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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. Theory suggests that downturns should be associated with a shift toward less information-sensitive securities, as well as a 'flight to quality,' in which firms can issue high-rated securities but not low-rated ones. We evaluate these hypotheses on a large sample of publicly-traded debt issues, seasoned equity offers, and bank loans. We find that worse macroeconomic conditions lead firms to use less information-sensitive securities. In addition, poor market conditions affect the structure of securities offered, shifting them towards shorter maturities and more security. Furthermore, market conditions affect the quality of securities offered, with worsening conditions substantially lowering the number of low-rated debt issues. Overall, these findings suggest that macroeconomic conditions are important factors in firms' capital raising decisions.

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As illustrated so dramatically by the Financial Crisis of 2008, macroeconomic conditions can dramatically affect firms' access to capital and the manner in which they can 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.

There has, however, been important work done on the role of monetary policy on firms' access to capital. Gertler and Gilchrist (1994) and Kashyap and Stein (2000) present empirical work suggesting that monetary policy's impact is mainly on small firms. Yet, as the Pfizer example and the financial crisis illustrate, macroeconomic conditions work more broadly than solely through the monetary policy channel, and affect large and highly-rated firms in important ways.

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 test the implications of theories 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 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.

Theory makes a number of predictions about the relation between macroeconomic conditions and the structure and availability of security issues. In particular, poor macroeconomic conditions will lead firms to issue less information-sensitive securities, shifting from equity to convertibles, and from convertibles to debt. Poor economic conditions should also increase the demand for monitoring of firms, causing them to shift from public to private securities. In addition to affecting the type of securities offered, macroeconomic conditions also can affect the structure of securities; in particular, poor financial conditions potentially lead firms to shorten the maturity and to add security to the securities they issue. Finally during poor financial times, issuing low-quality debt is particularly difficult, so that observed debt issuances will be primarily high quality debt.

We examine these hypotheses empirically using the database we assembled. Our econometric analysis suggests that macroeconomic conditions affect both firms' abilities to raise capital and the manner in which they raise it. We find that the conditional probability of issuing less information sensitive securities, i.e., convertibles rather than equity, increases when the economy contracts. We do not observe an increase in the demand for bank loans during economic downturns. However, we document that the borrowers of our sample of private loans tend to be of higher quality during bad economic times,

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

consistent with the view that capital available to intermediaries goes down, leading them to tighten lending standards during these periods. 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 bonds and loans are secured. These findings are consistent with the view that poor macroeconomic conditions lead firms to structure securities in ways that lessen their information sensitivity.

Finally, we consider the quality of the public securities, measured by their ratings. For our sample of public bonds, our results suggest that market downturns do not reduce the issuances of high quality bonds, but are associated with a substantial drop in the likelihood of a junk or unrated bond issue. This pattern suggests that lower quality firms tend to be shut out of the credit markets during poor market conditions.

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 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 implications of theories about the choice 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. In addition, our findings on the quality of private and public debt issues offered over the business cycle is consistent with commonly-stated practitioners' views but not as of yet documented in the academic literature.

The remainder of this paper is organized as follows: Section I summarizes theoretical work providing explanations on why economy-wide factors could affect the manner in which firms raise 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. It also provides

[2] Gomes and Phillips (2009) is a more recent paper along these lines.

statistics on the characteristics of the firms issuing different kinds of securities. Section IV uses multivariate analysis to estimate the way in which economy-wide factors can affect security choice, focusing on the broad question of what kind of security to issue; equity, public debt, or private debt. 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 provides a brief summary and conclusion.

I. Why economy-wide factors could conceivably 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.

Holmstrom and Tirole (1997) present a model in which managers can divert some of the firm's resources for their own private benefits, reducing the net worth of the firm and therefore make the firm less attractive to lenders. In the Holmstrom and Tirole model, firms can either borrow directly from lenders, or indirectly through an intermediary that provides monitoring. In this model, monitoring reduces the private benefits the manager can extract from the firm and hence alleviates the moral hazard problem. Monitoring is costly since it requires monitors to put up their own capital to avoid moral hazard on their part. Firms prefer to borrow directly rather than through an intermediary, since borrowing directly avoids paying the monitor for his services. In equilibrium, only the firms with sufficiently high net worth can borrow directly. Lesser quality firms can borrow directly only if (or after) they borrow from a monitoring intermediary. The worst quality firms cannot borrow at all.

