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Macroeconomic Conditions and Capital Raising

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Do macroeconomic conditions affect firms' abilities to raise capital? If so, how do they affect the manner in which the capital is raised? Using a large sample of publicly traded debt issues, seasoned equity offers, bank loans, and private placements of equity and debt, we find that a borrower's credit quality significantly affects its ability to raise capital during macroeconomic downturns. For noninvestment-grade borrowers, capital raising tends to be procyclical, while for investment-grade borrowers, it is countercyclical. Poor market conditions also affect the structure of securities offered, shifting them toward shorter maturities and more security. Overall, our results suggest that macroeconomic conditions influence the securities that firms issue to raise capital, the way in which these securities are structured, and indeed firms' ability to raise capital at all. (*JEL* E32, G30, G32)

Practitioners view the possibility that macroeconomic conditions will adversely affect their firm's access to capital markets as an important factor in their firm's financial policies. For example, Richard Passov, the longtime treasurer of Pfizer, argues that the primary reason Pfizer and other technology companies often place such importance on a high bond rating is the possibility of being shut out of the capital markets during market downturns (see Passov 2003). According to the well-known survey by Graham and Harvey (2001),

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an important goal of chief financial officers (CFOs) is to maintain financial flexibility "so that they [CFOs] do not need to shrink their business in case of an economic downturn" (p. 218). While practitioners view the potential shocks to the supply of capital as having a first-order impact in shaping financial decisions, academic corporate finance has focused more on the demand for capital as being the key determinant in security design (see, e.g., Baker 2009).

Do macroeconomic conditions in fact influence firms' capital raising? If so, through which channel do they operate? How do they affect firms' choices of securities, the structure of those securities, and firms' very access to the capital markets? In this article, we address these questions, using a sample that contains detailed information on 21,657 publicly traded debt issuances, 7,746 seasoned equity offerings, 40,097 bank loans, and 12,048 private placements in the United States between 1971 and 2007.[1]

Existing theories have a number of predictions about the relation between macroeconomic conditions and the structure and availability of security issues. These theories can be broadly classified into two groups: One group is based on firms' changing demand for certain types and quantities of financing over the business cycle; and the other group is based on supply-of-capital effects, which is either driven by a contraction in available funds or through changes in investor demand for relatively safe securities. The demand-for-capital mechanism is typically based on changes in information asymmetries over the business cycle.[2] If the adverse selection costs associated with asymmetric information between firms and investors are negatively related to overall business conditions, poor macroeconomic conditions will lead firms to issue less information-sensitive securities, shifting from equity to convertibles and from convertibles to debt. Traditional demand-based theories have found success in explaining cross-sectional differences in corporate financing decisions but have been less successful in describing the time series of issuance decisions (Baker 2009).

The second mechanism through which macroeconomic conditions can affect the distribution of financing choices is their effect on the supply of capital. Holmstrom and Tirole (1997) explain how economic downturns can create a "credit crunch" that reduces the availability of intermediary capital, especially for lower-rated firms. In addition, downturns can affect the availability of capital and also the types of securities that investors demand. If volatility and economic uncertainty increase during recessions, then "flight-to-quality" models, such as Caballero and Krishnamurthy (2008) and Vayanos (2004), suggest that investors will become more risk averse, leading them to sell risky assets and instead purchase relatively safe assets. Flight-to-quality models

[1] Syndicated loans tranches are available for the latter part of our sample (i.e., from 1988 to 2007), and private placement are available from 1981 to 2007. The primary sources of capital omitted from this sample are regular bank loans and commercial paper.

[2] Examples of demand-based models of security choice are Choe, Masulis, and Nanda (1993) and Bolton and Freixas (2000).

predict that poor macroeconomic conditions lead the supply of capital (i.e., investor demand for securities) to shift toward higher credit quality and lower volatility because of a change in the relative prices of risky and safe assets.

These explanations are not mutually exclusive, so it is possible that as macro-economic conditions could affect both (or neither) the demand and supply of capital. Both demand and supply of capital-based arguments could conceivably affect the quantity of capital raised by firms, the type of securities they use to raise this capital, and the way in which these securities are structured.

