The Motives for Long-Term Debt Issues[ϕ]

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Abstract

Capital market conditions, and the fact that conditions may change, have first order effects on long-term debt issuance decisions. The majority of issuers are not liquidity squeezed, and the majority of issuance proceeds are not invested. Instead, 51% of debt issue proceeds repurchase debt with more than 1 year remaining in maturity. Approximately half of these repurchases delay rollover risk, as firms issue (repurchase) debt with more (less) than 5 years until maturity. Even among liquidity squeezed firms, market conditions impact issuance decisions. If market conditions are unfavorable, then squeezed firms tend to not raise capital, and instead reduce spending.

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In this paper, we study and compare the various motives for long-term debt issues. A large literature has examined this topic for equity issues (e.g., Loughran and Ritter (1995, 1997), Baker and Wurgler (2000), Kim and Weisbach (2008), DeAngelo, DeAngelo, and Stulz (2010), and McLean (2011), and Greenwood and Hanson (2012)), yet there is much less focus in the literature on debt issues. Debt issues are both more frequent and account for more issuance proceeds than equity issues, so such an investigation seems warranted.[1]

We define a long-term debt issue as a firm-year observation for which the proceeds from debt issues with maturity of one year or greater exceed 5% of beginning-of-year assets. Perhaps the most obvious reason that a firm would issue long-term debt is to fulfill an immediate funding need (Myers (1984), and Myers and Majluf (1984)), but this is not what we find. Instead, we find that only 35% of long-term debt issuers are liquidity squeezed, where a liquidity squeeze is defined as a firm that cannot continue its current cash burn rate for another year without external funds. Moreover, only 38% of debt issue proceeds are spent on operations or invested. When we examine issue size, we find that, conditional on issuing, liquidity squeezed firms make smaller debt issues. Near-term funding needs are therefore not the primary motive in long-term debt issue decisions.

Surprisingly, the most important motive for long-term debt issues is to repurchase debt that has more than 1 year in remaining maturity. We find that on average, 51% of the proceeds from long-term debt issues are used for this purpose.

[1] In our sample period (1974-2015) there are 43,363 debt issues versus 18,484 equity issues. The average debt issue is $307M in 2009 dollars, while the average equity issue is $56M in 2009 dollars, Long-term debt issues in Compustat include all debt issues with maturities of 1 year or more.

For 44% of issuers, these repurchases are the single greatest use of debt issue proceeds. In addition, these effects are stronger for larger debt issues. For debt issues above the sample median in size, 54% of the proceeds are used for repurchases, and repurchases are the single greatest use of proceeds for 57% of debt issuers.

Firms may repurchase debt that is not mature in order to save on interest costs, or to delay rollover risk. With respect to rollover risk, the firm cannot be sure that it can rollover its debt when it matures. If the firm can raise capital in the current period, it may choose to rollover its debt over prematurely, by issuing debt with maturity that is longer than the maturity of the debt that is being replaced. Approximately half of the repurchases in our sample are of this nature. These repurchases result in large reductions in debt maturing in between 1 and 5 years, and are financed by new debt that has more than 5 years until maturity. These precautionary repurchases are more common with larger debt issues and larger repurchases.

We further explore the impacts that liquidity squeezes and capital market conditions may have on debt issuance decisions by reversing things. Instead of asking whether firms that raise capital are liquidity squeezed, we instead examine the tendency for squeezed firms to raise capital. In this part of the paper, we limit our sample to firms facing liquidity squeezes. We find that approximately half of liquidity squeezed firms do *not* issue debt or equity. Squeezed firms tend to be small, young, highly leveraged, and have speculative credit ratings. A large literature

suggests that the availability of external finance for such firms is sensitive to financial market conditions. Consistent with this idea, we find that squeezed firms are unlikely to issue debt or equity during years in which finance is costly. We document this result via a propensity matching exercise that uses a comprehensive financial conditions variable that is orthogonal to macroeconomic conditions as our treatment. We also use a binary treatment variable that reflects the 2007-2009 financial crisis and the years 1990-1993, which had negative shocks to the supply of credit for riskier firms (Lemmon and Roberts (2010)).[2] With this treatment as well, we find that squeezed firms are unlikely to issue debt or equity during years in which finance is costly.

Squeezed firms that do not issue survive by make significant cuts to spending, investment, and employment. The cuts are costly, and are followed by slower sales growth, loss of market share, and slower employment growth. It is true that in general, firms that do not raise capital tend to grow more slowly than firms that do raise capital. However, we find that this effect is twice as large for squeezed firms that do not raise capital. It therefore makes sense that firms try to reduce rollover risk, as the inability to roll debt over could create a costly liquidity squeeze.

Our paper builds on a number of existing literatures. The paper most similar to ours with respect to studying the motives for debt issues is Huang and Ritter (2016). A major difference between our studies is that Huang and Ritter (2016) study *net* debt issues, which are defined as long-term debt issues *minus* long-term

[2] This is argued in Lemmon and Roberts (2010) and is based on the collapse of Drexel Burnham Lambert, Inc.; the passage of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989; and regulatory changes in the insurance industry.

debt repurchases, and find that funding liquidity squeezes are the primary motive *net* debt issues. In contrast, we study *gross* debt issues, and find that the majority of debt issue proceeds are used for repurchases. Gross debt issues are interesting, because they contain the many issues that are used for repurchases. These debt issues are not in Huang and Ritter's (2016) *net* debt issues sample. Our papers agree that near term funding needs are the most common motivation for debt issues that are not spent on repurchases.

Denis and McKeon (2012) study firms that have large increases in leverage due to debt issues. Debt issues that are used for repurchases do not increase leverage, so these debt issues are not in Denis and McKeon's (2012) sample. However, Denis and McKeon (2012) ultimately conclude that firms choose capital structures to maintain financial flexibility. Our findings suggest that their financial flexibility framework may be relevant for *maturity structure* decisions as well. We find that firms manage their maturity structure in a way that is consistent with avoiding rollover risk and maintaining greater financial flexibility.

Our paper is related to a literature that studies the cross-sectional determinants of debt maturity structure. Influential papers in this literature include Barclay and Smith (1995), Guedes and Opler (1996), Stohs and Mauer (1996), and Datta, Datta, and Raman (2005). None of these studies focus on within-firm changes in maturity structure, which is what we study. Our results also suggest that maturity structure may be understudied. We show that significant changes to maturity

structure resulting from debt issues are more frequent than significant changes to leverage, yet the academic literature on leverage is far larger.

Our study builds on a growing literature that points out that rollovers are risky, as there is no guarantee that at the time of maturity the firm can issue new debt, at least at a reasonable cost (see Diamond, (1981), Guedes and Opler (1996), He and Xiong (2012), Holmstron and Tirole (2011) and Almeida, Campello, Laranjeira, and Weisbenner (2014)). The papers most closely related to our study are Mian and Santos (2014), who find that firms extend bank loan maturities to reduce liquidity risk, and Xu (2016), who finds that firms issue bonds to repurchase other bonds to delay rollover.[3] Like these studies, we also document the existence of precautionary repurchases, but do so using different data (we use virtually all debt issues) and different methods. An important difference between these papers and our study is that our main purpose is to compare the importance of the various motives for debt issues, including liquidity squeezes, which are not studied in these other papers.

We build on a literature that shows that capital market conditions can influence when firms issue. Greenwood and Hanson (2013) provide evidence that issuer quality varies with credit market conditions, and that low-quality firms tend to not issue debt when credit conditions are poor. Campello, Giambona, Graham, and Harvey (2010) find that low credit rating firms were more likely to cut spending

[3] Choi, Hackbarth, and Zechner (2016), who find that dispersion in maturities is larger for firms with greater rollover risk, and Harford, Klasa, and Maxwell (2014) find that firms hold cash to hedge against rollover risk. CFOs state that rollover risk is a major concern in surveys by Lin, Servaes, and Tufano (2010) and Graham and Harvey (2001).

during the financial crisis. Goldstein, Jiang, and Ng (2017) suggest that the increasing prevalence of corporate bond finds could worsen these effects. Bebchuk and Goldstein (2011) contend that coordination problems among banks can also worsen these effects. Holmstron and Tirole (2011) argue that such liquidity risk can impact firm performance and in turn the entire economy. This idea is also studied in monetary economics (see Bernanke and Gertler (1989), Shleifer and Vishny (1992), Kiyotaki and Moore (1997), and Bernanke, Gertler, and Gilchrist (1996, 1999), Bernanke (2007, 2010)).