The effect of a market downturn is twofold in the context of this model. First, a 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. Second, the capital available to intermediaries 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. This analysis implies that during market downturns, we should observe lower quality firms being shut out of the public debt market (the direct borrowing channel), some of whom can alternatively borrow from monitoring intermediaries and some of whom cannot borrow at all.

An alternative approach is to consider market imperfections coming from information asymmetries between firms and investors. Bernanke and Gertler (1989) take this approach, assuming that the degree of asymmetric information is a decreasing function of the firm's net worth. As the economy slows down, firms' net worth declines, increasing the information asymmetry problem. In market downturns, firms, especially ones that have a lower net worth to begin with, are unable to receive financing. These financial frictions serve to magnify the underlying economic problems and worsen business cycles.

The first-order prediction of this model for financing behavior is, similar to Holmstrom and Tirole, that poorer quality firms are shut out of the financial markets during overall market downturns. In addition, this analysis has an additional implication not emphasized by Bernanke and Gertler (1989): Firms will have an incentive to shift the securities they use toward less information-sensitive ones during market downturns. To illustrate, suppose that a firm is indifferent between issuing equity or a convertible bond during a boom. If market conditions deteriorate and information asymmetry problems worsen, then at the margin, the same firm will be pushed towards the convertible bond issue, since it is less information-sensitive than equity. Similarly, firms will have incentives to shorten maturities of the bonds they issue, and to issue bonds that offer more security to the lender.[3]

[3] Choe, Masulis, and Nanda (1993) make similar arguments and present a model in which the increased investment opportunities in expansions lower asymmetric information and lead to more equity offerings. Levy and Hennessy (2007) analyze a computable general equilibrium model in which financing behavior varies over the business cycle.

Similar to Holmstrom and Tirole (1997), Diamond (1991a) presents a moral hazard model focusing on the borrower's choice between direct financing (public debt) without monitoring and a bank loan with monitoring. The Diamond model explicitly examines this choice as a function of a borrower's reputation (track record), which is built over time through repeated borrowing and monitoring. Monitoring, which lowers moral hazard by the borrower, is costly and delegated to a financial intermediary. As in the papers discussed above, the key determinant of debt structure is credit quality. However, in Diamond (1991a), credit quality is determined over time through a rating, which is a function of a firm's reputation. Firms with sufficiently high credit quality borrow directly through public debt market since they do not need to incur monitoring costs. Also firms with low ratings do not benefit from bank monitoring since they do not have incentives to build a reputation.

The Diamond model predicts that the firms that borrow from a financial intermediary are the ones with credit ratings toward the middle of the spectrum. An important implication of the model is that during economic downturns, only some borrowers with the highest ratings can continue borrowing directly and the rest will need monitoring. In other words, during the down cycles, average bank borrowers will be higher-rated and the ratio of bank loans to lower-rated public debt will increase.

Bolton and Freixas (2000) also study the choice between different types of financing for the firm in a setting in which the underlying frictions are based on asymmetric information. This paper considers equity issues in addition to private and public debt as potential financing sources for the firm.[4] Similar to Myers and Majluf (1984), equity issuance is associated with information dilution costs. Furthermore, for some borrowers, public debt can also be costly because it can lead to inefficient liquidation. While bank loans are more flexible, borrowing from banks is relatively expensive because of monitoring costs. In equilibrium, variation in the credit quality of the borrowing firms determines the choice between these financing options. In this model, the riskiest firms cannot borrow, while the safest firms can borrow

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Underlying the model is a moral hazard problem solved by managerial ownership, the optimal level of which varies with business conditions.

[4] In addition to the papers discussed here, the literature on the firm's choice between bank and public debt include Besanko and Kanatas (1993), Hoshi, Kashyap, and Scharfstein (1993), Chemmanur and Fulghieri (1994), Boot and Thakor (1997a, 1997b), and Repullo and Suarez (2000).

directly through capital markets, either by issuing public debt or equity. The borrowers with moderate risk borrow from the banks because of the flexibility provided during financial distress.

These models' predictions concern the equilibrium effect of macroeconomic conditions on capital raising. Nonetheless, most of the analysis in these models focuses on the supply side. However, it is likely that macroeconomic conditions could affect the demand for capital as well. Unfortunately, it is not clear theoretically the direction in which demand for capital will change over the business cycle. It is possible that demand for capital could be pro-cyclical since the value of firms' investment opportunities is likely to increase during booming economies, as in the Shleifer (1986) model. However, during poor economic times, firms are also likely to use up their cash reserves and have to raise capital to finance operations, as occurred in the auto industry during 2008. The net effect of market-wide conditions on the demand for capital is unclear. Nonetheless, the observed effect of macroeconomic conditions on security choice is the equilibrium of both supply and demand effects, and the empirical results presented below should be interpreted as such.

