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Macroeconomic Conditions and the Structure of Securities

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Abstract

Economic theory, as well as commonly-stated views of practitioners, suggests that macroeconomic conditions can affect both the ability and manner in which firms raise external financing. Traditional theory focuses on the demand for capital and suggests that downturns are likely to be associated with a shift in the supply of securities toward less information sensitivity. Alternatively, financing could be affected by supply of capital in terms of both availability of funds and changes in investor preferences during periods of economic uncertainty. We evaluate these hypotheses on a large sample of publicly-traded debt issues, seasoned equity offers, and bank loans. We find that the issuance of convertibles and public bonds, especially those of higher quality, is counter-cyclical, while equity issues and private loans are pro-cyclical. This pattern is consistent with a credit crunch in intermediary capital and a shift towards relatively safe securities during recessions. Moreover, proceeds raised from investment grade bonds are more likely to be held in cash in recessions than in expansions. Poor market conditions also affect the structure of securities offered, shifting them towards shorter maturities and more security. Overall, these findings suggest that the channel through which macroeconomic conditions affect corporate finance is more likely to be the supply of capital rather than the demand.

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As illustrated so dramatically by the Financial Crisis of 2008, macroeconomic conditions can affect firms' access to capital and the manner in which they raise it. Practitioners view the possibility that macroeconomic conditions will adversely affect a firm's access to capital markets as an important factor in their firms' financial policies. For example, Richard Passov, the longtime treasurer of Pfizer, argues that the possibility of being shut out of the capital markets during market downturns is the primary reason why Pfizer and other technology companies often place such importance on a high bond rating [See Passov 2003]. According to Graham and Harvey (2001)'s well-known survey, an important goal of Chief Financial Officers is to maintain financial flexibility "so that they do not need to shrink their business in case of an economic downturn (p.218)." The extent to which this concern is justified and macroeconomic factors can affect a firm's access to capital is an important issue in finance and has clear policy implications. While the practitioners view the potential shocks to supply of capital (or demand for securities) as having the first order impact in shaping financial decisions, academic corporate finance has focused more on the demand for capital (or supply of securities) as the key determinant in security design (see for example Baker (2009)).

In this paper, we develop a set of stylized facts about the way in which macroeconomic conditions affect both firms' access to external capital and the manner in which they raise it. We then categorize theories based on demand for capital versus those based on supply of capital, and test the implications about the equilibrium issuances of different kinds of securities in market downturns. To perform this analysis, we assemble a database containing information on alternative ways in which firms can raise capital. Our sample contains detailed information on 21,657 publicly-traded debt issuances and 7,746 seasoned equity offerings in the U.S. between 1971 and 2007. The latter part of our sample (from 1988 to 2007) also includes data on 40,097 completed and mostly syndicated loan tranches.[1]

We first provide statistics documenting the average quantity of capital raised though issuance of different kinds of securities during different market conditions. A complicating factor when interpreting

[1] The primary sources of capital omitted from this sample are regular bank loans, commercial paper, and private placements of equity and debt.

these numbers is the enormous increase in the total value of funds raised during our sample period. Nonetheless, there are some noticeable differences in the average proceeds raised per month during weak and strong economic conditions. For example, average proceeds raised through SEOs tend to drop during poor market conditions. However, short-term and highly-rated public debt increases noticeably relative to longer-term and lower-rated issues during poor market conditions.

Existing theories have a number of predictions about the relation between macroeconomic conditions and the structure and availability of security issues. These theories can be broadly classified into two groups, one based on firms' changing demand for certain types and quantities of financing over the business cycle, and the other based on supply-of-capital effects, driven either by a contraction in available funds or through changes in investor demand for relatively safe securities. The demand-for-capital mechanism typically is based on changes in information asymmetries or adverse selection costs over the business cycle. If the adverse selection costs associated with asymmetric information between firms and investors is negatively related to overall business conditions, poor macroeconomic conditions will lead firms to issue less information-sensitive securities, shifting from equity to convertibles, and from convertibles to debt. While this approach has been helpful in explaining the cross-section of financing choices across firms, it has had less success explaining the time-series patterns in securities issuance.

The second mechanism by which macroeconomic conditions can affect the distribution of financing choices is through their effect on the supply of capital or on the demand for securities. For example, economic downturns can reduce the availability of the intermediary capital. In addition, downturns can affect not only the availability of capital but also the types of securities that investors demand. If volatility and economic uncertainty increase during recessions, "flight to quality" models suggest that investors will become more risk averse, leading them to sell risky assets and to purchase relatively safe assets instead. [See, for example, Caballero and Krishnamurthy (2008)]. Flight to quality models predict that poor macroeconomic conditions leads the supply of securities to shift toward higher credit quality and lower volatility because of a change in the relative prices of risky and safe assets.

While the former mechanism focuses on the direct impact of macroeconomic conditions on issuers' choice or supply of securities, the latter emphasizes the investors' choice or demand for securities and overall credit availability as having the first order effect. In addition to affecting the type of securities offered, both of these channels suggest that macroeconomic conditions would affect the structure of securities in the direction of less information sensitivity or more safety; in particular, poor financial conditions potentially lead firms to shorten the maturity and to add security to the securities they issue.

We examine these two hypotheses empirically using the database on security issues. Our econometric analysis suggests that macroeconomic conditions affect both firms' abilities to raise capital and the manner in which they raise it. Consistent with both hypotheses, we find that the issuance of equity over time is strongly pro-cyclical, while the issuance of bonds is counter-cyclical. Within the bond asset class, we find that the issuance of investment grade bonds is strongly counter-cyclical. Our results suggest that, broadly interpreted, it appears that the conditional probability of issuing less information sensitive securities, i.e., convertibles rather than equity, increases when the economy contracts.

However, we do not observe an increase in the quantity of bank loans during economic downturns, which is difficult to reconcile with issuers shifting towards less information sensitive financing source as predicted by the demand-based theory. Borrowers in our sample of private loans tend to be of higher quality during bad economic periods, consistent with the view that capital available to intermediaries goes down, leading them to tighten lending standards during these periods. This pattern in both bonds and bank loans suggests that lower quality firms tend to be shut out of the credit markets during times of poor market conditions.

In addition to the choice of securities, we also find that market-wide factors affect the structure of debt contracts. In particular, market downturns decrease the expected maturity of public bonds and private loans and increase the likelihood that these loans are secured. These findings are consistent with both views: poor macroeconomic conditions could lead firms to structure securities in ways that lessen their information sensitivity or an increase in investor demand for relatively safe securities could change the supply of securities in this direction.

A prediction of the flight-to-quality hypothesis that does not also come from the information arguments concerns the uses of the funds that are raised. The flight-to-quality theories predict that the increased demand for safer securities in recessions will make issuing them relatively attractive, so high quality firms will issue debt and keep the proceeds as cash in recessions, while lower quality firms will spend all capital they raise and not keep any as incremental cash. Consistent with the flight to quality hypothesis, we find that investment grade firms tend to hold a larger proportion of bond issuance proceeds in the form of cash during recessions than in normal times, suggesting that the change in the relative prices of high quality bonds induces a firm to issue, rather than raising the financing to invest in real assets.

Taken together, the empirical results tend to support the view that the supply of capital has a larger impact than the demand for capital on corporate finance during economic downturns. First, bond issues, particularly those with high credit quality and short-term maturity, are counter-cyclical while equity issues are pro-cyclical. Second, the pro-cyclicality of bank loans we find is contrary to the demand-based information asymmetry hypothesis, in which firms prefer financing sources with a lower sensitivity to information in response to a market downturn. Third, we find that the relative prices of highly rated bonds to bonds of lower credit quality shifts during recessions. Specifically, the AAA to BAA credit spread increases during recessions, consistent with an increase in investor demand for safer securities. Finally, investment grade firms hold a larger proportion of the funds from the bond issue in the form of cash during recessions compared to expansions, consistent with the hypothesis that firms respond to changes in the relative prices of securities.

This paper extends the literature on security choice in a number of ways. Important early contributions to this literature are Jung, Kim and Stulz (1996) and Lewis, Rogalski, and Seward (1999), whose concern is how firm-level factors influence the choice of securities.[2] In contrast, our focus is on how these choices are affected by the business cycle, in the tradition of Choe, Masulis and Nanda (1993) and Korajczyk and Levy (2003). To our knowledge, our paper is the first to evaluate the different

[2] Gomes and Phillips (2007) is a more recent paper along these lines.

implications of demand versus supply based theories about security issues over the business cycle, considering a menu of securities broader than between equity and public debt, including convertibles and private debt, as well as alternative characteristics of public and private debt such as maturity and security.

The remainder of this paper is organized as follows: Section I summarizes theoretical work providing explanations on why economy-wide factors could affect both the demand and supply of capital. Section II describes the data employed in this paper and reports summary statistics. Section III presents univariate comparisons of firms issuing securities in different market conditions. Section IV uses multivariate analysis to estimate the way in which economy-wide factors can affect security type, focusing on the broad question of what kind of securities are issued. Section V examines the impact of macroeconomic conditions on the design of debt contracts. Section VI looks more closely at the firms issuing public debt, and considers how public debt issues of different quality vary over the business cycle. Section VII compares the uses of funds between investment grade issuers and junk bond issuers across different macro economic conditions. Section VIII provides a brief summary and conclusion.

I. Why economy-wide factors could affect corporate capital-raising.

A. Theoretical Background.

There have been a number of attempts to link theoretically the state of the overall economy with firms' ability to borrow. Of course, in a Modigliani-Miller world with perfect information, no transactions costs, and managers whose interests are perfectly aligned with shareholders', economy-wide factors should have no effect on firms' financial decisions. Therefore, attempts to model the linkage between macroeconomic factors and firms' financial decisions necessarily rely on a market imperfection of one kind or another.

Choe, Masulis, and Nanda (1993) present an extension of Myers and Majluf (1984) adverse selection model in which investment opportunities vary over the business cycle. In this model, favorable investment opportunities in expansion periods mitigate adverse selection problems and reduce the costs of issuing more information-sensitive securities such as equities. In contrast, during recessions, the

asymmetric information problem is more severe, leading firms to raise capital through less information-sensitive securities. While originally specified in terms of the debt-equity choice, this logic applies equally to certain features of securities that are likely to be associated with the degree of information asymmetry, for example maturity and security. To the extent that short maturity and security reduces information asymmetry between investors and managers, Choe et al.'s argument implies that there should be increases in such characteristics during recessions. Assuming that private debt is less information sensitive than public debt, this theory also predicts a shift from public to private debt during downturns. The channel through which the state of overall economy affects financing choices in this model is through changes in real business opportunities or values of assets in place and their effect on information asymmetry.

Levy and Hennessy (2007) explicitly considers the choice between equity and debt over business cycles in a general equilibrium framework. Underlying the model is a moral hazard problem solved by committing to a level of managerial ownership that makes managers' wealth sufficiently sensitive to the state of the economy. During contractions, managerial wealth decreases more relative to household wealth, and to maintain sufficient ownership to address moral hazard concerns, firms replace equity with debt. In this model, macroeconomic conditions affect the financing choice through changes in the relative wealth distribution between managers and households that varies over the business cycle. Levy and Hennessy (2007) shares the prediction of Choe et al. that debt is preferred over equity during recessions.