Our econometric analysis suggests that macroeconomic conditions affect both firms' abilities to raise capital and the manner in which they raise capital. We also find that cyclicality of different types of securities depend on the credit quality of the issuing firms. For example, consistent with the prior literature, the aggregate issuance of public equity over time is procyclical. But this relation is primarily driven by noninvestment-grade borrowers, for whom public equity issuances as well as (noninvestment-grade) bond issuances are procyclical. In contrast, for investment-grade borrowers, public issuances of equity do not decline during downturns and issuances of both convertible and straight public bonds are *counter*cyclical. Similarly, during downturns, private loans significantly decline for noninvestment-grade borrowers but do not necessarily decline for investment-grade borrowers.

These differences between investment-grade and noninvestment-grade firms, in their capital-raising patterns over the business cycle, are difficult to reconcile with demand-based theories of capital raising. During worse economic times, they are more consistent with shifting the supply of capital toward less risky securities. Noninvestment-grade firms raise capital during strong economic conditions and appear to be shut out of the public capital markets when economic conditions are poor. Higher-quality firms take advantage of the increased demand for their higher-rated securities and actually increase their capital raising during macroeconomic downturns.

A prediction of the flight-to-quality hypothesis that is not shared with the information arguments concerns the uses of the funds that are raised. The flight-to-quality theories predict that the increased demand for safer securities in recessions will make issuing them relatively attractive, so that high-quality firms will issue securities and keep the proceeds as cash in recessions, while lower-quality firms will spend more of the capital they raise and keep less as incremental cash. Consistent with the flight-to-quality hypothesis, we find that investment-grade firms tend to hold a larger proportion of raised capital in the form of cash during recessions than is held in normal times. This finding suggests that the change in the relative prices of high-quality bonds, rather than a demand for financing for particular investments, is what drives the issuing decisions of high-quality firms.

In addition to the choice of securities, we also find that marketwide factors affect the structure of debt contracts. In particular, market downturns decrease the expected maturity of public bonds and private loans, and increase the

likelihood that these loans are secured. These findings are consistent with both views: Poor macroeconomic conditions could lead firms to structure securities in ways that lessen their information sensitivity, or an increase in investor demand for relatively safe securities could lead firms to issue securities with shorter maturities and more security.

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

This article extends the literature on security choice in a number of ways. Important contributions to this literature are Jung, Kim, and Stulz (1996), Lewis, Rogalski, and Seward (1999), and Gomes and Phillips (2007), who are concerned with how firm-level factors influence the choice of securities. Gomes and Phillips (2007), in particular, analyze a variety of securities, including both public and private issues of debt and equity, and find support for the view that information asymmetries are an important factor in firms' choice of which security to issue. We extend these papers by considering how macroeconomic effects change these choices at the margin. As such, our article is in the tradition of Choe, Masulis, and Nanda (1993) and Korajczyk and Levy (2003), focusing on the questions of how firms raise capital and how the capital-raising process changes over the business cycle. To the best of our knowledge, our article is the first to evaluate the different implications of demand- versus supply-based theories with regard to security issues over the business cycle. In addition, we consider a menu of securities that is substantially broader than the choice between equity and public debt; it includes convertibles, private debt, and private placements, as well as alternative characteristics of public and private debt, such as maturity and security.

1. Data Sources and Sample Description

1.1 Data sources

We obtain data on security issues from three different sources: the SDC Global New Issues Database, for public SEOs and private placements of both equity

and debt; the Mergent Fixed Income Securities Database (FISD), for convertible bonds and other public debt; and the 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. We drop SEOs that offer only secondary shares, since these offerings do not lead to a capital inflow for the firm. This process leads to a sample of 7,746 SEOs, occurring between 1971 and 2007. From SDC, we also obtain information on 12,048 private placements of equity and debt between 1981 and 2007.

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

Our data on bank debt are from Loan Pricing Corporation's DealScan, which contains detailed issuance-level information on the characteristics of mostly syndicated, but also sole-lender, bank loans. These characteristics include size and maturity of the loan, credit quality of the borrower, as well as information on whether or not the loan is secured by some type of collateral. Each loan can have multiple tranches, each of which has 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%).[3] 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 are available monthly, and we explore the manner in which macroeconomic conditions affect firms' capital-raising decisions.[4] We then match the firm-month observations with accounting information from the most recent fiscal year-end reported in Compustat and eliminate all financial firms (one-digit SIC equal to six) and utilities (two-digit SIC equal to forty-nine). After completing this process, we end with a sample containing 7,170 firm-months

[3] 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.

