Cross-Market Timing in Security Issuance

Pengjie Gao and Dong Lou*

This Draft: March 2011

Abstract

This paper analyzes the interaction between firms' debt and equity market timing decisions in response to equity misvaluation, as well as how these timing decisions vary across firms with different external funding needs. We use price pressure resulting from mutual fund flow-induced trading to identify equity misvaluation, and document substantial variation in the effect of market timing on financial policy. Specifically, we find that when equity is overvalued, the least financially constrained firms act as pure arbitrageurs by issuing equity to retire debt, thus leading to lower leverage ratios. In contrast, firms that are most financially constrained issue both overpriced equity and debt to increase investment, causing a slight increase in leverage ratio. In addition, our finding that equity market timing does not vary significantly with external funding needs, while debt market timing does, implies that the financing channel of equity mispricing impacting firm investment works primarily through debt issues.

Keywords: Market timing, Security issuance, Credit spreads, Price pressure
JEL classification: G12, G14

*Finance Department, Mendoza College of Business, University of Notre Dame, Notre Dame, IN 46556, pgao@nd.edu; Department of Finance, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, d.lou@lse.ac.uk. We thank Ulf Axelson, Andriy Bodnaruk, Lauren Cohen, Shane Corwin, Peter Easton, Daniel Ferreira, Ravi Jagannathan, Stephannie Larocque, Tim Loughran, Daniel Paravisini, Christopher Polk, Sophie Shive, Dimitri Vayanos, and seminar participants at Notre Dame for helpful comments. We are grateful to Jing Zhang at Moody's Analytics for his assistance with the Expected Default Frequency (EDF) data. Lou acknowledges financial support from the Paul Woolley center at the London School of Economics. All remaining errors are our own.

1 Introduction

In an efficient and perfect financial market, Modigliani and Miller (1958) prove that financial policy is irrelevant to firm value. If the market is inefficient, however, financial policy can matter for obvious reasons; for example, when equity or debt is overvalued, existing shareholders can benefit from issuing additional shares (i.e., to time the market). Consistent with this timing hypothesis, firms issuing both equity and debt, on average, underperform their peers subsequently. Ritter (1991), Spiess and Affleck-Graves (1995), and Loughran and Ritter (1995, 2002) document lower abnormal stock returns after both initial and seasoned equity offerings. Relatedly, Lee and Loughran (1998), Dichev and Piotroski (1999), and Spiess and Affleck-Graves (1999) find that both straight and convertible debt issuers also have lower subsequent stock returns.[1]

Despite considerable evidence that is consistent with the timing hypothesis, prior research has left open some important aspects of the timing behavior. First, are equity and debt market timing decisions independent from each other? Most prior studies on equity market timing take the simplifying view that debt is independently priced from equity and thus treat debt issues in the framework of equity mispricing as simply "taking up the slack" between investment and equity timing decisions (Stein (1996)). However, since both equity and debt are claims on the same underlying assets, costs of debt are likely affected by temporary shocks to equity prices as well (albeit to a less extent). A related, more important, aspect of market timing is the exact use of funds from issuing overpriced securities. On the one hand, firms can act as pure arbitrageurs by selling more overpriced securities and use the proceeds to buy back less overpriced securities. On the other hand, firms can use the proceeds from selling both overpriced equity and debt to carry out investment projects that would not be feasible otherwise due to, for example, financial constraints.[2]

[1] There has also been supportive evidence of the market timing hypothesis at the market level. For example, Baker and Wurgler (2000) document that a higher share of equity issues in total equity and debt issues forecasts lower stock market returns; Baker, Greenwood, and Wurgler (2003), Greenwood and Hansen (2010), and Greenwood, Hanson, and Stein (2010) show that the share of long-term and junk grade debt issues in total debt issues negatively predicts future excess bond returns.

[2] Financial constraints, loosely speaking, refer to the significant wedge between the internal and external costs of funds, which can be caused by asymmetric information between firm managers and investors (e.g., Myers (1984) and Myers and Majluf (1984)). Thus, firms that rely on external financing may have to forgo positive NPV projects due to financing constraints (see, e.g., Fazzari, Hubbard, and Petersen (1988) and Kaplan and Zingales (1997)).

To address these questions, we take a more comprehensive approach to the timing hypothesis, by jointly analyzing firms' debt and equity financing patterns in response to a common measure of equity misvaluation. In particular, since equity and debt are subject to the same price shocks, we hypothesize that firms, on average, issue more debt (in addition to equity) in response to signals of equity overvaluation. We label this hypothesis cross-market timing, because it relates timing behavior in one security to mispricing signals in another.

Moreover, motivated by the theoretical work of Stein (1996) and Baker, Stein, and Wurgler (2003), we further explore cross-sectional variation in cross-market timing behavior. In particular, since financially unconstrained firms are able to separate their investment and financing decisions, under the assumption that managers maximize long-term firm value, we predict that these firms act as pure arbitrageurs of their own securities by exploiting relative mispricing; for example, in the case of equity overvaluation, they issue overvalued equity to retire less overvalued debt. In contrast, financially constrained firms that rely on external financing should issue more equity and debt, and use the proceeds to increase investment, when their equity is more overvalued (or less undervalued).

The testable implications of these predictions regarding the sensitivities of equity and debt issuance to equity misvaluation can be summarized as follows:

Equity and Debt Market Timing

	$\frac{\partial(equity\_issues)}{\partial(equity\_mispricing)}$	$\frac{\partial(debt\_issues)}{\partial(equity\_mispricing)}$
unconstrained	$\oplus$	$\ominus$
constrained	$\oplus$	$\oplus$

In other words, we predict that the sensitivity of equity issues to equity mispricing be positive among both financially unconstrained and constrained firms, while that of debt issues be negative among financially unconstrained and yet positive among financially constrained firms. Following prior research (e.g., Lamont, Polk, and Saa-Requejo (2001) and Baker, Stein, and Wurgler (2003)), we use one off-the-shelf measure of financial constraints based on the work of Kaplan and Zingales (1997), which is a linear function of leverage, cash balances, cash flows, and dividend payout ratios.[3]

[3]We also use the three-variable version (by excluding leverage) or the five-variable version (by including Tobin's Q) of the KZ index, and obtain very similar results.

Our ex-ante measure of equity misvaluation is taken from the mutual fund capital flow literature, where a number of recent studies find that capital flows to individual mutual funds can generate significant price pressure on individual stock returns and that such flow-induced return effect reverses gradually in the next two years (see, for example, Coval and Stafford (2007), Frazzini and Lamont (2008), and Lou (2010)). The measure of flow-induced price shocks has two advantages that make it useful for our purpose to test the market timing hypothesis. First, relative to other measures of equity misvaluation used in prior literature, such as Tobin's Q or lagged (future) stock returns, flow-induced price pressure is subject to fewer alternative interpretations and is thus cleaner in this sense. Second, and more importantly, the return reversal pattern associated with flow-induced trading spans for about two years, leaving plenty of time for managers to adjust their financial decisions.[4]

Following Edmans, Goldstein, and Jiang (2010) and Lou (2010), we construct a measure of $FIPP$ (for flow-induced price pressure) for individual stocks by aggregating flow-induced trading (i.e., the part of mutual fund trading that is proportional to capital flows) across all mutual funds in the previous year. Consistent with prior findings, $FIPP$ is a significant and negative predictor of future stock returns. The differences in equal- and value-weighted portfolio returns between the top and bottom deciles ranked by $FIPP$ are -9.12% ($p < 0.01$) and -12.72% ($p < 0.01$) in the following two years, respectively. Adjusting these portfolio returns for known risk factors only marginally diminishes the magnitude of the return effect. Moreover, $FIPP$ significantly and positively predicts subsequent changes in credit spreads of publicly traded bonds. A one-standard-deviation increase in $FIPP$ measured at the end of quarter 0 forecasts an increase in credit spread of 21.72 ($p < 0.05$) basis points in quarters 3-8. Taking the average corporate bond duration of five years in our sample, this increase in credit spread implies a 1.09% lower bond return in these six quarters.

Building upon the spillover effect from equity mispricing to debt returns, our main results on cross-market timing can be summarized as follows. First, when a firm's stock price is inflated by mutual fund flow-induced trading, the firm on average issues both equity and debt to take advantage of overvaluation in both securities. Second, as equity is overvalued to a larger extent than debt, the firm issues relatively more equity. Lastly, since long-term debt is

[4] Frazzini and Lamont (2008), Khan, Kogan, and Serafeim (2009), and Edmans, Goldstein, and Jiang (2010) employ similar flow-based measures of equity mispricing to study different corporate finance issues. The first two studies examine the effect of mutual fund flow-induced price shocks on subsequent equity issues, while the third one analyzes equity mispricing as a potential determinant of corporate takeovers.

more sensitive to information shocks than short-term debt, the debt market timing pattern is almost entirely driven by long-term debt issues. Specifically, a one-standard-deviation increase in $FIPP$ at the end of fiscal year t-1 is associated with 7.69 ($p < 0.1$) and 8.02 ($p < 0.05$) basis point increases in total debt and long-term debt issuance, respectively, and a 13.32 ($p < 0.01$) basis point increase in net equity issuance (all scaled by lagged total assets) in fiscal year t.[5]

We further uncover substantial variation in the timing pattern across firms with different external financing needs. On the one hand, in response to equity overvaluation, financially unconstrained firms issue equity and retire debt, leading to lower leverage ratios. On the other hand, financially constrained firms issue both overpriced equity and debt, causing a slight (insignificant) increase in leverage ratio. Specifically, for firms in the least financially constrained tercile (ranked by the Kaplan-Zingales (KZ) index), a one-standard-deviation increase in the measure of $FIPP$ is associated with a 14.41 ($p < 0.01$) basis point *decrease* in net debt issuance, and a 13.78 ($p < 0.01$) basis point *increase* in net equity issuance in the subsequent year.[6] The effect of $FIPP$ on net cash flows from equity and debt financing activities (of 0.64 basis points) is indistinguishable from 0 in this subsample. In contrast, for firms in the most financially constrained tercile, a one-standard-deviation increase in $FIPP$ leads to a 26.27 ($p < 0.01$) basis point increase in net debt issuance, and a 14.04 ($p < 0.01$) basis point increase in net equity issuance. While the difference in the sensitivity of debt issuance to $FIPP$ between the most and least financially constrained terciles is highly significant (40.68=26.27-(-14.41) basis points, $p < 0.01$), the sensitivity of equity issuance to $FIPP$ does not vary across KZ-index terciles.[7]

Finally, to complement our results on financial policy, we further examine firms' investment decisions. Consistent with our earlier result that unconstrained firms act like arbitrageurs of their own securities, firms in the least financially constrained tercile have a

[5]Further analyses show that the documented debt issuance pattern in response to equity mispricing is not driven by capital rebalancing motives, as the pattern remains statistically significant in the subsample of firms without recent (and even future) equity issuance.

[6]This result complements the finding in Baker, Foley, and Wurgler (2008) that multinational firms are often engaged in cross-country arbitrage activities, by issuing securities and purchasing assets in different countries.

[7]The result that debt issuance is more sensitive to equity mispricing among high-KZ firms than among low-KZ firms also appears in Baker, Stein, and Wurgler (2003), where the authors use future stock returns to identify overvalued equity. However, their focus is on a different question – how investment-to-mispricing sensitivities vary with financial constraints – and they do not discuss this particular finding.

sensitivity of investment to $FIPP$ that is indistinguishable from 0. In contrast, firms that are most financially constrained have their investment importantly determined by equity misvaluation; a one-standard-deviation increase in $FIPP$ forecasts a higher investment-to-assets ratio of 52.71 ($p < 0.01$) basis points in the top KZ tercile, similar in magnitude to the sensitivity of net cash flows from all financing activities to $FIPP$ (61.56 basis points) in the same KZ tercile.

Our results on cross-market timing have implications for prior studies on the real effect of market inefficiency.[8] Baker, Stein, and Wurgler (2003) provide evidence that equity mispricing can influence firm investment through a financing channel. In particular, the authors find that firms that are more dependent on external financing choose investment that is more sensitive to non-fundamental fluctuations in stock prices. This paper complements Baker, Stein, and Wurgler (2003) by pinpointing the exact mechanism of this financing channel. When equity is more overvalued, low-KZ firms issue equity to retire debt, leaving their investment unchanged, while high-KZ firms issue both equity and debt to increase investment. In a way, it is the variation in sensitivity of debt issuance to equity mispricing that accounts for the variation in sensitivity of firm investment to equity mispricing across KZ terciles.

