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Sizing up corporate restructuring in the COVID crisis*

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Abstract

In the wake of the COVID-19 pandemic, the financial and legal system will need to deal with a surge of financial distress in the business sector. Some firms will be able to survive, while others will face bankruptcy and thus need to be liquidated or reorganized. Many surviving firms will need to be downsized or acquired. In normal times, this triage is supported by the court system, banks, and financial markets. The goal of this paper is to size up the coming surge of financial distress, list the challenges it presents in the current environment, and offer potential policy solutions. Overall, our analysis suggests that the two key issues will be court congestion and excess liquidation and failure of small firms.

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The 2019 Coronavirus pandemic is an economic shock of unprecedented magnitude. In the first two quarters of 2020, US GDP contracted by 9.5%, with many forecasters anticipating at best a slow recovery and persistent output gap for years to come.[1] Even if the most acute effects of the shock turn out to be temporary, the consequences for many businesses will be severe. Some will fail or have failed already, others will have to undergo major changes in order to survive. Failure may mean acquisition by a rival, voluntary exit, or liquidation. Even surviving firms may have to renegotiate legacy debt, raise fresh funds or downsize.

In normal times, the triage between dying and surviving firms is implemented by bankruptcy courts and financial markets. This architecture is generally suited to the job, but gets stretched during recessions. This time around, the size of the task appears daunting.

The goal of this paper is to estimate how many firms will fail, evaluate how effective the triage will be, and what, if anything, should be done to help it occur efficiently. Our analysis proceeds in three steps: We first size up the coming surge of financial distress, then list the challenges it presents to the legal and financial architecture in the current environment, and finally describe potential policy solutions.

To set the stage, we estimate the upcoming increase in financial distress. We start by measuring the impact on firm revenues and profits. Overall, the impact on firm profits and revenues so far is comparable to the worst quarter of the 2008-2009 financial crisis. But analyst forecasts beyond 2021 suggest the intermediate-term consequences will be milder. We then turn to forecasting the impact on corporate leverage, which will rise as a function of the severity and length of the recession. Using a methodology similar to Crouzet and Gourio (2020) but using data on smaller firms, we forecast the impact of reduced revenues and profits on corporate balance sheets. Unsurprisingly, the effects will be particularly acute for the smallest firms in the economy, because they have weaker initial balance sheets and, to a lesser extent, larger fixed costs. Then, relying on analysis by Ma (2020) and Altman (2020), we forecast bond ratings downgrades and defaults. The number of defaults can be expected to increase substantially in the coming year. We close this section with a forecast of the upcoming surge of bankruptcies. This forecast is based on the historical correlation between business bankruptcy filings and unemployment rates. Based on current

[1] While, as of Feb 14, 2020, economic forecasters polled by the Survey of Professional Forecasters anticipated cumulative growth over 2020-2022 of 5.8%, as of Aug 14, they expect growth over 2020-2023 to be 3.8%. Thus, even though they expect a clear rebound in 2021, professional forecasters anticipate an output gap (compared to earlier forecasts) lasting well into 2023.

state of the economy, we expect overall bankruptcies to increase by as much as 140% in the current year.[2] By all metrics then, corporate financial distress is set to increase.

In Section II, we discuss the challenges posed by this surge to the legal and financial infrastructure that deals with corporate distress. This infrastructure usually triages amongst financially distressed firms, filtering those who will disappear ("liquidate") from those who will reemerge ("restructure"). This time, because of the unprecedented flow of distress documented in Section 1 and the uncertainty created by the pandemic, this triage may be difficult to implement, leaving some firms wrongly liquidated, while other firms artificially alive. We discuss these concerns and, as it turns out, some are real, others probably less so.

First, we investigate the oft-cited claim that the COVID-led recession will require a large amount of cross-industry or cross-regional reallocation of capital, reducing the need for the bankruptcy system to selectively cull the restructuring-worthy firms. To be sure, the short-run impact of COVID has had a significant industry component: airlines and hospitality, among other industries, have been hard hit. But reallocation depends on longer-term prospects of these industries. To test this, we calculate the dispersion of equity analyst forecasts of firms' future earnings at various horizons. Such expected dispersion is in general a reliable indicator of ex-post realized dispersion. Since the crisis, it has, if anything, decreased. This time around, analysts thus expect the post-COVID economy to look more similar to the pre-COVID economy than is commonly argued. Second, we quantify the capacity constraints of courts. We predict that the coming surge of bankruptcies could increase the judge caseload by 158% from 2019 levels, well beyond the caseloads seen in 2009-2010.[3] Third, we contrast the fates of small and large firms. Looking at the data, we show that small firms restructure very rarely. This is especially worrisome as the balance sheets of small firms are hit the hardest by the current recession. Fourth, we discuss the availability of financing for firms undergoing restructuring. When in the process of redrafting their capital structures, firms typically need to rely on debtor-in-possession financing (DeMarzo, Krishnamurthy and Rauh, 2020). Relying on analysis by Wang (2020), we appraise the amount of such financing needed to handle the coming wave of restructuring.

[2] Despite the economic headwinds, the pace of business bankruptcy filings in 2020 has been modest, with a strong uptick among the very largest US companies but little change among small businesses. Among the largest US public companies, bankruptcy filings have been concentrated in industries and companies in distress well before the pandemic (retail, energy).

[3] Appointing new judges to handle such a surge would require Congress to approve funding for this expansion in a new bill, which has not occurred to date.

We find the required amount to be very small relative to the size of the corporate debt market. Fifth and last, we study the banking system. To handle default, banks must be able to absorb large losses on their corporate loan portfolios. Using Call Reports, we delve into banks' balance sheets and find that U.S. banks have, for the moment, sufficient capacity to absorb losses on commercial loans. Overall, our analysis suggests that the two key issues will be court congestion and excess liquidation of small firms. Meanwhile, lack of financing seems to be less problematic, consistent with Hanson, Stein, Sunderam and Zwick (this issue).

Building on the growing list of proposals that have circulated in the wake of the crisis, Section III discusses policy options that could make the triage of distressed firms more efficient. Our discussion focuses on the key issues identified in Section II: alleviating court congestion, and targeting smaller firms. A first form of solution consists of encouraging out-of-court restructuring for smaller firms. We discuss moratoria and payment deferral schemes, which essentially freeze debt repayment for a limited amount of time. Such moratoria have been implemented in many countries around the world, and could be implemented in the US. Another approach has been suggested by Greenwood and Thesmar (2020), who propose a tax credit for lenders and landlords who accept a haircut on existing loans to small businesses. Their idea consists in drafting a simple master agreement with pre-specified values, to avoid endless haggling over terms. Overall, restructuring subsidies and payment deferrals are options that are especially suited for small businesses and should be targeted at them. But even in ordinary times, just under half a million establishments per year close, suggesting that these programs must be carefully tailored to avoid inefficiently subsidizing large numbers of firms.

A second set of policy options consists of changing the bankruptcy process itself. Iverson, Ellias, and Roe (2020) focus on court staffing. They estimate that, by recalling between 50 and 250 judges, the U.S. court system would ensure that caseload by bankruptcy judge stays at the level of the 2009 crisis. Other policies are related to bankruptcy law. We discuss a recent provision enacted right before the pandemic, Subchapter V of the bankruptcy code, which offers an off-the-shelf streamlined process for small businesses to access restructuring. In recent months, Subchapter V filings have been increasing, but take-up is still limited with only 506 total Subchapter V filings as of June 2020.[4] We advocate for a real-time monitoring

[4] https://www.epiqglobal.com/en-us/about/news/restructuring-bankruptcy/chapter-11-commercial-bankruptcies-up-in-june

of this provision in the coming months, to evaluate its effectiveness and increase its attractiveness to failing small businesses. We also discuss recent proposals by Stiglitz (2020), who suggests a large scale, administrative procedure to substitute debt for government-sponsored equity, and by Blanchard, Philippon and Pisani (2020) who propose that the government accepts larger haircuts than other creditors, conditional on the firm reemerging from bankruptcy.

Our paper complements a growing number of studies on the impact of the COVID-19 crisis on firms. Brunnermeier and Krishnamurthy (2020) discuss the notion of excess leverage, and the effect of the Federal Reserve policies on debt overhang. Hanson, Stein, Sunderam and Zwick (2020) and Saez and Zucman (2020) emphasize direct government support to firms via grants. Compared to these papers, our focus is on how to deal with firms once they are in extreme distress or have already failed. To be sure, if the crisis is short and the landscape of economic activity looks similar post-pandemic, it may well make sense to keep as many firms as possible alive, with the government subsidizing firms to avoid macroeconomic "scarring". But the longer is the crisis, the more the burden should be shared between the government and private creditors and equity holders.

I. The Impact of the COVID-19 Shock on US businesses

As of September 2020, the ultimate length of the economic crisis is still highly uncertain. However, it seems clear that the most acute effects of the crisis on US firms occurred in the second quarter of 2020, when some industries – including airlines, restaurants, and hotels – came to a virtual standstill. This section seeks to estimate the impact of the pandemic on creating distress and restructuring among U.S. businesses, with an emphasis on the differential effects between large and small firms. We first estimate the impact of the crisis on revenues and earnings. We then trace the impact through to leverage ratios on firm balance sheets. Last, we turn to the impact of default rates and bankruptcy.

1.1 Revenues and Earnings for Small and Large Firms

A variety of data sources paint a detailed picture of the pandemic on US firms. Early in the pandemic, the US Census administered weekly surveys to small and medium sized enterprises on the impact that Covid-19 had had on their business. Panel A of Figure 1 plots data from the most recent of these surveys, administered in late July 2020. We show the percentage of small firms, by NAICS sector, that report the pandemic having a "large negative effect" on their business. The figure reveals the well-known pattern that

entertainment, restaurants and hotels were the most severely affected sectors. In the next group, more than 40% of firms in the mining, oil and gas, transportation and health care sectors reported severe adverse impact on their business. Overall, with the exceptions of utilities, construction, and finance and insurance, all sectors have a significant share of firms that have experienced negative effects of the pandemic.

More detailed measures of firm impact can be constructed for public firms, which report quarterly revenues. Panel B presents the percentage change in revenue between the second quarter of 2019 and the second quarter of 2020, weighted by 2019 revenues, for the same two-digit NAICS sectors shown in Panel A based on data from Compustat. To preserve comparability across firms and sectors reporting at the same time, we limit the sample to firms with US headquarters and fiscal years that end in December, March, June of September. As can be seen, the sectors most impacted for smaller firms are also hit among larger companies: entertainment, restaurants & hotels. But there are differences, indicating that smaller, private firms, are hit more severely than the typical Compustat firm.

Panel C shows the distribution of revenue changes for the full universe of public firms. For these larger firms, the shock is big but so far, its magnitude is similar to the Great Recession of 2009. Revenues for the median firm dropped by 9.3% between 2019 Q2 and 2020 Q2, while median growth between 2008Q1 and 2009 Q1 (the trough of the 2009 crisis) was -8.1%.

Compared to the Great Recession, the effect of the COVID crisis on sales is more left-skewed than the financial crisis, but somewhat dampened by these firms' more flexible cost structure. As can be seen from Panel C, more than 10% of firms lost over half their revenues in 2020Q2, while only about 5% of firms lost half their revenues at the trough of the 2009 crisis. Suspecting that this strong left tail could have been magnified by (operating and financial) leverage effects, we zoom in on the share of firms reporting negative *earnings*. Fixed costs structures turned out to have dampened, rather than magnified, the left tail of the sales shock. In Panel D, we plot the percentage of public firms in Compustat with negative earnings in any given quarter. Among the largest firms, 37% report negative earnings in 2020Q2, a number strikingly similar to the first quarter of 2009 and the first quarter of 2001. Overall, within publicly listed firms, while the shock on sales is more left-tailed compared to the financial crisis, the share of firms with negative earnings is so far not larger. This suggests that the most severely hit firms had more flexible cost structures. There are limits to the value of this comparison, however, because the length of the current crisis is still

unknown, and would be substantially impacted if the United States went through a second lockdown period similar to that of Q2 2020.

To help make the comparison between 2020 (which is ongoing) and 2009 (which is completed), we turn to analyst forecasts, which allow us to go further into the future. We use the same data as Landier and Thesmar (2020), which contain, for the largest 1,000 firms, analyst forecasts of earnings for years 2020, 2021, 2022 from data provider Refinitiv. For these larger firms, we show in Appendix Table B.1 that these forecasts have been reliable (i.e., unbiased) at a one-year horizon, while slightly optimistic at longer horizons.[5] We also check, in non-reported analysis, that analysts are unbiased in terms of the fraction of negative earnings predicted (i.e. the fraction of negative earnings firms they forecast is in line with ex post realizations).

Table 1 summarizes the revision of earnings forecasts for different sectors since mid-February. For each industry, we compute the unweighted average of the growth in earnings forecasts between February 2020 and May 2020. We exclude firms for which the beginning-of-period forecast of earnings is negative. We compare these estimated growth rates to the beginning of the Great Recession. Specifically, for the earlier period we compute the percentage revision between Jun 08 and March 09.

Table 1 shows that, from the point of view of large public firms, equity analysts do not believe that either the short- or long-term effects will be even half of what they believed would happen at the beginning of the Great Recession. Second, the short-term dispersion of revision is modest compared to 2009, both at short and longer horizon. This is consistent with the idea that the COVID shock is expected to have a relatively homogeneous impact across these large firms. In Section 2, we will use a version of this dispersion to appraise the extent of future reallocation expected by analysts.

To sum up, based on looking at current and expected earnings and revenues, large public firms are less impacted than is commonly supposed, both in terms of realized and expected earnings. For these large

[5] It is well known that analyst forecasts at one year horizon used to be biased towards optimism in the 1990s on the universe of IBES firms. But even on this sample, short-term optimism has essentially disappeared since the late 1990s (Kothari, 2002).

firms, the effect of the recession can be expected to be relatively homogeneous. Meanwhile, for smaller firms, the PULSE survey suggests that the shock seems to be stronger: We explore this further below.

1.2 Is the COVID crisis biased towards industries with predominantly smaller firms?

We lack timely and granular data on the financial position of small firms, but we can study indirect measures of small firm exposure by asking whether industries and sectors that are disproportionately populated by small firms (agricultural, construction, restaurants) are also those industries and sectors that are most impacted by the COVID-19 shock. Panel A of Figure 2 provides a simple depiction of this, by plotting the sector-level unemployment rate in July 2020 against the share of total employment in that sector represented by small businesses. As can be seen, leisure and hospitality has suffered the largest increase in unemployment, but overall this industry falls in the middle of the distribution in the mix of small and large firms (restaurants are mainly small firms, but hotels include many large firms, for example). Overall, there is no discernible correlation between sector-level unemployment and the small business employment share.