The models discussed above can be classified within the context of traditional corporate finance that focuses on the role of demand for capital and its impact on corporate finance.[3] Baker (2009) defines demand effects as the impact of issuers' fundamental characteristics such as investment opportunities and various forms of market frictions such as agency problems and information asymmetry on corporate finance. Under this view, the supply of capital is perfectly elastic and firm characteristics determine the financing choices. Consequently, economic downturns affect security design only through changes in firm

[3] A confusing point is that *supply* of capital is reflected in the *demand* for securities by investors, while *demand* for capital is reflected in the *supply of* securities by the issuing firms.

fundamentals such as investment opportunities or market frictions. A complicating factor here is that it is not clear exactly how the demand for (real) capital will change over the business cycle. Conventional wisdom suggests that demand for capital should be pro-cyclical since the value of firms' investment opportunities is likely to increase during booming economies, as in Shleifer (1986) and Choe et al. (1993). However, during poor economic times, firms are also likely to use up their cash reserves and have to raise capital to finance operations or to cover earnings shortfalls, as occurred in the auto industry during 2008.[4]

In addition to demand for capital, both the availability of overall capital and investors' demand for particular types of securities can affect firms' financing decisions. The first channel through which the supply of capital affects corporate finance is a negative shock on intermediary capital. Holmstrom and Tirole (1997) present a moral hazard model that allows both public debt and intermediated loans as the financing choices under different states of capital supply. In this model, monitoring reduces the private benefits and hence alleviates the moral hazard problem, but is costly since it requires monitors to put up their own capital. Firms prefer to borrow directly rather than through an intermediary, since borrowing directly avoids paying the monitor for his services. A market downturn lowers the value of all firms, leading to a *collateral crunch* that pushes firms that could previously borrow directly into the region where they have to rely on intermediaries, and pushes some of the intermediary-using firms out of the capital market altogether. In a downturn, the capital available to intermediaries also goes down, creating a *credit crunch* that reduces the number of firms to which they can lend. Since intermediaries prefer to lend to better firms, firms with the lowest net worth end up being shut out of the capital market. [5]

The second channel through which supply of capital or demand for securities affects financing choices is explained in "flight-to-quality" models. In these models, changes in economic uncertainty cause investors to become more risk averse and lead to an increase in demand for relatively safe or more liquid assets (See for example Caballero and Krishnamurthy (2008) and Vayanos (2004)). In a traditional

[4] Kahle and Stulz (2010) provide a detailed analysis of firms' financial policies during the Financial Crisis of 2008.
[5] In addition to the Holmstrom and Tirole (1997), the literature on the firm's choice between bank and public debt include Diamond (1991a), Besanko and Kanatas (1993), Hoshi, Kashyap, and Scharfstein (1993), Chemmanur and Fulghieri (1994), Boot and Thakor (1997a, 1997b), Bolton and Freixas (2000), and Repullo and Suarez (2000).

corporate finance setting where supply of capital is perfectly elastic, changes in investor demand for securities will not affect security issuances. However, as Baker (2009) emphasizes, an inelastic supply of capital can lead firms to change their security choices over time. For example, if an exogenous shock leads investors to become more risk averse, leading them to sell equities and to purchase highly rated corporate bonds, highly-rated firms would have an incentive to issue bonds in response to the changes in investor demand for safer assets, even without a need to finance real investment opportunity.

Despite the differences in the underlying assumptions, both demand-oriented and supply-oriented models suggest that firms' ability to raise capital as well as their choice of security conditional on issuance will be affected by overall market conditions. Both theories predict that firms will be more likely to use less information-sensitive or safer securities during recessions than during expansions. In particular, during recessions, firms will be less likely to issue equity and more likely to issue debt, and conditional on a debt issue, firms will tend to structure it with less information-sensitive or safer characteristics (i.e., shorter-term or secured).

In addition, theories on supply of capital or demand for securities provide additional testable implications, which have not been previously documented. First, the existence of limits on intermediary capital during market downturns implies not only a substitution effect where firms are expected to substitute away from publicly traded debt to private debt as in the demand-driven information hypothesis, but also an income effect where available loanable funds decrease. Moreover, poor quality firms will tend to be credit-rationed, so that the firms observed issuing securities should be of relatively higher quality than those issuing during expansions. Finally, flight to quality arguments suggest that proceeds raised through investment grade bonds in recessions are not necessarily used to finance real investment projects.

B. Related Empirical Work

There have been a number of papers documenting the manner in which equity offerings vary over the business cycle. These papers have all found that equity offerings are much more likely to occur during boom periods than during market downturns. This pattern appears to persist over a number of

different time periods. [See Hickman (1953), Moore (1980), Choe et al. (1993), Dittmar and Dittmar (2007) and Dittmar and Thakor (2007].[6]

Gomes and Phillips (2007) provide a fairly comprehensive analysis of the security choice decision, focusing on the way in which asymmetric information affects the choice among public and private equity and debt securities. These authors do not focus on the role of macroeconomic factors. However, to the extent that demand for capital driven models discussed above argue that market-wide factors affect security choice through their effect on asymmetric information, Gomes and Phillips' results are related to ours.

Several papers have documented evidence that flight to quality episodes affect the distribution of security choices. Gertler and Gilchrist (1994) and Kashyap and Stein (2000) present empirical work suggesting that monetary policy's impact is mainly on small firms. Gertler and Gilchrist also find that the relative proportion of loans to large corporations increases during periods of tightened monetary policy. Kashyap, Stein and Wilcox (1993) find that the relative quantities of commercial paper to bank lending increases when monetary policy is tight. Lang and Nakamura (1995) find that the fraction of loans issued with yields less than prime plus one percent is countercyclical and increases after monetary policy is tightened. Calomiris, Himmelberg and Wachtel (1994) find that the aggregate issuance of commercial paper is counter-cyclical, consistent with a flight to quality during downturns.

Recent work by Kahle and Stulz (2010) focuses on the impact of the Financial Crisis of 2008 on corporate financial policies. These authors find that large investment-grade firms are not affected much and at the same time they increase cash holdings substantially in the aftermath of the fall of Lehman. Kahle and Stulz (2010)'s findings for the Financial Crisis closely resemble ours for earlier periods, and consequently provide an out-of-sample confirmation of our results.

[6] There have also been several papers documenting the cross-sectional properties of debt maturity. [See Barclay and Smith (1995), Guedes and Opler (1996), and Scherr and Hulburt (2001)]. In addition, Rauh and Sufi (2009) provide detailed data on debt structure that goes well beyond the summary statistics found on Computstat.

Perhaps the most related paper to ours is Korajczyk and Levy (2003). Korazczyk and Levy examine the way in which firms' capital structures vary over the business cycle, and they focus their analysis on the differences between constrained and unconstrained firms. Their main finding is that leverage ratios tend to be countercyclical for unconstrained firms and cyclical for constrained firms. Korazczyk and Levy's focus is nonetheless quite different from ours; while they concentrate on the debt-equity ratio, our goal is to study how the business cycle affects the manner in which firms raise capital and the way they structure the securities they issue.

II. Data Sources and Sample Description

A. Data Sources

We obtain data on security issues from three different sources: SDC Global New Issues Database for SEOs, Mergent Fixed Income Securities Database (FISD) for convertible bonds and other public debt, and Loan Pricing Corporation's Dealscan for private loans. The SDC database provides information on total proceeds and the number of primary and secondary shares offered for each SEO. In our sample of SEOs, we exclude all private placements. In addition, we drop SEOs that only offer secondary shares since these offerings do not lead to a capital inflow to the firm. This process leads to a sample of 7,746 SEOs by 4,885 U.S. firms that have Compustat identifiers from 1971 to 2007.

Mergent FISD provides comprehensive information for U.S. corporate debt, including total proceeds raised as well as other characteristics such as maturity, security, convertibility, and credit quality. We utilize all public debt issues made by industrial firms reported in FISD from 1971 to 2007. Our initial public bond sample consists of 21,657 issues from 3,072 firms with Compustat identifiers. The average initial maturity is 12 years and the median is 10 years. Most of the bonds are unsecured (96.3%) while slightly more than half (55%) have investment-grade ratings.

Our data on private debt are from Loan Pricing Corporation's Dealscan, which contains detailed issuance-level information on the characteristics of syndicated and sole-lender bank loans. These characteristics include size and maturity of the loan, credit quality of the borrower, as well as information on whether the loan is secured by some type of collateral or not. Each loan can have multiple tranches,

each of which contains different characteristics. Our sample comprises 40,097 completed loan tranches to 7,465 firms with Compustat identifiers between 1988 and 2007, including 364-day facilities (9.58%), bridge loans (1.6%), term loans (29.84%), and revolving loans and credit lines (58.98%).[7] The mean loan maturity is about 3.7 years with a slightly shorter median of 3.4 years. Contrary to the sample of public bonds, most of the loans are secured, with 79% of sample loans being secured by some type of collateral.

Using these issue-level data, we collapse each firm's issues at the month level. We focus on monthly issue-level data because our macroeconomic data is available monthly and we explore the manner in which macroeconomic conditions affect firms' capital raising decisions.[8] We then match the firm-month observations with accounting information from Compustat and eliminate all financial firms (one-digit SIC equal to 6) and utilities (two-digit SIC equal to 49). After this process, we end up with a sample containing 7,170 firm-months with SEO issues, 2,546 firm-months with convertible bond issues, and 10,400 firm months with straight public bond issues from 1971 to 2007, and also 20,322 firm-months with private loan contracts from 1988 to 2007.

For macroeconomic data, we obtain recession/expansion dates from the National Bureau of Economic Research (NBER) and GDP growth rates from the US Bureau of Economic Analysis (BEA). In addition to macroeconomic data, we consider a direct survey-based measure of the state of financial conditions provided by the Federal Reserve, called the 'Senior Loan Officer Opinion Survey on Bank Lending Practices.' This survey is a quarterly survey of approximately sixty large domestic banks and twenty-four U.S. branches of foreign banks, asking the managers of these banks how their bank is changing their credit standards. The particular variable we focus on is the net percentage of domestic

[7] We thank Amir Sufi and Michael Roberts for sharing Compustat identifiers that allow us to match Dealscan Loan data with accounting data from Compustat. See Chava and Roberts (2008) for a discussion of the process of gathering these identifiers.

[8] We have estimated all equations in the paper using quarterly data as well. Quarterly data does not match perfectly with the macroeconomic data, but has the advantage of corresponding exactly with quarterly accounting data. The results using quarterly data are in all cases similar to those reported below and are available from the authors on request.

respondents who claim that they are tightening standards for commercial and industrial loans.[9] One limitation of this survey is that it is available only after the second quarter of 1990, so when we use the survey data, we restrict our sample to this sub-period.

B. The Pattern of Security Issues over Different Market Conditions

Table I presents descriptive statistics of our security issuance sample. To provide a rough idea of the time-series variation in the use of securities, we divide the sample into sub-periods based on the NBER's expansion/recession classification. For each sub-period, we report the proceeds raised in constant 2000 $US million for four types of securities in that period: SEOs, convertibles, straight public bonds, and private loans. Since recessions are substantially shorter than expansions during our sample period, we report the monthly average proceeds rather than total proceeds during each sub-period.

A complicating factor in our analysis is that the quantity of capital raised increased substantially over the sample period as the economy expanded even after controlling for the inflation, due in part to the development of the syndicated loan market. Given the rapid growth in the quantity of issuances, it is difficult to infer patterns about the relative effects of market conditions. Nonetheless, a few patterns relating macroeconomic conditions and security offerings are evident from Table I. In particular, equity offerings decline during recessions, but public debt offerings appear to rise. The rise of the syndicated loan market is also evident, coming into existence in the late 1980s and becoming the predominant form of capital raising by the 2000s.

We observe a similar pattern in Figure 1, which reports the time-series trend of the natural logarithm of the proceeds raised (in constant 2000 $US million) for each calendar month during our sample period. Shaded areas in the figure denote recessions as defined by the NBER. Figure 1 highlights the manner in which SEOs tend to decrease during recessions while public bonds and convertibles tend to increase.

[9] See Lown, Morgan, and Rohatgi (2000) for more information about the survey. These authors document that the survey results are strongly related to loan growth, with tightening standards being associated with slower loan growth.

Table II normalizes the amount of capital raised through each method in each calendar month by the total capital raised in that particular month and considers how the percentage of capital raised by different methods varies over different market conditions. To consider the effect of market downturns on security issuances, we rely on three alternative measures of market-wide conditions. In addition to an NBER-defined recession, we characterize months by GDP growth, and label a month 'Low Growth' if GDP growth in that particular quarter is below the 25th percentile of economic growth over the entire sample period. Finally we define 'Weak Credit Supply' months as those for which the net percentage of senior loan officers tightening standards for loans to large and medium firms is positive for that particular quarter.

Panel A of Table II presents the relative proceeds raised by different forms of financing for the 1971-1987 sub-period, for which there are no syndicated loans, while Panel B reports the results subsequent to 1988, the first year for which we have data for syndicated loans. For both sub-periods, the fraction of capital raised by public debt is larger during market downturns than in expansions. In contrast, equity issues appear to be pro-cyclical, with larger fractions being raised during expansions than contractions. This pattern for SEOs and bonds over the business cycle is consistent with both demand-driven and supply-driven explanations since both hypotheses predict a change in the distribution of financing choices towards less information sensitive or safer debt securities. Market conditions have a somewhat ambiguous effect on convertibles; in the earlier sub-period convertibles account for a larger fraction of capital raised during expansions while in the latter sub-period they account for a larger fraction during recessions.

On the other hand, the demand-driven information-asymmetry hypothesis does not do well at explaining patterns in private bank loans. Private debt appears to account for a higher fraction of capital raised during expansions than recessions, whereas the information hypothesis would suggest that bank loans should be counter-cyclical. The observed pattern is better explained by a supply of capital perspective where the reduction in overall intermediary capital dominates the substitution effect from public debt to private debt in the pursuit of more monitoring.

