The Real Effects of Credit Line Drawdowns*

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Abstract

Do firms use credit line drawdowns to finance investment? Using a unique dataset of 600 COMPUSTAT firms we assess purposes of drawdowns. Our data show that credit line drawdowns had already increased in 2007, precisely when disruptions in bank funding markets began to squeeze aggregate liquidity. Consistent with theory, our results confirm that firms use drawdowns to sustain investment after an adverse idiosyncratic shock. Using credit line contract features to address potential endogeneity concerns, we find that a one standard deviation increase in the drawdown is associated with an increase of 11 percent in average capital expenditures. Adverse aggregate liquidity shocks amplify this effect significantly. During the 2007-09 financial crisis, the effect of drawdowns on investment increases to 15 percent and for financially constrained firms the effect more than doubles. We find only limited evidence that drawdowns were used to boost (precautionary) cash holdings during the crisis. Finally, drawdowns reduce stock returns for financially less constrained firms.

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1 Introduction

Credit lines are the most common type of bank lending to corportaions. By extending these lines, banks commit to provide liquidity on demand during a contract period. Theory suggests that committed credit lines help firms to sustain investment plans as they insure against future revenue and liquidity shocks, particularly during times of low market liquidity — that is, when firms have only limited access to debt and equity markets. At the onset ofthe 2007-09 financial crisis non-financial firms were able to sustain their investment and only started to reduce it at the peak of the crisis, that is after the failure of Lehman Brothers and the collapse of AIG. However, little is known about the key question that this paper addresses; whether firms used their to credit lines to maintain their investment plans in the face of this liquidity crunch.

With few exceptions, previous work in literature on credit lines uses information on credit line contracts rather than on actual drawdowns because there is no readily available, comprehensive dataset on credit line drawdowns. To address this problem, we collect quarterly data on credit lines and their usage from regulatory filings for 600 public U.S. companies from 2005:Q4-2010:Q4. We follow the literature on corporate financing constraints and acknowledge that covenant-induced restrictions may reduce credit line limits. We therefore also collect data on credit line availability. The unique feature of our panel data is that we can track credit line drawdowns, drawdown size and credit line availability at the firm level.

In this paper, we utilize this new dataset to test whether firms used the proceeds of credit line drawdowns to finance investment and whether, as theory suggests, the effects of drawdowns on investment are larger when firms lack alternative funding sources. As theory suggests, our results show that firms finance investment with credit line drawdowns after experiencing an adverse idiosyncratic and aggregate liquidity shock. This mechanism was particularly important to sustain firms' investment during the 2007-09 financial crisis.

An alternative explanation for credit line drawdowns during the financial crisis is that firms, uncertain about banks' ability to honor credit line commitments in the future, drew on their credit lines and hoarded cash. Ivashina and Scharfstein (2010), using press releases, document that at least some executives of large firms gave "uncertainty about the future of the financial system" as the reason for increased credit line drawdowns. Contrary to this now common view, we cannot confirm that firms in general drew on their credit lines in order to hoard the cash during the crisis.

Our analysis has two main components. First, we describe credit line drawdowns and availability during our sample period. Second, we assess the real effects of credit line drawdowns and whether aggregate shocks amplify them. We then test whether in the recent financial crisis firms drew on their lines to hoard cash.

Credit line drawdowns already increased in 2007 and the amount of drawn credit doubled between the beginning and the peak of the crisis. Firms started to repay their credit lines early 2009, when financial market stress recided. This pattern suggests that credit lines were an important source of funding during the crisis. Yet not all firms had access to their credit lines because debt covenants can restrict the remaining *available* credit to a fraction of the *unused* credit line. Average credit line availability, measured as the change in credit limits due to binding debt covenants, is about 90 percent of the total credit line. Average credit line availability decreased at the onset of the crisis and declined even more after the Lehman Brothers failure.

Theory and the drawdown patterns suggest that firms used their credit lines to maintain investment during the financial crisis. Hence, we first study whether, controlling for investment opportunities, firms that draw on their credit line subsequently invest more. However, the main identification challenge in assessing the real effects of credit line drawdowns is that drawdowns may be endogenous. To address potential endogeneity, our empirical approach builds on previous work on corporate financing constraints. In particular, we exploit the variation in access to credit lines measured as covenant-induced reduction in credit line availability. Credit line terms specifying credit line availability are negotiated or bank-imposed for the duration of the facility. With the definition of credit line availability being set, firms have little scope to influence credit line availability when exposed to shocks. Therefore the variation in credit line availability and remaining debt capacity — that is, available remaining credit — allow us to identify the effect of credit lines. Following Almeida, Campello, Laranjeira, and Weisbenner (2012) who assess the real effects of tight aggregate liquidity using the maturity structure of long-term debt in the recent financial crisis, we also consider the remaining maturity of credit line facilities.

The underlying mechanism of this identification strategy is that firms rely on credit lines to smooth shocks. However, they can only do so if they have access to their credit line and enough remaining debt capacity. Using this identification strategy, we find that firms draw on their credit lines to maintain their investment plans. In particluar, we find a large, positive and significant effect of credit line drawdowns on a firm's capital expenditures. As firms lack alternative sources of funding during times of low aggregate liquidity such as the financial crisis, the effect of credit line drawdowns on investment should be larger during a crisis. In fact, our results show that during the financial crisis aggregate shocks amplified the effect of drawdowns on investment. This amplification is stronger for financially constrained firms. For these firms the effect of drawdowns on investment more than doubles during times of tight market liquidity.

Our paper is closely related to the literature on credit lines during the recent financial crisis and the real effect of financing constraints. Campello, Graham, and Harvey (2010) and Campello, Giambona, Graham, and Harvey (2011) study the use of corporate credit lines during 2009.

They use CFO survey data and provide evidence of large credit-line drawdowns of self-reported financially-constrained firms. In comparison, we exploit the panel dimension of our dataset to infer financially constrained firms when estimating the effect of drawdowns on investment. Chava and Roberts (2008), using a regression discontinuity around covenant violations, study the effect of financing constraints on investment. Our credit line availability data indicate that credit line availability can be reduced due to collateral covenants. Therefore our focus is on the extent to which covenants restrict credit line usage.

Previous work suggests that in the crisis at least some firms drew on credit lines due to uncertainty about future funding. A common interpretation of these drawdowns is that firms wanted to hoard cash for precautionary reasons. However, we cannot confirm that drawdowns are generally associated with larger cash holdings during the financial crisis. Our data show that cash holdings of firms with credit lines actually declined during the crisis and increased notably only in 2009, suggesting that firms started hoarding cash after the end of the crisis, perhaps in response to uncertain economic conditions or in anticipation of a slow recovery or due to low interest rates. While cash holdings increased in the post-crisis period, credit line drawdowns were repaid at the same time.

Credit line drawdowns may also signal information about the firm to the market. A credit line drawdown from a firm, especially one that is perceived as not financially constrained, may convey adverse information about the firm's finances to the market. For instance, drawdowns could reveal the severity of adverse idiosyncratic shocks. An alternative interpretation is that drawdowns reduce a firm's debt capacitiy which may force a firm to forgo profitable investment opportunities in the future. We therefore test whether drawdowns reduce stock returns. While we find only a weak link between drawdowns and stock returns in the full sample, stock returns for financially unconstrained firms are significantly reduced after a firm has drawn on its credit line.

Our findings do not only add to the literature on how financial contracts affect real outcomes but also have implications for bank regulation. In particular, we show that banks experienced a large liquidity demand from non-financial firms throughout the financial crisis period. From a bank's perspective, this drawdown behavior constitutes the realization of off-balance sheet risks and provides a rationale for the bank liquidity hoarding (Cornett, McNutt, Strahan, and Tehranian, 2011).[1] Our data indicate that about 11 percent of the pre-crisis unused commitments to non-financial firms were drawn during the financial crisis. While this large realization of off-balance sheet risk may tempt regulators to impose large liquidity requirements on unused commitments of credit lines to non-financial firms, the cost of such regulation may be more costly credit lines or lower credit supply to non-financial firms. Since our results show that non-financial firms rely on

[1]Drawdowns from ABCP back-up lines, and anticipated losses in loans and securities holdings are other liquidity hoarding motives (Berrospide, 2012).

credit lines to finance investment, especially in times of tight liquidity, an unintended consequence of bank liquidity regulation could be that non-financial firms may have to reduce investment in response to financial shocks, amplifying the real consequences such shocks.

The paper is organized as follows. Section 2 briefly reviews the literature on credit lines. In section 3 we describe the data collection process, present summary statistics and drawdowns during the sample period. Section 4 assesses the real effects of credit line drawdowns. Section 5 concludes.

2 Credit Lines - Theory and Evidence

The key rationale for firms to have credit lines in the theoretical literature is the ability to insure against revenue or liquidity shocks. Specifically, a firm may need liquidity in states of the world in which it has insufficient cash flows either to continue a current project—for instance, the firm may be unable to pay for intermediate goods or the wage bill—or to realize new investment opportunities. In such an environment, credit lines can be efficient in providing the required funding (Boot, Thakor, and Udell (1987), and Thakor (2005)). In general, the liquidity management literature suggests that firms do not wait until the liquidity shock occurs to secure the funds to withstand the shock. Instead, the firm opts to either: (i) hoard reserves in the form of cash or liquid securities that can be sold in the face of higher liquidity pressures, in the case of a cash-rich firm, or (ii) a credit line secured from a financial institution, in the case of a cash-poor firm (Holmström and Tirole (2000), and Tirole (2006)).[2]

Existing empirical evidence suggests that credit lines are widely used by firms to manage their liquidity needs. For instance, Shockley and Thakor (1997) document that most of the U.S. commercial bank lending to corporations is done via bank loan commitments. More recently, the literature has focused on the determinants of credit line use. Mian and Santos (2011), using data from the Shared National Credit program, document the cyclical behavior of credit line use and refinancing decisions. Chen, Hu and Mao (2011) and Barakova and Parthasarathy (2012) use annual firm-level data and find that firms are more likely to drawdown when they face negative shocks to their financial conditions. Sufi (2009) argues that while lines of credit are a liquidity substitute for firms with high cash flow, low cash flow firms rely more on cash as credit line covenants are tied to cash flow. Demiroglu, James, and Kizilaslan (2009), collecting data on bank lines of private firms and using Sufi's sample of publicly listed companies as comparison, show that tight credit conditions reduce access to credit more for privately held firms. Demiroglu and James (2011) provide a review of the evidence on the importance of credit lines on liquidity management.[3]

[2]Early work on credit lines and their usage shows that firms use credit lines frequently (Shockley and Thakor, 1997).

