers, and scaling back investment activity. Second, timely government support can aid firms through a financing channel. We provide direct evidence consistent with the financing channel by showing that firms receiving PPP loans at the beginning of the second round experienced increases in legal actions and deterioration in credit supply.

The micro-level evidence on the role of capital allocation in the Paycheck Protection Program highlights two policy implications in crises. First, delays are costly. In the face of a crisis and with high uncertainty, our results suggest that delays negatively impact firms and, potentially more broadly, the economy. Second, staged support or funding rounds can produce unintended consequences. Though it may provide policymakers with flexibility, it might push fragile firms into financial distress.

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Figure 1: Timing of Paycheck Protection Program Loans

This figure provides the daily approval of loans (in billions of dollars) in the Paycheck Protection Program (PPP) from April 3 to May 7. PPP loans approved after May 7 comprise \$35.2 billion of the \$523 billion disbursed by the program.

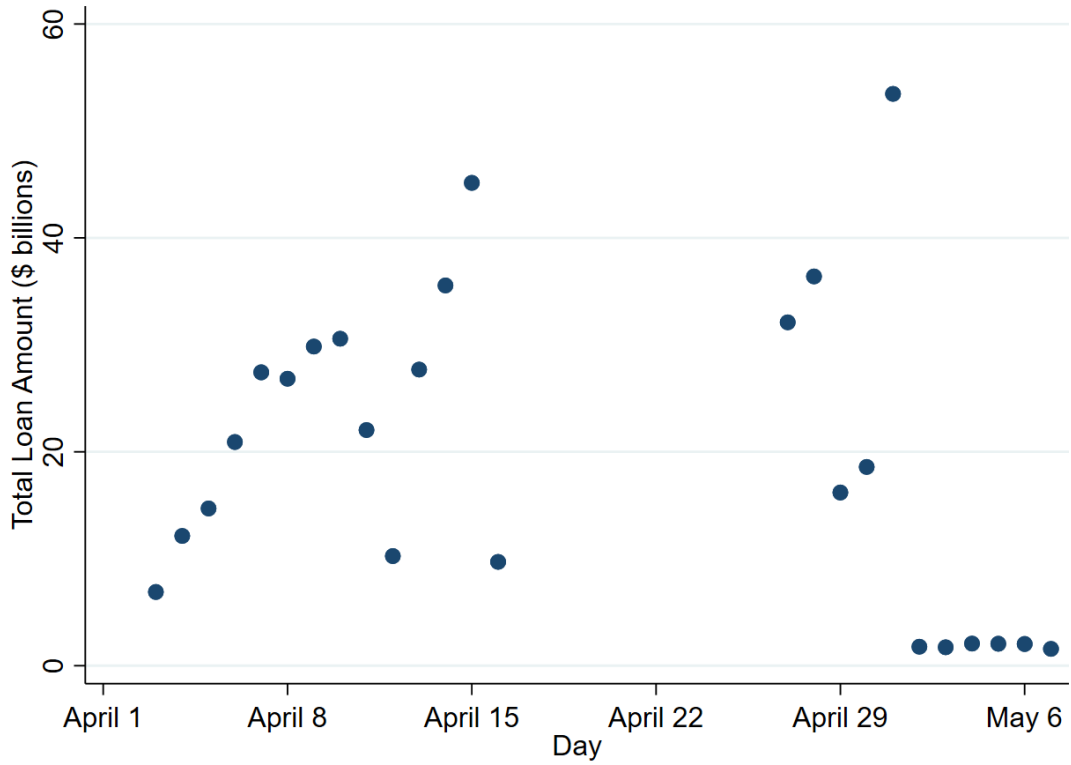
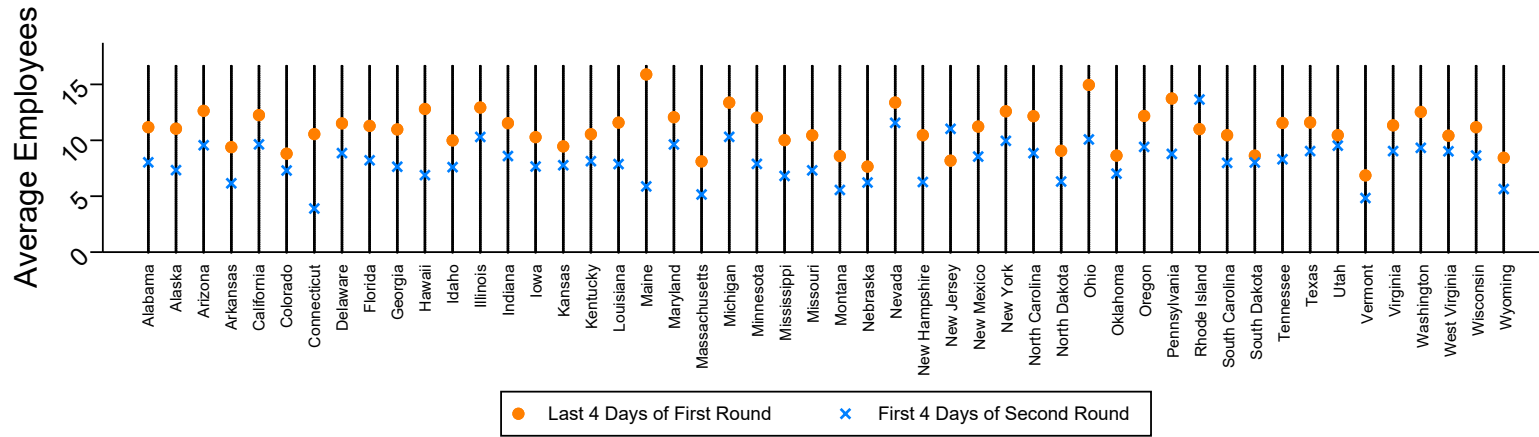


