Stocks, Bonds and Debt Imbalance:

The Role of Relative Availability of Bond and Bank Financing

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Abstract

We study how the relative availability of bond and bank financing supply affects the firm's ability to use its leverage to buffer shocks, impacting the firm's stock volatility and bond yields. We define a measure that proxies for the regional imbalance in the availability of bank and bond financing: "Imbalance". We show that Imbalance tilts the financial structure towards equity, increasing SEOs and lowering leverage. It proxies for a particular type of financial constraint that is more related to the local capital market to which the firm belongs, than to the characteristics of the firm itself. Higher imbalance increases the sensitivity of cash holdings to cash flows, reduces dividend payment and makes the firm more likely to pay equity in mergers and acquisitions. Imbalance, by constraining the investment of the firm, keeps the firm's Q above its marginal value and induces the firm to select higher value investments. Firms characterized by higher Imbalance have higher stock beta and idiosyncratic volatility. However, Imbalance is not a separate source of uncertainty, but merely increases the sensitivity of the firm's stock to market and idiosyncratic shocks. The bonds of firms characterized by higher Imbalance are more subject to Treasury yield shocks. The higher the Imbalance, the more a market shock will impact the bond yield and credit spread of the firm. A natural experiment confirms our story: the downgrade of GM and Ford bonds in 2005. The contagion effect of the downgrade has affected more severly the bonds that are characterized by higher Imbalance.

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Introduction

Geography affects the behavior of both investors and firms. The literature has hitherto mostly focused on how the local bias of *equity* investors affects stock prices (Chen *et al.,* 2005) and its corporate implications for governance (e.g., Gaspar *et al.*, 2005). However, geography also affects both the overall availability of *debt* financing and the *relative* availability ("Imbalance") of bond and bank-financing. If the debt market is locally segmented and bond and bank debt are not close substitutes (Massa *et al.,* 2005), a regional market with a high imbalance in the availability of bond and bank financing will make it harder/more costly for firms to replace one source of debt financing with the other when it is needed.

For example, let us consider a firm whose source of debt financing is located in a specific financial habitat – defined in terms of the potential bond-holders and lenders – in which it is possible to issue bonds, but the ability to replace them with bank debt is scarce – i.e., Imbalance is high. That is, if the bond market becomes unreliable and fickle, the firm will face constraints in substituting its bond financing with bank financing. The firm may then try to borrow outside of its local market, but then higher information asymmetry and steeper transaction costs would make the cost of doing it potentially very high. This would induce the firm either to scale down its activity or to switch to equity. Therefore, given the limited substitutability between debt and equity financing, Imbalance does in fact act as a financial constraint. This constraint is more related to the financial markets to which the firm belongs than to the characteristics of the firm itself.

We will argue that, for a fixed capacity of the bank and bond sector, debt Imbalance effectively constrains the firm's ability to buffer shocks and to finance its investment opportunities and shifts its financing towards equity. The inability to finance all the investment opportunities and to select only the more profitable ones should induce a higher Tobin's Q, creating a positive relationship between Imbalance and stock prices. The reduced ability to hedge shocks raises the stock's idiosyncratic volatility and beta as well as increases the probability of default of the firm. This raises the firm's credit spread, as well as the sensitivity of the firm's bond yields and bond spreads to the changes in the market yields. These considerations suggest a new channel through which local market conditions affect stock prices and volatility as well as bond yields and spreads.

Is Imbalance a distinct source of uncertainty? We entertain two alternative hypotheses. The "amplifier hypothesis" posits that Imbalance, by reducing the firm's ability to hedge cash flow shocks, amplifies the stock exposure to both idiosyncratic and systematic shocks and the bond exposure to market yield shocks. The "separate hypothesis", instead, posits that Imbalance is a distinct source of risk and behaves as a separate priced factor.

We test these intuitions on US corporations for the period 1991-2005. We start by showing that location matters in terms of the correlation of the leverage of the firms. We show that firms subject to similar geographical, industry, and idiosyncratic shocks – i.e., similar in terms of ratings, industry and location – tend to have similar leverages only if they share the same bank/bond financing local characteristics. Starting from this observation, we then create a proxy for Debt "Imbalance". It uses information contained in the local bank deposits and the bond holdings by institutional investors located in a particular area. A higher value of Imbalance implies that either the local banking sector is not able to absorb a reduction in bondholder appetite by granting new loans or that the local bond market is less able to replace bank financing.

We show that Imbalance tilts the financial structure of the firm towards equity. That is, a higher Imbalance increases SEOs and lowers leverage. An increase of one standard deviation of Imbalance raises the probability of issuing equity (the amount of net equity) by 15% (37%). A shock equivalent to one standard deviation change in Imbalance reduces the market (book) leverage of the firm by 3.5% (8% for firms with high cash flow uncertainty) (2%, 3.6% for firms with high cash flow uncertainty).

We then study whether Imbalance acts as a financial constraint. We focus on the main tests for financial constraints used in the literature and we apply them to Imbalance. We show that firms characterized by higher Imbalance also appear to be more financially constrained. In particular, they have a higher sensitivity of cash holdings to cash flows and of investment to Tobin's Q. The sensitivity of cash holding to cash flows for high Imbalance firms is twice as big as for the low Imbalance firms, while the sensitivity of investment to Q for high Imbalance firms is also twice as big as for the low Imbalance firms.

Another interesting feature is that higher Imbalance reduces dividend payment and the probability of using cash as means of payment in M&As. A one standard deviation higher Imbalance is related to a 26% lower dividend ratio and to a lower probability of using cash a means of payment (the only means of payment) by 11% (28%). The results are robust across alternative specifications that account for the simultaneous nature of the firm's policies as well as for already existing measure of financial constraints (e.g., KZ index) and the availability of local equity or bond capital (Chen *et al.*, 2005).

Firms characterized by higher Imbalance have higher Q. Indeed, Imbalance, by constraining the investment of the firm, induces the firm to select only the high Q investments. For high imbalance firms a one standard deviation higher investment leads to a 22% higher Q.

Then, we analyze how Imbalance affects the returns of the firm's stocks and bonds. We show that firms characterized by higher Imbalance have higher stock beta and idiosyncratic volatility. While Imbalance reduces the correlation of the stock returns with the market, it increases their volatility. High Imbalance firms have higher idiosyncratic volatility and higher overall volatility. The overall effect on beta is positive and, even though the correlation with the market is lower, this translates in higher beta. However, in line with the amplifier hypothesis, Imbalance is not a separate source of uncertainty, but merely increases the sensitivity of the firm's stock to market and idiosyncratic shocks. The impact of debt imbalance on idiosyncratic volatility and beta is stronger if the firm is also constrained on the equity side – i.e., when it there is high information asymmetry with the market.

Imbalance also affects the value of the bonds of the firm, by increasing the yield spread. A one standard deviation higher Imbalance is related to a 7% higher yield spread in general and to a 12% higher spread for firms with high cash flow uncertainty. Also, the bonds of firms characterized by higher Imbalance are more subject to Treasury yield shocks. The higher the Imbalance, the more a market change in Treasury yields will increase the bond yield of the firm and reduce its bond spread. A one standard deviation higher Imbalance increases the sensitivity of bond yields to their corresponding Treasury yield by 49%. The impact is stronger the lower the rating of the firm. In the case of AAA and AA firms, the effect is hardly significant, the imbalance measure starts to take effect for A and BBB firms, while in the case of BB, B, CCC, CC and C firms the effect is 4 times bigger and very significant.

Moreover, Imbalance reduces the impact of the yield shocks on bond spreads. A 100bp Treasury Yield shock (shock to 7-year Treasury Yields and 6-month Treasury Bills) reduces the bond spread by 53 bp (48 bp and 45 bp) in the case of low Imbalance and just by 35 bp (31 bp and 31 bp) in the case high Imbalance firms. The "attenuating" effect is stronger the lower the rating of the firm. In the case of AAA and AA the effect is hardly significant, while in the case of BB, B, CCC, CC and C firms the effect is 5 times stronger than in the case of A and BBB firms. As expected, the impact of Imbalance is stronger for callable bonds. This is consistent with the amplifier hypothesis.

A natural experiment confirms our story: the downgrade of GM and Ford bonds in 2005. We show that the contagion effect of the downgrade affected more the bonds that are characterized by higher Imbalance. In fact, the impact of the crisis dummy is significant only for high Imbalance firms. Firms characterized by a one standard deviation higher Imbalance display a 50% (70%) higher jump in their yields (spreads) during the crisis period.

It is worth mentioning that our results hold even after controlling for the local supply of both equity and debt financing. Our findings contribute to the literature on financial constraints. First, we define a new measure of financial constraints that is based on the regional imbalance between bank and bond financing. Unlike all the existing measures of financial constraints – e.g., KZ index – this measure is not dependent on firm specific actions or corporate policies – e.g., dividend policy, ratings – it is instead based on the characteristics of the market in which the firm is, with the advantage of being a way less endogenous variable. Moreover, our definition of financial constraints is based on a lack of substitutability between bond and bank loans, a concept that is novel in the literature (Massa *et al.*, 2005).

Second, we show that financial constraints need not be a separate stochastic source of uncertainty. As of now, the literature has concentrated on showing that financial constraints are a separate priced source of uncertainty (Whitehed and Wu, 2006, Gomes, Yaron and Zhang, 2006). We show that this particular constraint is not a separate source of uncertainty, but in fact enhances the existing sources of uncertainty.

Third, we contribute to the literature on idiosyncratic volatility and on the relation between bond and equity (Campbell and Tsakler, 1999). We show that idiosyncratic volatility is related to financial constraints. The fact that higher financial constraints lead to higher volatility provides a clue of why idiosyncratic volatility helps to explain bond yields.

Fourth, we relate to the literature on the bank-bond choice (Rajan, 1992, Bolton, and Scharfstein, 1996, Hovakimian, Opler, and Titman, 2001) and to the recent findings showing how the source of financing affects the capital structure. For example, Faulkender, and Petersen, (2005) show that firms that have access to the public bond markets have significantly more leverage, suggesting that the supply conditions that determine the firm's ability to increase its leverage are binding constraints for some firms. Massa *et al.,* (2005) examine the effects of institutional investors' credit supply uncertainty in the corporate bond markets on the capital structure of the firm and show how it leads firms to tilt their financing more towards equity. We build on these findings and show how the local imbalance between bond and bank financing opportunities acts as a financial constraint and we draw the impications for the firm's stocks and bonds.

Fifth, our results are related to the literature on proximity investment (e.g., Coval and Moskowitz, 1999, 2001). This literature has mostly focused on the equity side, showing that investors (households and institutional investors) tend to hold the stocks of firms located nearby and showing that this has implications in terms of the value of the stocks (Hong *et al.*, 2005). We focus on the debt side and we show that this has equally important implications for the value of the firm. In the case of the equity side, the identification between institutional investors and local investors is in general a first type approximation, as we do not have information about where the individual investors invest. In the case of bonds, instead, the results are potentially more telling, as corporate bonds are mostly held by institutional investors. This makes our estimates more accurate than one would hope in the equity side.

Finally, we relate to the literature on industrial clustering. Almazan *et al.,* (2005) show that being located within an industry cluster increases opportunities to make acquisitions and induces firms to have lower debt ratios and larger cash balances than their industry peers located outside clusters. We complement their results as we focus on the geographical clustering of financing.

The remainder of the paper is articulated as follows. Section 2 lays out our main testable hypothesis. Section 3 describes the sample and the variables we use. Section 4 analyzes the whether how Imbalance affect the financial structure of the firm. Section 5 test whether Imbalance acts as a financial constraint for the firm. In Section 6 and 7, we look at the relation between Imbalance and stock and bond returns. A brief conclusion follows.

2. Main hypotheses and testable propositions

We start from earlier findings that show that the debt market is locally segmented and bond and bank debt are not close substitutes (Massa *et al.,* 2007). This implies that a regional market with a higher imbalance in the availability of bond and bank-financing makes it harder/more costly to replace one source of debt financing with the other. This means that either the firm finds itself "rationed" in the debt market or it faces a higher cost of debt financing. This higher cost is related to the need to borrow outside of its local market, where it is less known, the information asymmetry with the distant lenders is higher and transaction costs are steeper. This increases the incentives for the firm to resort to equity financing.

H1a: Higher Imbalance induces firms to resort more to equity and less to debt, increasing SEOs and lowering leverage.

The impact on leverage is enhanced in the case the firm faces higher cash flow uncertainty, as a firm with more stable cash flows, instead, will be able to use them to finance its investment. This implies that:

H1b: The effect of Imbalance should be stronger for firms with higher uncertainty of cash flow shocks.

However, taxes, transaction costs, information asymmetry between the firm and the market, bankruptcy and agency costs limit the substitutability between debt and equity financing. In the presence of scarce substitutability between equity and debt, Imbalance affects the firm's payout and investment policies in a way similar to what financial constraint do.

H2: Firms characterized by a higher Imbalance have a higher sensitivity of investment to Tobin's Q and cash holdings to cash flows, are more likely to hold cash and less likely to pay dividends and use cash as method of payments in M&As.. Higher Imbalance leads to lower leverage.

What is the effect on the firm's stock? If Imbalance acts as a financial constraint, it should keep the firm from fully exploiting its investment opportunities and to select only investments with relatively higher Q. This implies that:

H3a: Firms characterized by higher Imbalance should have a higher Tobin's Q. The sensitivity of changes in Q on investment should be higher for firms with higher Imbalance.

Imbalance may act either as an amplifier of existing uncertainty or as a distinct source of uncertainty. The "amplifier hypothesis" posits that Imbalance reduces the firm's ability to change its leverage to adapt to cash flow shocks (Pulvino and Tarnham, 2006). Therefore, firms characterized by higher Imbalance should display a higher stock beta and idiosyncratic volatility. And the impact of debt imbalance on idiosyncratic volatility and beta should be even stronger if the firm is also constrained on the equity side – i.e., with high analyst dispersion (high information asymmetry) That is, Imbalance just changes the loadings on the existing risk factors. The "separate hypothesis", instead, posits that Imbalance is a distinct source of risk and a separate priced factor.

H3b: According to the amplifier hypothesis, Imbalance increases the reaction to firm specific and market shocks. According to the separate hypothesis, Imbalance represents a distinct and priced source of risk.

The amplifier hypothesis is consistent with the literature arguing that financially constrained firms are more subject to the business cycle and therefore more related to the market factor (Polk and Saa-Requejo, 2001). The separate hypothesis is consistent with the literature that finds financial constraints as a new risk factor. A shock to financial constraints can be interpreted as a shock to the ability of the firm to raise funds that affects all the constrained firms in the market in the same way and creates a sort of common source of uncertainty. The literature has argued that financial constraints represent an additional source of uncertainty affecting the stock price. For example, Gomes, Yaron and Zhang (2006) and Whited and Wu (2006) find a non-significant and positive alpha.

What is the impact on bonds? Imbalance also affects the value of the bonds of the firm. By constraining the ability of the firm to smooth shocks and increase its risk, Imbalance raises its yield spread. Moreover, according to the amplifier hypothesis, bonds of firms characterized by higher Imbalance react more to aggregate yield shocks. The higher the Imbalance, the more a change in Treasury bond yields increases the bond yield of the firm and lowers its bond spread.

H4: Imbalance raises the bond yield and the yield spread of the company. In the case of the amplifier hypothesis, it also changes the sensitivity of both bond yields and yield spreads to aggregate yield shocks.

3. Data and Empirical Testing Issues

We start by providing some evidence of the impact of the local bank/bond financing conditions on leverage and then we define our proxy for imbalance.

3.1 Preliminary Evidence on the Role of Bank/Bond Financing Conditions on Leverage.

Firms use their leverage to offset cash flow shocks. If the location of the firm constrains the supply of capital, the firm will be more exposed to shocks. The starting point is therefore the link between location and leverage. We start by providing some evidence on whether local geographical characteristics affect leverage. We consider firms that are otherwise identical in terms of regional, systematic and idiosyncratic shocks and we study if the fact that they share the same supply of both bank and bank financing induces them to have a more similar leverage than otherwise identical firms that share just either bond or bank financing conditions.

We construct matching samples of firms that are otherwise identical except for the "debt financing conditions" and we investigate how differences in the local supply of debt capital (i.e., bank and debt) affect their similarity in leverage. We argue that dissimilarity in financing conditions make otherwise similar firms have a different leverage. We define financing conditions in terms of "bank clusters" and "bond clusters".

We first cluster firms according to location. Our data on the geographical location (ZIP codes) and deposits of bank branches are from the FDIC's Summary of Deposits (SOD) database. It contains deposit data for more than 89,000 branches/offices of FDIC-insured institutions. The Federal Deposit Insurance Corporation (FDIC) collects deposit balances for commercial and savings banks as of June 30 of each year starting from 1994. The data are collected annually. Information on the geographical location of the institutions investing in bonds (ZIP codes) is from the Lipper's eMAXX fixed income database. We obtain joint bond investor and bank branch coordinates (longitudes and latitudes) by merging the ZIP codes with the Gazetteer Files of Census 2000.

We use partitioning clustering analysis to simplify the location structure of bond investors and bank branches. More specifically, we first cluster the set of bond investors based on their geographical distances with each other and set the number of clusters to be 10. Then, we independently partition the set of bank branches into 10 bank clusters according to their geographical distances. By this procedure for each year we set up 10 bond clusters and 10 bank clusters. We repeat our methodology from 1997 to 1991 for bond clustering and 1993-1991 for bank clustering after backfilling the location structures.[1]

Next, we decide the bond and bank cluster each firm belongs to. Our data on firm locations come from the historical Compustat location files. For example, we first calculate the average

[1] The formula to calculate distances is the first order approximation to the great circle distance: $\sqrt{[69.1*(lat2-lat1)]^2+[53.0*(lon2-lon1)]^2}$, where *lat1*, *lat2*, *lon1*, and *lon2* are latitude and longitude values in degrees. The backfilling procedure is as follows. We assume there is no big shift on the locations of insurance fund families and pension fund families so for these investors we use the location as of 1998. For mutual fund families, we focus on the ones matched with CRSP mutual fund database from 1991 to 1997. For bank clustering from 1991 to 1993, we use the same location structure of bank branches as of 1994.

distance of firm i to investors at bond cluster j. Then, we pick up the bond cluster with the smallest distance and assign firm i to it. We do analogously for the distance of firm i to bank branches: we pick up the bank cluster with the smallest distance and assign firm i to it.

The tests are based on the univariate analysis of correlation in leverage for firms that are "similar" in any other respect except for the affiliation with different bank or bond clusters. Similarity is defined in terms of industry (1-digit SIC code) and rating category (investment grade/below-investment grade/non-rated) at the beginning of each year. We define the correlation in leverage between firms that share the same bank *and* bond clusters as *(Bank in, Bond in).* This is calculated in the following way: for each firm we find all the other *similar* firms belonging to the same bank cluster and bond cluster that are located within 300 miles. Then, we compute the average correlation in leverage with these firms over the sample period. We analogously define the correlation in leverage between firms that share the same bank *but not* the same bond cluster as *(Bank in, Bond out).* For each firm we find all the other *similar* firms belonging to the same bank cluster but different bond cluster and also located within 300 miles. Then, we compute the average correlation in leverage with those firms over the sample period. The other specification (i.e., *Bank out, Bond in*) is defined likewise.

Firms similar in terms of credit rating, industry and location are expected to be subject to similar cash flow shocks. And indeed, (unreported) results show that "similar" firms do not significantly differ in terms of cash flow shocks. Therefore, comparing firms that differ along one financing dimension (*Bank in, Bond out* or *Bank out, Bond in*) to firms that share both of them (*Bank in, Bond in*) allows us to focus on the effect produced by sharing similar bond/bank financing conditions. We expect firms that differ along one financing dimension to be less similar in how they finance themselves than firms sharing both of them.

We report the results of the tests in Table II, the correlation in market leverage is in Panels A1-A2 and the correlation in book leverage is in Panels B1-B2. The results show that similar firms located in different bond- or bank-financing clusters are very different in terms of leverage. Conversely, both T-tests and Wilconxon tests show that firms that share similar local bank and bond financing conditions (i.e., "bank in, bond in") have a more similar leverage than firms that differ along one financing dimension (i.e., "bank in, bond out"). The results are not just statistically significant, but also economically relevant. Firms that share the same bond and bank financing conditions are 50% more likely to have a similar leverage than firms that have different bond financing conditions.

While these findings are consistent with Almazan *et al.* (2005), showing an impact of location on leverage, they also suggest that the impact is related to whether one of the sources of debt financing (bond or bank) can replace the other. Firms belonging to the same cluster for one source of financing and to a different for another should have less problems in replacing one source of financing with the other presumably not subject to the same shocks. This explains the lower correlation in leverage. This effect is symmetric in terms of substitutability of bank debts with bonds and bonds with bank debts. Henceforth, we will define "Imbalance" the inability of the bank (bond) supply to replace the bond (bank) one when it is needed.

3.2 Construction of the Imbalance Proxy.

These findings suggest how to construct a synthetic proxy for the local Imbalance between bond and bank supply. We define "Imbalance" at the level of the local bank/bond cluster. We recall our definition of clusters. For firm i, we first calculate the average distance of firm i to investors at bond cluster j and denote it as $\overline{d_{ij}}$. Then, we pick up the bond cluster j* with the smallest $\overline{d_{ij}}$ and assign firm i to j* (we denote j* as V*(i)). By the same token, for firm I, we first calculate the average distance of firm i to bank branches at bank cluster k and denote it as $\overline{d_{ik}}$. Then, we pick up the bank cluster k* with the smallest $\overline{d_{ik}}$ and assign firm i to k* (we denote k* as D*(k)). Let V_{jt} be the average holdings of bond investor j during year t, D_{kt} be the deposits of bank branch k at year t, and A_{it} be the book assets of firm i at year t, then for firm i our measure of bank/bond Imbalance is:

$$Bank/Bond\ Imbalance_{it} = \frac{\left| \dfrac{\sum_{j\in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} - \dfrac{\sum_{k\in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}} \right|}{\dfrac{\sum_{j\in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} + \dfrac{\sum_{k\in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}}}.$$

The data on holdings are obtained from Lipper's eMAXX fixed income database. It contains details of fixed income holdings for nearly 20,000 U.S. and European insurance companies, U.S., Canadian and European mutual funds, and leading U.S. public pension funds. It provides information on quarterly ownership of more than 40,000 fixed-come issuers with \$5.4 trillion in total fixed income par amount from the first quarter of 1998 to the second quarter of 2005.

3.3 Control Variables and Other Data.

To define the set of firm-specific control variables, we get data from the CRSP/Compustat database. We require non-missing information on bank/bond Imbalance and accounting variables such as firm size, market-to-book ratio, book leverage, Altman's z-Score, tangibility and profitability. We exclude financial firms with an SIC code between 6000 and 6999, firms with a minimum book value of assets less than 10 million, firms with market-to-book ratio larger than 10 and firms with market leverage or book leverage greater than 1. Our base sample includes 10,622 firm-year observations ranging from 1991 to 2005.

We consider two sets of controls. The first set proxies for local geographical characteristics. The second set proxies for firm-specific characteristics. Among the local geographical characteristics, we construct the *Cluster Debt-per-Asset* and the *Cluster Equity-per-Asset*. The *Cluster Debt-per-Asset* controls for the fact that in a region there may be a lot of debt-financing opportunities. It is constructed as follows. Let V_{jt} be the average bond holdings of investor j during year t, D_{kt} be the deposits of bank branch k at year t, and A_{it} be the book assets of firm i at year t, then the *Cluster Debt-per-Asset* is:

$$Cluster\ Debt\text{ - }per\text{ - }Asset_{it} = \frac{\sum_{j \in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} + \frac{\sum_{k \in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}}.$$

We apply a similar methodology to equity investors to construct the *Cluster Equity-per-Asset*. Our data on stock holdings of equity investors come from Thomson CDC/Spectrum. Since CDC/Spectrum doesn't report investor locations, we identify them from several different sources: we match 13F and Lipper by the name of managing firms as well as 13F and LPC DealScan by the name of banks. The location of mutual fund families comes from Nelson Investment Manager Database. Then, we partition the set of equity investor into 10 clusters according to their geographical distances. We assign a firm to its corresponding equity using the same method as in the bond (bank) case. For example, for firm i we first calculate the average distance of firm i with investors at equity cluster j and denote it as $\overline{d_{ij}}$. Then, we pick up the equity cluster j* with the smallest $\overline{d_{ij}}$ and assign firm i to j* (we denote j* as E*(i)). Let E_{jt} be the average equity holdings of investor j during year t and A_{it} be the book assets of firm i at year t, then the cluster equity-per-asset is defined as:

$$Cluster\ Equity\text{ - }per\text{ - }Asset\_i_{it} = \frac{\sum_{j \in E^*(i)} E_{jt}}{\sum_{E^*(f)=E^*(i)} A_{ft}}.$$

These variables control for the local supply of equity capital or debt capital. The latter is in line with the findings of Chen *et al.*, (2005) that local investment bias increases the price of the stocks of firms located in the region. This would have a direct impact on the capital structure of the firm, providing an incentive to issue equity.