[3]While most of the evidence in the literature uses U.S. data, Jiménez, Lopez, and Saurina (2009) provide evidence

Finally, Thakor (2005) and Acharya, Almeida, and Campello (fortcoming) propose models in which a large portion of firms draw on their credit lines simultaneously, for example, in response to an aggregate liquidity shortfall. Thakor (2005) argues that credit lines insure against credit contractions and that overlending may occur in times when debt covenants are not binding. Acharya, Almeida, and Campello (forthcoming) point out that the firm's exposure to aggregate liquidity risk is a key determinant of their choice between cash and credit lines.

Regarding the impact of financing constraints on firms' liquidity management (e.g. decision between cash and credit lines), Campello, Giambona, Graham, and Harvey (2011) and Campello, Giambona, Graham, and Harvey (2012) use a 2009 CFO survey with responses from 31 countries and find that "constrained" firms (small, private, non-investment grade, and unprofitable) were more likely to draw on their credit lines in the recent financial crisis. This study, which relies on firm information at two points in time, also concludes that constrained firms faced somewhat less favorable conditions for credit line renewal. Santos (2011), using LPC's Dealscan, links credit supply to bank health. Here credit supply is measured as loan terms of new credit during and after the crisis. Montoriol-Garriga and Sekeris (2009) and Huang (2010) exploit the Federal Reserve's Survey of Terms of Business Loans to argue that there was a run on credit lines in the financial crisis. Moreover, Campello, Graham, and Harvey (2010) document that financially constrained firms reduced investment significantly in the financial crisis.

Two key hypotheses related to the liquidity insurance role of credit lines emerge and we test these hypotheses building on the previous literature by using our unique dataset. First, there are real effects associated to the use of credit lines. In other words, firms drawing on the credit lines due to a shock use the drawdown to continue their current operations and to sustain their investment plans. Second, in the presence of an aggregate liquidity shock by excerbating individual shocks should amplify the effect of drawdowns on investment.

3 Data

This section first describes the sampling methods and data sources. We then provide a discussion of the sample properties and provide summary statistics.

from Spanish firms and reach similar conclusions. The authors also conclude that previous default leads to less credit line use, which may be the result of more intense bank monitoring. Lins, Servaes, and Tufano (2010) use an international survey to examine international differences in liquidity policies more closely. They find that firms make grater use of credit lines when external credit markets are poorly developed.

3.1 Data Collection Process

We use two main data sources: COMPUSTAT and SEC regulatory filings (10-Ks and 10-Qs). Our sample selection criterion for the universe of COMPUSTAT firms is that the firm was in operation in 2006:Q1 and in 2008:Q3, and was not an agricultural, utility, or financial service company. We stratify the remaining firms by industry and size to ensure the representativeness of our sample. We then randomly sample a total of 600 firms in 75 strata. We use the company's name and tax number to obtain the 10-Ks and 10-Qs for each firm from 2006:Q1 to 2011:Q1.

To identify credit line users, we conduct a key word search in the regulatory filings. Specifically, we search for"credit facility," "credit facilities," "credit line," "credit lines," "line of credit," "lines of credit," "loan facility," "loan facilities," "revolving facility," "term loan," and "term loans." We then read the respective paragraphs to extract the relevant information on credit lines and their use.[4] We exlucded credit lines denominated in foreign currency, which are usually small, bridge facilities, merger facilities, and floor plan facilities. Since we focus revolving credit lines, we excluded term loans that are part of credit line facilities.

A typical credit line contract includes debt covenants in the form of requirements on maximum leverage, minimum profitability and quality of collateral (the most common being receivables and inventories). In some cases, there are also material adverse change (MAC) provisions allowing the lender to terminate the loan agreement if the borrower experiences material changes in its financial conditions. These provisions are subject to legal interpretation, and invoking them usually leads to litigation.[5]

The most common interest rates on credit lines are a bank's prime rate or the 1 or 3 month LIBOR. Margins on LIBOR are higher than margins on prime rates. After the financial crisis, many (re-)negotiated lines have minimum interest rates or LIBOR/prime floors. Firms incur fees on the unused portion of their facility or on the total commitment. Firms may incur a fee if they terminate the agreement prior to the maturity date. The most common covenant violations are failure to submit the SEC filings on time, minimum EBITDA violations, collateral and cash flow violations, and leverage ratio violations. Generally, after a violation of covenant(s), firms also experience an increase in the LIBOR/prime margin, and the banks may waive the violation and

[4]Since firms sometimes convert credit line debt into term loans, we found including "term loan(s)" in the search useful. We observe that sometimes term loan facilities are not immediately drawn, though most are drawn within the quarter they are received. We also find situations in which firms have a combination of term loans and delayed draw term loans. These latter term loans must usually be drawn within a year of commitment, otherwise the firm pays a commitment fee on the remaining unused portion. In some other cases, the credit agreement is negotiated to include a revolving line and a term loan; while at other times the term loan is added later.

[5]A bank may not invoke MAC provisions when it is in good financial health. However, when needed, a bank may directly influence the volumes of drawdowns by reducing credit availability to borrowers who are not in compliance with covenants, or whose collateral has declined in value. For a more comprehensive discussion, see Sufi (2009) and Huang (2010).

modify the covenants. If a firm experiences violations over several quarters, the firm will either enter into a forbearance agreement and negotiate another line (possibly with another bank), or stop borrowing from existing credit lines. In certain situations, although a company does not violate a covenant, the fact that it exceeds a maximum ratio or falls below a minimum ratio leads to restrictive covenants that limit their borrowing capacity. We therefore distinguish unused credit lines (total credit line less amount outstanding) and available credit line (total credit line less covenant-induced reduction).[6]

Our firm level data extracted from regulatory filings include: the total amount of the credit facility, the amount drawn, the remaining unused amount, the amount available, and information on covenant violations and terms of credit described above (interest rate, maturity, unused commitment fees, and, in some cases, the lender). We complement our database with financial variables from COMPUSTAT. As additional controls in our analysis we add cash, cash and short term investments, credit ratings, long and short term debt measures, shareholder's equity, total assets, total debt, total expenses, total revenue, and working capital.

3.2 Sample Summary Statistics

Table 1 provides summary statistics for firms in our sample and for firms in the whole COMPUSTAT universe. Firm characteristics include size, leverage, cash holdings, cash flows, profits, and asset tangibility. We measure firm size using both, total assets and total revenues, in millions of dollars. Comparing the variables describing firm characteristics in our sample, shown in the top panel of table 1, with those in the COMPUSTAT universe in the bottom panel, we conclude that our sample is representative of the COMPUSTAT universe. Total assets for the average firm in our sample is about \$3.3 billion somewhat than higher total assets for average firm in COMPUSTAT(\$2.6 billion). The cash to total assets ratio is 21 percent for firms in our sample and 22 percent for the universe of firms in COMPUSTAT. Leverage, measured by the ratio of total debt to total assets is about 23 percent in our sample, slightly above the 19 percent of the COMPUSTAT universe. The market-to-book ratio (defined as book value of liabilities plus market value of equity divided by book value of liabilities plus book value of assets) is about 2.4 in our sample and 2.1 in the COMPUSTAT universe. Table 2 summarizes the key variables for firms with credit lines. This

[6] A specific example helps to clarify the difference between unused and available portions of a credit line. The 2007 10-K of IEC Electronics Corp. states that: "..., IEC has a line of credit with a maximum borrowing limit up to \$6.0 mill based upon advances on eligible accounts receivable and inventory." Hence, the unused portion is \$6 mill less the used portion. However, according to IEC's 10-K, the base formula for the available portion is the minimum of (1) \$6 mill and (2) 0.85*accounts receivable+0.35*inventory. Cash flow and leverage based formulas are also common. In other cases, the available portion is reduced by letters of credit or by the use of commercial paper facilities. It follows that the maximum amount a firm can still draw is the available portion less the used portion. Unused commitments therefore tend to overstate credit availability to firms.

table shows a widespread use of credit lines for firms in our sample. About 75 percent of firms in our sample have a credit line. On average, the ratio of credit line to total assets is 20 percent, relatively similar to the cash ratio, and larger than the cash flow ratio.[7]

3.3 Credit Line Drawdowns over the Sample Period

Our analysis is focused on revolving credit lines as they are the most common form of bank lending to non-financial firms. Revolving lines are the amount that firms can draw down, repay and continue drawing down for the duration of the facility. Firms rely on those lines to satisfy short-term liquidity needs. The upper panel of figure 1 shows the revolving credit lines over all firms in our sample.[8] Firms started to tap their revolving credit lines during the first half of 2007 and continued to increase credit line usage after the beginning of the financial panic in short-term funding markets (August 2007). Credit line usage (the solid blue line) increased significantly after the Bear Sterns failure in March 2008, spiked after the collapse of Lehman, and reached a peak during the first quarter of 2009. Credit line usage in our sample increased by about $14 billion, an increase of almost 100 percent, between 2007 and mid-2009. Total revolving lines of credit (red line) followed a similar pattern. They went up by $35 billion during the same period, with almost all of the increase occurring in 2007.[9] While the drawdowns before the Lehman collapse have not been documented before, the spike in usage around the Lehman collapse and the reduction in total lines of credit are consistent with the evidence from aggregate data and new syndicated loans presented in Ivashina and Scharfstein (2010). In total, the drawdowns during the crisis amount to about 11 percent of the 2007:Q2 unused commitments.

