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Analyzing the Effects of Credit Rating Changes, the Recent Financial Crisis and Other Variables on Firms' Debt Levels

Sean M. Wasserman
Claremont McKenna College

CLAREMONT McKENNA COLLEGE

ANALYZING THE EFFECTS OF CREDIT RATING CHANGES, THE RECENT FINANCIAL CRISIS AND OTHER VARIABLES ON FIRMS' DEBT LEVELS

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PROFESSOR FAN YU

AND

DEAN GREGORY HESS

BY

SEAN WASSERMAN

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Abstract

This paper utilizes a sample of firms over the years 2000–2009 to test the effects of credit rating changes, the financial crisis, interest rates, and other variables on short-term, long-term, and total debt levels on the balance sheet. Each independent variable was created using a one year lag in order to run the regressions. The values of these variables from the previous year are being analyzed to see if they can predict debt levels for the following year. The results of this paper suggest that levels of long-term and total debt are somewhat reliant on and are positively correlated with the federal funds rate. The results indicate that short-term debt levels are much harder to predict, but they appear to be negatively correlated with the financial crisis. Long-term debt levels were also affected by this variable, but were positively correlated with it. Z-score was a significant predictor of all types of debt, and was positively correlated with each. In an effort to acquire as many data points as possible for the regressions, strict data filtration techniques were used. This limited the sample to 177 firms. The overall insignificance of the results in this study suggest that further research on what drives debt levels on the balance sheet is necessary. This will generate a greater understanding of firm behavior both inside and outside of a financial crisis.

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1 Introduction

After the burst of the internet bubble, but before the most recent financial crisis, the economy experienced a brief period of stability. Little did we know, however, that this was simply the calm before the storm.

It is impossible to experience the bust without the boom. Soaring real estate prices as well as increased securitization of loans, especially subprime loans, were two drivers of the economic upswing prior to the meltdown. The outstanding number of mortgage-backed securities (MBS) rose from $3 trillion in 2000 to $6.9 trillion by 2007 (Dokko et al, 2009). This increase in MBS outstanding, along with a fall in housing prices, was soon followed by immense amounts of defaults and foreclosures concentrated mainly in the subprime market (Dokko et al, 2009). Due to the amount of firms affected by the falling real estate prices, defaults, and foreclosures, the reach of the economic crisis was vast. Consequently, countless companies around the world were impacted.

As a result of these events, counterparty risk skyrocketed and liquidity was significantly diminished, especially in the credit markets. On August 9, 2007, money market interest rates soared and marked the beginning of the severe stages of the crisis (Taylor, 2009). A good indicator of financial health and liquidity in the economy is the LIBOR-OIS spread. According to Brunnermeier (2008), "the LIBOR reflects banks' default risk and liquidity risk over the next three months, while the overnight rate is essentially riskless and hence not subject to pressures associated with these risks." This implies that the spread between the two can be viewed as an indicator of the amount of financial stress[1] in the market (Taylor, 2009). An increase in the spread reflects an

[1] "Financial stress" includes perceived counterparty risk and liquidity risk.

increase in counterparty and liquidity risk[2] as well as an overall increase in financial stress. Over the course of about four months—from July 2007 to November 2007—this spread increased from about 0.1% to over 1% (Figure 1 in Appendix).

In fact, within my sample, the amount of S&P Long-Term Issuer rating downgrades rose from twelve in 2005 to twenty nine in 2009. The amount of S&P Short-Term Issuer rating downgrades rose from eight in 2005 to twelve in 2009 (Figure 3 in Appendix). The amount of long-term upgrades fell from nineteen in 2005 to four in 2009, and the amount of short-term upgrades fell from eight in 2005 to four in 2009 (Figure 4 in Appendix).

As a result of the increased uncertainty, decreased liquidity, and decreased profitability, many firms had change their operating strategies as well as their capital structure in order to survive. How this capital structure changed in response to the financial crisis is what this paper plans to investigate. Specifically, this paper analyzes the effects of several variables on the normalized levels of short-term, long-term, and total debt on firms' balance sheets.[3]

2 Literature Review

My study aims to expand upon the limited research done on whether or not a change in credit rating affects a firm's debt levels. In addition, my paper will look into the effects of the most recent financial crisis and how this period of illiquidity and uncertainty influenced a firm's short-term and long-term debt levels as well as their total debt levels.

[2] As defined by Diamond (1991), "liquidity risk" is the risk that a solvent but illiquid borrower is unable to obtain refinancing. Liquidity risk comes from debt with shorter maturity than assets.
[3] Levels are normalized by the previous year's total assets. For the remainder of the paper the terms "short-term, long-term, and total debt" refer to the variables normalized by total assets.

Past studies have been done on how a credit rating downgrade affects the issuance of debt. Crabbe and Post (1994) analyzed the issuance of commercial paper, particularly by bank holding companies, after a downgrade. By looking at data between 1986 and 1991, Crabbe and Post found that following a downgrade, issuance of commercial paper fell 6.69 percent in the initial two weeks and 11.05 percent in the following 12 weeks. This comes as no surprise, because a lower credit rating equates to a higher cost of issuing debt. I plan to apply these conclusions to my hypothesis about the effects of rating changes on short-term debt.

Darren J. Kisgen (2006, 2009) took a slightly different approach to analyzing the effects of a rating change. Kisgen (2006) analyzed to what extent credit ratings affect a firm's capital structure decisions. He was able to prove that firms near a credit rating upgrade or downgrade issue less debt relative to equity than firms not near a change in rating. In a subsequent study, he expanded this research and analyzed what happened to a firm's capital structure—both debt and equity issuance—*following* a change in credit rating (Kisgen, 2009). He found that firms reacted to a change in rating differently depending on whether the change was an upgrade or a downgrade. Firms that experience a downgrade tend to lower leverage levels, while firms that experience an upgrade do very little in response.

Combined, Kisgen's two studies prove that capital structure decisions are influenced by credit ratings as well as standard tax and financial distress factors (Kisgen, 2009). In his 2006 and 2009 papers, Kisgen used data from 1986–2001 and 1987–2003 respectively. In an effort to capture the effects of the most recent crisis, I used data from 2000–2009.

I will be expanding his study by including the effects of the most recent financial crisis as well as looking at short-term and long-term debt levels in addition to total debt and equity issuance. Since I will be analyzing the differences in effects on short-term and long-term debt, some theory on how firms choose between these two different types of debt must be introduced.

Douglas W. Diamond (1991) discussed the two types of debt in his study. He believed that short-term debt brings about liquidity risk due to the fact that the borrower is occasionally unable to refinance and the lender may want to liquidate before the borrower would choose to. In addition, short-term debt may have a maturity that comes before cash flows, while long-term debt has maturities matching the future arrival of the cash flows. Higher rated firms tend to issue short-term debt directly to investors, while lower rated firms tend to issue long-term bonds or borrow through intermediaries.

Overall, very little research has been done on this topic, so I will be relying heavily on the few sources I have discussed above. Combining some of the theoretical aspects of Douglas W. Diamond's paper along with the modified methodology of Darren J. Kisgen, I will be taking a fresh approach to analyzing what influences different debt levels within a firm.

3 Hypothesis

Firm behavior should not remain the same in differing economic conditions. During a crisis in which liquidity is scarce and counterparty risk is high, a firm's capital structure will most certainly take on a different form. It would make sense for a company to try and lower the amount of leverage on their balance sheet during a crisis, but the question of whether short-term or long-term debt will be affected more still remains.

Due to fact that short-term debt has a shorter maturity than long-term debt, firms have the opportunity to change the amount of this type of debt on their balance sheet much more often than with long-term debt. As stated earlier, liquidity risk is created from short-term debt because the borrower may not always be able to refinance and the lender may want to liquidate before the borrower would like to (Diamond, 1991). Because of the inherent nature of short-term debt and the fact that it creates additional liquidity risk, it should be much more volatile and fluctuate more in a shorter time span than long-term debt. Because of this relationship, long-term debt may actually increase relative to short-term debt during a liquidity crunch.

During the most recent crisis, interest rates fluctuated greatly. The target nominal federal funds rate dropped from just above five percent in late 2007 to near zero in 2009 (Figure 2 in Appendix). The annual federal funds rate and the year-over-year changes in the federal funds rate are included as independent variables in my regressions.[4] I expect that debt levels in one year will actually be positively correlated with the federal funds rate and change in the federal funds rate. Interest rates tend to rise during periods of stability and fall during periods of distress, so a rise in rate should actually occur during a time period where firms are more willing to take on debt since the economic conditions are relatively better. This interest rate effect should outweigh all others when predicting levels of debt. However, it may not predict changes in short-term debt as well as changes in long-term and total debt since I believe short-term debt may respond more to other factors (e.g. loss of liquidity and credit rating changes).

Credit ratings should also play a role in determining the levels of the different kinds of debt. According to Kisgen's (2009) results, downgrades should decrease the

[4] Annual Federal Funds Rate data taken from: http://www.federalreserve.gov/releases/h15/data.htm

amount of debt within the firm while an upgrade should have little to no effect. Long-term rating changes will affect both long-term and total debt more and short-term rating changes will affect short-term debt the most. However, since both the long-term and short-term ratings reflect the overall creditworthiness of the firm, a rating change in each kind of debt will have an effect on all debt levels. In addition, a credit rating change during the crisis will have a more significant impact on debt levels than rating changes outside of the crisis because lenders became relatively more risk-averse during this time period.