Our results complement a literature on equity issues, which shows that firms issue equity and save the proceeds as cash when financial markets are accommodating, in order to have funds on hand and to not have to issue when financial market conditions are poor (see McLean (2011), Bolton, Chen and Wang (2013), Eisfeldt and Muir (2017), and Warusawitharana and Whited (2016)). The results in this paper suggest that precautionary motives also play a major role in both debt issuance decisions.

1. Sample and Measurement

1.1. Sample and Measuring Debt Issuance

We obtain data from the CRSP/Compustat merged annual database. Our sample period is from 1974 through 2015. We exclude non-U.S. firms, firms that are not listed on one of the three major stock exchanges (Amex, Nasdaq, and NYSE),

financial firms (SIC 6000 – 6999), and regulated firms (SIC 4000 – 4999). We also exclude observations that are missing total assets or stock price.

Our primary variable of interest is cash flow from long-term debt issues. Similar to Huang and Ritter (2016), we define a debt issue as a firm-year observation for which the proceeds from long-term debt issues are greater than 5% of beginning-of-year total assets (item *at*), although our findings are not sensitive to this particular definition. Our final sample contains 43,363 firm-year debt issue observations. Table 1 reports summary statistics for our debt issue variable and the other variables used in this study. The mean debt issue is 0.307, and the standard deviation is 0.370.

We are also interested in the extent to which firms repurchase non-current debt, i.e., long-term debt with a remaining maturity greater than one year. We measure non-current debt repurchases as the reduction in long-term debt (item *dltr*) net of current debt (*dd1*), where current debt is measured at the end of the *previous* year. Compustat includes repurchases of current debt in its reduction in long-term debt variable, but we are interested in non-current repurchases, so we subtract out current debt as measured at the beginning of the year. We study the effect of current debt using a separate variable in our tests. The resulting debt repurchase variable has a mean of 0.064 and a standard deviation of 0.160. These statistics are for the entire sample, and we show below that repurchases can be drastically different for debt issuers and non-issuers.

1.2 Measuring the Maturity of Existing Debt

We are interested in the maturity structure of the firm's debt and how this changes when firms issue new debt. We therefore create three different measures of existing debt, which we refer to as current, medium-term, and long-term.

Compustat reports the amount of long-term debt that is current, i.e., the amount of long-term debt that is due in one year or less (item *dd1*). This is our measure of current debt. The current portion of long-term debt is *not* reported in the company's long-term debt, instead it is reported as a part of current liabilities. Compustat also reports the amounts of long-term debt maturing in 2, 3, 4, and 5 years (items *dd2, dd3, dd4* and *dd5,* respectively). We define medium-term debt as the sum of these 4 items. We define long-term debt as long-term debt reported in Compustat (item *dltt*) minus medium-term debt. Long-term debt is therefore debt that matures in more than 5 years.[4] We scale these three debt values by total assets.

Summary statistics for the three debt variables are reported in Table 1. The mean values are 0.021, 0.093, and 0.074 for the current, medium-term, and long-term debt variables. Firms therefore on average have more medium-term debt than the other two types. The median values tell the same story. The median values are 0.007, 0.051, and 0.013 for the current, medium-term, and long-term debt variables. So overall, firms carry relatively large amounts of medium-term debt.

1.2. Liquidity Squeezes

[4] If *dltt* is missing or less than medium term debt, we set its value equal to zero.

Myers (1984) argues that firms should only raise capital to fund liquidity squeezes. DeAngelo, DeAngelo, and Stulz (2010) and Huang and Ritter (2016) contend that liquidity squeezes are important motives for equity and *net* debt issues. We are interested in the extent to which liquidity squeezes drive *gross* debt issues.

Similar to Huang and Ritter (2016), we define a firm as liquidity squeezed if its existing cash is not sufficient to last another year, based on the cash burn rate over the previous year. We measure the cash burn rate as the firm's cash flow used in investment (item *capx*) plus the change in non-cash net working capital (item *act* net of items *lct* and *che*), plus cash dividends (item *dv*), minus cash flow from operations (item *ibc +* item *dp*).[5] We scale the resulting number by assets measured at the beginning of the year.

If the cash burn rate is positive, then the firm is unable to fully fund its investment and operations with internal cash flow, and either consumes cash or uses external finance. If a firm's cash burn from the previous year exceeds its total cash holdings at the beginning of the current year, then we label the firm as liquidity squeezed, i.e., the firm is unable to last another year at its current cash burn rate without external funds.

Table 1 shows that the mean value for our liquidity squeeze variable is -0.104, while the median is -0.080, so the mean and median firms in our sample are not liquidity squeezed. We also create a squeezed indicator variable that is equal to

[5] If the item *ibc* is missing, we use net income (item *ni*) instead.

1 if the firm is liquidity squeezed and zero otherwise. The mean value of the squeezed indicator variable is 0.273, so 27.3% of the observations in our sample are liquidity squeezed.

1.3. Capital Market Conditions

A number of papers suggest that the supply of capital varies over time, and that it is not always the case that firms can cheaply and easily raise capital.[6] We therefore construct a parsimonious measure of debt market conditions by using the first principal component of 3 different variables: the credit spread, which is the spread between Baa and Aaa rated bonds, the rate on Baa corporate bonds, and the annual change in federal debt held by the public, measured as a percent of gross domestic product.[7]

We include the credit spread as Greenwood and Hanson (2013) show that it can affect issuance decisions. Barry, Mann, Mihov, and Rodriguez (2008) show that the level of the interest rates matters for companies' issuance decisions, so we proxy for this using the Baa yield. Greenwood, Hanson and Stein (2010), Graham, Leary, and Roberts (2014), and Badoer and James (2016) provide evidence that government bond issues affect corporate bond issues. They show that when the government issues more debt firms tend to issue less debt, as the government bonds

[6] See, for example, Greenwood, Hanson, and Stein (2010), Greenwood and Hanson (2013), Campello, Giambona, Graham, and Harvey (2010), Erel, Julio, Kim, and Weisbach (2012), Bernanke and Gertler (1989), Shleifer and Vishny (1992), Kiyotaki and Moore (1997), and Bernanke, Gertler, and Gilchrist (1996, 1999)).

[7] Aggregate data are from the Federal Reserve Economic Data (FRED) database: https://fred.stlouisfed.org.

absorb the supply of capital. More government bond issues are therefore associated with worse debt issuance conditions. We use the annual change in federal debt held by the public to capture this effect.[8]

Before constructing our index, we detrend each of these variables using the Hodrick-Prescott filter, although we get significant results (untabulated) using non-detrended variables as well. We refer to our final measure as the *Debt Market Factor*.

Summary statistics for the *Debt Market Factor* and its 3 subcomponents are reported in Table 2. Panel A reports the summary statistics, while Panel B reports the correlations among the *Debt Market Factor* and its 3 subcomponents. The credit spread and the level of the Baa yield are positively correlated, while the annual change in federal debt held by the public correlates positively only with the credit spread. As expected, higher values of the *Debt Market Factor* (more favorable debt market conditions) are associated with lower level of the baa yield, lower credit spreads, and less government bond issues.

A plot of the *Debt Market Factor* over the period 1974q1-2015q4 is reported in Figure 1. We highlight "Bad Times" periods, which are the two quarters before, the quarter of, and two quarters after a *Debt Market Factor* trough.[9] Figure 1 reveals that the "Bad Times" correspond strongly with well-known macroeconomic and financial shocks that resulted in contractions in the supply of credit.

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[8] We also construct an index including the difference between the 10-year and 1-year government bond yields (term spread) and the results are virtually unchanged.

[9] A quarter *t* is a Debt Market Factor trough if the value of the Debt Market Factor in quarter *t* is lower than the values in the previous 5 quarters and in the 5 subsequent quarters.

2. The Motives for Long-Term Debt Issues

2.1. Debt Issuers' Characteristics

Table 3 takes a first look at the different motivations for debt issues. The table reports summary statistics regarding the characteristics of debt issuers relative to non-issuers (firms that do not issue debt or equity).[10] The sample here is limited to firms with non-missing observations for debt repurchases, the liquidity squeeze variable, the three debt variables, and change in leverage.

Recall that a debt issue is a firm-year observation for which the total proceeds from debt issues exceeds 5% of assets. In the first column of Table 3 we see that there are 29,856 debt issues in our sample and 54,087 firm-year observations that do not issue debt or equity. Among debt issuers, the average issue is 0.296, or 29.6% of beginning-of-year assets.