The paper proceeds as follows. Section 2 describes the data sample and screening procedures. Section 3 examines the effect of mutual fund flow-induced trading on subsequent equity and bond returns. Sections 4 presents our main results of debt and equity financing decisions in response to equity misvaluation. Section 5 conducts further robustness checks. Finally, section 6 concludes.

2 Data and Main Variables

2.1 Stock and Bond Data

Transaction prices of publicly traded bonds are obtained from two sources.[9] The first data source is the National Association of Insurance Commissioners's (NAIC) bond transaction

[8] See, for example, Morck, Shleifer, and Vishny (1990); Gilchrist, Himmelberg, and Huberman (2005); Polk and Sapienza (2008).

[9] All analyses in this paper that involve bond prices and yields are based on transaction prices. This is to minimize the impact of the stale bond pricing issue.

files, which cover all insurance companies' trading records of publicly traded bonds in the post-1994 period. The second data source is the Trade and Reporting Compliance Engine (TRACE) database that initiated coverage in 2002. Compared to NAIC transaction files, TRACE provides more comprehensive coverage of bond transactions by all market participants (rather than only insurance companies). Thus, whenever possible, we use pricing information provided by TRACE in our analyses. To reduce data errors in bond prices, we clean up NAIC transaction files following the procedures outlined in Schultz (2001) and Campbell and Taksler (2003), and the TRACE database using the procedures suggested in Bessembinder, Kahle, Maxwell, and Xu (2008).

To minimize the impact of remaining data errors, we compute daily volume-weighted average bond prices, and use the last available daily price in each quarter as the quarter-end price. We then compute quarterly bond yields and durations by combining quarter-end bond prices with coupon information. Finally, for the benchmark rate that is needed to calculate credit spreads, we use a linear interpolation of the yields of the two on-the-run government bonds bracketing the corporate bond in terms of duration.

The detailed characteristics of individual bond issues (e.g., the coupon rate, maturity date, offering amount, and various special features) are obtained from the Mergent's Fixed Income Security Database (FISD). The time-series of credit ratings for each bond issue is extracted from FISD's rating files. If a bond has multiple ratings from different credit rating agencies, we take the average rating across all agencies. We also obtain from Moody's-KMV the historical Expected Default Frequencies (EDF) for nearly all public firms in our sample from January, 1994 to December, 2009.

We apply several filters to our sample to remove bonds with special features and apparent data errors. Specifically, we exclude all convertible bonds, pay-in-kind bonds, asset backed securities, Yankee bonds, Canadian bonds, bond denominated in non-U.S. currencies, floating-rate bonds, unit deals, putable bonds, exchangeable bonds, perpetual bonds, agency bonds, and bonds issued by quasi-government agencies. Since removing callable bonds would reduce our sample size substantially, we keep them in the sample and correct for this feature in our regressions using a dummy variable. We only include bond-quarter observations for which at least one transaction price is reported by either TRACE or NAIC transaction files.

Finally, stock price, trading volume, and market capitalization are obtained from the

Center for Research in Security Prices (CRSP). Accounting data, such as balance sheet, earnings, and cash flow information, is collected from Standard and Poor's COMPUSTAT database. Following the standard approach, we exclude utilities (SIC codes 4900 - 4999) and financial firms (SIC codes 6000 - 6999), as well as stocks priced below five dollars a share, from our analyses.

2.2 Mutual Fund Flow-Induced Price Pressure

Our measure of temporary shocks to equity prices is borrowed directly from the mutual fund flow literature, where a number of recent studies show that mutual fund flow-induced trading can cause significant price pressure on individual stocks that is reversed gradually in the subsequent two years. Following Edmans, Goldstein, and Jiang (2010) and Lou (2010), we construct a quarterly measure of flow-induced price pressure as

$$FIPP_{j,t} = \frac{\sum_i FIT_{i,j,t}}{\sum_i shares_{i,j,t-1}}, \tag{1}$$

where $FIT_{i,j,t} = shares_{i,j,t-1} * percflow_{i,t}$ is the trade by mutual fund i in stock j that is mechanically induced by capital flows in quarter t, $shares_{i,j,t-1}$ is the number of shares held by mutual fund i at the end of the previous quarter, and $percflow_{i,t}$ the capital flow to mutual fund i in quarter t as a fraction of its total net assets at the beginning of the quarter. We also use total shares outstanding or lagged trading volume in the denominator and the results are by and large unchanged.

Next, we calculate an annual version of $FIPP$ by summing up quarterly $FIPP$ in the previous four quarters. In all the following analyses, we use this annualized $FIPP$ as our main measure of temporary shocks to equity prices.

Mutual fund flow and return data are obtained from the CRSP survivorship-bias-free mutual fund database; quarterly stock holdings are obtained from the CDA/Spectrum 13-F mutual fund holdings database. We link the CRSP mutual fund dataset with the CDA/Spectrum holdings database using the MFLINK file. We exclude all international, fixed-income, and precious metal funds from the sample, that is, we only retain diversified domestic equity mutual funds in the construction of $FIPP$.[10]

[10] Our results are robust to the inclusion or exclusion of sector funds.

2.3 Financial Constraints

Based on the work of Kaplan and Zingales (1997), Lamont, Polk, and Saa-Requejo (2001) construct a Kaplan and Zingales (KZ) index using financial statement information:

$$KZ_{i,t} = -1.002\frac{CF_{i,t}}{A_{i,t-1}} - 39.368\frac{DIV_{i,t}}{A_{i,t-1}} - 1.315\frac{CASH_{i,t}}{A_{i,t-1}} + 3.139Lev_{i,t} + 0.283Q_{i,t}, \qquad (2)$$

where $CF_{i,t}$ is the cash flow of firm i in fiscal year t, A the total assets, DIV the dividend, $CASH$ the cash balance, Lev the book leverage, and Q (i.e., Tobin's Q) the market value of equity plus the book value of debt divided by lagged total assets. All variables are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers.

Following Baker, Stein, and Wurgler (2003), we adopt a four-variable definition of the KZ index in our study, by excluding Tobin's Q from the construction, as we control for Q in our regression specifications. Our results are robust to the original five-variable definition of the KZ index, as well as an alternative three-variable definition that further excludes leverage ratios from the construction.

2.4 Summary Statistics

Table I shows the summary statistics of the main variables used in the paper.[11] Our sample spans the period of 1980-2009 (given data availability). Consistent with large capital inflows to equity mutual funds in our sample period, the average annual flow-induced price pressure ($FIPP$) is 3.22% with a standard deviation of 9.12%. The average issue-specific credit spread is 2.74%, while the average expected default frequency (EDF) is 0.74%.[12] In addition, as reported in SDC, while public bond issuance is less frequent than equity issuance, the average bond offering size of 3.28% of lagged total assets is larger than the average equity offering size of 2.62%, consistent with the results in Fama and French (2005).

Net equity and debt issues in each fiscal year are obtained from Compustat. The average cash flow from financing activities (as a fraction of lagged total assets) is 6.91%, slightly larger than the sum of average debt and equity issuance (2.62%+3.28%=5.90%). The difference

[11] More details about variable constructions and data sources are provided in Appendix A.

[12] The expected default frequency (EDF), as provided by Moody's KMV, is winsorized at 35%. However, there are very few firms with default probability (in the next one year) exceeding 35%.

between the two reflects cash dividends and other unclassified financing activities. The average cash flow from all investing activities is -13.18%.[13] It is not surprising that the magnitude of investment cash flows is substantially larger than that of financing cash flows; the gap between the two is filled by cash flows generated by firm operations.

3 Return Effects of Fund Flow-Induced Trading

Recent research on mutual fund flows suggests that mutual funds tend to scale up or down their existing holdings in response to capital flows. Since mutual funds with capital inflows generally have similar holdings, and so do mutual funds facing capital outflows, these flow-induced trades can cause significant price pressure on individual stock returns (see, for example, Coval and Stafford (2007), Frazzini and Lamont (2008), and Lou (2010)). Compared to other measures of equity misvaluation used in the market-timing literature, such as Tobin's Q and lagged (future) stock returns, the measure of flow-induced price pressure is less likely affected by firms' growth opportunities and other alternative interpretations.[14] More importantly, unlike other price pressure phenomena, the flow-induced return effect is only gradually reversed in the subsequent two years.[15] This feature is crucial for our purpose to test the timing hypothesis, as equity and debt issues are unlikely determined and executed over a short period of time.

We start our analysis by replicating prior studies on the stock return effect of mutual fund flow-induced trading. At the end of each quarter, we sort all stocks into deciles based on the aggregate price pressure caused by mutual fund flow-induced trading in the previous year. We then form a self-financed portfolio that goes long in stocks experiencing the largest flow-induced purchases and goes short in stocks with the largest flow-induced sales in the previous year. We hold the long-short portfolio formed at the end of each quarter for the next eight quarters and report its average monthly returns over different holding periods.[16]

[13]The negative sign is due to the accounting convention that investment represents cash outflows.

[14]In all subsequent analyses, we control for industry fixed effects, book-to-market ratios, and market capitalization to eliminate the impact of industry and style components in mutual fund flows.

[15]The gradual, rather than immediate, reversal of flow-induce price impacts is likely due to the fact that mutual fund flows are highly persistent, so that flow-induced trading keeps pushing prices away in the same direction, and the reversal comes in only after the persistence in flows is faded away.

[16]We follow Jegadeesh and Titman (1993) to compute equal-weighted average returns across overlapping holdings in each quarter.

The results, shown in Table II, confirm the findings in prior research; $FIPP$ significantly and negatively forecasts monthly stock returns after quarter three. The long-short hedging portfolio generates equal-weighted monthly excess returns of -32 ($p > 0.1$) and -43 ($p < 0.05$) basis points in subsequent two years, respectively. Put differently, stocks in the top decile ranked by $FIPP$ underperform those in the bottom decile by 9.12% ($p < 0.01$) in the two years after portfolio formation. Adjusting these portfolio returns for the Fama-French three factor model only marginally diminishes the return effect; the difference in three-factor alpha between the top and bottom deciles is -8.40% ($p < 0.05$).[17] Interestingly, the return effect is even stronger for the analogous value-weighted long-short portfolio, consistent with the observation that mutual funds tend to hold large and liquid stocks. The difference in valued-weighted portfolio returns between the top and bottom $FIPP$ deciles is -12.72% ($p < 0.01$) and that in value-weighted three factor alpha is -12.00% ($p < 0.01$), in the subsequent two years. These results suggest that the effect of mutual fund flow-induced price pressure is unlikely driven by investor sentiment or style investing, as these alternative stories would predict the return effect be stronger among small-cap stocks and be explained by style (factor) returns, respectively.

We next analyze the potential spillover effect of equity mispricing on debt returns. The basic idea is that since equity and debt are securities written on the same underlying assets (albeit with different payoff structures), they are likely impacted by the same price shocks. There are a number of potential channels through which price pressure on stock returns can affect the cost of debt. For example, debt investors incorporate information in equity returns into debt prices but are unable to differentiate information from temporary demand shocks.[18] Alternatively, equity overvaluation lowers a firm's market leverage ratio and creates additional borrowing capacity, thur reducing its borrowing cost. The perhaps simplest story is that the underlying, unobserved, mechanism that drives mutual fund flows also drives bond returns. We note that, while the spillover effect from equity misvaluation to debt returns is crucial to our empirical analyses, we remain agnostic as to the exact mechanism responsible for this spillover effect.

At the end of each quarter, we calculate the yield-to-maturity of each publicly-traded

[17]We also construct $FIPP$ based on style-adjusted capital flows, and the results are similar.

[18]Kwan (1996), Gebhardt, Hvidkjaer, and Swaminathan (2005), and Downing, Underwood, and Xing (2009) show that equity returns are on average more sensitive to firm-specific information and thus lead bond returns.

corporate bond based on its last daily trading price in the quarter, and compute its quarter-end credit spread by subtracting off the interpolated yield of Treasury securities with the same duration. We then conduct a panel OLS regression with the dependent variable being the quarter-to-quarter change in credit spread. We use changes in credit spread, rather than total bond returns, to eliminate the impact of Treasury yield jumps. The main independent variable of interest in the regression is lagged $FIPP$ from various horizons. We conduct our regression analysis at a quarterly frequency, because a) mutual fund holdings are reported quarterly (so is the frequency of our $FIPP$ measure), and b) trading in many corporate bonds is infrequent, and thus conducting the analysis at a higher frequency may result in too many missing observations. Our prediction is that $FIPP$ positively forecasts changes in bond credit spread in subsequent quarters, or equivalently, negatively forecasts bond returns.