4 Data and Methodology

4.1 Data Collection and Filtration

In gathering my data, I used information pulled from COMPUSTAT's online database.[5] My filtration process was much more stringent than that of Kisgen's since I required firms to have both long-term and short-term S&P issuer ratings (COMPUSTAT data items 280 and 283) for five out of the seven years leading up to the financial crisis (2000–2006) and all three years during the financial crisis (2007–2009). I wanted each of my firms to have ratings in all three years from 2007–2009 so that I could gather relatively more robust information about the effects of the most recent financial crisis and credit rating changes during this time period. Firms were required to have ratings in only five of the seven years prior to the crisis to ensure that my sample did not become too small.

In an effort to obtain as many data points as possible, I executed my data filter a bit differently than Kisgen (2009) did. Kisgen constructed his sample of all

[5] The only data pulled from another source was the annual data on the federal funds rate pulled from: http://www.federalreserve.gov/releases/h15/data.htm

COMPUSTAT firms from 1987–2003 with a credit rating (S&P long-term issuer rating) for two consecutive years and two years of non-missing data for computing the variables As I stated above, I began my filtration process by taking all firms with S&P long-term and short-term issuer ratings in five out of the seven years leading up to the financial crisis and in all three years during the financial crisis.

Initially, I looked for firms with ratings on December 31st during each year from 2007–2009 (taking the credit rating at year-end allowed me to see if a change occurred from one year to the next). After this step, I had a sample of 542 active firms. From this point, I needed to find companies with ratings in five out of the seven years leading up to the financial crisis (2000–2006), and once I had executed this filter I was left with 460 firms. Now that I had my list of firms based on my credit rating restrictions, I moved on to filtering out firms based on the other required variables.

Since I attempted to mimic one of his regressions from Kisgen's (2009) study, I placed the same requirement as he did—two years of non-missing data—on my fundamental variables. These variables are COMPUSTAT data items 4, 5, 6, 12, 13, 25, 34, 35, 142, and 199. This list of data items differs slightly from Kisgen's since I am looking at a firm's debt levels on the balance sheet and I am not analyzing equity levels. After the completion of this step, a sample of 177 firms was left and was transformed into a panel data set.[6]

4.2 Regression Methodology

[6] Each firm in my sample was assigned a different numerical firm ID ranging from 1-177 to create my panel set.

My dependent variables are different from those regressed upon in Kisgen's (2009) study because I am looking exclusively at year-by-year changes to short-term, long-term, and total debt on the balance sheet. I used COMPUSTAT data items 34 (Debt in Current Liabilities – Total) and 142 (Long-Term Debt – Total) to compute my Y variables. To make my total debt variable, I simply added the amount of debt in current liabilities with total long-term debt. As stated earlier, these variables were each normalized by the previous year's total assets.

The only purpose of creating the total debt variable was to see how my sample matched up with Kisgen's (2009). In his regression, his dependent variable is net debt raised for the year minus net equity raised for the year divided by beginning of the year total book assets. From here, I computed the year-by-year change in each of these data items.

The construction of these independent variables was fairly simple (Exhibit 1 in Appendix contains a full list and description of independent variables). Since part of my goal was to mimic one of Kisgen's (2009) regressions, I used a lot of the same variables that he did and constructed these variables in the same way. These include book and market leverage as defined in Fama and French (2002)[7], the natural logarithm of sales (COMPUSTAT data item 12)[8], EBITDA, market value/book value[9], z-score, rating level, and upgrade and downgrade variables. Both the level and the change were measured for all variables and each was used in my regressions.[10] For purposes of my study, the rating

[7] Leverage = (liabilities plus preferred stock minus deferred taxes and investment tax credit)/(book assets or market value of the firm). Change in leverage is equal to the lagged year over year change in leverage. Taken from Kisgen (2009).
[8] "Natural logarithm of sales" will be referred to as "sales" for the remainder of the paper.
[9] "Market value/book value" will be referred to as "M/B" for the remainder of the paper.
[10] As defined in Kisgen (2009): Sales = ln(Sales(COMPUSTAT data item 12), Profitability = EBITDA/book assets (item 6), M/B is market equity (item 25 x item 199) plus total liabilities (item 181)

level, upgrade and downgrade variables each had short-term and long-term pieces, not just long-term pieces.

Following Kisgen's (2009) methodology, I include a numerical value for each rating level (AAA=1, AA+=2, AA=3, etc. for long-term ratings and A-1+=1, A-1=2, A-2=3, etc. for short-term ratings). An increase in the rating level is equivalent to a downgrade, and a decrease in the rating level is equivalent to an upgrade. Now that numerical values had been assigned to each credit rating I was able to compute whether or not a change in credit rating had occurred. Upgrade and downgrade dummy variables were created that exhibited whether or not a rating change had occurred in the previous year. From this point, I was able to create several other variables pertinent to my hypothesis.

In an effort to see whether or not being in the financial crisis mattered, I created a dummy variable which took on the value of 1 if the firm year was 2007, 2008, or 2009 and a value of 0 if the firm year was before 2007. In addition, other short-term and long-term credit rating upgrade and downgrade dummy variables were created. These took on the value of 1 if the upgrade or downgrade took place during the crisis years and a value of 0 for all years leading up to the crisis. The purpose of these variables was to exhibit whether or not an upgrade or downgrade during the financial crisis was more or less significant than an upgrade or downgrade at any other time.

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plus preferred stock (item 10) minus deferred taxes and investment tax credit (item 35) minus convertible debt (item 79)/book assets (item 6), and z-score is (3.3 x pretax income (item 170) plus 1.4 x retained earnings (item 36) plus 1.2 x working capital (item 4 minus item 5)/book assets (item 6). Changes in these variables are equal to the lagged year over year changes.

Once all of my variables were created, I made sure to create a whole new set of variables with a one year lag.[11] The purpose of the one year lag was to see how the value of the variables in the previous year helped to explain the amount of debt on the balance sheet in the next year. The same reasoning applies to the credit rating variables.

Ratings from December 31st of each year were used and made it easy to tell whether or not a change in rating took place over the course of a given year. The lag allowed me to see whether or not a change in rating or stability in rating in the previous year affected the debt levels of the next year. Now that all of my variables were created and set up correctly in STATA, the regressions could be run and it would become clear whether or not my hypothesis was correct. However, regular regressions would not suffice, so two different robustness checks were implemented in every regression to ensure that my results were legitimate.

I utilized two different STATA commands, absorb and cluster, in order to perform my robustness checks. These checks were selected because the data took the form of a panel[12] data set. Clustering by firm addresses the possibility that observations of the same firm over time are correlated beyond the level explained by the regressors. Jeffrey M. Woolridge (2003) stated that "for fixed effect estimation using panel data, the issue is serial correlation in [the idiosyncratic error term[13]]." By clustering the standard errors, the correlation of residuals within the cluster is corrected (Peterson, 2007).

[11] Created in STATA using the "l." command for creating lagged variables. All variables used in this study were assigned a one year lag.
[12] Each firm was assigned a numerical value. These different values create the "panel" referred to above.
[13] Defined in Woolridge (2003) as part of the error term: $v_{gm} = c_g + u_{gm}$. Here v_g is the error term, c_g is an unobserved cluster effect, and u_{gm} is the idiosyncratic error. g indexes the "group" or "cluster," and m indexes observations within the group or cluster.

The absorb command, on the other hand, deals with firm-level fixed effects. It addresses the possibility that I have failed to include some time invariant variables that might explain the dependent variable. If some variable that I haven't included in my regressions causes a firm to regularly change their level of debt, then the absorb command will account for this (Kisgen, 2009).

5 Results

5.1 Regressions on Total Debt Levels

In general, the results from the regressions run on total debt levels were fairly significant (Table 1 in Appendix contains results). The only variables that were significant in each regression they were run in were the federal funds rate, book leverage, sales, change in M/B, and z-score.[14] The federal funds rate, book leverage, sales, and z-score were all significant at the 1% level every time they were included while the change in M/B was significant at the 10% level each time it was included. The coefficients for book leverage and sales were all negative while the coefficients for the federal funds rate, change in M/B, and z-score were positive. It should also be noted that the change in z-score was significant at the 1% level in the regressions run with market leverage, but was insignificant in the regressions run with book leverage and its coefficient was negative.

The downgrade and upgrade variables were very insignificant with the exception of the short-term upgrade variable. This variable was significant at the 5% level in four of the twelve regressions in which it was included and at the 10% level in two of its twelve regressions and its coefficient was negative. In addition, the dummy variable denoting

[14] The "constant" or "intercept" was universally significant in regressions on long-term and total debt, and was significant in one third of the regressions run on short-term debt.

whether or not the firm year was within the crisis[15] was completely insignificant in all regressions.