In addition to the broad type of securities offered, the theories discussed above have predictions about the quality and structure of the securities offered during market downturns. To evaluate these predictions, Table III breaks down the public debt issues more finely, documenting the extent to which the use of bonds of different maturity, security, and quality vary by market conditions. In the first two columns we report the relative proportion of short-term public debt, as well as secured public debt.[10] We define a bond to be short-term if the time to maturity of the issue is less than five years.[11] Our measure of security level is a dummy variable set to one if the bond is secured and set to zero otherwise. If the firm issues more than one bond in a particular month, we label the observation as secured if the proceeds raised from the secured bond is at least half of the total proceeds raised. The relative proceeds raised through short-term debt increase significantly during recessions and weak credit supply. As with the previous univariate results, this pattern can be due to either demand-driven or supply-driven explanations. However, the results for secured debt are more ambiguous, with the proportion of debt that is secured being somewhat higher in good economic times than in downturns.

The remaining columns of Table III present the fraction of capital raised by public debt with different credit quality across varying macroeconomic conditions. The pattern here is clear: Lower quality and unrated debt issues decline substantially during poor market conditions. During recessions, the quantity of low-quality issues declines to one third to one half of the expansion levels, depending on the sample period used. In contrast, the level of investable B-rated issues is about the same, leading the fraction of A-rated issues to increase by about twenty percentage points during recessions. The pattern is similar if we measure market conditions using GDP growth or the survey of credit supply, although the differences are somewhat smaller.

Figure 2 illustrates this pattern graphically. The vertical axis measures the natural logarithm of proceeds raised (in constant 2000 $US million) through public bonds of various quality and the numbers

[10] Mergent does not contain any short-term debt issues prior to 1985. Hence, we consider short-term debt to be missing before 1985 when computing the numbers presented in Table III.
[11] If the firm issued more than one bond in a given month, then the issue activity is classified as short-term if the proceeds-weighted maturity of the bonds is less than five years.

reported are 11-month moving averages around each calendar month. The figure suggests an overall upward trend in the use of public debt financing in all levels of credit quality. However, it also points out the differential impact of a recession on the public debt with different ratings. During recessions, the quantity of capital raised by low-rated and non-rated debt issues drops significantly while highly-rated bonds remain relatively constant or even rise.

III. Firm Characteristics

In addition to market-level characteristics, firm-level characteristics affect both the likelihood of raising capital, and conditional on raising capital, the method used to raise the capital. To illustrate these differences, the first two columns of Table IV compare characteristics of firms in months in which some type of security was offered to months in which no security was issued. These characteristics are firm size (natural logarithm of total assets), leverage, market to book, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, and the stock return. Inverse interest coverage is defined as the natural logarithm of (1+interest/EBIT) and stock return is calculated over the previous twelve months.[12] As in Table II, we report the results separately for 1971-1987 sub-period (in panel A) and post-1988 sub-period (in panel B) during which we have the data for private loans. The accounting variables reported are taken from the fiscal year-end immediately prior to the issue.

Relative to firm-months with no issues, firms in issuing months tend to be larger, older, and have higher growth and better prior stock performance. For the issuing months, the average sales growth for the year just prior to the security issuance is 0.31 in panel A and 0.27 in panel B, compared to 0.19 in panel A and 0.18 in panel B for non-issuing months. The stock return over the previous twelve months is 0.62 and 0.34 for issuing months, compared to 0.19 and 0.17 for non-issuing months in panels A and B respectively. In addition, issues are less likely during market downturns, regardless of which measure of financial conditions one uses in both panels A and B.

[12] Appendix 1 contains exact definitions of all variables.

The remaining columns of Table IV summarize differences in firm characteristics across issuers of alternative securities. SEO issuers tend to be the smallest, youngest, and they have the highest market to book ratios in both panels. Public debt issuers are substantially larger, and they have higher fixed asset ratios than issuers of other types of securities. In contrast, issuers of private loans are noticeably smaller than public debt issuers, with lower cash flows and fixed assets. This pattern suggests that public debt issuers are noticeably different from other kinds of issuers, consistent with the view that publicly-traded debt is the most attractive form of financing, and that firms using other forms are unable to issue publicly-traded debt.

IV. Multivariate Analysis of Security Choice

The aggregate statistics and the univariate comparisons are both suggestive of the hypothesis that firm characteristics and macroeconomic conditions affect the way firms raise capital. However, to identify the effect of macroeconomic conditions on the issuance of the firms' funding choices, it is important to estimate this relation in a multivariate setting, controlling for firm-level factors and time trends. To evaluate formally the extent to which financing choices are affected by macroeconomic as well as firm-specific factors, we employ discrete-choice models that estimate the likelihood of a firm issuing a specified type of security in a particular time period. At any point in time, a firm can choose not to obtain financing, to obtain a private loan, or to access the public security markets by issuing a straight bond, convertible bond, or seasoned equity. Given the number of potential alternative outcomes, we utilize econometric approaches that allow for multiple discrete choices.

A. A Multinomial Logit Approach

Multinomial logit models provide one way to estimate systems in which independent variables affect the choice among a finite number of alternative outcomes. Thus, it provides a natural way of

modeling a firm's choice among raising capital through alternative financing methods, or not to raise capital at all.[13] Specifically, we estimate the following model:

$$\Pr(security\ type = j) = \frac{e^{\beta_j' X}}{\sum_{k=0}^{4} e^{\beta_k' X}} \tag{2}$$

where j equals 0 if the firm does not issue any type of security, 1 for a bank loan, 2 for a public bond, 3 for a convertible debt, and 4 for an SEO. β_j is a vector of coefficients for outcome j where β_0 is assumed to be zero, and X is a vector of explanatory variables where the detailed definitions are provided in Appendix 1.

Table V contains estimates of multinomial logit equations predicting the type of security issued. The model allows for five possible outcomes: The firm can choose not to issue any security, to get a loan, to issue a straight bond, to issue a convertible bond, or to do a seasoned equity offering. In each equation, 'no issue' is the omitted variable, so the coefficients in each column can be interpreted as the impact on the probability of issuing a particular type of security relative to not issuing at all.

Each of the three panels uses a different measure of market-wide conditions: Panel A uses the NBER-defined recession, Panel B uses the level of GDP growth, and Panel C uses the Senior Loan Officer Opinion survey on lending standards. Each specification also includes a number of variables designed to capture the firm's financial condition and demand for capital (e.g., market to book, cash flow, and sales growth). Other firm-level controls are firm's age, natural logarithm of the total assets, leverage, cash, natural logarithm of the inverse of interest coverage,[14] and a debt-rating dummy. We also include the firm's stock return for the prior twelve months, which restricts our sample to listed firms. Furthermore,

[13] One potential drawback to multinomial logit is the underlying independence of irrelevant alternatives assumption, which requires that the choice between any two financing choices be independent of the existence of a third choice. For example, the multinomial logit specification implicitly assumes that the choice between public debt and private debt is independent of the choice of whether or not to issue seasoned equity. See Greene (2000) pp. 857-862, and 875-879 for more discussion on the estimation and properties of multinomial logit.

[14] The transformation used is a negative function of conventional interest coverage, so that the negative coefficient on this variable for a specific security type means that better interest coverage increases the likelihood of the corresponding issue type. We use this transformation because the usual measure of interest coverage becomes infinite for all-equity firms.

all regressions include industry fixed effects. Finally, we include the term spread, defined as the difference between the yields on ten-year treasuries and one-year treasuries, as a macro-level control. The equation is estimated using a panel of monthly observations for all firms that had at least one type of security issue at any point during the sample period, a procedure that leads to 737,433 observations.[15] We calculate the standard errors in these equations allowing for clustering of observations at the firm level.

The coefficient on the variable indicating poor financial conditions is negative and statistically significantly different from zero for SEOs, regardless of which measure of macroeconomic conditions we use. Additionally, the coefficient is statistically significantly different from the coefficients on the other securities in the specifications using the recession dummy and the weak credit market dummy variable as our measures of financial conditions. This result indicates that a recession lowers the likelihood of issuing an SEO, relative to not issuing any security or issuing any other type of security and is consistent with the notion that as financial conditions worsen, firms are less likely to issue equity. As such, it confirms the findings of Hickman (1953), Moore (1980) and Choe, Masulis and Nanda (1993), who find similar patterns of security issuances over earlier time periods (1900-1938, 1946-1970, and 1971-1991 respectively).

The other coefficients in the equations in Table V are consistent with the view, implicit in the Holmstrom and Tirole (1997) model among others, that the firms issuing public debt are the lowest quality risks to a lender. The coefficients in Table V indicate that, relative to firms that issue other types of securities (or no issue at all), public debt issuers are oldest, largest, have the highest fixed asset ratio and sales growth, and are most likely to have a debt rating.

Convertible bonds appear to be more likely to occur during poor economic times, holding other factors constant. All three coefficients on the variables indicating poor financial conditions are positive, and two of them are statistically significantly different from zero. Combined with the negative coefficient on SEOs for the financial conditions variables, the positive coefficient could reflect firms that otherwise

[15] We obtain similar results when we include all other firms in Compustat that did not have any security issue during the sample period.

would be issuing equity choosing to issue a convertible bond during market downturns. If asymmetric information increases during these downturns, this pattern is consistent with the logic of the Stein (1992) model, in which convertible bonds are issued as an alternative to equity when asymmetric information is high.

B. The Credit Quality of Bank Borrowers

The results from Table V indicate that the coefficients on the market downturn variables for the loan issuance are all negative, and two of the three are statistically significantly different from zero. This pattern suggests that reduction in the availability of intermediary capital or *credit crunch* as in Holmstrom and Tirole (1997) overwhelms the substitution from public to private debt by firms that need more monitoring in downturns, which leads to a decrease in the equilibrium quantity of loans.

A complicating factor in empirical analysis of loan initiations is that instead of taking out new loans, firms have the option of drawing down existing lines of credit. It seems likely that firms will choose to draw down lines of credit more quickly during a recession. Ivashina and Scharfstein (2008) document that during the Financial Crisis of 2008, which occurred after our sample period, firms in fact did draw down lines of credit substantially faster than they typically do during good economic times. If the recent financial crisis is typical of other recessions in the respect that firms draw down lines of credit more than usual, the increase in bank lending during poor market-wide conditions is likely to be larger than one would infer by examining only the loans covered by Dealscan, as we do in Table V.

To explore further the effect of a *credit crunch* as outlined in Holmstrom and Tirole (1997), we test whether banks become more selective and lend to higher quality borrowers in downturns. If the credit crunch is really binding, loans initiated during market downturns should be to higher quality firms than those that received them in good economic times. We first order the ratings of borrowers from 0 to 4, with 0 representing borrowers with loans that are not rated, 1 representing C to Caa1 rated, 2 representing B3 to Ba1 rated, 3 representing Baa3 to Baa1 rated, and 4 representing A3 to Aaa rated. We estimate equations predicting this rating as a function of firm characteristics and the three measures of financial

conditions. Because of the natural ordering of the dependent variable, we estimate the following ordered logit model:

$$\Pr(\textit{credit}\ \text{rating} = \text{j}) = \Pr(\mu_{j-1} < \beta' X + \varepsilon < \mu_j) \qquad (3)$$

where j corresponds to borrower credit ratings (0 to 4) as described above, β is a vector of coefficients, X is a vector of firm characteristics and financial conditions as outlined in Table VI (and described in detail in Appendix 1), ε follows a logistic distribution, and μ_j's are unknown cutoff parameters to be estimated with the coefficients.

Table VI contains estimates of this equation, with each column using a different measure of market conditions. In each equation, the coefficient on the market conditions variable is positive and statistically significant, which suggest that, controlling for other factors, poor overall market conditions lead banks to provide loans to higher quality borrowers. This finding is consistent with the argument that poor market conditions lower the amount of credit available for banks to lend, leading them to drop the worse-quality borrowers and lend only to higher quality ones.[16]

V. Market Conditions and the Design of Debt Contracts

We have documented the way in which the distribution of financing choices changes over the business cycle. Equities and bank loans occur pro-cyclically, while bonds and convertible bonds are counter-cyclical. These findings are generally consistent with both information-based demand for capital arguments as well as supply of capital explanations, with the exception that decreases in bank loans during downturns are difficult to explain using the demand-based models.

An additional testable implication provided by both hypotheses is that, conditional on the *type* of security used, firms will alter the *structure* of those securities depending on macroeconomic conditions. Regardless of the type of security used, we expect to observe that as market-wide conditions weaken,

[16] When we estimate multinomial logit models using the same dependent variable and the no-issue as the base outcome, the coefficients on our downturn variables are significantly positive for the A-rated borrowers and significantly negative for the non-rated ones.

firms will adjust the design of their securities either to minimize their sensitivity to information or in response to relative price changes as investors' demand for safer assets increases.[17]

A. Publicly-traded Bonds

We first examine how the characteristics of public bonds vary over the business cycle. Both the information-sensitivity and risk profile of a bond increases in the bond's maturity and decreases when a bond is secured with real assets, holding all other factors constant. Therefore, we expect to observe that, all other things equal, firms are more likely to use shorter maturity bonds or secured bonds when market conditions are relatively poor.