[4] We have estimated all equations in the article using firm-quarter issuance data matched with quarterly Compustat data as well. Quarterly issuance data do not match perfectly with the macroeconomic data but have 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.

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; 2,957 firm-months with private placements of equity and 4,547 firm-months with private placements of debt from 1981 to 2007; and also 20,322 firm-months with private loan contracts from 1988 to 2007.

For macroeconomic data, we obtain recession/expansion dates from the National Bureau of Economic Research (NBER) and GDP growth rates from the U.S. 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 "Senior Loan Officer Opinion Survey on Bank Lending Practices" from the Federal Reserve. This survey is a quarterly survey of approximately sixty large domestic banks and twenty-four U.S. branches of foreign banks, which asks the managers of these banks how their bank is changing their credit standards. The particular variable that we focus on is the net percentage of domestic respondents who claim that they are tightening standards for commercial and industrial loans.[5] 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 subperiod.

1.2 The pattern of security issues over different macroeconomic conditions

Table 1 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 subperiods based on the NBER's expansion/recession classification. For each subperiod, we report the proceeds raised in constant 2000 US$ million for six types of securities in that period: SEOs, convertibles, straight public bonds, private loans, private placements of equity, and private placements of debt. Since, during our sample period, recessions are substantially shorter than are expansions, we report the monthly average proceeds, rather than the total proceeds during each subperiod.

A complicating factor in our analysis is that the quantity of capital raised increased substantially over the sample period, as the economy expanded. Given the rapid growth in the quantity of issuances, it is difficult to infer patterns about the incremental effect of macroeconomic conditions. Nonetheless, a few patterns about macroeconomic conditions and security offerings are evident from Table 1. In particular, during recessions, public equity offerings decline but public debt offerings increase. The rise of the syndicated loan market is also evident after coming into existence in the late 1980s and becoming the predominant form of capital raising by the 2000s.

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

Table 1
Sample descriptive statistics

	Average Proceeds per Month (constant 2000 US$ million)					
	SEOs	Convertibles	Public Bonds	Private Loans	Private Placemants	
					Equity	Debt
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	–	55.3	477.3
July 1981–November 1982 (recession)	413.6	76.7	1, 498.2	–	22.6	526.4
December 1982–June1990	710.9	477.6	3,965.5	11,915.9	194.1	2,584.9
July 1990–March 1991 (recession)	391.9	955.3	4,000.6	7,504.1	180.9	2,167.5
April 1991–February 2001	2,090.5	1,984.5	16,451.4	28,078.9	221.7	815.0
March 2001–November 2001 (recession)	1,677.9	8,264.4	35,598.8	48,832.1	503.2	766.8
December 2001–December 2007	1,680.4	4,948.9	19,623.0	38,876.3	532.3	569.1
All	844.0	1,543.0	8,124.2	12,291.6	155.5	718.8

The sample includes all SEOs, convertible bonds, other public debt, private loans, and private placements of equity and debt issued by U.S. 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 (1988–2007) and private placements (1981–2007). We divide the sample into six expansion periods and five recession periods based on the NBER classification. For each subperiod, we report the averages of proceeds raised per month in constant 2000 US$ for each of the six security types.

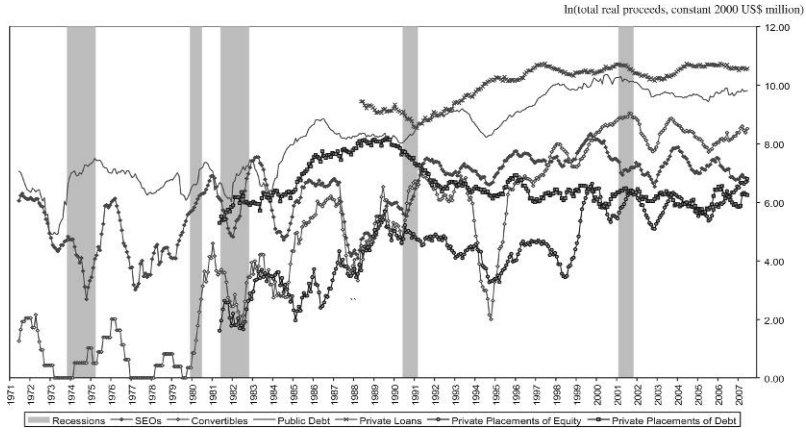

Figure 1
Proceeds raised from different types of securities over time
This figure presents the log of proceeds raised in real terms (constant 2000 US$ million) by each types of security issues for each calendar month from 1971 to 2007. To smooth out the series, we plot the eleven-month moving averages around a specific calendar month. The shaded areas correspond to recessions as defined by the NBER.