We also employ a set of firm-specific control variables. These are: Market value of assets, Market-to-Book Ratio, Book Leverage, Market Leverage, Altman's z-Score, Firm Size, Asset Tangibility, Profitability, the KZ (3-variable) index of financial constraints, Stock Illiquidity, Cash Holdings, Cash Flows, the firm's Investment, the firm's Tobin's Q, Net Equity Issuance, Dividend Ratio, Cash Flow Volatility. For a detailed definition of these variables we refer to the Appendix with the definition of the variables. For the KZ index, we recall that, we use its 3-varaible definition. That is, KZ (3-variable) = (-1.002*cash flow (data14+data18)-39.368*cash dividends (data21+data19)-1.315*cash holding (data1))/lagged assets (data6).

We also control for the credit-riskiness of the firms using: the Credit Rating (thin): senior long-term debt rating (data280). We further synthesize data280 into ten rating categories: AAA, AA, A, BBB, BB, B, CCC, CC, C and NR (not rated). Credit Rating (broad): senior long-term debt rating (data280). We further synthesize data280 into three rating categories: investment grade (AAA+ to BBB), below-investment grade (BBB- to C) and NR (not rated). Credit Rating Dummies: ten dummy variables created according to credit rating (thin). We also employ Industry Dummies, defined at the two-digit SIC industry codes.

Also, in order to separate the sample into the firms that have a relationship and those which do not have it, we also construct a proxy of "banking relationship". It is a dummy variable taking the value of 1 if firm *i* has completed a relationship-lending deal (defined as a deal in which at least one of the lead arrangers has lent to the borrower in the three years prior to the deal date) in the past five years and 0 otherwise. A deal is identified as a relationship lending deal if the firm has borrowed from at least one of the lead arrangers of the given deal in the prior three years. This variable is constructed analogously to Bharat *et al.*, (2005) and is in line with the literature on the relationships between firms and lenders (e.g., Boot, 2000, Boot and Thakor 2000, Berger and Udell, 1995, Petersen and Rajan 1994, 1995, and Yasuda, 2005). To construct this dummy, we obtain individual loan-transaction data from the DealScan database of Loan Pricing Corporation (LPC) for the years 1989-2005.

We report the descriptive statistics in Table I. In Panel A, we see that the mean (median) Imbalance, averaged over the 10,622 firm-year observations, is 0.22 (0.21). Let us suppose the overall debt available in the region is 1 dollar with 0.61 dollar of bonds and 0.39 dollar of bank debts. Imbalance measures the bank/bond mismatches (0.61-0.39) per dollar of (overall) debt available in the region (bank and bond cluster the firm is belonging to). The mean (median) Cluster Debt-per-Asset is 3.45 (1.83). This means that there are about 3.45 dollars of debt available per dollar of assets for firms located in the same bond and bank cluster. The mean (median) Cluster Equity-per-Asset is 1.89 (0.65). This means that there are 1.89 dollars of equity financing available per dollar of equity for each equity cluster. The mean market and book leverage are 0.33 and 0.32, respectively.

In Panel B, we report the average distances between the firms and both their cluster and the location they actually decide to fund. Panel B1 compares the actual bond issuer-bond fund distances with the bond issuer-bond cluster distances. Actual bond issuer-bond fund distance is the distance between the bond issuer and the funds holding its bond issues. Bond issuer-fund cluster distance is the average distance between the bond issuer and all the funds located at the bond cluster where the issuer belongs to. Panel B2 compares the actual borrower-bank distances with the borrower-bank cluster distances. Actual borrower-bank distance is the distance between the borrower and the lending banks. Borrower-bank cluster distance is the average distance between the borrower and all the bank branches located at the bank cluster where the borrower belongs to. It appears that both in the case of banks and bond financing, the firms tend to finance themselves further away from their cluster.

In Panel C, we look at the time variation of imbalance and at its components. Panel C1 reports summary statistics on imbalance and signed imbalance [(Bank-Bond)/(Bank+Bond)] year by year. Imbalance is very sticky and does not seem to change over time. If we consider "signed" imbalance, we see that it is almost monotonically increasing. The main determinant of it being the increasing availability of bank funding. This is consistent with changes in bank regulation that have favored state-wide and interstate branching.

Along this line, in Panel C2, we relate both imbalance and signed imbalance to some proxies for state-wide and interstate branching. They are: state-wide branching, MBHC activity, Region/National branching. State-wide branching is defined as the number of years from 1965 where statewide bank branching is allowed in the state where the firm is located. MBHC activity is defined as the number of years from 1965 where multi-bank holding company activity is allowed in the state the firm belongs to. Region/National branching is the number of years from 1965 where regional/national branching activity is allowed in the state of the firm.

The results show that both imbalance and signed imbalance are strongly related to proxies for state-wide and interstate branching. Not only the statistical significant is high, but these three proxies explain quite a high fraction of both imbalance (Adjusted R^2 up to 16%) and signed imbalance (Adjusted R^2 up to 46%). These will therefore be our main instruments in the folloing instrumental variable estimations.

It is also worth mentioning that less than 4.5% firms do move their headquarters in our sample period. This further reduces the concern for endogeneity of our imbalance proxy.

4. Does Imbalance Tilt the Firm's Leverage Towards Equity?

We argue that Imbalance restricts the access to the debt component of financing, tilting the financial structure towards equity. That is, higher Imbalance should increase SEOs and lower leverage (H1a). We test this hypothesis by focusing on both equity issuance and leverage. We start by estimating a probit model on the probability of issuing new equity (SEO). The dependent variable takes a value of 1 if the firm is a new equity issuer and 0 otherwise. We consider both the raw issuance and the net issuance.[2] In both specifications, we model the decision to issue equity as a function of Imbalance and a set of control variables. These are: the Cluster Debt-per-Asset, the Cluster Equity-per-Asset, Book Leverage, Firm Size, Altman Z-Score, Tangibility, Profitability, Market-to-Book, KZ Index (3-variable) and the Stock Illiquidity. We also include Year Dummies, Industry Dummies and Rating Dummies. Detailed definitions of each variable are provided in the Appendix. The standard errors are clustered either at the firm level or at the industry level (Petersen, 2006). As a robustness check, we also estimate an OLS specification in which the dependent is the level of net issuance.

We report the results in Table III, Panel A for raw issuance and Panel B for net issuance. They indicate that there is a strong positive relation between the firm's decision to issue equity and the degree of Imbalance it faces. This holds across the different specifications and for different controls. The results are not only statistically significant but also economically significant. An increase of one standard deviation of Imbalance increases the probability of issuing equity (net equity) by 15% (37%, this is level of net equity). This is in line with our working hypothesis that Imbalance tilts the incentives of the firm towards equity.

The last two columns split the sample in firms with/without banking relationship, as defined above. It appears that Imbalance only matters for firms that do not have a special bank relationship. This is on line with previous findings (Massa *et al.*, 2005) showing that the incentive of the firm to replace bank with bond financing exists only if the firm is not locked in a prior relationship with a bank. Indeed, such a relationship reduces the firm's incentive/ability to freely choose the more convenient form of debt. This result holds even after controlling for other proxies for financial constraints such as leverage itself and the KZ index. In fact, both leverage and KZ (3-variable) are positively related to the probability of issuing equity.

Both for the cases of probability of issuing new equity and for new equity issuance, in Column (4), we perform an IV (2SLS) regression with statewide branching, MBHC activity and region/national branching serving as instruments. The results confirm the previous ones. The impact of imbalance is statistically significant with the same (if not stronger) magnitude. The Hansen's test provides evidence in favor of the quality of our instruments.

We now focus on leverage. To control for the stickiness in leverage (e.g., Leary and Roberts, 2005), we run a partial adjustment model on firm leverage adjustments (e.g., Kayhan and Titman, 2007). This allows us to explicitly focus on the adjustment that the firm makes to the

[2] The data on raw stock issuance is obtained from the SDC Global New Issue database. We only include those issues with proceeds larger than 5% of the firm's book assets. Net issuance is defined as the difference between new equity issuance (Compustat data108) and stock repurchases (Compustat data105) divided by book value of assets at the beginning of the year (Compustat data6).

shocks to the Imbalance it faces. Each year *t*, we run a firm fixed effect regression (up to time *t*) of leverage on a set of variables: Market value of assets, Market-to-Book Ratio, Book Leverage, Market Leverage, Altman's z-Score, Firm Size, Asset Tangibility, Profitability, the KZ (3-variable) index of financial constraints, Stock Illiquidity, Cash Holdings, Cash Flows, the firm's Investment, the firm's Tobin's Q, Net Equity Issuance, Dividend Ratio, Cash Flow Volatility, Credit Rating dummies, a Rated/non-rated dummy, industry and time fixed effects. We then use the fitted value at year t as the target leverage and regress the change in market (book) leverage from year t-1 to year t on the target leverage and the change in Imbalance, defined as the current level of imbalance minus the lagged value.

We report the results in Table IV, Panel A for Market Leverage and Panel B for Book Leverage. They show a negative relationship between leverage and Imbalance. The result is not only statistically strong, but also economically relevant. A shock equivalent to one standard deviation in the change in Imbalance reduces the market (book) leverage of the firm by 3.5% (8% for firms with high cash flow uncertainty) (2%, 3.6% for firms with high cash flow uncertainty). As expected, the sign on the target adjustment is positive and significant.

As in the previous specification, in Column (3), we perform an IV (2SLS) regression with statewide branching, MBHC activity and region/national branching as instruments. The results confirm the previous ones, the impact of imbalance is statistically significant with the same (if not stronger) magnitude. The Hansen's test confirms the quality of our instruments.

In columns 4-6, we interact the shock to Imbalance with "High Cash Flow Uncertainty". This is a dummy taking the value of 1 if the firm's volatility of cash flow shocks (up to time t-1) is above sample median and 0 otherwise. It appears that the impact of Imbalance is stronger for firms characterized by higher volatility of cash flows. This supports the hypothesis H1B and is consistent with previous findings on the relation between financial constraints and corporate hedging behavior (e.g., Acharya, Almeida, and Campello, 2005). Finally, in columns (5)-(6), we look at the existence of a banking relationship. The results are consistent with the ones on equity issuance. Imbalance affects leverage only in firms without a prior banking relationship.

Overall, these findings show that Imbalance has a direct effect on the firm's financing choice, tilting it more towards equity. This may indicate that Imbalance is a source of financial constraints, as well as it that higher Imbalance characterizes firms with higher opportunity to finance in equity (Baker, Stein and Wurgler, 2003) We now turn to a direct test of whether Imbalance has the same characteristics as a financial constraint.

5. Is Imbalance a Form of Financial Constraint?

We now study whether imbalance acts as a financial constraint (H2). We focus on the main tests that the literature has devised to test for financial constraints and we apply them to

Imbalance to see whether it impacts the firm in the same way as financial constraints are expected to do. We consider the relation between cash holdings and cash flows as well as the relation between investment and Tobin's Q.

5.1 Standard Single-Equation Specifications

We start by separately analyzing the impact of Imbalance on the relation between cash holding and cash flows and the one between investment and Q. We follow the same specification as in Baker, *et al.*, (2003). In Table V, Panel A, we run firm fixed effect regressions of cash holding on the firm cash flows and interact them with an Imbalance Dummy. The latter is constructed as follows. For each firm, we first calculate its median Imbalance over the sample period and then define a high Imbalance dummy variable that equals 1 if the firm median is above the sample median and 0 otherwise. To control for the standard measures of financial constraints, we analogously define a High KZ dummy variable and we interact it with the cash flows.[3] In Panel B, we run firm fixed effect regressions of investment on the firm Tobin's Q and on its value interacted with an Imbalance Dummy as well as with a High KZ dummy. In both specifications, the other controls are the same as defined above.

The results are striking. We start with the cash holding-cash flows relationship. The results show a strong positive relationship between cash holdings and the interaction between cash flows and Imbalance. That is, the higher the Imbalance of the firm, the more the cash holdings of the firm will react to its cash flows. This result is not only statistically strong, but also economically relevant. The sensitivity of cash holding on cash flow for high imbalance firms is twice as big as it is for low imbalance firms. KZ (3-variable) does not have a similar impact. In fact, consistently with Almeida *et al.* (2005), it is not significantly affecting the cash holding-cash flows relationship. It is interesting to notice that Cluster Debt-per-Asset is negatively related to the amount of cash holdings. This is intuitive as the more the firm can count on easy access to debt financing, the less it needs to hold cash for precautionary purposes.

If we focus on the investment-cash flows relationship, we see a strong positive relationship between investment and the interaction between Tobin's Q and Imbalance. That is, the higher the Imbalance, the more the investment of the firm will react to its cash flows. This result is economically relevant. The sensitivity of investment to Tobin's Q for high imbalance firms is also twice as big as sensitivity for low imbalance firms. KZ (3-variable) is now significant and positive, confirming the previous findings of Baker, *et al.*, (2003). We notice that neither Cluster Debt-per-Asset nor Cluster Equity-per-Asset are significantly related to investment.

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[3] We do not need the level of either Imbalance or KZ in the regression as this is a fixed-effect regression and the high Imbalance (high KZ) dummy (by its construction) would drop out automatically.

As in the previous specifications, in the last two columns, we separately consider the case of the existence/lack of a prior banking relationship. The results confirm the previous ones: Imbalance does not play a significant role in the presence of a banking relationship. Again, this suggests that having being locked in a banking relationship prevents the firm from taking advantage of the possibility of optimally substituting bond and bank debt.

Finally, in Column (4)-(6), we redefine high imbalance dummy based on the predicted value out of the imbalance regression in Table I Panel C2 (Column 3). That is, we effectively perform an IV (2SLS) regression with statewide branching, MBHC activity and region/national branching serving as instruments. The results confirm the previous ones. The impact of imbalance is statistically significant with the same (if not stronger) magnitude.

5.2 System of Equation Analysis and Endogenizing Tobin's Q

These results are based on separate estimates of the investment and cash holding equation. Previously, we have also separately estimated the sensitivity of leverage to it. In fact, these three policies – investment, cash holding and leverage – are jointly determined. To address this issue and as a further robustness check, we examine the simultaneous responses of investment, cash and leverage policies to cash flow and their interactions with our measure of Imbalance. More specifically, we estimate a system of three equations in which the dependent variable is either the change in cash holdings, or investment or the change in book leverage. We employ the same identifying restrictions as in Almeida *et al.* (2005). In the Investment equation the contemporaneous change in cash holdings and leverage as well as the lagged value of investment are included among the explanatory variables. In the Cash Holding equation the contemporaneous change in leverage and investment as well as the lagged value of cash holding are included among the explanatory variables, while in the Leverage equation the contemporaneous change in cash holdings and investment and the lagged value of leverage are included among the explanatory variables. The control variables are defined as above.

The results are reported in Table VI. In Panel A, we estimate the system of equations through a two-stage least squares regression (2SLS) with firm fixed effects. Column (1)-(3) represent our baseline specification. In Column (4)-(6) we include the interaction term of cash flow with a high KZ dummy which equals 1 if the firm's KZ index is above the top third of the sample and 0 otherwise. To address the potential issue of endogeneity, we redefine the high imbalance dummy based on the predicted value out of the imbalance regression in Table I Panel C2 (Column 3). That is, we effectively perform an IV (2SLS) regression with statewide branching, mbhc activity and region/national branching serving as instruments. The results confirm the previous ones, the impact of imbalance is statistically significant with the same (if not stronger) magnitude. All specifications include year and credit ratings dummies and the standard errors are clustered at firm level. As additional robustness check, in Panel B we differentiate all of the variables (i.e., calculate the difference between year t and year t-1) and then estimate the system equation through a three-stage least squares regression (3SLS).

The results show that Imbalance on its own reduces cash holdings. This result is robust across all the different specifications – with and without the KZ dummy – as well as for both 2SLS and 3SLS in the differenced specification. There is some evidence that Imbalance reduces leverage in the 2SLS, while the significance disappears in the 3SLS. Imbalance does not seem to directly affect investment. However, if we look at the interaction between Imbalance and cash flows, it is always the case that firms facing higher imbalance are reacting more to cash flows by changing investment and cash holdings. This result holds across all the different specifications – i.e., controlling for KZ, differencing, with 2SLS and 3SLS.

The estimated specification follows the existing literature in either using Tobin's Q as a control variable or in studying the sensitivity of investment to Q. In fact, Q itself is affected by the cash holdings, investment and Imbalance. Therefore, in Panel C, we extend our analysis to the impact of bank/bond Imbalance on Tobin's Q. More specifically, we examine the impact of investment, the adjustments of cash holdings and change in capital structure on changes of Tobin's Q and relate their impact to Imbalance. We first estimate investment, the adjustments of cash holdings and change in capital structure by running the first stage regression of the 2SLS specification in Panel A. Here, we do not use information about Imbalance as explanatory variable. We then relate their projected values to Imbalance. In Column (1)-(4), we separate the sample according to Imbalance. In Column (5), we use the full sample and interact the projected values with the high Imbalance dummy. We add the interaction terms of the projected values with high KZ dummy in Column (6). Firm fixed effects are included.

The results show that Imbalance tends to reduce Q by its effect on leverage and to increase it through its effect on investment. Indeed, for firms characterized by higher Imbalance, a change in leverage has a negative impact and a change in investment a positive one. The effect is economically significant, a one standard deviation higher investment (leverage) leads to a 22% (26%) higher (lower) Q. This is consistent with our interpretation of Imbalance as a financial constraint. Bigger constraints prevent the firm from reaching its marginal Q. This keeps the firm's Q relatively higher. And indeed, investment increases Q more for high Imbalance firms than for the other firms.

5.3 Other Effects of Financial Constraints

Finally, we focus on two other signs of financial constraints. The first is the dividend payout. Given that financially constrained firms pay out less dividends, we expect a negative relationship between Imbalance and dividend. We test this in Table VII, by regressing dividend payout ratio (Compustat data21/data13) on Imbalance and a set of control variables.

We perform both an OLS regression (Column 1) and tobit regressions left censored at 0 (Columns (2)-(6)). We use the same controls and specification as before.

The results are once again consistent with Imbalance acting as a financial constraint. There is a strong negative relationship between Imbalance and dividend payout ratio. This result is robust across different specifications as well as after controlling for the KZ index (3-variable). A one standard deviation increase in Imbalance reduces the payout ratio by 26%. As in the previous specifications, in the last two columns, we separately consider the case of the existence/lack of a prior banking relationship. The results confirm the previous ones: Imbalance does not play a significant role in the presence of a banking relationship.

Again, to address the issue of endogeneity, in Column (4), we perform an IV (2SLS) regression with statewide branching, mbhc activity and region/national branching serving as instruments. The results confirm the previous ones, the impact of imbalance is statistically significant with the same (if not stronger) magnitude. The Hansen's test provides evidence in favour of the quality of our instruments.

Next, we zoom on the M&As started by the firm and we test whether Imbalance induces the firm to prefer equity as means of payment. If Imbalance tilts the firm towards equity in the capital structure, this should be evident in the M&A market as well. Indeed, an equity-for-equity M&A can be seen as a form of issuing equity without facing a higher price in terms of market impact (Cohen *et al.*, 2005). We therefore expect a negative relationship between origination of cash-based M&A and the degree of Imbalance that the firm faces.

In Table VIII, we report the results of estimating a probit model in which the dependent variable takes the value of value of 1 if cash is used as a means of payment and 0 otherwise (Columns (1)-(3)) or 1 if cash is used as the only means of payment and 0 otherwise (Column (4)-(6)). Our sample on M&A events is obtained from SDC Mergers and Acquisitions database. We require the deal value to be at least 10 million dollars. We decide the means of payment by looking at the "consider" keyword from SDC. Column (1) and (4) only contain bidder characteristics. We add merger characteristics such as deal value, friendly offer and tender offer. Column (3) and (6) includes both target and bidder characteristics. To deal with the potential self-selection problem, we run a first stage probit regression (not reported) to analyze the possibility of being a bidder and include the Heckman's Lambda to the second stage regression to examine the choice of payment. In these specifications we also use as control variables the characteristics of the target. A detailed definition of each variable is provided in the Appendix. Year, industry and rating dummies control for the other residual characteristics of the bidder that may affect the results.

The results show a strong and negative relation between the choice of cash as a means of payment and the degree of Imbalance that the firm faces. The results are striking. A one standard deviation increase in Imbalance reduces the probability of using cash a (the only) means of payment by 11% (28%). In Column (4), we perform an IV (2SLS) regression with statewide branching, mbhc activity and region/national branching serving as instruments. The results confirm the previous ones, the impact of imbalance is statistically significant with the same (if not stronger) magnitude. The Hansen's test provides evidence in favour of the quality of our instruments.

Overall, these results confirm the previous ones and suggest that Imbalance plays a role akin to financial constraints: it affects cash holdings, investment and leverage, in the way theory and the previous empirical literature indicate. Ascertained this, we now turn our attention to the impact on the stock and bond prices.

6. Imbalance and Stock Price/Returns

We now focus on how Imbalance affects stock and bond returns. We start by considering stock returns. If Imbalance reduces the ability of the firm to hedge shocks, we expect to find a positive relation between Imbalance and both idiosyncratic volatility and beta. We consider two proxies for idiosyncratic volatility and beta: one based on daily returns and one based on monthly returns. In the Appendix, we provide a detailed description of the way we computed them. Also, we consider both a one-factor model as well as a multi-factor one.

High Imbalance induces higher idiosyncratic volatility if it prevents firms from buffering firm-specific shocks. If lower idiosyncratic volatility is related to a lower correlation in cash flows shocks, this should reduce the covariance with the market and therefore the beta. However, it may be that the increase in cash flows uncertainty due to the inability to buffer systematic shocks more than offsets the reduction in correlation and increases beta.

We start by looking at the relation between Imbalance and firm's idiosyncratic volatility. In Table IX, we run a Fama-Mecbeth regression with idiosyncratic volatility calculated from CRSP daily returns (Panel A) and monthly returns (Panel B). Idiosyncratic volatility is derived from a 1-factor market model in Column (1)-(5) and derived from a Fama-French 4-factor model in Column (6)-(10). We also define a "High Cash Flow Uncertainty", defined as a dummy variable with a value of 1 if the firm's cash flow volatility (up to time t-1) is above the sample median and 0 otherwise. In column (3)-(5) and (8)-(10), we interact Imbalance with the cash flow shock dummy. We also separately consider firms with prior banking relationships and the others (columns (4)-(5) and (9)-(10)). In Panel C, we further explore the impact of debt imbalance on firm's idiosyncratic volatility by focusing on the interaction term of imbalance and the dispersion of analyst earnings forcasts. As in Panel A, we run a Fama-Mecbeth specification in which we regress idiosyncratic volatility (calculated from CRSP daily returns) on imbalance, a high analyst dispersion dummy, the interaction between a high analyst dispersion dummy and imbalance and a set of control variables. The high analyst dispersion dummy equals 1 if the firm's analyst dispersion is above the top third tercile in the year and 0 otherwise. The data on analyst earnings forcasts are obtained from I/B/E/S. For each firm-year, our measure of analyst dispersion is equal to the standard deviation of all outstanding analyst forcasts of long-term growth in the past two years. To have a credible measure of standard deviation we constrain the number of outstanding analyst forcasts to be larger than 5 in Column (1)-(3), (6)-(8) and change the constraint to 10 in Column (4)-(5), (9)-(10) as robustness check.

The results show a strong positive relation between Imbalance and idiosyncratic volatility. This is robust across all the alternative specifications. A one standard deviation higher Imbalance implies a 9.0% (8.6%) standard deviation increase of idiosyncratic volatility in the case of the 1 factor (4 factor) model. The impact of Imbalance is stronger for firms characterized by higher analyst dispersion. In this case, a one standard deviation higher Imbalance implies 16.5% (14.8%) higher idiosyncratic volatility in the case of the 1 factor (4 factor) model. These findings are confirmed if idiosyncratic volatility is constructed on the basis of monthly returns (16.3% for 1-factor model and 13.2% for 4-factor model). The results are weaker or not significant in the case the firm has a prior banking relationship. (Unreported) results in which imbalance is instruented using statewide branching, MBHC activity and region/national branching as instruments, provide consistent results.