Panel B of Figure 2 shows a related analysis. The solid line shows the national unemployment rate. The dashed line shows the unemployment rate based on the sum of sector-level unemployment rates in every month, weighted by small business employment. As can be seen, these two series track each other closely, including in the most recent period.[6]

1.3 Impact on Leverage Ratios

Crouzet and Gourio (2020), in a series of Federal Reserve blog posts, explore the financial position of US public firms as they enter the pandemic and make forecasts of their leverage in the coming year. Many nonfinancial publicly traded companies entered 2020 with elevated levels of leverage compared to the historical average, but only slightly. However, they suggest that the fragility is tempered by their low level of interest expense and high cash positions.

[6] A further dimension of heterogeneity is geographic dispersion in firms. While all states have restaurants and entertainment, some locations are concentrated in industries such as oil and gas, which suffered disproportionately in the early phases of the crisis. In general, the geographic dispersion of unemployment, measured as the standard deviation of unemployment rates across states, correlates strongly with the national unemployment rate over time. This recent period is consistent with this overall pattern.

Crouzet and Gourio (2020) forecast the future liquidity position of public firms using assumptions about the impact of Covid-19 on operating cash flows, and holding fixed payouts and investment. Although they forecast 30% of firms exhausting their cash buffers by the third quarter of 2020, the implications are softened by the heightened availability of credit for public firms.

There is much less information available on the financial structure of smaller, non-listed, businesses. However, for selected years the IRS publishes aggregate income statement and balance sheet data by size class through the Sources of Income Statistics. Table 2 summarizes statistics from these data for the most recent year available which is 2013. We measure shareholders equity as the sum of capital stock, paid in capital, and retained earnings. Leverage is one minus the ratio of shareholder equity to assets. As can be seen, smaller businesses have dramatically higher leverage ratios, relying heavily on bank debt and loans from shareholders.[7]

In the spirit of Crouzet and Gourio (2020), we ask what would happen if businesses in each size class experienced a 30% decline in revenues with no decline in fixed expenses, except for cost of goods sold which scales with revenues. For simplicity, in this exercise we assume no investment, although the conclusions are unchanged if one allows for it. Table 2 shows these results. For the smallest businesses (less than $1m in revenue), a 30% drop in annual revenue with no offsetting change in fixed expenses is enough to effectively wipe out the equity in the business. As can be seen, this comes from two forces. First, smaller firms have higher leverage to start with. This is partly due to the fact that firm's equity is partly on the owner's private balance sheet for smaller firms, but this pattern of decreasing is observed even for larger firms. Second, smaller firms have a much bigger share of fixed expenses (financial and operating leverage) and operate with at higher asset-to-sales ratios.[8]

1.4 Predicting Credit Downgrades and Defaults

Ma (2020) draws on 72 years of historical data from the Moody's Default and Recovery Database, to forecast default and downgrade rates for firms rated by Moody's. Across ratings classes, she finds that

[7] Some caution is warranted in interpreting financial statement for the very smallest firms in the economy, those with total assets under $0.5 million. These firms have low book assets and typically no external shareholders, and limited retained earnings because they are pass-through corporations. For the slightly larger smaller firms, these concerns are somewhat alleviated. We focus on the next larger set of firms, those with assets between $0.5M and $1.0M.

[8] Carletti et al (2020) implement a similar analysis on Italian firms. They estimate that the lockdown will lead about 17% of Italian firms to end up with negative book equity. These firms are disproportionately smaller firms. We cannot conduct the same analysis since we do no have details about the distribution of small firms' balance sheets.

increases in the unemployment rate and declines in real GDP growth strongly predict higher probabilities of a rating downgrade. Drawing on recent forecasts of the unemployment rate and real GDP growth for 2020-2022 from professional forecasters, she predicts significant increases in downgrades, ratings withdrawals, and default.

Of the 4,476 issuers overseen by Moody's at the start of 2020, 1.4% have defaulted and 3.4% have had their rating withdrawn by June of 2020. Ma forecasts that an additional 4.9% will default and an additional 8.8% will have their ratings withdrawn by the end of 2020. According to her estimates, the US economy is through only about a fifth of the predicted number of defaults for this year, not to mention the additional defaults in the following years. While the corporate sector has fared unusually well thus far, history indicates that many more defaults and downgrades are to be expected. Using different methodologies, Altman (2020) also forecasts default rates in 2020, using data at the bond- and issuer level. His conclusions are similar, forecasting an aggregate bond default rate of 5.75%.

1.5 Predicting the Rate of Bankruptcy

The most severe form of financial distress is firm failure or bankruptcy. Despite the economic headwinds, the pace of business bankruptcy filings in 2020 has been modest, with large increases among the largest US companies, but little change among small businesses (under 100 employees). Through August 2020, overall business bankruptcies are actually 1% *lower* than the same timeframe in 2019. However, larger firms have been entering bankruptcy at higher rates, with overall Chapter 11 bankruptcies up 35% relative to 2019 and bankruptcies of firms with more than $50 million in assets rising by 194% (Wang, Yang, Iverson and Kluender, 2020). But bankruptcy filings by the largest US public companies have been concentrated in industries and companies that were experiencing distress well before the pandemic or lockdown period. Among the largest 20 firms by assets filing for bankruptcy in the first two quarters of 2020, five were in retail and apparel sectors, and seven were in oil and gas and mining.

There is a strong and intuitive historical relationship between unemployment rate – as a high-frequency measure of economic conditions – and the frequency of business bankruptcy. Figure 3 shows the close historical relationship between business bankruptcy filings nationally and the national unemployment rate, based on official filing statistics from the Administrative Office of the U.S. Courts. Panel A plots the relationship for business Chapter 7 (liquidation) filings, which are dominated by small businesses. Firms

that file for Chapter 11 (reorganization), shown in Panel B, are generally larger than those that enter Chapter 7, but still contain many small firms as well. In Panel C we display filings only for public firms with greater than $100M in assets at the time of filing, from a different database, the LoPucki-UCLA Bankruptcy Research Database. As can be seen, all three series are strongly counter-cyclical, although the number of large business bankruptcies is somewhat noisy. Further, Figure 3 puts the sharp rise in the unemployment rate in the second quarter of 2020 into context – clearly, if historical trends are repeated, an unprecedented number of bankruptcies is on the horizon.

Following the methodology of Iverson, Ellias, and Roe (2020), we forecast business bankruptcies based on an expected unemployment rate from 2020Q3 – 2020Q4 of 9.2 percent from the Survey of Professional Forecasters.[9] Based on the historical relationship between bankruptcies and unemployment, a 9.2 percent unemployment rate predicts that the pace of business bankruptcy filings can be expected to increase by 140%, relative to 2019. Importantly, this forecast uses unemployment rate forecasts while ignoring the recent path of unemployment rates of 14.7 percent, 13.3 percent, 11.1 percent, and 10.2 in April, May, June and July, respectively. Even though much of this spike reflects temporary shutdowns, it is likely that the stresses of the initial lockdown period will lead to bankruptcy for some firms.[10]

There are several factors that may be dampening bankruptcy filings currently. First, there was a very strong policy response in the form of the CARES act, PPP, Main Street Lending Facility, and the extension of unemployment insurance. Second, many of the triggers that force restructuring and bankruptcy were relaxed. In the lead-up to the pandemic, loan covenants for public firms were notably light, resulting in fewer technical defaults and hence fewer renegotiations.[11] And, when firms have defaulted, lenders and landlords have been relatively lenient in allowing excess time to cure missed payments. Evidence suggests that missed payments have been quite common. For example, the Census Small Business Pulse survey shows that 11.5% of all small businesses had missed a loan payment by the first week of May, and 23.6% had missed other payments such as rent. If lenders have willing to be lenient thus far, many firms that have missed payments may avoid bankruptcy, at least in the short run. The temporary nature of the initial shock,

[9] https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2020/survq320

[10] Iverson, Ellias, and Roe (2020) explicitly adjust bankruptcy forecasts for temporary unemployment. Even with this adjustment, their methodology results in forecasted bankruptcy increases of close to 100%. Further, forecasts of the unemployment rate arguably already account for the temporary nature of the unemployment seen in the second quarter of 2020.

[11] https://www.bloomberg.com/opinion/articles/2020-02-18/the-cov-lite-fight-in-leveraged-loans-is-lost

the policy response, and the lack of triggers that force restructuring have combined to reduce the number of bankruptcies we might have otherwise expected so far. Importantly, if these factors are only temporary, low bankruptcy numbers seen so far in 2020 only indicate the calm before the storm. On the other hand, if these factors have served to actually prevent financial distress for many firms, our forecasted bankruptcies could be far too high.

II. Triaging of Distressed Firms in the Recession

The previous section laid out what we know about the size of the COVID-19 shock, and some forecasts of how this shock will affect large and small firms across the U.S. economy. In this section, we first describe the triage-type process by which distressed firms shut down, liquidate, or get reorganized. Within this framework, we lay out several frictions that could prevent efficient liquidation or restructuring from occurring. We then turn to understanding how the triage process and the underlying frictions are impacted by the pandemic. The overriding goal of this section is to identify the specific restructuring frictions that COVID-19 could exacerbate as well as those which might not be as concerning.

2.1 Triaging Distressed Firms in a Wave of Corporate Distress

How does the bankruptcy process triage distressed firms? To fix ideas, consider a firm with continuation value V, liquidation value L, and debt repayment D. The firm is financially distressed: V is close to D. It has barely enough future cash-flows to pay back its debt. The flow chart in Figure 4 describes the different outcomes of financial distress and the empirical probabilities associated with each branch of the tree.

Continuation: If $V>D$ and $V>L$, the firm has enough resources to pay back its debt. It can and seeks to continue to operate. But because V is close to D, it may underinvest. This is the classic problem of debt overhang: Debtholders absorb a disproportionate share of the value created by new projects, so that junior investors – especially shareholders-- are reluctant to fund them (see Brunnermeier and Krishnamurthy, 2020, for a recent presentation). The solution in this case would be an informal, out of court, restructuring to reduce D, though this rarely happens in practice.

Exit: If $L>D$ but $V<L$, the firm simply stops operating without filing for bankruptcy. The entrepreneur liquidates the firm, pays lenders, and pockets in the residual. This often occurs for small businesses such as

restaurants. For small businesses, such voluntary exit also happens when $D>L$, i.e. liquidation proceeds do not cover existing obligations. Technically, the firm should file for bankruptcy, but for small firms the fixed cost of doing so often outweighs the potential benefits for claimants such as landlords or lessors.

Exiting out of court is incredibly common. Statistics from the Census Business Dynamics Statistics database show that, in the past 20 years, 91.7% of firms that exit do so outside of bankruptcy.

Bankruptcy with straight-out liquidation: When $V<D$ and $L>V$. The firm defaults on payments, places itself under the authority of a court of justice and is liquidated. In some instances, the entire firm is sold off. In others, assets are sold separately (piecemeal liquidation). This is the most common path for bankrupt firms, particularly for smaller businesses. Among firms going through a formal bankruptcy process, 84.4% of the firms go through this process as opposed to the Chapter 11 filing that we describe below.[12]

Chapter 11 filing. When $V<D$, but V ? L. When there is uncertainty about the continuation value of the firm, the business may file for protection from creditors under Chapter 11 of the bankruptcy code. This occurs in 15.6% of bankruptcy filings. The court seeks to estimate the continuation value of the firm. If the court estimates that $L>V$, it sends the firm to liquidation, either by converting the case to Chapter 7 or dismissing it outright (leaving the firm to liquidate out of court). Alternatively, if the business is estimated to be viable ($V>L$), it is reorganized. In a reorganization, equity holders and some junior creditor claims are usually wiped out, with senior debtholders becoming owners of the new firm.

Conditional on chapter 11 filing, the majority of firms are liquidated. Among the 15.6% of bankruptcy filings that happen under Chapter 11, 10.2% end up liquidated, and 5.6% re-emerge. As we discuss below, the vast majority of the re-emerging firms are large.

2.2 Frictions to Efficient Triage in the Pandemic

The triage described above does not occur in a vacuum; it is organized by a financial and legal architecture. It requires support from courts, including bankruptcy judges and trustees, and lawyers who sometimes intervene ahead of the formal filing by drafting out-of-court restructuring proposals, which take place under the shadow of the law, or prepackaged bankruptcy proposals to speed up the process after filing.

[12] For ease of explanation, we assume that all firms for which V<D and L>V choose liquidation in bankruptcy. In practice, firms of this type could also liquidate outside of court as long as creditors agree to take a loss without need for court intervention.

On the financing side, different types of investors play important roles. First, firms may need funding during the negotiation itself ("debtor in possession" financing), which is often provided by senior lenders. Second, firms may need funding to emerge from bankruptcy. Such funding can be provided by current claimants as well as external investors. Last, investors may assist firms out of court in various capacities: providing risky funds (distressed investors), financing the takeover of the firm by an acquiror, accepting out of court renegotiation of their claims (usually in exchange for a share of the upside of the company).

The triage implemented by the financial and legal infrastructure is likely to become less efficient in times of acute crisis. In theory, to be efficient, the sorting described in Figure 4 should lead to continuation whenever $V>L$, and exit whenever $L>V$. In the COVID crisis however, the accumulation of corporate distress will impose stress on the legal and financial infrastructure, potentially reducing the quality of the triage. We have in mind four mechanisms:

- **There is uncertainty about whether the COVID crisis is temporary or structural**. If it is temporary, this corresponds to an increase in D (obligations that arose due to the temporary shock to revenue). V does not change as cumulative future cash-flows are virtually unchanged. In this case, continuation is best when the firm was viable before: $V>L$ Alternatively, if COVID leads to permanent reallocation across US regions or industries, this corresponds to a reduction of V (as the firm's prospects are diminished) and an increase in L (as the firms' assets should be deployed elsewhere).

- **Congestion: Judges and lawyers are overwhelmed by the large wave of financial distress**. As a result, their estimates of V and L are noisier and wrong decisions happen more often. Also, the duration of the process is longer, part of V is destroyed in the process, making it more likely that $L>V$ due to restructuring costs.