Figure 2: Employees at Firms Receiving PPP Loans

This figure shows employees at the end of the first round compared to employees at the beginning of the second round by state. Panel A provides the average employees by state. Panel B displays the median employee by state.

Panel A: Average Employees



Panel B: Median Employees

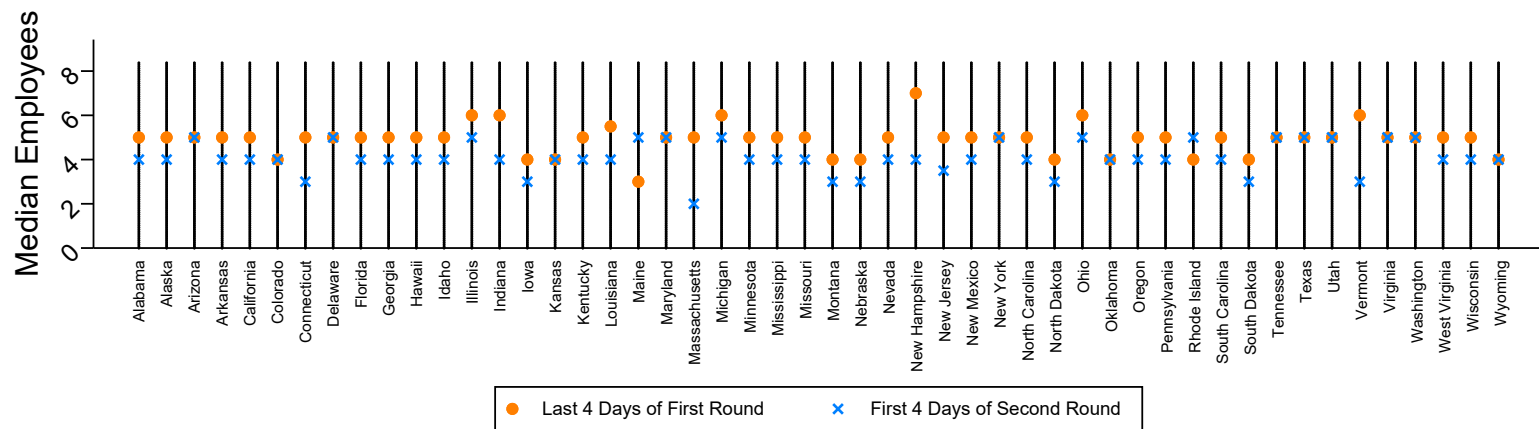


Figure 3: Industry Composition for Firms Receiving PPP Loans

This figure shows the composition of industries based on two-digit NAICS sectors receiving PPP loans at the end of the first round compared to the beginning of the second round by state. Panel A provides the proportion of total loan amount. Panel B displays the share based on loan count.