We now consider the effect on beta. (Unreported) results suggest that Imbalance is related to a lower correlation in returns with the market. What is the effect on beta? In Table X, we report the results of a Fama-Mecbeth regression with beta – as derived from a value-weighted market model – as the dependent variable. The dependent variable in Columns (1)-(5) is the monthly average beta calculated from daily returns, while in Columns (6)-(10) it is beta calculated from monthly returns. As in the previous specification, we also interact Imbalance with the "High Cash Flow Uncertainty" dummy (Columns (3)-(5) and (8)-(10)). In Panel C, we focus on the interaction term of imbalance and the dispersion of analyst earnings forcasts. The layout of the columns is the same as for the previous specification.

The results show that Imbalance is strongly positively related to beta. This holds across all the alternative specifications and both in the case of monthly and daily returns. It is also economically significant. A one standard deviation higher Imbalance is related to a 12.9% standard deviation increase in market beta based on daily returns and 9.2% based on monthly returns. As for the case of idiosyncratic volatility, the impact of Imbalance is stronger for firms characterized by higher analyst dispersions. A one standard deviation higher Imbalance is related to a 24.1% (for daily returns) (11.3% for monthly returns) standard deviation increase in market beta. The results are weaker or not significant if the firm has a prior banking relationship. (Unreported) results in which imbalance is instruented provide consistent results. This suggests that the increase in uncertainty of the firm's cash flows may actually more than compensate the reduction in correlation. It is consistent with the previous findings and confirms the direct impact of Imbalance on the riskiness of the stock.

One question that arises is whether this means that Imbalance is a distinct source of uncertainty, as the *separate* hypothesis suggests or whether it just amplifies the sensivity to the market, as the *amplifier* hypothesis suggests. To address this issue, we follow a methodology similar to Lamont *et al.* (2001). We first calculate the median Imbalance for each firm over the sample period. Then, we group firm medians into quintiles from low (1) to high (5) and construct value-weighted portfolios for each quintile. Then, we study the alphas and the factor loadings.

In Table XI, Panel A1, we report the loadings on the market factor for our 5 portfolios under different factor models: 1-factor (market factor), 3-factor (market factor, HML, SMB), 4-factor (market factor, HML, SMB, momentum) and 6-factor (market factor, HML, SMB, momentum, term spread, risk spread). We provide a detailed definition of risk factors in the Appendix. In Panel A2, we test the differences in factor loadings by stacking all the monthly portfolio returns and adding interaction terms of risk factors and the Imbalance index. Finally, in Panel C, we report the results of a strategy long the portfolio with high Imbalance index (level 5) and short the portfolio with low Imbalance index (level 1) and examine the abnormal return (alpha) of this long-short portfolio.

The results show that Imbalance amplifies the loading on the main factor. In the one-factor model the loadings on market factor for level 5 portfolio (highest imbalance) is 62% higher than level 1 portfolio (lowest imbalance). Under the 6-factor model, the loadings on market factor for level 5 portfolio (highest imbalance) is 33% higher than level 1 portfolio (lowest imbalance). However, the alpha of a portfolio long-short Imbalance is never significant but positive. (Unreported) results in which imbalance is instruented provide consistent results.

These findings support the *amplifier* hypothesis, suggesting that while Imbalance amplifies the impact of common shocks, it does not represent a distinct source of uncertainty.

7. Imbalance and Bonds Returns

7.1 Imbalance and Bond Spreads

We now focus on how Imbalance affects bond returns. If Imbalance increases the riskiness of the firm, bonds of high-imbalance firms should have a higher yield and should be more sensitive to yield shocks. We start by focusing on the impact of Imbalance on corporate bond yield spreads, regressing the bond spread on Imbalance and a set of control variables. The bond yield spread is constructed as the difference between the bond yield and the yield of an equivalent maturity Treasury bond.[4] The data on bond yield, time-to-maturity and coupon rate are obtained from Bloomberg. The data on Treasury constant maturity interest rates are obtained from the FRED database (Federal Reserve Bank of St. Louis). The other variables are defined as before.

We report the results in Table XII. In Column (1)-(5), we perform Fama-Mecbeth regressions using data on monthly bond yield spreads. Column (1) is our base specification, where only issue characteristics are included. In Column (2), we control for firm characteristics and include a cash flow uncertainty dummy variable which equals 1 if the volatility of cash flow shocks is above sample median and 0 otherwise. We then add the interaction term of Imbalance with a high cash flow uncertainty dummy in Column (3). In Columns (4)-(5), we split the sample according to bond issuers with/without banking relationships. In Column (6)-(10), we use the median yield spread for each bond issue-year as dependent variable. From Column (7)-(10), we include bond issuer fixed effects. All regressions include year dummies, credit rating dummies and two-digit SIC industry dummies.

The results show a strong positive relation between Imbalance and bond yield spread. This is robust across all the alternative specifications and it is economically significant. A one standard deviation higher Imbalance is related to a 7% higher yield spread. This rises to 12% for firms with high cash flow uncertainty. This holds both in the case of the Fama-MacBeth specification and in the pooled specification. Also, the overall impact of Imbalance (considering both the coefficient on the level of Imbalance and its interaction with cash flow uncertainty) is weaker or not significant in the case the firm has a prior banking relationship. (Unreported) results in which imbalance is instruented using statewide branching, mbhc activity and region/national branching as instruments, provide consistent results.

These findings are consistent with the previous ones and suggest that Imbalance is directly related to the bond yields. Does this imply that Imbalance is a separate bond factor or that it amplifies the reaction to existing factors? To address this issue we focus on the way Imbalance affects the reaction to yield shocks.

7.2 The GM and Ford Experiment

We start with an experiment – the reaction to the GM and Ford downgrade. On May 2005, the public debts of GM and Ford were downgraded to junk bond status. While the downgrading had been somewhat expected, the severity of the cut, especially in the case of GM, which went down two grades from BBB- to BB, sent a shiver through bond markets.

[4] We adjust bond yield in the following way: for bond i at month t, we first calculate the time to maturity and subtract the corresponding Treasury constant maturity rate from its bond yield.

Altogether the amount of debt affected could be as much as $400 billion. We use the downgrade as an exogenous shock and we assess how debt imbalance impacted the bond yield and credit spread changes *of the other firms*, conditioning on their Imbalance, during the GM and Ford downgrading period. We focus on both the yield change and the credit spread change. We define a crisis dummy equal to 1 if it is at the second quarter of 2005 and 0 otherwise. Then, we regress the yield (spread) change on the dummy, Imbalance, their product and the standard set of control variables.

We report the results in Table XIII. In Panel A, the dependent variable is the quarterly yield change of each bond issue calculated by first averaging monthly yields during a quarter and then subtracting the average of the previous quarter. In Panel B, the dependent variable is the quarterly credit spread change calculated in an analogous way. The bond yield spread is defined as the difference between bond yield and the corresponding Treasury yield with the same time to maturity. In Column (1)-(3), we run cross-sectional regressions for yield changes at the first quarter of 2005 (pre-crisis quarter), while in Column (4)-(6), we consider the yield changes for the second quarter of 2005 (crisis quarter). In Column (7)-(10), we stack the yield changes at the first, second and third quarter of 2005 and interact Imbalance with the crisis dummy. Bond Issuer fixed effects are added in Column (9)-(10).

Imbalance is not related to either yield changes (Panel A) or spread changes (Panel B) before the downgrade event (Columns (1)-(3)). However, it is related to them for the quarter when the crisis happens (Columns (4)-(6)). In particular, if we consider the overall period (from one quarter before to one quarter after the event), the interaction between the event dummy and Imbalance is positively and significant. This is robust across all the alternative specifications and it is economically significant. In fact the impact of the crisis dummy only takes effect when interacted with our measure of debt imbalance. Firms characterized by a one standard deviation higher Imbalance display a 50% (70%) higher jump in their changes of yields (spreads) during the crisis period. (Unreported) results in which imbalance is instruented provide consistent results.

7.3 Imbalance and Reaction to Yield Shocks

These findings display preliminary evidence that Imbalance affects the way bond prices react to shocks. We now directly test the impact of Imbalance on the sensitivity of bond yield changes using Treasury yield shocks. In Table XIV, we regress the monthly yield change for each bond issue on Imbalance, Treasury yield shocks, the interaction between yield shock and Imbalance and a set of control variables. We augment the previous set of control variables with bond characteristics. We get the data on bond yield, coupon rate and time-to-maturity from Bloomberg, while the other issue characteristics such as bond covenants and callability are from Mergent FDIC fixed-income database. We also control for the previous stock returns.

We define the yield shocks in the following way. We get from the FRED database (Federal Reserve Bank of St. Louis), information on Treasury yields for different maturities. We first model each Treasury yield series as an AR(1) process. For every month t, we estimate an AR(1) model using data for the prior 60 months and get the regression residual as interest rate shocks. We consider alternative types of shocks. In Panel A, we use the shocks to corresponding Treasury yields having the same time to maturity as the bond issue. Since the median time-to-maturity of our sample is 7 years, in Panel B we only use shocks to 7-year Treasury yields. In Panel C, we obtain monthly yield shocks from a 4-lag VAR system including Treasury yield, inflation rate, oil price and civilian unemployment.[5] We run the VAR for each month based on information in the past 60 months and get the regression residual out of the Treasury yield equation at month t as our measure of yield shock. Column (1) is our baseline specification where only bond issue characteristics are included. We control market conditions in Column (2). Stock returns and accounting variables of bond issuers are included in Column (3). In Column (4), we add two-digit SIC industry dummies, year dummies and detailed credit rating dummies. In Column (5), we add issuer fixed effects. In Column (6)-(8), we split the sample according to bond ratings and run the regression for each sub-sample.

Our focus is on the interaction of Imbalance and yield shocks. The results show that Imbalance amplifies the impact of the yield shocks. This holds across all the alternative specifications and is economically significant. The higher the Imbalance, the more a market change in Treasury yields will increase the bond yield of the firm and reduce its bond spread. A one standard deviation higher Imbalance increases the sensitivity of bond yields to their corresponding Treasury yield by 49%. The impact is stronger the lower the rating of the firm. In the case of AAA and AA firms, the effect is hardly significant, the imbalance measure starts to take effect for A and BBB firms, while in the case of BB, B, CCC, CC and C firms the effect is four times bigger and very significant. This is consistent with our working hypothesis that Imbalance acts as an alternative source of financial constraint and therefore is more impacted by a yield shock as it has more difficulty in raising funds. (Unreported) results in which imbalance is instruented provide consistent results.

We now move on to see how Imbalance affects the impact of yield shocks on the firm bond spreads. The literature has shown that while yield shocks help to explain a great deal of the changes in the yields of corporate bonds, no equivalent explanatory power is there in the case of bond spreads. Two elements emerge from the consensus about spread changes. First, little is known about what the main drivers are. Chen *et al.* (2001) and Colline-Dufresne *et al.* (2001)

[5] Interest rate is the 6-month Treasury Bill rate, inflation computed as $400\ln(C_t / C_{t-1})$ where C_t is the chain-weighted GDP price index, the oil price change (o_t) is calculated as $o_t = \ln(P_t / P_{t-1})$ where P_t is monthly oil price. All the macro variables are from thee FRED database.

argue that there is a common component but they do not identify it. Second, a positive shock to yields reduces bond spreads. The intuition being that an increase in yields raises the drift in the bond return process, increases the distance between the current firm conditions and default and therefore reduces the expected default probability of the firm.

We therefore expect Imbalance to directly affect the impact of yield shocks on bond yield spreads. In particular, it should *muffle* the negative relation between the two. Indeed, Imbalance, by acting as a financial constraint, reduces the ability of the firm to adjust to the new bond yield by altering its leverage. This stickiness in leverage should lower the reaction of the bond spread to a change in yields. Let us assume that there is a positive yield shock. This should reduce the proximity of the firm to bankruptcy. However, a firm characterized by high Imbalance would react less, being less able to take advantage of the change of yields.

We test these hypotheses by looking at the impact of Imbalance on the sensitivity of bond credit spread changes with respect to interest rate shocks. We estimate a specification similar to the one for yield changes, but the dependent variable is now the monthly yield spread change for each bond issue. Bond yield spread is the difference between the bond yield and the corresponding Treasury yield with same time to maturity. The data, the definition of the other variables as well as the construction of the yield shocks is the same as before.

The results are reported in Table XV. As before, in Panel A, we use the shocks to corresponding Treasury yields having the same time to maturity as the bond issue. Since the median time-to-maturity of our sample is 7 years, in Panel B we only use shocks to 7-year treasury yields. In Panel C, we obtain monthly interest rate shocks from a 4-lag VAR system including interest rate, inflation rate, oil price and civilian unemployment. The layout of the columns is the same as in Table XIV.

The results show that Imbalance reduces the impact of the yield shocks on bond spreads. This holds across all the alternative specifications. A 100bp Treasury Yield shock (shock to 7-year Treasury Yields and 6-month Treasury Bills) reduces the bond spread by 53 bp (48 bp and 45 bp) in the case of low Imbalance and just by 35 bp (31 bp and 31 bp) in the case high Imbalance firms. The “attenuating” effect is stronger the lower the rating of the firm. In the case of AAA and AA the effect is hardly significant, while in the case of BB, B, CCC, CC and C firms the effect is 5 times stronger than in the case of A and BBB firms. As expected, the impact of Imbalance is stronger for callable bonds. This is consistent with the amplifier hypothesis. (Unreported) results in which imbalance is instruented using statewide branching, mbhc activity and region/national branching as instruments, provide consistent results.

Finally, we consider whether the impact of Imbalance differs between callable and non-callable bonds. As shown by Duffee (1998), callability makes bond yield spreads react stronger to yield shocks. Indeed, a reduction in yield, by increasing the price of the callable bonds, also increases the value of the option embedded in the callability feature and increases the probability of the firm calling the bond. Given that the value of the callable bond for the bond holder is negatively related to such a feature, a reduction in yields should increase the spread of the callable bonds even more. Another way of saying it is that the option embedded in the callability feature increases the reactivity of the bond spread to changes in yields.

Given that Imbalance, by constraining the firm, makes it less likely that less likely that it will be able to refinance itself and therefore to call the bond, the callability feature should be less valuable in the case of high Imbalance. This implies that should reduce the impact of yield shocks on bond spreads more in the case Imbalance is high. Conversely, it should increase the impact on bond yields.

To test this hypothesis, in Table XIV and XV, in Column (9) and (10), we split the sample on the basis of the callability of each bond. The results show that Imbalance reduces the impact of yield shocks on bond spreads, while it increases the impact for bond yields. (Unreported) results in which imbalance is instruented provide consistent results.

8. Conclusion

We focus on how the relative availability of bond and bank financing supply affects the firm's ability to use its leverage to buffer shocks, impacting the firm's stock and bond returns. We show that the local market conditions for the supply of bond and bank financing matter in terms of the firm's inability to substitute between bond financing and bank financing and affect the correlation of the leverage of firms. We show that otherwise similar firms have different leverages due to the difference in debt financing structure arising from the local bias of financial intermediaries.

We define a measure that proxies for the regional imbalance in the availability of bank and bond financing. We call this measure Debt "Imbalance". The intuition is that, the higher the Imbalance, the less one of the component of the debt market (i.e., bond or bank) will be able to absorb a reduction in the other component. We show that Imbalance proxies for a particular type of financial constraint that is more related to the financial markets which the firm belongs to, than to the characteristics of the firm itself. Imbalance tilts the financial structure towards equity, increasing SEOs and lowering leverage.

We assess whether Imbalance acts as a financial constraint. We show that firms characterized by higher Imbalance also act as more financially constrained. In particular, they have a higher sensitivity of cash holdings to cash flows and of investment to the firm s Q. Also, Imbalance reduces dividend payment and the probability of paying cash in M&As. Imbalance, by constraining the investment of the firm, keeps the firm s Q above its marginal value. This implies that firms characterized by higher Imbalance have higher Q. Imbalance tends to increase Q through its effect on the selection of higher value investments.

Then, we analyze how Imbalance affects the returns of the firm's stocks and bonds. We show that firms characterized by higher Imbalance have higher stock beta and idiosyncratic volatility. While Imbalance reduces the correlation of the stock returns with the market, it increases their volatility. This translates in higher beta and idiosyncratic volatility. However, Imbalance is not a separate source of uncertainty, but merely increases the sensitivity of the firm's stock to market and idiosyncratic shocks.

Imbalance also affects the value of the bonds of the firm, by increasing the yield spread. Moreover, the bonds of firms characterized by higher Imbalance are more subject to yield shocks. The higher the Imbalance, the more a market downturn in bond yields will increase the bond yield of the firm and increase its bond spread. A natural experiment confirms our story: the downgrade of GM and Ford bonds in the second quarter of 2005. We show that the contagion effect of the downgrade affected more the bonds of high-Imbalance firms.

Our findings contribute to the literature on financial constraints. In particular, they define a new type of financial constraint based on the location of the firm and financial intermediaries and on the limited substitutability between bond- and bank-financing. An interesting avenue for further research will be to see how Imbalance may help to explain the value and growth premia puzzle.

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Appendix
Variable Definitions

Imbalance

Our data on the geographical location (zip codes) and holdings of bond investors (bond fund families) are obtained from Lipper's eMAXX fixed income database. It contains details of fixed income holdings for nearly 20,000 U.S. and European insurance companies, U.S., Canadian and European mutual funds, and leading U.S. public pension funds. It provides information on quarterly ownership of more than 40,000 fixed-come issuers with $5.4 trillion in total fixed income par amount from the first quarter of 1998 to the second quarter of 2005.

Our data on the geographical location (zip codes) and deposits of bank branches are from FDIC's Summary of Deposits (SOD) database. It contains deposit data for more than 89,000 branches/offices of FDIC-insured institutions. The Federal Deposit Insurance Corporation (FDIC) collects deposit balances for commercial and savings banks as of June 30 of each year starting from 1994. The data are collected annually.

We obtain bond investor and bank branch coordinates (longitudes and latitudes) by merging zip codes with Gazetteer Files of Census 2000. We try to use partitioning clustering analysis to simplify the location structure of bond investors and bank branches. More specifically, we first cluster the set of bond investors based on their geographical distances with each other and set the number of clusters to be 10. Then we independently partition the set of bank branches into 10 bank clusters according to their geographical distances. The formula we use to calculate distances is the first order approximation to the great circle distance: $\sqrt{[69.1*(\text{lat2}-\text{lat1})]^2+[53.0*(\text{lon2}-\text{lon1})]^2}$ where lat1, lat2, lon1, and lon2 are latitude and longitude values in degrees. By this procedure for each year we set up 10 bond clusters and 10 bank clusters.

We repeat our methodology from 1997 to 1991 for bond clustering and 1993-1991 for bank clustering after backfilling the location structures. The backfilling procedure is as follows. We assume there is no big shift on the locations of insurance fund families and pension fund families so for those types of investors we use the location structure as of 1998. For mutual fund families we focus on the ones matched with CRSP mutual fund database from 1991 to 1997. For bank clustering from 1991 to 1993 we use the same location structure of bank branches as of 1994.

Next we decide for each firm which bond and bank cluster it belongs to. Our data on firm locations come from the historical Compustat location files. For example, for firm i we first calculate the average distance of firm i to investors at bond cluster j and denote it as $\overline{d_{ij}}$. Then we pick up the bond cluster j* with the smallest $\overline{d_{ij}}$ and assign firm i to j* (we denote j* as V*(i)). By the same token, for firm i we first calculate the average distance of firm i to bank branches at bank cluster k and denote it as $\overline{d_{ik}}$. Then we pick up the bank cluster k* with the smallest $\overline{d_{ik}}$ and assign firm i to k* (we denote k* as D*(k)).

Now we can define Imbalance. Let V_{jt} be the average holdings of bond investor j during year t, D_{kt} be the deposits of bank branch k at year t, and A_{it} be the book assets of firm i at year t, then for firm i we can define our measure of Imbalance as:

$$\text{Bank/Bond Imbalance}_{\text{it}} = \frac{\left| \frac{\sum_{j\in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} - \frac{\sum_{k\in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}} \right|}{\frac{\sum_{j\in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} + \frac{\sum_{k\in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}}}.$$

Cluster Debt-per-Asset

Let V_{jt} be the average holdings of bond investor j during year t, D_{kt} be the deposits of bank branch k at year t, and A_{it} be the book assets of firm i at year t, then the cluster debt-per-asset is defined as:

$$\text{Cluster Debt - per - Asset}_{\text{it}} = \frac{\sum_{j\in V^*(i)} V_{jt}}{\sum_{V^*(f)=V^*(i)} A_{ft}} + \frac{\sum_{k\in D^*(i)} D_{kt}}{\sum_{D^*(f)=D^*(i)} A_{ft}}.$$

Cluster Equity-per-Asset

We apply the similar methodology to equity investors. Our data on stock holdings of equity investors come from Thomason CDC/Spectrum, a database of quarterly 13-F filings of money managers to the U.S. Securities and Exchange Commission. Since CDC/Spectrum doesn't report investor locations, we try to identify them from several different sources: we match 13F and Lipper by the name of managing firms as well as 13F and LPC DealScan by the name of banks. The location of mutual fund families comes from? Then we partition the set of equity investor into 10 clusters according to their geographical distances. We assign a firm to its corresponding equity using the same method as in the bond (bank) case. For example, for firm i we first calculate the average distance of firm i with investors at equity cluster j and denote it as $\overline{d_{ij}}$. Then we pick up the equity cluster j* with the smallest $\overline{d_{ij}}$ and assign firm i to j* (we denote j* as E*(i)). Let E_{jt} be the average equity holdings of investor j during year t and A_{it} be the book assets of firm i at year t, then the cluster equity-per-asset is defined as:

$$\text{Cluster Equity - per - Asset\_i}_{\text{it}} = \frac{\sum_{j\in E^*(i)} E_{jt}}{\sum_{E^*(f)=E^*(i)} A_{ft}}.$$

Market value of assets: stock price (data199) * shares outstanding (data25) + short term debt(data34) + long term debt(data9) + preferred stock liquidation value (data10) – deferred taxes and investment tax credits (data35).

Market-to-Book Ratio: market value of assets/book assets (data6)

Total Debt: long term debt (data9)+short term debt (data34)

Book Leverage: total debt/book assets(data6)

Market Leverage: total debt/market value of assets

Altman's z-Score: 3.3 * pre-tax income (data170) + sales (data12) + 1.4 * retained earnings (data36) + 1.2* (current assets (data4) – current liabilities (data5)) / book assets (data6)

Firm Size: log(sales) (data12)

Asset Tangibility: net PPE (data8)/book assets (data6)

Profitability: operating income before depreciation (data13)/book assets (data6)

KZ (3-variable): (-1.002*cash flow(data14+data18)-39.368*cash dividends (data21+data19)-1.315*cash holding (data1))/lagged assets(data6)

Stock Illiquidity: Amihood illiquidity measure downloaded from Joel Hasbrouck's website pages.stern.nyu.edu/~jhasbrou/Research/GibbsEstimates2006/, which is the year average of $1000*\sqrt{\frac{|R_{i,t}|}{DVol_{i,t}}}$ where R_t is the return and $DVol_t$ is the dollar volume of stock i at day t.

Cash Holding: cash and short-term investments (data1)/lagged assets(data6)

Cash Flow: (depreciation and amortization (data14)+ income before extraordinary items(data18))/lagged assets (data6)

Investment: capital expenditures(data128)/lagged assets(data6)

Tobin's Q: (market value of equity(data199*data25)+book assets(data6)-book value of equity(data60+data74))/book assets(data6)

Net Equity Issuance: (equity issuance(data108)-stock repurchases(data105))/lagged assets(data6)

Dividend Ratio: dividends(data21)/operating income before depreciation (data13)

Cash Flow Volatility: For each year t we run an OLS regression (up to time t) of cash flow on lagged cash flow and the control variables used in the main specification (not reported), and we use the residual ε_{it} as the measure of cash flow shock of firm i at year t. Then cash flow volatility is defined as the volatility of cash flow shock: $\frac{1}{t-1991}\sum_{s=1991}^{t}\varepsilon_{is}^2$.

Risk Factors: the excess return of market portfolio over the risk-free rate(market factor), the return difference between small and large capitalization stocks (SMB), the return difference between high and low book-to-market stocks (HML), the return difference between stocks with high and low past returns (momentum), the difference between the ten-year treasury constant maturity rate and the 90-day treasury bill rate (term spread, TS), and the difference between the baa corporate bond rate and the ten-year treasury constant maturity rate (credit spread, CS). The data on risk-free rate, market returns, SMB, HML and momentum are obtained from Kenneth French's website. The data on credit spread and term spread are obtained from the FRED database at the Federal Reserve Bank of Saint Louis.