- **The COVID crisis disproportionately impacts smaller firms, which are harder to continue.** For smaller firms, the estimate of V is noisier. Further, for small businesses a larger part of the continuation value V is not pledgeable to outside investors (it corresponds to the know-how of the entrepreneur, intangible capital like reputation, organization capital etc.).

  Suppose that only value $V'<V$ is pledgeable to investors. Then, investors value the continuation of the firm at V' and will thus choose liquidation whenever $V'<L$. Lastly, the fixed costs for

restructuring small firms may be quite large relative to their size, forcing V down and resulting in $L>V$ for these firms, even though V would be larger if restructuring were not needed.

- **Critical outside funding may be lacking in a crisis**. Firms typically need funding during the process and after emergence. The funding need is greatest among firms with large working capital balances, such as restaurants and retail, which are highly distressed due to the pandemic. As above, this may create a wedge between the actual continuation value of the firm V and what outside investors are able to fund. This can tilt the process towards excess liquidation

2.3 Costs of Financial Distress in the COVID Recession

Before discussing the extent to which these frictions are exacerbated by the COVID crisis, we perform a back-of-the-envelope estimate of the aggregate costs of financial distress that could occur during the COVID pandemic. Doing so is an important first step because it recognizes that even in regular times, bankruptcy and other milder forms of financial distress can be costly. For example, Andrade and Kaplan estimate that the costs of financial distress are between 10 and 23 percent of enterprise value. The frictions above potentially increase these costs further.

Data from the Federal Judicial Center's Integrated Database (IDB) gives the amount of liabilities owed by bankrupt firms from 2008-2017. Over this ten-year period, the average firm in Chapter 7 had $4.6M in liabilities at the time of filing while the average Chapter 11 firm owed $64.8M, and these distributions have been very stable over time. The bankruptcy forecasting exercise we discussed earlier suggested an estimated 15,638 Chapter 11 bankruptcies and 37,374 Chapter 7 bankruptcies over the next year. Given the average size of firms that enter bankruptcy, this yields $1.01 trillion dollars of liabilities will go into Chapter 11 and $171.9 billion will enter Chapter 7.

How much value could be lost from these bankruptcies? Financial distress costs are notoriously hard to estimate. We base our estimates on the midpoint of Andrade and Kaplan's (1998) estimates, but also recognize that there are many distress costs which occur well before a firm enters bankruptcy (Elkamhi, Ericsson, and Parsons, 2012) which are not included in our calculations. Assuming that 16.5% of firm value is lost due to financial distress, we estimate that frictions to restructuring could result in a loss of $195.5 billion, equal to 0.9% of U.S. GDP.

An alternative more fine-tuned calibration is obtained by predicting the number of bankruptcies for different size ranges of firms using the IDB (the overall bankruptcy forecasts in Section 1.5 use quarterly filing statistics for the longer 1980-2019 period, but official filing statistics are not divided by firm size). The IDB contains firm size, thereby allowing us to forecast bankruptcy filings for various size buckets using more recent data from 2008-2017. We estimate:

$$Bankruptcies_{st} = \alpha + \beta Unemp_t + \gamma_m + \varepsilon_{st}$$

where $Bankruptcies_{st}$ is the number of bankruptcies in size bucket s in month t, $Unemp_t$ is the national unemployment rate, and γ_m are calendar month fixed effects to soak up seasonality. We run this regression separately for each size bucket s.[13] Based on these estimates, we can forecast the number of bankruptcies in each size range if the unemployment rate were 9.2%, as expected in the Survey of Professional Forecasters. This exercise yields an expected 91,256 business bankruptcies over the next year (Table B.1), a substantially higher number than we forecast when using the longer time series from 1980-2019. This is because the relationship between unemployment and bankruptcies has strengthened over time, as can be seen in Figure 3. From this projection, we estimate aggregate costs of financial distress of $282.0 billion (1.4% of US GDP). Of these losses, roughly 20 percent are estimated to come from firms with less than $100M in liabilities.

Importantly, the above exercises assume that all firms experience a 16.5 percent loss of value due to financial distress, but this estimate is based on large, public companies. There is evidence that suggests that smaller firms may experience substantially higher losses. Bris, Welch, and Zhu (2006) estimate that direct fees alone could be as high as 30% of firm value for small businesses. In addition, smaller firms are much more likely to be liquidated, and Bris, Welch, and Zhu (2006) estimate that liquidation in Chapter 7 destroys significantly more value than Chapter 11, even after accounting for selection of firms into each chapter.

In addition to the firm value losses we just estimated, we can also estimate the costs of employee separations and reduced wages. To do so, we start from Bernstein, Colonnelli, and Iverson (2019), who show that the random assignment of a bankruptcy judge can exogenously move a firm from Chapter 11 to Chapter 7, resulting in a 34% drop in the number of employees at the establishments owned by the bankrupt firm. Their paper also shows that a surprisingly large fraction of firms – 58% – are sensitive to the

[13] The results of this estimation are in Appendix Table B.1, and we find essentially identical results if we use year-over-year differences instead of levels in the regression.

assignment of the judge, meaning that a large fraction of firms could easily be shifted across bankruptcy procedures. Given that bankrupt establishments in their samples have on average 36 employees, this suggests that assigning the most lenient judge to the average bankrupt firm could save 58% x 34% x 36 = 7 jobs. Multiplying this figure with our bankruptcy forecasting exercises above and in Section 1.5, which predict between 31,407 and 68,749 an additional business bankruptcies in the country, this would lead to some excess destruction of 220,000 to 480,000 jobs, or about 0.15% of the U.S. workforce.[14]

2.4 Evaluating Frictions in the COVID Crisis

In this section, we evaluate the frictions listed above, and provide evidence on whether the pandemic has made them more severe.

2.4.1 Is the COVID Crisis Temporary or Structural?

How much reallocation should we expect in the current crisis? If the crisis leaves the economy essentially unchanged except for a temporary, albeit very large shock, business fundamentals are unchanged and few firms should be liquidated. If however the crisis is going to deeply affect the productive structure of the economy, liquidation should become the norm so that capital and labor can be reallocated.

It is obviously very hard to gauge the expected allocative effect of the current crisis. Jaimovitch and Siu (forthcoming) document how recent business cycles have led to permanent shifts in capital-labor substitution, indicating durable changes in the structure of the economy, but the current crisis is different in nature. Barrero, Bloom and Davis (2020) use firm-level one-year ahead forecasts of employment to derive a measure of expected reallocation and find it to be quite large. This, in addition to other evidence, notably on stock returns dispersion and working from home, points to durable labor reallocation in the economy, consistent with the view that the crisis will permanently destroy some jobs.

We complement these analyses with an additional analysis is based on equity analyst forecasts. We analyze the dispersion of equity analysts' earnings forecasts during the spring of 2020 using the same data described in Section I. We compute the following reallocation index:

[14] While many of these workers will be reallocated to new firms, there is extensive evidence that job losses lead to permanent reduction in earnings. Looking at all mass layoffs in recessions, Davis and von Wachter (2011) find that workers experience a 20 percent reduction in long-term wages. Focusing on bankruptcy-related layoffs, Graham et al. (2019) find similar long-term wage reductions.

$$R_{t,h} = \sum_i w_i \left| FG_{i,t,h} \right|,$$

where w_i is a firm weight and $FG_{i,t,h}$ is the expected earnings growth for firm *i*, at date *t*, and at horizon $h \in \{2020,2021,2022\}$. We compute w_i as the earnings share of firm *i* in 2019 (we restrict ourselves to firms with positive 2019 earnings). Following Landier and Thesmar (2020), we compute the forecasted earnings growth of firm *i*, as of date *t*, and for horizon *h*: $FG_{i,t,h} = \frac{1}{h}\left(\left(F_t EPS_{i,t+h}/EPS_{i,2019}\right) - 1\right)$.

The reallocation index $R_{t,h}$ is an intuitive measure: It captures the cross-sectional dispersion of expected earnings growths, across firms. It can also receive a more structural interpretation. We show in Appendix A that, assuming firms operate with a Cobb-Douglas technology combining capital and labor and operate with a constant leverage, the measure $R_{t,h}$ corresponds to the total number of units of capital that are expected to be reallocated across firms, between 2019 and year *h*, normalized by the aggregate capital stock as of 2019. It essentially captures the share of capital (or labor) that will move across firms, provided investment tracks future profits.

Barrero, Bloom and Davis (2020), study smaller firms and conclude that the COVID shock will lead to substantial reallocation. Our approach differs from theirs in several ways. Its advantage is that it can leverage analyst forecasts, which are reasonably accurate and available at long horizons (until 2022, and even 2024 for a smaller set of firms). One drawback is that we focus on larger, publicly listed, firms. Another limitation of our approach is that it *does not* rely on actual forecasts of decisions (Barrero et al look at hiring plans), but on expected profits from these decisions. We are implicitly assuming a stable relation between expected profits and expected investment.

In order to build credibility for our measure, we display it in Appendix Figure B.2. over the 1990-2018 period, along with its realization (thereby replacing $F_t EPS_{i,t+h}$ by $EPS_{i,t+h}$ in the formula). This Figure shows that expected reallocation is in line with ex-post realization. Hence, the lack of responsiveness of expected reallocation cannot be attributed to forecasts "staleness". The only exception is for forecasts issued in April 2007, i.e. *before* the financial crisis, where analysts underestimated the amount of expected reallocation that would eventually happen. But as soon as the crisis unfolded, their forecasts were in line with ex post realizations.

In Figure 6, we show the evolution of our reallocation measure between February and May 2020, for each one of the three horizons 2020, 2021 and 2022. While expected dispersion for 2020 went up dramatically, this is not the case for longer horizon forecasts. Expected dispersion has not increased for

2021 and has actually decreased in 2022. Analyst forecasts have been revised downwards very strongly, but all in the same direction, making firms more similar to one another. Another explanation for this somewhat counter intuitive result is that, while some firms have benefited from the crisis (seeing their FG going up and thereby contributing to increase the index), their weight in aggregate earnings is relatively small. Most firms experienced a reduction in expected 2021 and 2022 earnings, which made firms more similar to one another. Overall, the term structure of expectations distortions has become *downward sloping*: The shock will make firms more different in the short-run, but less different in the longer-run, reducing the need for capital reallocation. In short, industry reallocation is forecast to be lower than is commonly supposed.

2.4.2 Crowding of the Bankruptcy Court System

Iverson (2018) estimates the effects of court congestion on several bankruptcy outcomes using the 2005 bankruptcy reform as a shock to court caseloads. First, looking at creditor recovery rates, Iverson (2018) estimates that a 5.8% increase in caseloads results in a 10% increase in bank business loan charge-offs. Extrapolating these estimates to a caseload shock of 30% (the typical increase seen in a recession), we might expect recovery rates to drop by 47%.

As discussed above, we use a simple forecasting model based on the unemployment rate to forecast business bankruptcies. The same bankruptcy judges who oversee business cases also deal with consumer bankruptcy cases, and consumers constitute about 80% of the total workload for an average bankruptcy judge. We can use the same process outlined in Section 1.5 to forecast consumer bankruptcies to estimate how overall bankruptcy court caseloads might react to the COVID-19 recession.[15] If unemployment is 9.2 percent over the next year, caseloads are forecasted to rise by 158%, close to five times the rise seen in a typical recession. While one should have caution when extrapolating Iverson's (2018) estimates outside the natural experiment, there are potentially large court congestion effects on creditor recovery rates if bankruptcies rise even half as much as our forecast.

The evidence in Iverson (2018) also suggests that as bankruptcy judges become busier, they focus their effort on larger firms, possibly at the expense of smaller firms. As caseloads rise, larger firms are

[15] A detailed explanation of this forecasting exercise and the calculation of court caseloads is in Iverson, Ellias, and Roe (2020).

actually more likely to emerge from bankruptcy, although the process takes longer. Meanwhile, smaller firms are more likely be dismissed from court, leaving many of them to liquidate without court protection.

2.4.3 The Small Firm Problem

The COVID crisis has the potential to especially distress small firms. This is not because the pandemic has especially affected industries dominated by small firms (Section 1.2), but instead because small firms' balance sheets are more vulnerable to losses in revenues (Section 1.3). We discuss here how financial distress differentially affects small and large firms.

Figure 4 confirms that large firms in need of restructuring have multiple options available, while small firms have no other option but to liquidate. Above $500m of liabilities, close to 80% of the bankruptcy filings end up as a Chapter 11-backed reorganization. The contrast with small businesses is striking: Below $1m of liabilities, 90% of the filings are straight-out liquidations, while less than 5% of bankruptcies end-up as re-emergence from a Chapter 11 filing. For a small firm, failure means liquidation almost all of the time.

There are reasons to believe that, for larger firms, the part of triaging system implemented by Chapter 11 is reasonably efficient in normal times. While academics have pointed out large frictions in the Chapter 11 process, in particular with regards to failures to fully rehabilitate distressed firms (Hotchkiss, 1995) and long delays in bankruptcy courts (Dou, Taylor, Wang, and Wang, 2020), the majority of large firms that enter Chapter 11 successfully emerge, and most estimates of inefficient continuation or liquidation are small (Djankov, Hart, McLiesh, and Shliefer (2008); Dou, Taylor, Wang, and Wang (2020)). One exception to these findings is Antill (2020), who estimates that 22% of large firms are inefficiently liquidated. We further note that, even if the firm itself is efficiently continued, many contracts within the firm may be inefficiently terminated. For example, Graham, Kim, Li, and Qiu (2019) show that, on average, employees who work for large corporations that enter Chapter 11 experience a 10% decline in wages over the next seven years. Importantly, this effect is most pronounced in thin labor markets, suggesting that inefficient reallocation of workers plays an important role in these losses.

Frictions to restructuring small firms are substantially larger. Even small disruptions to cash flow can trigger restructuring as many of these firms maintain low cash buffers and lack access to lines of credit (Bartik et al 2020). Based on the June 27 Census Pulse Survey, including financial assistance and loans,

only 30% of small businesses reported having enough cash to maintain operations for another three months. Thus, even when $V > L$, it is possible that forced, inefficient restructuring can occur simply because smaller firms run out of financing to continue to operate. Second, when restructuring does occur, smaller firms have fewer options available. Chapter 11 bankruptcy imposes costs that can be as high as 30% of a small business's total value (Bris, Welch, and Zhu, 2006), making it close to prohibitive for many small businesses even if they wish to continue. Consistent with this, small firms are more likely to simply shut down: Data from the Census Bureau Business Dynamics Statistics (BDS) shows that, on average from 2000 – 2016, 412,209 firms close annually. Meanwhile, only 36,783 businesses file for bankruptcy annually during the same time period, according to U.S. Courts filing statistics. In the end, while only 5.6% of all firms going bankrupt survive the process, these firms are predominantly large firms, so in liabilities-weighted terms, about 43% of the dollars of claims re-emerge.