The R-squared values for my regressions varied depending on the amount of independent variables included in the regression. The R-squared value explains how much of the variation in the dependent variable is caused by the independent variables. When three variables were included (Columns 1 and 7 of Table 1 in Appendix), the R-squared was at its lowest and was about 10.5%. The maximum R-squared value was 26.6% (Column 17 of Table 1 in Appendix).

5.2 Regressions on Short-Term Debt Levels

In comparison with the regressions run on total debt, the regressions run on short-term debt were far less significant (Table 2 in Appendix contains results). Only two variables, change in M/B and z-score, were significant in every regression in which they were included. Change in M/B was significant at the 5% level every time, while z-score was significant at the 10% level in the regressions run with book leverage and at the 1% level in the regressions run with market leverage. Each of these variables had positive coefficients, mirroring their results from the regressions on total debt levels.

Upgrade and downgrade variables were all relatively insignificant. However, unlike the regressions run on total debt levels, the crisis or not variable was significant in twelve of the eighteen regressions run on short-term debt levels. Levels of significance ranged from the 1% level to the 10% level depending on the regression. As expected, its coefficient was negative. In addition, both the federal funds rate and the change in the federal funds rate were insignificant in every regression.

[15] This variable will also be referred to as the "crisis or not" variable

The R-squared values were relatively low for the regressions run on short-term debt. At its highest (Column 17 of Table 2 in Appendix), the R-squared statistic was 14%. At its lowest (Columns 7 and 10 of Table 2 in Appendix) it took on a value of 4.3%. Of course, just as with the regressions run on total debt levels, the R-squared value increased along with the number of variables included in the regression.

5.3 Regressions on Long-Term Debt Levels

The regressions run on long-term debt levels were very similar in significance to the regressions run on total debt (Table 3 in Appendix contains results). Variables significant in every regression in which they were included were the federal funds rate, book leverage, change in book leverage, sales, and z-score. The federal funds rate and sales were both significant at the 1% level in each of their regressions, while z-score was significant at the 1% level in ten of twelve regressions and at the 5% level in the remaining two. Book leverage was significant at the 5% level in each of its regressions, while change in book leverage was significant at the 10% level in each of its regressions. Coefficients were positive for the federal funds rate, change in book leverage, and z-score, but were negative for book leverage and sales.

Downgrade and upgrade variables were relatively insignificant in the regressions run on short-term debt. However, the variable denoting whether or not a short-term downgrade took place during the crisis or not was significant at the 5% level in four of the six regressions in which it was included, and the coefficient for this variable was negative. The crisis or not variable was significant at the 1% level in one regression, the 5% level in six regressions, and the 10% level in four regressions. The coefficient for the crisis or not variable was positive in all regressions.

The R-squared values for the regressions on long-term debt ranged from 10.9% to 22.4%., and were positively correlated to the number of variables included in the regressions. These values are relatively higher than those seen from the regressions run on short-term debt, but they are lower than those from the regressions run on total debt.

6 Discussion

After running my regressions on total debt, it was clear that my sample was not comparable to Kisgen's (2009). Several factors could account for these differences. My data set needed to include firms with both short-term and long-term issuer ratings, not simply long-term ratings. There are many more firms in the COMPUSTAT database that have long-term ratings compared to those that have short-term ratings, and the number of companies is cut down even more when both ratings are required. Generally, firms with short-term ratings are firms of relatively higher credit stature than those who do not have them. Having the short-term rating gives companies access to short-term debt markets such as the commercial paper market, where reliability[16] is extremely important.

My data set includes the short-term rating, which is typically assigned less frequently than long-term ratings and is given to relatively more stable firms. Because of this, my sample may include firms that are not as volatile and may react differently to a crisis or a credit rating change than firms with only a long-term rating.

Interpreting the results from the three different regressions yields some interesting relationships within my sample. The variable denoting whether or not the previous year was or wasn't in the crisis was relatively significant in predicting levels of short-term and long-term debt, but was completely insignificant in predicting levels of total debt. Also,

[16] "Reliability" is equivalent to default risk in this context.

this variable had a negative coefficient in the regressions on short-term debt levels but had a positive coefficient in the regressions on long-term debt levels. This suggests that firms were taking on more long-term debt during the crisis and lessening the amount of short-term debt during the crisis. It's possible that firms did this in attempt to exploit the lower interest rates. However, this conclusion does not coincide with the behavior of the federal funds rate variable.

The federal funds rate variable was significant in predicting future levels of both long-term and total debt in this study. In alignment with expectations, the variable's coefficient was positive in all cases and ranged from about 0.69% to just over 0.8%. This suggests that as the federal funds rate increases so do the levels of long-term and total debt. A rise in the federal funds rate typically occurs when the economy is more stable, and a drop in the federal funds rate tends to occur during times of financial distress. Following this method of thinking, it makes sense that long-term and total debt levels are positively correlated with the federal funds rate from the previous year.

In no case were any of the upgrade or downgrade variables significant in enough regressions to say that they had a real effect on future debt levels. However, the short-term upgrade variable was significant in half of the regressions on long-term and total debt in which it was included and had a negative coefficient. This suggests that as a firm's short-term rating is upgraded that they will hold less long-term and total debt, which seems counterintuitive. Unfortunately, since this variable is only significant in half of the regressions on long-term and total debt levels and none of the regressions on short-term debt levels, it's hard to say if it holds any real predictive power. In addition to this, it

appears that a credit rating change occurring during the crisis holds no added significance to a credit rating change occurring at any other time.

However, in the regressions run on long-term debt levels, one of these variables was significant in four of the twelve regressions in which it was included. Looking at the regressions on long-term debt levels (Table 3 in Appendix), the variable denoting whether or not a short-term downgrade occurred in the crisis or not is significant at the 5% level in three regressions and at the 10% level in one regression. The negative coefficient suggests that as short-term ratings fall in one year, so do levels of long-term debt in the following year. Coupling this with the results above, it appears that any change in short-term rating in one year results in the firm reducing its levels of long-term debt in the next year. However, it should also be noted that these results were not universal, so it is hard to say whether or not the proposed effects would hold in other tests or with other samples.

When looking at the other independent variables, only one was significant in all three sets of regressions. This variable was z-score, and in all three sets of regressions it had a positive coefficient. Of course, this means that as z-score rises in one year, levels of debt rise in the next year. This makes sense, because as the z-score increases, so does the financial health of the firm in question. According to Altman (1968), firms within his study with a z-score of over 2.99 are non-bankrupt, firms with a z-score below 1.81 are all bankrupt, and firms with scores between those two values are in what is considered to be the “zone of ignorance” or “gray area.”

There were also other variables that were significant in two of three of the regression sets. As noted earlier, the federal funds rate was significant in predicting future

levels of total and long-term debt. In addition, book leverage was also significant in predicting future levels these types of debt and had a negative coefficient ranging from about -16% to -24%. The higher the amount of book leverage in the previous year, the lower the firm's levels of total and long-term debt will be in the next year. Sales was also significant in the same regressions as the federal funds rate and book leverage. Interestingly, however, the coefficient on this variable was negative in all regressions and ranged from about -4.5% to -5.5%. This means that as the amount of sales in the previous year increases, the lower the amount of total and long-term debt will be in the following year. Firms with a higher amount of sales should be generating more profit, which means that they would be able to take on more debt. However, the negative coefficient of this variable suggests that firms generating more sales in one year potentially use this income to fund projects rather than taking on more debt to do so.

7 Conclusion

Looking at some summary statistics of my sample reveals some obvious impacts of the financial crisis. As a percentage of the previous year's total assets, total debt fell from 5.79% in 2007 to -0.06% in 2009 (Figure 6 in Appendix). [17] Long-term debt increased 3.93% in 2007, 2.89% in 2008, and 1.91% in 2009 while short-term debt increased by 1.86% in 2007, 0.15% in 2008, and fell -1.97% in 2009 (Figure 5 in Appendix). In fact, short-term debt was only positive in 2004, 2005, 2007 and 2008. This pattern indicates that firms tend to lower leverage immediately following a crisis and increase it beforehand, with short-term debt being the more volatile and responsive of the two types of debt.

[17] All debt percentages are an average of all firms within my sample.

In the end, no upgrade or downgrade variables were very significant. However, it appears that if the previous year was in the financial crisis, then levels of short-term and long-term debt could be predicted to be lower and higher in the next year, respectively. This result suggests that firms will want to take advantage of lower interest rates by locking in more long-term debt, relative to short-term debt, at these low rates. In complete contradiction to this, however, are the results of the federal funds rate variable.

Although the federal funds rate was not significant in predicting future levels of short-term debt, it was significant in predicting levels of long-term and total debt at the 1% level. As previously stated, this suggests that the federal funds rate rises during periods of economic stability while the rate falls during periods of distress. This goes along with my hypothesis in that the federal funds rate cannot help to predict future levels of short-term debt, but it can help to predict levels of long-term and total debt.

Overall, the results of this study are generally insignificant. Further research is necessary to analyze what drives debt levels on the balance sheet both inside and outside of a crisis.