As in Table III, we define short-term firm-months as those with proceeds-weighted initial maturity of less than or equal to five years. Similarly, secured firm-months are defined as those with proceeds-weighted secured dummy greater than or equal to 0.5. We estimate equations predicting whether the bond is short term and whether the bond is secured, conditional on an issuance of public debt.

We restrict the sample to those firm-months for which there is a bond issue, so there are two possible outcomes, either short-term or long-term, and either secured or non-secured. Consequently, we estimate the following logit models:[18]

$$\Pr(bond\ maturity = short\ term) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} \tag{4}$$

$$\Pr(bond\ security = secured) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} \tag{5}$$

where β is a vector of coefficients for short-term debt in equation (4) and secured debt in equation (5), and X is a vector of firm characteristics and financial conditions (described in detail in Appendix 1),

[17] A related implication of this argument is that lenders should impose tighter covenants on borrowers during recessions. Zhang (2008) examines this hypothesis on a sample of large US firms and finds that covenants are stricter when set during downturns and they lead to higher recovery rates later. Similarly, Santos and Winton (2008) find that loan spreads rise in recession more so for those without public debt market access.

[18] We have estimated a number of alternative specifications that we have reported in previous drafts. In particular, we have estimated two-stage models in which we first estimate the likelihood of a bond issue, and then estimate, conditional on the issue, the factors that affect the structure of the issue. We have also estimated multinomial logit models in which firms face a choice of not to issue, to issue short-term, or to issue long-term (and similarly with security). As the results from each specification are similar, we choose to report results from the simpler specification.

Table VII contains estimates of these equations. The first three columns of this table report the estimates for equation (4). The sample period for this estimation is from 1985 to 2007 since there are no short-term bond issuances prior to 1985 in our sample. The results suggest that financial conditions and the maturity of publicly-traded bonds are negatively related. The coefficients on the variables representing poor conditions are all positive and statistically significant. This finding is consistent with the notion that weak macroeconomic conditions exacerbate asymmetric information problems, since shorter maturity securities' value fluctuates less with changes in information about firm value than does longer maturity securities' value. However, to the extent that short-term bonds are less risky-than long-term bonds the results can also be explained by a flight to quality within this asset class.

Additionally, consistent with the Diamond (1991b) liquidity-risk arguments, we find that short-term debt issuers tend to be larger, have stronger growth opportunities, and less cash on the balance sheet than firms that can issue long-term debt. The large effect of growth opportunities, as measured by the market-to-book ratio, is also consistent with Myers (1977) and Barnea, Haugen and Senbet (1980), in which firms with better growth opportunities issue on shorter term maturities to help minimize potential agency conflicts. The results are also largely consistent with Flannery (1986) in that short-term debt issuers seem to be of higher quality being older, larger and having more growth options compared to long-term debt issuers.

Columns 4, 5, and 6 of Table VII report estimates of equation (5). These estimates for bond security are more ambiguous than those for maturity. For the low-growth dummy, the coefficient is positive and significantly different from zero. However, the coefficients on the other financial condition variables are insignificantly different from zero with opposite signs from one another.

In addition, the results from Table VII document other factors that affect the decision to use secured debt. These results suggest that firms issuing secured debt tend to be smaller and much more highly levered than unsecured issuers. Firms also tend to issue secured debt when they have high fixed asset ratios and after periods of poor stock returns. They tend to hold more cash, which tends to indicate that they are concerned about liquidity constraints in the future. These findings are consistent with the

‘banking’ view of secured debt (Berger and Udell (1990)), which focuses more on the effect of (limited) supply of capital and catering to investors’ demands on financial choices. Here, poor quality firms have little choice but to issue secured debt as investors are more likely to require direct collateral when the firm is nearing bankruptcy. On the other hand, they do not support the traditional demand-driven ‘corporate finance’ view, in which high quality firms issue secured debt to avoid underinvestment problems associated with the priority of existing debt claims (Stulz and Johnson (1985), Smith and Warner (1979), and Berkovitch and Kim (1990)).

B. Private Loans

We now examine the way in which macroeconomic conditions and firm-specific factors affect the structure of private loans. As with our analysis of public debt offerings, we classify private loans by maturity and security level. As before, we consider a loan or collection of loans to be short-term if the weighted maturity is less than five years, and classify the loans as secured if the proceeds-weighted secured dummy is larger than or equal to 0.5. We then estimate equations predicting the factors that affect whether a loan is short or long-term, and whether or not it is secured. Similar to the equations (4) and (5) estimated for bonds, we restrict our sample to those firm-months for which a loan was issued, and estimate the equations using a logit model.

Table VIII presents estimates of these equations. The first three columns report estimates of the factors that affect the choice between short-term and long-term loans. Similar to public bonds, the conditional probability of obtaining a short-term loan increases during economic downturns and tightening credit markets, consistent with the hypothesis that firms turn away from more information-sensitive or risky loans during downturns. In addition, firms that get short-term private loans tend to be smaller, have lower debt levels, and are less likely to have obtained a credit rating compared to firms that obtain long-term loans. These findings are in contrast to those for short-term bond issuers, who tend to be larger firms that have credit ratings.

The last three columns of Table VIII report estimates of equations predicting whether a given loan will be secured or unsecured. The coefficients on the three indicators of financial market conditions

are positive and statistically significant. These results suggest that weak credit conditions are associated with a higher use of secured relative to unsecured loans.

The effect of macroeconomic conditions on security appears to be different for loans, where market downturns clearly increase the likelihood of security, than for bonds, where this effect is significant only for one of three measures of financial conditions. One possible explanation is that secured public debt is relatively rare, with only 5 percent of issues being secured. In contrast, 79% of private loans in our sample are secured. Thus, it is not surprising that the results for security are more unambiguous for the sample of loans, where security is a common feature, than for bonds, where it is not.

In addition, the same firm-level factors that lead firms to issue secured public debt lead firms to use secured private loans. In particular, firms obtaining secured loans tend to be younger, smaller, highly levered with low interest coverage and weak cash flows. Similar to the results from the public debt, this pattern strongly supports the supply of capital–driven 'banking view' of secured debt, in which firms tend to use secured debt in situations in which lenders are unwilling to lend absent security. It is counter to the demand for capital-driven 'corporate finance' view, in which firms use secured debt as a way of finessing future agency problems.

VI. The Determinants of Credit Quality of Public Debt

In addition to the features of the debt contracts, we are also interested in the factors that affect the credit quality of the bond. Consequently, we estimate equations predicting the bond's quality, measured by its rating. We estimate these equations using a multinomial logit setup similar to equation (2) in which the dependent variable encompasses five possible levels of credit quality: non-rated, C-rated, speculative B-rated, investment grade B-rated, and A-rated bonds. The baseline corresponds to the firm choosing not to issue any kind of debt.

Table IX reports coefficient estimates from equations predicting the credit quality of a firm's bond issue. This table contains three panels, each of which utilizes an alternative measure of market conditions. A number of the results correspond to the firm characteristics commonly associated with

bond ratings of different types. For example, larger firms, and firms with higher market to book, higher cash flows and better coverage ratios are more likely to issue high-rated debt than low-rated debt, while more levered firms are more likely to issue low-rated debt.

More interestingly, Table IX clearly shows that weaker market conditions lead to a shift in the distribution of issued bonds towards higher credit ratings. Consistent with the commonly discussed arguments of practitioners and Holmstrom and Tirole (1997) model, during bad economic times, poor quality borrowers appear to be shut out of the bond market. The only bonds that are not affected by poor economic times are highly-rated ones. In other words, the fact that the quality of bonds issued is strongly countercyclical is evidence consistent with the view that financial constraints are exacerbated during recessions. This finding mirrors the patterns reported in Kahle and Stulz (2010), who report that large investment-grade firms' capital raising is not substantially affected by the recent Financial Crisis of 2008.

A somewhat counterintuitive finding is the strong negative relation between cash holdings and the probability of issuing investment grade debt. This finding is consistent with the logic of Almeida, Campello and Weisbach (2004, 2009), who argue that more financially constrained firms are likely to save a higher percentage of cash from their cash flows. Since firms with low bond ratings are more likely to face financial constraints, they will tend to save more cash, leading to a negative relation between firms' cash holdings and the ratings of the bonds they issue. This finding complements the results from Tables VII and VIII showing that high cash levels also predict the use of secured debt, which also is consistent with constrained firms holding more cash and using security as a way of enabling access to credit.

VII. Uses of Funds from New Public Debt Issues over the Business Cycle

The flight-to-quality hypothesis that focuses on the supply of capital or demand for securities shares many of the same predictions as the demand for capital-driven information hypothesis. In particular, both suggest that the distribution of external financing choices shift towards securities of less information sensitivity or lower risk during a downturn. The flight-to-quality hypothesis, however,

contains the additional prediction that investors' demand for safer securities changes the relative prices between securities of different risk. If, as predicted by the flight-to-quality models, investor demand shifts toward safer securities in response to a poor macroeconomic environment, there should be a shift in the relative prices of securities of different quality. Confirming this hypothesis, Figure 3 reports the time-series trend in AAA and BAA corporate bonds as well as the difference between the two. The figure clearly indicates that credit spread increases in recessions making higher quality debt more attractive to issue. As Baker (2009) argues, firms have an incentive to issue these safer securities when their relative prices have dropped. Consequently, we expect the distribution of securities issuance choices to shift towards relatively safer assets, such as from equities to bonds, similar to the prediction of the asymmetric information hypothesis.

One key difference between these hypotheses is that in the demand for capital-driven information story, firms issue securities when they have a need for external financing, such as for investing in fixed capital. In contrast, if firms are issuing securities in response to changes in relative prices due to a flight to quality episode, firms are more likely to hold the funds as cash, rather than to invest the proceeds immediately. Thus, one way to distinguish whether macroeconomic conditions are changing issuance choices directly through information asymmetries or indirectly through affecting investor demand for securities is to investigate differences in the uses of proceeds from the issuance of public debt across the business cycle.

To examine the effect of macroeconomic conditions on the ex-post uses of funds from new debt issues, we first aggregate all new issuance of public debt within a calendar quarter. We then match the most recent fiscal quarter before the issuing quarter and the most adjacent fiscal quarter after the issuing quarter.[19] We then estimate equations similar to those reported in Kim and Weisbach (2008), using the following specification:

[19] For March, June, September, December firms, the most adjacent fiscal quarter would be the same as the issuing calendar quarter.

$$Y = \beta_0 + \beta_1 \ln\left[\left(\frac{\text{new public debt}}{\text{total assets}_0}\right)+1\right] + \beta_2 \ln\left[\left(\frac{\text{new public debt}}{\text{total assets}_0}\right)+1\right] \times \text{RecessionDummy} + \beta_3 \ln\left[\text{total assets}_0\right] + \varepsilon \quad (6)$$

where $Y = \ln[((V_t - V_0)/\text{total assets}_0) + 1]$ and V is set to either total assets or cash and short term investments. We estimate the uses of capital from the debt issues depending on both debt quality and macroeconomic conditions. We classify debt issues with either no rating or ratings below Ba1 based on Moody's as speculative grade and those with ratings above Baa3 are classified as investment grade. We define a calendar quarter as being in a recession if that quarter includes a recession month based on NBER classification. We estimate this equation for intervals of one quarter, four quarters and eight quarters following the issuing quarter.

We present estimates of equation (6) for speculative grade and investment grade issuers separately in Table X. The coefficient β_1 gauges the contribution of new debt in increasing total assets or cash including short-term investments during expansions while β_2 captures the incremental impact of a recession on the use of funds. The results suggest that debt issues generally contribute to increases in assets for both junk and investment grade debt issuers. However, recessions reduce the increases in assets following debt issues, implying that firms are using the funds they raised in either replacing existing debt or on operating expenses.

A direct implication of the flight-to-quality arguments comes from the effect of debt issues on increases in cash and short-term investments. In expansions firms issuing junk bonds save a substantially higher portion of the capital raised than firms issuing investment grade bonds, consistent with the usual precautionary savings motive (see Almeida et al. 2004). However, in recessions, firms issuing junk bonds save much less of the capital they raise when measured using either the one-year or two-year intervals. In contrast, investment grade firms issuing bonds during recessions actually save substantially more than they do in expansions. This pattern is consistent with the flight-to quality arguments: In recessions the cost of raising capital for low-quality firms is extremely high, so they only do so when it is absolutely necessary to fund investments. In contrast, the price of capital is abnormally low for high quality issuers

during recessions, so they will actually increase their issuances beyond what is necessary to fund investments and save the proceeds as cash.