Despite the differences in the underlying assumptions, these models all suggest that firms' ability to raise capital as well as their choice of security conditional on issuance will be affected by overall market conditions. During market downturns, poor quality firms will tend to be credit-rationed, so that the firms observed issuing securities should be of relatively higher quality than those firms issuing during expansions. In addition, all other things equal, firms will be more likely to use less information-sensitive 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 characteristics (i.e., shorter-term or secured). Finally, during market downturns, firms will substitute away from publicly traded debt to private debt that is associated with greater monitoring.

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].[5]

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 a number of 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.

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

[5] 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.

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 US 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%).[6] 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.[7] We then match the firm-month observations with accounting information from Compustat and eliminate all financial firms

[6] 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.

[7] We have estimated all equations in the paper using quarterly data as well. Quarterly data is less fine and 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.

(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 are 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 respondents who claim that they are tightening standards for commercial and industrial loans.[8] 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

[8] 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.

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 CBs tend to increase.

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 25^{th} 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 is consistent with the idea that less information-sensitive securities such as debt are more attractive during poor economic times. 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. Contrary to the theories presented above, private debt appears to account for a higher fraction of capital raised during expansions than recessions.

These numbers suggest that there are differences in methods of capital raising across different market conditions. Consistent with theory, Table II suggests that SEOs, the most information-sensitive security we consider, decline noticeably during market downturns. The issuance of public debt is insensitive to market conditions and is even larger during downturns, consistent with the models of Holmstrom and Tirole (1997) and Bernanke and Gertler (1989). In addition to the type of securities offered, these theories have predictions about the quality and structure of the securities offered during market downturns. These models predict that there will be a 'flight to quality', in which higher quality debt is relatively insulated from market downturns while lower quality debt issuances decline in quantity. In terms of the structure of securities, the Bernanke and Gertler model predicts that firms will prefer less information-sensitive securities during market downturns, leading them to shorten the maturities of their bonds and loans, and to be more likely to issue secured rather than unsecured bonds and loans.

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.[9] We define a bond to be short-term if the time to maturity of the issue is less than five years.[10] 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. Consistent with the predictions of the theories, the relative proceeds raised through short-term

[9] 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.

[10] If the firm issued more than one bond, then the issue activity is classified as short-term if the proceeds-weighted maturity of the bonds is less than five years.

debt, which is less information sensitive, increase significantly during recessions and weak credit supply. 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 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) bu public bonds of various quality and the numbers 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.[11] 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 nonissuing 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 nonissuing 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.

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 effect in a multivariate setting, controlling for firm-level factors and time

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

trends. An important consideration is that the effect of changing macroeconomic conditions on the demand for capital is theoretically ambiguous. Worsening market conditions could either increase demand for capital, because of a decline in cash flows, or decrease the demand for capital, because of fewer investment opportunities. Since demand for capital will clearly be an important consideration in the decision to issue securities, it is important to control econometrically for factors likely to be related to demand for capital.

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. An Ordered Logit Approach

Theoretically, we expect that during poor financial conditions, firms will, at the margin, be more likely to issue less information-sensitive securities than during good financial conditions. This hypothesis suggests a natural ordering of the possible issuances arising from their information sensitivity. In particular, internally generated funds are least sensitive to information, followed by private debt, public debt, convertible debt, and finally, seasoned equity. We assign a '4' to equity, a '3' to convertibles, and a '2' to public bonds. Since for monitoring reasons, private debt is likely to be more attractive during poor times, we assign private debt a '1', and if a firm does not issue a security, a '0'. Our prediction is that this ordering will be positively related with market-wide conditions, so that a recession, a period of low growth, or tight credit markets should be negatively related to this variable.

We estimate a model predicting which of these securities will be issued as a function of firm-specific factors as well as market-wide factors. Since the dependent variable is ordered, we utilize an 'ordered logit' specification that takes advantage of the ordering of the dependent variable to improve the efficiency of the estimator. Specifically, we estimate the following latent variable model:

$$\Pr(\text{security type} = \text{j}) = \Pr(\mu_{j-1} < \beta' X + \varepsilon < \mu_j) \quad (1)$$

where j equals 0 if the firm is not issuing 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 is a vector of coefficients, X is a vector of explanatory variables outlined in Table V (described in detail in Appendix 1), ε follows a logistic distribution, and μ_j represents unknown cutoff parameters to be estimated.