The size of aggregate drawdowns during the crisis suggests that many firms relied on their credit lines to weather the financial crisis. However, not all firms have access to their credit lines. Debt covenants can reduce the credit amount that is available to a firms. The lower panel of figure 1 plots average credit line availability and usage over the sample period. The percentage of credit line used (red line) mimics the drawdown pattern documented in the upper panel. Average credit line availability (blue line) is about 90 percent at the beginning of the sample. It declines early

[7]For comparison, Sufi (2007) reports that 85 percent of firms in his sample have a line of credit between 1996 and 2003, and the line of credit is about 16 percent of assets. Campello, Giambona, Graham, and Harvey (2011) report average ratio of credit lines of 24 percent of total assets, 12 percent for cash holdings, and 9 percent for cash flows for their sample of 397 U.S. non-financial firms based on their 2009 CFO Survey. The difference in the cash holdings and cash flow ratios reflects not only the differences in our definitions of cash and cash flows relative to theirs, but also the fact that our sample covers the financial crisis period, when—as already documented—firms significantly boost their cash holdings and savings from cash flows in anticipation of liquidity pressures.

[8]We exclude four companies. Anadarko Petroleum Corporation, First Data Management, and ConocoPhillips have large bridge loan facilities due to merger and acquisition activities. Alltel was the target of a LBO.

[9]The Lehman failure was not followed by credit line cancelation though the Lehman portion in syndicated loans was typically not taken up by another bank in the syndicate, which reduced total revolving lines somewhat.

in the crisis, recovers, and then falls again in the wake of the Lehman failure. Only towards the end of the sample average credit line availability has recovered close to precrisis levels. Plotting the percentile of the credit line availability distribution, figure 2 shows that the lower percentiles of the distrubtion dropped during the crisis. These drops indicate that an increasing number of firms experienced reduced access to their credit line.

3.4 Determinants of Credit Line Drawdowns

Having documented the large increase in drawdowns during the financial crisis, we now study why firms drew on their credit lines. To be consistent with the insurance theory of credit lines and our main hypothesis that firms use drawdown to maintain investment after an adverse shock, firms should draw on their credit line in response to adverse shocks. To assess which variables determine credit line drawdowns, we employ two measures of drawdown. First, we use an indicator variable that is equal to 1 if credit line usage — the amount outstanding — increased from the previous to the present quarter and zero otherwise. Second, we measure the drawdown size as the change in the credit line amount outstanding from the previous to the present quarter scaled by previous quarter total assets. We use the following baseline regression framework:

$$Drawdown_{i,t} \;=\; c_i + \tau_t + \beta_1 shock_{i,t-1} + \gamma X_{i,t-1} + \epsilon_{i,t}. \tag{1}$$

In the first set of regressions, our dependent variable *Drawdown* refers to a dummy variable that is equal to 1 in a quarter in which a firm increased their credit line usage. We employ binary discrete choice models (fixed effects panel logit models). Our measures of *shock* include idiosyncratic shocks to sales growth, the operating profit-to-total assets ratio, and the cash flow-to-total assets ratio and a crisis dummy variable that is equal to one for the quarters 2007:Q3 to 2008:Q4 (from the the collapse of the ABCP market to the Troubled Asset Relief Program (TARP)) to reflect the squeeze in the interbank market. Since we are using firm fixed effects, the identification of the coefficient is driven by within firm variation. Hence, the interpretation of the coefficients on sales growth, the operating profit-to-total assets ratio, and the cash flow-to-total assets ratio as idiosyncratic shocks is plausible. The controls $X_{i,t-1}$ include size measured as log(assets), a modified Altman Z-score, tangible assets-to-total assets ratio, market-to-book ratio, a dummy indicating whether the market-to-book ratio is greater than 8, cash-flow volatility, used credit line/available credit line, leverage, firm credit rating, commercial paper usage, and industry fixed effects.

Theory suggests that an idiosyncratic, negative shock, e.g. to sales growth, increases the

probability of a credit line drawdown. We therefore expect β_1 to be negative and significant. With less access to alternative sources of liquidity, firms are more likely to draw on credit lines after a large adverse liquidity shock. We therefore expect β_1 to be positive and significant for the crisis dummy variable.

As theory suggests, we find that our measures of idiosyncratic shocks have a strong negative effect on credit line drawdowns when drawdowns are measured by the drawdown dummy variable (table 3, columns 1 through 3). To measure aggregate liquidity shocks, we include a crisis dummy variable. The crisis dummy is positive and significant (column 4).[10]

In the second set of regressions, our dependent variable *Drawdown* refers to the drawdown size relative to the firm's total assets — that is, we substract the amount outstanding in period $t-1$ from the amout outstanding in period t and divide this change in amount outstanding by total assets. Note that in this specification, repayments show up as negative drawdowns. Our measures of idiosyncratic shocks have a strong negative effect on the size of credit line drawdowns (Table 3, columns 5 through 7). However, we find little evidence that drawdowns were generally larger during the crisis (column 8).

In sum, firms draw on their credit lines in response to adverse shocks. This finding is consistent with the insurance theory of credit lines. The next section assesses whether credit line drawdowns are positively associated with investment. precautionary

4 Real Effects of Credit Line Drawdowns

4.1 Drawdowns Finance Investment

Having established the relationship between credit line drawdowns and idiosyncratic and aggregate shocks, we now test the second part of the insurance hypothesis. This hypothesis suggests that firms use credit line drawdows to finance investment or current operations. In general, investment activities depend on investment opportunities and on the abilitiy to capitalize on them. A positive association of credit line drawdowns with investment therefore indicates that the ability to draw on credit lines *facilitates* investment when the opportunity arises.

[10]When employing fixed effect logit panel regression, the cross-sectional variation is absorb and only within firm variation is used to identified the coefficients. Firms that have a credit line but never drew on their credit line during the sample period lack sufficient variation after substracting the firm fixed effect. Hence, these regressions exclude 125 firms that did not draw on their credit lines during the sample period. Only firms that exhibited a drawdown at any point in time are included in these regressions. For robustness, we used random effect logit panel regressions which also include the firms that have credit lines but chose not to draw on them during the sample period. The coefficients in the random effects models are larger in part because they exploit variation between firms that draw on their lines and those that never draw and lines (not reported here). Using a random effect probit model yields similar results.

Looking at capital expendiures, our measure of investment, over the sample period, shows that average capital expenditures during the financial crisis 2007:Q3-2008:Q4 were almost constant at some 1.3 percent of total assets while average capital expenditures after the financial crisis to 2010:Q4 were about 1 percent of total assets (figure 3). This pattern is not specific to our sample but holds for all firms in the COMPUSTAT universe. A possible explanation for this pattern is that the decrease in output in late 2007 and early 2008 surprised most market participants. In fact, the NBER Business Cycle Dating Committee announced that the recession started in December 2007 only in December 2008 when policy interventions such as TARP were reducing the TED spread to pre-crisis levels.[11] This figure together with the drawdown behaviour documented above suggest that firms may have used their credit lines to maintain investment and only adjusted their investment plans after the severity of the recession became clear.[12]

To test whether a positive association between drawdowns and investment exists in the data, we specify the following regression,

$$\begin{aligned} Investment_{i,t} &= c_i + \tau_t + \alpha \cdot drawdown_{i,t-1} + \beta_1 \cdot aggregate\ shock_t + \\ &\quad \beta_2 \cdot drawdown_{i,t-1} \times aggregate\ shock_t + \gamma \cdot X_{i,t-1} + \epsilon_{i,t}, \end{aligned} \tag{2}$$

where *Investment* is defined as the ratio of capital expenditures to total assets. As in section 3.4, we define drawdown as size of the drawdown relative to total assets. Since credit lines serve as liquidity insurance, we expect the coefficient on drawdown, α, to be positive and significant. We include market-to-book ratio, sales growth and the operating profit-to-total assets ratio to proxy for investment opportunities in the controls $X_{i,t-1}$. We also include size measured as log(assets), the cash flow-to-total assets ratio, tangible assets-to-total assets ratio, a dummy whether the market-to-book ratio is greater than 8, the Z-score, cash flow volatility, and leverage as additional control variables.

We start with a simple specification using past drawdowns for all firms with credit lines. Table 4, columns 1 to 3 shows the results.[13] The effect of past drawdowns on capital expenditure is large, positive and significant. The capital expenditure mean of firms that have credit lines in our sample is 1.3 percent of total assets. A one standard deviation increase in the size of the drawdown is associated with a 4 percent increase in capital expenditure (an increase of 0.05 percent of total assets). Next, we add an interaction of drawdowns with a measure of the likelihood of financial distress, the Z-score. A low Z-score has been found to predict bankruptcy two years ahead. The

[11] See http://www.nber.org/cycles/dec2008.html.
[12] Another possible explanation is the presence of large adjustment costs for capital expenditures.
[13] We also used current drawdowns and found similar results.

positive coefficient on the interaction of drawdown and the Z-score indicates that the effect of drawdown on investment is larger for less financially distressed firms (column 2). These findings are consistent with the theoretical literature. For instance, Holmström and Tirole (2000) argue that after a negative liquidity shock a firm can draw on a credit line to finance investment. Perhaps surprisingly, the coefficient on the measure of the aggregate shock, the crisis dummy, is positive (column 3). However, figure 3 shows that investment only dropped after the Lehman failure, making the positive coefficient plausible.