Table 3 shows that on average, debt issuers had non-current debt repurchases equal to 0.154, about half the amount of the average debt issue, whereas non-issuers had debt repurchases equal to 0.013. Hence, repurchases are an activity that is for the most part limited to debt issuers. This suggests that repurchases are an important motivation for long-term debt issues. To further appreciate this, note that 70% of debt issuers had a contemporaneous repurchase of non-current debt of at least 1% of assets, and 52% of issuers had a repurchase that

[10] In untabulated results we include equity issuers in the sample of non-issuers, and the inferences are similar. In the second part of the paper we focus on squeezed firms that do not raise capital. So for consistency, we define non-issuers as firms that do not issue debt or equity through the paper.

exceeded 5% of assets. For non-issuers, that corresponding statistics are 22% and 7% for issues exceeding 1% and 5% of assets.

The next few rows show that debt issuers tend to have more debt than non-issuers, especially medium-term debt (maturity 1-5 years). Current debt (maturity < 1 year) is 2.6% of assets for debt issuers and 1.5% for non-issuers; not an economically large difference. In contrast, medium-term debt (maturity 1-5 years) is 13.5% of assets for debt issuers and 6.9% of assets for non-issuers. Long-term debt (maturity > 5 years) is 9.9% of assets for issuers and 6.5% of assets for non-issuers. These results show that debt issuers tend be more leveraged than non-issuers, and therefore have relatively large amounts of debt at various maturities that could be repurchased. The effects are greatest for medium-term debt though, suggesting that firms may issue and repurchase to extend maturity, rather than simply reduce interest costs.

The next rows report our statistics for our liquidity squeeze variable and the percentage of firms that are liquidity squeezed. As we explain in the previous section, a positive value of the squeeze variable reflects a firm whose cash would not last another year at its current cash burn rate. The squeeze variable is -0.046 for debt issuers and -0.166 for non-issuers. Hence, on average, firms in both groups have enough cash to last one more year. The next row shows that 35% of debt issuers are liquidity squeezed vs. 19% for non-issuers. Liquidity squeezes therefore appear to be an important factor in debt issuance decisions, albeit for a non-majority of firms.

As a comparison, Huang and Ritter (2016) show that for *net* debt issues, 43% of issuers were liquidity squeezed, which is significantly larger than the 32% number that we report. As we explain earlier, the difference here is driven by the fact that we study gross debt issues, and therefore include a large number of issues in which the majority of proceeds were used in repurchases, and therefore would be not meet Huang and Ritter's (2016) definition of a *net* debt issue.

In terms of quantity, there are almost as many squeezed firms that do not issue debt (or equity) as firms that do issue. The first row of this table shows that we have 29,856 debt issuers and 54,087 non-issuers. We therefore have 10,450 squeezed firms that issue debt and 10,277 squeezed firms that do not issue debt or equity. We further explore the reasons for why squeezed firms may not issue in Section 3 of the paper.

In the final two rows, we report the percentage of debt issuers that have a significant change in capital structure. We measure leverage following Denis and McKeon (2012) as total debt (item *dltt* plus item *dlc*) scaled by total debt plus market value of equity (item *prcc* multiplied by item *csho*). Like Denis and McKeon (2012), we define a significant change in capital structure as a change in leverage that is greater than 0.10. We find that 27% of debt issuers have significant changes in leverage. This is consistent with the other findings in this table showing that most debt issues are associated with debt repurchases, and therefore do not affect capital structure. The last row shows that 17% of issuers that had significant leverage changes were *not* liquidity squeezed. This suggests that 27%-17%=10% of issuers

with significant leverage changes may reflect firms issuing debt to fund liquidity squeezes and not to adjust capital structure, i.e., the capital structure change is just a side effect of having to fund the liquidity squeeze. The 27% number is therefore an upper bound on the percentage of debt issuers that sought to increase their leverage.

2.2. The determinants of long-term debt issues and repurchases

In this section of the paper we formally test for the determinants of long-term debt issues and repurchases. We report three regressions in Table 4. In the first regression, we ask what factors determine whether a firm decides to issue debt or not. In this regression, the dependent variable is equal to 1 if the firm issued debt and zero otherwise. In the second regression, we ask, conditional on issuing, what determines the size of the issue? In this regression, the sample is limited to debt issuers. The dependent variable is equal to 1 if the firm made a large issue and zero otherwise. We define a large issue as an issue that is above the sample median, where size is measured as the issue amount scaled by beginning-of-year assets. In the third regression, the dependent variable is non-current debt repurchases scaled by beginning-of-year assets. The sample in regression 3 is limited to debt issuers. So regression 3 asks, conditional on issuing, what determines how much debt firms repurchase?

In all of the regressions the independent variables include current debt, medium-term debt, long-term debt, the liquidity squeeze variable, and the *Debt*

Market Factor. We also include market-to-book, property, plant and equipment scaled by total assets, log of sales, age, and credit rating. Since not all firms have a credit rating, we create a credit rating dummy variable that takes value of one if the firm is missing a credit rating and zero otherwise. We set the credit rating variable to zero when missing. We have broad ratings coverage beginning in 1986, so for this table we begin our sample in 1986.

With the exception of the credit rating dummy variable all of the right-hand side variables are scaled by their own standard deviations. The regressions include industry fixed effects. We do not include time fixed effects because the *Debt Market Factor* is a time series variable, although including time fixed effects does not have material impact on the other coefficients. We cluster the standard errors on firm. Clustering on time does not change the reported statistical significance.

In the regression reported in the first column the sample has 39,933 non-issuers and 22,066 debt issuers, so the unconditional likelihood of a debt issue is 35.6%. In this regression, the coefficients are 0.046, 0.082, and 0.011 for current, medium, and long-term respectively. Medium-term debt (maturity 1 to 5 years) therefore has 2x stronger effect than current debt (maturity <1 year), and an almost 6x stronger effect than long-term debt (maturity > 5 years) on the decision to issue. The variables are standardized, so this shows, for example, that a one standard deviation increase in medium-term debt leads to a 8.2% increase in the likelihood of a debt issue. Given that the unconditional likelihood of a debt issue is only 35.6% (not reported in tables), this is a sizeable effect. These findings, taken together with

those in Table 3, suggest that when firms issue debt they may be planning to repurchase existing debt. We will take a closer look at repurchasing and changes to maturity structure in the tables that follow, although we note here that medium-term debt has the greatest effect, and that medium-term debt would likely be repurchased in an effort to delay rollover risk.

The coefficient for the *Debt Market Factor* is 0.029 and significant, so firms are more likely to issue when borrowing costs are lower. The liquidity squeeze variable is positive and significant, showing that squeezed firms are more likely to issue. The coefficients for market-to-book and size (sales) are positive, whereas the coefficient for age is negative. We also see that firms with stronger credit ratings (a higher rating value is associated with a better rating) are less likely to issue debt and that firms without credit ratings are less likely to issue debt. Hence, debt issues are more common among larger firms, firms with strong growth opportunities, younger firms, and rated firms with weaker ratings.

The results reported in the second column show that, conditional on issuing, medium-term debt is associated with larger debt issues, whereas current debt and long-term debt are associated with smaller debt issues. Recall that in this regression the dependent variable is equal to 1 if the firm made a large issue and zero otherwise. In this regression, the coefficient for current debt is -0.009, so rollovers lead to smaller debt issues. The coefficient for long-term debt is -0.010 and insignificant. The coefficient for medium-term debt is 0.035 and significant, showing that medium-term debt leads to larger debt issues. The unconditional likelihood of a

large issue is 0.50, so the medium-term coefficient reflects a sizeable effect. These results therefore suggest that if firms make *large* issues and refinance it is to *extend* maturity and not just lower interest costs. If interest costs were a main motivation, then the long-term coefficient should be positive and significant. The *Debt Market Factor* coefficient is 0.025 and significant, so firms make larger issues when the costs of borrowing are lower.

The liquidity squeeze coefficient is -0.012 and significant. Hence, if a firm is facing financial hardship it is *less* likely to make a large debt issue. The reason for this could be that debt issues are more expensive for firms facing liquidity squeezes, so squeezed firms only issue as much as they have to, i.e., enough to fund the squeeze. Firms also make larger issues if market-to-book is higher, the firm is younger, and the firm has worse credit ratings. So conditional on issuing, speculative firms tend to make larger issues.

The final regression in Table 4 studies the amount of debt repurchased, conditional on having issued. As we explain earlier, the repurchase variable we use is limited to repurchases of debt that is *not* current, so these repurchases do not reflect rollovers. The coefficient for medium-term debt is 0.053 and statistically significant. The medium-term debt coefficient shows that long-term debt issuers make larger repurchases when they have more debt maturing in 1 to 5 years, i.e., rollover risk is increasing so firms have an incentive to extend maturity.