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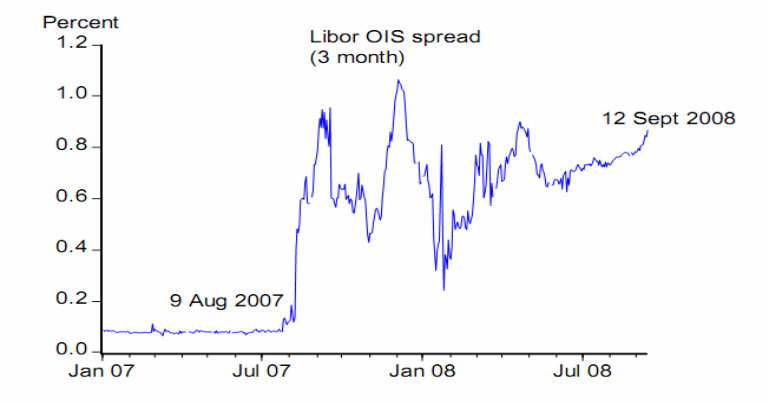
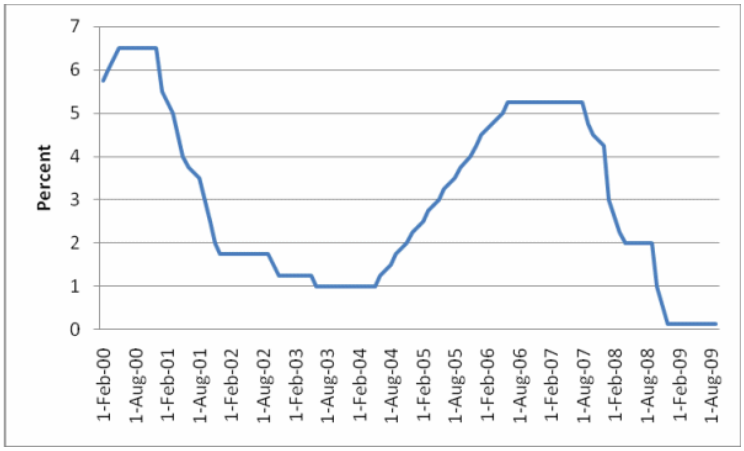
Appendix

Figure 1: 3-Month LIBOR-OIS Spread



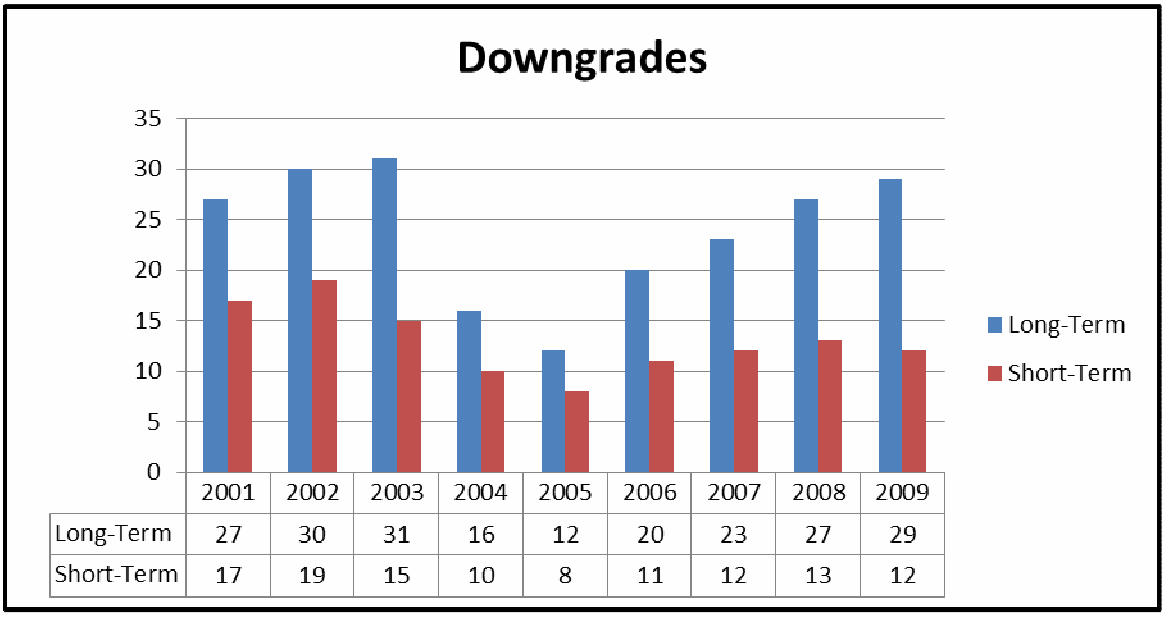
Source: Taylor, John B., The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong (January 2009). NBER Working Paper Series, Vol. w14631, pp. -, 2009.

Figure 2: The Target Nominal Federal Funds Rate



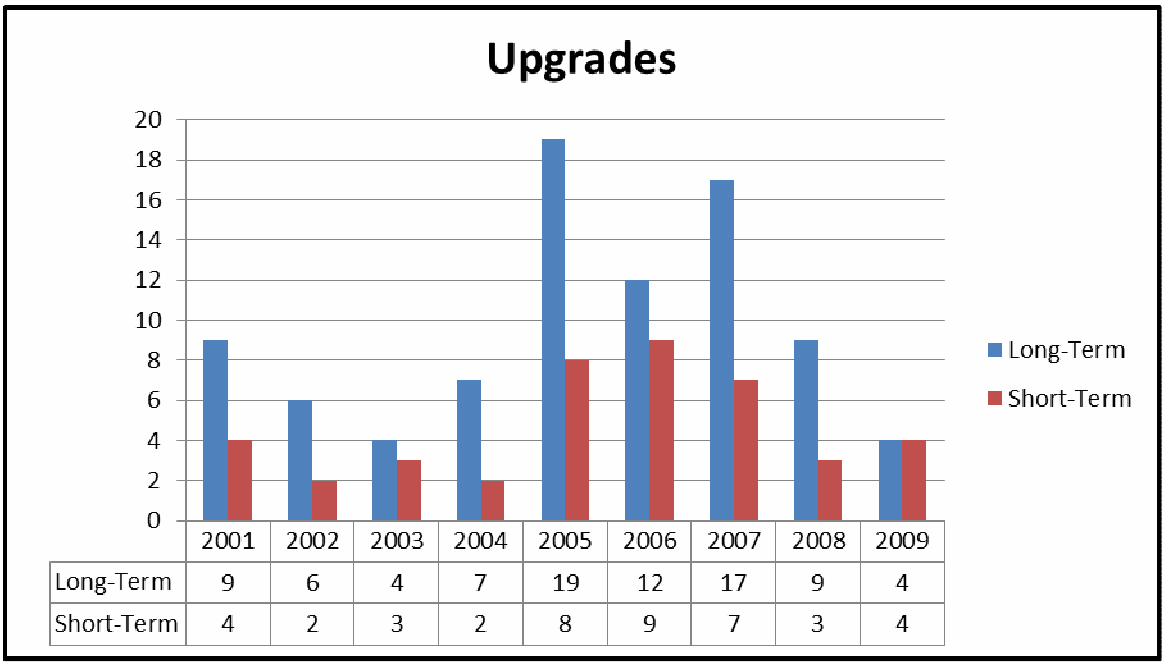
Source: Dokko, Jane, et al. *Monetary Policy and the Housing Bubble*. Board of Governors of the Federal Reserve System (U.S.), Finance and Economics Discussion Series: 2009-49, 2009. Print.

Figure 3: Number of Downgrades within Sample



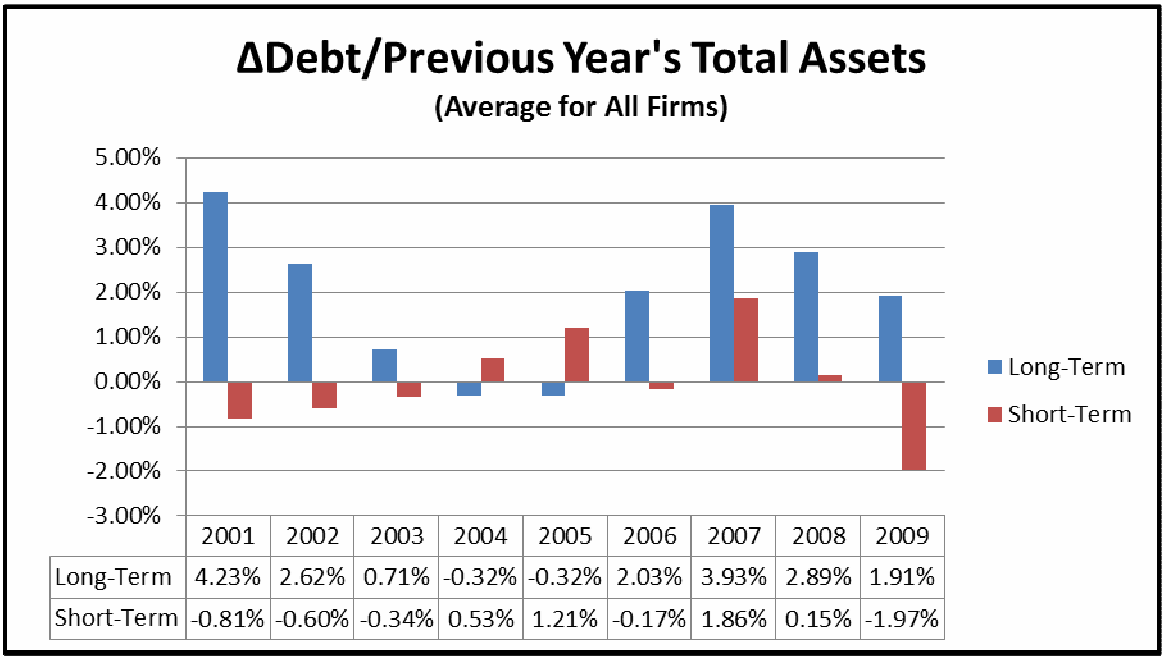
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Long-Term	27	30	31	16	12	20	23	27	29
Short-Term	17	19	15	10	8	11	12	13	12