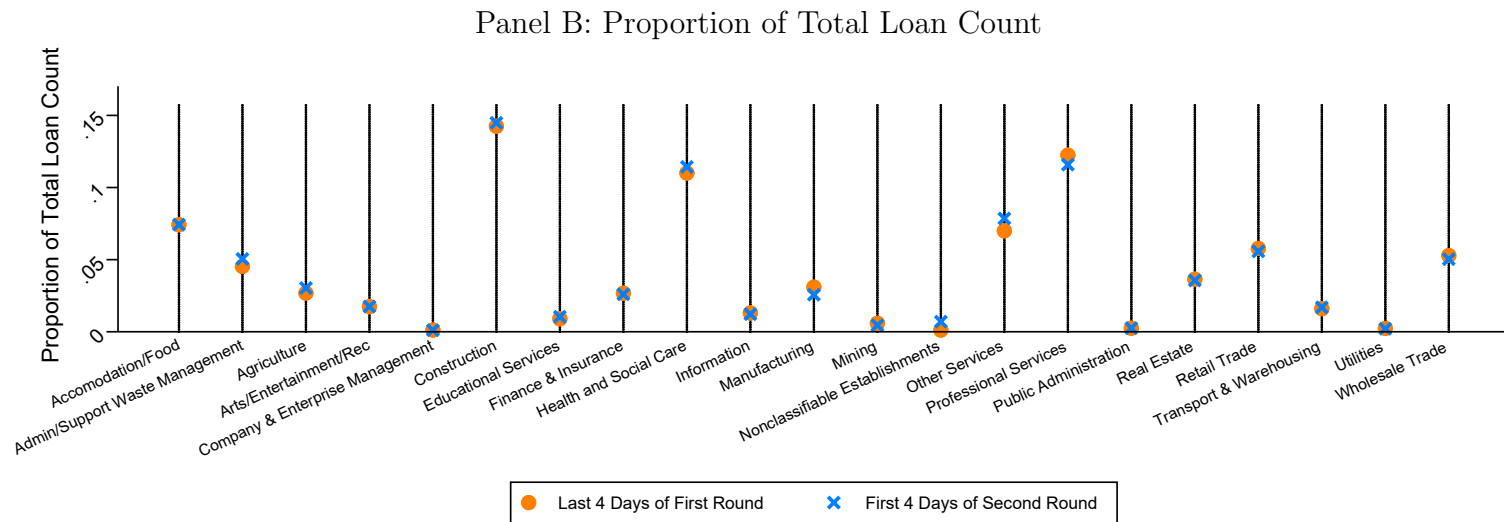
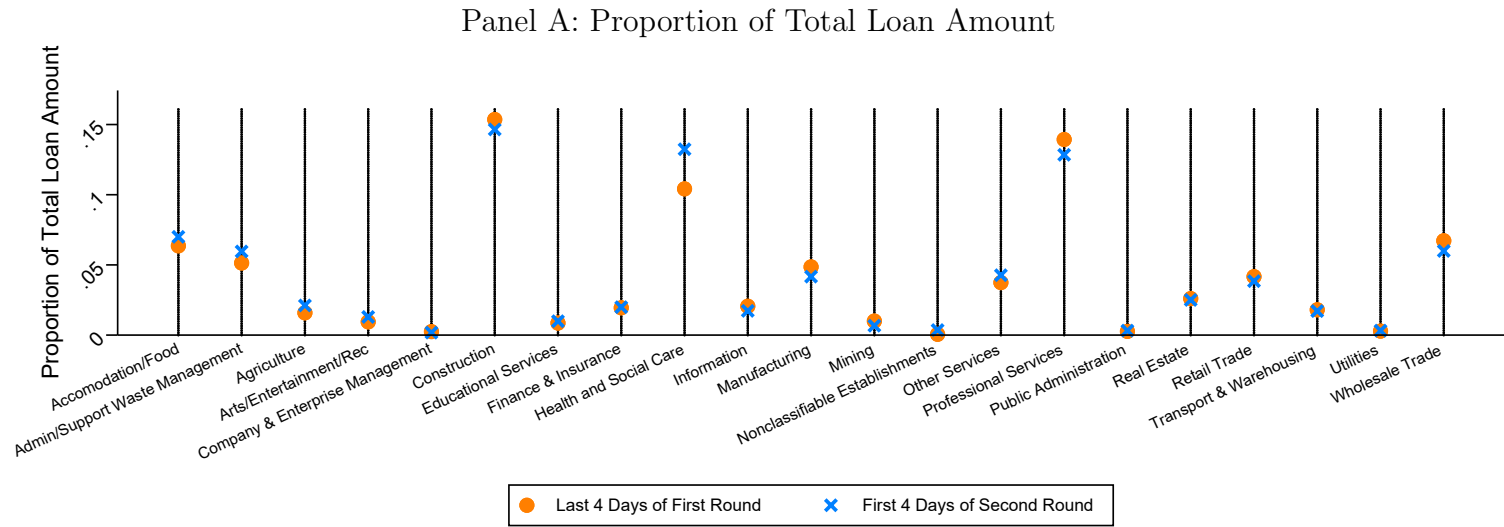