High liquidation rates among small businesses are not inherently inefficient; it depends on how well labor and capital can be redeployed to new uses. Most evidence shows that after liquidation, reallocation of capital and labor to new uses is quite difficult. Graham, Li, Kim, and Qiu (2019) show that workers experience large wage losses after liquidation, especially in thin markets. Capital reallocation appears even harder than labor reallocation. Eisfeldt and Rampini (2006) show that capital reallocation is lower during recessions, indicating stronger search and financing frictions precisely when liquidations tend to happen. Bernstein, Colonnelli, and Iverson (2019) estimate the effects on capital utilization when a small business is forced to Chapter 7: a business establishment that is forced to liquidate is 17 percentage points more likely to be unoccupied five years after the bankruptcy, relative to an identical establishment that remained in Chapter 11.[16]

2.4.4 Financing Restructuring

To deal with the upcoming large flow of bankruptcies, and in particular handle debt restructuring, the financial system will be needed at several levels. Brunnermeier and Krishnamurthy (2020) fear that banks will have a propensity to interrupt lending to firms in financial trouble, and propose policies designed

[16] This is not because Chapter 11 firms are inefficiently continued. Roughly 75% of all business establishments that stay in Chapter 11 are reallocated to other uses, so even in Chapter 11 there is a large amount of reallocation. But, because the liquidation is not forced, it allows for reallocation that leads to higher utilization rates overall. Moreover, these effects are driven entirely by forced liquidation in "thin" asset markets, defined as areas with few other businesses in the same industry or areas with low amounts of small business financing available.

avoid this. DeMarzo, Krishnamurthy and Rauh (2020) fear a lack of DIP financing for firms in the process of restructuring (DIP) financing, and propose setting a government-sponsored SPV to fill that gap.

2.4.4.1 Corporate debt restructuring will have a small effect on banks' balance sheets

We explore here how much banks' balance sheets would be impacted by the upcoming wave of defaults and also large-scale debt restructuring. Our main finding is that the effect of a large wave of defaults or debt restructuring would be modest, since SME loans are only a small fraction of banks' assets.

In the first step of this analysis, we predict corporate loans charge-offs using unemployment data. To do this, we use Call Reports to compute aggregate charge-off rates (we use Charge-off rates on C&I loans and secured loans to corporations, which we aggregate over all banks covered in the Call reports). As shown in Figure 5, charge-off rates, which are typically around 1% in economic expansions and rose to 5% during the financial crisis, are strongly correlated with unemployment rate fluctuations. We exploit this relationship to build an econometric model linking the innovation of charge-off rates and unemployment rate (in this we follow Blank, Hanson, Stein, and Sunderam 2020). We obtain an *R*-squared of 0.87 for secured loans and 0.55 for C&I loans.

We then use forecasts of unemployment for 2020, 2021, 2022 and 2023 from the Survey of Professional Forecasters, which, combined with our models allow us to make forecasts of charge-off rates until 2023. We report these forecasts in Figure 5. We expect charge-off rates on C&I loans to be as high as 3% and secured loans to increase to 2%. These projections are less dramatic than during the financial crisis because, as of this writing in August 2020, professional forecasters anticipate that, post COVID crisis, unemployment will return faster to normal than in the aftermath of the financial crisis.

Do these projections have the power to shock banks' balance sheets in a meaningful way? Current data suggests they do not. In Table 3, we report the results of this analysis, separately for all banks, the 20 largest ones by assets and the rest. The first take away is that SME loans are already just a fraction of equity (slightly less than 40% for all banks, and a much smaller fraction for the top 20, a priori systemically more important, banks). As a result, a 2 percentage points increase in the fraction of charge-offs only has a very small impact on aggregate equity (2% times 40%), an order of magnitude smaller than 2019 dividend payouts which were 26% of book equity. The overall lesson of this quantification exercise is that SME loan

defaults will not meaningfully affect bank balance sheet in aggregate, even if they were as big as, or even twice as large as the GFC.[17]

The main reason for this small effect is that banks – in particular the largest ones -- are not lending much to small businesses, as noted by Chen, Hanson, and Stein (2017) and Gopal & Schnabl (2020). This is due to the rise of non-banks, notably Fintech, which have replaced bank lending over the past few years.

2.4.4.2 DIP financing: Will there be enough DIP financing?

Firms who are restructuring their debt need financing during negotiation. Such debtor-in-possession (DIP) financing is critical to allow the firm to function and make sure capital structure restructuring happens effectively. DIP financing is typically supplied by senior debtholders. Using various data sources covering bankruptcies of more than $50m in constant dollars, Wei Wang (2020) estimates that, over 1996-2014, about 60% of the firms receive DIP financing. Looking at all 79 "large" chapter 11 filings from January to May 2020, he finds that such bankruptcies raised some $9bn in DIP financing or about 5% of the $186m of liabilities involved. Smaller bankruptcies are much less likely to receive DIP financing. Overall, these amounts are reasonably small compared to total corporate credit, which is about $3,000bn.

In addition, it is not entirely obvious why DIP financing would be lacking. A classic problem with debt overhang is that new investors are not granted priority over existing ones. If they are, in theory this solves the problem of overhang, since overhang arises from legacy lenders having priority over the present value of new investments. But DIP is by definition senior in bankruptcy, so this problem should not arise. In addition, DIP is typically provided by senior lenders. If these are banks, the above analysis suggests that their balance sheets might be more resilient than commonly expected.

In sum, we do not consider it likely that there will be a scarcity in DIP financing, but the situation should be monitored closely, and if needed, setting a government sponsored SPV dedicated to DIP financing (as suggested by DeMarzo et al, 2020), could prove useful and relatively cheap for the US taxpayers.

2.4.4.3 Distress Investing: High elasticity to the Incidence of Distress

[17] The main reason for this small effect is that banks – in particular the largest ones -- are not lending much to small businesses. This is due to the rise of non-banks, notably Fintech, which have replaced bank lending over the past few years.

Bankruptcy and liquidation are not the only mechanisms to reallocate assets. Another mechanism for reallocation is merger or acquisition by a firm in a stronger financial position, or by a financial buyer such as a private equity firm. Consider the role of M&A in saving struggling public firms during the Great Recession. Out of approximately 5,600 firms listed as of June 2008 in the CRSP database, about 7% were acquired between September 2008 and December 2009. For comparison, about 8% were delisted for reasons other than exchange or merger, usually because they were headed towards bankruptcy. The median drawdown of the stock price just prior to acquisition was 64 percent, compared with a median drawdown of 98% for the firms that were ultimately delisted. This suggests that the market for corporate control is a useful exit path for struggling firms, but one that occurs more often for firms experiencing only moderate distress. For example, the two largest acquisitions during the Great Financial Crisis were the March 2009 purchase of Genentech by Roche and the October 2009 purchase of Wyeth by Pfizer. Neither of these were distressed, with both acquisitions occurring at valuations that exceeded their valuations in June 2008.

Gilson, Hotchkiss and Osborn (2016) document a rise in M&A in bankruptcy in recent years. They show that post-bankruptcy survival rates are similar whether bankrupt firms sell businesses as going concerns versus reorganizing independently, consistent with redeployment of asset via sales.

Specialized financial buyers also play a role. Distressed bond investors seek to benefit from the resolution of financial distress by buying debt at discounted values and see the company reemerge. Distressed equity investors bring in managerial skills to develop a strategy in order to benefit from the company's strengths and weaknesses.

Ahead of the crisis, assets under management held by distressed investors were at an all-time low (about $20bn in 2020Q1). But the supply of funds in that industry is highly elastic to the state of the economy. Beyond the strict specialty of distressed investing, there is much "dry powder" in the private equity industry that could be deployed to rescue struggling but viable businesses. Bain Capital (2020) documents that the amount of funds raised by the private equity sector was about $894bn in 2019, the second highest level since 2017.

III. Policy options

A series of policy proposals have been put forth to address the frictions listed in the previous section. These proposals fall into roughly three categories, tabulated in Table 4. First, several proposals involve

straight-out grants to firms to keep them alive through the initial lockdowns and subsequent downturn. The government's Paycheck Protection Program, although structured as forgivable loans, effectively did this. The second category of proposal consists of steps to encourage out-of-court restructuring, including payment moratoria and debt restructuring subsidies. The third category consists of modifications to bankruptcy procedures – such as increasing the number of judges and easing debtor-in-possession financing – to make it easier to restructure or liquidate in court. We focus our discussion on proposals dealing with the two latter categories, since the moment for supporting firms with grants has passed.

3.1 Encouraging out-of-court restructuring

Although bankruptcy is the most extreme outcome of financial distress, it is not the only one. Some businesses, after having accumulated obligations during the lockdown, will remain functional (like a restaurant becoming a food delivery operation), yet the accumulation of legacy debt will lead to debt overhang and underinvestment. Many firms will seek to deleverage progressively, by cutting investment and possible equity payouts, but this could be too slow, leading to a protracted period of underinvestment, in a sense similar to the slow recovery of consumption after the financial crisis. Debt overhang may not just arise from financial debt, but also fixed expenses coming from utility bills or rents (the focus of Hanson, Stein, Sunderam and Zwick's 2020 proposal). A number of policies can help restructuring this debt out-of-court, thereby avoiding bankruptcy. The proposals below focus on smaller firms.

3.1.1 Moratoria & payment deferrals programs for SMEs

One simple option is for the government to temporarily stop contractual payments to claimholders. Most moratoria have historically applied to individuals (for rents) and government (for public debt). For instance, during the first world war, French landlords did not receive rent from their occupants by decree until 1920. Since the beginning of the COVID crisis, various states and cities have implemented eviction moratoria. In mid-April, the G20 suspended debt payments for many developing countries. The CARES act allows borrowers to suspend or reduce payments on federally-backed mortgages, but interest and principal still accrue. So this provision is more of a payment deferral program.

As shown by Coelho and Zamil (2020), many countries have implemented loan payment deferral programs since the beginning of the crisis. Programs targeting SME lending were implemented in Australia,

Hong-Kong, Italy, Singapore and South Africa. Although the details vary, in most of these programs firms can reschedule both interest and principal, and in no case are interest and principal forgiven. In some of them, banks have been required to accept companies' requests to reschedule payments. In others, banks are not mandated to do so but the government coordinates with professional associations to encourage compliance. In some countries (like Italy), banks can request state guarantees for loans whose payments are suspended. Overall, this crisis has revealed how reluctant most countries are to arbitrarily modify private contracts without the consent of participants without providing implicit or explicit subsidies.

A key challenge facing payment moratoria is the pain these inflict on lenders, primarily banks. We already addressed the effect of SME loans on US banks' balance sheets in Section II. Overall our take is that SME loans do not have the power to shock banks' balance sheets to a significant extent, because SME loans have always been a small fraction of U.S. banks' balance sheets, and also because non-banks have taken over this market since the financial crisis (see e.g. Gopal and Schnabl, 2020).

3.1.2 Subsidizing voluntary restructuring

Another related policy option is to subsidize voluntary restructuring. Greenwood and Thesmar (2020) propose a one-size-fits-all approach for small businesses, subsidized by the government to reduce haggling between different counterparties and thereby to reduce the deadweight costs of bankruptcy and business failure.

Greenwood and Thesmar focus their discussion on unpaid rents, because these are often the largest class of financial claim facing the smallest businesses, after salaries and wages. Using SOI data, Figure 8 shows the aggregate rent to asset ratio by firm size. Cancelling rents altogether can offer a significant relief: In the smallest category of firms, cancelling one year of rent can reduce the debt to asset ratio by some 8 percentage points.

To illustrate their proposal, consider a restaurant owner with a viable business post-pandemic, with a landlord to whom she owes $1000. The landlord voluntarily gives up her $1000 claim against the restaurant in exchange for a tax credit of $300. If, for instance, rents are taxed at say 40%, giving up $1000 worth of claims has a net cost of only $300 to the landlord. This proposal is designed to make renegotiation of debt simple and fast, and, because the agreement is standardized, eliminates the need of the landlord or

creditor to investigate the financial resources of the small business. It is focused on small firms and valid for a prespecified grace period.

Government-subsidized restructuring shares the costs of restructuring between taxpayers (in the form of lower tax receipts in the future) and lenders or landlords. In this way, subsidized out-of-court restructuring lies somewhere between straight-out grants, which pass costs fully to taxpayers, and moratoria, which keep restructuring costs fully with investors. The Greenwood-Thesmar proposal recognizes the unique position of the government in implement a form of debt-for-equity swap: the government "buys" the forgiven debt in exchange for a slice of the value created from restructuring the debt. The government can do this because it can both give tax credits and cash via corporate income taxes.

3.2 Bankruptcy-specific policies

3.2.1 Bolstering the Bankruptcy Judicial System

If bankruptcies increases as much as we forecast, they will strain the legal system. Crowded courts may lead to either excess liquidation or excess continuation and lower recovery rates overall.

There are 349 bankruptcy judges in the US. According to Iverson, Ellias, and Roe (2020), between 50 and 246 temporary judges could be needed to ensure that the workload per judge does not increase more than it did in 2010. Congress could authorize additional judgeships, or retired bankruptcy judges could be temporarily recalled. Bankruptcy caseloads are expected to vary substantially across districts, with the largest needs in Delaware, Texas, Illinois, and Florida, suggesting the need to transfer judges across jurisdictions.

Since February 2020, small businesses have their own simplified version of Chapter 11, as put forth by the Small Business Restructuring Act. All businesses with less than $7.5m of liabilities can file under the new Subchapter V, whose goal it is to protect the owners' equity. The economic rationale is that, for many small businesses, wiping out the owner's equity destroys the enterprise value, as the entrepreneur is critical to the going concern value of the firm.

There are two key differences between the Subchapter V procedure and Chapter 11. First, unsecured debt loses priority to equity. Second, the court has the power to confirm a plan without a formal vote of creditors. This has the effect of making creditors weaker than in Chapter 11, and leaves a pivotal role for the judge and trustee. It is, in short, untested. The efficiency of the process depends heavily on the

ability of the legal system to filter viable from non-viable firms. As this form of bankruptcy became available just as the pandemic was taking root, its take-up has so far been limited. We suspect it will have little impact on the very smallest businesses that will close without filing for bankruptcy, but still has the potential to alleviate pressures on businesses with assets between $1 million and $10 million. To the extent that Subchapter V becomes more widely used, even more judges and trustees will be needed to be able to carefully consider these small business cases.