The long-term debt coefficient is 0.010, much smaller than the medium-term coefficient. This difference suggests that repurchasing to lower interest costs is less

of a factor than repurchasing to extend maturity. If firms were primarily issuing and repurchasing to reduce interest costs, then the long-term debt coefficient should be larger than or at least similar to the medium-term debt coefficient, as all else equal, debt with longer maturity remaining represents greater interest costs. Similarly, the *Debt Market Factor* coefficient is insignificant, so low interest rates are not a driving force behind repurchase decisions. The results also show that firms make larger repurchases if they are larger, not rated, and if they have weaker credit ratings. This makes sense, as unrated firms and firms with weak ratings are less able to increase leverage and have a greater incentive to manage rollover risk.

Taken together, the results in Table 4 show that medium-term debt (maturity 1 to 5 years) has a first order impact on the decision to issue, the size of the issue, and conditional on issuing, how much debt the firm repurchases. These results suggest that firms issue debt to increase the maturity stricture of their debt, i.e., firms issue debt with maturity longer than 5 years and repurchase non-current debt with maturity less than 5 years. We explore this idea more in the tables that follow.

2.3. Use of Proceeds

Table 5 takes a closer look at how firms use their issuance proceeds. The uses that we consider include repurchases of non-current debt, rollovers (the retiring of current debt), net equity repurchases (equity repurchases minus equity issues), cash burn (as defined in Section 1), and increases in cash savings. For each debt issuer we divide the 5 cash uses by the total debt issue proceeds. The resulting

ratios estimate the percentage of proceeds that go towards each use. We then take an average across all of the debt issues in our sample. In Panel A we report results for the full sample of debt issuers, while Panels B and C examine large and small issuers separately. With respect to debt repurchases, in this section of the paper we do not ask whether the repurchases extend maturity. Here, we simply ask how important repurchases are relative to other uses.

Consistent with what is suggested in Tables 3 and 4, the results in Table 5 show that debt repurchases are the dominant motivation for debt issues. Panel A shows that 51% of debt issue proceeds are used for long-term debt repurchases and that for 44% of debt issuers, repurchases are the largest use of proceeds. Cash burned in operations and investment is the second largest use of proceeds. Panel A shows that 38% of the proceeds from debt issues are consumed by the cash burn rate, and that for 34% of issuers this is the greatest use of issuance proceeds. The third largest use of debt issuance proceeds are rollovers, which account for 19% of the proceeds and are the largest use of proceeds for 8% of issuers.

Panels B and C examine the use of proceeds for large and small debt issues. As in Table 4, we define large (small) debt issues as issues above (below) the sample median. Issue size is measured as issue proceeds scaled by lagged total assets. The results in Panels B and C show that for both large and small issues non-current repurchases are of first order importance, however the effect is stronger with large issues. Large issuers spend 54% of their proceeds on repurchases while small

issuers spend 48%. Repurchases are the single largest use of proceeds for 57% of large issuers, and for 31% of small issuers.

Cash burn consumes 29% and 46% of proceeds for large and small issuers respectively, and cash burn is the greatest use proceeds for 29% of large issues and 40% of small issues. Rollovers are an especially important motivation for small issues, accounting for 29% of the issue proceeds vs. 4% for large issues.

Taken in its entirety, Table 5 shows that non-current repurchases are of first order importance in long-term debt issue motivations and consume the most proceeds. This effect is especially true for large issues. For small issues, cash burn has a similar importance as repurchases.

2.4. Changes in Maturity Structure

Table 5 shows that repurchases consume the majority of debt issuance proceeds. Table 4 shows that medium-term debt has a large impact on long-term debt issuance and repurchase decisions. Taken together, these results suggest that firms may be replacing debt that is close to maturity by issuing new debt that has longer maturity. Table 6 investigates this idea more closely.

The first column of Table 6 shows that 38% of debt issuers have at least some reduction in medium-term debt (maturity between 1 and 5 years).[11] This effect increases with the size of the repurchase. Looking across the columns, we see

[11] A reduction in medium-term debt is measured as the difference between the sum of *dd1*, *dd2*, *dd3*, and *dd4* in year t and the sum of *dd2*, *dd3*, *dd4*, and *dd5* in year t-1. A negative value for this variable is a lower bound on the amount of medium-term debt that was repurchased. Recall that we define medium-term debt as debt with maturity between 2 and 5 years. One year later, such debt will have maturity between 1 and 4 years.

that 45%, 52%, and 56% of debt issuers reduce medium-term debt if there is a debt repurchase that is at least 1%, 5%, and 10% of assets respectively. What this shows is that the larger the repurchase that a debt issuer makes, the more likely it is that the repurchase reduces medium-term debt.

Moreover, these reductions in medium-term debt are economically meaningful. As an example, in column 1 we see that debt issuers that repurchase at least some medium-term debt reduce medium-term debt by 41.1%, or by an amount equal to 8.4% of assets. Another way to view the economic significance of these medium-term debt repurchases is to note that these reductions are on average equal to 43.8% of the total debt issue proceeds and 80.8% of the total repurchase proceeds.

Table 6 further shows that the reductions in medium-term debt were financed by issuing debt with maturity greater than 5 years. In column 1, we see that among debt issuers that had at least some reduction in medium-term debt, debt maturing in more than 5 years increases 110.9% or by an amount equal to 10.3% of assets.[12]

To further assess these effects, we examine debt maturity structure, which we define as medium-term debt scaled by the sum of medium-term and long-term debt (maturity > 5 years). The results in Table 6 show that, among debt issuers that reduce at least some medium-term debt, the average maturity structure is 0.655

[12] Change in debt maturing in more than 5 years is *dd5* plus debt with maturity > 5 years in year t minus debt with maturity > 5 years in year t-1. We add back *dd5*, because this reflects a reduction in long-term debt due to the passage of time, i.e., *dd5* this year was part of debt with maturity > 5 years the previous year.

before the debt issue, and 0.508 after. Hence, there is on average a significant lengthening in the maturity structure of debt issuers.

Taken together with our results in Table 3, the results in Table 6 suggest that firms may more actively manage their debt maturity structures than their overall capital structures. Recall that Table 3 shows that 27% of debt issues result in a significant capital structure change. This is an upper bound, as some of these issues were liquidity squeezed, and therefore may have issued simply to fund liquidity squeezes, rather than to purposefully alter capital structure. In Table 6 we see that 38% of debt issuers had reductions in medium term debt, and that these changes are on average quite large.

3. Do Squeezed Firms Always Issue?

In this Section of the paper we further explore the impacts that liquidity squeezes and capital market conditions have on debt issuance decisions. Perhaps surprisingly, the results in Table 3 show that many squeezed firms do not issue debt or equity. In total, we have 10,277 squeezed firms that do not issue debt or equity, as compared to 10,450 squeezed firms that issue debt. Why do some squeezed firms issue and not others?

A good deal of literature, first in monetary economics and then in finance, argues that more speculative firms are unable to raise capital when credit market conditions are poor. Bernanke and Gertler (1989), Shleifer and Vishny (1992), Kiyotaki and Moore (1997), and Bernanke, Gertler, and Gilchrist (1996, 1999) argue

that borrowing is especially difficult for small firms and firms with poor credit ratings during times when there is greater uncertainty over collateral values and when the likelihood of default is higher. Consistent with this idea, Campello, Giambona, Graham, and Harvey (2010) find that low credit rating firms were more likely to cut spending during the financial crisis, while Greenwood and Hanson (2013) provide evidence that low quality firms tend to not issue debt when credit market conditions are poor. We therefore examine the characteristics of squeezed firms, and ask whether credit market conditions influence their debt issuance decisions.

In Table 7 we compare firms facing liquidity squeezes to firms that are not squeezed. The results show that squeezed firms are on average smaller, younger, more highly leveraged, burn far more cash, and more likely to have a speculative credit rating. Squeezed firms are therefore precisely the type of firm that the literature referenced above posits will be unable to raise capital when credit conditions are poor. These are also the same firms that Table 4 shows issue debt and use the proceeds to repurchase non-current debt.

The average squeezed firm has assets and sales about $1.02B, whereas the average non-squeezed firm has assets and sales of about $1.89B. The median assets and sales for squeezed firms are about $100M, whereas the medians for non-squeezed firms are both over $200M. Squeezed firms are also younger than non-squeezed firms. Hadlock and Pierce (2010) argue that small and young firms tend be more financially constrained, so squeezed firms fit this description well.

Squeezed firms have debt-to-assets ratio of 0.294, whereas for non-squeezed firms the ratio is 0.188. Squeezed firms burn cash, whereas non-squeezed firms, on average, are able to build cash. The cash burn rates are 0.285 and -0.016 for squeezed and non-squeezed firms respectively. Finally, 64% of squeezed firms that are rated have speculative (non-investment grade) credit ratings, whereas on 48.1% of non-squeezed firms do. Hence, squeezed firms are far more speculative than non-squeezed firms, so it seems plausible that their ability to raise capital is more sensitive to credit market conditions.