We also include in our regression a host of control variables that are known to be related to (changes in) credit spreads. These control variables can be roughly divided into three categories. The first category concerns firm characteristics, such as the market (or book) leverage ratio, size of the firm, the share of tangible assets in total assets, lagged stock returns, idiosyncratic volatilities of daily stock returns based on the Carhart four-factor model, and the average expected default frequency (EDF) provided by Moody's KVM. The second group of control variables captures bond related features, for example, the size, duration (and maturity), and coupon rate of each debt issue, and an indicator function that equals one if a bond is callable and zero otherwise. The last category of variables reflects general debt market conditions; for this purpose, we include the cumulative CRSP value-weighted return in the previous year, the term spread between 10-year and 3-month treasury securities, and the credit spread between Moody's AAA- and BAA-rated corporate bonds. We also control for year-fixed and industry-fixed effects to absorb additional variations across time and industries. To account for possible correlations within each issuer, we report standard errors clustered at the firm level.

The results of the baseline regression are presented in Panel A of Table 3. In each column, we fix the timing of $FIPP$ and other control variables at the end of quarter 0, and vary the timing of the dependent variable from quarters 1 through 8. $FIPP$ computed at quarter 0 is positively related to credit spread changes in all quarters from 3 to 8, and the relation is statistically significant in the latter four quarters. A one-standard-deviation increase in

$FIPP$ at the end of quarter 0 forecasts higher credit spreads of 1.50 ($p > 0.1$), 2.40 ($p > 0.1$), 4.19 ($p < 0.05$), 4.61 ($p < 0.05$), 4.38 ($p < 0.05$), 4.65 ($p < 0.05$) basis points in quarters 3 to 8, respectively, and the resulting total increase in credit spread of 21.72 ($p < 0.05$) basis points over these six quarters is statistically significant. Taking the average corporate bond duration in our sample of around 5 years, a one-standard-deviation increase in $FIPP$ implies a 1.09% lower bond return in these six quarters. It should not come as a surprise that the effect of $FIPP$ on bond returns is weaker than that on equity returns, as debt is less sensitive to information (price) shocks than equity.

A further implication of this information-sensitivity argument is that the impact of $FIPP$ on bond returns (or credit spreads) should be strongers for bonds that are more sensitive to price shocks. To test this prediction, we classify all publicly traded bonds into two groups: one that is issued by investment-grade issuers and the other by non-investment-grade issuers (including non-rated issuers).[19] As shown in Panels B and C, the effect of $FIPP$ on subsequent credit spread changes is insignificant (positive) in the investment-grade issuer sample, while that in the non-investment-grade sample is both economically and statistically significant. Specifically, a one-standard-deviation increase in $FIPP$ is associated with a mere 13.40 ($p > 0.1$) basis point increase in credit spread among investment-grade issuers, and a 48.09 ($p < 0.01$) basis point increase among non-investment-grade issuers. Based on the average bond duration in our sample of 5 years, a one-standard-deviation increase in $FIPP$ implies a lower bond return of 2.40% in quarters 3 to 8 for non-investment-grade issuers.

Taken together, the results presented here suggest that mutual fund flow-induced trading in the equity market causes significant price impacts on both equity and debt returns. More importantly, such flow-induced price pressure is only gradually reversed in the following two years. Therefore, it is reasonable to expect that firm managers opportunistically issue overpriced equity and debt to take advantage of this flow-driven mispricing.

[19]Issuer ratings by Standard and Poors are obtained from COMPUSTAT annual filings. We obtain similar results using issue-specific ratings.

4 Main Results of Cross-Market Timing

Prior research on corporate financial policy has uncovered considerable evidence that is consistent with the market timing hypothesis. Ritter (1991), Spiess and Affleck-Graves (1995), and Loughran and Ritter (1995, 2002), among many others, document lower abnormal stock returns after both initial and seasoned equity offerings. Lee and Loughran (1998), Dichev and Piotroski (1999), and Spiess and Affleck-Graves (1999), on the other hand, report that both straight and convertible debt issuers have lower future stock returns.

The literature, however, has left unaddressed some important aspects of market timing behavior. First, are equity and debt timing decisions independent from each other? In particular, given that equity and debt are claims on the same underlying assets and are affected by the same price shocks (as shown in the previous section), do firms simultaneously issue overpriced equity and debt? A related, perhaps more important, question is the exact use of funds from selling overpriced securities. On the one hand, firms can act as arbitrageurs of their own securities by selling the more overpriced and use the proceeds to buy back the less overpriced. Since firms are less subject to various market frictions that limit arbitrage activities, such as performance-sensitive arbitrage capital and short-sale constraints, they are in a stronger position to profit from market inefficiency than professional arbitrageurs (see, e.g., Shleifer and Vishny (1997) and Stein (2005)). On the other hand, firms can use the proceeds from selling overpriced equity and debt to carry out investment projects that would not be feasible otherwise, especially for those that are financially constrained (i.e., dependent on external financing).

To address these issues, we take a different approach from prior literature on market timing. Instead of analyzing subsequent stock returns of equity and debt issuers, we investigate firms' equity and debt financing decisions in response to a common ex-ante measure of equity misvaluation.[20] Doing so allows us to explicitly examine the interaction between equity and debt timing, which can not be addressed by the traditional approach of looking at future stock returns of security issuers.

More specifically, motivated by the theoretical work of Stein (1996) and Baker, Stein,

[20]Frazzini and Lamont (2008), Khan, Kogan, and Serafeim (2009), and DellaVigna and Pollet (2011) employ a similar empirical strategy of using ex-ante mispricing measures to study equity market timing decisions, but none of them examine the implications for debt market timing.

and Wurgler (2003), we examine the variation in equity and debt timing patterns with financial constraints. On the one hand, since financially unconstrained firms can separate their financial policy from their investment policy, under the assumption that managers maximize long-term firm value, we predict that these firms act as pure arbitrageurs of their own securities. In particular, when equity is overvalued, they issue overpriced equity to retire less overpriced debt; similarly, when equity is undervalued, they repurchase underpriced equity using the proceeds from issuing less underpriced debt. There are two reasons why firms may not tab into their cash reserves to carry out these arbitrage trades. First, deviating from the optimal cash policy in either direction can be costly, due to various agency problems and the positive value of liquidity. Second, forming a long-short portfolio using the firm's own securities can help reduce the risk exposures of market timing trades. The extent to which firms use cash vs. debt issues in these arbitrage trades is thus an empirical question.

On the other hand, for financially constrained firms whose hurdle rates are importantly determined by temporary fluctuations in external costs of capital, when equity is more overvalued (or less undervalued), they should issue both more equity and debt and use the proceeds to increase investment. Financially constrained firms should optimally issue both securities instead of equity alone, even if equity is more overvalued than debt, because issuing equity exerts downward pressure on equity prices (e.g., Stein (1996)). To the extent that equity and debt markets are not perfectly integrated, issuing securities in both markets can result in a lower combined cost of capital. In sum, our cross-sectional predictions of market timing behavior can be summarized in the following table:

Equity and Debt Market Timing

	overvalued equity	undervalued equity
unconstrained	equity +, debt − (to exploit relative mispricing)	equity −, debt + (to exploit relative mispricing)
constrained	equity +, debt + (issue both to a larger extent)	equity +, debt + (issue both to a smaller extent)

The ex-ante measure of equity misvaluation used in this study is the price shocks caused by mutual fund flow-induced trading. As shown in the previous section (and partly in prior literature), firms that are heavily bought by mutual funds due to capital inflows have lower future stock and bond returns in the following two years than stocks heavily sold by mutual funds due to capital outflows. That the return reversal pattern associated with flow-induced trading spans for about two years is crucial for our purpose to test the market timing hypothesis, as equity and debt issues are unlikely driven by very short-term price fluctuations. Our main measures of equity and debt issues are annual net issues constructed from financial statement data, following the definitions in Baker, Stein, and Wurgler (2003) and Baker, Greenwood, and Wurgler (2003), respectively.

4.1 A Preliminary Analysis using SDC Issuance Data

We start our tests for the cross-market timing hypothesis by examining firms' public bond and equity issues, obtained from Security Data Corporation's (SDC) issuance database. The advantage of this dataset is that we know exactly when each issue takes place, its initial offering size, and other issue-related information; thus, we can conduct our analysis at a higher frequency than using the annual Compustat data. The downside is that the SDC issuance database only covers public issues of equity and debt, and thus misses the full picture of firm financial policy which also includes private placements and issues that are expired or repurchased. In balance, tests based on the SDC data provide some interesting, initial, evidence for cross-market timing behavior.

More specifically, at the end of each quarter, we sum up all public bond or equity issues taking place in the quarter, and test if these quarterly measures of security issues are related to lagged flow-induced price pressure (or $FIPP$). We take two related empirical approaches here: i) a logistic regression with the dependent variable being an indicator function that takes the value of one if the firm in question has at least one public bond (or equity) issue in that quarter, and ii) a pooled OLS regression where the dependent variable is the total amount of public bond (or equity) issues in the quarter as a fraction of lagged total assets.[21] The main independent variable of interest in both regression specifications is $FIPP$ measured in the previous four quarters. Aside from the list of control variables reported in Table 3, we also include in our analysis three additional variables: the leverage gap, long-term past stock returns, and idiosyncratic stock return volatility. The leverage gap, defined in Fama

[21] To improve the power of our tests, we only consider firms with Standard and Poor's long-term issuer credit ratings as of the previous fiscal-year end in the bond issue analysis. This criterion effectively excludes all firms that have never issued a public bond or are very infrequent issuers.

and French (2002) as the difference between a firm's current leverage ratio and its long-run average leverage ratio, reflects the firm's tendency to revert its capital structure back to its long-run mean, while the latter two variables have been shown in prior literature to be related to security issuance.

In addition, as we have seen in the previous section, mutual fund flow-induced trading has a substantially larger price effect on bonds that are issued by non-investment-grade firms than on those issued by investment-grade firms. A natural prediction is therefore that the timing behavior in bond issues induced by flow-induced price effects should also be more pronounced among non-investment-grade firms than invest-grade firms. Consequently, we conduct the same set of regression analyses on these two subsamples to sharpen our interpretation.

The results of bond issuance decisions as a function of lagged $FIPP$ are shown in Panel A of Table 4. The first three columns present results from the logistic regression approach, of which the first column reports coefficient estimates using the full sample, the second column reports coefficient estimates from all investment-grade issuers, and the last column based on all non-investment-grade issuers. Consistent with our prediction, $FIPP$ positively and significantly forecasts subsequent bond issues by non-investment-grade issuers, and is unrelated to future bond issues by investment-grade issuers. Specifically, the point estimates on $FIPP$ in the full sample and the non-investment-grade issuer sample are 0.146 ($p > 0.1$) and 0.463 ($p < 0.05$), respectively.

The next three columns of Panel A, again corresponding to the full sample, the investment-grade issuer sample, and the non-investment-grade issuer sample, respectively, present coefficient estimates from the pooled OLS regression. The results are similar to those based on the logistic approach. A one-standard-deviation increase in $FIPP$ leads to a 8.24 ($p < 0.05$) basis points increase in aggregate bond issue size (scaled by lagged total assets) in the subsequent quarter among non-investment-grade issuers, while its effect on subsequent bond issues among investment-grade issuers is statistically insignificant. The average effect of $FIPP$ on subsequent bond issue size in the full sample is also significant.

For comparison, we also examine equity issues as a function of equity misvaluation. Consistent with the findings in Frazzini and Lamont (2008) and Khan, Kogan, and Serafeim (2009), $FIPP$ positively predicts both the likelihood of having at least one equity issue and the aggregate equity issue size in the following quarter. The point estimate on $FIPP$ in the logistic regression is 0.283 ($p < 0.01$), and a one-standard-deviation increase in $FIPP$ forecasts a 1.76 ($p < 0.01$) basis point increase in equity issue size (relative to lagged total assets) in the following quarter. Since bond issues are, on average, much larger than equity issues (the median public bond offering size of $557 million vs. the median equity offering size of $61.6 million), it should not come as a surprise that the sensitivity of the likelihood of equity issues to $FIPP$ is larger than that of bond issues, while the sensitivity of equity offering size to $FIPP$ is smaller than that of bond offering size.

In sum, the results shown here provide some initial evidence of equity misvaluation affecting both firms' bond and equity issuance decisions. This evidence is most consistent with the market timing hypothesis, as the sensitivity of bond issues to $FIPP$ is larger precisely when bond mispricing is more severe (i.e., in the subsample of non-investment-grade issuers).