3.2.2 Pre-packaged Bankruptcies for Small Firms

A related policy consists of setting up a program of "pre-packaged" bankruptcies that are standardized for small businesses. Pre-packaged procedures have become more and more popular recently, but are still used almost exclusively by large firms, where the firm files for Chapter 11 with a plan that is already preapproved by all classes of creditors. This shortens the procedure considerably, avoiding uncertainty, court fees, and a need for DIP financing. Skeel (2020) suggests generalize this insight to help the bankruptcy system absorb the coming wave of financial distress.

An example of such pre-packaged bankruptcy is the "Super Chapter 11" proposed by Marcus Miller and Joseph Stiglitz. This proposal creates a new chapter of the bankruptcy code which resembles Chapter 11. The main difference is that the government injects fresh funds and becomes an equity holder, while creditors get a haircut. Management stays in place, allowing the firm to continue operations without firing employees. An economic rationale for such a policy is that firms are to some extent interdependent, so that the government is best placed to internalize these externalities, against taking a slice of the upside. The other rationale is that such a restructuring is simple and reduces costs of financial distress.

Such a proposal has a lot of caveats though. First, the government cannot rescue all firms that file, and if it did so it would rescue far too many nonviable entities. It has to make a choice, and it would need to set up a large-scale administrative process with little expertise and no time. This would be battlefield medicine with no experienced surgeon. As we discussed earlier, to this point it appears that private DIP financing is sufficient for the larger firms that typically rely on it. Second, some firms may have such large claims that the government would become the primary equity holder. Third, political economy considerations would likely pollute the process, with local politicians lobbying for federal funds to save small businesses.

3.2.3 Government subsidizing successful restructuring.

In the same spirit as Greenwood and Thesmar (2020), Blanchard, Philippon and Pisani (2020) suggest that the government could subsidize court-assisted debt restructuring, by taking an extra haircut on its debt. This extra haircut would be a transfer to existing creditors, but only conditional on the firm emerging from bankruptcy. If the firm were to liquidate, the government would not make any concession. In theory, the difference between the haircut facing private investors and the haircut taken by the government should reflect the wedge between the private and social value of business continuity. This wedge would need to be estimated in order to calibrate the policy parameters.

3.2.4 DIP financing subsidy

DeMarzo, Krishnamurthy and Rauh (2020) suggested that there is an undersupply of debtor-in-possession funding. They suggest that the government setup a funding special purpose vehicle, itself funded by equity from the Treasury and with Fed backing, to lend senior at very low discount rates. As our earlier discussion suggests an abundant supply of private capital, this will not be necessary.

3.2.5 Extending Chapter 11 Court Deadlines

Finally, there are policy options to modify the bankruptcy code without requiring any government funding. In May 2020, the Bankruptcy and COVID-19 Working Group sent a letter to Congress with recommendations designed to give small businesses more breathing room once they enter Chapter 11.[18] In particular, their proposal is to temporarily extend all major deadlines by six months for small business bankruptcies. This would allow the business to continue to operate with protection from creditors, but give the owner, judge, and trustee more time to evaluate the long-term viability of the business before needing to come up with a reorganization plan.

IV. Conclusion

[18] The full text of the letter can be found here: http://blogs.harvard.edu/bankruptcyroundtable/files/2020/06/Small-Business-Letter-Final-5.26.20-pm.pdf

Every year, firms become financially distressed. Some of these firms are affected by transitory shocks: to get back on their feet, they need new funding and a reduction of legacy leverage. Other firms are facing more existential threats: their products or markets are disappearing, their technology is obsolete. Usually, a financial and legal infrastructure helps route firms to the correct outcome. But this process is expensive; most distressed smaller firms simply shut down.

This paper addresses the question of whether this system is going to work as it should when, in the next months and years, we encounter a potentially unprecedented surge of distress. Much depends on the length of the pandemic and what structural shifts in the economy it engenders. The longer is the crisis and the greater the amount of reallocation needed, the more that some form of restructuring and liquidation will be inevitable. Viewed from this perspective, interventions that can reduce the costs of financial distress and ease the burden on the court system are low hanging fruit. Especially promising are interventions that encourage out-of-court restructuring. Meanwhile, our analysis suggests that the financial system generally has enough liquidity to support restructuring, but this should be monitored closely as the pandemic lengthens.

Our focus has been on firm-specific inefficiencies related to restructuring. But there may be additional spillovers as well, which combine to have long-lasting economic effects, including aggregate demand externalities from failing businesses to the deadweight losses from firm-worker separations. For example, Bernstein et al. (2019) show that forced liquidation has a strong negative effect on employment at other firms located in the same block as the liquidated business, and this effect lasts for at least five years. Moreira (2016) shows that firms born during recessions begin smaller and remain smaller throughout their lifecycles. All of these forms of economic scarring reinforce our conclusion that policy should focus on smaller firms.

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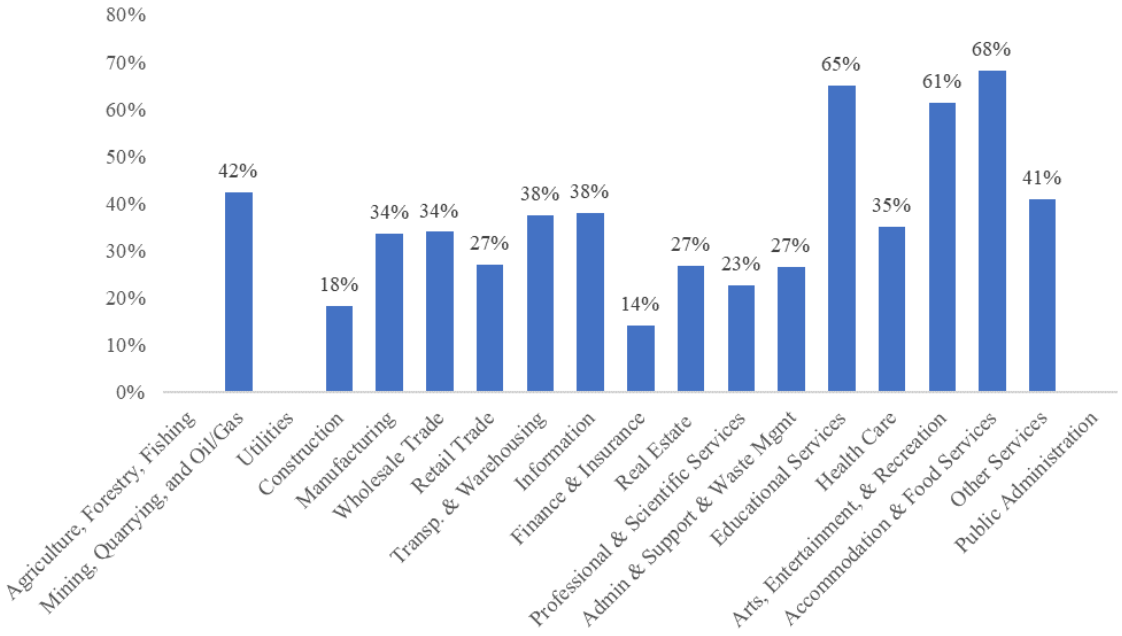
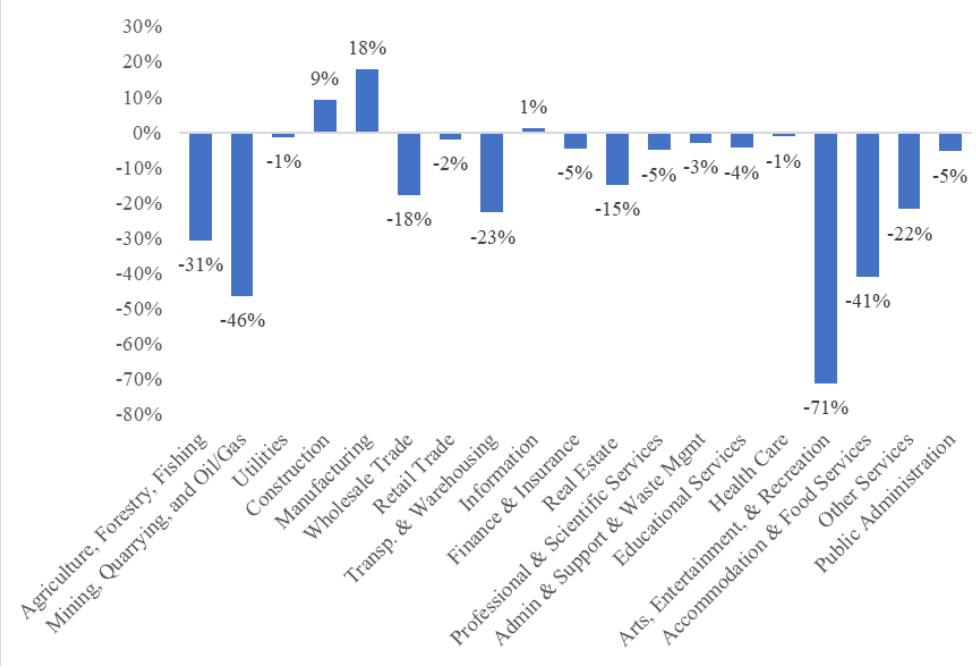
Figure 1. Impact of Pandemic on US Businesses

This figure displays various measures of how the pandemic has affected revenues and earnings of U.S. businesses. In Panel A, we display the share of small businesses who report a severe negative impact of the pandemic on their business, as reported in the Census Bureau's Small Business Pulse Survey of 6/27/2020. Panel B shows the average percentage change in revenues from 2019Q2 to 2020Q2 by two-digit NAICS industry, weighted by 2019 revenues, from Compustat. Panel C displays a histogram of these same year-over-year percent change in revenues across all firms in Compustat. Panel D shows the percentage of public firms with negative EPS in that quarter. For Panel C and Panel D, we exclude financials.

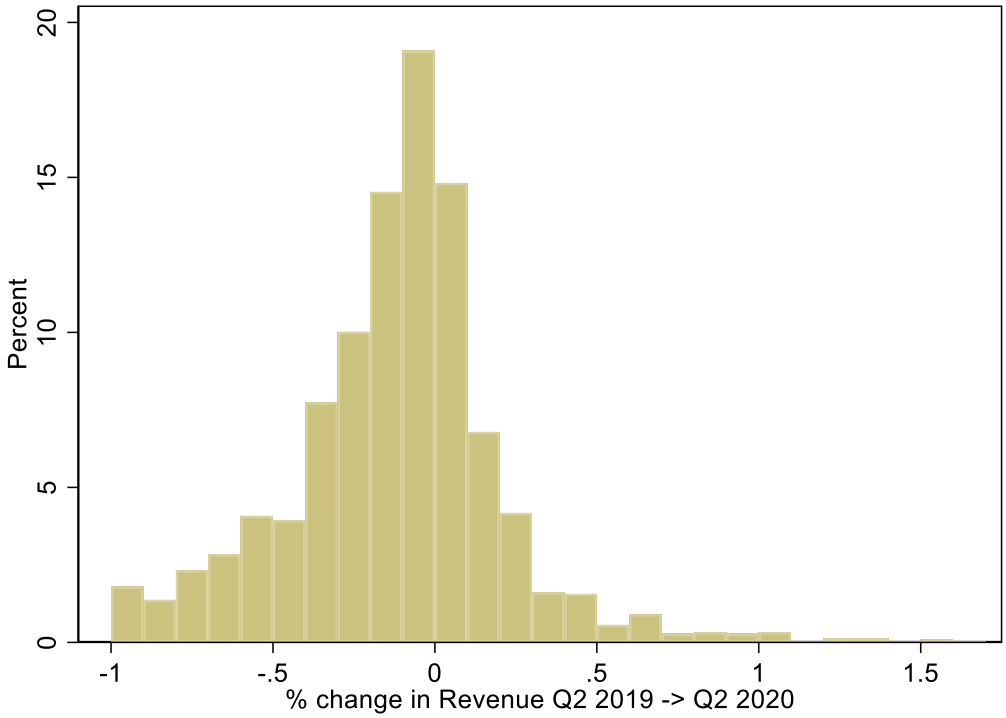
Panel A: % of small businesses in a sector reporting severe impact of pandemic on business



Panel B: YOY % change in revenues across industries



Panel C: YOY % change in revenues for public firms



Panel D. Time series of % of public firms with negative quarterly EPS (all firms=solid; large firms=dashed)