Table V contains estimates of this ordered logit model. Each of the three columns uses a different measure of market-wide conditions: Column (1) uses the NBER-defined recession, Column (2) uses the level of GDP growth, and Column (3) uses the Senior Loan Officer Opinion survey on lending standards. Each equation 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,[12] 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, 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.[13] We calculate the standard errors in these equations allowing for clustering of observations at the firm level.

In each column of Table V, the coefficient on each measure of market conditions is negative and is statistically significantly different from zero in two of the three specifications. The implication of these negative coefficients is that when conditions worsen, it is more likely that there is a low value of the dependent variable, corresponding to a less information-sensitive security. For example, if GDP growth

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

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

is low, it becomes less likely that there is any security issue at all, and if there is an issue, it is likely to be a less information-sensitive one.[14]

A potential concern in interpreting the ordered logit results is that it is impossible to tell exactly which of the choices is driving the negative coefficient. For example, estimated coefficient in the ordered logit model would be negative if all issuances were less likely during market downturns, or if SEOs declined but there was no changes in other issuances. To evaluate the extent to which each type of issuance is affected by market conditions, we estimate the probability of an issue of a particular type, conditional on firm-specific and market-wide factors.

B. A Multinomial Logit Approach

Multinomial logit provides one way to estimate systems of this type, 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.[15] Specifically, we estimate the following model:

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

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 outlined in Table VI (described in detail in Appendix 1).

[14] We reestimate all equations throughout the paper excluding refinancing firm-months, which account for 8.7% of all issuing firm-months. An issuing month is defined as refinancing if the total value raised in that specific month is within plus or minus 15% of the size of the reduction in long-term debt as of the fiscal year end immediately following the issue. The results are similar to the full sample results.

[15] 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.

Table VI 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 panel utilizes a different measure of financial conditions.

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. The estimated effect is fairly large; holding other factors constant, the econometric model implies that a recession decreases the likelihood of offering an SEO by 24%.[16] 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 (with respective p-values of 0 and 0.014) 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. This result 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 periods (1900-1938, 1946-1970, and 1971-1991 respectively).

The other coefficients in the equations in Table VI 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 VI 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.

[16] The model implies that a recession decreases the likelihood of offering an SEO by 0.11%, which is 24% of 0.46%, the unconditional probability of offering an SEO.

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. The coefficients are also fairly large, as the incremental effect of a recession, holding other factors constant, is to increase the probability of issuing a convertible bond by 8%. Combined with the negative coefficient on SEOs for the financial conditions variables, the positive coefficient could reflect firms that otherwise 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.

C. The Credit Quality of Bank Borrowers

The results from Table VI indicate that the coefficients on the market downturn variables on the likelihood of a loan issuance are all negative, and two of the three are statistically significantly different from zero. To the extent that syndicated loans are intermediated and are associated with increased monitoring relative to public bonds, this pattern does not appear to be consistent with the Diamond (1991a) and Holmstrom and Tirole (1997) models. In these models, poor market conditions induce firms to substitute toward intermediated rather than public debt, while these equations indicate that poor macroeconomic conditions actually decrease the equilibrium quantity of loans.

There are several potential explanations for this pattern of results. First of all, the models discussed above predict that some firms will substitute from directly-placed debt toward intermediated debt, while other firms that could have received intermediated debt during good times are shut out of the capital market altogether. The impact on overall quantity of loans initiated could be unclear. Second, Dealscan sample reflects large, mostly syndicated loans that are more 'bond-like' and not associated with monitoring like smaller sole-lender bank loans. Finally, it could be that this substitution from direct to intermediated debt could simply be inconsistent with empirical realities.

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 VI.

Consequently, we consider another implication of the Diamond (1991a) and Holmstrom and Tirole (1997) models. In particular, these models predict that as a credit crunch begins to bind, banks will become more selective and lend to higher quality borrowers. In equilibrium, loans initiated during market downturns should be to higher quality firms than those that received them in good economic times.

We test this prediction using the ratings of borrowers in our sample of loans. We order the ratings of borrowers from 0 to 4, with 0 representing borrowers with bonds 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.