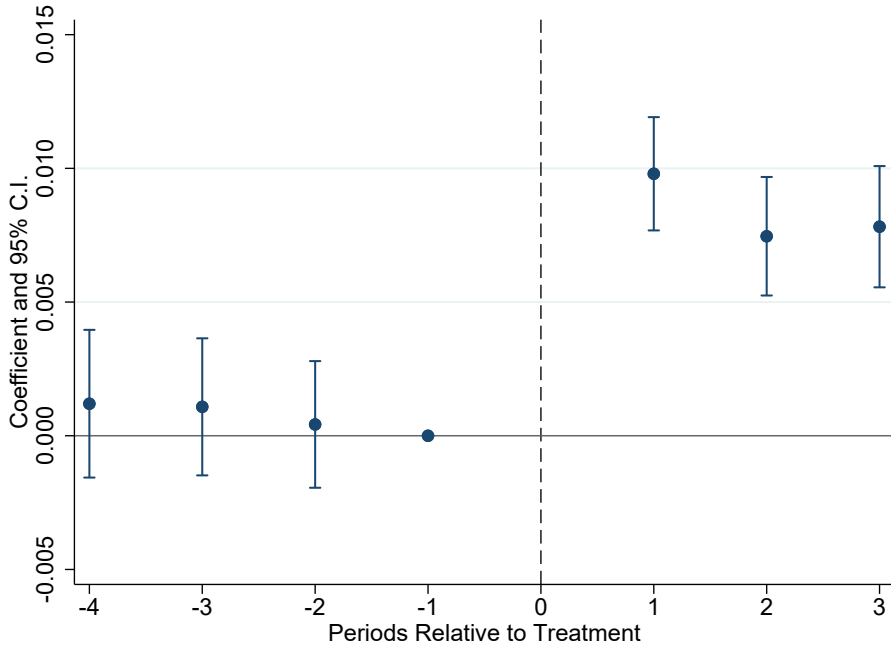