3.1.2. Propensity Matching Exercise

In Table 8 we more formally test the hypothesis that some squeezed firms do not issue because credit market conditions make raising capital difficult or impossible for them. We perform a propensity matching exercise. We limit our sample to squeezed firms, and ask whether credit market conditions can separate issuers from non-issuers. Squeezed firms are matched on market-to-book, PP&E scaled by total assets, age, total assets, sales, cash burn rate, current debt, medium-term debt, and long-term debt. We bootstrap 500 samples with 3,000 squeezed issuers and 3,000 squeezed non-issuers without replacement and report the average values across these simulations in Table 8. We provide 6 separate treatments; the *Debt Market Factor*, its 3 subcomponents, a version of the *Debt Market Factor* that is orthogonal to a recession dummy and to GDP deviations from

its HP-filtered trend, and a *Financial Shock Dummy* takes value of 1 in years 1990, 1991, 1992, 1993, 2008, and 2009 and 0 otherwise.

The *Financial Shock Dummy* is based on the financial shocks documented in Lemmon and Roberts (2010) and Duchin, Ozbas, and Sensoy (2010). Lemmon and Roberts contend that the years 1990-1993 had negative shocks to the supply of credit, especially for riskier firms. Their argument is based on the collapse of Drexel Burnham Lambert, Inc.; the passage of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989; and regulatory changes in the insurance industry. Duchin, Ozbas, and Sensoy (and others) use the recent financial crisis as an exogenous shock to finance. The crisis began in August 2007, however we use annual data, so we code the years 2008 and 2009 as crisis years.

The results in Table 8 show that we can successfully match issuers to non-issuers along the lines of the firm-level variables that we mention above. None of the differences between the two groups is statistically significant. All of the treatments are correctly signed and statistically significant. The most comprehensive measure, the *Debt Market Factor*, is statistically significant, as is its orthogonalized version, which removes all business cycle variation. The orthogonal version is perhaps too conservative, as it is widely believed that credit markets are tighter in recessions (Bernanke, 2007, 2010). The *Financial Shock Dummy* is also significant, showing that squeezed firms were less likely to issue during the years that have financial shocks. The results here are therefore consistent with the argument that squeezed firms, which tend to be speculative, are often unable to raise capital when credit markets

tighten. In unreported results we perform a similar exercise with equity issues, and reach the same conclusion. The final takeaway is that many firms facing liquidity squeezes are unable to raise capital.

3.2. How do Squeezed Non-Issuers Survive?

If a liquidity squeezed firm does not raise capital, then it must reduce its cash burn rate in order to remain solvent. We examine this issue in Tables 9 and 10. Table 9 provides within-firm comparisons, whereas Table 10 makes comparison across firms in the same industry. The within-firm comparisons in Table 9 compare spending and other variables in year *t*, the year that the firm was squeezed and did not issue, to averages over the three previous years.

The burn rate can fall either because gross profitability (sales minus cost of goods sold) improves, or because discretionary spending falls. Table 9 shows that gross profitability does not improve, but instead spending falls across the board among squeezed firms that do not raise capital. The average cash burn rate in the 3 years preceding the squeezed-non-issue year is 0.087. In year *t*, the squeezed-no-issue year, it is -0.006, which means that these firms completely revered course and built cash, and no longer burned it, in the squeezed-non-issue year. Gross profits (scaled by lagged assets) are 0.464 during the previous 3 years, and 0.431 during the squeezed-non-issue year, so gross profitability got declined and did not help reduce the cash burn rate. In contrast, CAPEX, SG&A, and R&D spending are all significantly lower in the squeezed-non-issuance year. Inventory also decreases and

firms reduce employment. Our employment variable is the yearly difference in the log number of employees. During the previous 3 years it averages 0.031, reflecting an average yearly growth rate of 3.1%, while in the squeezed-non-issue year it falls to -0.062, reflecting a decline in the number of employees of 6.2%.

In Table 10 we report a comparison across firms in the same industry. We regress the same outcome variables studied in Table 9 on a non-issue dummy, a squeezed dummy, a squeezed-non-issue dummy, total assets, and book-to-market. We also include industry-year fixed effects to control for industry-year shocks. Like in Table 9, the results in Table 10 show that squeezed firms that do not issue have significant reductions in both spending and employment.

In the first regression reported in Table 10, the dependent variable is the cash burn rate. The squeezed-no-issue dummy is -0.046 and significant at the 1% level. This means that, compared to a similar firm in the same industry, a squeezed-non-issuer has a burn rate that is lower by 0.046, which is an economically meaningful effect. Looking across the columns in Table 10 we see that the lower burn rate is not caused by higher gross profits, but instead is caused by lower spending and less employment growth. The squeezed-non-issue coefficient is negative and significant in the CAPEX, R&D, inventory growth, and employment growth regressions. The coefficient is also negative in the SG&A regression, although it is not significant. Like Table 9, the results in Table 10 show that squeezed firms that do not issue have abnormally low investment, spending, and employment growth.

3.3. The Subsequent Effects of Being Liquidity Squeezed and Not Issuing

The previous tables show that spending and investment decrease among squeezed firms that do not issue. Here we ask what the subsequent effects are. Papers in monetary economics, such as Bernanke and Gertler (1989), Shleifer and Vishny (1992), Kiyotaki and Moore (1997), and Bernanke, Gertler, and Gilchrist (1996, 1999), and a book by Holmstrom and Tirole (2011), argue that if financial conditions cause firms to skip investment, then this can be detrimental to the overall economy, even exacerbating recessions. Statements in Bernanke (2007, 2010) suggest that US monetary policy during and after the financial crisis was governed by this idea.

We explore these effects further at the firm-level. We ask whether squeezed firms that do not issue have slower future growth. We measure growth over the subsequent 3 years, as sales growth, employment growth, and growth in market share, where market share is defined relative to 3-digit SIC code. We take log values of 1 + each variable at the end of years *t* and year *t+3*, and use the difference in log values as our estimate of the growth rate. We use the same explanatory variables that we did in Table 10.

The results in Table 11 show that subsequent growth is slower for squeezed firms that do not issue. The results show that squeezed firms that do not issue have significantly slower growth in sales, lose market share, and have slower employment growth. The effects in Table 11 are economically meaningful. As an

example, in the first regression the squeezed-no-issue dummy is -0.033, which means that squeezed firms that did not issue grew their sales by 3.3% less than other firms in the same industry-year, after controlling for size, book-to-market, whether the firm is squeezed, and whether the firm issued. The results also show that not issuing leads to lower growth, which is not surprising, but being squeezed and not issuing has twice the effect on growth. The no-issue dummy is -0.037 and significant, while the squeezed dummy is -0.013 and insignificant. So overall, sales growth rates are 0.037 + 0.033 = 7% lower over the subsequent 3 years for squeezed firms that do not issue. Taken in their entirety, the results in Table 11 are consistent with the idea that costly external finance can reduce growth among liquidity squeezed firms.

4. Conclusion

In this paper, we study the motivations for long-term debt issues. We find that the primary reason that firms issue long-term debt is to repurchase non-current debt. On average, non-current repurchases consume 51% of debt issue proceeds. This effect is greater for larger issues. Approximately half of these repurchases have a precautionary motive, replacing debt that is maturing in between 1 and 5 years with debt that has maturity greater than 5 years.

Funding current operations and investment is the second most common motivation for debt issues. We find that 35% of debt issuers are liquidity squeezed, and that on average, 38% of the proceeds from debt issues are used to fund

operations and investment. This is a more important use of funds for smaller debt issues.

We find that, even among liquidity squeezed firms, market conditions can outweigh immediate cash needs in issuance decisions. We find that about half of liquidity squeezed firms do *not* issue debt or equity. Squeezed firms tend to be young, highly leveraged, and have speculative credit ratings. A large literature suggests that the availability of external finance for such firms tends to be highly sensitive to financial market conditions. We find that squeezed firms issue debt when credit market conditions are favorable, and cut spending, employment, and inventory when credit markets are tighter. It therefore makes sense that firms try to reduce rollover risk, as the inability to roll debt over could create a costly liquidity squeeze.

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Figure 1: Capital Market Conditions

This figure shows the *Debt Market Factor* over the period 1974q1 to 2015q2. Shaded grey bars are "Bad Times" periods, which are the two quarters before, the quarter of, and two quarters after a Debt Market Factor trough. A quarter *t* is a Debt Market Factor trough if the value of the Debt Market Factor in quarter *t* is lower than the values in the previous 5 quarters and in the 5 subsequent quarters. In our sample period, there are 12 "Bad Times" for issuing debt. These "Bad Times" coincide with well-known macroeconomic and financial shocks, i.e., periods during which it was clearly difficult to raise capital.