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

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 VII (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 VII 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. These positive coefficients strongly 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.[17]

V. Market Conditions and the Design of Debt Contracts

We have provided evidence that the distribution of financing choices changes over the business cycle. In particular, firms are less likely to issue types of securities that are relatively more sensitive to information during economic downturns. An additional testable implication of the idea that information-sensitive securities are relatively less attractive during market downturns 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, firms will adjust the design of their securities to minimize their sensitivity to information.[18]

A. Publicly-traded Bonds

We first examine how the characteristics of public bonds vary over the business cycle. The information-sensitivity of a bond increases in the bond's maturity and decreases when a bond is secured with real assets. 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.

[17] When we run 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 not-rated ones.

[18] 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.

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.[19]

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

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

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),

Table VIII contain 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.

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

[19] 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.

agency conflicts. The results are also largely consistent with Flannery (1986) in that short-term debt issuers seem to be higher quality in that they are older, larger and have more growth options compared to long-term debt issuers.

Columns 4, 5, and 6 of Table VIII 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 VIII 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)), in which 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. They do not support the '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 IX 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 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 IX 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, consistent with the information-sensitivity arguments, that weak credit conditions are associated with a higher use of secured relative to unsecured loans. Security lessens the importance of information asymmetries, which tend to increase in worse financial conditions.

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. This pattern strongly supports the '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 'corporate finance' view, in which firms use secured debt as a way of finessing future agency problems.

C. Combinations of Issue Features

The previous analysis considered each provision separately and estimated the factors that lead firms to choose each one. However, in practice, the features are agreed to at the same time, and undoubtedly they are negotiated as a group rather than individually. To mirror the joint decision process, we estimate a model in which the features of the debt are estimated simultaneously.

We first consider combinations of securities that are observed, and rank them according to their expected sensitivity to market conditions. In addition to public bonds, we include loans and equity offerings in this analysis. We rank the possibilities from least to most sensitive to market-wide conditions: no issue, short-term secured loan, short-term unsecured loan, long-term secured loan, long-term unsecured loan, secured bond, short-term unsecured bond, long-term unsecured bond, convertible bond, and seasoned equity issue.

We estimate these combinations of features using an ordered logit model similar to equation (1) where *j* is now from 0 (no issue) to 9 (SEO) based on above ranking. The results are presented in Table X. Market conditions appear to have a large impact on the likelihood that a firm uses a more information-sensitive security. Each of the three measures of market conditions, the recession dummy variable, the low-growth dummy, and the survey-based measure of credit tightness, has a negative coefficient and is highly statistically significantly different from zero. This finding confirms the results discussed above, in which the most information-sensitive securities are used in expansions while the least-information sensitive securities are used during market downturns.

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 XI 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. Some of the results are not particularly surprising as they correspond to the firm characteristics 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.

A clear finding from Table XI concerns the impact of market downturns on bond ratings. Regardless of which measure of market conditions is used, the estimates indicate that weaker market conditions correspond to a shift in the distribution of issued bonds towards higher credit ratings. Consistent with the commonly discussed arguments of practitioners, during bad economic times, poor quality borrowers appear to be shut out of the bond market. The estimated effect is fairly large. For example, holding other factors constant, the econometric model implies that a recession decreases the likelihood of a not-rated bond issue by 12%. 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.

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 VIII and IX 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. Conclusion

Macroeconomic conditions can affect firms' ability to raise capital, as well as the manner in which they do so. Theories based on asymmetric information 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)). In addition, market downturns can force riskier firms to rely on intermediated debt rather than direct issuances (Diamond (1991a)) or shut these firms out of the capital market completely (Bernanke and Gertler (1989)). To the extent that a worsening of overall market conditions can exacerbate information problems, information-based theories also imply that such a worsening of market conditions leads to firms' using less information sensitive securities to raise capital.

We evaluate these predictions empirically using a sample of security issuances 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 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. 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, i.e., convertibles or nonconvertible debt rather than equity. We also find that market downturns lead banks to prefer higher quality borrowers, although the results on the quantity of loans over the business cycle are more ambiguous.

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

the view that poor macroeconomic conditions lead firms to structure securities in ways that lessen their information sensitivity. 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 bonds and loans are secured.

Finally, we consider the way in which the quality of the securities, measured by their ratings, changes over business cycles. For our sample of public bonds, we find that market downturns do not affect or even increase the issuances of high quality bonds. However downturns are associated with a significant drop in the likelihood of a junk or unrated bond issue.