Figure 4: Dynamics

This figure plots the dynamics of the difference-in-differences estimates in Table 5 using equation (2). Panel A provides the dynamics for *Late payments* and Panel B shows the estimates for *Number of days late*. The base period is 2019.

Panel A: Late Payments



Panel B: Number of Days Late

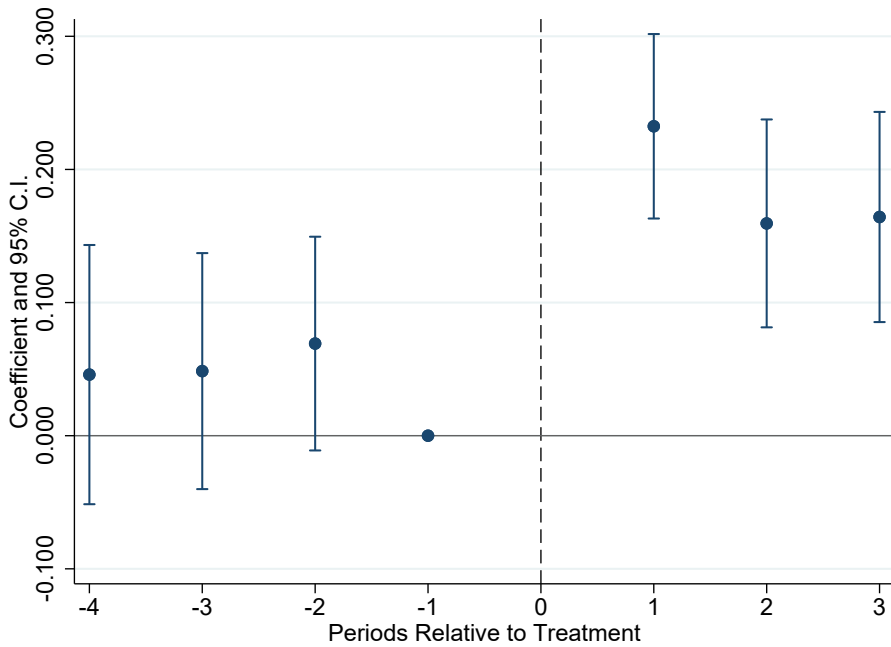


Table 1: Daily Loan Activity for the Paycheck Protection Program

This table provide summary statistics on daily loan activity in the Paycheck Protection Program. *Total loan amount* is the total loans approved in billions of dollars on a particular date. *Number of loans* is the total number of loans approved on a particular date. *Average loan amount* is the average loan amount in dollars on a particular date. *Median loan amount* is the median loan amount in dollars on a particular date. *Standard deviation of loan amount* is the standard deviation of loan amount in dollars on a particular date.

Date	Total Loan Amount (\$ billion)	Number of Loans	Average Loan Amount (\$)	Median Loan Amount (\$)	Standard Deviation of Loan Amount (\$)
April 3	6.9	23,532	293,113	103,700	600,318
April 4	12.1	44,949	270,046	89,750	600,812
April 5	14.7	50,443	291,535	95,700	634,030
April 6	20.9	82,830	252,553	79,700	588,818
April 7	27.4	117,246	234,005	74,600	553,173
April 8	26.8	114,455	234,464	70,500	580,233
April 9	29.8	126,490	235,985	67,800	588,796
April 10	30.6	140,000	218,425	60,764	562,968
April 11	22.0	104,721	210,444	63,640	534,204
April 12	10.3	47,488	215,977	67,800	525,979
April 13	27.7	151,513	182,796	52,800	505,918
April 14	35.6	220,282	161,419	48,250	450,808
April 15	45.2	315,830	142,957	40,000	431,393
April 16	9.7	79,976	121,447	32,818	364,052
April 27	32.1	273,981	117,194	29,615	391,091
April 28	36.4	441,660	82,419	23,369	281,515
April 29	16.2	252,311	64,186	20,800	223,001
April 30	18.6	311,524	59,669	20,605	212,408
May 1	53.5	801,456	66,719	24,123	200,100
May 2	1.8	42,282	42,070	16,558	165,033
May 3	1.7	32,825	52,652	18,192	200,703
May 4	2.1	58,198	35,635	14,001	137,349
May 5	2.1	56,676	36,251	14,300	137,614
May 6	2.0	56,330	36,138	14,261	179,808
May 7	1.6	48,292	32,692	13,116	121,433

Table 2: Banking Relationships

This table studies the relation between bank characteristics and when firms receive PPP loans. *Assets* is the log of bank assets in the fourth quarter of 2019. *Core Deposits Ratio* is the ratio of transaction and insured time deposits to bank assets in the fourth quarter of 2019. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round. Appendix A provides additional details on variable definitions. Industries are defined at the six-digit NAICS code level. Standard errors are reported in parentheses and clustered at the state level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Bank's Assets

Dependent Variable	Assets		
	(1)	(2)	(3)
Second Round	-0.007 (0.075)	-0.053 (0.065)	-0.054 (0.062)
State Fixed Effects	No	Yes	Yes
Industry Fixed Effects	No	No	Yes
R ²	0.000	0.083	0.102
Observations	445,179	445,179	445,179

Panel B: Bank's Core Deposits Ratio

Dependent Variable	Core Deposits Ratio		
	(1)	(2)	(3)
Second Round	-0.010 (0.007)	-0.007 (0.006)	-0.006 (0.006)
State Fixed Effects	No	Yes	Yes
Industry Fixed Effects	No	No	Yes
R ²	0.000	0.040	0.049
Observations	445,179	445,179	445,179

Table 3: Summary Statistics

This table provides summary statistics for variables in the analysis. *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit. *Number of days late* is the average number of days that a firm is beyond terms on its credit. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. *Total Credit* is the log of all credit reported in Experian. *Trade Credit* is the log of trade credit reported in Experian. *Derogatory filing* is an indicator variable equaling one if a firm has any derogatory public records, including tax liens, judgments, bankruptcy, or any collections. *Derogatory amount* is the log of the total dollar amount of the firm’s legal liability, including tax liens, judgments, bankruptcies, and collections. *Number of visits* is the standardized number of visits to firms, which is adjusted to have a mean of zero and standard deviation of one. *Closed* is an indicator variable equaling one if a firm is listed as temporarily or permanently closed on Google Maps. *Shutdown* is an indicator variable equaling one if a firm is listed as permanently closed on Google Maps. Appendix A provides additional details on variable definitions.