Market Beta and Idiosyncratic volatility (daily returns)

For each firm-day (i,t), we first estimate the daily factor loadings by running the following regression:

$$r_{i,s} - r_{f,s} = a_{i,s} + \beta_{i,t-1}(r_{m,s} - r_{f,s}) + \varepsilon_{i,s},$$

where $t-180 < s \leq t-1$ and we require a minimum of 90 observations for each regression. The dependent variable is the daily return of firm i at day s less the risk-free rate $r_{f,s}$. The independent variables include the excess return of market portfolio over the risk-free rate ($r_{m,s} - r_{f,s}$). We then calculate the average estimated $\hat{\beta}_{i,t}$ in each month and use it in later regressions. Meanwhile, the abnormal return at day t is $\varepsilon_{i,t} = r_{i,t} - r_{f,t} - \hat{\beta}_{i,t-1}(r_{m,t} - r_{f,t})$. We then define idiosyncratic volatility as the standard deviation of $\varepsilon_{i,t}$ in each month. We require the number of days to be at least 10 to calculate each standard deviation.

Market Beta and Idiosyncratic volatility (monthly returns)

For each firm-month (i,t), we first estimate the daily factor loadings by running the following regression:

$$r_{i,s} - r_{f,s} = a_{i,s} + \beta_{i,t-1}(r_{m,s} - r_{f,s}) + \varepsilon_{i,s},$$

where $t-36 < s \le t-1$ and we require a minimum of 30 observations for each regression. The dependent variable is the monthly return of firm i at month s less the risk-free rate $r_{f,s}$. The independent variables include the excess return of market portfolio over the risk-free rate ($r_{m,s} - r_{f,s}$). We use the estimated $\hat{\beta}_{i,t}$ in later regressions. Meanwhile, the abnormal return at month t is $\varepsilon_{i,t} = r_{i,t} - r_{f,t} - \hat{\beta}_{i,t-1}(r_{m,t} - r_{f,t})$. We then define idiosyncratic volatility as the standard deviation of $\varepsilon_{i,t}$ for every year. We require the number of months to be at least 10 to calculate each standard deviation.

Idiosyncratic Volatility (multi-factors): Standard deviation of abnormal returns estimated from multi-factor models. The calculation procedure is the same as before.

Bond Yield Spread: Our data on bond yield are obtained from Bloomberg database. The relevant treasury rates come from FRED database. We adjust bond yield in the following way: for bond i at month t, we first calculate the time to maturity and subtract the corresponding treasury constant maturity rate from its bond yield. In detail, the adjustment is the 90-day T-bill rate if the time to maturity is less than one year, the 2-year T-bill rate if the time to maturity is between 1 and 5 years, and the 10-year treasury constant maturity rate if the time to maturity is larger than 5 years.

Credit Rating (thin): senior long-term debt rating (data280). We further synthesize data280 into ten rating categories: AAA, AA, A, BBB, BB, B, CCC, CC, C and NR (not rated)

Credit Rating (broad): senior long-term debt rating (data280). We further synthesize data280 into three rating categories: investment grade (AAA+ to BBB), below-investment grade (BBB- to C) and NR (not rated)

Credit Rating Dummies: ten dummy variables created according to credit rating (thin).

Industry Dummies: Two-digit SIC industry dummies

Table I
Summary Statistics

This table presents summary statistics for the major variables used in the subsequent analysis. The definition of each variable can be found in the appendix. We require non-missing information on Imbalance and accounting variables such as firm size, market-to-book ratio, book leverage, Altman's z-Score, tangibility and profitability. We exclude financial firms with an SIC code between 6000 and 6999, firms with a minimum book value of assets less than 10 million, firms with market-to-book ratio larger than 10 and firms with market leverage or book leverage greater than 1. Our base sample includes 10622 firm-year observations ranging from 1991 to 2005.

Panel A: Summary Statistics

	Freq.	Source	N	Mean	Median	Std.
Imbalance	Yearly	Lipper/FDIC	10622	0.223	0.215	0.172
Cluster Debt-per-Asset	Yearly	Lipper/FDIC	10622	3.445	1.838	4.926
Cluster Equity-per-Asset	Yearly	Lipper/FDIC	10622	1.394	0.658	2.504
Firm Size	Yearly	Compustat	10622	6.764	6.732	1.704
Market-to-Book Ratio	Yearly	Compustat	10622	1.389	1.090	0.996
Book Leverage	Yearly	Compustat	10622	0.310	0.299	0.173
Market Leverage	Yearly	Compustat	10622	0.307	0.274	0.212
Altman's z-Score	Yearly	Compustat	10622	1.707	1.779	1.275
Tangibility	Yearly	Compustat	10622	0.363	0.314	0.228
Profitability	Yearly	Compustat	10622	0.131	0.127	0.089
KZ	Yearly	Compustat	9961	-0.765	-0.569	0.753
Stock Illiquidity	Yearly	CRSP	10156	26.162	14.439	34.411
Cash Holding	Yearly	Compustat	9596	0.113	0.042	0.215
Cash Flow	Yearly	Compustat	9596	0.086	0.091	0.095
Investment	Yearly	Compustat	9596	0.075	0.054	0.071
Tobin's Q	Yearly	Compustat	9932	1.619	1.365	0.806
Net Equity Issuance	Yearly	Compustat	9375	0.0067	0.0003	0.065
Dividend Ratio	Yearly	Compustat	10554	0.073	0.027	0.096
Idiosyncratic volatility (monthly returns)	Yearly	CRSP	8709	0.094	0.086	0.042
Idiosyncratic volatility (daily returns)	Monthly	CRSP	112153	0.021	0.019	0.011
Market Beta (monthly returns)	Monthly	CRSP	112153	0.936	0.868	0.676
Market Beta (daily returns)	Monthly	CRSP	112153	0.819	0.741	0.589
Bond Yield Spread	Monthly	Bloomberg	109478	2.492	1.718	2.714

Panel B:Univariate Results: Borrowing Distances

Panel B1 compares the actual bond issuer-bond fund distances with the bond issuer-bond cluster distances. Actual bond issuer-bond fund distance is calculated as the average great circle distances between the bond issuer and the funds holding its bond issues. Bond issuer-fund cluster distance is the average distance between the bond issuer and all the funds located at the bond cluster where the issuer belongs to. Panel B2 compares the actual borrower-bank distances with the borrower-bank cluster distances. Actual borrower-bank distance is calculated as the average great circle distances between the borrower and the lending banks. Borrower-bank cluster distance is the average distance between the borrower and all the bank branches located at the bank cluster where the borrower belongs to. The information needed to calculate those distances are obtained from Lipper (bond) and LPC/FDIC (bank). Both two-tailed t-test and Wilconxon rank-sum test are performed to compare the differences.

Panel B1: Bond Issuer-Bond Fund Distances

(Actual) Distance: Bond Issuer-Bond Fund	Distance: Bond Issuer-Bond Cluster	T-test	Wilconxon
734.04	442.83	49.73***	34.73***
(4778)	(4267)		

Panel B2: Borrower-Bank Distances

(Actual) Distance: Borrower-Bank	Distance: Borrower-Bank Cluster	T-test	Wilconxon
597.17	270.68	34.74***	29.92***
(1814)	(4267)		

Panel C: Imbalance and Signed Imbalance

Panel C1 reports summary statistics on imbalance and signed imbalance [(Bank-Bond)/(Bank+Bond)] year by year. The exact definition can be found in the appendix. Panel C2 offers some evidence on the potential instruments for debt imbalance. State-wide branching is defined as the number of years from 1965 where statewide bank branching is allowed in the state where the firm is located. MBHC activity is defined as the number of years from 1965 where multi-bank holding company activity is allowed in the state the firm belongs to. Region/National branching is the nubmer of years from 1965 where regional/national branching activity is allowed in the state the firm belongs to. Column (1)-(3) is for imbalance and Column (4)-(6) is for signed imbalance. ***, ** and * represent significance levels at 1%, 5% and 10% respectively.

Panel C1: Summary Statistics

Year	Imbalance	(Bank-Bond)/(Bank+Bond) (Signed Imbalance)
1991	0.208	-0.111
1992	0.209	-0.126
1993	0.221	-0.128
1994	0.221	-0.144
1995	0.207	-0.092
1996	0.210	-0.082
1997	0.190	-0.068
1998	0.193	-0.035
1999	0.198	0.042
2000	0.231	0.098
2001	0.209	0.068
2002	0.209	0.074
2003	0.240	0.191
2004	0.305	0.261
2005	0.308	0.275

Panel C2: Instruments for Imbalance

	Imbalance			(Bank-Bond)/(Bank+Bond)		
	(1)	(2)	(3)	(4)	(5)	(6)
Statewide Branching	0.0435***	0.0446***	0.0445***	0.1752***	0.1790***	0.1653***
	(16.80)	(17.61)	(17.13)	(43.68)	(52.47)	(48.87)
MBHC Activity	0.0059***	0.0058***	0.0080***	0.0128***	0.0119***	0.0056**
	(3.07)	(3.09)	(4.22)	(4.33)	(4.71)	(2.26)
Regional/National Branching	-0.1990***	-0.2030***	-0.1919***	-0.1051***	-0.1249***	-0.1222***
	(-27.72)	(-28.93)	(-27.46)	(-9.45)	(-13.21)	(-13.43)
Const	0.5612***	0.5527***	0.5758***	-0.1969***	-0.3061***	-0.0590
	(40.20)	(35.99)	(3.63)	(-9.11)	(-14.78)	(-0.29)
Year Dummies	N	Y	Y	N	Y	Y
Industry Dummies	N	N	Y	N	N	Y
R-squared	0.0727	0.1161	0.1571	0.1676	0.3994	0.4655
N	10622	10622	10622	10622	10622	10622

Table II
Correlation in Leverage

This table provides univariate tests of correlation in leverage for "similar" firms but belonging to different bank or bond clusters. Here by similarity we mean firms with similar industry (1-digit SIC code) and similar rating category (investment grade/below-investment grade/non-rated) at the beginning of each year. Correlation of (Bank in, Bond in) with radius less than 300 miles is calculated in the following way: for each firm we find all the other similar firms belonging to the same bank cluster and bond cluster and also located within 300 miles, then compute the average correlation in leverage with those firms over the sample period. Correlation of (Bank in, Bond out) with radius less than 300 miles is calculated in the same way: for each firm we find all the other similar firms belonging to the same bank cluster but different bond cluster and also located within 300 miles, then compute the average correlation in leverage with those firms over the sample period. The other specifications are defined likewise. We report correlation in market leverage in Panel A1-A2 and correlation in book leverage in Panel B1-B2. Both T-test and Wilconxon ranksum test are performed to compare the differences. ***, ** and * represent significance levels at 1%, 5% and 10% respectively

Panel A: Market Leverage

Panel A1: (Bank in, Bond in) vs. (Bank in, Bond out)

Radius	(Bank in, Bond in)	(Bank in, Bond out)	T-test	Wilconxon
<=300 miles	0.26	0.15	3.16***	2.87***
	(221)	(221)		
<=250 miles	0.25	0.10	3.67***	3.58***
	(187)	(187)		
<=200 miles	0.26	0.08	2.89***	2.88***
	(99)	(99)		

Panel A2: (Bank in, Bond in) vs. (Bank out, Bond in)

Radius	(Bank in, Bond in)	(Bank out, Bond in)	T-test	Wilconxon
<=300 miles	0.27	0.18	2.97***	2.66***
	(312)	(312)		
<=250 miles	0.29	0.21	2.15**	2.24**
	(212)	(212)		
<=200 miles	0.28	0.16	2.03**	1.95**
	(101)	(101)		

Panel B: Book Leverage

Panel B1: (Bank in, Bond in) vs. (Bank in, Bond out)

Radius	(Bank in, Bond in)	(Bank in, Bond out)	T-test	Wilconxon
<=300 miles	0.27	0.11	4.71***	4.22***
	(230)	(230)		
<=250 miles	0.22	0.09	3.30***	3.31***
	(188)	(188)		
<=200 miles	0.25	0.11	2.40**	3.18***
	(101)	(101)		

Panel B2: (Bank in, Bond in) vs. (Bank out, Bond in)

Radius	(Bank in, Bond in)	(Bank out, Bond in)	T-test	Wilconxon
<=300 miles	0.26	0.18	2.61***	2.38**
	(320)	(320)		
<=250 miles	0.27	0.17	2.65***	3.05***
	(219)	(219)		
<=200 miles	0.26	0.12	2.52**	2.10**
	(105)	(105)		

Table III: The Impact of Imbalance on Equity Issuance

This table reports the impact of Imbalance on equity issuance. In Panel A we run a probit model to analyze the probability of issuing new equity (SEO). The dependent variable takes a value of 1 if the firm is a new equity issuer and 0 otherwise. The data on stock issuance is obtained from SDC Global New Issue database. We only include those issues with proceeds larger than 5% of the firm's book assets. In Column (4) we run an IV probit regression with statewide branching, mbhc activity and region/national branching serving as instruments. In Panel B we analyze the impact of Imbalance on the level of net equity issuance. The dependent variable is defined as the difference between new equity issuance (data108) and stock repurchases (data105) divided by book value of assets at the beginning of the year (data6). Detailed definitions of each variable are provided in the appendix. In Column (4) we perform an IV (2SLS) regression with statewide branching, mbhc activity and region/national branching serving as instruments.

Panel A: Probability of Issuing New Equity

	(1)	(2)	(3)	(4)	(5) N-Relation	(6) Y-Relation
Imbalance	0.4277***	0.3640***	0.3498***	1.2298**	0.3603**	0.0636
	(3.83)	(3.47)	(2.66)	(2.03)	(2.52)	(0.17)
Cluster Debt-per-Asset	-0.0008	-0.0061	-0.0054	-0.0092*	0.0017	-0.0292
	(-0.21)	(-1.30)	(-1.21)	(-1.82)	(0.40)	(-1.65)
Cluster Equity-per-Asset	-0.0125	-0.0112	-0.0073	-0.0011	-0.0034	-0.0025
	(-1.28)	(-0.97)	(-0.58)	(-0.08)	(-0.27)	(-0.11)
Book Leverage	0.5429***	0.4905***	0.5393***	0.6558***	0.5379***	0.6187
	(4.59)	(3.21)	(3.58)	(3.93)	(3.34)	(1.60)
Firm Size	-0.1840***	-0.0927***	-0.1028***	-0.0933***	-0.0786**	-0.1152*
	(-14.32)	(-2.79)	(-3.61)	(-3.20)	(-2.46)	(-1.75)
Altman z-Score	-0.0221	0.0009	0.0133	0.0175	0.0381	0.0308
	(-1.20)	(0.03)	(0.49)	(0.63)	(1.30)	(0.41)
Tangibility	-0.1879**	0.1626	0.1780	0.1644	-0.0073	0.0638
	(-2.07)	(0.92)	(1.24)	(1.14)	(-0.04)	(0.20)
Profitability	0.4803*	-0.0506	-0.1800	-0.1089	-0.3961	-1.5675
	(1.73)	(-0.15)	(-0.54)	(-0.32)	(-1.08)	(-1.43)
Market-to-Book		0.2774***	0.2872***	0.2725***	0.3025***	0.3658***
		(7.47)	(9.62)	(8.35)	(9.28)	(4.03)
KZ		0.1781***	0.1637***	0.1598***	0.1954***	-0.0705
		(3.64)	(3.70)	(3.57)	(3.81)	(-0.67)
Stock Illiquidity		-0.0062***	-0.0064***	-0.0067***	-0.0093***	-0.0051
		(-3.06)	(-3.46)	(-3.65)	(-3.77)	(-1.55)
Const	-0.6517***	-6.0607***	-1.4394***	-1.8345***	-1.5036***	-1.7913***
	(-4.68)	(-10.64)	(-3.53)	(-4.50)	(-5.71)	(-2.94)
Year Dummies	Y	Y	Y	Y	Y	Y
Rating Dummies	-	Y	Y	Y	Y	Y
Industry Dummies	-	-	Y	Y	Y	Y
Clustering at	-	Industry	Firm	Firm	Firm	Firm
Pseudo R-squared	0.0684	0.1026	0.1195	-	0.1249	0.1810
N	10622	9640	9640	9640	7834	1806

Panel B: Net Equity Issuance

	(1)	(2)	(3)	(4)	(5) N-Relation	(6) Y-Relation
Imbalance	0.0234***	0.0170***	0.0147***	0.0670***	0.0157***	0.0096
	(5.35)	(4.08)	(3.07)	(3.32)	(3.00)	(0.99)
Cluster Debt-per-Asset	0.0000	0.0000	0.0001	-0.0002	0.0001	-0.0003
	(-0.05)	(0.28)	(0.73)	(-0.95)	(0.81)	(-1.08)
Cluster Equity-per-Asset	-0.0005***	-0.0005***	-0.0005**	-0.0002	-0.0005*	-0.0004
	(-2.70)	(-2.88)	(-2.14)	(-0.66)	(-1.85)	(-0.85)
Book Leverage	0.0253***	0.0213***	0.0272***	0.0338***	0.0263***	0.0239**
	(4.98)	(3.40)	(4.63)	(4.96)	(4.13)	(1.99)
Firm Size	-0.0078***	-0.0052***	-0.0050***	-0.0045***	-0.0054***	-0.0061**
	(-15.13)	(-4.47)	(-5.07)	(-4.30)	(-4.88)	(-2.54)
Altman z-Score	-0.0017**	-0.0012	0.0001	0.0001	0.0000	0.0004
	(-2.28)	(-1.02)	(0.12)	(0.09)	(0.02)	(0.16)
Tangibility	-0.0043	0.0060	0.0015	0.0010	0.0003	0.0168*
	(-1.26)	(1.16)	(0.31)	(0.20)	(0.06)	(1.74)
Profitability	-0.0726***	-0.0831***	-0.0836***	-0.0794***	-0.0683***	-0.1934***
	(-5.23)	(-4.32)	(-4.64)	(-4.39)	(-3.53)	(-4.21)
Market-to-Book		0.0077***	0.0082***	0.0075***	0.0088***	0.0055*
		(4.63)	(5.56)	(5.13)	(5.45)	(1.71)
KZ		0.0075***	0.0075***	0.0074***	0.0090***	-0.0034
		(4.65)	(4.98)	(4.82)	(5.45)	(-1.02)
Stock Illiquidity		0.0000	0.0000	0.0000	0.0000	0.0001
		(-0.10)	(-0.29)	(-0.88)	(-0.99)	(1.09)
Const	0.0540***	0.0292***	0.0092	-0.0022	0.0210**	-0.0246
	(9.94)	(3.30)	(0.96)	(-0.20)	(2.24)	(-0.81)
Year Dummies	Y	Y	Y	Y	Y	Y
Rating Dummies	-	Y	Y	Y	Y	Y
Industry Dummies	-	-	Y	Y	Y	Y
Clustering at	-	Industry	Firm	Firm	Firm	Firm
R-squared	0.0897	0.1024	0.1156	0.1014	0.1158	0.1791
N	9375	8654	8654	8654	7005	1649

Table IV
The Impact of Imbalance on Leverage Adjustments

In this table we run a partial adjustment model to explore the impact of Imbalance on firm leverage adjustments. The dependent variable is the change in market (book) leverage from year t-1 to year t. For each year t we run a firm fixed effect regression (up to time t) of leverage on the control variables used in the main specification (not reported), and we use the fitted value at year t as the target leverage. "High Cash Flow Uncertainty" is a dummy variable with a value of 1 if the firm's cash flow volatility (up to time t-1) is above sample median and 0 otherwise. In Column (3) we approximate imbalance using the predicted value out of the imbalance regression in Table I Panel C2 (Column 3). In column (4)-(6) we add the interaction term of change in Imbalance and High Cash Flow Uncertainty dummy. "N-relation" represents the sub-sample without a previous banking relationship. "Y-relation" represents the sub-sample with a previous banking relationship. Panel A reports the results of market leverage adjustments and Panel B is for book leverage adjustments. ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Panel A: Market Leverage Adjustments

	(1)	(2)	(3)	(4)	(5)	(6)
					N-Relation	Y-Relation
Target Leverage-Lag Leverage	0.1456***	0.4721***	0.469***	0.4741***	0.4722***	0.5626***
	(8.34)	(27.76)	(27.29)	(28.10)	(24.95)	(14.29)
Imbalance-Lag Imbalance	-0.0628**	-0.0415**	-0.2822***	0.0224	0.0363	-0.0524
	(-2.47)	(-2.50)	(-2.82)	(1.04)	(1.58)	(-1.15)
(Imbalance-Lag Imbalance) * High Cash Flow Uncertainty				-0.1245***	-0.1534***	-0.0860
				(-3.87)	(-4.25)	(-1.13)
High Cash Flow Uncertainty				-0.0078	-0.0088	-0.0037
				(-1.58)	(-1.56)	(-0.31)
Const	0.0205**	0.0120*	0.0152**	0.0169**	0.0221***	-0.0079
	(2.23)	(1.83)	(2.25)	(2.52)	(2.93)	(-0.35)
Year Dummies	-	Y	Y	Y	Y	Y
Rating Dummies	Y	Y	Y	Y	Y	Y
Fixed Firm Effects	-	Y	Y	Y	Y	Y
Clustering at	Firm & Year	Firm	Firm	Firm	Firm	Firm
R-squared	0.0679	0.3785	0.3793	0.3801	0.4044	0.5723
N	8713	8713	8713	8713	6920	1793

Panel B: Book Leverage Adjustments

	(1)	(2)	(3)	(4)	(5)	(6)
					N-Relation	Y-Relation
Target Leverage-Lag Leverage	0.1403***	0.4557***	0.4483***	0.4568***	0.4597***	0.4815***
	(16.86)	(24.24)	(23.41)	(24.46)	(23.36)	(8.35)
Imbalance-Lag Imbalance	-0.0362***	-0.0239**	-0.2213***	0.0082	0.0082	-0.0266
	(-4.24)	(-2.06)	(-2.83)	(0.56)	(0.52)	(-0.93)
(Imbalance-Lag Imbalance) * High Cash Flow Uncertainty				-0.0625***	-0.0736***	-0.0003
				(-2.82)	(-2.98)	(-0.01)
High Cash Flow Uncertainty				-0.0072*	-0.0080*	-0.0004
				(-1.95)	(-1.88)	(-0.05)
Const	0.0147**	0.0098**	0.0129**	0.0141***	0.0180***	0.0326**
	(2.54)	(1.96)	(2.52)	(2.71)	(3.10)	(2.23)
Year Dummies	-	Y		Y	Y	Y
Rating Dummies	Y	Y		Y	Y	Y
Fixed Firm Effects	-	Y		Y	Y	Y
Clustering at	Firm & Year	Firm	Firm	Firm	Firm	Firm
R-squared	0.0666	0.3508	0.3529	0.3518	0.3813	0.5373
N	8713	8713	8713	8713	6920	1793

Table V: The Impact of Imbalance on Cash Holding-Cash Flow & Investment-Q Sensitivity