While lagging drawdowns alleviates simultaneity concerns, drawdowns may still be endogenous. For instance, a firm may foresee the need for additional liquidity to finance capital expenditures after experiencing an adverse firm-specific shock. We therefore also employ fixed-effects instrumental variable panel regressions using debt capacity and financing constraint measures as instruments for drawdowns in $t-1$.

We measure the extent to which a firm is financing constrained. The credit line availability-to-total credit line ratio, which is defined by credit contract terms, is our preferred measure of constraints. This definition is related to Chava and Roberts (2008) who identify financing constraints as firms breaching covenants to those close to covenant breaches. In comparision, our measure includes contractually defined automatic reductions in the debt capacity. Moreover, our measure accounts for the possibility that a covenant breach was waived. Figure 2 shows the percentiles of credit line availability throughout the sample period. There is not only at lot of variation in the cross-section but also within firms. The firm-level standard deviation of the availability ratio in table 2 shows that there is a considerable amount of variation on the firm level that we are exploiting in our identification strategy.

Since the median firm has almost always full credit line availability, we add an indicator variable for whether firm has a ratio of 1 — that is, the firm faces no constraints when accessing the credit line. Following Almeida, Campello, Laranjeira, and Weisbenner (2012), who found that the maturity structure of long-term debt affected investment in the financial crisis, we also include the quarters to maturity of the credit facility. We allow by different effect for constrained and unconstrained firms by including the interaction of quarters to maturity and the credit line availability-to-total credit line ratio. Firms whose credit facility are closer to maturity and are more constrained may weaken their bargaining position when refinancing by drawing on their credit lines. Therefore, such firms may be less likely to finance long-term projects with it.

In addition, we proxy remaining debt capacity on the credit line by the ratio of used credit line to credit line availability in the previous quarter, where the credit line availability depends on pre-determined contract terms. With the possible exception of commercial back-up lines, reductions in the credit line availability are beyond a firm's direct control, as they relate to collateral or cash-

flow requirements that are often violated due to lower than expected sales. For this measure of remaining debt capacity, the key identification assumption is that the availability ratio in $t-2$ is exogenous to capital expenditures in t and only affects capital expenditures in t through drawdowns in $t-1$. In fact, the availability ratio in $t-2$ has a low correlation with capital expenditures in t scaled by total assets (a correlation coefficient of -0.08). However, we find the availability ratio in $t-2$ to be a crucial determinant for the size of credit line drawdowns in $t-1$. Moreover, we separately control for overall debt capacity by including overall leverage in the main regression. Sargan-Hansen tests confirm that we use valid instruments.

Table 4 columns 4 shows the result of the instrumental variable regression without additional interactions. The coefficient on drawdowns more than doubles. A one standard deviation increase in the drawdown is associated with a 11 percent increase in capital expenditures (an increase of 0.15 percent of total assets). This finding supports the insurance hypothesis of credit lines.[14] Columns 5 to 7 subsequently add interactions of the instrumented drawdown with the Z-score and the crisis dummy. The coefficients on both interaction terms are positive and statistically significant. The effect of drawdowns on capital expenditures increases by 40 percent during the crisis. Adding the triple interaction of (instrumented) drawdowns, crisis, and the Z-score (column 8) shows that during the crisis financial distress was less relevant for the effect of drawdowns on capital expenditures. All firms appeared to have used their drawdowns more for investment regardless their Z-score during the crisis.

We expect the effects of credit line drawdowns on investment to be largest for the most financially constrained firms that rely most on credit lines to smooth shocks. Therefore we split the sample by dividend paying status. Our definition of a dividend paying firm is a firm that paid at least one positive dividend during the sample period. Table 5 shows the results. The top panel shows the regression results for firms that never paid dividends during the sample period. The effects of drawdowns are large and significant and about the same size as the full sample. However, the drawdowns during the crisis had a significantly large effect on investment than in the full sample (columns 7 and 8). Including the drawdown-crisis interaction term almost doubles the total effect of drawdowns during the crisis period, confirming that during times of tight liquidity more constrained firms rely more on their credit line. For these firms, a one standard deviation increase in the drawdown is associated with a 20 percent increase in capital expenditures (an increase of 0.25 percent of total assets).

The results for dividend paying firms, the less financially constrained firms, are shown in the bottom panel of 5. We find a large, positive effect of drawdowns on investment in the IV-regression (column 4). The effect of drawdowns on investment increases significantly during the the crisis

[14] In addition to capital expenditure, we also tested whether drawdowns are used to finance inventories. We cannot confirm a positive association of drawdowns and inventories.

period. Even in this subgroup that is generally thought of as less financially constrained, the firms that have a higher likelihood of bankruptcy, a lower Z-Score, and therefore are somewhat financially constrained exhibit the largest of drawdowns on investment (triple interaction, column 8).[15] In sum, the results from the subsamples confirm that firms use credit line drawdowns to finance investment. Since we use credit line availability as instruments, our findings are consistent with the view that financing constraints affect investment.

4.2 Cash Hoarding during the Crisis

An alternative reason to firms using credit lines to maintain investment during the crisis is cash hoarding. Anectodal evidence from the financial crisis suggests that firms drew on their credit lines for precautionary reasons (Ivanshina and Scharfstein, 2010). However, the aggregate figures in our sample cast doubt on large (precautionary) cash hoarding during the financial crisis. The bottom panel of figure 3 shows that average cash holdings of firms with credit lines declined during the financial crisis and increased only strongly after 2009:Q2. However, the average cash holdings could cover up heterogeneity with respect to the firms' overall financial situations.

Therefore, we test the precautionary drawdown hypothesis by assessing whether last period's drawdowns increased this period's cash holdings differently during the crisis. We therefore use the cash-to-total assets ratio as dependent variable and assess whether during the crisis more of last periods drawdown is held in cash this period. Hence, the key variable of interest is the interaction of *Drawdown* with the crisis dummy variable and the triple interaction of *Drawdown*, the Z-score, and the crisis dummy. Positive coefficients on the interaction would be consistent with precautionary cash hoarding. However, a positive coefficient on the triple interaction may be stronger evidence as a positive effect suggests that firms that are relatively more financially sound increase their cash holdings even more with credit line drawdowns during the crisis.

Table 6 shows the results of the regression analysis for the full sample. We find only weak evidence for cash hoarding in general. While the interaction terms of of drawdown and crisis are positive they are statistically insignificant and economically small. Consistent with the aggregate figure, the coefficient on the crisis dummy variable is negative and significant, indicating that, on average, the cash holdings-to-total asset ratio dropped by some 2 percentage points during the crisis.

Splitting the sample by dividend paying status, we find weak evidence for cash hoarding for with that never paid dividends. In particular, the coefficient on triple interaction of *Drawdown*,

[15] We also split the sample by bond rating. The results for no bond rated firms are comparable to those of the firms that never paid dividends. For high yield rate firms, we only find a strong positive effect of drawdowns during the crisis and for investment grade firms we find no effect of drawdowns on capital expenditures.

the Z-score, and the crisis dummy is positive, large, and significant for firms (Table 7, top panel). However, the effect is economically small. We do not find any evidence for cash hoarding in the dividend paying firms subsample (Table 7, bottom panel). We also split the sample by bond ratings but did not find any additional evidence for cash hoarding. In sum, the findings in this section are consistent with the view that only a few financially less constrained firms used drawdowns to hoard cash and it is also consistent with the evolution of cash holding during the crisis period.

4.3 Drawdowns and Stock Returns

Since credit lines serve as insurances against revenue and liquidity shocks, drawing on credit lines therefore may signas that a firm experienced a severe adverse shock. Moreover, drawing on the credit line also reduces the firm's credit capacity and thereby the firm's ability to capitalize on future investment opportunities.[16] In general, investors can learn about a firm's credit line usage from the firm's quarterly filings. However, the delay in disclosure of credit line usage means that the stock market can react to disclosure only in the quarter following the drawdown.[17] Hence, to estimate the stock market reacting to credit line drawdowns, we use the following regression.

$$\begin{aligned} \textit{Quarterly Stock Return}_{i,t} \; = c_i + \tau_t + \alpha \cdot \textit{drawdown}_{i,t-1} + \beta_1 \cdot \textit{aggregate shock}_t + \\ \beta_2 \cdot \textit{drawdown}_{i,t-1} \times \textit{aggregate shock}_t + \gamma \cdot X_{i,t-1} + \epsilon_{i,t}, \end{aligned} \tag{3}$$

where quarterly stock returns are adjusted for dividends and stock splits. To match the firms' reporting and disclosure policies, we calculate the quarterly stock returns using the firms' fiscal year. As in section 3.4, we define drawdown as size of the drawdown. We include market-to-book ratio, sales growth, and the operating profit-to-total assets ratio to proxy for investment opportunities in the controls $X_{i,t-1}$. We also include size measured as log(assets), the Z-score, cash flow volatility over the last 4 years divided by total assets, the cash flow-to-total assets ratio, tangible assets-to-total assets ratio, a dummy whether the market-to-book ratio is greater than 8, used credit line/available credit line, and leverage as control variables. As before we include 1 lag of the control variables in our baseline specification as older innovations to the control variables should already be priced.

Section 3.4 shows that firms draw on their credit lines in response to adverse idiosyncratic shocks. While credit lines serve as liquidity insurance, being in need of this insurance signals that a firm experiences an adverse shock to the markets and reduces a firm's ability to invest in the future. We therefore expect the coefficient on drawdowns, α, to be negative. Adverse shocks to aggregate liquidity, a higher TED spread, are also expected to reduce stock returns. Hence, we expect β_1 to

[16] See Lorenzoni and Walentin (2007) and Rampini and Viswanathan (2010).