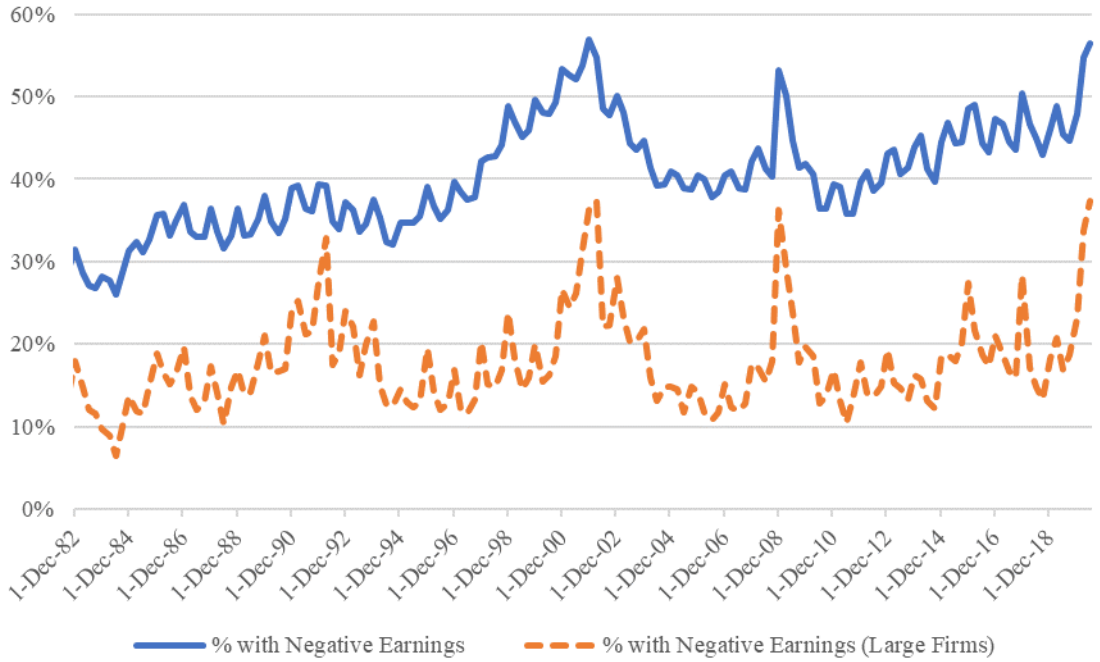
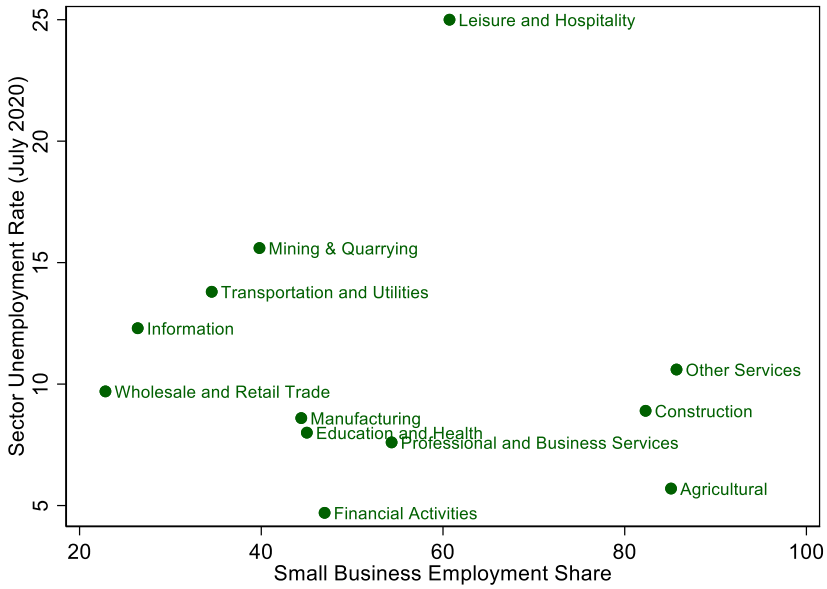


Figure 2 Where does the burden of the Covid-19 shock fall?
Panel A plots sector-level unemployment in July 2020 against the small business share of employment. Panel B plots the national unemployment rate (solid) alongside the unemployment rate weighted by the small business share of employment in that sector (dashed). Small business employment shares on 2015 data reported in the 2018 Small Business Profile by the US Small Business Administration.

Panel A. Sector Unemployment vs. Small Business Employment Share



Panel B. Unemployment vs. Small Business Unemployment

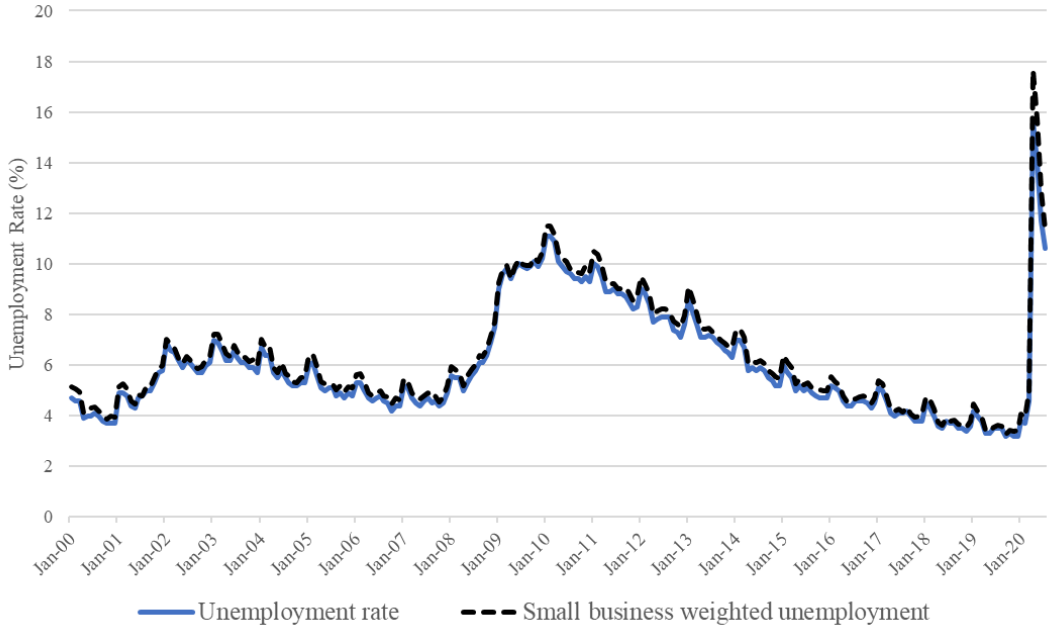
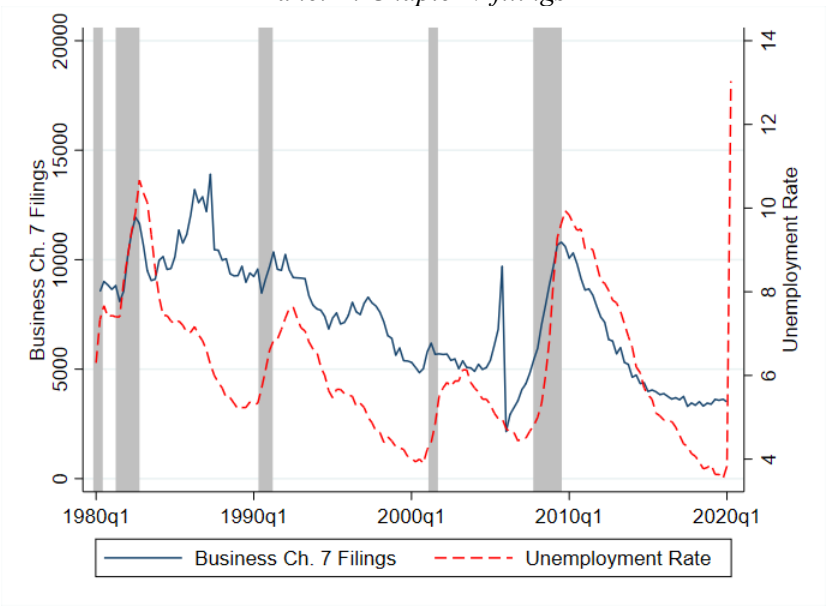
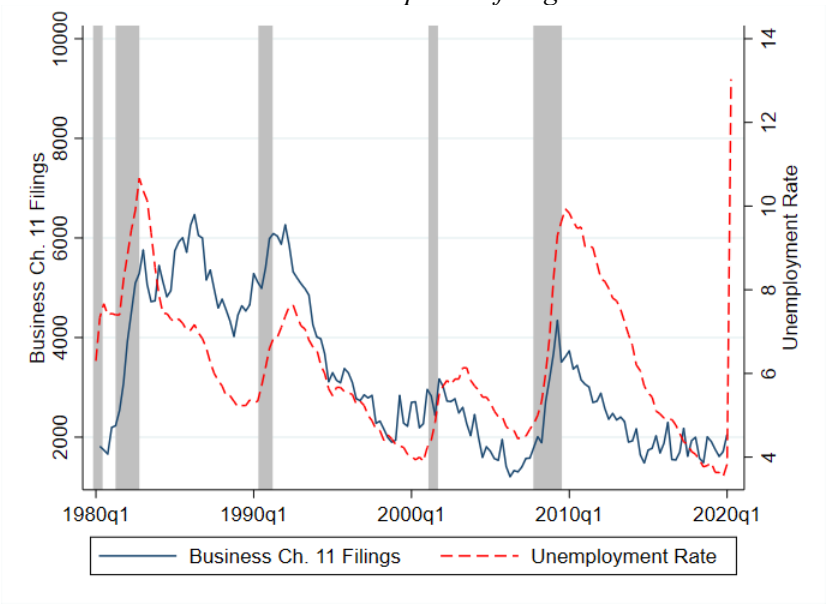


Figure 3 Business bankruptcy filings as a function of economic conditions
This figure displays time series plots of the U.S unemployment rate (all panels) against total business Chapter 7 filings (Panel A), Chapter 11 filings (Panel B), and Chapter 11 filings by public firms with greater than $100M in assets in constant 1980 dollars (Panel C). Unemployment rate comes from BLS, Chapter 7 and Chapter 11 filings are from the Administrative Office of the U.S. Courts, and large business filings are from the LoPucki-UCLA Bankruptcy Research Database.

Panel A. Chapter 7 filings



Panel B. Chapter 11 filings.



Panel C. Chapter 11 filings of public businesses with > $100M in Assets

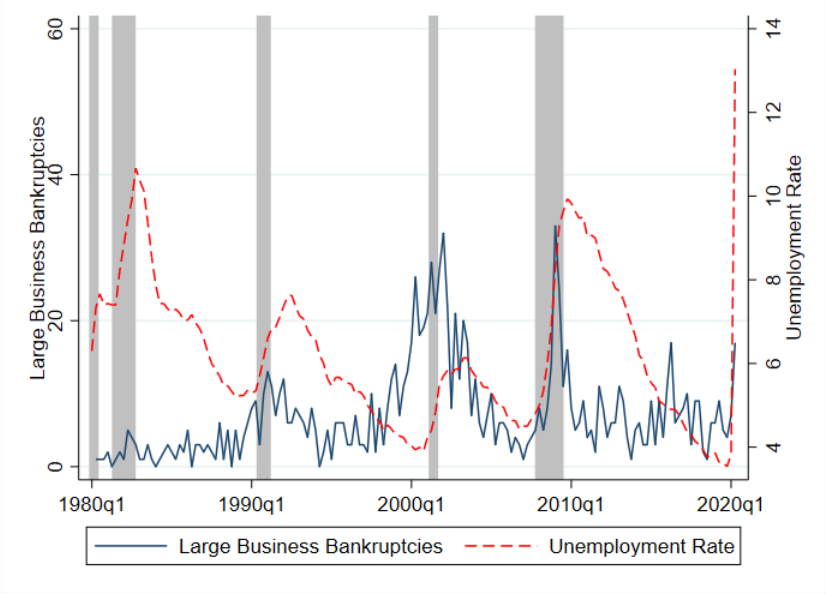


Figure 4. The triage process of bankruptcy
This figure displays a schematic of how firms deal with financial distress. Percentages listed under the bankruptcy branch represent the number of firms that go through each process, based on data from the Federal Judicial Center's (FJC) Bankruptcy Petition Database. We classify as "liquidated" all firms that enter Chapter 11 and are either converted to Chapter 7 or dismissed from court. Percentages listed at the bottom of the diagram are estimates of the share of firm closures that occur in- and out-of-court. We compute these figures using the total number of firm exits from the Census Bureau's Business Dynamics Statistics reports from 2000-2016 and comparing this number in each year to the number of firms that liquidate in bankruptcy from the FJC database.

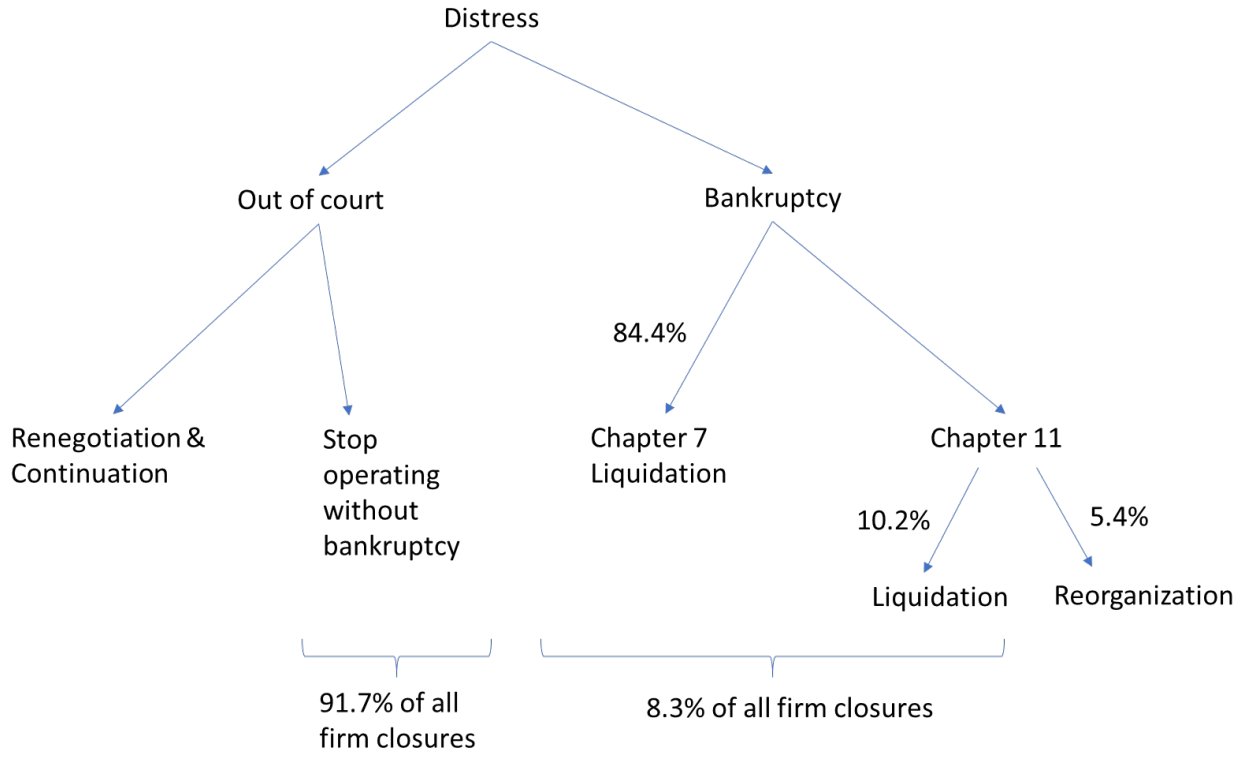


Figure 5. Liquidation vs. Reorganization as a function of Firm size
This figure displays the share of firms that liquidate directly in Chapter 7, liquidate after filing for Chapter 11, or reorganize in Chapter 11, separated by the size of the firm, as measured by reported total liabilities at the time of the bankruptcy filing. Data is from the Federal Judicial Center's (FJC) Bankruptcy Petition Database. We classify as "Chapter 11 liquidated" all firms that enter Chapter 11 and are either converted to Chapter 7 or dismissed from court.