Figure 4: Number of Upgrades within Sample



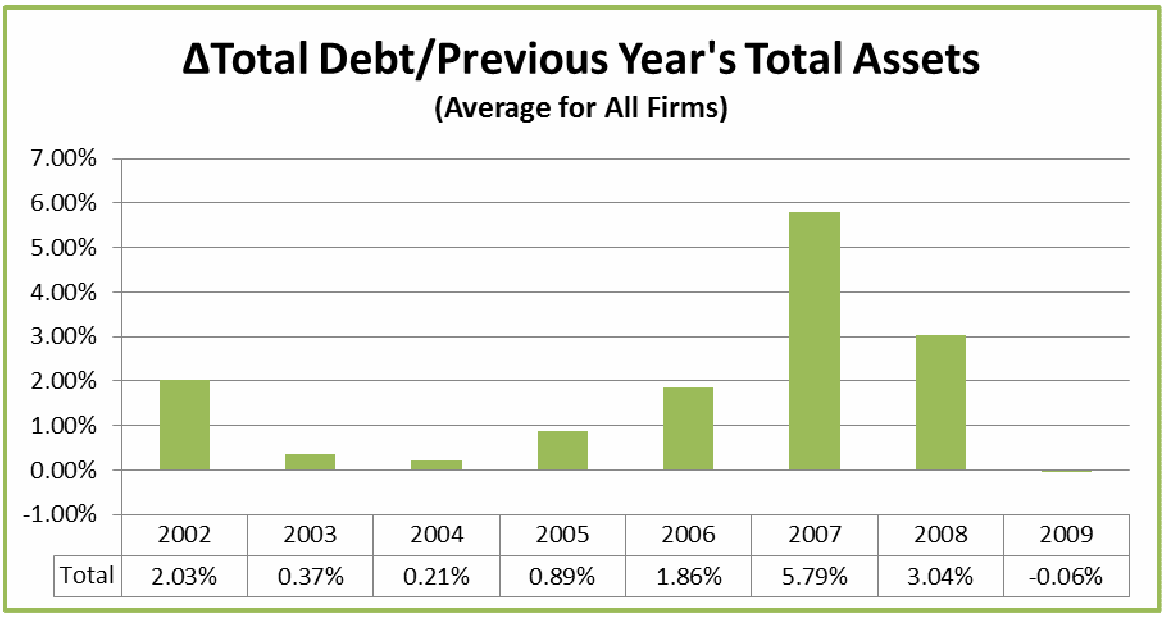
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Long-Term	9	6	4	7	19	12	17	9	4
Short-Term	4	2	3	2	8	9	7	3	4

Figure 5: Change in Long-Term and Short-Term Debt Normalized by the Previous Year's Total Assets



	2001	2002	2003	2004	2005	2006	2007	2008	2009
Long-Term	4.23%	2.62%	0.71%	-0.32%	-0.32%	2.03%	3.93%	2.89%	1.91%
Short-Term	-0.81%	-0.60%	-0.34%	0.53%	1.21%	-0.17%	1.86%	0.15%	-1.97%

Figure 6: Change in Total Debt Normalized by the Previous Year's Total Assets



	2002	2003	2004	2005	2006	2007	2008	2009
Total	2.03%	0.37%	0.21%	0.89%	1.86%	5.79%	3.04%	-0.06%

Exhibit 1: List of Variables[18]

Crisis or Not = dummy variable indicating whether or not the previous firm year was during the crisis.

LT Downgrade = dummy variable indicating whether or not the firm's S&P Long-Term Issuer Rating was downgraded in the previous year.

LT Upgrade = dummy variable indicating whether or not the firm's S&P Long-Term Issuer Rating was upgraded in the previous year.

ST Downgrade = dummy variable indicating whether or not the firm's S&P Short-Term Issuer Rating was downgraded in the previous year.

ST Upgrade = dummy variable indicating whether or not the firm's S&P Short-Term Issuer Rating was upgraded in the previous year.

LT Downgrade in Crisis = dummy variable indicating whether or not the firm's S&P Long-Term Issuer Rating was downgraded in the previous year only if the previous year was also during the crisis.

LT Upgrade in Crisis = dummy variable indicating whether or not the firm's S&P Long-Term Issuer Rating was upgraded in the previous year only if the previous year was also during the crisis.

ST Downgrade in Crisis = dummy variable indicating whether or not the firm's S&P Short-Term Issuer Rating was downgraded in the previous year only if the previous year was also during the crisis.

ST Upgrade in Crisis = dummy variable indicating whether or not the firm's S&P Short-Term Issuer Rating was upgraded in the previous year only if the previous year was also during the crisis.

Fed Funds Rate = Average annual Federal Funds Rate.

Δ*Fed Funds Rate* = year-over-year change in *Fed Funds Rate*.

$$\textit{Leverage (BK)} = \frac{\textit{Liabilities+Preferred Stock−Deferred Taxes and Investment Tax Credit}}{\textit{Total Assets}}$$

Δ*Leverage (BK)* = year-over-year change in *Leverage (BK)*.

$$\textit{Leverage (MK)} = \frac{\textit{Liabilities+Preferred Stock−Deferred Taxes and Investment Tax Credit}}{\textit{Market Value of the Firm}}$$

[18] All fundamental variables are equivalent to those used in Kisgen's 2009 study, with the exception of the *Crisis or Not, Fed Funds Rate,* and Δ*Fed Funds Rate* variables.

Δ*Leverage (MK)* = year-over-year change in *Leverage (MK)*.

ln(sales) = natural logarithm of sales (COMPUSTAT data item 12).

Δ*ln(sales)* = year-over-year change in *ln(sales)*.

$$EBITDA = \frac{EBITDA}{Total\ Assets}$$

Δ*EBITDA* = year-over-year change in *EBITDA*.

M/B = Market Value/Book Value

Δ*M/B* = year-over-year change in *M/B*.

$$Z\text{-}Score = \frac{3.3(pretax\ income) + 1.4(retained\ earnings) + 1.2(workingcapital)}{Total\ Assets}$$

Δ*Z-Score* = year-over-year change in *Z-Score*.

ST Number Rating = numerical rating assigned to differing S&P Short-Term Issuer credit ratings (1 = A-1+, 2 = A-1, 3 = A-2, etc.).

LT Number Rating = numerical rating assigned to differing S&P Long-Term Issuer credit ratings (1 = AAA, 2 = AA+, 3 = AA, etc