Variable	Number of Observations	Mean	Median	Minimum	Maximum	Standard Deviation
Late Payment	2,491,341	0.197	0.000	0.000	1.000	0.397
Number of Days Late	2,491,341	3.870	0.000	0.000	105.000	14.728
Second Round	2,491,341	0.123	0.000	0.000	1.000	0.327
Total Credit	2,491,341	7.891	8.666	0.000	18.316	3.566
Trade Credit	2,491,341	6.408	7.100	0.000	18.316	4.184
Derogatory Filing	2,491,341	0.140	0.000	0.000	1.000	0.347
Derogatory Amount	2,491,341	0.298	0.000	0.000	18.558	1.582
Number of Visits	2,461,624	0.000	-0.194	-0.393	181.838	1.000
Ln(Number of Visits)	2,461,624	3.876	4.044	0.470	10.835	1.395
Closed	400,703	0.025	1.000	0.000	1.000	0.155
Shutdown	400,703	0.022	0.000	0.000	1.000	0.147

Table 4: Financial Distress

This table studies the effect of timing of government capital on financial distress. Panel A examines the short-run effects in the second quarter of 2020. Panel B evaluates the long-run effects using data until the fourth quarter of 2020. *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit. *Number of days late* is the average number of days that a firm is beyond terms on its credit. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Short-Run Effects

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round	0.009*** (0.001)	0.209*** (0.034)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.551	0.614
Observations	2,491,341	2,491,341

Panel B: Long-Run Effects

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round	0.008*** (0.001)	0.147*** (0.030)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.508	0.577
Observations	3,548,608	3,548,608

Table 5: Dynamics

This table examines the dynamics of the effect of timing of government capital on financial distress. *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit. *Number of days late* is the average number of days that a firm is beyond terms on its credit. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round _{t-4}	0.0012 (0.0014)	0.0459 (0.0487)
Second Round _{t-3}	0.0011 (0.0013)	0.0485 (0.0443)
Second Round _{t-2}	0.0004 (0.0012)	0.0692* (0.0401)
Second Round _{t+1}	0.0098*** (0.0011)	0.2324*** (0.0346)
Second Round _{t+2}	0.0075*** (0.0011)	0.1595*** (0.0390)
Second Round _{t+3}	0.0078*** (0.0011)	0.1643*** (0.0395)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.551	0.614
Observations	3,548,608	3,548,608

Table 6: Robustness

This table evaluates the robustness of the baseline estimates using a two-day window around the funding gap. Panel A provides the short-run effects in the second quarter of 2020 and Panel B shows the long-run effects until the fourth quarter of 2020. *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit. *Number of days late* is the average number of days that a firm is beyond terms on its credit. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Short-Run Effects

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round	0.007*** (0.001)	0.198*** (0.047)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Window	[-2, 2]	[-2, 2]
R ²	0.548	0.604
Observations	1,353,526	1,353,526

Panel B: Long-Run Effects

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round	0.006*** (0.001)	0.169*** (0.041)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Window	[-2, 2]	[-2, 2]
R ²	0.510	0.570
Observations	2,001,415	2,001,415

Table 7: Ex-ante Financial Constraints

This table studies the role of financial constraints on the timing of capital deployment. *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit. *Number of days late* is the average number of days that a firm is beyond terms on its credit. *Financial constraints* is an indicator variable equaling one if a firm has a below median Intelliscore Plus, which is Experian’s firm credit score, in 2019. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	Late Payments	Number of Days Late
	(1)	(2)
Second Round	0.005**	0.504***
× Financial Constraints	(0.003)	(0.120)
Second Round	0.008***	0.080***
	(0.001)	(0.023)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.551	0.614
Observations	2,491,341	2,491,341

Table 8: Credit Supply

This table studies the impact of timing of government support on credit supply. Panel A examines the short-run effects in the second quarter of 2020 and Panel B provides the long-run effects until the last quarter of 2020. *Total Credit* is the log of all credit reported in Experian. *Trade Credit* is the log of trade credit reported in Experian. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Short-Run Effects