[17] In some extraordinary cases, firms announce drawdowns with a press release (Ivanshina and Scharfstein, 2010).

be negative. An aggregate shock, forcing more firms to draw on their credit line, should reduce the stock market reaction to drawdowns as they have less informational content. We therefore expect the coefficient on the interaction term, β_2, to be positive. As in the previous section, we also use instrumental variable regressions to address potential endogeneity concerns.

Table 8 summarizes the results. In general, the effect of drawdowns on stock returns is negative as expected. However, despite being economically large, the staticially significance of the point estimate is weak.

When splitting the sample by dividend paying status, we find no significant results for firms that never paid dividends (top panel of table 9). In the subset of firms that paid dividends, we find large positive and statistically significant effects of credit lines drawdowns. The bottom panel of table 8 shows that in this group that is generally considered less financially constrainted, drawdowns of the most unconstrained firms, those with higher Z-scores, reduce stock returns significantly, suggesting that credit line drawdowns are preceived as a particularly bad signal for firms that are considered financially unconstrained. The positive, albeit statisically insignificant, effect on the triple interaction term of drawdowns, Z-score, and crisis indicates that investors responded less negatively to drawdowns during the crisis period. This finding is consistent with the view that credit line drawdowns send adverse signals to investors but during the crisis, drawdowns may have been less informative about the situation of the firms.

4.4 Robustness

All robustness checks confirm the large effects of drawdowns on investment and the considerable amplification of this effect during the crisis. In the first robustness test we use a different measure of investment expenses, changes in property, plant, and equipment (PP&E). Using changes in PP&E as dependent variable, we find comparable results to the ones reported for capital expenditures (Table 10). However, two observations stand out. First, in the full sample the triple interaction is negative and strongly significant indicating that less constrained firms used their drawdowns less for investment in PP&E during the crisis. This result is confirmed in most subsamples including the dividend and non-dividend paying firms. Second, different from capital expenditures, drawdowns have a significant effect on PP&E in the sample for small firms. In sum, the results on PP&E confirm that the amplification in the effect of drawdowns on investment during is crisis is strongest for the most financially constrained firms.

We conduct three additional sets of robustness checks. First, instead of a crisis dummy, we use the TED spread and the Federal Reserve's Senior Loan Officier Opinion Survey (SLOOS) as measures of the aggregate shock. Second, we allow for a richer lag structure allow for up to 4 lags in the dependent variables. Third, we used positive drawdowns only. For brevity, we report

the selected results on capital expenditures for the full sample only and discuss finding for the subsample succinctly.

As table 11 shows, using the TED spread or the SLOOS does not change the results. The interaction terms with the TED spread indicate even stronger effects of credit line drawdowns on capital expenditures during the crisis. The subsample analysis also yields comparable results to those reported in the section 4.1. Similarly, our results on the effect of the triple interaction of drawdowns, Z-score, the TED spread (SLOOS) on cash hoarding for firms that never paid dividends are robust (section 4.2). In fact, the triple interaction is also positive and weakly significant also for dividend paying firms when using the SLOOS. Last, the results on the stock returns appears to be somewhat stronger than the ones reported in section 4.3 especially when using the TED spread. However, since we drop the quarterly dummies in the regressions with the TED spread the results may not be directly comparable.

Next, we allow for a richer lag structure and include up to 4 lags of most control variables (log(assets), the cash flow-to-total assets ratio, tangible assets-to-total assets ratio, a dummy indicating whether the market-to-book ratio is greater than 8, and leverage). Table 12 shows that our main results are robust to including more lags. Similarly, the results in the subsample are robust to this specification.

Finally, we also use only positive drawdowns, measured as a drawdown dummy variable and drawdown size. In all regressions we find results similar to the benchmark specification. In sum, all our robustness test confirm the large effect of drawdowns on investment and the significant amplification of this effect in times of low market liquidity and tight credit markets.

5 Conclusion

Using a unique datase, we document that credit line drawdowns had already increased in 2007 when disruptions in bank funding markets began to squeeze aggregate liquidity. This finding indicates that the realization of off-balance sheet risk out additional pressure on banks. However, banks may partially protected against run on credit lines as debt covenants can reduce firms' access to credit lines.

We use this variation in access to credit lines for the key contribution of this paper: the real effects associated with the use of credit lines. We show that firms use credit line drawdowns to finance investment, thereby verifying that credit lines function as insurance against adverse shocks. The effects of credit line drawdowns on investment are economically large and statistically significant. A one standard deviation increase in the size of the drawdown is associated with an 11 percent increase in average capital expenditures (an increase of 0.15 percent of total assets).

The financial crisis amplified the effect of drawdowns on investment significantly. The effect of drawdowns on investment increases by 40 percent in the full sample and more than doubles for financially constrained firms. However, we find only weak evidence that firms draw on their lines to increase precautionary cash holdings. Finally, we document that credit line drawdowns of financially unconstrained firms reduce the drawing firms' stock returns, indicating that investors infer adverse information about these firms from credit line drawdowns.

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Appendix - Data definitions

Total Assets - Sum of assets.
Cash - Sum of all cash and cash-like instruments.
Cash-flow - Cash-flow from operations.
Operating Income - Firm's income less all operating expenses.
Sales Growth - (Sales in t-Sales in $t-1$)/Sales in $t-1$
Market to Book Ratio - (Market value of equity pluse book value of debt)/total assets
Tangible Assets - Net property, plant, and equipment
Capital Expenditures - Cash outflow or funds used for additions to firm's property, plant and equipment.
Quarterly Stock Returns - Matching the firms' reporting and disclosure policies, the quarterly stock returns adjusted for dividends and stock splits are calculated on the firms' fiscal year.
Z-score - Modified Altman Z-score = (1.2 working capital + 1.4 retained earning + 3.3 EBIT + 0.999 sales) / total assets. Note that we use quarterly data except for EBIT which is annual. We use last year's EBIT. The market to book ratio is included separately in the regressions and therefore excluded here.
Cash-Flow Volatility - Standard deviation of quarterly cash-flow from operations over the previous 16 quarters.
Leverage - (long-term debt + debt in current liabilities)/total assts.
Availability Ratio - Outstanding amount on the credit line/total available credit line. Note that availability can be lower than the total credit line due to covenant restrictions. Data collected from 10Ks and 10-Qs.
Credit Line Drawdown Size - (Outstanding amount on the credit line in t - Outstanding amount on the credit line in $t-1$)/total assets

Table 1: Summary Statistics

	Our Sample							
Variable	N	Mean	Std. Dev.	Min.	25%	Median	75%	Max
Total Asset (in mill.)	11,977	3,386.33	13,372.33	0.00	102.29	509.32	1,909.25	212,949.00*
Total Revenue (in mill.)	11,971	890.46	4,952.29	0.00	21.69	115.71	437.74	113,622,00*
Debt/Assets	11,658	0.23	0.25	0.00	0.01	0.17	0.34	1.36
Cash/Assets	11,972	0.21	0.23	0.00	0.04	0.13	0.30	0.95
Net Income/Assets	11,969	-0.01	0.08	-0.50	-0.01	0.01	0.02	0.11
Cash-flow/Assets	11,616	0.00	0.08	-0.48	0.00	0.02	0.03	0.11
Operating Margin	11,610	0.01	0.07	-0.33	0.01	0.03	0.04	0.12
Tangible Assets/Assets	11,970	0.82	0.19	0.24	0.71	0.89	0.99	1.00
Market to Book Ratio (Assets)	11,977	2.44	2.28	0.62	1.19	1.62	2.49	10.00
	COMPUSTAT Universe**							
Variable	N	Mean	Std. Dev.	Min.	25%	Median	75%	Max
Total Asset (in mill.)	124,267	2,618.33	8,047.89	0.03	34.74	203.21	1,138.63	56,390.00
Total Revenue (in mill.)	123,637	590.15	1,890.93	0.00	4.98	39.78	252.37	13,489.34
Debt/Assets	120,832	0.20	0.21	0.00	0.00	0.14	0.32	1.00
Cash/Assets	123,808	0.22	0.24	0.00	0.03	0.12	0.33	0.97
Net Income/Assets	123,379	-0.03	0.19	-3.79	-0.03	0.00	0.02	0.17
Cash-flow/Assets	116,791	-0.02	0.19	-3.75	-0.02	0.02	0.03	0.19
Operating Margin	116,636	-0.01	0.15	-2.64	-0.01	0.02	0.04	0.15
Tangible Assets/Assets	123,555	0.85	0.20	0.20	0.76	0.95	1.00	1.00
Market to Book Ratio (Assets)	92,977	2.04	1.53	0.33	1.08	1.58	2.45	10.00

COMPUSTAT does not report credit lines. Therefore, credit line variables are not available for the bottom panel. Note that not all firms have credit lines. For variable construction, see text.

* Observations are winsorized at the 1 percent level, which is why the sample maximum of a variable can be higher than the COMPUSTAT universe maximum value that variable.

** COMPUSTAT observations with Market to Book ratio > 10, tangible assets to total assets ratio > 1, or leverage > 1 were excluded.