Table 1: Regressions on Total Debt Levels

VARIABLES	1 Total	2 Total	3 Total	4 Total	5 Total	6 Total	7 Total	8 Total	9 Total	10 Total	11 Total	12 Total	13 Total	14 Total	15 Total	16 Total	17 Total	18 Total
Crisis or Not	-0.00354	0.00414	0.00649	-0.00194	0.00443	0.00689	-0.00374	0.00606	0.00785	-0.000915	0.00888	0.0103	-0.00377	0.00378	0.00647	-0.000744	0.00503	0.00765
	(0.00565)	(0.00934)	(0.00832)	(0.00588)	(0.00877)	(0.00787)	(0.00568)	(0.00945)	(0.00858)	(0.00590)	(0.00906)	(0.00823)	(0.00562)	(0.00953)	(0.00850)	(0.00600)	(0.00896)	(0.00808)
LT Downgrade	-0.0161*	0.00369	0.00196	-0.0124	0.00197	0.00103							-0.00841	0.00324	0.00276	-0.00878	-0.00471	-0.00364
	(0.00885)	(0.00859)	(0.00856)	(0.00798)	(0.00907)	(0.00923)							(0.00929)	(0.0109)	(0.0108)	(0.00771)	(0.00990)	(0.00988)
LT Upgrade	0.00608	-0.00838	-0.00889	0.00495	-0.00283	-0.00462							0.00926	0.00287	0.00106	0.00831	0.00740	0.00471
	(0.00691)	(0.00872)	(0.00859)	(0.00891)	(0.00990)	(0.00971)							(0.00725)	(0.00951)	(0.00931)	(0.00920)	(0.0110)	(0.0107)
LT Downgrade in Crisis				-0.0137	0.00804	0.00467										-0.00227	0.0237	0.0183
				(0.0213)	(0.0219)	(0.0227)										(0.0226)	(0.0238)	(0.0247)
LT Upgrade in Crisis				0.00409	-0.0187	-0.0142										0.00458	-0.0143	-0.0118
				(0.0141)	(0.0186)	(0.0183)										(0.0161)	(0.0202)	(0.0207)
ST Downgrade							-0.0235**	-0.000339	-0.00158	-0.0144	0.00681	0.00520	-0.0171	0.000676	-0.00213	-0.00719	0.0140	0.00958
							(0.0116)	(0.0117)	(0.0119)	(0.0116)	(0.0126)	(0.0128)	(0.0125)	(0.0149)	(0.0154)	(0.0123)	(0.0148)	(0.0150)
ST Upgrade							-0.00465	-0.0266**	-0.0258**	-0.00422	-0.0185	-0.0200	-0.0109	-0.0322**	-0.0282**	-0.00917	-0.0281*	-0.0256*
							(0.00970)	(0.0124)	(0.0123)	(0.0116)	(0.0132)	(0.0134)	(0.00972)	(0.0137)	(0.0136)	(0.0116)	(0.0149)	(0.0154)
ST Downgrade in Crisis										-0.0394	-0.0329	-0.0319				-0.0397	-0.0480*	-0.0432
										(0.0263)	(0.0237)	(0.0252)				(0.0287)	(0.0273)	(0.0285)
ST Upgrade in Crisis										-5.25e-05	-0.0287	-0.0192				-0.00604	-0.0144	-0.00772
										(0.0174)	(0.0281)	(0.0266)				(0.0200)	(0.0314)	(0.0308)
Fed Funds Rate		0.00810***	0.00800***		0.00806***	0.00797***		0.00801***	0.00796***		0.00798***	0.00794***		0.00810***	0.00801***		0.00807***	0.00800***
		(0.00219)	(0.00221)		(0.00219)	(0.00221)		(0.00223)	(0.00226)		(0.00223)	(0.00226)		(0.00223)	(0.00226)		(0.00223)	(0.00226)
ΔFed Funds Rate		-0.000173	0.00113		-0.000154	0.00115		0.000314	0.00145		0.000321	0.00145		-0.000106	0.00125		-0.000124	0.00124
		(0.00189)	(0.00176)		(0.00188)	(0.00175)		(0.00189)	(0.00172)		(0.00189)	(0.00171)		(0.00190)	(0.00175)		(0.00189)	(0.00174)
Leverage (BK)		-0.235***			-0.237***			-0.218***			-0.223***			-0.237***			-0.244***	
		(0.0855)			(0.0854)			(0.0824)			(0.0824)			(0.0848)			(0.0855)	
ΔLeverage (BK)		0.0804			0.0819			0.0729			0.0756			0.0793			0.0830	
		(0.0737)			(0.0734)			(0.0732)			(0.0735)			(0.0738)			(0.0737)	
Leverage (MK)			-0.00861			-0.00856			-0.00683			-0.00726			-0.00763			-0.00791
			(0.00585)			(0.00593)			(0.00604)			(0.00601)			(0.00589)			(0.00594)
ΔLeverage (MK)			0.00538			0.00535			0.00355			0.00397			0.00440			0.00471
			(0.00575)			(0.00581)			(0.00590)			(0.00586)			(0.00578)			(0.00581)
ln(sales)		-0.0525***	-0.0571***		-0.0520***	-0.0567***		-0.0508***	-0.0555***		-0.0510***	-0.0558***		-0.0500***	-0.0551***		-0.0496***	-0.0548***
		(0.0175)	(0.0156)		(0.0173)	(0.0155)		(0.0174)	(0.0156)		(0.0174)	(0.0156)		(0.0175)	(0.0156)		(0.0175)	(0.0156)
Δln(sales)		0.0108	0.00996		0.0104	0.00961		0.0101	0.00982		0.0107	0.0104		0.0105	0.00994		0.0110	0.0104
		(0.0150)	(0.0146)		(0.0151)	(0.0147)		(0.0149)	(0.0145)		(0.0148)	(0.0144)		(0.0148)	(0.0145)		(0.0150)	(0.0146)
EBITDA		0.268	0.232		0.266	0.229		0.247	0.221		0.252	0.225		0.261	0.221		0.265	0.222
		(0.254)	(0.210)		(0.255)	(0.212)		(0.255)	(0.211)		(0.257)	(0.214)		(0.254)	(0.211)		(0.257)	(0.214)
ΔEBITDA		-0.0256	0.0539		-0.0232	0.0561		-0.0163	0.0622		-0.0262	0.0541		-0.0158	0.0656		-0.0265	0.0578
		(0.122)	(0.118)		(0.123)	(0.119)		(0.124)	(0.119)		(0.127)	(0.122)		(0.123)	(0.119)		(0.127)	(0.122)
M/B		0.00469	0.00246		0.00484	0.00260		0.00522	0.00311		0.00510	0.00296		0.00512	0.00298		0.00488	0.00277
		(0.00911)	(0.00977)		(0.00909)	(0.00977)		(0.00926)	(0.00986)		(0.00924)	(0.00988)		(0.00908)	(0.00977)		(0.00911)	(0.00986)
ΔM/B		0.00887*	0.00982*		0.00887*	0.00982*		0.00856*	0.00942*		0.00837*	0.00928*		0.00864*	0.00953*		0.00853*	0.00943*
		(0.00499)	(0.00542)		(0.00499)	(0.00541)		(0.00490)	(0.00530)		(0.00484)	(0.00524)		(0.00499)	(0.00536)		(0.00494)	(0.00529)
Z-Score		0.0901***	0.102***		0.0903***	0.102***		0.0872***	0.0988***		0.0872***	0.0990***		0.0894***	0.101***		0.0894***	0.102***
		(0.0175)	(0.0229)		(0.0176)	(0.0231)		(0.0177)	(0.0226)		(0.0177)	(0.0225)		(0.0178)	(0.0230)		(0.0180)	(0.0232)
ΔZ-Score		-0.0252	-0.0386***		-0.0249	-0.0385***		-0.0230	-0.0373***		-0.0230	-0.0375***		-0.0247	-0.0385***		-0.0244	-0.0386***
		(0.0153)	(0.0133)		(0.0153)	(0.0133)		(0.0156)	(0.0133)		(0.0155)	(0.0133)		(0.0155)	(0.0135)		(0.0152)	(0.0135)
LT Number Rating		2.75e-05	-0.00332		-0.000844	-0.00395								0.00906	0.00463		0.00781	0.00365
		(0.00503)	(0.00461)		(0.00527)	(0.00477)								(0.00630)	(0.00618)		(0.00655)	(0.00636)
ST Number Rating								-0.00958	-0.0139		-0.00800	-0.0121		-0.0238*	-0.0213*		-0.0213*	-0.0190
								(0.00999)	(0.00922)		(0.0108)	(0.00992)		(0.0122)	(0.0122)		(0.0127)	(0.0127)
Constant	0.0203***	0.491***	0.433***	0.0199***	0.493***	0.433***	0.0205***	0.495***	0.433***	0.0198***	0.495***	0.430***	0.0207***	0.469***	0.416***	0.0200***	0.472***	0.413***
	(0.00212)	(0.148)	(0.152)	(0.00196)	(0.150)	(0.154)	(0.00180)	(0.146)	(0.151)	(0.00176)	(0.148)	(0.154)	(0.00215)	(0.150)	(0.153)	(0.00199)	(0.153)	(0.157)
Observations	1,416	1,251	1,250	1,416	1,251	1,250	1,416	1,249	1,248	1,416	1,249	1,248	1,416	1,248	1,247	1,416	1,248	1,247
R-squared	0.105	0.260	0.255	0.105	0.261	0.255	0.106	0.262	0.257	0.108	0.263	0.258	0.107	0.264	0.257	0.109	0.266	0.260

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Regressions on Short-Term Debt Levels