VIII. Conclusion

Macroeconomic conditions can affect the way in which firms raise capital, and indeed their very ability to do so. To the extent that a worsening of overall market conditions can exacerbate information problems, information-based theories imply that poor overall market conditions can lead to firms' using less information sensitive securities to raise capital. Similarly, changes in investor demand for relatively safe securities can shift the distribution of actual security issuances in largely the same direction as those implied by the information asymmetry hypothesis. However, an additional prediction of "flight to quality" models is that firms should respond to the increase in the demand for safer securities by issuing relatively more high quality securities during time of economic downturns.

Theories based on supply of intermediary capital suggest that the highest quality firms will be relatively unaffected by a market downturn. However, some lesser quality firms will be forced to shift from direct issuances of debt to intermediated debt, while other lesser quality firms will be shut out of the capital markets altogether (Holmstrom and Tirole (1997)).

We evaluate these predictions empirically using a sample of capital-raising activities by US corporations, including 7,746 seasoned equity offerings, 21,657 public debt offerings, and 40,097 private loans. Our results suggest that the likelihood that a firm raises capital decreases in general when overall market conditions worsen, regardless of whether we measure this worsening by an NBER-defined recession, the growth rate of GDP, or credit tightness due to a Federal Reserve Survey of bankers. One important exception to this pattern is that the issuance of highly-rated public bonds is counter-cyclical, consistent with the view that supply of capital plays an important role in corporate finance.

Controlling for the identity of the issuing firm, we find that a macroeconomic downturn increases the likelihood that the firm issues a less information sensitive security in general, i.e., convertibles or nonconvertible debt rather than equity. However, we do not find a significant shift towards bank loans

during economic downturns, as the information hypothesis would suggest. Rather, market downturns reduce the equilibrium loan amount and lead banks to prefer higher quality borrowers.

In addition to the choice of securities, we also consider the possibility that macroeconomic factors affect the structure of securities. In particular, we examine how overall market conditions affect the maturity and security of the public and private debt issuances. In general, the results are consistent with both hypotheses. In particular, holding other factors fixed, a downturn tends to decrease the expected maturity of both public bonds and private loans and to increase the likelihood that these loans are secured.

We also find that the issuers of highly rated public bonds hold a larger proportion of proceeds from the issuance in the form of cash during recessions, rather than investing in real assets. This relation suggests that firms with high ratings respond to investors' demand for high-quality securities during recessions by raising more capital than is necessary to fund their investments. This finding is consistent with the view that recessions increase the demand for relatively safe securities and consequently provides support for the supply-driven flight to quality hypothesis as an explanation for the pattern of security issues documented throughout the paper.

Overall, our results are consistent with the view that macroeconomic conditions are important determinants of the structure of securities issued, and, equally importantly, of the ability of firms to raise capital at all. The supply of capital available to firms as well as investors' demand for certain type of securities appear to be important determinants of the manner in which firms raise capital. These findings appear to justify the concerns of Passov (2003) that firms without investment-grade bond ratings could conceivably be shut out of the capital markets during down cycles. Indeed, in the well-known Graham and Harvey (2001) survey of Chief Financial Officers, the two most common concerns in debt policy were maintaining financial flexibility and bond ratings (p. 210). Consistent with this survey evidence are Kisgen (2008) and Hovakimian et al. (2009), who document that firms do appear to target bond ratings rather than debt levels. Our findings suggest that the concern about bond ratings is potentially warranted, since firms with poor bond ratings potentially are shut out of the capital markets during downturns.

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Appendix 1

This data appendix describes the primary variables of interest. All firm characteristics, unless noted otherwise, represent beginning-of-year values. Data sources, included in the last column, include Compustat, CSRP, Loan Pricing Corporation's Dealscan, Mergent Fixed Income Securities Database, SDC Global New Issues Database, US Bureau of Economic Analysis, National Bureau of Economic Research, and the US Federal Reserve Board.

Variable	Definition	Source
Bond Issuance Proceeds	Total proceeds raised through a public bond offering in a given month	Mergent FISD
Bond Maturity Dummy	Set equal to one if the proceeds-weighted initial maturity of bonds issued in a given month is less than 5 years, zero otherwise	Mergent FISD
Bond Security Dummy	Set equal to one if the proceeds-weighted initial secured bond dummy a given month is greater than 0.5, zero otherwise	Mergent FISD
Cash	Cash and short-term investments, scaled by total assets	Compustat
Cash Flow	Income before extraordinary items plus depreciation, scaled by the book value of total assets	Compustat
Convertible Bond Proceeds	Total proceeds raised through a convertible bond offering in a given month	Mergent FISD
Credit Quality	Obtained from Moody's credit ratings and classified as follows: 0 - not rated, 1 - C to Caa1, 2 - B3 to Ba1, 3 - Baa3 to Baa1, 4 - A3 to Aaa	Mergent FISD
Equity Issuance Proceeds	Total proceeds raised through a seasoned equity offering in a given month	SDC Global
Financing Choice Variable for the Multinomial and Ordered Logit Models	Classified as following for each firm-month: 0 - No issue, 1 - Loan, 2 - Bond, 3 - Convertible, 4 - Seasoned equity offering. In months with multiple issues, the classification is determined by the largest issue in terms of proceeds raised	Dealscan, Mergent FISD, SDC Global
Fixed Asset Ratio	Net property, plant and equipment scaled by the book value of total assets	Compustat
Inverse Interest Coverage	log(1+(Interest Expense/EBIT))	Compustat
Leverage	Long-term debt plus debt in current liabilities, scaled by the book value of total assets	Compustat
Loan Maturity Dummy	Set equal to one if the proceeds-weighted initial maturity of loans obtained in a given month is less than 5 years, zero otherwise	Dealscan
Loan Proceeds	Total proceeds raised through a bank loan in a given month	Dealscan
Loan Security Dummy	Set equal to one if the proceeds-weighted initial secured loan dummy a given month is greater than 0.5, zero otherwise	Dealscan
Log(Total Assets)	Natural logarithm of the book value of assets in constant 1994 dollars	Compustat

Low Growth Dummy	Set equal to one in quarters in which GDP growth was below the 25th percentile of growth between 1971 and 2007, zero otherwise	BEA
Market to Book	Book value of total debt plus the liquidating value of preferred stock plus the market value of equity, scaled by the book value of total assets	Compustat
Rated Firm Dummy	Indicator set equal to 1 if a firm has an S&P domestic long-term issuer credit rating, zero otherwise	Compustat
Recession Dummy	Set equal to one in months designated as recession by the NBER	NBER
Sales Growth	Percentage change in sales over the previous year	Compustat
Secured Bond Dummy	Set equal for to one if an issued bond is classified as secured	Mergent FISD
Secured Loan Dummy	Set equal for to one if a bank loan is classified as secured	Dealscan
Stock Return	Previous 12-month stock return	CRSP
Term Spread	Difference in the yields on ten-year treasuries and one-year treasuries.	Federal Reserve
Weak Credit Dummy	Set equal to one in months when the net percentage of senior loan officers tightening standards for large to medium firms is positive, zero otherwise	Federal Reserve

Table I
Sample Descriptive Statistics

The sample includes all SEOs, convertible bonds, other public debt, and private loans issued by US industrial firms that have corresponding accounting information in Compustat as of the fiscal year-end immediately prior to the issue. Sample period is between 1971 and 2007, except for private loans where the data is only available after 1988. We divide the sample into six expansion periods and five recession periods based on the NBER classification. For each sub-period, we report the averages of proceeds raised per month in constant 2000 $US for each of the four security types.

	Average Proceeds per Month (constant 2000 $US mil)			
	SEOs	Convertibles	Public Bonds	Private Loans
January 1971-October 1973	395.3	29.5	936.1	-
November 1973-March 1975 (recession)	137.2	16.9	1,632.1	-
April 1975-December 1979	308.0	35.8	1,096.3	-
January 1980-July 1980 (recession)	393.1	42.0	2,937.7	-
August 1980-June 1981	1,085.1	141.3	1,626.2	-
July 1981-November 1982 (recession)	413.6	76.7	1,498.2	-
December 1982-June 1990	710.9	477.6	3,965.5	11,915.9
July 1990-March 1991(recession)	391.9	955.3	4,000.6	7,504.1
April 1991-February 2001	2,090.5	1,984.5	16,451.4	28,078.9
March 2001-November 2001(recession)	1,677.9	8,264.4	35,598.8	48,832.1
December 2001-December 2007	1,680.4	4,948.9	19,623.0	38,876.3
All	844.0	1,543.0	8,124.2	12,291.6

Table II
Macro Economic Conditions and Security Issues

This table presents the averages of relative proportions of proceeds raised through four types of securities within each calendar month. The sample includes all SEOs, convertible bonds, other public debt, and private loans issued by US industrial firms that have corresponding accounting information in Compustat as of the fiscal year-end immediately prior to the issue. Sample period is between 1971 and 2007, except for private loans where the data is only available after 1988. Expansions and recessions are based on the NBER classification. A month is defined as low growth if GDP growth in that particular quarter is below the 25th percentile of economic growth over the entire sample period. A month with weak credit supply takes a value of one if the net percentage of senior loan officers tightening standards for loans to large and medium firms is positive for that particular quarter. This classification is based on a Federal Reserve survey available since the 2nd quarter of 1990. For each calendar month, we first calculate the relative proportions of each of the four security types within that month. Panel A reports the monthly averages for the first half of sample period, till 1987, while panel B reports the monthly averages since 1988, when private loan data became available.

Panel A: 1971 to 1987

	Numbef of months	Averages of Relative Proceeds within Month (%)		
		SEOs	Convertibles	Public Bonds
Expanson	162	25.7%	4.0%	70.3%
Recession	41	18.6%	2.9%	78.5%
t-stat(difference)		-1.78	-0.97	1.95
High GDP growth	144	25.6%	4.2%	70.2%
Low GDP growth	59	21.2%	2.7%	76.1%
t-stat(difference)		-1.24	-1.56	1.59

Panel B: 1988 to 2007

	Numbef of months	Averages of Relative Proceeds within Month (%)			
		SEOs	Convertibles	Public Bonds	Private Loans
Expanson	222	4.0%	5.3%	29.9%	60.7%
Recession	18	2.5%	8.3%	34.8%	54.4%
t-stat(difference)		-1.75	2.57	1.44	-1.65
High GDP growth	180	4.1%	5.3%	30.0%	60.6%
Low GDP growth	60	3.2%	6.3%	31.2%	59.3%
t-stat(difference)		-1.70	1.44	0.58	-0.56
Strong Credit Supply	108	3.9%	4.1%	26.6%	65.4%
Weak Credit Supply	105	4.3%	7.3%	34.8%	53.5%
t-stat(difference)		0.88	5.26	4.52	-5.96

Table III
Macro Economic Conditions and Types of Public Debt Issues

This table presents the averages of relative proportions of proceeds raised through public debt issues with various characteristics. Short-term months are those firm-months with proceeds-weighted initial maturities shorter than or equal to 5 years. Short-term debts are only available since 1985. Secured months are those firm-months with proceeds-weighted issue-level secured dummy greater than or equal to 0.5. We group all public debt into five categories based on credit ratings from Moody's; not rated, C's(C to Caa1), speculative B's (B3 to Ba1), investable B's (Baa3 to Baa1), and A's (A3 to Aaa). Expansions and recessions are based on the NBER classification. A month is defined as low growth if GDP growth in that particular quarter is below the 25th percentile of economic growth over the entire sample period. A month is defined as with weak credit supply if the net percentage of senior loan officers tightening standards for loans to large and medium firms is positive for that particular quarter, and is based on Federal Reserve survey. For each calendar month, we first calculate the relative proportions of each of the bond types out of total proceeds raised from public debt within that month. Panel A reports the monthly averages for the full sample period, while panel B reports the monthly averages since the 2nd quarter of 1990, when the Federal Reserve survey became available.