4.2 Main Results of Net Debt and Equity Issues

Since the SDC issuance database does not include private placements, or issues that are expired or repurchased, we resort to Compustat annual files to form a more complete picture of market timing behavior in firm financial policy. Specifically, using firm balance sheet and cash flow statement information, we construct measures of net debt and equity issues, which reflect all public and private placements, as well as issues that are expired or repurchased, and examine their relations to equity misvaluation.[22]

Our empirical design allows us to study interactions between debt and equity timing across firms with different characteristics. By categorizing firms into subsamples based on their needs for external financing, we predict that financially unconstrained firms act as arbitrageurs of their own securities, while financially constrained firms issue both overpriced equity and debt to increase investment. Following Lamont, Polk, and Saa-Requejo (2001) and Baker, Stein, and Wurgler (2003), we adopt an off-the-shelf measure based on the work of Kaplan and Zingales (1997). The KZ index is constructed as a linear function of leverage,

[22]Following Baker, Greenwood, and Wurgler (2003), we calculate total debt issuance as the sum of long-term and short-term debt issuance, where long-term debt issuance is defined as the change in long-term debt plus the change in debt due in one year, and short-term debt issuance as the change in notes payable, both normalized by lagged total assets. Following Baker, Stein, and Wurgler (2003), we define equity issuance as the change in book equity minus the change in retained earnings.

dividend payout ratio, cash holdings, cash flows, and growth opportunities. The coefficients on various components are estimated from a small sample of manufacturing firms. Like Baker, Stein, and Wurgler (2003), we exclude growth opportunities, measured by Tobin's Q, from our definition of the KZ index as we explicitly control for Q in our regression specifications, but our main results will go through with the original five-variable definition of the KZ index.[23]

Table 5 reports regression results for net debt issues. The dependent variable in the first column is total debt issues in a fiscal year. The main independent variable is the flow-induced price pressure ($FIPP$) constructed two quarters before the fiscal year beginning. We leave two quarters between the construction of $FIPP$ and the dependent variable as the effect of $FIPP$ on costs of debt appears to peak at the end of quarter two (Table 3 Panels A and C).[24] The set of control variables are identical to those in Table 4. The results from the first column suggest that, after accounting for a host of known predictors of debt issues, lagged $FIPP$ positively and significantly forecasts future debt issuance. Specifically, a one-standard-deviation increase in $FIPP$ forecasts a 1.82 ($p < 0.1$) basis point increase in total debt issuance (as a fraction of lagged total assets) in the following fiscal year.

Column 2 conducts a similar regression analysis as in Column 1, except that we also include interaction terms between $FIPP$ and two indicator variables; the first indicator variable, $MedianConstaint$, takes the value of one if the firm in question is in the middle financial-constraint (KZ) tercile, and the second indicator variable, $HighConstaint$, equals one if the firm is in the top KZ tercile (i.e., most financially constrained). By including these interaction terms, the coefficient on $FIPP$ reflects the sensitivity of debt issues to $FIPP$ among the least financially constrained firms, while the coefficients on $FIPP$ interacting with $MedianConstaint$ and $HighConstaint$ capture the difference in debt-issuance sensitivity to $FIPP$ between the bottom and middle KZ terciles, and that between the bottom and top KZ terciles, respectively.

The difference-in-sensitivity analysis yields an interesting pattern. Firms in the bottom KZ tercile (i.e., those that are least financially constrained) tend to reduce debt in response

[23]For further robustness, we also conduct all our analyses using a three-variable version of the KZ index, which excludes the leverage ratio from its construction, and the results are by and large unchanged.

[24]Our results are robust to other choices of timing in the regression specification. For example, we obtain similar results using $FIPP$ constructed in the four quarters immediately preceding the fiscal year beginning.

to equity overvaluation, while those in the middle and top KZ terciles tend to issue debt. Specifically, a one-standard-deviation increase in $FIPP$ forecasts a 14.41 ($p < 0.01$) basis point reduction in total debt (as a fraction of lagged total assets) among the least financially constrained subsample, a 6.48 (insignificant) basis point increase in total debt among the the median tercile, and a 26.27 ($p < 0.01$) basis point increase in total debt issues among the most financially constrained subsample in the following year. The difference in debt-issuance sensitivity to equity mispricing between the bottom and middle KZ terciles, and that between the bottom and top KZ terciles are both statistically significant at the 1% level. These results suggest that, while the average effect of $FIPP$ on subsequent debt issues in the full sample are only marginally significant, there is substantial variation in this effect across firms with different external financing needs.

To further understand the mechanism of cross-market timing, we conduct the same set of analyses on firms' long-term and short-term debt issues. Since long-term debt is more sensitive to changes in credit spread, we expect the cross-market timing behavior to be more pronounced in long-term than in short-term debt issues. Put differently, when a firm's equity is overvalued and so is its debt, the firm should issue more longer-term debt in order to lock in this unusually low cost of debt for a longer period. We report our results on the two components of debt financing in Columns 3-6 in Table 5.

As shown in Columns 3 and 4, a one-standard-deviation increase in $FIPP$ forecasts a 8.02 ($p < 0.05$) basis point increase in long-term debt issues in the full sample in the following year, which is similar in magnitude to the effect based on total debt issuance. There is also significant cross-sectional variation in the sensitivity of long-term debt issues to equity misvaluation. Among the least financially constrained group of firms, a one-standard-deviation increase in $FIPP$ predicts a 11.58 ($p < 0.05$) basis point reduction in debt issues in the next year. In contrast, a one-standard-deviation increase in $FIPP$ predicts a 27.09 ($p < 0.01$) basis point increase in debt issues among the most financially constrained group. The difference between the coefficient estimates of the top and bottom KZ terciles is statistically significant at the 1% level.

The last two columns of the table present the regression results on short-term debt issues. $FIPP$ predicts a marginally significant reduction in short-term debt among the least constrained tercile of firms, and has insignificant effect on short-term debt issues in the middle and top KZ-index terciles. Specifically, a one-standard-deviation in $FIPP$ forecasts 2.43 ($p < 0.1$) basis points lower short-term debt issues in the following year. Taken together, evidence presented thus far in this section suggests that firms on average issue more debt, in particular longer-term debt, in response to equity overvaluation, and that this cross-market timing pattern varies significantly across firms with different needs for external financing.

To complete the picture of financial policy, we next analyze the effect of equity misvaluation on subsequent equity issues. The regression analysis reported in the first two columns of Table 6 is virtually identical to that reported in Table 5, except that the dependent variable is now the net equity issues in each fiscal year. Not surprisingly, as can be seen from Column 1, equity overvaluation has a large and significant average effect on net equity issues in the following year. A one-standard-deviation increase in $FIPP$ forecasts a 13.32 ($p < 0.01$) basis point increase in equity issues in the following year.

In Column 2, we again classify firms into terciles based on their corresponding KZ indices, and examine the effect of $FIPP$ on future equity issues in these three subsamples. Distinct from debt issuing patterns, there is no variation in the sensitivity of equity issues to equity misvaluation across these KZ-index terciles. A one-standard-deviation increase in $FIPP$ is associated with a 13.78 ($p < 0.01$) basis point increase in equity issues in the following year in the least financially constrained tercile, which is similar in magnitude to the amount of debt reduction in the same tercile (with a point estimate of 14.41). The difference in the sensitivity of equity issuance to $FIPP$ between the bottom and middle terciles, and that between the bottom and top terciles are both economically small and statistically insignificant.

An interesting, perhaps surprising, observation is that firms that are most financially constrained, when their equity is overvalued, issue more debt than equity in the subsequent year. Specifically, as shown in Column 2 of Tables 5 and 6, a one-standard-deviation increase in $FIPP$ forecasts 27.18 and 14.04 basis points higher net debt issues and equity issues in the top KZ-index tercile, respectively. In other words, the sensitivity of debt issues to equity misvaluation is almost twice as large as that of equity issues among most financially constrained firms. This result is consistent with prior findings that debt in general plays a more important role than equity in financing firm investment.

As a robustness check, we also conduct the same analysis using information from the cash flow statement. In Columns 3 and 4 of Table 6, we replace the dependent variable in

Columns 1 and 2 with net cash flows from all financing activities in each fiscal year, which is roughly equal to the sum of net equity issues and net debt issues, with the residual being cash flows from other (unspecified) financing activities. Doing so allows us to analyze the impact of equity misvaluation on a firm aggregate financial policy.

As shown in Column 3, equity overvaluation forecasts significantly positive total cash flows from all financing activities. A one-standard-deviation increase in $FIPP$ forecasts 35.84 ($p < 0.01$) basis points higher total cash flows from financing activities in the following year. There is also significant variation in the sensitivity of cash flows from financing activities to equity overvaluation across firms with different external financing needs, most of which is driven by differential debt issuing patterns in different KZ terciles. A one-standard-deviation increase in $FIPP$ is related to an insignificant 11.13 basis point increase in net cash flows from financing in the least financially constrained group, a 27.18 ($p < 0.01$) basis point increase among medium constrained firms, and a 61.56 ($p < 0.01$) basis point increase in the most constrained group in the following year.[25]

Finally, we examine the effect of equity misvaluation on leverage ratios. The results are shown in Columns 5 and 6 of Table 6, where the dependent variable is the change in leverage ratio between two consecutive years. Consistent with the results on equity and debt issuance patterns, we find that while $FIPP$ is unrelated to subsequent changes in leverage ratio in the full sample, there is substantial variation in the leverage-to-equity-mispricing sensitivity across firms with different needs for external financing.[26] Specifically, a one-standard-deviation increase in $FIPP$ forecasts a 69 ($p < 0.05$) basis point decrease in leverage ratio among the least financially constrained firms, and an insignificant 13 ($p > 0.1$) basis point increase in leverage ratio among the most financially constrained firms.

Combined, the results shown in this section delineate a more complete picture of market timing behavior in financial policy. Firms that are least financially constrained – i.e., those with sufficient internal resources – choose to substitute debt for equity (or vice versa) to profit from relative mispricing, thus acting as pure arbitrageurs of their own securities. In contrast, firms that are most financially constrained – i.e., those dependent on external

[25] This pattern is also robust to an alternative definition of net cash flows from financing activities, which is calculated as the sum of net equity issues and net debt issues.

[26] In the full sample, the sensitivity of equity issuance to $FIPP$ is about twice as large as that of debt issuance (0.0146 vs. 0.0843), which is similar in magnitude to the equity-to-debt ratio of a typical firm in our sample (the average leverage ratio in our sample is around 20-25%).

capital to finance investment projects – issue both overpriced equity and debt, and perhaps surprisingly the latter to a larger extent.

4.3 Investment and Equity Misvaluation

As a natural extension to the analysis of firm financial decisions, we further examine the implications of market timing for firm investment policy. Doing so allows us to complete the circle of the use of funds from issuing overpriced securities, and to further our understanding of the underlying mechanism behind market timing behavior.

Following Baker, Greenwood, and Wurgler (2003), we start by looking at the sensitivity of capital expenditures to lagged $FIPP$, and how this sensitivity varies across firms. Specifically, we conduct the same analyses as those reported in Tables 5 and 6 except that the dependent variable now is the capital expenditures in each fiscal year. The results, presented in Column 1 of Table 7, confirm prior findings that firm investment, on average, is importantly determined by equity misvaluation. A one-standard-deviation increase in $FIPP$ forecasts a 6.26 ($p < 0.01$) basis point increase in subsequent capital expenditures (as a fraction of lagged total assets). There is also substantial variation in the sensitivity of capital expenditures to equity misvaluation across firms. A one-standard-deviation increase in $FIPP$ leads to an insignificant change in capital expenditures among least financially constrained firms, and a significant 12.99 ($p < 0.01$) basis point increase in capital expenditures in the top KZ-index tercile.

Next, motivated by Shleifer and Vishny (2003), we further examine the sensitivity of firms' acquisition spending to equity misvaluation.[27] The results, shown in Columns 3 and 4 of Table 7, are similar to those based on capital expenditures. Specifically, a one-standard-deviation increase in $FIPP$ forecasts 6.26 ($p < 0.1$) basis points higher spending on acquisition activities in the full sample. Further sorting firms into three KZ-terciles, we show that a one-standard-deviation increase in $FIPP$ is associated with an insignificant change in acquisition spending in the least constrained tercile, and a significant 21.60 ($p < 0.01$) basis point increase in acquisition spending in the most constrained tercile in the following

[27]Acquisition spending for each fiscal year is obtained from the section of net cash flows from investing activities in the cash flow statement. As shown in Table I, acquisition spending (scaled by lagged total assets) is highly skewed. To address potential econometric concerns, we also use the logarithm of one plus the acquisition-to-assets ratio, and the results are by and large unchanged.

year.