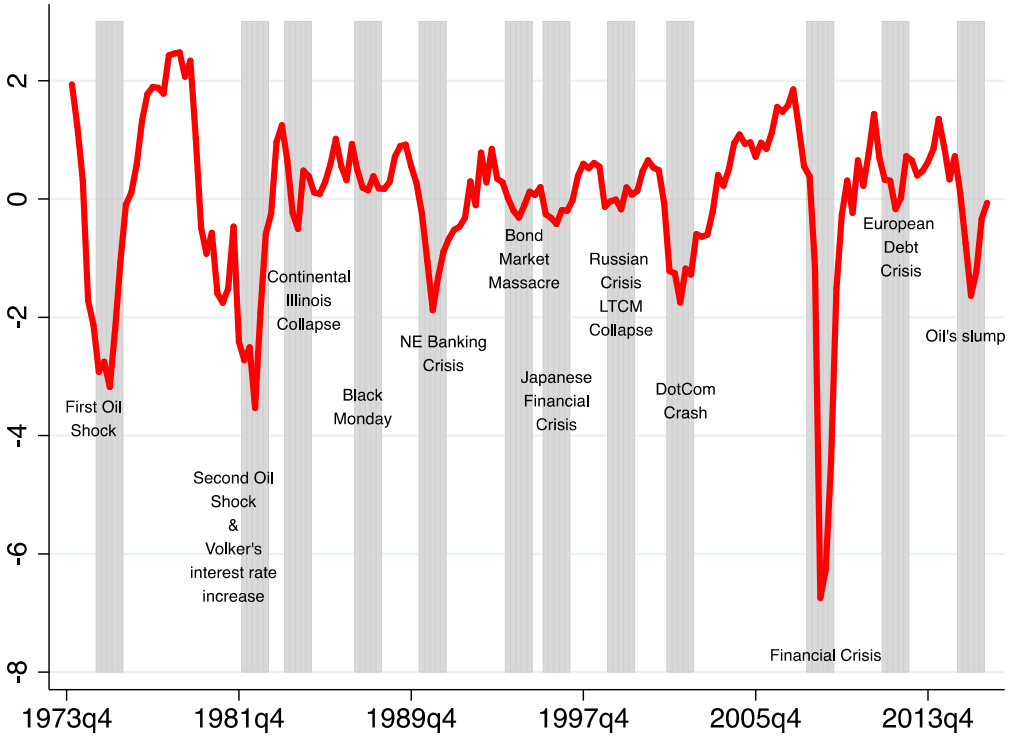

Table 1: Summary Statistics

This table reports the mean, standard deviation, 25% percentile, 50% percentile, 75% percentile, and number of available observations for the variables used in the empirical analysis. We exclude non-U.S. firms, firms that are not listed on one of the three major stock exchanges (AMEX, NYSE, and NASDAQ), financial firms (SIC 6000-6999), and regulated firms (SIC 4000-4949). We exclude observations that are missing either total assets or stock price. Unless otherwise noted, all variables are scaled by the beginning-of-fiscal-year total assets (item *at*). We define *Debt Issuance* as a yearly observation for which the total yearly proceeds of long-term debt issues (item *dltis*) are greater than 5% of lagged assets. *Debt Issuance* is therefore set equal to zero if the issue amount scaled by lagged assets is less than 0.05. *Debt Repurchase* is the repurchased amount of non-current long-term debt scaled by the beginning-of-year total assets. *Debt Repurchase* is measured as the reduction in long-term debt (item *dltr*) net of *Current Debt* at the end of the previous year. If the variable takes a negative value, we set it equal to zero. *Current Debt* is the amount of long-term debt that is due in one year or less (item *dd1*). *Medium Debt* is the sum of the amounts of long-term debt maturing in between 1 and 5 years (items *dd2, dd3, dd4* and *dd5,* respectively). *Long Debt* is long-term debt reported in Compustat (item *dlttq*) minus medium-term debt. If *dltt* is missing or less than medium term debt, we set its value equal to zero. *Leverage* is total debt (item *dltt* plus item *dlc*) scaled by total debt plus market value of equity (item *prcc* times item *csho*). *Rating* is the numerical credit rating created using the S&P domestic long-term issuer credit rating (item *splticrm*). We assign a value of 28 to *AAA* ratings and decrease this value by one unit for each subsequent credit rating category. *Cash Holdings* is the value of cash and marketable securities (item *che*). *ΔCash* is the yearly change in cash and marketable securities (item *che*). *Cash Flow* is the sum of income before extraordinary items (item *ibc*) with depreciation and amortization (item *dp*). If income before extraordinary items is missing, we use net icome (item *ni*). *Capex* is capital expenditures (item *capx)*. *Burn Rate* is the cash burned in a given year. It is given by the sum of *Capex,* cash dividends (item *dv*), and change in non-cash net working capital (item *act* net of item *lct* and item *che*) minus *Cash Flows. Liquidity Squeeze* is the difference between the cash burned over the year and current cash holdings. *Squeezed dummy* takes a value of one if *Liquidity Squeeze* is positive and zero otherwise. *R&D* is research and development expenditure (item *xrd*). We set *R&D* equal to zero if the value is missing. *SGA* is selling, general, and administrative expenses (item *xsga*). *Market-to-Book* is the log of the market value of equity (item *prcc* times item *csho*) scaled by the book value of equity (item *ceq*). If the book value of equity is negative, we set the market-to-book value to missing. *PPE* is net property, plant, and equipment (item *ppent*). *Sales* is the log value of total sales (item *sale*) expressed in 2009 dollars using the implicit price deflator for the U.S. GDP. *Assets* is the log value of total book assets (item *at*) expressed in 2009 dollars using the implicit price deflator for the U.S. GDP. *Age* is the number of years the firm has been in the Compustat database. Gross Profits is total sales (item *sale*) minus the cost of goods sold (item *cogs*) divided by the beginning of the year total assets. Δ Log Employment is the yearly change in the log value of the number of employees (item *emp)*. ΔInventory is the yearly change in inventories (item *invt*). All the variables are winsorized at the top and bottom 0.5%. The sample period is 1975-2015.

Table 1 (Continued)

Variable	mean	sd	p25	p50	p75	count
Debt Issuance	0.307	0.370	0.095	0.171	0.348	43,363
Debt Repurchase	0.064	0.160	0.000	0.002	0.044	124,615
Current debt	0.021	0.040	0.000	0.007	0.023	108,670
Medium debt	0.093	0.117	0.001	0.051	0.137	108,670
Long Debt	0.074	0.112	0.000	0.013	0.117	108,670
Leverage	0.251	0.245	0.032	0.183	0.407	128,281
Rating	18.581	3.645	16.000	18.000	21.000	21,269
Cash Holdings	0.186	0.269	0.027	0.084	0.234	127,978
ΔCash	0.021	0.183	-0.026	0.001	0.038	127,973
Cash Flows	0.040	0.229	0.019	0.087	0.142	126,364
Capex	0.073	0.092	0.021	0.045	0.089	127,594
Burn Rate	0.056	0.245	-0.055	0.005	0.093	122,866
Liquidity Squeeze	-0.104	0.290	-0.229	-0.080	0.009	122,866
Squeezed Dummy	0.273	0.445	0.000	0.000	1.000	122,866
R&D	0.051	0.111	0.000	0.000	0.052	128,205
SGA	0.368	0.296	0.160	0.299	0.490	119,001
Market-to-Book	2.861	4.434	0.964	1.671	2.993	123,406
PPE	0.315	0.262	0.119	0.249	0.434	127,806
Sales (log)	5.233	2.175	3.800	5.242	6.690	128,020
Assets (log)	5.225	2.015	3.794	5.103	6.543	128,205
Age	12.737	9.194	6.000	10.000	17.000	129,059
Gross Profits	0.434	0.351	0.227	0.394	0.603	127,861
Δ Log Employment	0.029	0.292	-0.064	0.022	0.126	124,019
ΔInventory	0.016	0.075	-0.006	0.001	0.031	127,007

Table 2: Capital Market Conditions

This table reports summary statistics for the capital market variables used in this study. The variables are detrended via Hodrick-Prescott filter. Panel A reports the mean, standard deviation, 25% percentile, 50% percentile, 75% percentile, and number of available observations for the unfiltered capital market variables. *Credit Spread* is the annualized difference between the Moody's seasoned Baa corporate bond yield and Moody's seasoned Aaa corporate bond yield. *Baa* is the yield on Baa-rated *bond*s. *Federal Debt Change* is the annual change in federal debt held by the public, measured as percent of gross domestic product. The *Debt Market Factor* is the first principal component of the above three detrended variables. Panel B reports the correlations among the detrended the variables. The sample period is 1974q1-2015q4. *** Significant at 1%.