Panel A: Full Sample Period

	Numbef of	Averages of Relative Proceeds within Month (%)						
	months	Short term	Secured	Non Rated	C's(C to Caa1)	Speculative B's	Investable B's	A's (A3 to Aaa)
Expanson	381	13.2%	5.3%	6.2%	3.7%	25.8%	18.7%	45.6%
Recession	58	22.9%	4.8%	2.7%	1.2%	14.4%	15.7%	66.0%
t-stat(difference)		2.80	-0.24	-2.12	-2.57	-3.97	-1.35	5.70
High GDP growth	321	13.1%	4.6%	6.5%	3.8%	26.2%	18.6%	45.0%
Low GDP growth	118	16.3%	6.8%	3.8%	2.4%	19.0%	17.7%	57.2%
t-stat(difference)		1.53	1.65	-2.09	-1.88	-3.31	-0.52	4.40

Panel B: 1990 2nd Quarter to Dec. 2007

	Numbef of	Averages of Relative Proceeds within Month (%)						
	months	Short term	Secured	Non Rated	C's(C to Caa1)	Speculative B's	Investable B's	A's (A3 to Aaa)
Expanson	195	14.3%	3.9%	3.1%	2.8%	32.8%	23.2%	38.0%
Recession	18	22.9%	0.7%	1.2%	0.5%	14.5%	26.8%	56.9%
t-stat(difference)		2.45	-3.01	-1.87	-2.60	-4.76	1.12	3.96
High GDP growth	156	14.2%	4.0%	3.2%	2.8%	34.2%	22.6%	37.2%
Low GDP growth	57	17.1%	2.7%	2.3%	2.1%	23.2%	26.1%	46.3%
t-stat(difference)		1.28	-1.85	-1.51	-1.35	-4.51	1.74	3.02
Strong Credit Supply	108	11.2%	3.8%	3.6%	3.4%	36.4%	22.8%	33.7%
Weak Credit Supply	105	18.9%	3.5%	2.3%	1.8%	25.9%	24.3%	45.7%
t-stat(difference)		3.98	-0.61	-2.35	-3.41	-4.94	0.87	4.54

Table IV
Firm Characteristics by Security Issues: Univariate Analysis

This table presents the averages of firm characteristics for the four security types over the sample period. These characteristics are natural logarithm of the total assets, leverage, market to book, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, and the stock return. Inverse interest coverage is defined as the natural logarithm of (1+interest/EBIT) and stock return is calculated over the previous twelve months. Panel A reports the results for the first half of the sample period, from 1971 until 1987, while panel B reports the results since 1988, when private loan data became available.

Panel A: 1971 to 1987

	Averages per Firm-Months Observations				
	No Issue	Issue	SEOs	CBs	Bonds
Firm Age	11.533	12.891	9.494	14.366	17.707
Log(Total Assets)	4.697	5.555	4.242	5.334	7.544
Leverage	0.276	0.306	0.296	0.299	0.324
Market to Book	1.231	1.525	1.936	1.459	0.925
Fixed Asset Ratio	0.353	0.417	0.363	0.366	0.506
Cash Flow	0.062	0.078	0.070	0.088	0.088
Cash	0.106	0.087	0.106	0.114	0.054
Inverse Interest Coverage	0.205	0.235	0.206	0.263	0.273
Rated Firm Dummy	0.052	0.181	0.045	0.405	0.347
Sales Growth	0.188	0.311	0.412	0.351	0.155
Stock Return	0.193	0.622	0.893	0.579	0.221
Term Spread	0.784	0.973	0.875	1.183	1.086
Recession Dummy	0.188	0.141	0.130	0.070	0.169
Low Growth Dummy	0.269	0.207	0.209	0.086	0.223
N	461,020	4,244	2,384	257	1,603

Panel B: 1988 to 2007

	Averages per Firm-Months Observations					
	No Issue	Issue	SEOs	CBs	Bonds	Loans
Firm Age	14.479	16.966	9.746	15.907	22.781	16.297
Log(Total Assets)	4.561	5.849	4.271	6.101	7.522	5.485
Leverage	0.281	0.332	0.260	0.299	0.409	0.320
Market to Book	1.765	1.646	2.808	2.323	1.325	1.445
Fixed Asset Ratio	0.287	0.335	0.285	0.261	0.417	0.321
Cash Flow	-0.029	0.029	-0.057	0.004	0.067	0.036
Cash	0.167	0.112	0.236	0.228	0.060	0.094
Inverse Interest Coverage	0.184	0.243	0.161	0.134	0.312	0.243
Rated Firm Dummy	0.234	0.507	0.192	0.543	0.922	0.403
Sales Growth	0.179	0.270	0.543	0.364	0.194	0.231
Stock Return	0.171	0.341	1.022	0.593	0.216	0.191
Term Spread	1.200	1.229	1.299	1.354	1.269	1.183
Recession Dummy	0.073	0.066	0.046	0.078	0.071	0.068
Low Growth Dummy	0.236	0.212	0.190	0.236	0.214	0.214
Weak Credit Dummy	0.489	0.469	0.435	0.529	0.482	0.465
N	936,776	34,846	4,492	2,140	8,280	19,975

Table V
A Multinomial Logit Model of Security Choice

This table reports coefficient estimates for a multinomial logit model. The dependent variable includes four different types of security issuance: bank loan, public bond, convertible debt, and SEO. The base outcome is not issuing any type of security. Inverse interest coverage is defined as $\ln(1+(\text{interest}/EBIT))$. The sample period is from 1988 to 2007 in Panels A and B and from the second quarter of 1990 to 2007 in Panel C. Standard errors are corrected for clustering of observations at the firm level. Robust *z* statistics are in parentheses. The symbols ***, ** and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

	Panel A				Panel B				Panel C			
	Loan	Bond	Convert	SEO	Loan	Bond	Convert	SEO	Loan	Bond	Convert	SEO
Firm Age	-0.005	0.005	-0.017	-0.044	-0.005	0.005	-0.017	-0.044	-0.005	0.005	-0.017	-0.044
	(4.47)***	(2.38)**	(4.46)***	(15.89)***	(4.38)***	(2.36)**	(4.49)***	(15.81)***	(4.99)***	(2.26)**	(4.40)***	(15.58)***
ln(Total Assets)	0.172	0.429	0.366	0.042	0.173	0.431	0.366	0.043	0.171	0.417	0.369	0.033
	(19.57)***	(17.01)***	(13.54)***	(3.22)***	(19.63)***	(17.09)***	(13.52)***	(3.35)***	(19.29)***	(16.34)***	(13.37)***	(2.41)**
Leverage	0.267	1.026	1.049	0.542	0.267	1.030	1.050	0.541	0.238	1.027	1.075	0.579
	(5.23)***	(7.00)***	(8.38)***	(7.40)***	(5.25)***	(7.03)***	(8.41)***	(7.37)***	(4.57)***	(6.85)***	(8.54)***	(7.82)***
Market-to-Book	0.004	0.044	0.021	0.052	0.004	0.045	0.021	0.052	-0.003	0.035	0.015	0.052
	(0.58)	(1.81)*	(1.72)*	(7.86)***	(0.60)	(1.84)*	(1.76)*	(7.96)***	(0.43)	(1.38)	(1.22)	(7.67)***
Fixed-Assets Ratio	-0.396	0.560	-0.815	0.185	-0.400	0.554	-0.813	0.181	-0.341	0.605	-0.790	0.218
	(6.15)***	(3.51)***	(3.64)***	(1.64)	(6.21)***	(3.47)***	(3.63)***	(1.60)	(5.32)***	(3.75)***	(3.45)***	(1.87)*
Cash Flow	0.334	0.185	-0.007	0.057	0.332	0.189	-0.004	0.055	0.371	0.227	0.042	0.071
	(4.90)***	(0.82)	(0.06)	(0.98)	(4.88)***	(0.84)	(0.03)	(0.95)	(5.27)***	(0.97)	(0.35)	(1.20)
Cash	-2.040	-2.047	1.255	0.302	-2.036	-2.043	1.252	0.307	-2.037	-1.943	1.252	0.324
	(23.11)***	(5.52)***	(7.02)***	(3.09)***	(23.07)***	(5.50)***	(7.00)***	(3.14)***	(22.77)***	(5.20)***	(6.96)***	(3.23)***
Inverse Interest Coverage	-0.023	-0.107	-0.210	0.056	-0.023	-0.107	-0.211	0.056	-0.016	-0.097	-0.203	0.060
	(1.33)	(2.56)**	(3.98)***	(1.57)	(1.31)	(2.55)**	(3.97)***	(1.56)	(0.87)	(2.27)**	(3.50)***	(1.60)
Debt Rating Dummy	0.237	2.503	0.843	0.051	0.236	2.501	0.843	0.049	0.243	2.513	0.781	0.079
	(8.16)***	(22.51)***	(7.27)***	(0.89)	(8.13)***	(22.54)***	(7.27)***	(0.85)	(8.33)***	(22.22)***	(6.61)***	(1.33)
Sales Growth	0.308	0.545	0.333	0.369	0.306	0.543	0.331	0.369	0.307	0.532	0.334	0.371
	(20.63)***	(13.26)***	(10.08)***	(22.34)***	(20.45)***	(13.26)***	(10.01)***	(22.33)***	(20.13)***	(12.81)***	(9.90)***	(22.10)***
Stock Return	0.042	0.156	0.199	0.232	0.040	0.151	0.198	0.233	0.030	0.152	0.192	0.229
	(4.23)***	(7.50)***	(9.12)***	(16.84)***	(3.94)***	(7.03)***	(9.02)***	(16.94)***	(2.85)***	(7.31)***	(8.82)***	(16.73)***
Term Spread	0.692	8.098	17.243	13.425	-0.192	7.319	17.829	11.921	-2.665	5.564	15.837	10.324
	(1.01)	(5.24)***	(6.59)***	(9.28)***	(0.27)	(4.51)***	(6.90)***	(8.05)***	(3.74)***	(3.37)***	(6.02)***	(6.79)***
Recession Dummy	-0.045	0.065	0.178	-0.340								
	(1.58)	(1.20)	(1.81)*	(4.42)***								
Low Growth Dummy					-0.125	-0.126	0.050	-0.203				
					(6.56)***	(3.49)***	(0.88)	(4.81)***				
Weak Credit Dummy									-0.112	-0.039	0.109	-0.228
									(7.18)***	(1.07)	(2.02)**	(6.62)***
Constant	-4.411	-10.023	-9.495	-5.374	-4.379	-9.987	-9.499	-5.344	-4.230	-9.875	-9.402	-5.158
	(28.04)***	(32.12)***	(14.24)***	(16.23)***	(27.83)***	(31.96)***	(14.25)***	(16.14)***	(25.93)***	(32.76)***	(14.00)***	(14.18)***
Industry FEs	Yes				Yes				Yes			
Observations	737,433				737,433				666,424			
Pseudo R2	0.10				0.10				0.10			

Table VI
An Ordered Logit Model of Credit Quality of Bank Borrowers

This table reports coefficient estimates for an ordered logit model only for private loans in our sample. The dependent variable takes the following values: 0 (not rated), 1 (C to Caa1 rated), 2 (B3 to Ba1 rated), 3 (Baa3 to Baa1 rated), and 4 (A3 to Aaa rated), using bond ratings for the borrowing firms. The sample period is from 1988 to 2007 in Columns 1 and 2 and from second quarter of 1990 to 2007 in Column 3. Firm-level controls are natural logarithm of the total assets, leverage, market to book, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, and the stock return. Inverse interest coverage is defined as the natural logarithm of (1+interest/EBIT) and stock return is calculated over the previous twelve months. Our macro-level control is the term spread, defined as the difference between the yields on ten-year treasuries and one-year treasuries. Standard errors are corrected for clustering of observations at the firm level. Robust *z* statistics are in parentheses. The symbols ***, ** and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

	Credit Quality		
	(1)	(2)	(3)
Firm Age	0.025	0.024	0.024
	(7.97)***	(7.92)***	(7.73)***
ln(Total Assets)	0.925	0.923	0.959
	(29.04)***	(28.99)***	(30.24)***
Leverage	1.457	1.447	1.493
	(8.68)***	(8.63)***	(8.96)***
Market-to-Book	0.167	0.169	0.128
	(5.08)***	(5.14)***	(3.76)***
Fixed-Assets Ratio	-0.989	-0.983	-0.909
	(4.20)***	(4.16)***	(3.88)***
Cash Flow	1.870	1.854	2.218
	(4.71)***	(4.69)***	(5.29)***
Cash	-0.879	-0.943	-0.587
	(2.24)**	(2.39)**	(1.51)
Inverse Interest Coverage	-0.252	-0.250	-0.239
	(4.19)***	(4.12)***	(3.98)***
Sales Growth	-0.013	-0.026	-0.011
	(0.18)	(0.37)	(0.16)
Stock Return	0.024	0.028	0.082
	(0.74)	(0.84)	(2.84)***
Term Spread	-6.812	-4.029	-10.552
	(3.11)***	(1.80)*	(4.78)***
Recession Dummy	0.469		
	(6.75)***		
Low Growth Dummy		0.199	
		(3.87)***	
Weak Credit Dummy			0.626
			(13.79)***
Industry FEs	yes	yes	yes
Observations	15,997	15,997	15,236
Pseudo R2	0.27	0.27	0.28

Table VII
Factors affecting the Maturity and Security of Bonds: Logit Model

This table reports coefficient estimates for a logit model. The sample includes only public bond issuances and their characteristics from 1985 to 2007 in the first three columns (since there is no short-term bond issue before 1985 in our sample) and from 1971 to 2007 in the last three columns. Also, in columns (3) and (6), where we include weak credit dummy, the sample period is from the second quarter of 1990 to 2007. The dependent variable is equal to one if the public debt issued is short-term in columns (1) through (3), or secured in columns (4) through (6).