For further robustness, instead of going through investment activities one at a time, we utilize information from the cash flow statement. Specifically, we examine the sensitivity of net cash flows from all investing activities (including but not limited to capital and acquisition expenditures) to lagged equity misvaluation.[28] The results, shown in Columns 5 and 6 of Table 7, are consistent with those based on various components of firm investment. A one-standard-deviation increase in $FIPP$ predicts 36.75 ($p < 0.01$) basis points higher net cash flows from investing activities. Further, while $FIPP$ is unrelated to cash flows from investment among the least financially constrained group of firms, a one-standard-deviation increase in $FIPP$ is associated with a 65.30 ($p < 0.01$) basis point increase in total cash flows from investing activities.

These documented investment patterns, as a function of lagged $FIPP$, complement the debt and equity issuance patterns shown in the previous section. For firms without immediate needs for external financing, they simply issue the more overpriced security and use the proceeds to buy back the less overpriced security while leaving their investment unaffected, acting like pure arbitrageurs of their own securities. In contrast, for firms that depend on external financing, when their equity is more overvalued (less undervalued), they issue both more equity and debt, and use the proceeds to increase investment.

These results have interesting implications for prior studies on the real effect of market inefficiency. For example, Morck, Shleifer, and Vishny (1990) and Baker, Stein, and Wurgler (2003) test a financing channel through which mispricing can cause fluctuations in firm investment. A testable implication of this hypothesis is that firms facing binding financial constraints should exhibit stronger investment-to-mispricing sensitivities. This prediction is corroborated by the evidence in Baker, Stein, and Wurgler (2003). Our analyses provide further evidence to help pin down the underlying financing channel. In our sample, while firms always issue overpriced equity, their decision to issue debt in response to equity overvaluation depends crucially on financial constraints. In a way, the variation in investment-to-mispricing sensitivity across firms with different KZ indices, as shown in Baker, Stein, and Wurgler (2003), is accounted for by the sensitivity of debt issues to equity mispricing.

[28]Since investment represents cash outflows, the sensitivity estimate will have a negative sign.

5 Robustness Checks

5.1 Mutual Fund Flow-Induced Trading and Future Credit Rating Changes

We perform further robustness checks and address alternative interpretations of our results. First, to complement our results on the effect of mutual fund flow-induced trading on future changes in public bond yields, we examine subsequent changes in bond credit ratings as a function of lagged $FIPP$. Specifically, we conduct a logistic regression with the dependent variable being an indicator function that takes the value of 1 if the bond in question is downgraded in the quarter.[29] The independent variable of interest is lagged $FIPP$ constructed from four consecutive quarters, and the control variables are borrowed directly from Table 3. We then fix the timing of $FIPP$ and the control variables at the end of quarter zero, and vary the timing of the dependent variable from quarters one through eight.

The results, shown in Table 8, are consistent with those in Table 3. $FIPP$ constructed at the end of quarter zero predicts higher likelihood of credit rating downgrades in the following eight quarters and the coefficient estimates are statistically significant in six of the eight quarters. For example, the coefficient estimates on $FIPP$ for credit rating changes measured in quarters three through eight are 1.20 ($p < 0.05$), 1.51 ($p < 0.01$), 1.77 ($p < 0.01$), 1.83 ($p < 0.01$), 1.49 ($p < 0.01$) and 0.95 ($p < 0.1$), respectively. These results suggest that not only bond investors, but also credit rating agencies are affected by price shocks in the equity market.

5.2 A Subsample of Firms without Equity Issuance

An alternative interpretation of the debt issuance pattern as a function of equity overvaluation shown in Table 5 is that firms with different degrees of financial constraints may have different (yet unobservable) target leverage ratios. More specifically, while firms' issuing more equity in response to equity overpricing represents genuine market timing behavior, what appears as debt market timing may simply be driven by firms' equity timing decisions

[29]If a bond has credit ratings from more than one rating agency, we use the average rating across all agencies.

combined with considerations to maintain target leverage ratios. To address this alternative possibility, we first note that we explicitly control for the leverage gap (proposed by Fama and French (2002)) in our regressions, which measures a firm's deviation in the current leverage ratio from its long-run average ratio. If the debt issuance pattern that we document merely reflects the tendency to revert back to target leverage ratios, we would expect the predictability of $FIPP$ on subsequent debt issues to be largely subsumed by the leverage gap measure. The results shown in Table 5 clearly reject this possibility.

We further rule out this alternative interpretation by conducting the same set of regression analyses as in Table 5 on a subsample of firms that do not report significant changes in book equity from five years before to the end of the fiscal year in question. For example, if the dependent variable is the net debt issues in fiscal year 2006, we only include firms that do not have significant changes in book equity in years 2001 to 2006.[30] Doing so allows us to better isolate the direct effect of $FIPP$ on debt financing decisions from the indirect effect that works through equity issues.

The results shown in Table 9, albeit based on a much smaller sample, are similar to those reported in Table 5. Firms on average issue more debt, in particular long-term debt, in response to equity overvaluation even if they do not issue equity in the same period. A one-standard-deviation increase in $FIPP$ forecasts 12.59 ($p < 0.01$) and 13.04 ($p < 0.01$) basis points higher debt and long-term debt issues in this subsample sample, respectively. Moreover, while firms without immediate need for external financing tend to buy back their debt (insignificantly) in response to equity overvaluation, firms that are most financially constrained substantially increase their debt issues, in particular long-term debt issues, when their equity is overvalued. A one-standard-deviation increase in $FIPP$ is associated with increases of 44.96 ($p < 0.01$) and 42.65 ($p < 0.01$) basis points in debt and long-term debt issues in the top KZ-index tercile, respectively. These results imply that the documented debt issuance pattern as a function of equity misvaluation is unlikely to be solely driven by the tendency to maintain target leverage ratios, and is more consistent with our cross-market timing hypothesis.

[30] We define significant changes in book equity as those over 10% of lagged total assets in either direction. Our results are also robust to other cutoffs. We require no significant changes in book equity in the previous 5 years, plus the year in question, as prior literature (e.g., Leary and Roberts (2005); Alti (2006); Flannery and Rangan (2006); Kayhan and Titman (2007)) shows that it can sometimes take a long time for firms to adjust their leverage ratios back to their optimal levels.

6 Conclusion

Using price pressure resulting from mutual fund flow-induced trading as a measure of temporary shocks to stock prices, this paper analyzes interactions between equity and debt market timing in response to a common measure of equity misvaluation. We further examine such cross-market timing patterns among firms with different needs for external financing. We find that for the group of least financially constrained firms, when their equity is overvalued, they issue equity to retire debt, acting as pure arbitrageurs. In contrast, among the group of firms that are most financially constrained, they issue both overpriced equity and debt to take advantage of the window of opportunity and substantially increase their investment. This paper thus contributes to prior literature by depicting a more complete picture of firms' market timing behavior.

Our results also have implications for prior studies on the real effects of market inefficiency. Baker, Stein, and Wurgler (2003) test a financing channel of equity misvaluation impacting firm investment and show that firms that are more financially constrained exhibit stronger investment-to-mispricing sensitivities. Our results help pin down the exact financing channel. While firms always issue overpriced equity in our sample, they use the proceeds in different ways when faced with more vs. less binding financial constraints: Firms without external financing needs use the proceeds to retire debt and leave their investment unchanged, while those with external financing needs issue additional debt and use the combined proceeds to increase investment. In other words, the difference in investment-to-mispricing sensitivity between high- and low-KZ firms documented in Baker, Stein, and Wurgler (2003) can be accounted for by the difference in the sensitivity of debt issues to equity mispricing across the same KZ-index groups.

References

Alti, Aydogan, 2006, How Persistent Is the Impact of Market Timing on Capital Structure?, *Journal of Finance* 61, 1681–1710.

Baker, Malcolm, C. Fritz Foley, and Jeffrey Wurgler, 2008, Multinationals as Arbitrageurs: The Effect of Stock Market Valuations on Foreign Direct Investment, *Review of Financial Studies*.

Baker, Malcolm, Jeremy C. Stein, and Jeffrey Wurgler, 2003, When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms, *Quarterly Journal of Economics* 118, 969–1005.

Baker, Malcolm, and Jeffery Wurgler, 2000, The Equity Share in New Issues and Aggregate Stock Returns, *Journal of Finance* 55, 2219–2257.

Baker, Malcolm P., Robin Greenwood, and Jeffrey Wurgler, 2003, The Maturity of Debt Issues and Predictable Variation in Bond Returns, *Journal of Financial Economics* 70, 261–291.

Bessembinder, Hendrik, Kathleen M. Kahle, William F. Maxwell, and Danielle Xu, 2008, Measuring Abnormal Bond Performance, *Review of Financial Studies* 22, 4219–4258.

Campbell, John Y., and Glen B. Taksler, 2003, Equity Volatility and Corporate Bond Yields, *Journal of Finance* 58, 2321–2349.

Coval, Joshua D., and Erik Stafford, 2007, Asset Fire Sales (and Purchases) in Equity Markets, *Journal of Financial Economics* 86, 479–512.

DellaVigna, Stefano, and Joshua M. Pollet, 2011, Capital Budgeting vs. Market Timing: An Evaluation using Demographics, Working Paper, University of California Berkeley.

Dichev, Ilia D., and Joseph D. Piotroski, 1999, The Performance of Long-run Stock Returns Following Issues of Public and Private Debt, *Journal of Business Finance & Accounting* 26, 1103–1132.

Downing, Chris, Shane Underwood, and Yuhang Xing, 2009, The Relative Informational Efficiency of Stocks and Bonds: An Intraday Analysis, *Journal of Financial and Quantitative Analysis* Forthcoming.

Edmans, Alex, Itay Goldstein, and Wei Jiang, 2010, Takeover Activity and Target Valuations: Evidence of Feedback in Financial Markets, Working Paper, Columbia University.

Fama, Eugene F., and Kenneth R. French, 2002, Testing Trade-Off and Pecking Order Predictions About Dividends and Debt, *Review of Financial Studies* 15, 1–33.

——— , 2005, Financing Decisions: Who Issues Stock, *Journal of Financial Economics* 76, 549–582.

Fazzari, Steven M., Glenn R. Hubbard, and Bruce C. Petersen, 1988, Financing Constraints and Corporate Investment, *Brookings Papers on Economic Activity* 1, 141–195.

Flannery, Mark J., and Kasturi P. Rangan, 2006, Partial Adjustment Toward Target Capital Structures, *Journal of Financial Economics* 79, 469–506.

Frazzini, Andrea, and Owen A. Lamont, 2008, Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns, *Journal of Financial Economics* 88, 299–322.

Gebhardt, William R., Soeren Hvidkjaer, and Bhaskaran Swaminathan, 2005, Stock and Bond Market Interaction: Does Momentum Spill Over?, *Journal of Financial Economics* 75, 651–690.

Gilchrist, Simon, Charles P. Himmelberg, and Gur Huberman, 2005, Do stock price bubbles influence corporate investment?, *Journal of Monetary Economics* 52, 805–827.

Greenwood, Robin, and Samuel Hansen, 2010, Share Issuance and Factor Timing, *Journal of Finance* Forthcoming.

Greenwood, Robin, Samuel Hanson, and Jeremy C. Stein, 2010, A Gap-Filling Theory of Corporate Debt Maturity Choice, *Journal of Finance* Forthcoming.

Jegadeesh, Narasimhan, and Sheridan Titman, 1993, Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency, *Journal of Finance* 48, 65–91.

Kaplan, Steven N., and Luigi Zingales, 1997, Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?, *Quarterly Journal of Economics* 112, 169–215.

Kayhan, Ayla, and Sheridan Titman, 2007, Firms Histories and Their Capital Structures, *Journal of Financial Economics* 83, 1–32.

Khan, Mozaffar, Leonid Kogan, and George Serafeim, 2009, Mutual Fund Trading Pressure: Firm-Level Stock Price Impact and Timing of SEOs, Working Paper, MIT Sloan School of Management.

Kwan, Simon H., 1996, Firm Specific Information and the Correlation between Individual Stocks and Bonds, *Journal of Financial Economics* 40, 63–80.

Lamont, Owen, Christopher Polk, and Jesus Saa-Requejo, 2001, Financial Constraints and Stock Returns, *Review of Financial Studies* 14, 529.

Leary, Mark T., and Michael R. Roberts, 2005, Do Firms Rebalance Their Capital Structures?, *Journal of Finance* 60, 2575–2619.

Lee, Inmoo, and Tim Loughran, 1998, Performance Following Convertible Bond Issuance, *Journal of Corporate Finance* 4, 185–207.