Dependent Variable	Total Credit	Trade Credit
	(1)	(2)
Second Round	-0.136 ^{***} (0.006)	-0.272 ^{***} (0.008)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.809	0.756
Observations	2,491,341	2,491,341

Panel B: Long-Run Effects

Dependent Variable	Total Credit	Trade Credit
	(1)	(2)
Second round	-0.130 ^{***} (0.006)	-0.202 ^{***} (0.008)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.767	0.707
Observations	3,548,608	3,548,608

Table 9: Firm Visits

This table explores the effect of delayed government capital on firm visits. *Number of visits* is the standardized number of visits to firms, which is adjusted to have a mean of zero and standard deviation of one. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and month fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	Number of Visits	Ln(Number of Visits)
	(1)	(2)
Second Round	-0.017*** (0.005)	-0.046*** (0.005)
Firm Fixed Effects	Yes	Yes
Month Fixed Effects	Yes	Yes
R ²	0.789	0.827
Observations	2,461,624	2,461,624

Table 10: Firm Closures

This table evaluates closures of firms during the pandemic. Panel A examines firm closures and Panel B provides the effect on firm shutdowns. *Closed* is an indicator variable equaling one if a firm is listed as temporarily or permanently closed on Google Maps. *Shutdown* is an indicator variable equaling one if a firm is listed as permanently closed on Google Maps. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. Industries are defined at the six-digit NAICS code level. Standard errors are reported in parentheses and clustered at the state level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Temporary and Permanent Firm Closure

Dependent Variable	Closed		
	(1)	(2)	(3)
Second Round	0.0043 ^{***} (0.0004)	0.0040 ^{***} (0.0004)	0.0035 ^{***} (0.0004)
State Fixed Effects	No	Yes	Yes
Industry Fixed Effects	No	No	Yes
R ²	0.000	0.001	0.014
Observations	400,703	400,703	400,703

Panel B: Firm Shutdown

Dependent Variable	Shutdown		
	(1)	(2)	(3)
Second Round	0.0038 ^{***} (0.0004)	0.0036 ^{***} (0.0004)	0.0033 ^{***} (0.0004)
State Fixed Effects	No	Yes	Yes
Industry Fixed Effects	No	No	Yes
R ²	0.000	0.001	0.012
Observations	400,703	400,703	400,703

Table 11: Legal Actions by Creditors

This table examines the effect of timing of government capital on derogatory filings. *Derogatory filing* is an indicator variable equaling one if a firm has any derogatory public records, including tax liens, judgments, bankruptcy, or any collections. *Derogatory amount* is the log of the total dollar amount of the firm’s legal liability, including tax liens, judgments, bankruptcies, and collections. *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started. Appendix A provides additional details on variable definitions. All models include firm and time fixed effects. Standard errors are reported in parentheses and clustered at the firm level. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	Derogatory Filing	Ln(Derogatory Amount)
	(1)	(2)
Second Round	0.001** (0.001)	0.006** (0.003)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R ²	0.775	0.728
Observations	2,491,341	2,491,341

Appendix A Variable Definitions

This appendix provides variable definitions.

- *Assets* is the log of bank assets in the fourth quarter of 2019.
- *Closed* is an indicator variable equaling one if a firm is listed as temporarily or permanently closed on Google Maps.
- *Core Deposits Ratio* is the ratio of transaction and insured time deposits to bank assets in the fourth quarter of 2019.
- *Derogatory amount* is the log of the total dollar amount of the firm's legal liability, including tax liens, judgments, bankruptcies, and collections.
- *Derogatory filing* is an indicator variable equaling one if a firm has any derogatory public records, including tax liens, judgments, bankruptcy, or any collections.
- *Ex-ante distress* is an indicator variable equaling one if a firm has a below median Intelliscore Plus, which is Experian's firm credit score, in 2019.
- *Late payments* is an indicator variable equaling one if a firm is beyond terms on its credit.
- *Number of days late* is the average number of days that a firm is beyond terms on its credit.
- *Number of visits* is the normalized number of visits, which is adjusted for changes in the availability of location data.
- *Second round* is an indicator variable equaling one if a firm received a PPP loan at the beginning of the second round and after the program started.
- *Shutdown* is an indicator variable equaling one if a firm is listed as permanently closed on Google Maps.
- *Total Credit* is the log of all credit reported in Experian.
- *Trade Credit* is the log of trade credit reported in Experian