VARIABLES	1 Short	2 Short	3 Short	4 Short	5 Short	6 Short	7 Short	8 Short	9 Short	10 Short	11 Short	12 Short	13 Short	14 Short	15 Short	16 Short	17 Short	18 Short
Crisis or Not	-0.0130***	-0.00565	-0.0107**	-0.0108***	-0.00384	-0.00915*	-0.0133***	-0.00619	-0.0116**	-0.0134***	-0.00627	-0.0117**	-0.0130***	-0.00584	-0.0109**	-0.0110***	-0.00427	-0.00944*
	(0.00268)	(0.00525)	(0.00520)	(0.00326)	(0.00537)	(0.00531)	(0.00274)	(0.00519)	(0.00525)	(0.00298)	(0.00528)	(0.00533)	(0.00269)	(0.00531)	(0.00525)	(0.00333)	(0.00543)	(0.00536)
LT Downgrade	-0.0142***	-0.00610	-0.00644	-0.00991*	-0.00374	-0.00447							-0.0131***	-0.00646	-0.00600	-0.00611	-0.00253	-0.00226
	(0.00489)	(0.00453)	(0.00463)	(0.00515)	(0.00549)	(0.00562)							(0.00493)	(0.00456)	(0.00489)	(0.00495)	(0.00516)	(0.00569)
LT Upgrade	-0.00392	-0.00791	-0.00777	-0.00376	-0.00444	-0.00453							-0.00481	-0.00521	-0.00642	-0.00507	-0.00124	-0.00289
	(0.00626)	(0.00560)	(0.00573)	(0.00827)	(0.00682)	(0.00704)							(0.00639)	(0.00538)	(0.00563)	(0.00825)	(0.00611)	(0.00650)
LT Downgrade in Crisis				-0.0161	-0.00917	-0.00765										-0.0216*	-0.0124	-0.0116
				(0.0114)	(0.0118)	(0.0118)										(0.0112)	(0.0112)	(0.0112)
LT Upgrade in Crisis				2.42e-05	-0.0103	-0.00979										0.000819	-0.0124	-0.0110
				(0.0105)	(0.0116)	(0.0117)										(0.0122)	(0.0131)	(0.0130)
ST Downgrade							-0.0118**	-0.00343	-0.00445	-0.0121*	-0.00387	-0.00509	-0.00246	0.000459	-0.00129	-0.00755	-0.00291	-0.00478
							(0.00597)	(0.00611)	(0.00602)	(0.00686)	(0.00710)	(0.00692)	(0.00600)	(0.00668)	(0.00674)	(0.00696)	(0.00744)	(0.00753)
ST Upgrade							-0.000404	-0.0112	-0.00828	-0.000682	-0.0108	-0.00768	0.00248	-0.00775	-0.00373	0.00312	-0.00967	-0.00511
							(0.00785)	(0.00810)	(0.00826)	(0.0103)	(0.0104)	(0.0105)	(0.00792)	(0.00803)	(0.00844)	(0.0101)	(0.00995)	(0.0104)
ST Downgrade in Crisis										0.00130	0.00228	0.00342				0.0131	0.00954	0.0104
										(0.0137)	(0.0138)	(0.0138)				(0.0134)	(0.0131)	(0.0133)
ST Upgrade in Crisis										0.00103	-0.00189	-0.00308				-0.00159	0.00736	0.00494
										(0.0125)	(0.0155)	(0.0159)				(0.0145)	(0.0178)	(0.0180)
Fed Funds Rate		0.000508	0.000883		0.000484	0.000859		0.000608	0.00101		0.000603	0.00100		0.000585	0.000957		0.000566	0.000937
		(0.00118)	(0.00116)		(0.00118)	(0.00116)		(0.00119)	(0.00117)		(0.00119)	(0.00117)		(0.00119)	(0.00117)		(0.00119)	(0.00117)
ΔFed Funds Rate		0.00111	0.000730		0.00109	0.000722		0.000990	0.000558		0.000994	0.000565		0.00106	0.000689		0.00105	0.000681
		(0.00129)	(0.00122)		(0.00129)	(0.00122)		(0.00128)	(0.00122)		(0.00129)	(0.00123)		(0.00131)	(0.00124)		(0.00130)	(0.00123)
Leverage (BK)		-0.0536			-0.0545			-0.0561			-0.0562			-0.0540			-0.0535	
		(0.0399)			(0.0395)			(0.0390)			(0.0391)			(0.0400)			(0.0397)	
ΔLeverage (BK)		-0.0561			-0.0557			-0.0586			-0.0585			-0.0565			-0.0569	
		(0.0380)			(0.0380)			(0.0378)			(0.0379)			(0.0381)			(0.0379)	
Leverage (MK)			-0.00297			-0.00308			-0.00280			-0.00277			-0.00292			-0.00295
			(0.00379)			(0.00376)			(0.00380)			(0.00381)			(0.00383)			(0.00383)
ΔLeverage (MK)			0.00518			0.00527			0.00502			0.00500			0.00509			0.00509
			(0.00386)			(0.00384)			(0.00386)			(0.00387)			(0.00389)			(0.00390)
ln(sales)		-0.00796	-0.00545		-0.00780	-0.00531		-0.00760	-0.00510		-0.00759	-0.00509		-0.00752	-0.00520		-0.00732	-0.00505
		(0.00629)	(0.00717)		(0.00629)	(0.00714)		(0.00627)	(0.00718)		(0.00628)	(0.00719)		(0.00635)	(0.00721)		(0.00638)	(0.00720)
Δln(sales)		0.0113	0.00929		0.0111	0.00909		0.0112	0.00928		0.0112	0.00920		0.0114	0.00952		0.0110	0.00913
		(0.00903)	(0.00917)		(0.00905)	(0.00918)		(0.00900)	(0.00915)		(0.00892)	(0.00907)		(0.00890)	(0.00909)		(0.00893)	(0.00910)
EBITDA		0.0449	-0.0797		0.0462	-0.0784		0.0527	-0.0765		0.0523	-0.0772		0.0493	-0.0761		0.0488	-0.0759
		(0.0882)	(0.0896)		(0.0884)	(0.0898)		(0.0890)	(0.0908)		(0.0892)	(0.0910)		(0.0884)	(0.0909)		(0.0889)	(0.0913)
ΔEBITDA		-0.0205	-0.0120		-0.0209	-0.0120		-0.0146	-0.00566		-0.0140	-0.00471		-0.0182	-0.0101		-0.0158	-0.00783
		(0.0818)	(0.0757)		(0.0813)	(0.0754)		(0.0823)	(0.0765)		(0.0816)	(0.0760)		(0.0822)	(0.0761)		(0.0816)	(0.0757)
M/B		0.00434	0.00512		0.00460	0.00534		0.00442	0.00514		0.00442	0.00515		0.00455	0.00526		0.00490	0.00557
		(0.00334)	(0.00353)		(0.00338)	(0.00356)		(0.00339)	(0.00358)		(0.00340)	(0.00359)		(0.00337)	(0.00353)		(0.00343)	(0.00359)
ΔM/B		0.00815**	0.00865**		0.00814**	0.00865**		0.00841**	0.00891**		0.00841**	0.00891**		0.00829**	0.00874**		0.00829**	0.00875**
		(0.00357)	(0.00357)		(0.00356)	(0.00357)		(0.00361)	(0.00359)		(0.00361)	(0.00359)		(0.00361)	(0.00360)		(0.00360)	(0.00360)
Z-Score		0.0302*	0.0489***		0.0301*	0.0487***		0.0295*	0.0493***		0.0296*	0.0494***		0.0293*	0.0480***		0.0291*	0.0477***
		(0.0178)	(0.0139)		(0.0176)	(0.0138)		(0.0176)	(0.0140)		(0.0176)	(0.0141)		(0.0176)	(0.0140)		(0.0175)	(0.0139)
ΔZ-Score		-0.00456	0.00150		-0.00459	0.00144		-0.00434	0.00148		-0.00433	0.00147		-0.00429	0.00166		-0.00432	0.00166
		(0.0109)	(0.0109)		(0.0109)	(0.0109)		(0.0111)	(0.0111)		(0.0111)	(0.0111)		(0.0110)	(0.0109)		(0.0110)	(0.0109)
LT Number Rating		-0.000528	-0.00133		-0.000261	-0.00113								-0.000397	-0.00127		-8.73e-05	-0.000984
		(0.00218)	(0.00220)		(0.00234)	(0.00240)								(0.00284)	(0.00293)		(0.00291)	(0.00302)
ST Number Rating								-0.000553	-0.00195		-0.000744	-0.00225		-0.000198	-6.58e-05		-0.000534	-0.000492
								(0.00402)	(0.00406)		(0.00427)	(0.00439)		(0.00490)	(0.00503)		(0.00498)	(0.00511)
Constant	0.00618***	0.0717	0.0287	0.00562***	0.0680	0.0255	0.00505***	0.0659	0.0197	0.00508***	0.0664	0.0204	0.00620***	0.0670	0.0258	0.00569***	0.0628	0.0230
	(0.00108)	(0.0642)	(0.0656)	(0.00114)	(0.0655)	(0.0668)	(0.000899)	(0.0633)	(0.0655)	(0.000969)	(0.0636)	(0.0657)	(0.00111)	(0.0650)	(0.0662)	(0.00119)	(0.0665)	(0.0676)
Observations	1,416	1,251	1,250	1,416	1,251	1,250	1,416	1,249	1,248	1,416	1,249	1,248	1,416	1,248	1,247	1,416	1,248	1,247
R-squared	0.048	0.138	0.138	0.050	0.139	0.138	0.043	0.136	0.136	0.043	0.136	0.136	0.048	0.138	0.138	0.050	0.140	0.139

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Regressions on Long-Term Debt Levels