Lou, Dong, 2010, A flow based explanation for return predictability, Working Paper, London School of Economics.

Loughran, Tim, and Jay R. Ritter, 1995, The New Issues Puzzle, *Journal of Finance* 50, 23–51.

——— , 2002, Why Don't Issuers Get Upset about Leaving Money on the Table in IPOs?, *Review of Financial Studies* 15, 413.

Modigliani, Franco, and Merton H. Miller, 1958, The Cost of Capital, Corporation Finance and The Theory of Investment, *American Economic Review* 48, 261–297.

Morck, Randall, Andrei Shleifer, and Robert W. Vishny, 1990, The Stock Market and Investment: Is the Market a Sideshow?, *Brookings Papers on Economic Activity* pp. 157–215.

Myers, Stewart C., 1984, The Capital Structure Puzzle, *Journal of Finance* 39, 575–592.

——— , and Nicholas S. Majluf, 1984, Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not, *Journal of Financial Economics* 13, 187–221.

Polk, Christopher, and Paola Sapienza, 2008, The Stock Market and Corporate Investment: A Test of Catering Theory, *Review of Financial Studies* 22, 187–217.

Ritter, Jay R., 1991, The Long-Run Performance of Initial Public Offerings, *Journal of Finance* 46, 3–27.

Schultz, Paul, 2001, Corporate Bond Trading Costs: A Peek Behind the Curtain, *Journal of Finance* 56, 677–698.

Shleifer, Andrei, and Robert W. Vishny, 1997, The Limits of Arbitrage, *The Journal of Finance* 52, 35–55.

——— , 2003, Stock Market Driven Acquisitions, *Journal of Financial Economics* 70, 295–311.

Spiess, Katherine, and John Affleck-Graves, 1995, Underperformance in Long-Run Stock Returns Following Seasoned Equity Offerings, *Journal of Financial Economics* 38, 243–267.

Spiess, Katherine D., and John Affleck-Graves, 1999, The Long-Run Performance of Stock Returns Following Debt Offerings, *Journal of Financial Economics* 54, 45–73.

Stein, Jeremy C., 1996, Rational Capital Budgeting In An Irrational World, *Journal of Business* 69, 429.

——— , 2005, Why Are Most Funds Open-End? Competition and the Limits of Arbitrage?, *Quarterly Journal of Economics* 120, 247–272.

Table 1: Summary Statistics

Table 1 provides the sample summary statistics (the first quartile, mean, standard deviation, median and third quartile) of main variables used in this study. The details of variable definitions and constructions, as well as data sources, are provided in Appendix A.

Variable Names	Q1	Mean	Std. Dev.	Median	Q3
FIPP (annual)	-0.0258	0.0322	0.0912	0.0184	0.0809
Basic Bond Characteristics (FISD)					
Bond Yield Spread	0.0110	0.0274	0.0301	0.0181	0.0316
Log(Issue Size)	11.9184	12.3287	1.0105	12.4292	12.8992
Log(Duration)	1.1034	1.4621	0.7961	1.6031	1.9611
Basic Stock Information (CRSP)					
Expected Default Frequency (EDF)	0.0500	0.7413	2.2381	0.1495	0.4450
Return, Past 1 Year	-0.1750	0.1836	0.7402	0.0831	0.3679
Return, Past 2-3 Year	-0.1800	0.4392	1.3916	0.2000	0.6763
VW. Industry Return, Past 1 Year	0.0019	0.1316	0.2170	0.1316	0.2571
VW. Industry Return, Past 2-3 Year	0.0937	0.3038	0.3593	0.2673	0.5032
Idiosyncratic Volatilities	0.0474	0.0729	0.0384	0.0639	0.0858
Firm Fundamentals (Compustat)					
Sales Growth	0.0104	0.1556	1.5100	0.0787	0.1856
Tangibility	0.1448	0.3091	0.2185	0.2497	0.3983
Profitability	0.0182	0.0338	0.1707	0.0664	0.1055
B/M	0.3204	0.6876	0.6186	0.5699	0.9200
Size (Relative)	0.0007	0.0210	0.0773	0.0028	0.0111
Log(Total Asset)	8.5939	9.9165	1.9125	9.7956	10.9712
Leverage Gap	-0.1053	0.0110	0.2769	0.0294	0.1675
Leverage	0.0345	0.2488	0.2415	0.1837	0.4002
Equity Issuance (Compustat)					
Net Equity Issuance	-0.0035	0.0262	0.1056	0.0007	0.0121
Equity Issuance, Past 3-year	-0.0130	0.1329	0.3430	0.0087	0.1325
Equity Issuance, Past 5-year	-0.0190	0.1921	0.4104	0.0247	0.3201
Debt Issuance (Compustat)					
Total Debt Issuance	-0.0245	0.0328	0.1753	0.0000	0.0385
Long-term Debt Issuance	-0.0193	0.0314	0.1677	0.0000	0.0268
Short-term Debt Issuance	0.0000	0.0013	0.0353	0.0000	0.0000
Investment and Acquisition Activities (Compustat)					
Capital Expenditures	0.0218	0.0695	0.0768	0.0470	0.0882
Acquisition Spending	0.0000	0.0405	0.1335	0.0000	0.0120
Sources and Uses of Funds (Compustat)					
Net Cash Flow of Financing	-0.0500	0.0691	0.3508	-0.0032	0.0594
Net Cash Flow of Investment	-0.1575	-0.1318	0.2893	-0.0694	-0.0198

Table 2: Mutual Fund Flow-Induced Price Pressure (FIPP) and Future Stock Returns

This table reports the calendar-time returns of a portfolio that goes long in stocks in the top decile sorted by annual flow-induced price pressure ($FIPP$) and goes short in stocks in the bottom decile. Annual $FIPP$ is calculated as the sum of quarterly $FIPP$ in four consecutive quarters. The portfolios are rebalanced every quarter and held for two years. Quarter 0 is the portfolio formation period. Both equal-weighted and value-weighted monthly portfolio returns are reported. To deal with overlapping portfolios in each holding month, we follow Jegadeesh and Titman (1993) to take the equal-weighted average return across portfolios formed in different quarters. Three different monthly returns are reported: the return in excess of the risk-free rate, the CAPM alpha, and the Fama-French three-factor alpha. The sample period is from 1980 to 2009. White's standard errors are shown in parentheses. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Equal Weighted			Value Weighted		
	excess return	1-factor alpha	3-factor alpha	excess return	1-factor alpha	3-factor alpha
Qtr 1	-0.15%	-0.25%	-0.14%	-0.32%	-0.48%	-0.20%
	(0.0023)	(0.0026)	(0.0023)	(0.0029)	(0.0032)	(0.0029)
Qtr 2	-0.29%	-0.39%	-0.23%	-0.48%*	-0.64%*	-0.51%
	(0.0023)	(0.0026)	(0.0023)	(0.0029)	(0.0033)	(0.0032)
Qtr 3	-0.40%*	-0.50%**	-0.32%	-0.70%**	-0.88%***	-0.61%*
	(0.0022)	(0.0025)	(0.0024)	(0.0030)	(0.0034)	(0.0031)
Qtr 4	-0.40%*	-0.49%**	-0.49%**	-0.72%**	-0.87%***	-0.66%**
	(0.0021)	(0.0023)	(0.0022)	(0.0029)	(0.0031)	(0.0031)
Qtr 5	-0.41%**	-0.49%**	-0.52%**	-0.65%**	-0.78%***	-0.80%***
	(0.0021)	(0.0022)	(0.0022)	(0.0028)	(0.0028)	(0.0029)
Qtr 6	-0.51%***	-0.57%***	-0.45%**	-0.69%***	-0.81%***	-0.50%**
	(0.0019)	(0.0020)	(0.0020)	(0.0027)	(0.0026)	(0.0023)
Qtr 7	-0.48%***	-0.55%***	-0.36%*	-0.42%*	-0.49%**	-0.30%
	(0.0019)	(0.0020)	(0.0020)	(0.0022)	(0.0023)	(0.0021)
Qtr 8	-0.37%**	-0.43%**	-0.22%	-0.25%	-0.31%	-0.33%
	(0.0019)	(0.0019)	(0.0020)	(0.0022)	(0.0022)	(0.0021)
Qtrs 1-4	-0.32%	-0.41%*	-0.29%	-0.55%**	-0.71%**	-0.50%*
	(0.0020)	(0.0023)	(0.0020)	(0.0026)	(0.0030)	(0.0026)
Qtrs 5-8	-0.43%**	-0.50%***	-0.39%**	-0.49%**	-0.59%***	-0.49%**
	(0.0017)	(0.0017)	(0.0017)	(0.0021)	(0.0022)	(0.0019)
Qtrs 1-8	-0.38%***	-0.45%***	-0.35%**	-0.53%***	-0.65%***	-0.50%***
	(0.0014)	(0.0015)	(0.0014)	(0.0019)	(0.0020)	(0.0018)

Table 3: Mutual Fund Flow Induced Price Pressure and Future Credit Spread Changes (NAIC + TRACE)

The dependent variables in all regressions are duration-adjusted corporate bond yield spread changes between quarter ends. Columns 1 to 8 report the results for duration-adjusted corporate bond yield spread changes between (Q, Q+1), (Q+1, Q+2), (Q+2, Q+3), (Q+3, Q+4), (Q+4, Q+5), (Q+5, Q+6), (Q+6, Q+7), and (Q+7, Q+8) respectively. The main independent variable of interest is the flow-induced price pressure (FIPP). Firm-level control variables include past one-year average expected default frequency (EDF), cumulative past one-year return, past one-year stock return idiosyncratic volatilities, tangibility, sales growth rate, leverage, size, profitability, assets maturity. Bond-level control variable include callable bond dummy, issue size (in logarithm), bond duration (months, in logarithm), and coupon rate. The macroeconomic control variables include changes of CRSP value-weight index return, term spreads, and default spreads at the time the bond yield is measured. All regressions include the year-quarter and industry-fixed effects. Panel A reports the estimates from the full sample of bonds. Panel B reports the estimates from the bond issued by investment grade issuers. Panel C reports the estimates from the non-investment-grade issuers. The sample period is from January, 1995 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by issuers. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

Panel A: Mutual Fund Flow Induced Equity Price Pressure and Bond Yield Spread Changes, Full Sample

	Dependent Variable: Change of Bond Yield Spreads							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	Q+7	Q+8
FIPP(Q)	-0.00423*	-0.000768	0.00165	0.00263	0.00459**	0.00505**	0.00480**	0.00510**
	(0.00240)	(0.00225)	(0.00214)	(0.00201)	(0.00215)	(0.00211)	(0.00209)	(0.00207)
Underlying Firm's Fundamental Control Variables:								
Sales Growth	0.00109*	0.00110*	0.00110*	0.00107*	0.00107	0.00112	0.00105	0.000919
	(0.000647)	(0.000650)	(0.000651)	(0.000650)	(0.000666)	(0.000707)	(0.000685)	(0.000637)
Leverage	0.00150	0.00132	0.00124	0.00134	0.00131	0.00125	0.00146	0.00161
	(0.00116)	(0.00115)	(0.00115)	(0.00116)	(0.00118)	(0.00120)	(0.00121)	(0.00123)
Size	0.000378*	0.000417**	0.000443**	0.000461**	0.000487**	0.000485**	0.000475**	0.000485**
	(0.000201)	(0.000202)	(0.000203)	(0.000204)	(0.000207)	(0.000209)	(0.000211)	(0.000213)
Tangibility	0.00244**	0.00245**	0.00244**	0.00210	0.00214	0.00225	0.00206	0.00192
	(0.00121)	(0.00121)	(0.00121)	(0.00131)	(0.00142)	(0.00148)	(0.00150)	(0.00149)
Return, past 1 year	-0.000508***	-0.000556***	-0.000581***	-0.000569***	-0.000573***	-0.000579***	-0.000554***	-0.000549***
	(0.000184)	(0.000187)	(0.000186)	(0.000186)	(0.000191)	(0.000196)	(0.000196)	(0.000199)
Idiosyncratic Volatility	0.0132	0.0132	0.0129	0.0126	0.0120	0.0120	0.0113	0.0107
	(0.0107)	(0.0107)	(0.0107)	(0.0107)	(0.0106)	(0.0107)	(0.0108)	(0.0110)
EDF	0.000395*	0.000402*	0.000408*	0.000405*	0.000415*	0.000418*	0.000415*	0.000399*
	(0.000217)	(0.000218)	(0.000218)	(0.000218)	(0.000216)	(0.000216)	(0.000218)	(0.000221)