We analyze the impact of imbalance on cash holding-cash flow and investment-Q sensitivity. In Panel A, we run firm fixed effect regression of cash holding on cash flow and interact it with Imbalance. For each firm we first calculate its median imbalance over the sample period then define a high imbalance dummy variable which equals 1 if firm median is above the sample median and 0 otherwise. The High KZ dummy variable is defined in the same way. In Panel B, we run firm fixed effect regression of investment on Tobin's Q and interact it with Imbalance. In Column (4)-(6) we redefine high imbalance dummy based on the predicted value out of the imbalance regression in Table I Panel C2 (Column 3). "N-relation" is the sub-sample without a previous banking relationship. "Y-relation" is the sub-sample with a previous banking relationship. The variable definitions are detailed in the appendix. Year and Credit Rating dummies are included. ***, ** and * represent significance levels at 1%, 5% and 10% with heteroscedasticity robust standard errors with t-statistics in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Cash Holding Sensitivity to Cash Flow						
					N-Relation	Y-Relation
Cash Flow	0.2574***	0.2722***	0.2690***	0.2767**	0.3011***	0.0742
	(2.71)	(2.90)	(2.75)	(2.33)	(2.67)	(1.03)
Tobin's Q	0.0230***	0.0189***	0.0194***	0.0189***	0.0183**	0.0137**
	(3.86)	(3.11)	(3.02)	(2.94)	(2.48)	(2.59)
Cash Flow*High Imbalance	0.3002***	0.2896***	0.2948***	0.2974***	0.3037***	0.0853
	(3.76)	(3.70)	(3.60)	(3.25)	(3.32)	(0.73)
Cash Flow * High KZ	-0.1187	-0.1470	-0.1474	-0.1614	-0.1575	-0.0158
	(-1.21)	(-1.53)	(-1.42)	(-1.54)	(-1.36)	(-0.15)
Cluster Debt-per-Asset		-0.0011***	-0.0011***	-0.0012***	-0.0013***	-0.0004
		(-2.86)	(-2.68)	(-2.82)	(-2.66)	(-0.52)
Cluster Equity-per-Asset		0.0010	0.0011	0.0012	0.0006	0.0006
		(1.03)	(1.12)	(1.25)	(0.55)	(0.35)
Book Leverage		-0.1785***	-0.1805***	-0.1797***	-0.1944***	-0.0492
		(-6.30)	(-6.07)	(-6.05)	(-5.80)	(-1.13)
Tangibility		-0.0961***	-0.0947**	-0.0949**	-0.1024**	-0.0722**
		(-3.04)	(-2.40)	(-2.39)	(-2.15)	(-2.11)
Profitability		-0.0117	-0.0070	0.0041	-0.0056	-0.1049
		(-0.15)	(-0.08)	(0.05)	(-0.06)	(-1.42)
Firm Size		-0.0335***	-0.0339***	-0.0348***	-0.0366***	-0.0219***
		(-3.42)	(-3.77)	(-3.83)	(-3.49)	(-3.36)
Altman's Z-score		-0.0036	-0.0040	-0.0048	-0.0057	0.0133
		(-0.43)	(-0.45)	(-0.55)	(-0.58)	(1.65)
Const	0.0693***	0.3994***	0.5596**	0.5590**	0.4307***	0.2785***
	(5.95)	(5.82)	(2.56)	(2.52)	(6.11)	(4.31)
Year Dummies	Y	Y	Y	Y	Y	Y
Rating Dummies	Y	Y	Y	Y	Y	Y
Clustering at	-	-	Firm	Firm	Firm	Firm
R-squared	0.6417	0.6536	0.7060	0.7061	0.7073	0.8515
N	9596	9596	9596	9596	7935	1661
Panel B: Investment Sensitivity to Tobin's Q						
					N-Relation	Y-Relation
Cash Flow	0.1493***	0.1137***	0.1146***	0.1143***	0.1113***	0.1737***
	(14.24)	(10.71)	(9.78)	(9.72)	(8.93)	(4.20)
Tobin's Q	0.0013	-0.0011	-0.0013	-0.0004	-0.0008	-0.0017
	(1.08)	(-0.90)	(-0.80)	(-0.27)	(-0.47)	(-0.53)
Tobin's Q* High Imbalance	0.0043**	0.0058***	0.0058**	0.0048**	0.0057**	0.0051
	(2.35)	(3.23)	(2.38)	(2.00)	(2.30)	(0.73)
Tobin's Q* High KZ	0.0096***	0.0082***	0.0083***	0.0078***	0.0088***	0.0020
	(4.66)	(4.10)	(3.03)	(2.89)	(3.22)	(0.24)
Cluster Debt-per-Asset		0.0000	0.0000	0.0000	0.0000	0.0001
		(0.00)	(0.09)	(0.04)	(-0.14)	(0.22)
Cluster Equity-per-Asset		-0.0003	-0.0003	-0.0003	-0.0003	-0.0005
		(-1.30)	(-1.11)	(-1.03)	(-0.96)	(-0.78)
Book Leverage		-0.0654***	-0.0636***	-0.0630***	-0.0690***	-0.0845***
		(-9.39)	(-7.96)	(-7.88)	(-7.74)	(-3.22)
Tangibility		-0.0104	-0.0118	-0.0118	-0.0152	-0.0312
		(-0.79)	(-0.76)	(-0.75)	(-0.92)	(-0.64)
Profitability		0.0709***	0.0691***	0.0682***	0.0667***	0.1133**
		(4.36)	(3.75)	(3.69)	(3.42)	(2.25)
Firm Size		-0.0114***	-0.0118***	-0.0120***	-0.0108***	-0.0194**
		(-7.06)	(-6.31)	(-6.39)	(-5.26)	(-2.49)
Altman's Z-score		0.0055***	0.0059***	0.0059***	0.0046**	0.0067
		(3.56)	(3.48)	(3.53)	(2.45)	(1.20)
Const	0.0364***	0.1256***	0.1348***	0.1338***	0.1216***	0.2091***
	(13.40)	(9.80)	(7.26)	(7.38)	(8.04)	(2.67)
Year Dummies	Y	Y	Y	Y	Y	Y
Rating Dummies	Y	Y	Y	Y	Y	Y
Clustering at	-	-	Firm	Firm	Firm	Firm
R-squared	0.6547	0.6753	0.7244	0.7252	0.7278	0.8389
N	9596	9596	9596	9596	7935	1661

Table VI: Systematic Equation: The Impact of Imbalance on Cash Flow Sensitivities

We examine the simultaneous responses of investment, cash and debt policies to cash flow innovations and their interactions with our measur of Imbalance. More specifically we performs a systematic equation analysis to jointly study the impact of Imbalance on cash flow sensitivities of investment, change in cash holdings and change in book leverage. Our focus is on the interaction term of cash flow with an imbalance dummy which equals 1 if for each year the firm's Imbalance is above the top third quintile of the sample and 0 otherwise. High KZ dummy equals 1 if the firm's KZ index is above the top third of the sample and 0 otherwise. The definitions of other variables are detailed in the appendix. In Panel A we estimate the system equation through a two-stage least squares regression (2SLS) with firm fixed effects. Column (1)-(3) represent our baseline specification. In Column (4)-(6) we redefine high imbalance dummy based on the predicted value out of the imbalance regression in Table I Panel C2 (Column 3). All specifications include year and credit ratings dummies and the standard errors are clustered at firm level. As an robustness check in Panel B we differentiate all of the variables (calculate the difference between year t and year t-1) and then estimate the system equation through a three-stage least squares regression (3SLS). In Panel C, we examine the effectiveness of investment, the adjustments of cash holdings and change in capital structure on changes of Tobin's Q and relate it to the firm's bank/bond imbalance. We first estimate investment, the adjustments of cash holdings and change in capital structure by the first stage regression of the 2SLS specification in Panel A (without any information about imbalance on the right-hand side). In Column (1)-(4), we separate the sample according to imbalance. In Column (5)-(6) we redefine high imbalance dummy based on the predicted value out of the imbalance regression as before. All the specifications are clustered at the firm level. ***, ** and * represent significance levels at 1%, 5% and 10%. t-statistics are in parentheses.

Panel A: 2SLS Regression with Firm Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Δ Cash Holdings	Δ Book Leverage	Investment	Δ Cash Holdings	Δ Book Leverage
Cash Flow	0.0521**	0.2345**	-0.2890***	0.0484	0.1737	-0.2819***
	(2.13)	(2.49)	(-6.32)	(1.59)	(1.53)	(-5.92)
Cash Flow*High Imbal.	0.1194***	0.3001***	0.0801*	0.0956**	0.3414***	0.0464
	(3.25)	(3.39)	(1.81)	(2.24)	(3.20)	(0.91)
High Imbalance	-0.0059*	-0.0333***	-0.0071	-0.0080	-0.0336***	0.0009
	(-1.85)	(-3.53)	(-1.31)	(-1.45)	(-3.03)	(0.12)
Cash Flow*High KZ Dum.	0.0786**	-0.0134	0.0210	0.0848**	0.0056	0.0240
	(2.08)	(-0.14)	(0.48)	(2.13)	(0.06)	(0.55)
High KZ Dummy	-0.0051	-0.0074	-0.0032	-0.0057	-0.0097	-0.0036
	(-1.47)	(-0.74)	(-0.61)	(-1.59)	(-0.97)	(-0.69)
Investment		-0.6422***	0.2545**		-0.6362***	0.2569**
		(-4.18)	(2.61)		(-4.21)	(2.64)
Δ Cash Holdings	0.0102**		0.0186**	0.0113***		0.0194**
	(2.42)		(1.97)	(2.73)		(2.04)
Δ Book Leverage	0.1288***	0.4015***		0.1266***	0.3920***	
	(5.89)	(6.83)		(5.91)	(6.64)	
Lagged Investment	0.2653***			0.2673***		
	(8.20)			(8.29)		
Lagged Cash Holdings		-0.9484***			-0.9514***	
		(-36.12)			(-36.16)	
Lagged Book Leverage			-0.4841***			-0.4832***
			(-21.08)			(-21.06)
Tobin's Q	0.0087***	0.0556***	-0.0022	0.0089***	0.0555***	-0.0021
	(5.79)	(5.36)	(-0.69)	(6.08)	(5.34)	(-0.67)
Cluster Debt-per-Asset	0.0002	-0.0007	0.0001	0.0002	-0.0008	0.0001
	(1.31)	(-1.54)	(0.34)	(1.00)	(-1.65)	(0.29)
Cluster Equity-per-Asset	-0.0002	0.0009	-0.0011*	-0.0001	0.0009	-0.0011
	(-0.98)	(1.00)	(-1.69)	(-0.49)	(0.97)	(-1.66)
Tangibility	-0.0443**	-0.0473	0.0395	-0.0454**	-0.0448	0.0394
	(-2.45)	(-1.25)	(1.60)	(-2.53)	(-1.20)	(1.59)
Profitability	0.0281	-0.0646	0.1712***	0.0379	-0.0370	0.1758***
	(0.91)	(-0.74)	(3.32)	(1.26)	(-0.42)	(3.30)
Firm Size	-0.0187***	-0.0534***	0.0142***	-0.0192***	-0.0543***	0.0139***
	(-5.24)	(-5.49)	(3.11)	(-5.37)	(-5.54)	(3.03)
Altman's Z-score	0.0063***	-0.0017	-0.0202***	0.0061***	-0.0014	-0.0203***
	(3.04)	(-0.22)	(-3.99)	(3.05)	(-0.19)	(-3.94)
Const	0.1530***	0.4791***	-0.0375	0.1567***	0.4800***	-0.0387
	(5.05)	(6.57)	(-0.80)	(5.18)	(6.52)	(-0.83)
Year & Firm & Rating Dummies	Y	Y	Y			
R-squared	0.6668	0.7347	0.4325	0.6656	0.7352	0.4310
N	9206	9206	9206	9206	9206	9206

Table VI (Cont'd)

Panel B: 3SLS Regression with Differenced Variables

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Δ Cash Holdings	Δ Book Leverage	Investment	Δ Cash Holdings	Δ Book Leverage
Cash Flow	0.0563***	0.0296	-0.1958***	0.0504***	-0.0140	-0.2069***
	(5.63)	(1.19)	(-12.11)	(4.36)	(-0.49)	(-11.10)
Cash Flow*High Imbal.	0.0616***	0.3479***	0.0258	0.0555***	0.3322***	0.0397*
	(4.99)	(11.37)	(1.29)	(4.01)	(9.67)	(1.78)
High Imbalance	-0.0020	-0.0320***	-0.0029	-0.0025	-0.0296***	-0.0025
	(-0.92)	(-6.06)	(-0.85)	(-0.68)	(-3.25)	(-0.43)
Cash Flow* High KZ Dum.	0.0148	-0.0724**	-0.0357*	0.0211*	-0.0364	-0.0322*
	(1.28)	(-2.52)	(-1.91)	(1.82)	(-1.26)	(-1.72)
High KZ Dummy	-0.0078***	0.0134**	0.0010	-0.0083***	0.0107**	0.0008
	(-3.73)	(2.59)	(0.31)	(-3.96)	(2.07)	(0.25)
Investment		0.2587***	0.2560***		0.2665***	0.2547***
		(9.17)	(14.02)		(9.43)	(13.96)
Δ Cash Holdings	0.0121***		0.0098**	0.0130***		0.0096**
	(4.95)		(2.50)	(5.35)		(2.47)
Δ Book Leverage	0.0764***	0.0757***		0.0759***	0.0717***	
	(15.52)	(6.14)		(15.40)	(5.79)	
Lagged Investment	-0.2001***			-0.1978***		
	(-17.18)			(-16.97)		
Lagged Cash Holdings		-1.2042***			-1.2084***	
		(-141.45)			(-141.94)	
Lagged Book Leverage			-1.1053***			-1.1048***
			(-89.08)			(-89.01)
Tobin's Q	0.0113***	0.0517***	-0.0071***	0.0111***	0.0507***	-0.0072***
	(10.59)	(19.43)	(-4.10)	(10.43)	(19.01)	(-4.18)
Cluster Debt-per-Asset	0.0001	-0.0014***	0.0002	0.0001	-0.0014***	0.0003
	(0.54)	(-3.15)	(0.84)	(0.37)	(-3.16)	(0.87)
Cluster Equity-per-Asset	0.0000	0.0013	-0.0008	0.0000	0.0014	-0.0008
	(-0.11)	(1.49)	(-1.48)	(0.01)	(1.60)	(-1.47)
Tangibility	-0.0996***	0.1857***	0.0969***	-0.1013***	0.1829***	0.0974***
	(-7.33)	(5.53)	(4.45)	(-7.45)	(5.43)	(4.47)
Profitability	0.0356**	0.1710***	0.0152	0.0369**	0.1789***	0.0163
	(2.15)	(4.16)	(0.57)	(2.22)	(4.34)	(0.61)
Firm Size	-0.0121***	-0.0563***	0.0096**	-0.0122***	-0.0565***	0.0094**
	(-4.85)	(-9.07)	(2.37)	(-4.86)	(-9.08)	(2.33)
Altman's Z-score	0.0105***	-0.0135***	-0.0158***	0.0108***	-0.0120***	-0.0156***
	(6.23)	(-3.19)	(-5.61)	(6.41)	(-2.84)	(-5.53)
Const	-0.0014**	0.0030*	-0.0012	-0.0014**	0.0030*	-0.0012
	(-2.10)	(1.86)	(-1.15)	(-2.09)	(1.86)	(-1.16)
Year & Firm & Rating Dummies	Y	Y	Y	Y	Y	Y
R-squared	0.1625	0.7749	0.5822	0.1612	0.7739	0.5823
N	7415	7415	7415	7415	7415	7415

Panel C: The Effectiveness of Adjustments on Tobin's Q

	(1)	(2)	(3)	(4)	(5)	(6)
	High Imbalance		Low Imbalance		High Imb.	Low Imb.
Investment	3.3193***	4.8446***	1.4306*	1.6600*	4.2664***	2.0903***
	(2.98)	(3.88)	(1.69)	(1.78)	(3.75)	(2.69)
Δ Cash Holdings		0.0119		0.3355***	-0.0354	0.3797***
		(0.05)		(3.48)	(-0.17)	(3.75)
Δ Book Leverage		-2.5559***		-0.4370*	-1.8223***	-0.7515***
		(-4.86)		(-1.72)	(-4.08)	(-3.11)
Lagged Q	-0.7165***	-0.7327***	-0.6016***	-0.6047***	-0.7551***	-0.5499***
	(-13.03)	(-12.92)	(-11.83)	(-11.73)	(-16.91)	(-10.54)
Const	0.9399***	1.0374***	1.1002***	0.4886***	1.1872***	0.4914***
	(5.25)	(5.55)	(4.19)	(4.66)	(6.23)	(3.27)
Year & Industry & Rating Dummies	Y	Y	Y	Y	Y	Y
R-squared	0.4852	0.4119	0.5016	0.4181	0.4126	0.4139
N	3020	6186	3020	6186	3220	5986

Table VII
The Impact of Imbalance on Dividend Payout

This table reports the impact of Imbalance dividend policy. We explore the impact of Imbalance on the dividend payout ratio (data21/data13). Column (1)-(6) are tobit regressions left censored at 0. In Column (4) we run an IV tobit regression with statewide branching, mbhc activity and region/national branching serving as instruments. "N-relation" represents the sub-sample without a previous banking relationship. "Y-relation" represents the sub-sample with a previous banking relationship. Detailed definitions of each variable are provided in the appendix.

Dividend Payout

	(1)	(2)	(3)	(4)	(5)	(6)
					N-Relation	Y-Relation
Imbalance	-0.1142***	-0.0231***	-0.0186***	-0.0723***	-0.0226***	0.0019
	(-12.53)	(-4.90)	(-3.90)	(-3.41)	(-4.33)	(0.16)
Cluster Debt-per-Asset	-0.0004	-0.0002	-0.0003	0.0000	-0.0004**	0.0008*
	(-1.24)	(-1.05)	(-1.57)	(-0.06)	(-2.39)	(1.80)
Cluster Equity-per-Asset	0.0011*	0.0002	-0.0002	-0.0005	-0.0007*	0.0013**
	(1.70)	(0.71)	(-0.54)	(-1.43)	(-1.89)	(2.11)
Book Leverage	-0.1177***	-0.0241***	0.0012	-0.0063	0.0006	-0.0039
	(-11.15)	(-4.14)	(0.18)	(-0.89)	(0.08)	(-0.25)
Firm Size	0.0358***	0.0086***	0.0060***	0.0056***	0.0063***	0.0044*
	(35.89)	(11.97)	(6.71)	(6.16)	(6.28)	(1.87)
Altman z-Score	0.0119***	0.0057***	0.0093***	0.0091***	0.0110***	0.0007
	(6.40)	(5.49)	(7.03)	(6.89)	(7.37)	(0.24)
Tangibility	0.1864***	0.0355***	0.0236***	0.0241***	0.0234***	0.0164
	(25.30)	(8.91)	(4.28)	(4.34)	(3.80)	(1.27)
Profitability	0.1486***	0.1947***	0.1557***	0.1485***	0.1580***	0.1214***
	(5.71)	(10.88)	(8.33)	(7.88)	(7.52)	(2.80)
Market-to-Book		-0.0179***	-0.0155***	-0.0150***	-0.0164***	-0.0123***
		(-13.59)	(-11.62)	(-11.02)	(-11.06)	(-3.73)
KZ		-0.0191***	-0.0215***	-0.0222***	-0.0213***	-0.0255***
		(-12.95)	(-13.26)	(-13.49)	(-11.95)	(-5.48)
Stock Illiquidity		0.0000	0.0000	0.0000	0.0000	0.0000
		(0.55)	(-0.08)	(0.38)	(-0.23)	(-0.18)
Lag Dividend Payout		0.9544***	0.8447***	0.8343***	0.8430***	0.8076***
		(104.94)	(82.54)	(76.16)	(73.31)	(26.65)
Const	-0.2708***	-0.1140***	-0.1322***	-0.1136***	-0.1333***	-0.0955***
	(-23.01)	(-17.33)	(-8.40)	(-6.58)	(-7.29)	(-2.98)
Year Dummies	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	Y	Y	Y	Y
Industry Dummies	-	-	Y	Y	Y	Y
N	10554	9722	9722	9722	7904	1818

Table VIII
The Impact of Imbalance on Means of Payment in Mergers and Acquisitions

In this table we run a probit model to explore the impact of Imbalance on the means of payment in mergers and acquisitions. Our sample on M&A events are obtained from SDC Mergers and Acquisitions database. We require the deal value to be at least 10 million dollars. We decide the means of payment by looking at the "consider" keyword from SDC. The dependent variable in Column (1)-(3) takes a value of 1 if cash is used as a means of payment and 0 otherwise. The dependent variable in Column (4)-(6) equals 1 if cash is used as the only means of payment and 0 otherwise. Column (1) only contains bidder characteristics. In Column (2) we add merger characteristics such as deal value, friendly offer and tender offer as well as target characteristics. In Column (3) and (6) we run an IV probit regression with statewide branching, mbhc activity and region/national branching as instruments.To deal with the potential self-selection problem we run a first stage probit regression (not reported) to analyze the possibility of being a bidder and include the Heckman's Lambda to the second stage regression to examine the choice of payment. Detailed definitions of each variable are provided in the appendix. ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)
		Payment: Cash			Payment: Cash Only	
Bidder Characteristics						
Imbalance	-0.9721***	-1.6422***	-4.240***	-0.8436***	-1.3858***	-3.579***
	(-4.94)	(-3.71)	(-4.62)	(-5.39)	(-3.23)	(-3.12)
Cluster Debt-per-Asset	0.0065	0.0116	0.0359	0.0012	0.0048	0.0211
	(0.61)	(0.36)	(1.14)	(0.15)	(0.22)	(0.86)
Cluster Equity-per-Asset	0.0129	0.0112	-0.0077	0.0144	-0.0158	-0.0249
	(0.99)	(0.43)	(-0.30)	(1.31)	(-0.80)	(-1.15)
Heckman's Lambda	0.2846	0.3142	-0.4166	-0.0791	-1.1367*	-2.5007**
	(0.92)	(0.31)	(-0.43)	(-0.31)	(-1.73)	(-2.46)
Book Leverage	0.6828***	1.3387**	1.3256**	0.0146	1.1179**	0.9721*
	(3.51)	(2.57)	(2.56)	(0.09)	(2.24)	(1.95)
Firm Size	-0.0616*	0.0378	0.0530	0.0766***	0.1647*	0.2536**
	(-1.87)	(0.31)	(0.45)	(2.76)	(1.71)	(2.15)
Altman z-Score	0.0608	0.2590***	0.2495***	-0.0660*	0.0769	0.0573
	(1.26)	(2.69)	(2.76)	(-1.73)	(0.90)	(0.62)
Tangibility	0.5926***	0.8597	0.6595	0.2745*	0.3081	-0.2037
	(3.12)	(1.33)	(1.07)	(1.93)	(0.53)	(-0.32)
Profitability	0.5592	-1.4918	-1.4895	2.2290***	0.5222	0.7488
	(1.01)	(-1.29)	(-1.34)	(4.66)	(0.47)	(0.64)
Market-to-Book	-0.2666***	-0.1232	-0.0563	-0.2098***	0.1448*	0.2432**
	(-6.87)	(-1.20)	(-0.56)	(-5.71)	(1.93)	(2.51)
KZ	-0.0375	0.0868	0.1607**	-0.0573	0.1287	0.1905**
	(-0.84)	(1.02)	(1.98)	(-1.52)	(1.52)	(2.24)
Stock Illiquidity	-0.0006	0.0029	0.0036*	-0.0006	0.0044**	0.0052***
	(-0.56)	(1.29)	(1.78)	(-0.72)	(2.23)	(2.65)
Merger Characteristics						
Deal Value		-0.4024***	-0.3361***		-0.5687***	-0.5083***
		(-6.05)	(-4.36)		(-8.81)	(-6.24)
Friendly Offer		0.0037	0.0679		-0.1514	-0.1462
		(0.02)	(0.34)		(-0.75)	(-0.74)
Tender Offer		1.7376***	1.5449***		1.7983***	1.7171***
		(7.73)	(6.50)		(10.50)	(8.49)
Target Characteristics						
Book Leverage		0.5913	0.3114		-0.5874	-0.5126
		(1.54)	(0.81)		(-1.48)	(-1.30)
Firm Size		0.2257***	0.2208***		0.1841***	0.1556**
		(3.32)	(3.10)		(2.74)	(2.26)
Altman z-Score		-0.1096	-0.1427**		-0.1314**	-0.1632**
		(-1.63)	(-2.20)		(-2.05)	(-2.37)
Tangibility		-0.0477	-0.0922		-0.3159	-0.4976
		(-0.10)	(-0.19)		(-0.73)	(-1.10)
Profitability		-0.1087	0.0788		1.0176*	1.1626**
		(-0.16)	(0.12)		(1.78)	(1.97)
Market-to-Book		-0.1139*	-0.1308**		-0.0358	-0.0745
		(-1.95)	(-2.27)		(-0.65)	(-1.33)
Const	1.5299***	4.2133***	1.9506*	-0.0758	2.0364**	1.4097
	(5.32)	(3.91)	(1.79)	(-0.33)	(2.30)	(1.28)
Year Dummies	Y	Y	Y	Y	Y	Y
Industry Dummies	-	Y	Y	-	Y	Y
Rating Dummies	-	Y	Y	-	Y	Y
Pseudo R-squared	0.1346	0.3686	-	0.0925	0.3881	-
N	2905	622	622	2905	622	622

Table IX
The Impact of Imbalance on Idiosyncratic Volatility

This table examines the impact of Imbalance on firm's idiosyncratic volatility. In Panel A we run a Fama-Mecbeth regression with idiosyncratic volatility calculated from CRSP daily returns. The dependent variable in Column (1)-(5) is idiosyncratic volatility derived from a 1-factor market model. The dependent variable in Column (6)-(10) is idiosyncratic volatility derived from a Fama-French 4-factor model. Detailed definition of idiosyncratic volatility and other control variables can be found in the appendix. "High Cash Flow Uncertainty " is a dummy variable with a value of 1 if the firm's cash flow volatility (up to time t-1) is above sample median and 0 otherwise. In column (3)-(5) and (8)-(10) we interact Imbalance with the cash flow shock dummy. "N-relation" represents the sub-sample without a previous banking relationship. "Y-relation" represents the sub-sample with a previous banking relationship. Some robust checks are provided in Panel B where idiosyncratic volatility is calculated based on CRSP monthly returns. We also report separately the one-factor model idiosyncratic volatility and 4-factor model idiosyncratic volatility.