	Short-term vs. Long-term Bond			Secured vs. Unsecured Bond		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.017	0.016	0.019	-0.011	-0.010	0.002
	(3.62)***	(3.47)***	(4.04)***	(0.88)	(0.86)	(0.12)
ln(Total Assets)	0.287	0.288	0.263	-0.233	-0.254	-0.571
	(7.27)***	(7.26)***	(6.30)***	(2.07)**	(2.15)**	(4.72)***
Leverage	0.141	0.135	0.026	1.813	1.829	1.866
	(0.32)	(0.31)	(0.06)	(3.05)***	(3.09)***	(3.44)***
Market-to-Book	0.214	0.222	0.188	-0.839	-0.835	-0.702
	(4.21)***	(4.36)***	(3.54)***	(2.47)**	(2.52)**	(2.35)**
Fixed-Assets Ratio	-0.791	-0.798	-0.772	2.822	2.861	0.864
	(2.33)**	(2.36)**	(2.10)**	(3.47)***	(3.53)***	(0.80)
Cash Flow	-1.336	-1.330	-1.294	-1.385	-1.429	-1.208
	(2.15)**	(2.15)**	(2.03)**	(1.16)	(1.22)	(1.19)
Cash	-1.567	-1.673	-1.448	2.404	2.571	2.438
	(1.89)*	(2.01)**	(1.74)*	(2.61)***	(2.81)***	(2.32)**
Inverse Interest Coverage	0.012	0.014	0.030	0.174	0.161	0.202
	(0.08)	(0.10)	(0.22)	(1.06)	(0.97)	(0.97)
Debt Rating Dummy	-0.292	-0.284	-0.428	-0.365	-0.290	0.291
	(1.26)	(1.23)	(1.48)	(1.67)*	(1.25)	(0.79)
Sales Growth	-0.364	-0.379	-0.479	-0.059	-0.048	-0.013
	(2.04)**	(2.10)**	(2.32)**	(0.27)	(0.23)	(0.06)
Stock Return	-0.391	-0.392	-0.255	-0.512	-0.476	-0.483
	(2.83)***	(2.83)***	(2.03)**	(3.37)***	(3.22)***	(3.02)***
Term Spread	-15.112	-13.264	-13.272	4.033	7.368	18.614
	(3.34)***	(2.97)***	(2.78)***	(0.41)	(0.78)	(2.02)**
Recession Dummy	0.410			-0.244		
	(3.36)***			(1.19)		
Low Growth Dummy		0.140			0.439	
		(1.67)*			(2.88)***	
Weak Credit Dummy			0.437			0.239
			(4.42)***			(1.19)
Constant	-4.474	-4.487	-4.454	-21.222	-21.347	-20.585
	(7.88)***	(7.95)***	(7.42)***	(16.79)***	(17.45)***	(16.29)***
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,702	7,702	6,817	8,498	8,499	6,817
Pseudo R2	0.11	0.11	0.12	0.19	0.20	0.24

Table VIII
Factors affecting the Maturity and Security of Bank Loans: Logit Model

This table reports coefficient estimates for a logit model. The sample includes bank loans only and their characteristics. The dependent variable is equal to one if the private loan is short-term in columns (1) through (3), or secured in columns (4) through (6)**.** The sample period is from 1988 to 2007, except for in Columns (3) and (6). In columns (3) and (6), where we include weak-credit dummy, the sample period is from the second quarter of 1990 to 2007.

	Short-term vs. Long-term Loan			Secured vs. Unsecured Loan		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.002	0.002	0.002	-0.013	-0.013	-0.013
	(0.94)	(0.85)	(1.02)	(4.13)***	(4.23)***	(4.03)***
ln(Total Assets)	-0.073	-0.073	-0.066	-0.744	-0.750	-0.766
	(3.65)***	(3.64)***	(3.20)***	(23.20)***	(23.23)***	(23.19)***
Leverage	-0.715	-0.716	-0.768	2.347	2.353	2.317
	(5.88)***	(5.89)***	(6.07)***	(10.79)***	(10.77)***	(10.60)***
Market-to-Book	0.072	0.073	0.062	-0.156	-0.157	-0.147
	(3.28)***	(3.33)***	(2.77)***	(5.76)***	(5.79)***	(5.51)***
Fixed-Assets Ratio	-0.098	-0.097	-0.063	-0.539	-0.537	-0.572
	(0.68)	(0.67)	(0.42)	(2.46)**	(2.45)**	(2.57)**
Cash Flow	-1.708	-1.712	-1.742	-4.403	-4.393	-5.074
	(6.49)***	(6.52)***	(6.91)***	(8.34)***	(8.27)***	(10.90)***
Cash	-0.528	-0.554	-0.423	0.801	0.802	0.773
	(2.61)***	(2.74)***	(2.01)**	(2.46)**	(2.47)**	(2.30)**
Inverse Interest Coverage	-0.029	-0.025	-0.028	0.314	0.315	0.328
	(0.72)	(0.61)	(0.65)	(4.91)***	(4.90)***	(4.84)***
Debt Rating Dummy	-0.310	-0.311	-0.373	0.429	0.435	0.446
	(4.76)***	(4.76)***	(5.54)***	(4.57)***	(4.63)***	(4.63)***
Sales Growth	-0.170	-0.184	-0.163	-0.001	0.008	0.024
	(3.90)***	(4.22)***	(3.62)***	(0.01)	(0.11)	(0.31)
Stock Return	-0.105	-0.108	-0.088	0.060	0.068	0.058
	(4.46)***	(4.57)***	(3.68)***	(1.57)	(1.79)*	(1.49)
Term Spread	27.195	29.230	29.845	1.735	4.197	3.592
	(15.33)***	(16.07)***	(15.83)***	(0.68)	(1.60)	(1.36)
Recession Dummy	0.655			0.188		
	(7.95)***			(1.79)*		
Low Growth Dummy		0.109			0.315	
		(2.54)**			(4.69)***	
Weak Credit Dummy			0.587			0.224
			(14.99)***			(4.12)***
Constant	1.159	1.162	0.970	5.015	4.953	5.087
	(3.62)***	(3.57)***	(2.77)***	(7.49)***	(7.49)***	(7.38)***
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,949	15,949	15,197	10,620	10,620	10,252
Pseudo R2	0.07	0.06	0.08	0.27	0.27	0.28

Table IX
Determinants of Debt Quality

This table reports coefficient estimates for a multinomial logit model. The dependent variable includes five different types of bond ratings: not rated, C to Caa1 rated, B3 to Ba1 rated, Baa3 to Baa1 rated, and A3 to Aaa rated. The base outcome is not issuing any type of security. Each panel uses different measures of financial conditions employed: Panel A uses the NBER-defined recession dummy, panel B uses the low-GDP-growth dummy, and panel C uses the weak-credit dummy. The sample period is from 1971 to 2007. Firm-level controls are natural logarithm of the total assets, leverage, market to book, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, and the stock return. Our macro-level control is the term spread, the difference between the yields on ten-year treasuries and one-year treasuries. Standard errors are corrected for clustering of observations at the firm level. Robust *z* statistics are in parentheses. The symbols ***, ** and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

Panel A

	Not Rated	C to Caa1	B3 to Ba1	Baa3 to Baa1	A3 to Aaa
Firm Age	-0.006	0.001	-0.014	0.015	0.017
	(0.92)	(0.12)	(3.62)***	(3.10)***	(3.00)***
ln(Total Assets)	0.202	0.115	0.136	0.581	0.974
	(4.66)***	(1.56)	(4.37)***	(12.99)***	(21.05)***
Leverage	1.732	2.517	1.695	0.189	0.023
	(6.84)***	(7.08)***	(8.43)***	(0.45)	(0.05)
Market-to-Book	-0.091	-0.074	-0.272	-0.065	0.093
	(1.72)*	(0.84)	(5.23)***	(0.92)	(2.04)**
Fixed-Assets Ratio	0.286	0.223	-0.206	0.733	1.186
	(0.85)	(0.48)	(1.19)	(2.01)**	(2.56)**
Cash Flow	-0.252	-0.092	0.269	1.649	6.108
	(1.51)	(0.31)	(1.04)	(2.34)**	(6.22)***
Cash	1.532	1.273	-1.183	-6.443	-7.419
	(3.46)***	(1.68)*	(2.77)***	(6.77)***	(6.94)***
Inverse Interest Coverage	-0.078	0.213	-0.036	-0.045	-0.386
	(0.69)	(1.61)	(0.82)	(0.46)	(4.97)***
Debt Rating Dummy	0.495	1.466	3.002	2.153	1.073
	(2.71)***	(4.90)***	(22.90)***	(12.52)***	(5.33)***
Sales Growth	0.450	0.484	0.547	0.621	0.220
	(7.88)***	(5.38)***	(13.60)***	(8.46)***	(1.59)
Stock Return	0.137	0.209	0.174	-0.004	0.098
	(5.31)***	(9.23)***	(11.03)***	(0.05)	(1.45)
Term Spread	-5.365	-10.061	10.334	8.564	9.701
	(1.29)	(1.29)	(4.24)***	(2.84)***	(3.90)***
Recession Dummy	-0.497	-0.505	0.021	0.181	0.410
	(2.29)**	(1.29)	(0.25)	(1.90)*	(5.78)***
Constant	-9.465	-36.579	-8.052	-11.313	-39.712
	(13.23)***	(34.11)***	(11.81)***	(20.93)***	(35.95)***
Industry FEs			yes		
Observations			1,073,557		
Pseudo R2			0.26		

Table IX – *continued*

Panel B

	Not Rated	C to Caa1	B3 to Ba1	Baa3 to Baa1	A3 to Aaa
Firm Age	-0.005	0.001	-0.014	0.014	0.016
	(0.84)	(0.15)	(3.59)***	(3.06)***	(2.88)***
ln(Total Assets)	0.202	0.118	0.140	0.581	0.976
	(4.64)***	(1.60)	(4.51)***	(13.01)***	(21.12)***
Leverage	1.733	2.521	1.702	0.194	0.045
	(6.82)***	(7.04)***	(8.46)***	(0.46)	(0.11)
Market-to-Book	-0.089	-0.071	-0.272	-0.066	0.095
	(1.70)*	(0.82)	(5.19)***	(0.92)	(2.10)**
Fixed-Assets Ratio	0.269	0.208	-0.220	0.734	1.188
	(0.80)	(0.45)	(1.27)	(2.01)**	(2.57)**
Cash Flow	-0.254	-0.081	0.283	1.671	6.175
	(1.52)	(0.28)	(1.09)	(2.37)**	(6.30)***
Cash	1.546	1.285	-1.189	-6.473	-7.533
	(3.49)***	(1.71)*	(2.79)***	(6.81)***	(7.03)***
Inverse Interest Coverage	-0.078	0.211	-0.036	-0.044	-0.387
	(0.70)	(1.60)	(0.80)	(0.45)	(4.89)***
Debt Rating Dummy	0.515	1.478	2.986	2.136	1.024
	(2.82)***	(4.90)***	(23.09)***	(12.49)***	(5.15)***
Sales Growth	0.447	0.480	0.543	0.617	0.199
	(7.89)***	(5.37)***	(13.59)***	(8.36)***	(1.43)
Stock Return	0.140	0.212	0.171	-0.006	0.080
	(5.48)***	(9.23)***	(10.64)***	(0.09)	(1.16)
Term Spread	-7.307	-13.825	8.361	9.149	10.705
	(1.68)*	(1.73)*	(3.31)***	(2.92)***	(3.90)***
Low Growth Dummy	-0.328	-0.492	-0.277	0.066	0.133
	(2.44)**	(2.39)**	(5.05)***	(1.11)	(2.40)**
Constant	-9.428	-37.745	-7.976	-11.308	-39.545
	(13.19)***	(35.23)***	(11.74)***	(20.98)***	(35.85)***
Industry FEs			yes		
Observations			1,073,557		
Pseudo R2			0.26		