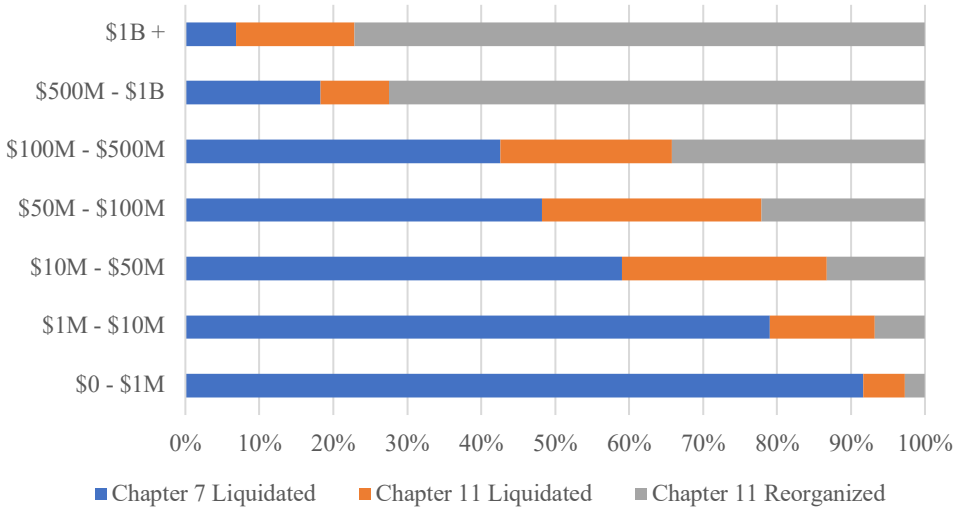


Figure 6: Expected Reallocation during the COVID crisis

This Figure calculates the index of expected reallocation described in Equation (1). We restrict ourselves to the largest 1000 firms by stock market capitalization as of December of year 2019. We further require that these firms have positive earnings in 2019, and that fiscal year ends in December. Every day *t*, we calculate horizon *h* expected reallocation as:

$$R_{t,h} = \sum_i w_i \left| FG_{i,t,h} \right|, \text{ with } FG_{i,t,h} = \left(F_t EPS_{i,h} / EPS_{i,2019} \right) - 1$$

We compute w_i as the firm's share in 2019 earnings. We plot lines for *h*=2020, 2021 and 2022.

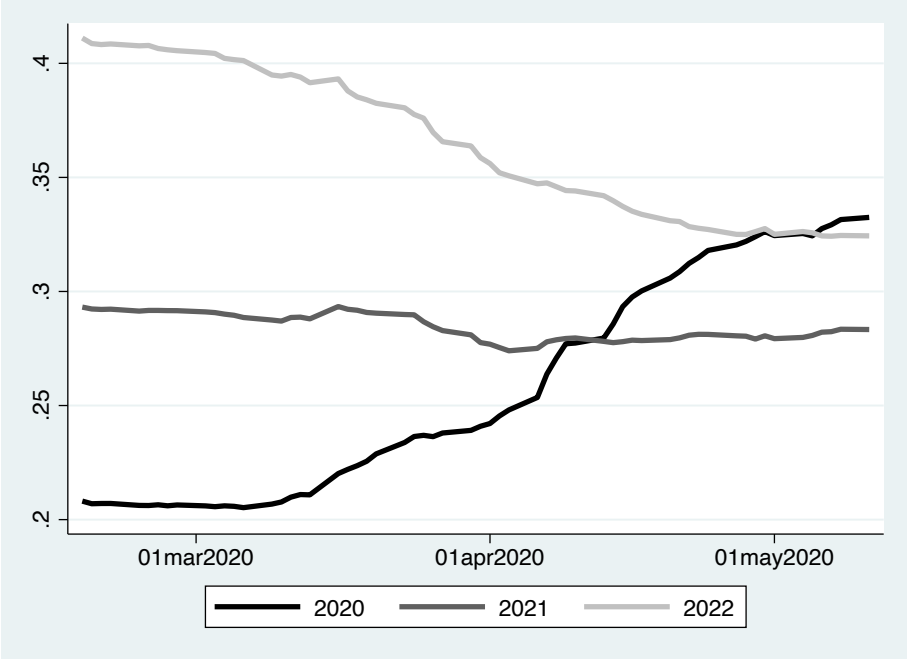
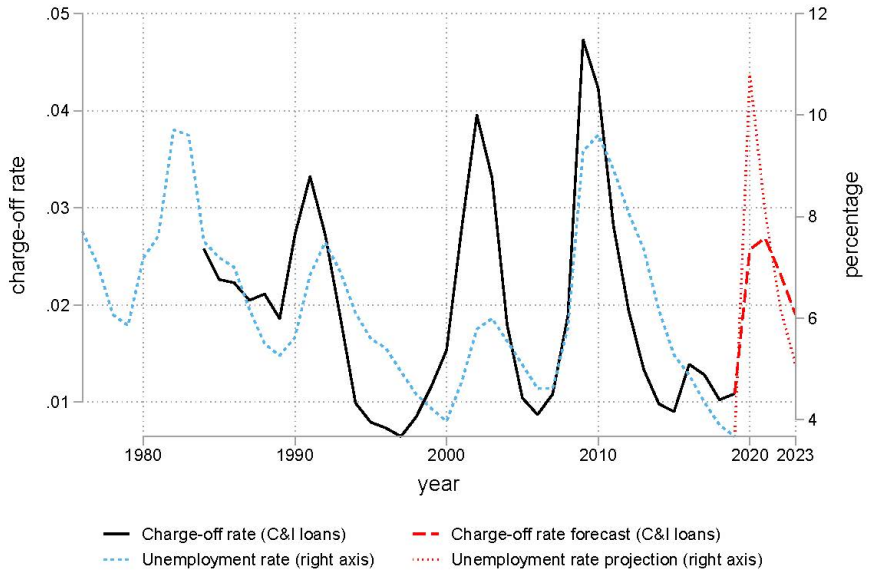


Figure 7. Loan Chargeoffs and the Unemployment Rate

This figure displays historical and forecasted charge-off rates for commercial and industrial (C&I) loans and secured business loans (i.e., loans secured by nonfarm nonresidential properties). Data on charge-offs come from bank call reports. Forecasts of charge-off rates are based on historical unemployment rate (BLS) and unemployment rate forecasts (SPF), using the regression: $Rate_t = \alpha + \beta_1 Rate_{t-1} + \beta_2 Unemployment\ Rate_t + \epsilon_t$.

Panel A: Past and forecasted charge-offs on C&I loans



Panel B: Past and forecasted charge-offs on secured business loans

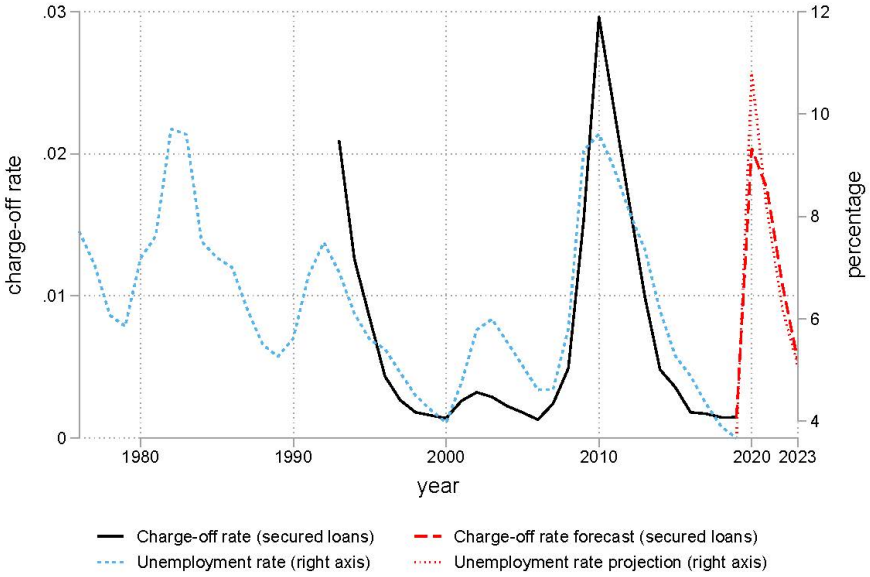


Figure 8. Rent to asset Ratio by Firm Size
This Figure uses 2013 SOI data to measure the ratio of annual rent to asset ratio.

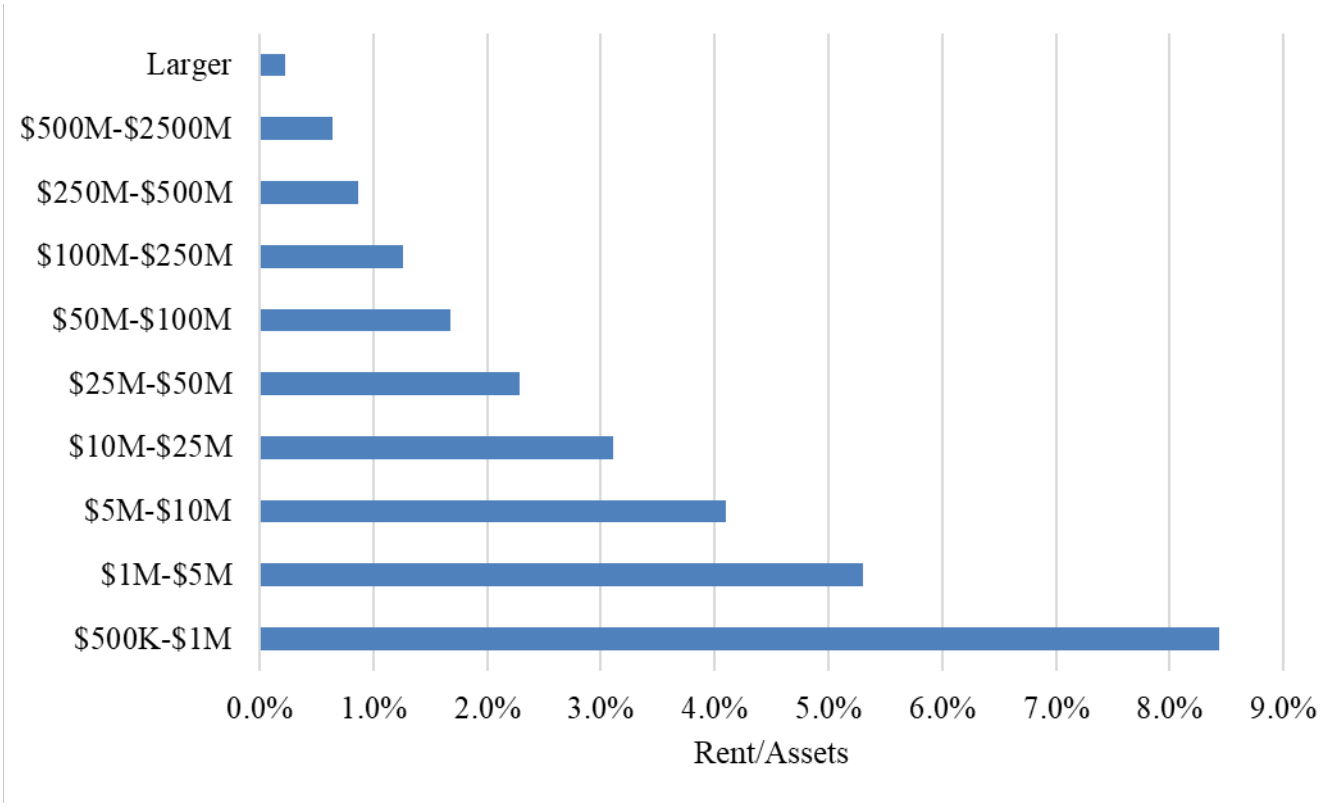


Table 1. Impact of COVID-19 on Earnings of Public Firms

Industry forecasts of impact of COVID-19 on earnings, contrasted with Great Recesssion. For each industry, we compute the unweighted average of the growth in earnings forecasts between the beginning and the end of the period. We exclude firms for which the beginning of period forecast of earnings is negative.

	% Growth in Expected Earnings between Jun 2008 and Mar 2009		% Growth in Expected Earnings between Feb 2020 and May 2020	
Forecast horizon:	**FY 2009**	**FY 2011**	**FY 2020**	**FY 2022**
Revision of industry forecasts:				
Communication	-50	-35	-19	-13
Consumer Discretionary	-75	-47	-25	-17
Consumer Staples	-13	-15	-10	-7
Energy	-40	-24	-19	-20
Financials	-16	-21	-25	-13
Health Care	-18	-31	-15	-5
Industrials	-37	-32	-24	-15
IT	-44	-19	-12	-9
Materials	-47	-28	-19	-9
Real Estate	-71	-32	-33	-7
Utilities	-17	-13	-3	0
Aggregate Statistics:				
Mean:	-39	-27	-19	-10
Cross-sectional dispersion:	22	10	8	6

Table 2. Forecasting the impact of COVID-19 on Balance Sheet Health

Based on authors' computation using the 2013 Statistics of Income Data from the IRS. The last line shows the simulated debt-to-assets ratio if firms in the group were in aggregate to experience a 30% revenue drop but hold their fixed (non-COGS) expenses fixed over the same interval. We exclude businesses with under $500,000 of total assets. *E* refers to Equity, *A* to total assets, *D* to *A-E*, and *COGS* to Cost of Goods Sold. Other expenses equals total expenses minus *COGS*. The last column shows the same exercise for all public nonfinancial firms with US headquarters in Compustat based on data for the end of 2019.