Panel A: Fama-Mecbeth Regression with Idiosyncratic Volatility Calculated from Daily Returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	One Factor Model					Four Factor Model				
				N-Relation	Y-Relation				N-Relation	Y-Relation
Imbalance	0.0043***	0.0028***	0.0008**	0.0012***	0.0026**	0.0040***	0.0026***	0.0007***	0.0012***	0.0025**
	(13.27)	(10.51)	(2.53)	(3.04)	(2.34)	(13.16)	(10.64)	(2.66)	(3.47)	(2.21)
Imbalance * High Cash Flow Uncertainty			0.0027***	0.0023***	0.0014			0.0024***	0.0019***	0.0020
			(5.39)	(4.14)	(0.42)			(4.98)	(3.55)	(0.57)
High Cash Flow Uncertainty			0.0016***	0.0018***	0.0016***			0.0016***	0.0018***	0.0015***
			(15.00)	(14.96)	(3.11)			(16.53)	(16.37)	(3.05)
Cluster Debt-per-Asset	0.0000**	0.0000	0.0000	0.0000***	-0.0001	0.0000**	0.0000	0.0000	0.0000***	-0.0001
	(-2.24)	(-0.12)	(0.50)	(3.06)	(-0.95)	(-2.50)	(-0.36)	(0.17)	(2.74)	(-0.97)
Cluster Equity-per-Asset	0.0004***	0.0001*	0.0001**	0.0001	0.0000	0.0004***	0.0001	0.0001*	0.0001	-0.0001
	(6.32)	(1.79)	(2.02)	(1.63)	(-0.21)	(6.30)	(1.52)	(1.78)	(1.50)	(-0.52)
Book Leverage		0.0027***	0.0032***	0.0037***	0.0113***		0.0031***	0.0036***	0.0042***	0.0124***
		(9.34)	(11.12)	(11.47)	(2.89)		(10.93)	(12.79)	(13.32)	(2.99)
Firm Size		-0.0015***	-0.0014***	-0.0015***	-0.0004		-0.0016***	-0.0015***	-0.0016***	-0.0004
		(-21.94)	(-20.13)	(-22.19)	(-1.10)		(-23.44)	(-21.54)	(-23.62)	(-1.17)
Altman z-Score		-0.0003***	-0.0002***	-0.0003***	0.0008		-0.0003***	-0.0002***	-0.0003***	0.0008
		(-6.46)	(-4.41)	(-5.82)	(1.64)		(-6.46)	(-4.28)	(-5.45)	(1.51)
Tangibility		-0.0020***	-0.0016***	-0.0018***	-0.0002		-0.0022***	-0.0019***	-0.0020***	-0.0007
		(-9.38)	(-7.19)	(-7.78)	(-0.25)		(-11.23)	(-8.97)	(-9.48)	(-0.73)
Profitability		-0.0132***	-0.0135***	-0.0124***	-0.0201***		-0.0130***	-0.0133***	-0.0125***	-0.0190***
		(-15.77)	(-15.84)	(-14.13)	(-9.88)		(-16.10)	(-16.22)	(-14.47)	(-10.07)
Market-to-Book		0.0006***	0.0006***	0.0006***	-0.0010		0.0006***	0.0005***	0.0005***	-0.0013*
		(8.58)	(8.37)	(7.83)	(-1.53)		(7.64)	(7.40)	(6.90)	(-1.76)
KZ		0.0016***	0.0016***	0.0016***	-0.0002		0.0017***	0.0016***	0.0017***	-0.0002
		(26.90)	(26.49)	(25.78)	(-0.58)		(28.13)	(27.58)	(27.12)	(-0.47)
Const	0.0225***	0.0357***	0.0336***	0.0350***	0.0232***	0.0229***	0.0368***	0.0348***	0.0356***	0.0237***
	(32.98)	(43.96)	(42.43)	(39.33)	(6.49)	(31.97)	(43.41)	(41.72)	(38.34)	(6.33)
Rating Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	112153	107700	102787	82379	20408	112153	107700	102787	82379	20408

Table IX (Cont'd)

Panel B: Robust Check: OLS Regression with Idiosyncratic Volatility Calculated from Monthly Returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	One Factor Model					Four Factor Model				
				N-Relation	Y-Relation				N-Relation	Y-Relation
Imbalance	0.0197***	0.0160***	0.0136***	0.0156***	0.0055	0.0158***	0.0126***	0.0100***	0.0118***	0.0014
	(8.19)	(3.49)	(4.09)	(4.50)	(0.81)	(7.60)	(3.40)	(3.51)	(3.90)	(0.25)
Cluster Debt-per-Asset	0.0002**	0.0002**	0.0002**	0.0002**	0.0000	0.0002**	0.0002**	0.0002**	0.0002**	0.0001
	(2.48)	(2.07)	(2.32)	(2.28)	(0.24)	(2.36)	(2.06)	(2.25)	(2.05)	(0.70)
Cluster Equity-per-Asset	0.0006***	0.0000	0.0003	0.0004*	-0.0001	0.0006***	0.0000	0.0003**	0.0004**	0.0001
	(4.05)	(-0.06)	(1.40)	(1.80)	(-0.34)	(4.23)	(0.20)	(2.03)	(2.13)	(0.50)
Book Leverage		-0.0048	0.0023	0.0035	-0.0045		-0.0056	0.0003	0.0023	-0.0111*
		(-0.92)	(0.56)	(0.77)	(-0.61)		(-1.27)	(0.08)	(0.61)	(-1.69)
Firm Size		-0.0033***	-0.0038***	-0.0044***	-0.0010		-0.0031***	-0.0035***	-0.0040***	-0.0006
		(-5.45)	(-7.58)	(-7.68)	(-1.12)		(-5.53)	(-8.04)	(-8.11)	(-0.80)
Altman z-Score		-0.0001	-0.0021**	-0.0032***	0.0026*		0.0006	-0.0009	-0.0016**	0.0026*
		(-0.05)	(-2.50)	(-3.40)	(1.76)		(0.43)	(-1.18)	(-2.04)	(1.94)
Tangibility		-0.0196***	-0.0096**	-0.0100**	-0.0003		-0.0157**	-0.0078**	-0.0088**	0.0032
		(-2.69)	(-2.45)	(-2.35)	(-0.05)		(-2.37)	(-2.37)	(-2.46)	(0.52)
Profitability		-0.0669***	-0.0667***	-0.0555***	-0.0959***		-0.0512***	-0.0529***	-0.0441***	-0.0683***
		(-4.61)	(-6.47)	(-4.99)	(-4.54)		(-4.39)	(-5.86)	(-4.58)	(-3.65)
Market-to-Book		0.0056***	0.0041***	0.0040***	0.0025*		0.0055***	0.0040***	0.0040***	0.0024*
		(4.77)	(6.15)	(5.63)	(1.69)		(5.23)	(7.21)	(6.66)	(1.89)
KZ		0.0110***	0.0079***	0.0080***	0.0054***		0.0101***	0.0075***	0.0076***	0.0057***
		(4.51)	(8.65)	(8.52)	(2.91)		(4.51)	(9.05)	(9.10)	(3.04)
Const	0.0708***	0.1086***	0.1283***	0.1391***	0.0976***	0.0701***	0.1012***	0.1099***	0.1142***	0.0879***
	(40.98)	(18.41)	(15.00)	(10.25)	(6.91)	(47.58)	(23.26)	(17.47)	(12.88)	(7.55)
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	-	-	Y	Y	Y	-	-	Y	Y	Y
Clustering at	-	Industry	Firm	Firm	Firm	-	Industry	Firm	Firm	Firm
R-squared	0.3342	0.4078	0.4501	0.4531	0.4884	0.3320	0.4060	0.4491	0.4498	0.4983
N	8709	8356	8356	6738	1618	8709	8356	8356	6738	1618

Table IX (Cont'd)
Panel C: The Interaction of Debt Imbalance with Analyst Dispersion

In this panel we further explore the impact of debt imbalance on firm's idiosyncratic volatility by focusing on the interaction term of imbalance and the dispersion of analyst earnings forcasts. Like Panel A we run a Fama-Mecbeth regression with idiosyncratic volatility calculated from CRSP daily returns. The dependent variable in Column (1)-(5) is idiosyncratic volatility derived from a 1-factor market model. The dependent variable in Column (6)-(10) is idiosyncratic volatility derived from a Fama-French 4-factor model. The data on analyst earnings forcasts are obtained from I/B/E/S. For each firm-year, our measure of analyst dispersion is equal to the standard deviation of all outstanding analyst forcasts of long-term growth in the past two years. To have a credible measure of standard deviation we constrain the number of outstanding analyst forcasts to be larger than 5 in Column (1)-(3), (6)-(8) and change the constraint into 10 in Column (4)-(5), (9)-(10) as robust checks. We create a high analyst dispersion dummy which equals 1 if the firm's analyst dispersion is above the top third quantile in the year and 0 otherwise. Then we interact imbalance with the high analyst dispersion dummy.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	One Factor Model					Four Factor Model				
Imbalance	0.0048***	0.0018***	0.0007**	0.0021***	0.0007	0.0048***	0.0018***	0.0007**	0.0020***	0.0005
	(11.20)	(5.07)	(2.39)	(4.16)	(1.60)	(11.47)	(5.05)	(2.32)	(4.21)	(1.27)
Imbalance * High Analyst Dispersion	0.0081***	0.0077***	0.0063***	0.0076***	0.0051***	0.0070***	0.0068***	0.0056***	0.0066***	0.0044***
	(11.43)	(12.65)	(12.11)	(9.89)	(8.14)	(10.99)	(12.55)	(11.77)	(9.95)	(8.22)
High Analyst Dispersion	0.0036***	0.0019***	0.0014***	0.0021***	0.0019***	0.0038***	0.0020***	0.0015***	0.0022***	0.0020***
	(21.57)	(13.57)	(11.17)	(11.88)	(11.80)	(23.95)	(15.40)	(12.95)	(13.64)	(13.55)
Cluster Debt-per-Asset	0.0000*	0.0000	0.0000	0.0000	0.0000	0.0000*	0.0000	0.0000	0.0000*	0.0000
	(1.86)	(1.07)	(1.64)	(-1.25)	(-0.23)	(1.88)	(0.95)	(1.36)	(-1.83)	(-0.74)
Cluster Equity-per-Asset	0.0002***	0.0001	0.0002***	0.0001*	0.0003***	0.0002***	0.0001	0.0002***	0.0001**	0.0003***
	(3.07)	(0.87)	(2.73)	(1.86)	(4.52)	(3.11)	(0.96)	(2.73)	(2.14)	(4.74)
Book Leverage		0.0008***	0.0005*	-0.0008**	-0.0009**		0.0013***	0.0008**	-0.0003	-0.0007*
		(2.65)	(1.75)	(-2.16)	(-2.39)		(4.08)	(2.64)	(-0.94)	(-1.86)
Firm Size		-0.0017***	-0.0011***	-0.0015***	-0.0008***		-0.0018***	-0.0011***	-0.0016***	-0.0008***
		(-41.20)	(-16.38)	(-37.25)	(-12.18)		(-40.82)	(-17.17)	(-36.76)	(-12.57)
Altman z-Score		0.0007***	0.0000	0.0005***	-0.0002**		0.0008***	0.0000	0.0006***	-0.0001*
		(12.08)	(0.06)	(8.00)	(-2.14)		(12.91)	(0.15)	(9.07)	(-1.68)
Tangibility		-0.0039***	-0.0012***	-0.0040***	-0.0018***		-0.0041***	-0.0015***	-0.0043***	-0.0022***
		(-14.13)	(-3.69)	(-14.01)	(-4.86)		(-16.73)	(-5.00)	(-16.40)	(-6.28)
Profitability		-0.0177***	-0.0154***	-0.0120***	-0.0111***		-0.0173***	-0.0143***	-0.0118***	-0.0106***
		(-13.74)	(-13.57)	(-8.58)	(-8.60)		(-14.41)	(-12.98)	(-9.00)	(-8.44)
Market-to-Book		0.0011***	0.0007***	0.0010***	0.0008***		0.0010***	0.0006***	0.0009***	0.0007***
		(15.02)	(10.18)	(13.67)	(10.83)		(14.78)	(9.27)	(13.27)	(9.95)
KZ		0.0024***	0.0011***	0.0023***	0.0012***		0.0024***	0.0012***	0.0024***	0.0012***
		(33.18)	(16.67)	(27.66)	(14.14)		(35.82)	(18.54)	(29.33)	(15.17)
Const	0.0171***	0.0343***	0.0331***	0.0327***	0.0289***	0.0170***	0.0344***	0.0334***	0.0327***	0.0294***
	(42.52)	(61.95)	(41.99)	(54.68)	(38.91)	(43.30)	(59.41)	(41.51)	(53.85)	(38.92)
Rating Dummies	N	N	Y	N	Y	N	N	Y	N	Y
Industry Dummies	N	N	Y	N	Y	N	N	Y	N	Y
N	67843	65633	65633	45388	45388	67843	65633	65633	45388	45388

Table X
The Impact of Imbalance on Market Beta

This table examines the impact of Imbalance on firm's market beta. We run a Fama-Mecbeth regression with beta derived from a value-weighted market model. The dependent variable in Column (1)-(5) is the monthly average beta calculated from daily returns. The dependent variable in Column (6)-(10) is beta calculated from monthly returns. Detailed definition of beta and other control variables can be found in the appendix. "High Cash Flow Uncertainty " is a dummy variable with a value of 1 if the firm's cash flow volatility (up to year t-1) is above sample median and 0 otherwise. In column (3)-(5) and (8)-(10) we interact Imbalance with the cash flow shock dummy. "N-relation" represents the sub-sample without a previous banking relationship. "Y-relation" represents the sub-sample with a previous banking relationship. Credit rating dummies and industry dummies are included in all specifications.

Panel A: Debt Imbalance and Market Beta

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Average Beta: Daily Return					Beta: Monthly Return				
				N-Relation	Y-Relation				N-Relation	Y-Relation
Imbalance	0.4418***	0.2853***	0.1181***	0.1221***	-0.2769**	0.2958***	0.1400***	-0.0605***	-0.0330	-0.2418***
	(17.07)	(16.15)	(9.78)	(7.99)	(-2.41)	(11.07)	(7.07)	(-3.23)	(-1.12)	(-4.03)
Imbalance * High Cash Flow Uncertainty			0.2809***	0.2798***	0.8475***			0.2807***	0.2924***	0.0277
			(8.94)	(7.54)	(3.38)			(7.78)	(6.59)	(0.22)
High Cash Flow Uncertainty			0.0264***	0.0263***	0.0541			0.0422***	0.0407***	0.1272***
			(3.81)	(3.18)	(1.37)			(3.93)	(3.11)	(6.49)
Cluster Debt-per-Asset	0.0019**	0.0029***	0.0030***	0.0043***	-0.0054	0.0003	0.0005	0.0010	0.0024***	-0.0157***
	(2.32)	(4.96)	(5.46)	(6.82)	(-0.91)	(0.36)	(0.70)	(1.39)	(3.01)	(-3.35)
Cluster Equity-per-Asset	0.0206***	0.0218***	0.0228***	0.0285***	-0.0172*	0.0102***	0.0013	0.0017	0.0020	-0.0416**
	(6.90)	(6.74)	(6.83)	(7.32)	(-1.82)	(4.74)	(0.69)	(0.83)	(0.95)	(-2.53)
Book Leverage		-0.5304***	-0.4781***	-0.4938***	0.0710		-0.4446***	-0.4171***	-0.4211***	-0.6637***
		(-32.63)	(-30.61)	(-27.76)	(0.49)		(-24.09)	(-21.78)	(-20.33)	(-6.13)
Firm Size		0.0916***	0.0902***	0.0922***	0.1533***		0.0506***	0.0531***	0.0552***	0.0511***
		(30.31)	(28.42)	(29.27)	(7.11)		(21.57)	(22.14)	(19.42)	(3.72)
Altman z-Score		-0.0839***	-0.0710***	-0.0753***	0.0241		-0.0745***	-0.0634***	-0.0705***	-0.0132
		(-22.72)	(-20.80)	(-19.81)	(1.00)		(-17.30)	(-14.88)	(-15.12)	(-0.70)
Tangibility		-0.0478***	-0.0318**	-0.0463***	0.3375***		-0.1026***	-0.0632***	-0.0877***	-0.0858**
		(-3.87)	(-2.52)	(-3.51)	(5.83)		(-6.46)	(-4.25)	(-5.26)	(-2.01)
Profitability		-0.3404***	-0.4440***	-0.3913***	-1.8878***		-0.6120***	-0.7517***	-0.6934***	-1.0990***
		(-5.30)	(-7.31)	(-6.23)	(-5.86)		(-5.51)	(-6.72)	(-6.02)	(-5.76)
Market-to-Book		0.1713***	0.1641***	0.1617***	0.0276		0.1015***	0.0997***	0.0916***	-0.0038
		(26.50)	(23.90)	(22.15)	(0.70)		(15.89)	(14.64)	(12.50)	(-0.16)
KZ		0.0566***	0.0488***	0.0449***	-0.0232		0.0640***	0.0583***	0.0605***	-0.0528**
		(9.57)	(8.47)	(6.90)	(-0.74)		(12.00)	(11.45)	(10.08)	(-2.44)
Const	0.4745***	0.2089***	0.1498**	0.0932	-0.3960**	0.7032***	0.7589***	0.6258***	0.9456***	1.0378***
	(9.31)	(3.48)	(2.43)	(1.46)	(-2.10)	(12.56)	(15.13)	(12.26)	(17.43)	(7.75)
Rating Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	112153	107700	102787	82379	20408	112153	107700	102787	82379	20408

Table X (Cont'd)
Panel B: The Interaction of Debt Imbalance with Analyst Dispersion

In this panel we further explore the impact of debt imbalance on firm's market beta by focusing on the interaction term of imbalance and the dispersion of analyst earnings forcasts. Like Panel A we run a Fama-Mecbeth regression with beta derived from a value-weighted market model. The dependent variable in Column (1)-(5) is the monthly average beta calculated from daily returns. The dependent variable in Column (6)-(10) is beta calculated from monthly returns. The data on analyst earnings forcasts are obtained from I/B/E/S. For each firm-year, our measure of analyst dispersion is equal to the standard deviation of all outstanding analyst forcasts of long-term growth in the past two years. To have a credible measure of standard deviation we constrain the number of outstanding analyst forcasts to be larger than 5 in Column (1)-(3), (6)-(8) and change the constraint into 10 in Column (4)-(5), (9)-(10) as robust checks. We create a high analyst dispersion dummy which equals 1 if the firm's analyst dispersion is above the top third quantile in the year and 0 otherwise. Then we interact imbalance with the high analyst dispersion dummy.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Average Beta: Daily Return					Beta: Monthly Return				
Imbalance	0.2876***	0.2243***	0.1436***	0.2251***	0.1107***	0.3765***	0.2291***	0.1865***	0.2318***	0.1592***
	(7.82)	(9.99)	(8.69)	(9.16)	(6.02)	(9.64)	(9.97)	(9.43)	(8.45)	(6.14)
Imbalance * High Analyst Dispersion	0.6604***	0.5197***	0.4168***	0.5877***	0.5157***	0.3048***	0.2524***	0.2138***	0.2115***	0.0933***
	(11.27)	(10.58)	(11.24)	(10.25)	(11.52)	(6.40)	(6.77)	(7.97)	(4.65)	(2.88)
High Analyst Dispersion	0.0905***	0.0627***	0.0407***	0.0598***	0.0389***	0.2173***	0.1362***	0.0540***	0.1565***	0.0857***
	(7.29)	(6.12)	(5.13)	(4.81)	(4.20)	(14.77)	(13.12)	(6.62)	(10.71)	(7.10)
Cluster Debt-per-Asset	0.0047***	0.0071***	0.0033***	0.0086***	0.0034***	0.0060***	0.0069***	0.0023***	0.0075***	0.0022***
	(4.28)	(8.85)	(6.52)	(9.75)	(6.49)	(4.53)	(7.93)	(3.14)	(7.20)	(2.70)
Cluster Equity-per-Asset	0.0346***	0.0209***	0.0108***	0.0239***	0.0107***	0.0305***	0.0060**	0.0018	0.0152***	0.0065***
	(7.17)	(6.19)	(3.66)	(5.99)	(3.60)	(7.76)	(2.01)	(0.79)	(4.85)	(3.94)
Book Leverage		-0.5197***	-0.4507***	-0.5902***	-0.5070***		-0.4084***	-0.3560***	-0.5059***	-0.4247***
		(-33.84)	(-25.97)	(-31.97)	(-20.84)		(-17.72)	(-14.12)	(-18.42)	(-14.56)
Firm Size		0.0242***	0.0602***	0.0078	0.0421***		-0.0192***	0.0188***	-0.0308***	0.0047*
		(4.56)	(15.13)	(1.65)	(10.42)		(-8.66)	(5.81)	(-12.44)	(1.69)
Altman z-Score		-0.0286***	-0.0397***	-0.0278***	-0.0482***		-0.0285***	-0.0371***	-0.0148***	-0.0297***
		(-6.36)	(-10.11)	(-5.43)	(-9.29)		(-9.09)	(-6.76)	(-4.23)	(-5.15)
Tangibility		-0.3557***	0.0189	-0.4183***	0.0469**		-0.5844***	-0.0408	-0.5824***	0.0571**
		(-16.89)	(0.94)	(-17.17)	(2.23)		(-29.16)	(-1.62)	(-29.60)	(2.32)
Profitability		-0.5934***	-0.7515***	-0.2828*	-0.4237***		-0.8900***	-1.1502***	-0.6114***	-1.0005***
		(-4.50)	(-7.06)	(-1.81)	(-3.09)		(-5.18)	(-7.77)	(-3.53)	(-7.19)
Market-to-Book		0.1282***	0.1332***	0.1014***	0.1055***		0.0794***	0.0871***	0.0624***	0.0792***
		(23.66)	(24.00)	(20.22)	(21.08)		(14.63)	(18.14)	(12.40)	(17.25)
KZ		0.1291***	0.0348***	0.1376***	0.0383***		0.1348***	0.0375***	0.1389***	0.0404***
		(25.05)	(6.42)	(24.87)	(5.75)		(32.83)	(6.73)	(26.09)	(5.30)
Const	0.7195***	0.9364***	0.2200***	1.1104***	0.2551***	0.7558***	1.4902***	0.8495***	1.5564***	0.7950***
	(48.60)	(19.25)	(3.45)	(24.14)	(3.08)	(38.17)	(68.86)	(12.49)	(66.12)	(12.33)
Rating Dummies	N	N	Y	N	Y	N	N	Y	N	Y
Industry Dummies	N	N	Y	N	Y	N	N	Y	N	Y
N	67843	65633	65633	45388	45388	67843	65633	65633	45388	45388

Table XI: Portfolio Regression

In this table we form portfolios based on levels of Imbalance and study the alpha and loadings on risk factors. We first calculate median imbalance for each firm over the sample period and group firm medians into quintiles from low (1) to high (5) and then construct value-weighted portfolios for each quantile. Panel A1 reports the loadings on market factor for our 5 portfolios under different factor models: 1-factor (market factor), 3-factor (market factor, HML, SMB), 4-factor (market factor, HML, SMB, momentum) and 6-factor (market factor, HML, SMB, momentum, term spread, risk spread). Detailed definition of risk factors can be found in the appendix. In Panel A2 we test the differences in factor loadings by stacking all the monthly portfolio returns and adding interaction terms of risk factors and the Imbalance index. In Panel C we long the portfolio with high imbalance index (level 5) and short the portfolio with low imbalance index (level 1) and examine the abnormal return (alpha) of this long-short portfolio. ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Panel A: Loadings on Market Factor

Imbalance Index	One-Factor Model	Three-Factor Model	Four-Factor Model	Six-Factor Model
1	0.69	0.73	0.75	0.75
2	0.74	0.82	0.81	0.81
3	0.82	0.90	0.90	0.91
4	0.81	0.92	0.91	0.93
5	1.12	1.00	0.98	1.00