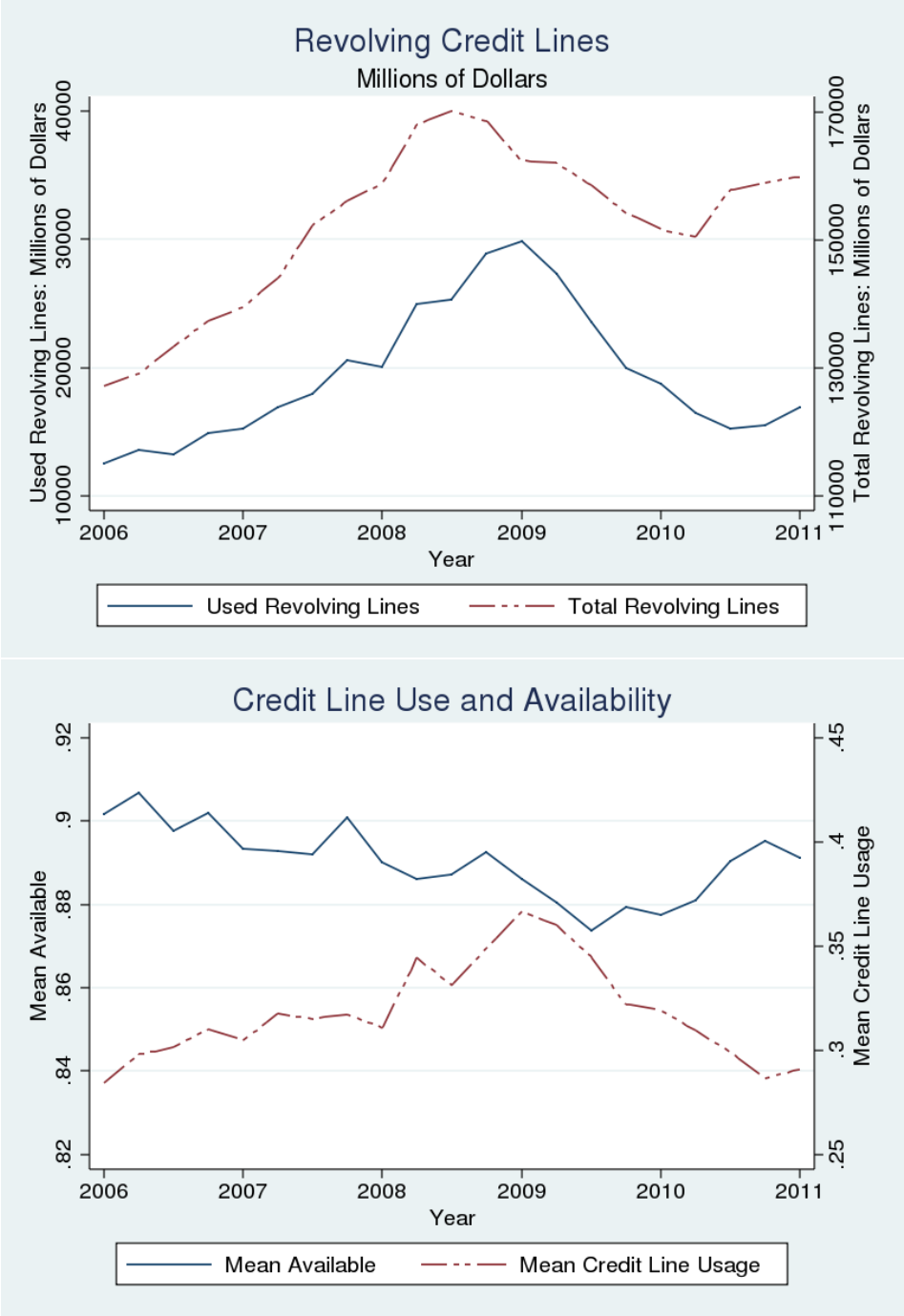

Figure 1: Revolving Credit Lines: Total, Use, and Availability

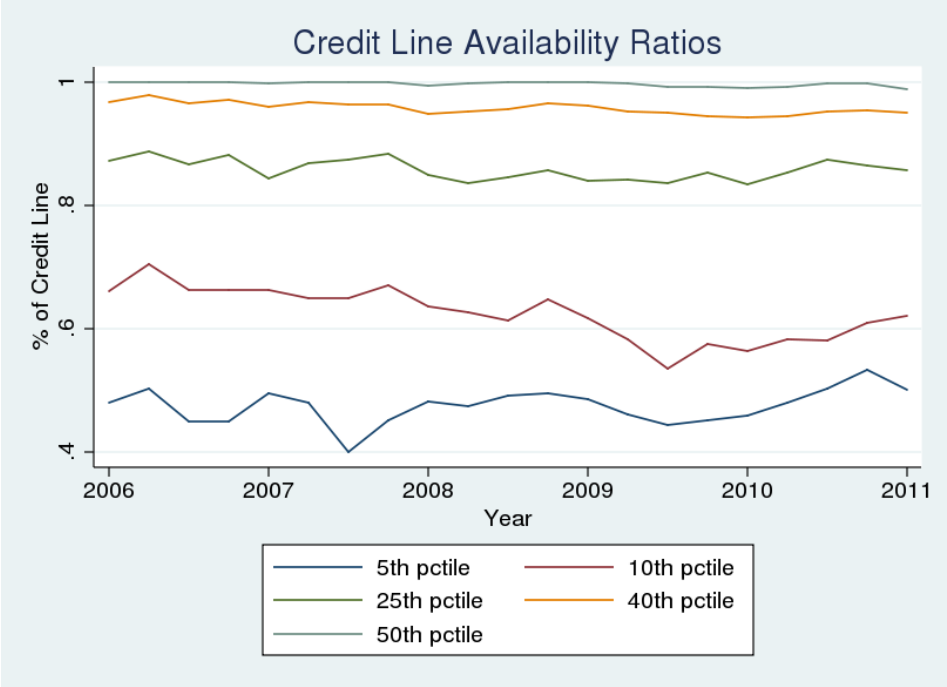

Figure 2: Credit Line Availability by Percentile

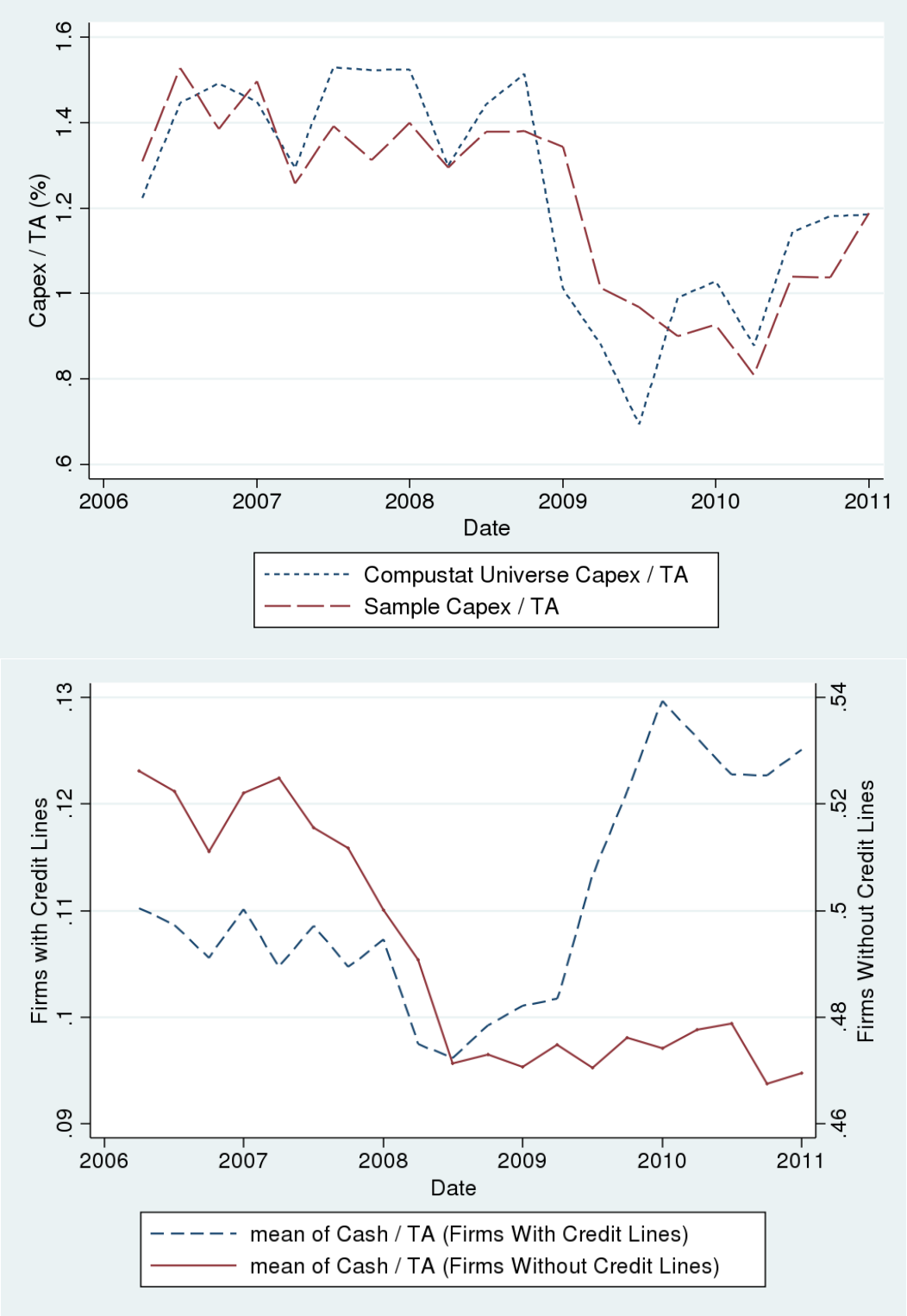

Figure 3: Capital Expenditures and Cash Holdings

Table 2: Summary Statistics of Regression Variables - Firms With Credit Lines Only