Bond Characteristics Control Variables:								
Log(Issue Size)	-0.00191***	-0.00191***	-0.00191***	-0.00192***	-0.00191***	-0.00191***	-0.00191***	-0.00191***
	(0.000615)	(0.000613)	(0.000612)	(0.000612)	(0.000612)	(0.000613)	(0.000613)	(0.000614)
Log(Duration)	-0.00444***	-0.00443***	-0.00444***	-0.00444***	-0.00445***	-0.00445***	-0.00445***	-0.00444***
	(0.000247)	(0.000247)	(0.000247)	(0.000247)	(0.000247)	(0.000248)	(0.000248)	(0.000249)
Coupon Rate	-0.000597	-0.000601	-0.000604	-0.000612	-0.000620	-0.000620	-0.000627	-0.000633
	(0.000381)	(0.000380)	(0.000381)	(0.000381)	(0.000382)	(0.000383)	(0.000384)	(0.000385)
Callable	0.00238***	0.00239***	0.00240***	0.00239***	0.00242***	0.00240***	0.00243***	0.00242***
	(0.000549)	(0.000550)	(0.000549)	(0.000548)	(0.000550)	(0.000552)	(0.000554)	(0.000556)
Macroeconomic Control	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	112,368	112,410	112,310	112,050	111,674	111,259	110,832	110,417
Adjusted R^2	0.128	0.128	0.128	0.128	0.129	0.129	0.128	0.128

Panel B: Mutual Fund Flow Induced Equity Price Pressure and Bond Yield Spread Changes, Investment Grade Issuers

	Dependent Variable: Change of Bond Yield Spreads							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	Q+7	Q+8
FIPP	-0.00246	0.000149	0.00130	0.00202	0.00324	0.00293	0.00254	0.00266
	(0.00196)	(0.00174)	(0.00161)	(0.00174)	(0.00201)	(0.00213)	(0.00217)	(0.00224)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bond Characteristics Controls	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomic Control	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	87,520	87,539	87,485	87,357	87,180	86,992	86,798	86,608
Adjusted R^2	0.119	0.119	0.119	0.119	0.119	0.119	0.119	0.119

Panel C: Mutual Fund Flow Induced Equity Price Pressure and Bond Yield Spreads Changes, Non-investment Grade Issuers

	Dependent Variable: Change of Bond Yield Spreads							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	Q+7	Q+8
FIPP	-0.00830**	-0.00189	0.00366	0.00582*	0.00935***	0.0115***	0.0114***	0.0110***
	(0.00392)	(0.00372)	(0.00359)	(0.00334)	(0.00352)	(0.00327)	(0.00318)	(0.00325)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bond Characteristics Controls	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomic Control	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,848	24,871	24,825	24,693	24,494	24,267	24,034	23,809
Adjusted R^2	0.232	0.232	0.232	0.232	0.235	0.237	0.238	0.237

Table 4: Mutual Fund Flow Induced Price Pressure (FIPP) and Quarterly Bond and Equity Issuance (SDC + FISD)

This table reports the propensity to issue bonds and equities. The main independent variable is the flow-induced price pressure (FIPP). Panel A estimates the propensity to issue bond among firms with a credit rating. In columns 1 to 3, the dependent variable is a binary variable taking a value of one if there is at least one bond issuance during quarter (q), and zero otherwise. Column 1 reports results of all issuers. Column 2 and column 3 report investment-grade and non-investment grade issuers. In columns 4 to 6, the dependent variable is total dollar amount of bond issuance during quarter (q), normalized by the total asset size at the beginning of the fiscal year. Column 4 reports results of all issuers. Column 5 and column 6 report investment-grade and non-investment grade issuers. In all regressions, firm-level control variables include Sale growth rate, profitability, asset tangibility, leverage ratio, boo-to-market equity, relative size, firm age, past 1-year underlying equity's idiosyncratic volatility, past 1-year underlying equity's cumulative return, past 1-year average expected default frequency. All regressions include the year-quarter and industry-fixed effects. The sample period is from January, 1995 to December, 2009.

Panel B estimates the propensity to issue equity among all firms. In column 1, the dependent variable is a binary variable taking a value of one if there is at least one seasoned equity offering during quarter (q), and zero otherwise. In column 2, the dependent variable is the total amount of seasoned equity offerings during quarter (q), normalized by the previous quarter (q-1) end total assets. In all regressions, firm-level control variables include sale growth rate, profitability, asset tangibility, leverage ratio, boo-to-market equity, relative size, past 1-year underlying equity's cumulative return, past 2 to 3 year underlying equity's cumulative return. The sample period is from January, 1982 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by firm. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

Panel A: Mutual Fund Flow Induced Price Pressure (FIPP) and Quarterly Bond Issuance

	Dependent Variables: Bond Issuance Decisions			Dependent Variables: Bond Issue Size/TA		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample	Investment Grade Issuer	Non-Investment Grade Issuer	Full Sample	Investment Grade Issuer	Non-Investment Grade Issuer
FIPP	0.146	-0.333	0.463**	0.0100***	0.00205	0.00904**
	(0.177)	(0.357)	(0.209)	(0.00306)	(0.00284)	(0.00408)
Sales Growth	0.272***	0.0648	0.393***	0.00810***	0.00393***	0.00764***
	(0.0871)	(0.162)	(0.0987)	(0.00184)	(0.00116)	(0.00236)
Profitability	-0.440*	-1.428**	-0.166	-0.0142**	-0.00282	-0.0140**
	(0.243)	(0.603)	(0.269)	(0.00590)	(0.00424)	(0.00708)
B/M	0.0582	0.225	0.0901	-0.000398	-0.000241	-0.000701
	(0.0476)	(0.142)	(0.0550)	(0.000650)	(0.000732)	(0.000776)
Leverage Gap	-0.539***	-0.919***	-0.497***	-0.0131***	-0.0104***	-0.0101***
	(0.129)	(0.261)	(0.141)	(0.00199)	(0.00240)	(0.00277)
Size	626.0***	577.2***	913.9***	-2.099***	-0.684**	-6.221***
	(61.04)	(65.28)	(162.7)	(0.401)	(0.286)	(1.582)
Tangibility	0.568***	0.638***	0.494***	0.00707***	0.00337***	0.00783***
	(0.103)	(0.195)	(0.109)	(0.00152)	(0.00102)	(0.00216)
Return, past 1 year	0.0553	0.0252	0.0419	-0.000732	-0.000955	-0.000796
	(0.0488)	(0.0964)	(0.0585)	(0.000665)	(0.000632)	(0.000842)
Return, past 2 to 3 year	-0.0152	0.0172	-0.0267	-0.000429	-8.66e-05	-0.000643
	(0.0275)	(0.0548)	(0.0339)	(0.000425)	(0.000372)	(0.000551)
Idiosyncratic Volatilities	-11.33***	-18.71**	-5.063	0.182***	0.119**	0.0723
	(3.945)	(9.335)	(4.302)	(0.0522)	(0.0559)	(0.0697)
EDF	-0.0466***	-0.0750	-0.0554***	-0.000762***	-0.000705	-0.000713***
	(0.0143)	(0.136)	(0.0158)	(0.000177)	(0.000440)	(0.000209)
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	45,206	21,526	23,680	45,206	21,526	23,680
Pseudo R^2 / Adjusted R^2	0.0617	0.0546	0.0931	0.025	0.012	0.032

Panel B: Mutual Fund Flow Induced Price Pressure (FIPP) and Quarterly Equity Issuance

	Dependent Variables: Equity Issuance Decision	Dependent Variables: Issuance Amount / TA
	(1)	(2)
FIPP	0.283***	0.00193***
	(0.0888)	(0.000567)
Sales Growth	0.387***	0.00241***
	(0.0297)	(0.000352)
Profitability	-0.0686***	-0.00372***
	(0.0189)	(0.00124)
B/M	-0.755***	-0.00229***
	(0.0483)	(0.000153)
Leverage Gap	0.0755	0.00129**
	(0.0641)	(0.000563)
Size	34.43	-1.708***
	(47.27)	(0.103)
Tangibility	0.775***	3.47e-05
	(0.0657)	(0.000399)
Return, past 1 year	0.265***	0.00442***
	(0.0225)	(0.000327)
Return, past 2 to 3 year	-0.0294**	4.01e-05
	(0.0122)	(6.40e-05)
Time Fixed Effect	YES	YES
Industry Fixed Effect	YES	YES
Observations	272,225	272,225
Pseudo R^2 / Adjusted R^2	0.0769	0.018

Table 5: Mutual Fund Flow Induced Price Pressure (FIPP) and Annual Net Debt Issuance (COMPUSTAT)

The dependent variables are the sum of long-term and short-term debt issuance (columns 1 and 2), long-term debt issuance (columns 3 and 4), and short-term debt issuance (columns 5 and6) between fiscal year (t-1) and year (t), all divided by total assets at the beginning of fiscal year (t-1). The main independent variable is the flow-induced price pressure (FIPP). Firm-level control variables include sales growth rates, B/M equity ratio, size, leverage-gap, cumulative past one-year return, cumulative past second- and third-year return. All regressions include the year and industry-fixed effects. To adjust for the difference of fiscal year-ends, cumulative past one-year industry returns between fiscal year (t-1) and year (t), cumulative past second and third-year industry returns between fiscal year (t-3) and year (t-1), cumulative past one-year market returns between fiscal year (t-1) and year (t), change of credit spreads between fiscal year (t-1) and year (t), and change of term spreads between fiscal year (t-1) and year (t) are also included. In columns 2, 4, and 6, Medium Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the middle 40% of all firms in terms of financial constraint index ranking, zero otherwise. High Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the top 30% of all firms in terms of financial constraint index ranking, zero otherwise. The sample period is from January, 1982 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by firm. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Total Debt Issuance		LT Debt Issuance		ST Debt Issuance	
	(1)	(2)	(3)	(4)	(5)	(6)
FIPP	0.00843*	-0.0158**	0.00879**	-0.0127**	-0.000287	-0.00266*
	(0.00464)	(0.00617)	(0.00443)	(0.00589)	(0.000989)	(0.00149)
FIPP x Medium Constraint		0.0229***		0.0178**		0.00355*
		(0.00860)		(0.00819)		(0.00208)
FIPP x High Constraint		0.0446***		0.0424***		0.00285
		(0.0113)		(0.0110)		(0.00219)
Medium Constraint		0.0112***		0.0114***		0.000219
		(0.00162)		(0.00157)		(0.000364)
High Constraint		0.0318***		0.0309***		0.000548
		(0.00251)		(0.00239)		(0.000448)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES
Industry Returns Controls	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	55,273	55,273	55,273	55,273	55,273	55,273
Adjusted R^2	0.067	0.072	0.065	0.070	0.008	0.008

Table 6: Mutual Fund Flow Induced Equity Price Pressure (FIPP) and Annual Equity Issuance (COMPUSTAT)

The dependent variables are the net equity issuance (columns 1 and 2), the net cash flow from financing (columns 3 and 4), and the change in leverage ratio between fiscal year (t-1) and year (t). The main independent variable is the flow-induced price pressure (FIPP). Firm-level control variables include sales growth rates, B/M equity ratio, size, leverage-gap, cumulative past one-year return, cumulative past second- and third-year return. All regressions include the year and industry-fixed effects. To adjust for the difference of fiscal year-ends, cumulative past one-year industry returns between fiscal year (t-1) and year (t), cumulative past second and third-year industry returns between fiscal year (t-3) and year (t-1), cumulative past one-year market returns between fiscal year (t-1) and year (t), change of credit spreads between fiscal year (t-1) and year (t), and change of term spreads between fiscal year (t-1) and year (t) are also included. In columns 2, 4, and 6, Medium Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the middle 40% of all firms in terms of financial constraint index ranking, zero otherwise. High Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the top 30% of all firms in terms of financial constraint index ranking, zero otherwise. The sample period is from January, 1982 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by firm. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Total Equity Issuance		Net CF from Financing		Leverage Ratio Change	
	(1)	(2)	(3)	(4)	(5)	(6)
FIPP	0.0146***	0.0151***	0.0393***	0.0122	0.000209	-0.00758**
	(0.00253)	(0.00399)	(0.00980)	(0.0133)	(0.00208)	(0.00306)
FIPP x Medium Constraint		-0.00180		0.0176		0.0123***
		(0.00522)		(0.0173)		(0.00417)
FIPP x High Constraint		0.000300		0.0553**		0.00904*
		(0.00608)		(0.0240)		(0.00493)
Medium Constraint		0.00452***		0.0236***		-0.00535***
		(0.00114)		(0.00313)		(0.000739)
High Constraint		0.0144***		0.0671***		-0.00912***
		(0.00151)		(0.00480)		(0.000988)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES
Industry Returns Controls	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	62,640	62,640	55,412	55,412	54,631	54,631
Adjusted R^2	0.228	0.230	0.170	0.172	0.043	0.044