Panel A: Summary Statistics for Detrended Variables

	mean	sd	p25	p50	p75	Count
Credit Spread (%)	0.000	0.327	-0.192	-0.036	0.088	168
Baa (%)	0.000	0.818	-0.468	-0.014	0.384	168
Federal Debt Change (%)	0.000	1.640	-1.050	-0.106	0.759	168
Debt Market Factor	0.000	1.304	-0.427	0.215	0.710	168

Panel B: Correlation among Detrended Variables

Credit Spread	1.000			
Baa	0.518***	1.000		
Federal Debt Change	0.435***	0.049	1.000	
Debt Market Factor	-0.905***	-0.712***	-0.612***	1.000

Table 3: Debt Issuers' Characteristics

This table reports key quantities for debt issuers and firms that do not issue equity or debt in a given fiscal year over the period 1975-2015. A debt issuer is a firm-year observation with total proceeds from long-term debt issues that exceed 5% of beginning-of-year assets. We only consider firms with non-missing observations for all of the reported variables. *Debt Issue$_t$/Assets$_{t-1}$* are the total proceeds from debt issues scaled by the beginning-of-year total assets. *Repurchases* are non-current debt repurchases and are defined in Table 1. *Repurchase (>1%)* (*Repurchase (>5%), Repurchase (>10%)*) is the fraction of firms that repurchase debt in an amount larger than 1% (5%, 10%) than beginning-of-year assets. *Current Debt*, *Medium-Term Debt*, and *Long-Term Debt* are defined. The liquidity squeeze variables are defined in Table 1. *% with 10% change in leverage* is the fraction of firms that experience a change in leverage of at least 10%. Leverage is defined in Table 1. We also report the fraction of firms that experience a change in leverage of at least 10% that were not also squeezed at the beginning of the year.

	Issuers	Non-Issuers
Observations	29,856	54,087
Debt Issue$_t$/Assets$_{t-1}$	0.296	0.006
Repurchase$_t$	0.154	0.013
Repurchase$_t$ (>1%)	70%	22%
Repurchase$_t$ (>5%)	52%	7%
Repurchase$_t$ (>10%)	39%	3%
Current Debt $_{t-1}$	0.026	0.015
Medium Debt $_{t-1}$	0.135	0.069
Long Debt $_{t-1}$	0.099	0.065
Liquidity squeeze $_{t-1}$	-0.046	-0.166
% squeezed $_{t-1}$	35%	19%
% with 10% change in leverage$_t$	27%	8%
% with10% change in leverage$_t$ & not squeezed$_{t-1}$	17%	5%

Table 4: The determinants of long-term debt issues and repurchases

This table formally tests for the determinants of long-term debt issues and repurchases. In the columns *Issue Decision* and *Issue Size* we perform logit regressions, while in the column *Debt Repurchase* we estimate an OLS regression. In column *Issue Decision* the dependent variable takes value of 1 if there is debt issues in a given year and zero if the firm does not issue debt or equity. In column *Issue Size* the dependent variable takes value of 1 if there is a large debt issue in a given year and zero otherwise. We define large issues as those above the sample median, and small issues as those below the sample median. In the last column the dependent variable is *Debt Repurchase*, which is defined in Table 1. The coefficients for the continuous variables in the logit regressions are the marginal effects of the independent variable on the probability of a large debt issue next year. All continuous variables are standardized so that the coefficients across all regressions indicate the effect of a one-standard deviation increase. All of the independent variables are lagged one year. Table 1 reports the definitions of the firm-level control variables, while Table 2 defines definitions of the *Debt Market Factor*. The sample is from 1986-2015. We begin in 1986 due to the availability of the credit ratings data. The regressions include industry fixed effects calculated using a 3-digit SIC code. The R-square for logit regressions is the pseudo r-square. Robust standard errors, reported in parentheses, are computed by clustering at the firm level. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

	Issue Decision	**Issue Size**	**Debt Repurchase**
Current debt	0.046***	-0.009***	0.019***
	(0.002)	(0.003)	(0.002)
Medium Debt	0.082***	0.035***	0.053***
	(0.003)	(0.004)	(0.003)
Long Debt	0.011***	-0.010**	0.010***
	(0.003)	(0.004)	(0.003)
Liquidity squeeze	0.083***	-0.012***	0.007***
	(0.003)	(0.004)	(0.002)
Market-to-book	0.026***	0.028***	-0.002
	(0.003)	(0.004)	(0.002)
PPE	0.056***	0.004	-0.012***
	(0.004)	(0.005)	(0.003)
Sales	0.059***	-0.001	0.031***
	(0.004)	(0.007)	(0.004)
Age	-0.015***	-0.025***	-0.005
	(0.003)	(0.005)	(0.003)
Rating	-0.040***	-0.144***	-0.052***
	(0.007)	(0.011)	(0.005)
Dummy rating	-0.227***	-0.690***	-0.214***
	(0.037)	(0.056)	(0.027)
Debt Market Factor	0.029***	0.025***	0.001
	(0.002)	(0.004)	(0.002)
Industry FE	YES	YES	YES
Observations	61,999	22,070	21,518
R-square	0.129	0.0412	0.119

Table 5: Use of Proceeds

This table reports a comparison of key accounting ratios during the issuance year. *Percentage* reports the results in percentage of the debt issue. *Single Largest Use* reports the fraction of observations for which a given variable experiences the largest change. Panel A reports the results for all issues. Panel B (C) reports the results for large (small) issues only. *Debt Repurchase* is defined in Table 1. *Rollover* is the amount of *Current Debt* (item *dd1*) in the previous year. *Net Equity Repurchase* is the average of equity repurchases net of equity issues during the issuance quarter (item *prstkc* minus item *sstk*). *Burn Rate* reflects the cash burned during the year and is defined in Table 1. *ΔCash* is the yearly change in cash and marketable securities (item *che*) during the issuance year scaled by the beginning of the year total assets (item *at)*.

Panel A: All Issues

	Debt Repurchase	Rollover	Net Equity Repurchase	Burn Rate	ΔCash
Percentage	51%	19%	-17%	38%	6%
Single Largest Use	44%	8%	5%	34%	10%

Panel B: Large Issues

	Debt Repurchase	Rollover	Net Equity Repurchase	Burn Rate	ΔCash
Percentage	54%	9%	-12%	29%	7%
Single Largest Use	57%	4%	3%	29%	8%

Panel C: Small Issues

	Debt Repurchase	Rollover	Net Equity Repurchase	Burn Rate	ΔCash
Percentage	48%	29%	-21%	46%	5%
Single Largest Use	31%	12%	6%	40%	12%

Table 6: Maturity Changes

This table reports maturity data for debt issuers that also witness a reduction in medium-term debt. Medium-term debt and long-term debt are both defined in Table 1. A reduction in medium-term debt is measured as the difference between the sum of *dd1*, *dd2*, *dd3*, and *dd4* in year t and the sum of *dd2*, *dd3*, *dd4*, and *dd5* in year t-1. A negative value for this variable is a lower bound on the amount of medium-term debt that was repurchased. Recall that we define medium-term debt as debt with maturity between 1 and 5 years. One year later, such debt will have maturity between <1 year and 4 years. *Δ Long Debt* is *dd5* plus long-term debt in year t minus long-term debt in year t-1. We add back *dd5*, because this reflects a reduction in long-term debt due to the passage of time, i.e., *dd5* this year is *dd4* next year. Recall that we define long-term debt as debt with maturity greater than 5 years. *Debt Issue* and *Debt Repurchase* are defined in Table 1. In the first column, we report all debt issuers with a reduction medium-term debt. In the second column, we report all firms with a reduction medium-term debt with repurchases that exceed 1% of assets; in third column, we report all firms with a reduction medium-term debt with repurchases that exceed 5% of assets; and in fourth column, we report all firms with a reduction medium-term debt with repurchases that exceed 10% of assets. In the first row, we report the percentage of firms with a reduction in medium-term debt in each repurchase category. All the observations have non-missing values for all of the reported variables.