	N	Mean	Std. Dev.	25%	Median	75%
Cash/Assets	8512	0.1223	0.1325	0.0256	0.0757	0.1825
Cashflow/Assets	8272	0.0129	0.0589	0.0099	0.0218	0.0332
Oper. Inc. / Assets	8267	0.0281	0.0429	0.0184	0.0319	0.0455
Sales Growth	8067	0.0278	0.2134	-0.0545	0.0169	0.0860
Market to Book Ratio	7972	1.7326	0.9817	1.1420	1.4530	1.9985
Tangible Assets/Assets	8511	0.7989	0.2018	0.6763	0.8702	0.9706
Capex / Assets	8136	0.0135	0.0165	0.0037	0.0078	0.0158
Inventory / Assets	8361	0.1341	0.1313	0.0118	0.1120	0.2067
Quarterly Stock Returns	7569	0.0305	0.3341	-0.1202	0.0152	0.1474
Z-score	7849	1.4312	3.0351	1.0054	1.8813	2.6806
Cash-Flow Volatility	8484	0.0343	0.0384	0.0162	0.0243	0.0389
Leverage	8274	0.2652	0.2412	0.0791	0.2251	0.3808
Available / Total Line Ratio	8421	0.8902	0.1906	0.8600	1.0000	1.0000
Used to Availabile Credit Line	8348	0.2142	0.2971	0.0000	0.0000	0.4000
Firm-level Std of Availability Ratio	467	0.082	0.094	0.000	0.049	0.134
Drawdowns/Assets	7979	0.0011	0.0280	0.0000	0.0000	0.0000
Positive Drawdowns/Assets	1849	0.0312	0.0323	0.0072	0.0193	0.0442

Variables are winsorized at the 1 percent level.

Table 3: Regression Results: Drawdowns

This table summarizes fixed effect logit panel regression results with a drawdown indicator in time t as dependent variable and panel fixed effect regression with drawdown size in time t as dependent variable. The drawdown indicator is equal to 1 if a firm drew on the credit line in the current quarter. Drawdown size is measured as the ratio of credit line drawdowns to total assets. Sales growth is measured as the quarterly change in sales divided by last quarter sales. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. Additional controls are size (log assets), cash/assets, market to book ratio, tangible assets/assets, leverage, used credit line/available credit line as a measure of remaining debt capacity, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. All independent variables are lagged one period.

	Drawdown Propensity Fixed-Effect Logit Regression				Drawdown Size Fixed-Effect Panel Regression			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cashflow/TA	-2.273***				-0.029**			
	(0.835)				(0.012)			
Oper. Inc./TA		-3.816**				-0.056**		
		(1.515)				(0.024)		
Sales Growth			-0.359*				-0.008***	
			(0.186)				(0.002)	
Crisis Dummy				0.755***				0.003
				(0.222)				(0.002)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	4820	4817	4560	4858	6606	6602	6305	6661
χ^2	347	345	332	340	-	-	-	-
Adjusted R^2	-	-	-	-	0.09	0.09	0.10	0.09

Standard errors in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Regression Results: Capital Expenditures

This table summarizes fixed effect panel regression results with capital expenditure in time t as dependent variable. Capital expenditure is measured as the ratio of capital expenditures to total assets. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression				Fixed Effects Panel IV Regression			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drawdown	0.019***	0.018***	0.018***	0.052***	0.049***	0.049***	0.044***	0.037***
	(0.005)	(0.005)	(0.005)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Drawdown*Z-score		0.001*	0.001*		0.007***	0.007***	0.006**	0.009***
		(0.001)	(0.001)		(0.003)	(0.003)	(0.003)	(0.003)
Drawdown*Crisis							0.029***	0.044***
							(0.007)	(0.009)
Z-score*Crisis								-0.001***
								(0.000)
Drawdown*Z-score*Crisis								-0.007***
								(0.003)
Z-score	0.000**	0.000**	0.000**	0.000	0.001**	0.001**	0.001**	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Crisis			0.002**			0.002***	0.002**	0.003***
			(0.001)			(0.001)	(0.001)	(0.001)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	6320	6320	6320	4914	4914	4914	4914	4914
Adjusted R^2	0.69	0.69	0.69	0.71	0.71	0.71	0.71	0.72

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Regression Results: Capital Expenditures by Dividend Status

This table summarizes fixed effect panel regression results with capital expenditure in time t as dependent variable. Capital expenditure is measured as the ratio of capital expenditures to total assets. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression			Fixed Effects Panel IV Regression				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Never Paid Dividends				
Drawdown	0.018**	0.018**	0.018**	0.045**	0.048***	0.048***	0.041**	0.035*
	(0.007)	(0.007)	(0.007)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Drawdown*Z-score		0.000	0.000		0.007**	0.007**	0.006*	0.008**
		(0.001)	(0.001)		(0.003)	(0.003)	(0.003)	(0.003)
Drawdown*Crisis							0.050***	0.068***
							(0.013)	(0.017)
Z-score*Crisis								-0.001***
								(0.000)
Drawdown*Z-score*Crisis								-0.008**
								(0.004)
Z-score	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Crisis			0.001			0.002*	0.002	0.003**
			(0.001)			(0.001)	(0.001)	(0.001)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	2826	286	2826	2044	2044	2044	2044	2044
Adjusted R^2	0.69	0.69	0.69	0.73	0.73	0.73	0.73	0.73
				Paid Dividends				
Drawdown	0.020***	0.012	0.012	0.056***	0.050**	0.050**	0.044**	0.039*
	(0.006)	(0.008)	(0.008)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)
Drawdown*Z-score		0.005**	0.005**		0.004	0.004	0.003	0.006
		(0.002)	(0.002)		(0.004)	(0.004)	(0.004)	(0.004)
Drawdown*Crisis							0.034***	0.055***
							(0.011)	(0.015)
Z-score*Crisis								-0.000*
								(0.000)
Drawdown*Z-score*Crisis								-0.013***
								(0.005)
Z-score	0.000	0.001**	0.001**	0.000	0.001*	0.001*	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Crisis			0.002**			0.002**	0.002*	0.003**
			(0.001)			(0.001)	(0.001)	(0.001)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	3494	3494	3494	2870	2870	2870	2870	2870
Adjusted R^2	0.69	0.69	0.69	0.70	0.70	0.70	0.70	0.70

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Regression Results: Cash Holding

This table summarizes fixed effect panel regression results with teh cash-to-total assets ratio in time t as dependent variable. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression			Fixed Effects Panel IV Regression				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drawdown	-0.010	-0.012	-0.012	0.524^{***}	0.546^{***}	0.546^{***}	0.536^{***}	0.497^{***}
	(0.026)	(0.031)	(0.031)	(0.085)	(0.090)	(0.090)	(0.091)	(0.093)
Drawdown*Z-score		0.003	0.003		-0.050^{*}	-0.050^{*}	-0.051^{*}	-0.038
		(0.011)	(0.011)		(0.027)	(0.027)	(0.027)	(0.029)
Drawdown*Crisis							0.054	0.033
							(0.045)	(0.053)
Z-score*Crisis								-0.002
								(0.002)
Drawdown*Z-score*Crisis								0.038^{*}
								(0.021)
Z-score	0.007^{***}	0.007^{***}	0.007^{***}	0.010^{***}	0.006^{**}	0.006^{**}	0.006^{**}	0.007^{***}
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Crisis Dummy			-0.022^{***}			-0.023^{***}	-0.023^{***}	-0.021^{***}
			(0.005)			(0.005)	(0.005)	(0.006)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	6320	6320	6320	4914	4914	4914	4914	4914
Adjusted R^2	0.81	0.81	0.81	0.82	0.82	0.82	0.82	0.82

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Regression Results: Cash Holding by Dividend Status

This table summarizes fixed effect panel regression results with the cash-to-total asset ratio in time t as dependent variable. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression			Fixed Effects Panel IV Regression				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Never Paid Dividends				
Drawdown	-0.052	-0.053	-0.053	0.520***	0.494***	0.494***	0.481***	0.473***
	(0.038)	(0.038)	(0.038)	(0.127)	(0.125)	(0.125)	(0.126)	(0.126)
Drawdown*Z-score		-0.002	-0.002		-0.048*	-0.048*	-0.050*	-0.051*
		(0.012)	(0.012)		(0.028)	(0.028)	(0.028)	(0.029)
Drawdown*Crisis							0.081	0.022
							(0.081)	(0.093)
Z-score*Crisis								0.000
								(0.002)
Drawdown*Z-score*Crisis								0.071**
								(0.030)
Z-score	0.009***	0.009***	0.009***	0.012***	0.009***	0.009***	0.009***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Crisis Dummy			-0.021**			-0.019**	-0.020**	-0.023**
			(0.008)			(0.010)	(0.010)	(0.010)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	2826	2826	2826	2044	2044	2044	2044	2044
Adjusted R^2	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
				Paid Dividends				
Drawdown	0.045	0.058	0.058	0.475***	0.543***	0.543***	0.523***	0.468***
	(0.033)	(0.055)	(0.055)	(0.097)	(0.109)	(0.109)	(0.111)	(0.111)
Drawdown*Z-score		-0.008	-0.008		-0.052*	-0.052*	-0.054*	-0.030
		(0.019)	(0.019)		(0.028)	(0.028)	(0.028)	(0.029)
Drawdown*Crisis							0.097	0.038
							(0.060)	(0.087)
Z-score*Crisis								-0.003
								(0.002)
Drawdown*Z-score*Crisis								0.027
								(0.032)
Z-score	-0.003	-0.004	-0.004	0.004	0.000	0.000	0.000	0.004
	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Crisis			-0.022***			-0.025***	-0.026***	-0.020***
			(0.005)			(0.005)	(0.005)	(0.006)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	3494	3494	3494	2870	2870	2870	2870	2870
Adjusted R^2	0.81	0.81	0.81	0.82	0.82	0.82	0.82	0.82