VARIABLES	1 Long	2 Long	3 Long	4 Long	5 Long	6 Long	7 Long	8 Long	9 Long	10 Long	11 Long	12 Long	13 Long	14 Long	15 Long	16 Long	17 Long	18 Long
Crisis or Not	0.00944*	0.00978	0.0172**	0.00883	0.00827	0.0160**	0.00957*	0.0122	0.0194**	0.0125**	0.0151	0.0220***	0.00923*	0.00962	0.0173**	0.0103*	0.00930	0.0171**
	(0.00523)	(0.00942)	(0.00803)	(0.00563)	(0.00932)	(0.00794)	(0.00522)	(0.00954)	(0.00819)	(0.00543)	(0.00931)	(0.00797)	(0.00521)	(0.00953)	(0.00815)	(0.00572)	(0.00941)	(0.00806)
LT Downgrade	-0.00189	0.00979	0.00840	-0.00251	0.00570	0.00549							0.00469	0.00970	0.00876	-0.00267	-0.00218	-0.00138
	(0.00718)	(0.00806)	(0.00763)	(0.00674)	(0.00815)	(0.00792)							(0.00761)	(0.00998)	(0.00965)	(0.00702)	(0.00967)	(0.00944)
LT Upgrade	0.01000	-0.000471	-0.00111	0.00871	0.00161	-9.22e-05							0.0141*	0.00808	0.00748	0.0134	0.00864	0.00760
	(0.00651)	(0.00730)	(0.00718)	(0.00865)	(0.00885)	(0.00856)							(0.00766)	(0.00754)	(0.00732)	(0.0102)	(0.00927)	(0.00876)
LT Downgrade in Crisis				0.00241	0.0172	0.0123										0.0194	0.0361*	0.0300
				(0.0180)	(0.0199)	(0.0199)										(0.0182)	(0.0211)	(0.0214)
LT Upgrade in Crisis				0.00407	-0.00835	-0.00442										0.00376	-0.00183	-0.000777
				(0.0128)	(0.0137)	(0.0137)										(0.0160)	(0.0148)	(0.0157)
ST Downgrade							-0.0117	0.00309	0.00287	-0.00222	0.0107	0.0103	-0.0146	0.000217	-0.000837	0.000359	0.0169	0.0144
							(0.0100)	(0.0111)	(0.0113)	(0.0101)	(0.0118)	(0.0120)	(0.0110)	(0.0140)	(0.0146)	(0.0113)	(0.0145)	(0.0148)
ST Upgrade							-0.00424	-0.0154	-0.0176*	-0.00354	-0.00765	-0.0123	-0.0133*	-0.0245**	-0.0245**	-0.0123	-0.0185	-0.0204*
							(0.00689)	(0.0102)	(0.00995)	(0.00851)	(0.0113)	(0.0113)	(0.00795)	(0.0106)	(0.0103)	(0.0101)	(0.0119)	(0.0118)
ST Downgrade in Crisis										-0.0407*	-0.0352	-0.0353				-0.0528**	-0.0575**	-0.0535**
										(0.0234)	(0.0230)	(0.0233)				(0.0255)	(0.0267)	(0.0270)
ST Upgrade in Crisis										-0.00108	-0.0268	-0.0161				-0.00445	-0.0218	-0.0127
										(0.0122)	(0.0192)	(0.0180)				(0.0167)	(0.0214)	(0.0210)
Fed Funds Rate		0.00759***	0.00711***		0.00757***	0.00711***		0.00740***	0.00695***		0.00738***	0.00693***		0.00751***	0.00706***		0.00751***	0.00706***
		(0.00196)	(0.00197)		(0.00196)	(0.00198)		(0.00201)	(0.00203)		(0.00201)	(0.00203)		(0.00201)	(0.00203)		(0.00201)	(0.00203)
ΔFed Funds Rate		-0.00128	0.000402		-0.00125	0.000425		-0.000676	0.000890		-0.000673	0.000887		-0.00117	0.000562		-0.00117	0.000559
		(0.00207)	(0.00183)		(0.00205)	(0.00181)		(0.00209)	(0.00180)		(0.00209)	(0.00180)		(0.00207)	(0.00183)		(0.00205)	(0.00181)
Leverage (BK)		-0.181**			-0.182**			-0.162**			-0.167**			-0.183**			-0.190**	
		(0.0769)			(0.0767)			(0.0745)			(0.0745)			(0.0762)			(0.0764)	
ΔLeverage (BK)		0.136*			0.138*			0.131*			0.134*			0.136*			0.140*	
		(0.0753)			(0.0749)			(0.0753)			(0.0751)			(0.0756)			(0.0745)	
Leverage (MK)			-0.00564			-0.00547			-0.00403			-0.00448			-0.00471			-0.00496
			(0.00578)			(0.00585)			(0.00581)			(0.00580)			(0.00569)			(0.00577)
ΔLeverage (MK)			0.000201			7.49e-05			-0.00147			-0.00103			-0.000692			-0.000381
			(0.00579)			(0.00585)			(0.00578)			(0.00577)			(0.00569)			(0.00577)
ln(sales)		-0.0445***	-0.0517***		-0.0442***	-0.0514***		-0.0432***	-0.0504***		-0.0434***	-0.0507***		-0.0425***	-0.0499***		-0.0423***	-0.0498***
		(0.0157)	(0.0137)		(0.0156)	(0.0136)		(0.0158)	(0.0137)		(0.0158)	(0.0138)		(0.0158)	(0.0138)		(0.0158)	(0.0138)
Δln(sales)		-0.000510	0.000671		-0.000737	0.000514		-0.00116	0.000537		-0.000513	0.00117		-0.000942	0.000424		1.16e-05	0.00123
		(0.0141)	(0.0129)		(0.0142)	(0.0130)		(0.0144)	(0.0131)		(0.0143)	(0.0130)		(0.0140)	(0.0128)		(0.0143)	(0.0131)
EBITDA		0.223	0.311*		0.220	0.307*		0.194	0.298*		0.200	0.302*		0.211	0.297*		0.217	0.298*
		(0.241)	(0.174)		(0.242)	(0.176)		(0.244)	(0.176)		(0.246)	(0.179)		(0.240)	(0.174)		(0.243)	(0.178)
ΔEBITDA		-0.00515	0.0659		-0.00232	0.0681		-0.00161	0.0679		-0.0122	0.0588		0.00234	0.0757		-0.0107	0.0656
		(0.103)	(0.101)		(0.104)	(0.102)		(0.105)	(0.103)		(0.107)	(0.105)		(0.103)	(0.102)		(0.107)	(0.105)
M/B		0.000357	-0.00266		0.000243	-0.00274		0.000796	-0.00203		0.000672	-0.00219		0.000572	-0.00227		-1.84e-05	-0.00280
		(0.00920)	(0.00994)		(0.00919)	(0.00994)		(0.00941)	(0.0101)		(0.00940)	(0.0101)		(0.00910)	(0.00989)		(0.00914)	(0.00998)
ΔM/B		0.000728	0.00118		0.000737	0.00117		0.000147	0.000508		-4.52e-05	0.000367		0.000352	0.000792		0.000243	0.000683
		(0.00513)	(0.00533)		(0.00514)	(0.00537)		(0.00513)	(0.00527)		(0.00510)	(0.00522)		(0.00512)	(0.00527)		(0.00509)	(0.00527)
Z-Score		0.0599***	0.0526***		0.0602***	0.0532***		0.0577***	0.0495**		0.0576***	0.0496**		0.0601***	0.0532***		0.0603***	0.0543***
		(0.0202)	(0.0199)		(0.0201)	(0.0201)		(0.0207)	(0.0200)		(0.0210)	(0.0199)		(0.0205)	(0.0199)		(0.0205)	(0.0201)
ΔZ-Score		-0.0206	-0.0401***		-0.0203	-0.0400***		-0.0187	-0.0388**		-0.0187	-0.0390**		-0.0204	-0.0402***		-0.0201	-0.0403***
		(0.0173)	(0.0149)		(0.0173)	(0.0150)		(0.0178)	(0.0152)		(0.0177)	(0.0151)		(0.0174)	(0.0151)		(0.0172)	(0.0149)
LT Number Rating		0.000555	-0.00200		-0.000583	-0.00281								0.00946*	0.00590		0.00790	0.00464
		(0.00443)	(0.00395)		(0.00461)	(0.00406)								(0.00561)	(0.00550)		(0.00579)	(0.00563)
ST Number Rating								-0.00903	-0.0119		-0.00725	-0.00987		-0.0236**	-0.0212**		-0.0208*	-0.0185*
								(0.00862)	(0.00773)		(0.00930)	(0.00830)		(0.0105)	(0.0106)		(0.0109)	(0.0110)
Constant	0.0141***	0.419***	0.404***	0.0143***	0.425***	0.408***	0.0154***	0.429***	0.413***	0.0147***	0.428***	0.409***	0.0145***	0.402***	0.390***	0.0143***	0.409***	0.390***
	(0.00179)	(0.138)	(0.136)	(0.00174)	(0.139)	(0.137)	(0.00161)	(0.137)	(0.134)	(0.00158)	(0.139)	(0.137)	(0.00181)	(0.140)	(0.137)	(0.00176)	(0.142)	(0.140)
Observations	1,416	1,251	1,250	1,416	1,251	1,250	1,416	1,249	1,248	1,416	1,249	1,248	1,416	1,248	1,247	1,416	1,248	1,247
R-squared	0.109	0.207	0.217	0.109	0.208	0.217	0.109	0.207	0.218	0.112	0.209	0.220	0.111	0.211	0.220	0.114	0.216	0.224

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1