	All	**Repurchase >1%**	**Repurchase >5%**	**Repurchase >10%**
% with Reduction in Med. Debt	38%	45%	52%	56%
Δ Med. Debt /Med. Debt$_{t-1}$	-0.411	-0.432	-0.453	-0.481
Δ Med. Debt /Assets $_{t-1}$	-0.084	-0.089	-0.097	-0.109
Δ Long Debt /Long Debt $_{t-1}$	1.109	0.575	0.529	0.472
Δ Long Debt /Assets $_{t-1}$	0.103	0.094	0.090	0.093
Debt Issue	0.308	0.329	0.360	0.418
Debt Repurchase	0.253	0.289	0.328	0.392
Δ Med. Debt / Debt Issue	-0.438	-0.447	-0.457	-0.454
Δ Med. Debt / Rep	-0.808	-0.486	-0.414	-0.377
Med Debt / (Long + Med) Before (t-1)	0.655	0.666	0.684	0.702
Med Debt / (Long + Med) After (t)	0.508	0.520	0.536	0.547

Table 7: Why Don't Squeezed Firms Issue?

This table reports quantities for liquidity squeezed firms and non-squeezed firms during the period 1986-2015. We start in 1986 because of rating data availability. The variables are defined in Table 1. Sales and Assets are reported in millions of dollars. *%Junk* is the percentage of firms with credit ratings that are below investment grade.

	Obs.	**Leverage**	**Burn Rate**	**Sales (Median)**	**Assets (Median)**	**Age**	**%Junk**
Liquidity Squeezed	23,648	0.294	0.285	1,024 (101)	1,061 (91)	12.113	0.640
Non-Squeezed	67,508	0.188	-0.016	1,893 (230)	2,054 (215)	15.071	0.481
Difference		-0.106	-0.300	869	993	2.958	-0.159
T-stat		-61.75	-95.54	20.98	15.82	39.68	-18.81

Table 8: Propensity Score Analysis

This table reports a comparison of debt market conditions for liquidity squeezed firms that issue and liquidity squeezed firms that do not issue in a given year. We randomly match 3,000 liquidity squeezed debt issuers with liquidity squeezed firms that do not issue equity or debt but have similar characteristics using observations for the 1975-2015 period. We report the average values across 500 draws. The column *Issuers* reports the average values for the market condition variables and control variables for issuers, while Column *Non-Issuers* reports the average for value market timing variables and control variables for the non-issuers. The column *Difference* reports the differences in the market condition and control variables. For the market timing variables, Column *S. E.* reports the standard error of the difference evaluated following Abadie and Imbens (2006) and the column *t-stat* the corresponding t-statistics. For the control variables, Column *p-value* reports the p-value for the difference in control variables across groups and Column *% Bias* the standardized percentage bias suggested by Rosenbaum and Rubin (1985). *Financial Shock Dummy* takes value of 1 in years 1990, 1991, 1992, 1993, 2008, and 2009 and 0 otherwise. The other variables are defined in Tables 1 and 2.

Debt Market Conditions

	Issuers	Non Issuers	Difference	S. E.	t-stat
Debt Market Factor	-0.035	-0.210	0.174	0.037	4.68
Credit Spread	-0.022	0.065	-0.087	0.023	-3.80
Baa	0.031	0.073	-0.042	0.010	-4.33
Fed. Debt Change	-0.153	0.130	-0.284	0.114	-2.49
Debt Market Factor (Orth.)	-0.098	-0.180	0.082	0.034	2.41
Financial Shock Dummy	0.136	0.157	-0.020	0.009	-2.22

Matched Sample

Control Variables	Issuers	Non Issuers	Difference	p-value	% Bias
Market-to-Book	2.762	2.804	-0.042	0.512	2.46
PPE	0.515	0.507	0.008	0.401	2.67
Age	11.121	11.178	-0.057	0.555	1.70
Total Assets (log)	5.404	5.417	-0.012	0.541	1.800
Sales (log)	5.411	5.438	-0.027	0.497	2.06
Burn Ratio	0.117	0.116	0.001	0.553	1.76
Current Debt	0.023	0.024	-0.001	0.466	2.42
Medium Debt	0.154	0.156	-0.003	0.443	2.52
Long Debt	0.113	0.113	-0.001	0.554	1.78
Observations: 20,368; Issuers: 10,084; Likelihood-ratio test (p-value): 0.545					

Table 9: How do Squeezed-Non-Issuers Survive? (Within-firm analysis)

In this table we study the changes in spending for liquidity squeezed firms that do not issue debt or equity. We compute past averages using data from years t-3, t-2, and t-1, and compare to year t values. The variables are all defined in Table 1.

	Past Average Value	Year t Value	Difference	t-statistic
Burn Rate	0.087	-0.006	-0.093	-54.82
Gross Profits	0.464	0.431	-0.033	-18.26
CAPEX	0.091	0.057	-0.034	-46.20
SG&A	0.354	0.339	-0.015	-12.02
R&D	0.030	0.027	-0.003	-8.51
Δ Inventories	0.032	-0.004	-0.037	-40.58
Δ Log Employment	0.031	-0.062	-0.093	-30.02

Table 10: How do Squeezed Non-Issuers Survive?
(Across-Industry analysis)

This table performs a cross-industry comparison of the spending variables. *No Issue* is a dummy variable that takes value of 1 if a firm does not issue debt or equity in year t. *Squeezed* is a dummy variable that takes value of 1 if a firm is squeezed at the beginning of the year t. *Squeezed_No_Issue* is a dummy variable that takes value of 1 if a firm does not issue in year t and is squeezed at the beginning of the year t. The other variables are all defined in Table 1. Each regression includes industry-year fixed effects and standard errors clustered at the firm-year level. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

	Burn Rate	Gross Profits	CAPEX	SG&A	R&D	Δ Inventories	Δ Log Employment
No Issue	-0.056***	-0.012***	-0.024***	-0.007**	0.005***	-0.021***	-0.066***
	(0.004)	(0.004)	(0.002)	(0.003)	(0.001)	(0.002)	(0.004)
Squeezed	0.046***	-0.054***	0.024***	-0.012***	0.002	-0.004***	-0.023***
	(0.005)	(0.005)	(0.002)	(0.004)	(0.001)	(0.001)	(0.004)
NoIssueSqueezed	-0.046***	-0.001	-0.028***	-0.003	-0.006***	-0.008***	-0.024***
	(0.004)	(0.005)	(0.002)	(0.005)	(0.001)	(0.001)	(0.005)
Assets	-0.013***	-0.016***	0.002***	-0.037***	-0.002***	0.000*	0.008***
	(0.001)	(0.002)	(0.000)	(0.002)	(0.000)	(0.000)	(0.001)
Market-to-Book	0.002***	0.011***	0.001***	0.009***	0.002***	0.001***	0.003***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Constant	0.106***	0.563***	0.069***	0.537***	0.036***	0.027***	0.019***
	(0.005)	(0.010)	(0.002)	(0.011)	(0.003)	(0.002)	(0.006)
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year Clustered S.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64,425	64,425	64,425	64,425	64,425	64,425	64,425
R-squared	81,225	81,225	81,225	81,225	81,225	81,225	81,225

Table 11: Future Performance of Squeezed Non-Issuers

This table performs an industry-year comparison of future performance. This table performs a cross-industry comparison of the spending variables. *No Issue* is a dummy variable that takes value of 1 if a firm does not issue in year t. *Squeezed* is a dummy variable that takes value of 1 if a firm is squeezed at the beginning of the year. *Squeezed_No_Issue* is a dummy variable that takes value of 1 if a firm does not issue in year t and is squeezed at the beginning of the year. The other variables are all defined in Table 1. *Sales Growth* is the difference between the log of sales measured at the end of years t and t+3. *Change in Mkt Share* is the change in market share between the end of years t and t+3. Market share is the firm's percentage of total revenues within a 3-digit SIC code. See Table 1 for further variable definitions. Each regression includes industry-year fixed effects and standard errors clustered at the firm-year level. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

	Sales Growth	**Change in Mkt Share**	**Employment Growth**
No Issue	-0.037***	-0.033***	0.004
	(0.006)	(0.005)	(0.005)
Squeezed	-0.013	-0.012	-0.025**
	(0.009)	(0.008)	(0.010)
Squeezed_No_Issue	-0.033***	-0.028***	-0.026**
	(0.012)	(0.011)	(0.012)
Assets	-0.005**	0.001	-0.008***
	(0.002)	(0.002)	(0.002)
Market-to-Book	0.014***	0.011***	0.013***
	(0.002)	(0.001)	(0.001)
Constant	0.125***	-0.060***	0.080***
	(0.013)	(0.011)	(0.015)
Industry-Year FE	Yes	No	No
Year FE	No	Yes	Yes
Firm-Year Clustered S.E.	Yes	Yes	Yes
Observations	61,029	61,029	60,622
R-squared	0.124	0.013	0.093