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Regression Results: Quarterly Stock Returns

This table summarizes fixed effect panel regression results with quarterly stock returns in time t as dependent variable. Quarterly stock returns are calculated to match the firms' fiscal year and are adjusted for dividends and stock splits. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression				Fixed Effects Panel IV Regression			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drawdown	-0.200	-0.189	-0.189	-0.879*	-0.847	-0.847	-0.809	-0.689
	(0.153)	(0.161)	(0.161)	(0.526)	(0.528)	(0.528)	(0.532)	(0.532)
Drawdown*Z-score		-0.015	-0.015		-0.084	-0.084	-0.079	-0.116
		(0.035)	(0.035)		(0.097)	(0.097)	(0.098)	(0.102)
Drawdown*Crisis							-0.208	-0.202
							(0.224)	(0.264)
Z-score*Crisis								0.006
								(0.006)
Drawdown*Z-score*Crisis								-0.072
								(0.082)
Z-score	0.003	0.003	0.003	0.003	-0.004	-0.004	-0.004	-0.009
	(0.009)	(0.009)	(0.009)	(0.010)	(0.015)	(0.015)	(0.015)	(0.016)
Crisis			-0.438***			-0.443***	-0.442***	-0.450***
			(0.020)			(0.022)	(0.022)	(0.025)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	5872	5872	5872	4659	4659	4659	4659	4659
Adjusted R^2	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Regression Results: Quarterly Stock Returns by Dividend Status

This table summarizes fixed effect panel regression results with quarterly stock returns in time t as dependent variable. Quarterly stock returns are calculated to match the firms' fiscal year and are adjusted for dividends and stock splits. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression				Fixed Effects Panel IV Regression			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Never Paid Dividends				
Drawdown	-0.198	-0.197	-0.197	-0.762	-0.763	-0.763	-0.727	-0.618
	(0.227)	(0.227)	(0.227)	(0.592)	(0.587)	(0.587)	(0.592)	(0.597)
Drawdown*Z-score		0.014	0.014		-0.002	-0.002	0.003	-0.019
		(0.035)	(0.035)		(0.087)	(0.087)	(0.088)	(0.090)
Drawdown*Crisis							-0.243	-0.216
							(0.450)	(0.512)
Z-score*Crisis								0.004
								(0.009)
Drawdown*Z-score*Crisis								-0.184
								(0.129)
Z-score	0.012	0.012	0.012	0.014	0.013	0.013	0.013	0.011
	(0.010)	(0.011)	(0.011)	(0.013)	(0.015)	(0.015)	(0.015)	(0.015)
Crisis			-0.468***			-0.495***	-0.493***	-0.490***
			(0.033)			(0.037)	(0.037)	(0.040)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	2609	2609	2609	1902	1902	1902	1902	1902
Adjusted R^2	0.25	0.25	0.25	0.27	0.27	0.27	0.27	0.27
				Paid Dividends				
Drawdown	-0.197	0.146	0.146	-1.173	-0.540	-0.540	-0.502	-0.287
	(0.193)	(0.262)	(0.262)	(0.878)	(0.881)	(0.881)	(0.889)	(0.884)
Drawdown*Z-score		-0.189**	-0.189**		-0.504***	-0.504***	-0.499***	-0.582***
		(0.080)	(0.080)		(0.169)	(0.169)	(0.171)	(0.193)
Drawdown*Crisis							-0.181	-0.559
							(0.294)	(0.448)
Z-score*Crisis								0.015*
								(0.009)
Drawdown*Z-score*Crisis								0.232
								(0.153)
Z-score	-0.005	-0.013	-0.013	0.002	-0.039	-0.039	-0.038	-0.048
	(0.019)	(0.018)	(0.018)	(0.024)	(0.026)	(0.026)	(0.027)	(0.033)
Crisis			-0.406***			-0.389***	-0.388***	-0.418***
			(0.024)			(0.027)	(0.028)	(0.033)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	3263	3263	3263	2757	2757	2757	2757	2757
Adjusted R^2	0.27	0.27	0.27	0.27	0.28	0.28	0.28	0.28

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Robustness: Investment in PPE / Total Assets

This table summarizes fixed effect panel regression results with investment in time t as dependent variable. Investment is measured as the ratio of the change in PPE to total assets. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression				Fixed Effects Panel IV Regression			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drawdown	0.013	0.011	0.011	0.062**	0.055**	0.055**	0.053**	0.043*
	(0.008)	(0.008)	(0.008)	(0.024)	(0.025)	(0.025)	(0.025)	(0.025)
Drawdown*Z-score		0.003**	0.003**		0.017***	0.017***	0.017***	0.020***
		(0.001)	(0.001)		(0.005)	(0.005)	(0.005)	(0.005)
Drawdown*Crisis							0.011	0.032**
							(0.013)	(0.016)
Z-score*Crisis								-0.001***
								(0.000)
Drawdown*Z-score*Crisis								-0.010**
								(0.005)
Z-score	0.001***	0.001***	0.001***	0.001**	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Crisis			-0.003*			-0.003**	-0.003**	-0.002
			(0.001)			(0.002)	(0.002)	(0.002)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	6320	6320	6320	4914	4914	4914	4914	4914
Adjusted R^2	0.42	0.42	0.42	0.43	0.44	0.44	0.44	0.44

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Robustness: Capital Expenditures Regressions with Macro Variables

This table summarizes fixed effect panel regression results with capital expenditure in time t as dependent variable. Capital expenditure is measured as the ratio of capital expenditures to total assets. The TED spread is defined as LIBOR minus the Treasury rate of similar maturity. SLOOS, measuring banks' willingness to lend, is taken from the Federal Reserve's Senior Loan Officier Opinion Survey. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. All independent variables are lagged one period.

	Fixed Effects Panel Regression			Fixed Effects Panel IV Regression				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				TED Spread				
Drawdown	0.019***	0.018***	0.023***	0.052***	0.049***	0.052***	0.043***	0.030**
	(0.005)	(0.005)	(0.005)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)
Drawdown*Z-score		0.001*	0.001*		0.007***	0.008***	0.007***	0.012***
		(0.001)	(0.001)		(0.003)	(0.003)	(0.003)	(0.003)
Drawdown*TED[a]							0.016**	0.033***
							(0.007)	(0.009)
Z-score*TED[a]								-0.001***
								(0.000)
Drawdown*Z-score*TED[a]								-0.011***
								(0.004)
Z-score	0.000**	0.000**	0.001***	0.000	0.001**	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TED Spread[a]			0.002***			0.002***	0.002***	0.003***
			(0.000)			(0.000)	(0.000)	(0.000)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	no	yes	yes	no	no	no
No. Obs	6320	6320	6320	4914	4914	4914	4914	4914
Adjusted R^2	0.69	0.69	0.68	0.71	0.71	0.71	0.71	0.71
				SLOOS				
Drawdown	0.019***	0.018***	0.023***	0.052***	0.049***	0.052***	0.046***	0.041***
	(0.005)	(0.005)	(0.005)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Drawdown*Z-score		0.001*	0.001*		0.007***	0.008***	0.008***	0.010***
		(0.001)	(0.001)		(0.003)	(0.003)	(0.003)	(0.003)
Drawdown*SLOOS[a]							0.052***	0.076***
							(0.013)	(0.017)
Z-score*SLOOS[a]								-0.001***
								(0.000)
Drawdown*Z-score*SLOOS[a]								-0.006
								(0.004)
Z-score	0.000**	0.000**	0.001***	0.000	0.001**	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SLOOS[a]			0.002***			0.002***	0.002***	0.004***
			(0.000)			(0.000)	(0.000)	(0.001)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	no	yes	yes	no	no	no
No. Obs	6320	6320	6320	4914	4914	4914	4914	4914
Adjusted R^2	0.69	0.69	0.68	0.71	0.71	0.70	0.70	0.70

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

[a] TED and SLOOS coefficients multiplied with 100.

Table 12: Robustness: Capital Expenditures Regression with Additional Lags

This table summarizes fixed effect panel regression results with capital expenditure in time t as dependent variable. Capital expenditure is measured as the ratio of capital expenditures to total assets. Crisis is a dummy variable equal to 1 for the period 2007:Q3-2008:Q4. All regressions include the following additional controls: size (log assets), sales growth, operating income/assets, cash/assets, market to book ratio, tangible assets/assets, leverage, market to book ratio greater than 8 dummy, cash-flow volatility, and the inverse mills ratio. Instruments are described in the main text. Four lags of additional control variables, expect cash-flow volatility, are included.

	Fixed Effects Panel Regression			Fixed Effects Panel IV Regression				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drawdown	0.013**	0.013**	0.013**	0.047***	0.044**	0.044**	0.039**	0.036**
	(0.005)	(0.006)	(0.006)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)
Drawdown*Z-score		0.001	0.001		0.004**	0.004**	0.004**	0.006***
		(0.001)	(0.001)		(0.002)	(0.002)	(0.002)	(0.002)
Drawdown*Crisis							0.024**	0.038***
							(0.011)	(0.012)
Z-score*Crisis								-0.001**
								(0.000)
Drawdown*Z-score*Crisis								-0.009***
								(0.003)
Z-score	-0.000	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Crisis			0.001			0.002**	0.001*	0.003***
			(0.001)			(0.001)	(0.001)	(0.001)
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Time Effects	yes	yes	yes	yes	yes	yes	yes	yes
No. Obs	5121	5121	5121	3960	3960	3960	3960	3960
Adjusted R^2	0.71	0.71	0.71	0.73	0.73	0.73	0.73	0.73

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.