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. Consistent with commonly-stated arguments of practitioners as well as models of Holmstrom and Tirole (1997) and Bernanke and Gertler (1989), higher quality bonds are relatively unaffected by market-wide factors, but lower-quality bonds appear to be noticeably more difficult to issue during market downturns. In addition, firms appear to substitute away from information-sensitive securities toward less information-sensitive securities.

These findings appear to justify the concerns of Passov (2003) that firms with less than stellar 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.

While this paper documents substantial relations between security issuances and market conditions, it raises as many questions as it answers. The results are consistent with a number of alternative models, yet it does not distinguish between these models. In particular, are the results driven primarily by moral

hazard or ex-ante asymmetric information considerations? To what extent are the patterns presented above a consequence of supply shocks, as emphasized by the formal models, or do they reflect shifts in demand for capital over the business cycle? When do these market imperfections justify government intervention to stabilize capital markets, as in the response to the Financial Crisis of 2008? What covenants potentially mitigate the asymmetric information problems affecting debt issuances during market downturns, and can we predict when such covenants should or should not be adopted? The answers to these and other questions are likely to be fruitful topics of future research.

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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	Averages of Relative Proceeds within Month (%)		
	months	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	Averages of Relative Proceeds within Month (%)			
	months	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
An Ordered Logit Model of Security Choice

This table reports coefficient estimates for an ordered logit model. The dependent variable takes the following values: 0 (not issuing any type of security), 1 (bank loan), 2 (straight public bond), 3 (convertible debt), and 4 (SEO). 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.

	Ordered Issue Choice		
	(1)	(2)	(3)
Firm Age	-0.005	-0.005	-0.005
	(5.31)***	(5.25)***	(5.62)***
ln(Total Assets)	0.223	0.224	0.220
	(24.48)***	(24.59)***	(23.89)***
Leverage	0.475	0.476	0.471
	(9.12)***	(9.15)***	(8.93)***
Market-to-Book	0.032	0.033	0.028
	(6.15)***	(6.22)***	(5.16)***
Fixed-Assets Ratio	-0.083	-0.088	-0.039
	(1.29)	(1.35)	(0.60)
Cash Flow	-0.020	-0.022	0.003
	(0.50)	(0.55)	(0.07)
Cash	-0.866	-0.862	-0.840
	(12.82)***	(12.77)***	(12.44)***
Inverse Interest Coverage	-0.041	-0.041	-0.034
	(2.68)***	(2.65)***	(2.09)**
Debt Rating Dummy	0.563	0.562	0.569
	(21.95)***	(21.91)***	(22.07)***
Sales Growth	0.362	0.360	0.361
	(29.75)***	(29.65)***	(29.31)***
Stock Return	0.163	0.162	0.157
	(18.52)***	(18.56)***	(18.21)***
Term Spread	5.412	4.603	2.591
	(8.66)***	(7.15)***	(3.93)***
Recession Dummy	-0.020		
	(0.78)		
Low Growth Dummy		-0.116	
		(7.25)***	
Weak Credit Dummy			-0.083
			(5.83)***
Industry FEs	yes	yes	yes
Observations	737,433	737,433	666,424
Pseudo R2	0.05	0.05	0.05

Table VI
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 VII
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 VIII
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 IX
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 X
Ordered Logit Model of Security Choice and Structure

This table reports coefficient estimates for an ordered logit model. The dependent variable takes the following values: 0 (not issuing any type of security), 1 (short-term secured loan), 2 (short-term unsecured loan), 3 (long-term secured loan), 4 (long-term unsecured loan), 5 (secured bond), 6 (short-term unsecured bond), 7 (long-term unsecured bond), 8 (convertible bond), and 9 (SEO). The sample period is from 1988 to 2007 in Columns (1) and (2) and from the 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. Our macro-level control is the term spread. 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.