Panel B: Test Differences in Factor Loadings

	(1)	(2)	(3)	(4)	(5)	(6)
Imbalance Index	0.0011	0.0017**	0.0009	0.0011*	0.0010	-0.0026
	(1.58)	(2.37)	(1.41)	(1.74)	(0.65)	(-1.04)
Market Factor	0.5649***	0.7137***	0.6854***	0.7006***	0.7005***	0.7003***
	(8.67)	(11.03)	(11.46)	(11.24)	(11.14)	(11.05)
Market Factor * Imbalance Index	0.0916***	0.0550**	0.0628***	0.0565***	0.0565***	0.0601***
	(4.59)	(2.57)	(3.17)	(2.81)	(2.81)	(2.98)
HML		0.3422***	0.0788	0.0876	0.0946	0.0946
		(3.61)	(0.88)	(0.99)	(1.09)	(1.10)
HML * Imbalance Index		-0.0844**	-0.0110	-0.0146	-0.0148	-0.0146
		(-2.57)	(-0.39)	(-0.53)	(-0.55)	(-0.54)
SMB			-0.4878***	-0.4961***	-0.4839***	-0.4837***
			(-7.33)	(-7.61)	(-7.32)	(-7.22)
SMB * Imbalance Index			0.1360***	0.1394***	0.1390***	0.1360***
			(5.65)	(5.87)	(5.78)	(5.52)
Momentum				0.0471	0.0437	0.0436
				(0.95)	(0.90)	(0.90)
Momentum * Imbalance Index				-0.0196	-0.0195	-0.0174
				(-1.15)	(-1.18)	(-1.07)
Term Spread					-0.0027	-0.0027
					(-1.37)	(-1.35)
Term Spread * Imbalance Index					0.0001	0.0000
					(0.14)	(-0.04)
Risk Spread						-0.0001
						(-0.02)
Risk Spread * Imbalance Index						0.0018
						(1.59)
Const	0.0042*	0.0016	0.0044**	0.0039*	0.0091*	0.0093
	(1.91)	(0.74)	(2.14)	(1.86)	(1.92)	(1.19)
R-squared	0.6624	0.6729	0.6987	0.6998	0.7038	0.7089
N	900	900	900	900	900	900

Panel C: Alpha of Long-Short Imbalance Portfolio

Portfolio: Long High & Short Low	(1)	(2)	(3)	(4)	(5)	(6)
Market Factor	0.4260***	0.2275*	0.2620**	0.2328**	0.2327**	0.2422**
	(3.79)	(1.84)	(2.33)	(2.09)	(2.08)	(2.17)
HML		-0.4566***	-0.1357	-0.1526	-0.1519	-0.1513
		(-3.02)	(-1.15)	(-1.32)	(-1.30)	(-1.28)
SMB			0.5943***	0.6103***	0.6116***	0.6036***
			(6.73)	(6.72)	(6.61)	(6.36)
Momentum				-0.0904	-0.0908	-0.0852
				(-1.35)	(-1.35)	(-1.25)
Term Spread					-0.0003	-0.0006
					(-0.10)	(-0.20)
Risk Spread						0.0048
						(0.88)
Alpha	0.0043	0.0078**	0.0044	0.0054*	0.0060	-0.0036
	(1.25)	(2.14)	(1.39)	(1.71)	(0.87)	(-0.30)
R-squared	0.1372	0.2197	0.3936	0.4016	0.4017	0.4045
N	180	180	180	180	180	180

Table XII:
The Impact of Imbalance on Bond Yield Spread

This table analyzes the impact of Imbalance on corporate bond yield spread. Our data on bond yield, time-to-maturity and coupon rate are obtained from Bloomberg. The data on Treasury constant maturity interest rates are obtained from the FRED database (Federal Reserve Bank of St. Louis). Institutional bond holdings and trading volume are calculated from Lipper/Emaxx database. Bond yield spread is defined as the difference between bond yield and corresponding treasury yield with same time to maturity. Detailed definitions of other variables can be found in the appendix.

In Column (1)-(5) we perform Fama-Mecbeth regression using data on monthly bond yield spread. Column (1) is our base specificaiton where only issue characteristics are included. In Column (2) we control for firm characteristics and include a cash flow uncertainty dummy variable which equals 1 if the volatility of cash flow shocks is above sample median and 0 otherwise. We then add the interaction term of Imbalance with high cash flow uncertainty dummy in Column (3). In Clumn(4)-(5) we split the sample according to bond issuers with or without banking relationships.

In Column (6)-(10) we use median yield spread for each bond issue-year as dependent variable and run OLS regressions with similar specifications. From Column (7)-(10) bond issuer fixed effects are included in the regression. All regressions include year dummies, credit rating dummies and two-digit SIC industry dummies. ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Table XII (Cont'd)
The Impact of Imbalance on Bond Yield Spread

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Fama-Mecbeth Regression: Monthly Bond Yield Spread					OLS regression: Yearly Bond Yield Spread				
				N-Relation	Y-Relation				N-Relation	Y-Relation
Imbalance	0.5618***	0.5460***	-0.0368	-0.6095**	1.5260***	0.7419***	0.4341*	-0.5501**	-0.1601	-0.5636
	(4.29)	(4.65)	(-0.27)	(-2.45)	(5.39)	(2.67)	(1.82)	(-2.20)	(-0.44)	(-1.58)
Imbalance * High Cash Flow Uncertainty			1.1328***	0.8455***	0.5574**			1.8017***	1.7156***	1.4520**
			(5.48)	(3.42)	(2.18)			(4.06)	(2.85)	(2.34)
High Cash Flow Uncertainty		0.2056***	-0.0730	-0.1192**	0.1685***		0.2131***	-0.1719*	-0.3177*	0.0762
		(8.73)	(-1.62)	(-2.14)	(3.63)		(3.15)	(-1.67)	(-1.84)	(0.50)
Coupon Rate	0.1859***	0.1544***	0.1552***	0.1584***	0.1266***	0.2264***	0.1104***	0.1106***	0.1131***	0.0562***
	(16.07)	(11.45)	(11.49)	(10.63)	(10.72)	(8.96)	(6.26)	(6.27)	(4.95)	(2.78)
Time-to-Maturity	0.0076***	0.0055***	0.0056***	0.0021	0.0114***	0.0051***	0.0090***	0.0090***	0.0095***	0.0084***
	(5.72)	(3.38)	(3.53)	(1.19)	(9.48)	(3.84)	(13.30)	(13.38)	(10.97)	(10.73)
Institutional Bond Holdings	-0.2566***	-0.2455***	-0.2506***	-0.2535***	-0.2143***	-0.2149***	-0.0763**	-0.0743**	-0.0515	-0.0237
	(-12.54)	(-11.26)	(-11.45)	(-9.76)	(-9.66)	(-4.63)	(-2.34)	(-2.28)	(-1.22)	(-0.64)
Institutional Bond Trading Volume	0.6052***	0.5492***	0.5359***	0.3789***	0.4492***	-0.0990	-0.1991*	-0.2147*	-0.0804	-0.2708*
	(8.73)	(8.44)	(8.36)	(5.60)	(7.12)	(-0.75)	(-1.69)	(-1.82)	(-0.56)	(-1.73)
Cluster Debt-per-Asset	-0.0112***	-0.0160***	-0.0166***	-0.0068	-0.0643***	-0.0069	-0.0162**	-0.0165**	0.0101	-0.0213**
	(-3.58)	(-5.32)	(-5.37)	(-1.62)	(-6.52)	(-1.09)	(-2.34)	(-2.42)	(0.90)	(-2.62)
Cluster Equity-per-Asset	0.0006	-0.0100	-0.0106	-0.0538***	-0.0628***	-0.0062	0.0205***	0.0190***	0.0258**	0.0278**
	(0.06)	(-1.06)	(-1.12)	(-3.82)	(-4.02)	(-0.60)	(3.15)	(2.91)	(2.04)	(2.48)
Book Leverage		1.5087***	1.4821***	1.4796***	1.3815***	2.2589***	2.7034***	2.7311***	2.9895***	1.7297**
		(14.86)	(15.19)	(10.75)	(9.70)	(7.63)	(4.58)	(4.65)	(4.11)	(1.96)
Firm Size		-0.1035***	-0.1076***	-0.0788***	-0.2022***	-0.0696**	0.6749***	0.6498***	0.3048*	1.2714***
		(-5.59)	(-5.90)	(-4.21)	(-9.06)	(-2.10)	(4.79)	(4.83)	(1.80)	(5.63)
Altman z-Score		0.1229***	0.1262***	-0.1031**	0.2432***	0.0968*	-0.0476	-0.0445	-0.2521	-0.0940
		(5.10)	(5.26)	(-2.44)	(10.70)	(1.87)	(-0.43)	(-0.40)	(-1.29)	(-0.62)
Tangibility		0.3866***	0.3330***	0.1611	0.1499	0.5232**	3.1177***	3.2289***	3.4247***	3.4053***
		(4.65)	(4.09)	(1.53)	(0.64)	(2.34)	(5.94)	(6.12)	(4.86)	(3.66)
Profitability		-6.3296***	-6.3216***	-4.6170***	-10.5263***	-8.6087***	-9.8320***	-9.9650***	-6.7767***	-10.3752***
		(-14.65)	(-14.76)	(-9.91)	(-17.27)	(-11.91)	(-7.27)	(-7.32)	(-3.65)	(-5.83)
Market-to-Book		-0.1201***	-0.1168***	-0.2390***	-0.0837***	-0.0812**	-0.2123***	-0.1942***	-0.2772***	-0.0524
		(-7.69)	(-7.60)	(-8.53)	(-4.22)	(-2.34)	(-4.04)	(-3.62)	(-3.16)	(-0.78)
KZ		-0.1165***	-0.1238***	-0.0870***	-0.3395***	-0.0790*	0.1135*	0.1087*	0.2243**	0.1767
		(-6.41)	(-6.40)	(-3.33)	(-9.06)	(-1.72)	(1.77)	(1.68)	(2.20)	(1.34)
Const	6.3191***	8.1567***	8.4727***	8.2049***	8.2604***	10.9665***	0.4948	1.0366	0.0335	-3.3793
	(11.20)	(14.52)	(15.74)	(14.82)	(10.93)	(6.10)	(0.38)	(0.83)	(0.02)	(-1.50)
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Credit Rating Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	-	-	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	-	-	Y	Y	Y	Y
Clustering at	-	-	-	-	-	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared (Avg.)	0.6746	0.7008	0.7057	0.7460	0.8097	0.5768	0.7576	0.7587	0.8126	0.8021
N	87982	82839	82839	42864	39975	8910	8910	8910	4833	4077

Table XIII
The Impact of Imbalance on Bond Yield (Spread) Changes during GM and Ford Downgrading Period

This table analyzes the impact of Imbalance on bond yield and credit spread changes during the GM and Ford downgrading period.

In Panel A the dependent variable is quarterly yield changes of each bond issue calculated by first averaging monthly yields during a quarter then subtracting the previous one from the last quarter. We define a crisis dummy equal to 1 if it is at the second quarter of 2005 and 0 otherwise. Detailed definition of other variables can be found in the appendix. In Column (1)-(3) we run cross-sectional regressions for yield changes at the first quarter of 2005 (pre-crisis quarter) and Column (4)-(6) are for yield changes at the second quarter of 2005 (crisis quarter). In Column (7)-(10) we stack the yield changes at the first, second and third quarter of 2005 and interact Imbalance with the crisis dummy. Bond Issuer fixed effects are added in Column (9)-(10). ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

In Panel B the dependent variable is quarterly credit spread changes of each bond issue calculated by first averaging monthly bond yield spread during a quarter then subtracting the previous one from the last quarter. Bond yield spread is defined as the difference between bond yield and corresponding treasury yield with same time to maturity. We define a crisis dummy equal to 1 if it is at the second quarter of 2005 and 0 otherwise. Detailed definition of other variables can be found in the appendix. In Column (1)-(3) we run cross-sectional regressions for yield changes at the first quarter of 2005 (pre-crisis quarter) and Column (4)-(6) are for spread changes at the second quarter of 2005 (crisis quarter). In Column (7)-(10) we stack the spread changes at the first, second and third quarter of 2005 and interact Imbalance with the crisis dummy. Bond Issuer fixed effects are added in Column (9)-(10). ***, ** and * represent significance levels at 1%, 5% and 10% respectively using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Table XIII (Cont'd)
Panel A: The Impact of Imbalance on Yield Change during GM and Ford Downgrading Period

	Pre-Crisis: Q1 2005			Crisis: Q2 2005			Quarter 1-3 2005			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Imbalance	-0.0589	-0.0399	-0.0637	0.4655***	0.4577***	0.5389***	0.0349	-0.0964		
	(-0.55)	(-0.37)	(-0.59)	(2.84)	(2.85)	(3.41)	(0.39)	(-1.05)		
Crisis							0.0716***	-0.0663	0.0708***	-0.0921*
							(3.89)	(-1.26)	(3.96)	(-1.76)
Imbalance * Crisis								0.3989***		0.4712***
								(2.73)		(3.21)
Coupon Rate	-0.0111	-0.0074	-0.0037	0.0886***	0.0515***	0.0247*	0.0058	0.0054	0.0100	0.0100
	(-1.46)	(-0.86)	(-0.40)	(7.66)	(4.22)	(1.86)	(0.78)	(0.73)	(1.20)	(1.21)
Time-to-Maturity	-0.0251***	-0.0255***	-0.0257***	-0.0128***	-0.0121***	-0.0116***	-0.0144***	-0.0144***	-0.0136***	-0.0136***
	(-23.21)	(-22.81)	(-23.60)	(-7.99)	(-7.57)	(-7.60)	(-16.80)	(-16.76)	(-14.53)	(-14.47)
Institutional Bond Holdings	0.0132	0.0100	0.0062	-0.0844***	-0.0556**	-0.0211	-0.0061	-0.0063	-0.0017	-0.0019
	(0.85)	(0.59)	(0.36)	(-3.54)	(-2.34)	(-0.86)	(-0.47)	(-0.49)	(-0.10)	(-0.11)
Institutional Bond Trading Volume	-0.0268	-0.0384	-0.0233	0.4421***	0.2526*	0.0638	0.1678***	0.1676***	0.2358***	0.2361***
	(-0.32)	(-0.43)	(-0.25)	(3.26)	(1.95)	(0.49)	(3.08)	(3.10)	(3.73)	(3.78)
Cluster Debt-per-Asset	-0.0073**	-0.0071**	-0.0065**	0.0085*	0.0045	0.0037	-0.0012	-0.0012		
	(-2.35)	(-2.21)	(-2.02)	(1.93)	(0.97)	(0.80)	(-0.52)	(-0.52)		
Cluster Equity-per-Asset	-0.0205**	-0.0237**	-0.0211**	-0.0022	-0.0002	0.0002	-0.0049	-0.0047		
	(-1.96)	(-2.20)	(-1.98)	(-0.13)	(-0.01)	(0.02)	(-0.55)	(-0.53)		
Book Leverage		0.0275	0.1291		0.8568***	0.6438***	0.1561	0.1587		
		(0.23)	(0.98)		(4.58)	(3.30)	(1.40)	(1.42)		
Firm Size		0.0141	0.0216		-0.0326*	-0.0215	0.0093	0.0093		
		(1.17)	(1.53)		(-1.95)	(-1.07)	(0.80)	(0.79)		
Altman z-Score		-0.0367	-0.0392		0.0117	0.0324	0.0035	0.0041		
		(-1.62)	(-1.62)		(0.34)	(0.92)	(0.20)	(0.24)		
Tangibility		-0.0695	-0.0668		0.3468**	0.3657**	0.0382	0.0395		
		(-0.75)	(-0.73)		(2.22)	(2.33)	(0.49)	(0.51)		
Profitability		0.9564**	0.8179**		-0.8703	-0.7525	-0.2657	-0.2709		
		(2.47)	(2.17)		(-1.32)	(-1.14)	(-0.81)	(-0.82)		
Market-to-Book		-0.0567**	-0.0421		-0.1432***	-0.1251***	-0.0419*	-0.0421*		
		(-2.40)	(-1.64)		(-3.73)	(-3.26)	(-1.92)	(-1.94)		
KZ		0.0009	0.0145		-0.0199	-0.0333	-0.0101	-0.0101		
		(0.05)	(0.81)		(-0.84)	(-1.26)	(-0.68)	(-0.69)		
Const	0.7030***	0.6384**	0.2882	0.3171	0.1266	-0.1298	-0.0944	-0.0445	0.1169	0.1199
	(2.90)	(2.30)	(0.98)	(0.83)	(0.29)	(-0.29)	(-0.26)	(-0.12)	(0.57)	(0.58)
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y	-	-
Rating Dummies	-	-	Y	-	-	Y	Y	Y	-	-
Issuer Fixed Effects	-	-	-	-	-	-	-	-	Y	Y
R-squared	0.3918	0.4053	0.4231	0.3713	0.4442	0.4754	0.1085	0.1125	0.2747	0.2801
N	873	841	841	876	843	843	2502	2502	2502	2502

Table XIII (Cont'd)
Panel B: The Impact of Imbalance on Credit Spread Change during GM and Ford Downgrading Period

	Pre-Crisis: Q1 2005			Crisis: Q2 2005			Quarter 1-3 2005			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Imbalance	-0.0861	-0.0699	-0.0960	0.5289***	0.5206***	0.6064***	0.0140	-0.1360		
	(-0.80)	(-0.65)	(-0.88)	(3.24)	(3.26)	(3.89)	(0.16)	(-1.52)		
Crisis							0.3087***	0.1515***	0.3075***	0.1317**
							(16.89)	(2.89)	(17.33)	(2.54)
Imbalance * Crisis								0.4548***		0.5085***
								(3.09)		(3.48)
Coupon Rate	-0.0033	-0.0041	-0.0045	0.0952***	0.0563***	0.0274**	0.0044	0.0039	0.0082	0.0083
	(-0.44)	(-0.48)	(-0.48)	(8.32)	(4.60)	(2.06)	(0.59)	(0.53)	(1.02)	(1.03)
Time-to-Maturity	-0.0009	-0.0010	-0.0011	-0.0018	-0.0009	-0.0003	0.0013	0.0013	0.0017**	0.0017*
	(-0.87)	(-0.96)	(-1.11)	(-1.17)	(-0.55)	(-0.19)	(1.60)	(1.60)	(1.97)	(1.93)
Institutional Bond Holdings	0.0354**	0.0422**	0.0461***	-0.0607**	-0.0245	0.0142	0.0215	0.0214	0.0284*	0.0281*
	(2.29)	(2.52)	(2.65)	(-2.64)	(-1.06)	(0.60)	(1.62)	(1.62)	(1.75)	(1.74)
Institutional Bond Trading Volume	0.0684	0.0479	0.0515	0.5997***	0.4167***	0.2177*	0.1699***	0.1693***	0.1842***	0.1845***
	(0.88)	(0.58)	(0.61)	(4.64)	(3.36)	(1.73)	(3.24)	(3.25)	(2.94)	(2.98)
Cluster Debt-per-Asset	-0.0064**	-0.0068**	-0.0062*	0.0100**	0.0058	0.0048	-0.0016	-0.0014		
	(-2.02)	(-2.06)	(-1.88)	(2.29)	(1.23)	(1.03)	(-0.75)	(-0.61)		
Cluster Equity-per-Asset	-0.0248**	-0.0258**	-0.0248**	0.0002	0.0037	0.0030	-0.0085	-0.0077		
	(-2.39)	(-2.44)	(-2.37)	(0.01)	(0.23)	(0.19)	(-1.04)	(-0.88)		
Book Leverage		0.0499	0.1259		0.8295***	0.6030***	0.1526	0.1563		
		(0.44)	(0.99)		(4.60)	(3.23)	(1.40)	(1.43)		
Firm Size		-0.0047	0.0068		-0.0488***	-0.0391**	0.0005	0.0006		
		(-0.41)	(0.50)		(-3.00)	(-2.06)	(0.04)	(0.05)		
Altman z-Score		-0.0391*	-0.0380		0.0315	0.0545	0.0155	0.0160		
		(-1.81)	(-1.63)		(0.96)	(1.62)	(0.94)	(0.98)		
Tangibility		-0.0477	-0.0486		0.3554**	0.3664**	0.0352	0.0366		
		(-0.53)	(-0.55)		(2.31)	(2.38)	(0.46)	(0.48)		
Profitability		1.0794***	0.9817***		-0.9851	-0.8288	-0.2874	-0.2887		
		(2.91)	(2.71)		(-1.51)	(-1.27)	(-0.88)	(-0.90)		
Market-to-Book		-0.0571**	-0.0426*		-0.1402***	-0.1296***	-0.0421*	-0.0422*		
		(-2.52)	(-1.71)		(-3.69)	(-3.41)	(-1.93)	(-1.94)		
KZ		0.0039	0.0176		-0.0242	-0.0372	-0.0117	-0.0118		
		(0.23)	(0.99)		(-1.09)	(-1.50)	(-0.80)	(-0.82)		
Const	-0.0253	-0.0783	-0.4537	-0.0854	-0.2405	-0.6892	-0.6663*	-0.6181*	-0.5267***	-0.5234***
	(-0.11)	(-0.28)	(-1.56)	(-0.23)	(-0.56)	(-1.64)	(-1.89)	(-1.74)	(-2.64)	(-2.63)
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y	-	-
Rating Dummies	-	-	Y	-	-	Y	Y	Y	-	-
Issuer Fixed Effects	-	-	-	-	-	-	-	-	Y	Y
R-squared	0.1508	0.1688	0.1973	0.3713	0.4474	0.4835	0.1486	0.1536	0.3165	0.3227
N	873	841	841	876	843	843	2502	2502	2502	2502

Table XIV: The Impact of Imbalance on Bond Yield Change with Interest Rate Shocks

This table analyzes the impact of Imbalance on the sensitivity of bond yield changes with respect to interest rate shocks. The dependent variable is monthly yield change for each bond issue. The data on bond yield, coupon rate and time-to-maturity are obtained from Bloomberg. Other issue characteristics such as bond covernants and callability are from Mergent FDIC fixed-income database. Institutional bond holdings and trading volume are calculated from Lipper/Emaxx database. Treasury rates with different maturities are from the FRED database (Federal Reserve Bank of St. Louis). Information on monthly stock returns are from CRSP. We first model each treasury yield series as an AR(1) process. For every month t, we run the AR(1) regression using data in the past 60 months and get the regression residual as interest rate shocks. In panel A we use shocks to corresponding treasury yields having the same time to maturity with the bond issue. Since the median time-to-maturity of our sample is 7 years, in Panel B we only use shocks to 7-year treasury yields. In Panel C we obtain monthly interest rate shocks from a four-variable VAR regression of $\overrightarrow{V_t} = (i_t, \pi_t, o_t, u_t)$ with 4 lagged values, where i_t is 6-month treasury rates, π_t is inflation rate computed as $\pi_t = 400\ln(C_t / C_{t-1})$ where C_t is the chain-weighted GDP price index, o_t is oil price change calculated as $o_t = \ln(P_t / P_{t-1})$ where P_t is monthly oil price, and u_t is the civilian unemployment rate at month t. All the macro variables are from thee FRED database. We run the VAR for each month based on information in the past 60 months and get the regression residual out of the treasury rate equation at month t as our measure of interest rate shocks. The regression results of both AR(1) and VAR are not reported. From Panel A to Panel C, our focus is on the interaction term of Imbalance and interest rate shocks. Column (1) is our baseline specification where only bond issue characteristics are included. We control market conditions in Column (2). Stock returns and accounting variables of bond issuers are included in Column (3). In Column (4) we add two-digit SIC industry dummies, year dummies and detailed credit rating dummies. In Column (5) we add issuer fixed effects to the regression. From Column (6)-(8) we split the sample according to bond ratings and run the regression for each sub-sample. In Column (9) and (10) we split our smaple based on the callability feature of each bond. The definitions of all the control variables can be found in the Appdenix. ***, ** and * represent significance levels at 1%, 5% and 10% using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Panel A: Shocks to Corresponding Treasury Yields