	Firm Assets:					
	0.5-$1 M	**<$5 M**	**<$10 M**	**<$25 M**	**<$50 M**	**<$100 M**
E ($ billions)	264	881	497	755	667	828
A ($ billions)	78	305	183	304	250	366
E/*A*	30%	35%	37%	40%	37%	44%
Revenues/*A*	252%	208%	194%	181%	140%	106%
COGS/Revenues	51%	59%	66%	70%	69%	67%
Other Expenses/Revenues	45%	37%	31%	27%	28%	30%
D/*A*	70%	65%	63%	60%	63%	56%
Forecasts After 30% Revenue Drop:						
D/*A* (After)	97%	84%	77%	71%	72%	63%
Δ [*D*/*A*] (After – Before)	+27%	+19%	+14%	+11%	+9%	+7%

Table 3. Impact of Firm Failure on Bank Balance Sheets.
This table shows the impact of firm failure on bank balance sheets. Data on all bank variables come from call reports. Small business secured loans are secured business loans (loans secured by nonfarm nonresidential properties) with original amounts of $1 million or less. Small business C&I loans are commercial and industrial (C&I) loans with original amounts of $1 million or less. The charge-off rate of small business secured loans is proxied by the charge-off rate of secured business loans. The charge-off rate of small business C&I loans is proxied by the charge-off rate of C&I loans. Forecasts of charge-off rates are based on historical unemployment rate (BLS) and unemployment rate forecasts (SPF), using the regression: $Rate_t = \alpha + \beta_1 Rate_{t-1} + \beta_2 Unemployment\ Rate_t + \epsilon_t$ (see Figure 7). We calculate the ratios of outstanding balance of loans in 2019, pre-provision revenue in 2019 and dividends in 2019 to total bank equity capital in 2019. Predicted charge-off rate for 2020 and loan balance in 2019 are used to calculate the amount of charge-offs in 2020, and its ratio to total bank equity capital in 2019 is calculated. Panel A shows the results for all banks, Panel B for top 20 banks ranked by total assets, and Panel C for banks not in the top 20.

	Corporate loans/Equity in 2019	Predicted chargeoff rate for 2020	Predicted chargeoffs/Equity in 2019	Pre-provision revenue/Equity in 2019	Dividends/ Equity in 2019
			Panel A. All banks		
Total loans	638%	2.38%	15.15%	54.81%	26.41%
SME secured loans	16.51%	2.10%	0.35%		
SME C&I loans	22.15%	2.57%	0.57%		
Secured business loans	89.42%	2.10%	1.88%		
C&I loans	124.05%	2.57%	3.19%		
			Panel B. Top 20 Banks		
Total loans	342%	2.58%	8.82%	39.02%	21.44%
SME secured loans	2.75%	1.55%	0.04%		
SME C&I loans	9.38%	2.34%	0.22%		
Secured business loans	26.42%	1.55%	0.41%		
C&I loans	95.14%	2.34%	2.23%		
			Panel C. Smaller banks		
Total loans	1,473%	2.32%	34.22%	99.35%	40.43%
SME secured loans	55.32%	2.06%	1.14%		
SME C&I loans	58.20%	2.91%	1.69%		
Secured business loans	267.14%	2.06%	5.50%		
C&I loans	205.59%	2.91%	5.98%		

Table 4. Policy Options to fight financial distress

Policy/Proposal	Friction	Instruments
Panel A: Straight-out grants to fund firms		
Hanson, Stein, Sunderam and Zwick (2020)	Financial constraints Input reallocation frictions	Grants to cover fixed obligations only (rents, utility bills)
Saez and Zucman (2020)	All reallocation frictions	Grants to cover all firm expenses
Panel B: Non-Bankruptcy financing policies		
Payment deferral schemes (already implemented in several countries)	Financing constraints, Credit supply shock	Moratoria/Forbearance (no accrued interest) Payment deferrals (accrued interest) State guarantees of payment deferrals by banks Voluntary vs mandatory participation SME targeting
Brunnermeier and Krishnamurthy (2020)	Financing constraints Credit Supply shock	Fed to set up a SME loan refinancing facility at subsidized rates Regulators to actively encourage evergreening loans
Greenwood and Thesmar (2020)	Debt overhang Lack of out-of-court negotiation	Tax credit to haircut-consenting claimants
Panel C: Bankruptcy-specific policies		
Iverson, Ellias, and Roe (2020)	Bankruptcy court congestion	Recall retired judges Create new temporary posts
Skeel (2020)	Fixed cost of restructuring	Create a standard "prepacked" restructuring process
Subchapter V of Chapter 11 (already enacted as part of SBRA)	Fixed cost of restructuring	Expedited procedure to restructure small firms No need for a creditor vote, easy to cram down
Blanchard, Philippon and Pisani (2020)	Wedge between private and social value of restructuring in bankruptcy	Government takes higher haircut than other creditors
DeMarzo, Krishnamurthy and Rauh (2020)	Undersupply of DIP funding	Government to set up a DIP funding SPV, with equity from the treasury and Fed backing, to lend senior at Fed discount rate (0%).
Bankruptcy and COVID-19 Working Group	Uncertainty of viability of bankrupt firms	Extend deadlines for all small businesses that enter Chapter 11 by six months.

--- Appendix Material not for Publication ----

Appendix A: Measuring expected reallocation

Assume that each firm *i* has a profit (per share) function for a given horizon *h* (omitted here):

$$\pi_i = z_i k_i^{\alpha}$$

The cost of capital is rl, and we assume fixed leverage of $l = \frac{d_i}{k_i}$. Then, optimal earnings (per share) are given by:

$$\pi^*{}_i \propto z_i^{\frac{1}{1-\alpha}} \propto k_i^*$$

Log earnings is equal to log capital stock the firm at each horizon. Taking logs of the above, forecasts and differencing leads to:

$$\log FE_{i,t,h} - \log E_{i,2019} = \log Fk_{i,t,h} - \log k_{i,2019}$$

where $FE_{i,t,h}$ is the forecast of earnings of firm *i*, $k_{i,2019}$ is the capital stock as of 2019, and $Fk_{i,t,h}$ the corresponding forecast of the firm's capital stock.

Under the model, if analysts expect a 10% EPS growth between 2019 and 2022, it means they also expect a capital stock of 10% too over the same horizon.

So now, we can compute the percent of expected reallocated capital as:

$$\begin{aligned} R_{t,h} &= \frac{\sum_i \left| Fk_{i,t,h} - k_{i,2019} \right|}{\sum_j k_{j,2019}} \\ &= \sum_i \left(\frac{k_{i,2019}}{\sum_j k_{j,2019}} \right) \left| \frac{Fk_{i,t,h} - k_{i,2019}}{k_{i,2019}} \right| \\ &\approx \sum_i w_i \left| \log Fk_{i,t,h} - \log k_{i,2019} \right| \\ &\approx \sum_i w_i \left| \log FE_{i,t,h} - \log E_{i,2019} \right| \end{aligned}$$

which is the equation used in the paper. The weighted average of the absolute expected earnings growth is equal to the expected percentage of capital that will be reallocated across firms between 2019 and year *h*.

Note that in this model, labor and capital reallocation are the same. Assume for instance the profit function is given by $\pi_i = z_i \left(k_i^{\alpha} l_i^{1-\alpha} \right)^{\theta}$. Then, assuming the wage level is constant, one can show that the amount of labor reallocation is the same as capital reallocation. This is due to Cobb Douglas technology and fixed price assumption, which will not hold exactly if the labor market clears.

Appendix B: Additional Tables and Figures

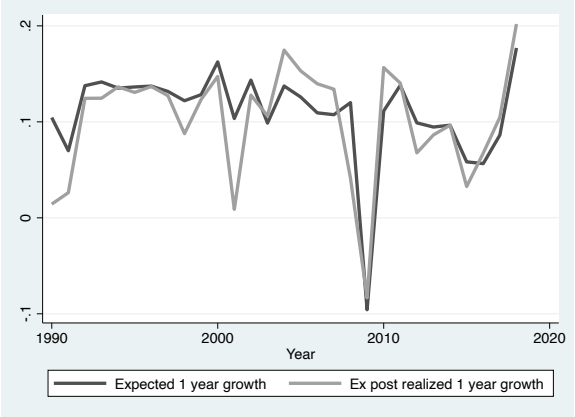
Figure B.1. Analyst forecasts vs realizations at various horizons

This Figure shows the forecasted *and* realized earnings growth at various horizons. We restrict ourselves to the 1,000 largest firms by market capitalization as of dec 31 of the previous year. Then, we further restrict the sample to firms whose earnings are positive in the previous year, fiscal year end is in December, and forecast is available in IBES. For each firm, we calculate the forecasted and realized earnings growth as:

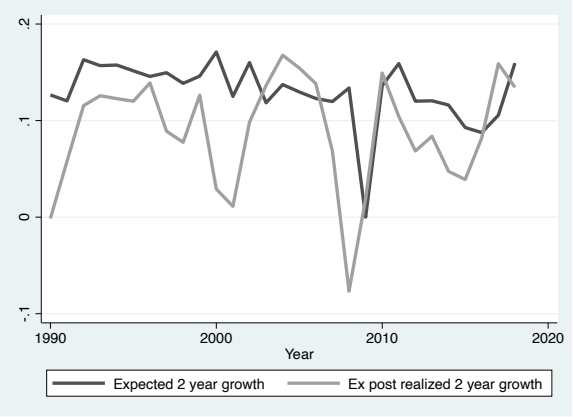
$$FG_{i,t,h} = \frac{1}{h}\left(\frac{F_t EPS_{i,t+h}}{EPS_{i,t}} - 1\right) \text{ and } G_{i,t,h} = \frac{1}{h}\left(\frac{EPS_{i,t+h}}{EPS_{i,t}} - 1\right)$$

where EPS stands for earnings per share and $F_t EPS_{i,t+h}$ is the consensus forecast in April of t for horizon $t+h$ about firm i. Panels A, B and C report median forecasts at horizons $h=1,2,$ and 3.

Panel A: 1 year growth forecasts



Panel B: 2 year growth forecasts



Panel C: 3 year growth forecasts

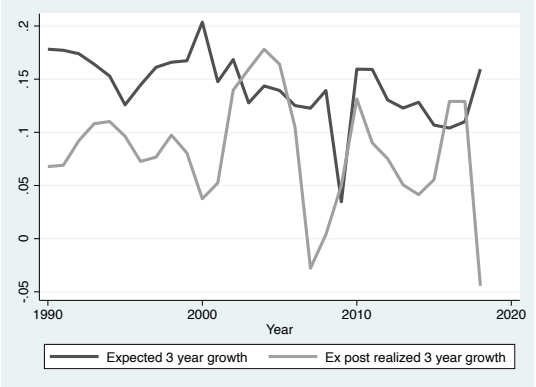


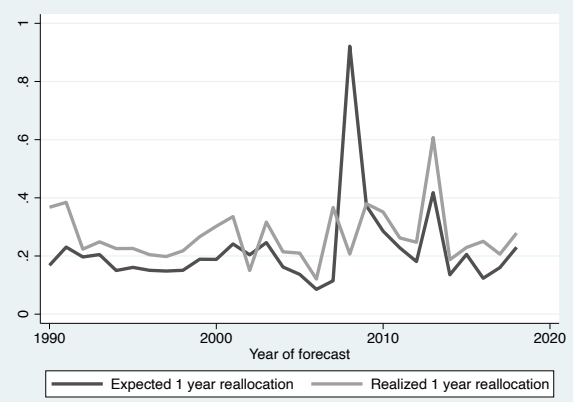
Figure B.2. Expected and Realized Reallocation over 1990-2018

This Figure calculates the index of expected reallocation described in Equation (1). We restrict ourselves to the largest 1000 firms by stock market capitalization as of December of year t-1. We further require that these firms have positive earnings in *t-1*, and fiscal year ends in December. Every year *t*, in April, we calculate horizon *h* expected reallocation as:

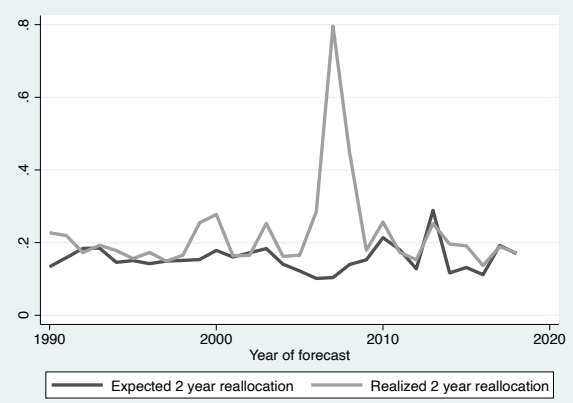
$$R_{t,h} = \sum_i w_i \left| FG_{i,t,h} \right|, \text{ with } FG_{i,t,h} = \left(F_t EPS_{i,t+h} / EPS_{i,t} \right) - 1$$

We also compute *realized* reallocation using ex post realizations $EPS_{i,t+h}$ instead of its forecast. We report both for horizons 1,2,3 in Panels A, B and C.

Panel A: 1 year reallocation



Panel B: 2 year growth reallocation



Panel C: 3 year reallocation

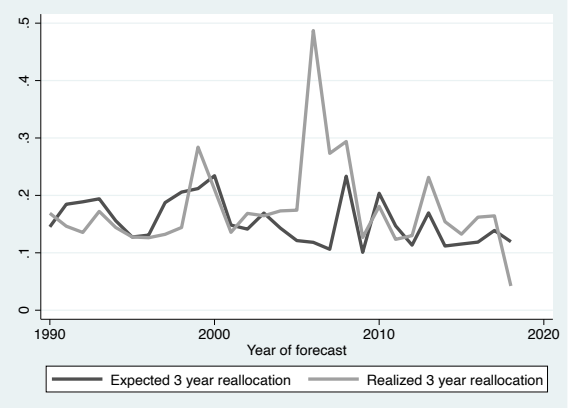


Table B.3. Forecasted Bankruptcy Filings by Size of Firm

This table uses monthly data from the FJC Integrated Database to correlate business bankruptcy filings and the national unemployment rate. Each row shows the coefficient on the unemployment rate for a separate time series regression. The dependent variable is the number of bankruptcies per month of firms in the corresponding size bucket, defined as the total liabilities of the firm at the time of bankruptcy. All regressions also include calendar month fixed effects. Newey-West standard errors that account for up to 12 months of serial correlation are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The final column displays the total number of predicted bankruptcies in each size bucket over the course of a year if the unemployment rate were 9.2%.

Size Bucket	Coefficient on Unemployment Rate	Forecasted bankruptcies @ 9.2% unemployment
$0 - $50K	23.863***	3,155
	(4.373)	
$50K - $100K	23.948***	2,898
	(4.067)	
$100K - $500K	205.341***	21,166
	(31.957)	
$500K - $1M	196.739***	17,326
	(25.866)	
$1M - $10M	460.237***	37,780
	(46.133)	
$10M - $50M	77.112***	6,283
	(7.917)	
$50M - $100M	10.267***	1,027
	(2.647)	
$100M - $500M	6.929	1,120
	(5.057)	
$500M - $1B	-2.754	189
	(2.583)	
$1B+	2.401	310
	(5.532)	