	Ordered Issue Choice Incorporating Characteristics		
	(1)	(2)	(3)
Firm Age	0.002	0.002	0.002
	(3.63)***	(3.76)***	(3.65)***
ln(Total Assets)	0.143	0.144	0.132
	(20.31)***	(20.60)***	(20.47)***
Leverage	0.689	0.689	0.700
	(11.99)***	(12.00)***	(11.96)***
Market-to-Book	0.037	0.038	0.033
	(5.41)***	(5.50)***	(4.88)***
Fixed-Assets Ratio	-0.245	-0.251	-0.218
	(6.22)***	(6.36)***	(5.43)***
Cash Flow	0.212	0.210	0.227
	(3.03)***	(2.98)***	(3.35)***
Cash	-0.960	-0.956	-0.950
	(7.34)***	(7.27)***	(6.96)***
Inverse Interest Coverage	-0.034	-0.034	-0.028
	(2.54)**	(2.52)**	(1.99)**
Debt Rating Dummy	0.892	0.890	0.896
	(26.84)***	(26.79)***	(25.67)***
Sales Growth	0.392	0.390	0.388
	(25.22)***	(25.01)***	(23.74)***
Stock Return	0.155	0.155	0.149
	(23.95)***	(23.97)***	(23.16)***
Term Spread	0.068	0.057	0.036
	(10.80)***	(8.92)***	(5.65)***
Recession Dummy	-0.065		
	(2.36)**		
Low Growth Dummy		-0.142	
		(8.40)***	
Weak Credit Dummy			-0.097
			(6.92)***
Industry FEs	Yes	Yes	Yes
Observations	731,652	731,652	661,038
Pseudo R2	0.05	0.05	0.05

Table XI
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 XI – *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 XI – *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		

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.