Table 7: Mutual Fund Flow Induced Price Pressure (FIPP) and Firm Investment (COMPUSTAT)

In Columns 1 and 2, the dependent variable is the capital expenditure investment between fiscal year (t-1) and fiscal year (t), normalized by the total assets at the beginning of fiscal year (t-1). In columns 3 and 4, the dependent variable is the acquisition activities (from the statement of cash flows), normalized by the total assets at the beginning of fiscal year (t-1). In columns 5 and 6, the dependent variable is the net cash flow from investment activities (from the statement of cash flows), normalized by the total assets at the beginning of fiscal year (t-1). The main independent variable is the flow-induced price pressure (FIPP). Firm-level control variables include sales growth rates, B/M equity ratio, size, leverage-gap, cumulative past one-year return, cumulative past second- and third-year return. All regressions include the year and industry-fixed effects. To adjust for the difference of fiscal year-ends, cumulative past one-year industry returns between fiscal year (t-1) and year (t), cumulative past second and third-year industry returns between fiscal year (t-3) and year (t-1), cumulative past one-year market returns between fiscal year (t-1) and year (t), change of credit spreads between fiscal year (t-1) and fiscal year (t), and change of term spreads between fiscal year (t-1) and year (t) are also included. When appropriate, Medium Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the middle 40% of all firms in terms of financial constraint index ranking, zero otherwise. High Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the top 30% of all firms in terms of financial constraint index ranking, zero otherwise. The sample period is from January, 1982 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by firm. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Capital Expenditure		Acquisitions		Net CF from Investment	
	(1)	(2)	(3)	(4)	(5)	(6)
FIPP	0.00687***	-0.00156	0.00721*	-0.00312	-0.0403***	-0.0138
	(0.00207)	(0.00273)	(0.00371)	(0.00688)	(0.00830)	(0.0120)
FIPP x Medium Constraint		0.00827**		0.00198		-0.0149
		(0.00389)		(0.00831)		(0.0154)
FIPP x High Constraint		0.0158***		0.0268***		-0.0578***
		(0.00487)		(0.00964)		(0.0205)
Medium Constraint		0.0201***		0.00338*		-0.0225***
		(0.00149)		(0.00188)		(0.00316)
High Constraint		0.0206***		0.00425*		-0.0351***
		(0.00184)		(0.00219)		(0.00435)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES
Industry Return Controls	YES	YES	YES	YES	YES	YES
Macroeconomic Controls	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	62,025	62,025	55,412	55,412	55,412	55,412
Adjusted R-squared	0.242	0.255	0.072	0.072	0.170	0.172

Table 8: Robustness - Mutual Fund Flow Induced Price Pressure (FIPP) and Future Credit Rating Changes (FISD)

In all regressions, the dependent variables are the bond rating change binary indicator variables, taking value of one for downgrades, and zero otherwise. Columns 1 to 8 report the results for bond rating changes between (Q, Q+1), (Q+1, Q+2), (Q+2, Q+3), (Q+3, Q+4), (Q+4, Q+5), (Q+5, Q+6), (Q+6, Q+7), and (Q+7, Q+8) respectively. The main independent variable of interest is the flow-induced price pressure (FIPP). Firm-level control variables include duration-adjusted bond yield spreads at the beginning of quarter (Q), past one-year average expected default frequency (EDF), cumulative past one-year return, past one-year stock return idiosyncratic volatilities, tangibility, sales growth rate, leverage, size, profitability, assets maturity. Bond-level control variable include callable bond dummy, issue size (in logarithm), bond duration (months, in logarithm), and coupon rate. The macroeconomic control variables include changes of CRSP value-weight index return, term spreads, and default spreads at the time the bond yield is measured. All regressions include the year-quarter and industry-fixed effects. The sample period is from January, 1995 to December, 2009. Standard errors adjust for both heteroskedasticity and within correlation clustered by issuers. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Dependent Variable: Indicator of Credit Rating Downgrade							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	Q+7	Q+8
FIPP	0.4386	0.8233	1.2016**	1.5091***	1.7713***	1.8255***	1.4919***	0.9534*
	(0.6709)	(0.6214)	(0.5339)	(0.5120)	(0.5041)	(0.5016)	(0.5039)	(0.4925)
Yield	5.8951***	5.8864***	5.7996***	5.7543***	5.7361***	5.7191***	5.7162***	5.7628***
	(1.3763)	(1.3781)	(1.3749)	(1.3766)	(1.3792)	(1.3812)	(1.3870)	(1.3915)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bond Characteristics Controls	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomic Control	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	117,606	117,590	117,432	117,153	116,844	116,504	116,172	115,799
Pseudo-R^2	0.1777	0.1779	0.1790	0.1800	0.1809	0.1815	0.1812	0.1801

Table 9: Robustness – A Subsample without Equity Issuance in Years -5 to 0

The dependent variables are the sum of long-term and short-term debt issuance (columns 1 and 2), long-term debt issuance (columns 3 and 4), and short-term debt issuance (columns 5 and6) between fiscal year (t-1) and year (t), all divided by total assets at the beginning of fiscal year (t-1). The main independent variable is the flow-induced price pressure (FIPP). Firm-level control variables include sales growth rates, B/M equity ratio, size, leverage-gap, cumulative past one-year return, cumulative past second- and third-year return. All regressions include the year and industry-fixed effects. To adjust for the difference of fiscal year-ends, cumulative past one-year industry returns between fiscal year (t-1) and year (t), cumulative past second and third-year industry returns between fiscal year (t-3) and year (t-1), cumulative past one-year market returns between fiscal year (t-1) and year (t), change of credit spreads between fiscal year (t-1) and year (t), and change of term spreads between fiscal year (t-1) and year (t) are also included. In columns 2, 4, and 6, Medium Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the middle 40% of all firms in terms of financial constraint index ranking, zero otherwise. High Constraint dummy variable takes the value of one if the financial constraint index value designates the firm to the top 30% of all firms in terms of financial constraint index ranking, zero otherwise. The sample period is from January, 1982 to December, 2009, excluding all firm-year observation when past-five year total equity issuance is greater than 10%, or year (t) total equity issuance is greater than 5% of total asset size. Standard errors adjust for both heteroskedasticity and within correlation clustered by firm. Standard errors are reported in parenthesis. ***, **, and * indicate a two-tailed test significance level of less than 1%, 5%, and 10%, respectively.

	Total Debt Issuance		LT Debt Issuance		ST Debt Issuance	
	(1)	(2)	(3)	(4)	(5)	(6)
FIPP	0.0138***	-0.00670	0.0143***	-0.00444	-0.000501	-0.00226
	(0.00537)	(0.00707)	(0.00523)	(0.00684)	(0.00122)	(0.00169)
FIPP x Medium Constraint		0.0120		0.0111		0.000958
		(0.00980)		(0.00952)		(0.00248)
FIPP x High Constraint		0.0560***		0.0512***		0.00483*
		(0.0138)		(0.0135)		(0.00285)
Medium Constraint		0.0121***		0.0121***		-7.38e-06
		(0.00186)		(0.00180)		(0.000441)
High Constraint		0.0285***		0.0279***		0.000620
		(0.00295)		(0.00288)		(0.000634)
Firm Fundamental Controls	YES	YES	YES	YES	YES	YES
Industry Returns Controls	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES
Industry Fixe Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	33,420	33,420	33,420	33,420	33,420	33,420
Adjusted R^2	0.062	0.069	0.055	0.062	0.013	0.013

Appendix A: Main Variables Definitions and Constructions

Appendix A describes the definition and construction of main variables used in this study, followed by the source of the data. When possible, the data item names or mnemonics are provided as well.

Variable Name	Variable Definitions and Constructions	Source of Data
FIPP	Mutual fund flow induced price pressure. See the data section for the construction of the variable.	CRSP, CDA/Spectrum 13F and MFLINK
Bond Yield Spread	Corporate bond's yield computed from the trade price minus the corresponding duration matched treasure yield.	FISD, NAIC transaction files, TRACE and CRSP Treasure files
Issue Size	The size of the bond	FISD
Duration	Duration of the bond	FISD
Expected Default Frequencies (EDF)	The expected default frequency computed and calibrated to actual defaults by the Moody's KMV. See Crosbie and Bohn (2003) for details.	Moody's-KMV
Idiosyncratic Volatility	Residual standard deviations estimated using Fama-French- Carhart four-factor model, based on daily returns over the past one-year	CRSP
Tangibility	[PPENT(t) + INVT (t)]/AT(t-1)	COMPUSTAT
Size	Size is defined as the total dollar value of sales divided by aggregated sales reported in COMPUSTAT.	COMPUSTAT
Leverage Ratio	Leverage Ratio = [DLTT(t) + DLC(t)]/[DLTT(t) + DLC (t) + PRCC_F(t)*CSHO(t)]	COMPUSTAT
Leverage Gap	Leverage Gap = Estimated long-term leverage ratio – Current leverage ratio, following the procedure in Fama and French (2002)	COMPUSTAT
BE	Book value of equity, BE(t) = total assets (AT) – liabilities (LT) + balance sheet deferred taxes and investment tax credit (if available) (TXDITC) – preferred stock	COMPUSTAT

Book Value of Preferred Stock	The book value of preferred stock is computed as preferred stock's liquidation value (PSTKL) if available, else redemption value (PSTKRV) if available, else carrying value (PSTK).	COMPUSTAT
ME	Market value of equity, ME(t) = SHROUT * PRC	CRSP
M/B	Market value of equity (BE) / book value of equity (ME)	CRSP/ COMPUSTAT
Equity Issuance	We consider two definitions of equity issuance. In the first definition, following Baker, Stein and Wurgler (2003), Equity Issuance = [CEQ(t) – CEQ(t-1)] + [TXDB(t) – TXDB(t-1)] – [RE(t) – RE(t-1)], normalized by total assets (AT) at the beginning of fiscal year (t-1). In the second definition, following Fama and French (2002), is defined as Equity Issuance = SSTK (t) – PRSTKC (t), normalized by total assets at the beginning of fiscal year (t-1).	COMPUSTAT
Short-Term Debt Issuance	Following Baker, Greenwood and Wurgler (2002), short-term debt issuance is defined as note payable (NP), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT
Long-Term Debt Issuance	Following Baker, Greenwood and Wurgler (2002), long-term debt issuance is defined as change in the level of long-term debt (DLTT(t) – DLTT(t-1)) plus debt due in one year (DD1(t) – DD1(t-1))., normalized by total assets at the beginning of fiscal year (t-1).	COMPUSTAT
Total Debt Issuance	Total debt issuance = short-term debt issuance + long-term debt issuance	COMPUSTAT
Capital Expenditure	CAPEX(t), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT
Acquisition	ACQ(t) from the statement of cash flows (SCF), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT
Net Cash Flow of Financing	FINCF(t) from the statement of cash flows (SCF), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT
Net Cash Flow of Investment (IVNCF)	IVNCF(t) from the statement of cash flows (SCF), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT

Financing and Investment Net Cash Flow	The sum of FINCF(t) and IVNCF(t) from the statement of cash flows (SCF), normalized by total assets (AT) at the beginning of fiscal year (t-1).	COMPUSTAT
Profitability	Operating Income Before Depreciation (t) / Total Assets (t-1)	COMPUSTAT
Sales Growth Rate	(SALE(t)/SALE(t-1) – 1)	COMPUSTAT
Industry Classification	The Fama-French (1997) 30-industry classifications.	CRSP/ French's website
Seasoned Equity Offering Decision	A binary variable takes the value of one if the firm issues equity in the secondary market during quarter (q)	Security Data Corporation
Seasoned Equity Offering Amount	The dollar value of seasoned equity offerings, normalized by the most recent fiscal year's total asset (AT) before the equity offering.	Security Data Corporate/ CRSP
Bond Issuance Decision	A binary variable takes value of one if the firm issues bond on the secondary market during quarter (q)	Security Data Corporation
Bond Issuance Amount	The dollar value of bond offerings, normalized by the most recent fiscal year's total asset (AT) before the bond offering	Security Data Corporate/ CRSP
Term Spreads	The difference between 10-year treasury yield and 3-month treasury yield	Federal Reserve
Default Spreads	The difference between the Moody's BAA corporate bond index yield and Moody's AAA corporate bond index yield	Federal Reserve
CFNAIC	Chicago Fed National Activity Index	Federal Reserve Bank of Chicago