Table IX – *continued*

Panel C

	Not Rated	C to Caa1	B3 to Ba1	Baa3 to Baa1	A3 to Aaa
Firm Age	-0.002	0.003	-0.013	0.014	0.016
	(0.25)	(0.31)	(3.55)***	(2.96)***	(2.82)***
ln(Total Assets)	0.138	-0.073	0.051	0.523	0.953
	(2.26)**	(0.72)	(1.45)	(10.52)***	(16.63)***
Leverage	1.525	2.245	1.619	-0.086	-0.308
	(4.77)***	(5.35)***	(7.52)***	(0.17)	(0.77)
Market-to-Book	-0.020	-0.055	-0.352	-0.088	0.106
	(0.43)	(0.64)	(6.06)***	(1.15)	(1.97)**
Fixed-Assets Ratio	0.301	0.212	-0.091	0.672	0.986
	(0.63)	(0.38)	(0.50)	(1.78)*	(2.06)**
Cash Flow	-0.342	-0.363	0.342	1.407	7.458
	(2.11)**	(1.32)	(1.15)	(1.98)**	(6.64)***
Cash	1.577	1.359	-0.717	-6.419	-8.005
	(3.05)***	(1.57)	(1.58)	(6.52)***	(5.84)***
Inverse Interest Coverage	-0.207	0.244	-0.020	-0.012	-0.369
	(1.50)	(1.29)	(0.40)	(0.11)	(3.72)***
Debt Rating Dummy	0.570	2.539	3.455	2.812	3.071
	(1.87)*	(5.49)***	(20.20)***	(7.71)***	(9.72)***
Sales Growth	0.348	0.378	0.569	0.613	0.048
	(4.60)***	(3.12)***	(12.08)***	(7.21)***	(0.27)
Stock Return	0.111	0.210	0.168	0.022	0.071
	(2.50)**	(8.78)***	(9.38)***	(0.31)	(0.72)
Term Spread	-12.005	-22.794	6.188	5.925	12.519
	(1.74)*	(1.96)**	(2.35)**	(1.82)*	(4.03)***
Weak Credit Dummy	-0.610	-0.637	-0.142	-0.012	0.097
	(4.23)***	(2.91)***	(2.57)**	(0.17)	(1.37)
Constant	-32.581	-144.163	-7.820	-11.230	-46.190
	(29.91)***	(108.35)***	(11.50)***	(18.35)***	(37.07)***
Industry FEs			yes		
Observations			645,949		
Pseudo R2			0.27		

Table X
Uses of Funds from New Public Debt Issues

This table presents the estimation results from the following regression specification:

$$Y = \beta_0 + \beta_1 \ln\left[\left(\frac{\text{new public debt}}{\text{total assets}_0}\right)+1\right] + \beta_2 \ln\left[\left(\frac{\text{new public debt}}{\text{total assets}_0}\right)+1\right] \times \text{Recession Dummy} + \beta_3 \ln\left[\text{total assets}_0\right] + \varepsilon,$$

where $Y = \ln[((V_t - V_0)/\text{total assets}_0) + 1]$, and V = total assets or cash and short term investments. t = 1, 4, 8 corresponds to the fiscal quarter following the issuing quarter. All new public debt issues are aggregated within a calendar quarter and these quarters are matched with the NBER's expansion/recession dates.

Dep Var		All Debt				Speculative Grade				Investment Grade			
		β_1		β_2		β_1		β_2		β_1		β_2	
		Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Total Asset	1 Q	0.731	65.21	-0.216	-6.25	0.832	41.68	-0.131	-2.15	0.427	16.08	-0.251	-5.65
	4 Q	0.843	52.26	-0.437	-8.48	0.945	31.92	-0.371	-4.14	0.467	11.31	-0.327	-4.69
	8 Q	0.903	37.65	-0.647	-8.51	0.949	21.53	-0.586	-4.55	0.602	9.20	-0.502	-4.57
Cash &	1 Q	0.397	59.30	-0.175	-8.51	0.456	38.31	-0.105	-2.89	0.068	8.54	-0.035	-2.65
ST Inv	4 Q	0.388	53.25	-0.169	-7.25	0.356	28.05	-0.099	-2.59	-0.002	-0.21	0.069	3.48
	8 Q	0.400	44.51	-0.143	-5.02	0.367	22.65	-0.094	-1.99	0.044	2.91	0.108	4.23

Figure 1. Proceeds Raised from Different Types of Securities over Time

This figure presents the log of proceeds raised in real terms (constant 2000 $US millions) by each types of security issues for each calendar month from 1971 to 2007. To smooth out the series, we plot the 11-month moving averages around a specific calendar month. The shaded areas correspond to recessions as defined by the NBER.

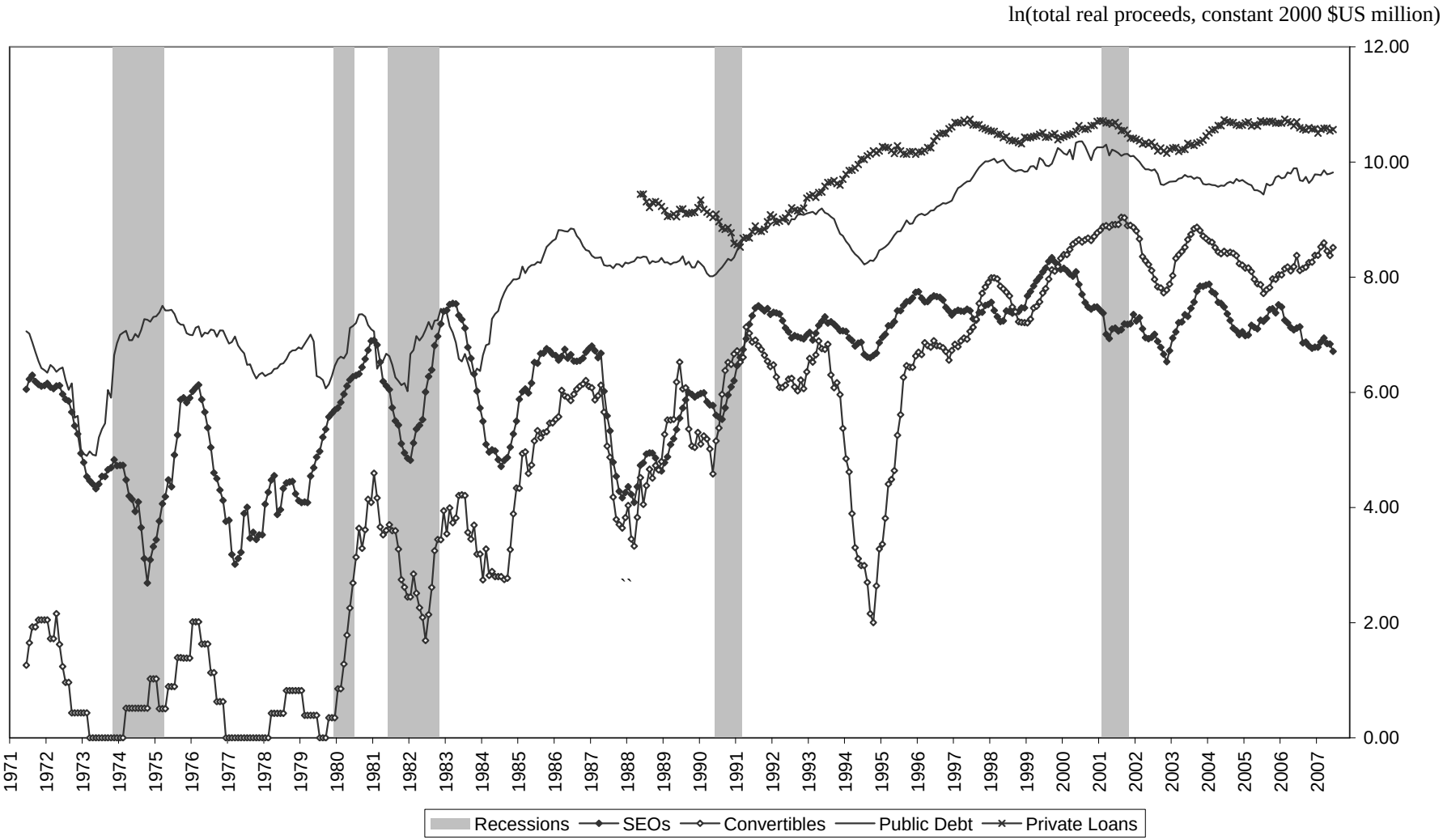

Figure 2. Proceeds Raised from Public Bonds by Credit Quality over Time

This figure presents the log of proceeds raised in real terms (constant 2000 $US millions) by public bonds of various quality for each calendar month from 1971 to 2007. To smooth out the series, we plot the 11-month moving averages around a specific calendar month. The shaded areas correspond to recessions as defined by the NBER.

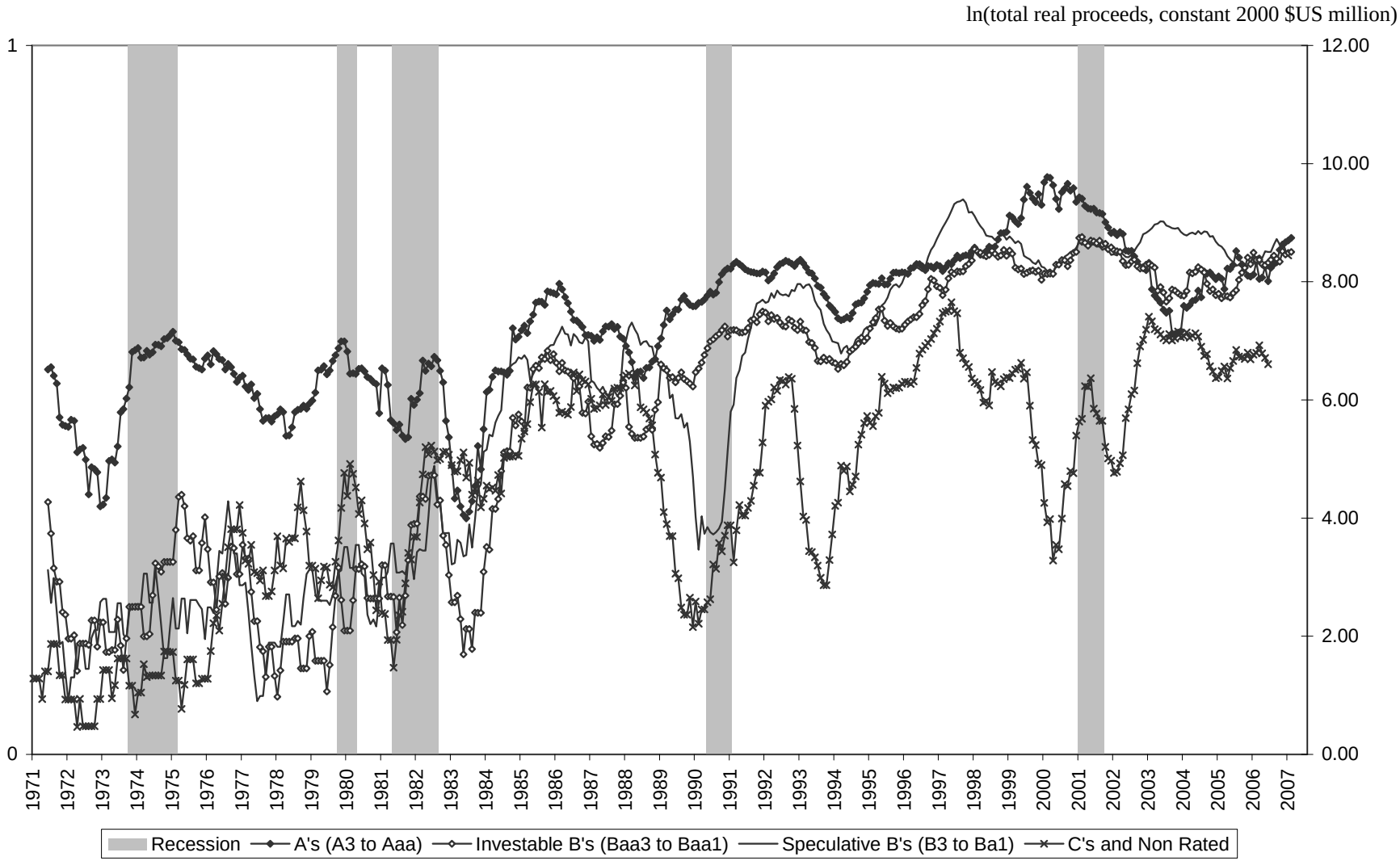

Figure 3. Credit Spread over Time

This figure presents the yields of AAA and BAA corporate bonds as well as the spread between the two for each calendar month from 1971 to 2008. The shaded areas correspond to recessions as defined by the NBER.