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
						Rating Category			Callability	
						AAA & AA	A & BBB	BB,B&CCC,CC,C	Callable	Non-Callable
Imbalance	0.0151	0.0548***	0.0579***	0.0202	0.0444**	0.0263	0.0059	0.0274	0.0014	0.0497***
	(1.04)	(3.76)	(4.88)	(1.61)	(2.63)	(1.00)	(0.61)	(0.88)	(0.08)	(2.73)
Imbalance*Corresp.Treas.Yield Shocks	0.8360***	0.7599***	0.6682***	0.5802***	0.5835***	0.1683	0.2396***	1.2970***	0.6972***	0.3993***
	(11.37)	(10.43)	(9.57)	(8.38)	(8.31)	(1.12)	(3.90)	(10.05)	(7.80)	(3.74)
Corresponding Treasury Yield Shocks	0.3692***	0.3885***	0.4450***	0.3966***	0.3980***	0.6792***	0.6048***	-0.0966**	0.3383***	0.4709***
	(18.46)	(19.65)	(23.42)	(19.35)	(19.23)	(21.32)	(35.41)	(-2.19)	(11.76)	(15.90)
Bond Issue Characteristics										
Coupon Rate	0.0055***	0.0032**	-0.0027**	-0.0062***	-0.0068***	0.0021	-0.0073***	-0.0013	-0.0069***	-0.0058***
	(3.50)	(2.20)	(-2.06)	(-4.42)	(-5.34)	(1.44)	(-6.91)	(-0.40)	(-3.66)	(-3.03)
Time-to-Maturity	0.0274***	0.0205***	0.0221***	0.0218***	0.0237***	0.0206***	0.0234***	0.0203***	0.0230***	0.0188***
	(15.18)	(11.78)	(13.82)	(14.54)	(18.46)	(9.59)	(17.56)	(2.78)	(9.25)	(9.47)
Bond Covenants	-0.0002	-0.0049	-0.0093	-0.0078	-0.0091	-0.0096	-0.0035	-0.0234*	-0.0047	-0.0089
	(-0.02)	(-0.48)	(-1.08)	(-1.02)	(-1.15)	(-1.51)	(-0.32)	(-1.81)	(-0.41)	(-1.03)
Institutional Bond Holdings	-0.0166***	-0.0057**	-0.0055**	-0.0004	0.0030	-0.0002	0.0024	-0.0077	-0.0032	0.0128***
	(-6.28)	(-2.19)	(-2.14)	(-0.14)	(1.17)	(-0.07)	(1.10)	(-1.30)	(-1.06)	(2.75)
Institutional Bond Trading Volume	-0.0373***	0.0044	-0.0122	-0.0215*	-0.0229**	0.0021	-0.0248**	0.0019	-0.0173	-0.0281
	(-3.31)	(0.40)	(-1.15)	(-1.92)	(-2.06)	(0.14)	(-2.29)	(0.07)	(-1.20)	(-1.62)

Market Conditions										
7-Year Treasury Yield		0.0024	-0.0102***	-0.0716***	-0.0730***	-0.0470***	-0.0759***	-0.0722***	-0.0703***	-0.0676***
		(0.94)	(-4.49)	(-14.72)	(-14.86)	(-6.44)	(-14.51)	(-5.64)	(-11.23)	(-8.83)
Term Spread		0.1404***	-0.0295***	0.0419***	0.0425***	0.0100**	0.0120***	0.1191***	0.0449***	0.0366***
		(14.56)	(-13.58)	(10.91)	(10.98)	(1.97)	(3.66)	(11.19)	(8.70)	(6.61)
Credit Spread		0.2519***	-0.0617***	-0.3368***	-0.3427***	-0.1804***	-0.2989***	-0.6292***	-0.4140***	-0.2675***
		(11.15)	(-7.68)	(-16.06)	(-16.28)	(-5.16)	(-15.13)	(-10.37)	(-13.73)	(-9.06)
Term Spread Shocks		-0.0257***	0.1661***	0.3273***	0.3256***	0.2641***	0.2885***	0.3983***	0.3592***	0.2993***
		(-10.61)	(17.92)	(27.06)	(26.79)	(13.02)	(24.50)	(11.30)	(19.06)	(19.47)
Credit Spread Shocks		-0.0507***	0.2837***	0.5254***	0.5268***	-0.0959**	0.3475***	1.1716***	0.6766***	0.3141***
		(-5.84)	(12.40)	(16.06)	(16.14)	(-2.22)	(11.66)	(13.30)	(15.34)	(6.58)
Market Return		-0.9251***	-0.2279***	-0.2214***	-0.2367***	0.0569	0.0416	-1.5463***	-0.2995***	-0.1651***
		(-18.25)	(-5.36)	(-4.86)	(-5.22)	(0.87)	(1.03)	(-11.76)	(-4.24)	(-3.11)
Firm Characteristics										
Stock Return			-0.7501***	-0.7348***	-0.7080***	-0.0529	-0.3276***	-1.2343***	-0.8980***	-0.4451***
			(-25.87)	(-25.69)	(-24.76)	(-1.28)	(-11.77)	(-24.46)	(-24.01)	(-10.77)
Lag Stock Return			-0.3872***	-0.3536***	-0.3315***	0.0606	-0.2928***	-0.4425***	-0.4434***	-0.2032***
			(-15.52)	(-14.41)	(-13.39)	(1.55)	(-12.93)	(-9.03)	(-14.45)	(-5.04)
Lead Stock Return			-0.1680***	-0.1726***	-0.1483***	-0.0673*	-0.0677***	-0.1997***	-0.1911***	-0.1154***
			(-8.49)	(-8.63)	(-7.37)	(-1.87)	(-3.70)	(-4.77)	(-7.28)	(-3.84)
Cluster Debt-per-Asset			-0.0001	-0.0005*	0.0003	0.0059*	-0.0007***	0.0002	-0.0005	-0.0006
			(-0.26)	(-1.69)	(0.38)	(1.92)	(-3.79)	(0.24)	(-1.21)	(-1.35)
Cluster Equity-per-Asset			0.0005	0.0007	0.0007	0.0012	0.0003	0.0024	0.0008	0.0016***
			(0.88)	(1.21)	(1.10)	(1.18)	(0.91)	(1.16)	(0.85)	(3.22)
Book Leverage			0.0228*	0.0220	0.0158	0.0113	0.0018	0.0521*	0.0147	0.0762***
			(1.89)	(1.44)	(0.41)	(0.25)	(0.14)	(1.74)	(0.74)	(3.08)
Firm Size			-0.0050***	-0.0033**	0.0144*	-0.0038	-0.0018	-0.0054	-0.0060***	-0.0040
			(-3.64)	(-2.13)	(1.87)	(-1.15)	(-1.34)	(-1.19)	(-3.02)	(-1.50)
Altman z-Score			0.0108***	0.0102***	0.0132	-0.0095	-0.0054*	0.0271***	0.0162***	0.0007
			(4.80)	(3.41)	(1.53)	(-1.39)	(-1.78)	(4.20)	(3.96)	(0.19)
Tangibility			0.0147**	0.0126	0.0148	-0.0972**	0.0125	0.0111	0.0032	0.0263**
			(2.15)	(1.13)	(0.37)	(-2.53)	(1.65)	(0.42)	(0.20)	(2.06)
Profitability			-0.2923***	-0.2038***	-0.2255**	0.0955	0.0460	-0.3918***	-0.1809**	-0.2559***
			(-5.91)	(-3.77)	(-2.17)	(1.48)	(1.01)	(-4.00)	(-2.64)	(-3.13)
Market-to-Book			0.0003	-0.0035	-0.0060	-0.0004	-0.0057**	-0.0077	-0.0096**	0.0011
			(0.14)	(-1.63)	(-1.60)	(-0.15)	(-2.40)	(-0.75)	(-2.53)	(0.53)
KZ			-0.0073***	-0.0109***	-0.0166***	0.0045	-0.0034	-0.0160*	-0.0095**	-0.0118***
			(-3.34)	(-4.16)	(-2.94)	(0.68)	(-1.54)	(-1.83)	(-2.50)	(-3.27)
Const	0.0964**	0.0713*	0.2427***	0.5621***	0.3410***	0.3979***	0.5342***	1.0781***	0.7356***	2.7104***
	(2.64)	(1.83)	(7.13)	(11.28)	(3.26)	(6.52)	(10.04)	(8.00)	(10.89)	(22.62)
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0707	0.0908	0.1341	0.1478	0.1609	0.4038	0.2339	0.1518	0.1482	0.1684
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378

Table XIV (Cont'd)
Panel B: Shocks to 7-Year Treasury Yields

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
							Rating Category		Callability	
						AAA & AA	A & BBB	Below BB+	Callable	Non-Callable
Imbalance	0.0279*	0.0640***	0.0665***	0.0272**	0.0482***	0.0057	0.0054	0.0388	0.0109	0.0578***
	(1.92)	(4.36)	(5.60)	(2.16)	(2.80)	(0.22)	(0.54)	(1.25)	(0.64)	(3.20)
Imbalance * 7-Year Treasury Yield Shocks	0.8792***	0.8067***	0.7100***	0.6187***	0.6210***	0.1999	0.2784***	1.3211***	0.7035***	0.4754***
	(12.54)	(11.55)	(10.74)	(9.46)	(9.35)	(1.17)	(4.43)	(10.63)	(8.48)	(4.60)
7-Year Treasury Yield Shocks	0.3199***	0.3467***	0.4011***	0.3457***	0.3465***	0.5737***	0.5143***	-0.0750*	0.3071***	0.3930***
	(16.99)	(18.76)	(22.85)	(18.25)	(18.15)	(14.73)	(29.24)	(-1.72)	(11.89)	(14.05)
Bond Issue Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Market Conditions	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Characteristics	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0671	0.0872	0.1295	0.1429	0.1561	0.3617	0.2170	0.1526	0.1463	0.1568
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378

Panel C: Shocks to 6-Month Treasury Rates from a VAR Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
							Rating Category		Callability	
						AAA & AA	A & BBB	Below BB+	Callable	Non-Callable
Imbalance	0.0347**	0.1334***	0.1490***	0.0171	0.0422**	0.0129	0.0017	0.0435	0.0066	0.0429**
	(2.40)	(8.63)	(11.34)	(1.38)	(2.45)	(0.54)	(0.17)	(1.41)	(0.39)	(2.56)
Imbalance * VAR 6-Month Treasury Rate Shocks	0.7782***	0.6626***	0.7596***	0.6165***	0.6154***	1.1373***	0.3727***	1.2956***	0.7571***	0.4810***
	(6.83)	(5.98)	(6.79)	(5.71)	(5.63)	(3.31)	(3.22)	(4.94)	(4.67)	(3.60)
VAR 6-Month Treasury Rate Shocks	0.2925***	0.4147***	0.4056***	0.4060***	0.4077***	0.3316***	0.4770***	0.2313***	0.3955***	0.3865***
	(11.77)	(16.52)	(16.13)	(16.15)	(16.09)	(5.49)	(18.11)	(3.27)	(9.75)	(13.52)
Bond Issue Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Market Conditions	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Characteristics	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0175	0.0628	0.0993	0.1323	0.1454	0.2941	0.1841	0.1530	0.1397	0.1379
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378

Table XV: The Impact of Imbalance on Credit Spread Changes with Interest Rate Shocks

This table analyzes the impact of Imbalance on the sensitivity of bond credit spread changes with respect to interest rate shocks. The dependent variable is monthly yield spread change for each bond issue. The data on bond yield, coupon rate and time-to-maturity are obtained from Bloomberg. Bond yield spread is defined as the difference between bond yield and corresponding treasury yield with same time to maturity. Other issue characteristics such as bond covernants and callability are from Mergent FDIC fixed-income database. Institutional bond holdings and trading volume are calculated from Lipper/Emaxx database. Treasury rates with different maturities are from the FRED database (Federal Reserve Bank of St. Louis). Information on monthly stock returns are from CRSP. We first model each treasury yield series as an AR(1) process. For every month t, we run the AR(1) regression using data in the past 60 months and get the regression residual as interest rate shocks. In panel A we use shocks to corresponding treasury yields having the same time to maturity with the bond issue. Since the median time-to-maturity of our sample is 7 years, in Panel B we only use shocks to 7-year treasury yields. In Panel C we obtain monthly interest rate shocks from a four-variable VAR regression of $\overrightarrow{V_t} = (i_t, \pi_t, o_t, u_t)$ with 4 lagged values, where i_t is 6-month treasury rates, π_t is inflation rate computed as $\pi_t = 400\ln(C_t / C_{t-1})$ where C_t is the chain-weighted GDP price index, o_t is oil price change calculated as $o_t = \ln(P_t / P_{t-1})$ where P_t is monthly oil price, and u_t is the civilian unemployment rate at month t. All the macro variables are taken from thee FRED database. We run the VAR for each month based on information in the past 60 months and get the regression residual out of the treasury rate equation at month t as our measure of interest rate shocks. The regression results of both AR(1) and VAR are not reported. From Panel A to Panel C, our focus is on the interaction term of Imbalance and interest rate shocks. Column (1) is our baseline specification where only bond issue characteristics are included. We control market conditions in Column (2). Stock returns and accounting variables of bond issuers are included in Column (3). In Column (4) we add two-digit SIC industry dummies, year dummies and detailed credit rating dummies. In Column (5) we add issuer fixed effects to the regression. From Column (6)-(8) we split the sample according to bond ratings and run the regression for each sub-sample. In Column (9) and (10) we split our smaple based on the callability feature of each bond. The definitions of all the control variables can be found in the Appdenix. ***, ** and * represent significance levels at 1%, 5% and 10% using heteroscedasticity robust standard errors with t-statistics given in parentheses.

Panel A: Shocks to Corresponding Treasury Yields

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
							Rating Category		Callability	
						AAA & AA	A & BBB	BB,B&CCC,CC,C	Callable	Non-Callable
Imbalance	0.0290**	0.0604***	0.0617***	0.0204	0.0462***	0.0127	0.0005	0.0317	0.0023	0.0518***
	(2.05)	(4.21)	(5.32)	(1.65)	(2.77)	(0.60)	(0.05)	(1.01)	(0.14)	(2.90)
Imbalance*Corresp.Treas.Yield Shocks	0.8175***	0.7541***	0.6625***	0.5745***	0.5763***	0.2142	0.2313***	1.2872***	0.6931***	0.4004***
	(11.20)	(10.38)	(9.52)	(8.32)	(8.24)	(1.44)	(3.79)	(9.99)	(7.79)	(3.77)
Corresponding Treasury Yield Shocks	-0.6369***	-0.6001***	-0.5431***	-0.5993***	-0.5993***	-0.3256***	-0.3905***	-1.0975***	-0.6622***	-0.5252***
	(-31.85)	(-30.38)	(-28.64)	(-29.19)	(-28.94)	(-10.17)	(-22.89)	(-24.87)	(-23.04)	(-17.77)
Coupon Rate	0.0040**	0.0020	-0.0043***	-0.0072***	-0.0080***	-0.0002	-0.0089***	-0.0020	-0.0066***	-0.0086***
	(2.60)	(1.40)	(-3.36)	(-5.25)	(-6.52)	(-0.18)	(-8.92)	(-0.63)	(-3.56)	(-4.73)
Time-to-Maturity	0.0090***	0.0032*	0.0048***	0.0048***	0.0064***	0.0094***	0.0076***	-0.0090	-0.0005	0.0065***
	(5.34)	(1.89)	(3.17)	(3.28)	(5.18)	(4.88)	(6.25)	(-1.22)	(-0.19)	(3.41)
Bond Covenants	0.0054	0.0008	-0.0039	-0.0044	-0.0055	-0.0031	-0.0028	-0.0203	-0.0022	-0.0084
	(0.51)	(0.08)	(-0.45)	(-0.56)	(-0.69)	(-0.60)	(-0.26)	(-1.56)	(-0.19)	(-0.97)
Institutional Bond Holdings	-0.0143***	-0.0047*	-0.0048*	-0.0019	0.0007	-0.0046*	0.0015	-0.0090	-0.0045	0.0109**
	(-5.53)	(-1.84)	(-1.87)	(-0.75)	(0.26)	(-1.85)	(0.72)	(-1.52)	(-1.51)	(2.38)
Institutional Bond Trading Volume	-0.0298***	0.0088	-0.0093	-0.0203*	-0.0218**	0.0197	-0.0272**	-0.0002	-0.0224	-0.0198
	(-2.65)	(0.79)	(-0.88)	(-1.82)	(-1.96)	(1.34)	(-2.56)	(-0.01)	(-1.55)	(-1.16)

7-Year Treasury Yield		0.0059**	-0.0074***	-0.0828***	-0.0839***	-0.0552***	-0.0850***	-0.0899***	-0.0835***	-0.0765***
		(2.28)	(-3.24)	(-17.28)	(-17.35)	(-8.05)	(-16.83)	(-7.00)	(-13.38)	(-10.37)
Term Spread		0.0729***	-0.0297***	0.0465***	0.0471***	0.0223***	0.0169***	0.1214***	0.0456***	0.0486***
		(7.59)	(-13.57)	(11.86)	(11.96)	(3.94)	(4.96)	(11.23)	(8.63)	(8.55)
Credit Spread		0.2282***	-0.0433***	-0.3907***	-0.3965***	-0.2308***	-0.3524***	-0.6794***	-0.4480***	-0.3425***
		(10.14)	(-5.43)	(-18.84)	(-19.05)	(-7.19)	(-18.28)	(-11.17)	(-14.82)	(-11.98)
Term Spread Shocks		-0.0254***	0.0997***	0.2768***	0.2765***	0.2083***	0.2382***	0.3558***	0.3159***	0.2454***
		(-10.44)	(10.87)	(22.86)	(22.73)	(10.24)	(20.36)	(10.10)	(16.81)	(15.93)
Credit Spread Shocks		-0.0327***	0.2607***	0.5708***	0.5726***	-0.0579	0.3899***	1.2277***	0.7162***	0.3624***
		(-3.80)	(11.42)	(17.51)	(17.60)	(-1.41)	(13.21)	(13.95)	(16.23)	(7.67)
Market Return		-0.8937***	-0.1944***	-0.1668***	-0.1812***	0.1233*	0.0964**	-1.4931***	-0.2548***	-0.1008*
		(-17.59)	(-4.56)	(-3.66)	(-3.99)	(1.88)	(2.37)	(-11.33)	(-3.61)	(-1.89)
Stock Return			-0.7599***	-0.7503***	-0.7241***	-0.0765*	-0.3465***	-1.2417***	-0.9105***	-0.4620***
			(-26.16)	(-26.28)	(-25.39)	(-1.84)	(-12.45)	(-24.60)	(-24.36)	(-11.21)
Lag Stock Return			-0.3965***	-0.3589***	-0.3372***	0.0504	-0.3000***	-0.4423***	-0.4447***	-0.2122***
			(-15.86)	(-14.61)	(-13.61)	(1.28)	(-13.25)	(-9.01)	(-14.47)	(-5.25)
Lead Stock Return			-0.1578***	-0.1736***	-0.1498***	-0.0655*	-0.0696***	-0.1995***	-0.1913***	-0.1157***
			(-7.94)	(-8.68)	(-7.44)	(-1.83)	(-3.80)	(-4.76)	(-7.27)	(-3.85)
Cluster Debt-per-Asset			0.0000	-0.0005	0.0003	0.0035	-0.0007***	0.0003	-0.0005	-0.0005
			(0.00)	(-1.60)	(0.40)	(1.29)	(-3.56)	(0.28)	(-1.26)	(-1.16)
Cluster Equity-per-Asset			0.0003	0.0005	0.0005	0.0001	0.0001	0.0025	0.0006	0.0013**
			(0.49)	(0.87)	(0.78)	(0.16)	(0.32)	(1.19)	(0.69)	(2.45)
Book Leverage			0.0316***	0.0245	0.0149	0.0221	0.0008	0.0564*	0.0144	0.0838***
			(2.66)	(1.62)	(0.39)	(0.52)	(0.07)	(1.88)	(0.74)	(3.41)
Firm Size			-0.0051***	-0.0033**	0.0134*	-0.0002	-0.0020	-0.0049	-0.0056***	-0.0043
			(-3.67)	(-2.14)	(1.75)	(-0.07)	(-1.58)	(-1.06)	(-2.81)	(-1.63)
Altman z-Score			0.0107***	0.0105***	0.0144*	-0.0114*	-0.0049	0.0266***	0.0153***	0.0015
			(4.86)	(3.60)	(1.70)	(-1.77)	(-1.64)	(4.12)	(3.80)	(0.39)
Tangibility			0.0108	0.0121	0.0214	-0.0449	0.0094	0.0119	0.0051	0.0276**
			(1.61)	(1.09)	(0.53)	(-1.28)	(1.30)	(0.44)	(0.32)	(2.20)
Profitability			-0.3083***	-0.2152***	-0.2339**	0.0238	0.0439	-0.4029***	-0.1871***	-0.2497***
			(-6.30)	(-4.04)	(-2.29)	(0.42)	(0.99)	(-4.14)	(-2.76)	(-3.13)
Market-to-Book			0.0012	-0.0033	-0.0062	0.0019	-0.0056**	-0.0071	-0.0093**	0.0016
			(0.56)	(-1.57)	(-1.64)	(0.86)	(-2.44)	(-0.69)	(-2.42)	(0.80)
KZ			-0.0063***	-0.0103***	-0.0165***	0.0044	-0.0031	-0.0162*	-0.0087**	-0.0110***
			(-2.92)	(-3.96)	(-2.90)	(0.69)	(-1.44)	(-1.82)	(-2.31)	(-3.01)
Const	0.1095***	0.0623	0.2447***	0.6992***	0.4773***	0.4417***	0.6548***	1.2483***	0.8673***	2.8090***
	(3.06)	(1.60)	(7.31)	(14.32)	(4.77)	(7.37)	(12.78)	(9.38)	(12.90)	(23.30)
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0527	0.0698	0.1016	0.1178	0.1314	0.0909	0.0996	0.2037	0.1293	0.1124
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378

Table XV (Cont'd)

Panel B: Shocks to 7-Year Treasury Yields

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
							Rating Category		Callability	
						AAA & AA	A & BBB	Below BB+	Callable	Non-Callable
Imbalance	0.0312**	0.0615***	0.0617***	0.0239*	0.0507***	0.0284	0.0030	0.0387	0.0059	0.0549***
	(2.19)	(4.26)	(5.28)	(1.92)	(3.03)	(1.42)	(0.34)	(1.24)	(0.35)	(3.02)
Imbalance * 7-Year Treasury Yield Shocks	0.7904***	0.7298***	0.6331***	0.5411***	0.5429***	0.2591**	0.1914***	1.3145***	0.6313***	0.4266***
	(11.19)	(10.34)	(9.63)	(8.31)	(8.20)	(2.13)	(3.41)	(10.42)	(7.48)	(4.27)
7-Year Treasury Yield Shocks	-0.5834***	-0.5460***	-0.4891***	-0.5469***	-0.5458***	-0.3264***	-0.3505***	-1.0605***	-0.5818***	-0.5035***
	(-30.73)	(-29.39)	(-27.88)	(-28.69)	(-28.39)	(-10.72)	(-22.04)	(-23.90)	(-21.77)	(-18.33)
Bond Issue Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Market Conditions	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Characteristics	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0475	0.0646	0.0966	0.1130	0.1266	0.0892	0.0958	0.1986	0.1241	0.1079
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378

Panel C: Shocks to 6-Month Treasury Rates from a VAR Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
							Rating Category		Callability	
						AAA & AA	A & BBB	Below BB+	Callable	Non-Callable
Imbalance	-0.0021	-0.0243*	-0.0126	0.0139	0.0437**	0.0455**	-0.0029	0.0457	0.0018	0.0383**
	(-0.14)	(-1.71)	(-1.16)	(1.13)	(2.61)	(2.34)	(-0.33)	(1.46)	(0.11)	(2.24)
Imbalance * VAR 6-Month Treasury Rate Shocks	0.1858*	0.2330**	0.3492***	0.3756***	0.3721***	1.5048***	0.1246	1.0164***	0.4278**	0.3192**
	(1.69)	(2.09)	(3.14)	(3.46)	(3.38)	(4.15)	(1.13)	(3.66)	(2.53)	(2.51)
VAR 6-Month Treasury Rate Shocks	-0.4468***	-0.4285***	-0.4324***	-0.4123***	-0.4098***	-0.5885***	-0.3149***	-0.6355***	-0.3884***	-0.4450***
	(-17.96)	(-16.69)	(-17.02)	(-16.34)	(-16.10)	(-9.72)	(-12.56)	(-8.52)	(-9.12)	(-16.42)
Bond Issue Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Market Conditions	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Characteristics	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Industry Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Rating Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Year Dummies	-	-	-	Y	Y	Y	Y	Y	Y	Y
Issuer Fixed Effects	-	-	-	-	Y	-	-	-	-	-
Clustering at	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue	Bond Issue
R-squared	0.0152	0.0478	0.0829	0.0963	0.1099	0.0887	0.0836	0.1707	0.1079	0.0910
N	86005	86005	80000	80000	80000	6973	51675	20943	48622	31378