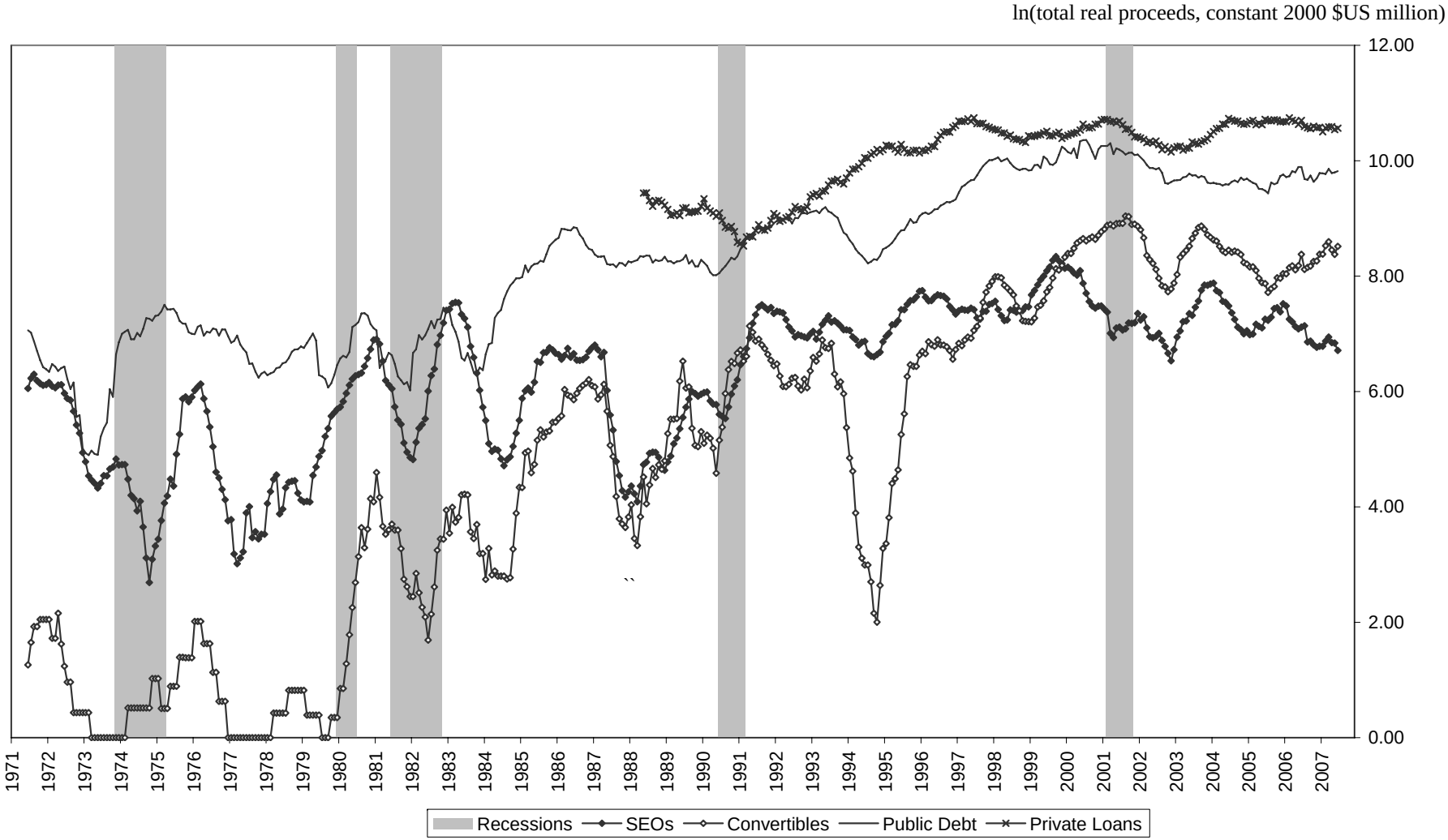
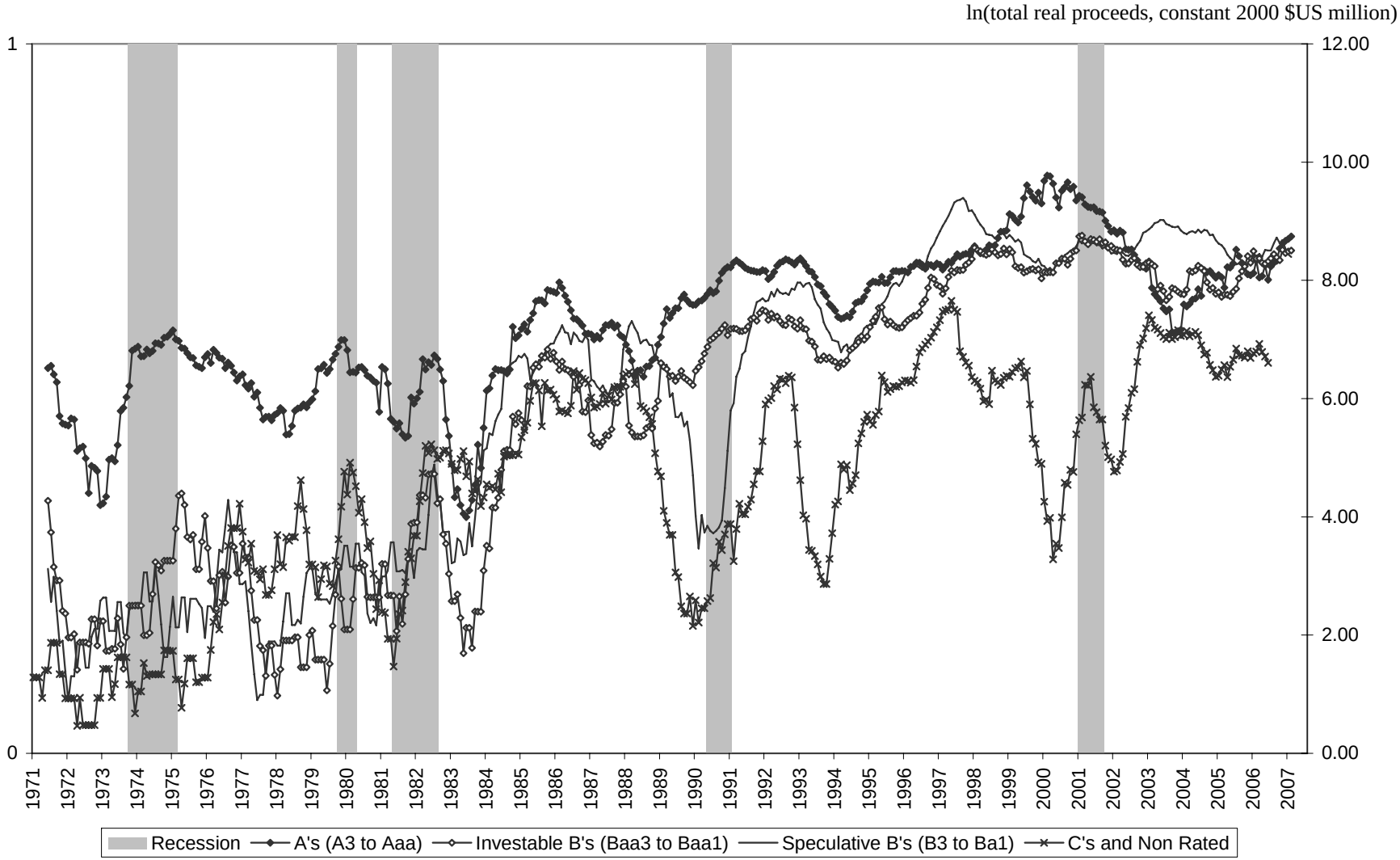


Figure 2. Proceeds Raised from Public Bonds by Credit Quality over Time

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.



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