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 decrease during recessions, while public bonds and convertibles increase.

Table 2 normalizes the value raised through each method of raising capital in each calendar month by the total capital raised in that particular month and documents the way in which the fraction of capital raised by different methods varies over macroeconomic conditions. We measure macroeconomic conditions by using three alternative measures. In addition to an NBER-defined recession, we characterize months by GDP growth and label a month "Low Growth" if the GDP growth in that particular quarter is below the 25th percentile of economic growth over the entire sample period. Finally, we define "Weak Credit Supply" months as those in which the net percentage of senior loan officers, who indicated that they are tightening standards for loans to large- and medium-sized firms, is positive for that particular quarter.

Panel A of Table 2 presents, for the 1971–1987 subperiod, the proceeds that are raised through alternative forms of financing, for which there are no bank loans from DealScan, while Panel B reports the results subsequent to 1988, i.e., the first year for which we have data on bank loans. For both subperiods, the fraction of capital that is raised by public debt is larger during market downturns than it is during expansions. In contrast, public equity issues are procyclical, with larger fractions being raised duringexpansions than during

Table 2
Macroeconomic conditions and security issues

Panel A: 1971–1987

	Number of months	Average of Relative Proceeds within Month (%)				
		SEOs	Convertibles	Public Bonds	Private Placements	
					Equity	Debt
Expansion	162	23.4	3.4	63.1	1.9	22.7
Recession	41	15.2	2.1	70.5	1.9	27.4
t (difference)		−2.22	−1.32	1.66	0.03	0.92
High GDP growth	144	22.7	3.6	61.5	1.8	23.5
Low GDP growth	59	19.3	2.1	71.9	2.2	24.0
t (difference)		−1.06	−1.58	2.64	0.27	0.08

(*continued*)

Table 2
Continued

Panel B: 1988–2007

	Number of months	Average of Relative Proceeds within Month (%)					
		SEOs	Convertibles	Public Bonds	Public Loans	Private Placements	
						Equity	Debt
Expansion	222	3.8	5.1	28.5	58.0	0.7	3.9
Recession	18	2.2	7.6	31.9	49.4	1.0	7.8
t (difference)		−1.91	2.27	1.05	−2.22	1.10	2.25
High GDP growth	180	3.9	5.0	28.6	57.8	0.7	4.0
Low GDP growth	60	3.1	5.9	29.4	55.9	0.9	4.8
t (difference)		−1.71	1.25	0.39	−0.79	1.68	0.81
Strong Credit Supply	108	3.8	4.0	26.0	64.1	0.5	1.6
Weak Credit Supply	105	4.1	7.0	33.4	51.3	0.8	3.3
t (difference)		0.69	5.09	4.16	−6.54	3.85	3.18

This table presents the averages of relative proportions of proceeds raised through six types of securities within each calendar month. The sample includes all SEOs, convertible bonds, other public debt, private loans, and private placements of both equity and debt issued by U.S. 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 for SEOs, convertibles, and other public bonds, 1988–2007 for private loans, and 1981–2007 for private placements. 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 six security types within that month. Panel A reports the monthly averages between 1971 and 1987 where private placements are treated as missing prior to 1981, while Panel B reports the corresponding numbers from 1988 to 2007, respectively.

contractions. Macroeconomic conditions have a somewhat ambiguous effect on convertibles; in the earlier subperiod, convertibles account for a larger fraction of raised capital during expansions, while in the latter subperiod, they account for a larger fraction during recessions. Similar to public bonds, the fraction of private placements of both equity and debt generally increases in worse macroeconomic conditions. These results are generally consistent with the demand for capital argument that says firms use more information-sensitive securities during better economic conditions.

On the other hand, the demand-driven information-asymmetry hypothesis does not do well in explaining patterns in private bank loans. Private debt appears to account for a higher fraction of capital that is raised during expansions than in recessions, which is in contrast to the information hypothesis that suggests that bank loans should be countercyclical. The observed pattern is better explained by the supply of capital changing over the business cycle, so that in a recession overall intermediary capital sufficiently declines to more than offset the substitution from public to private debt for monitoring reasons.

In addition to the broad type of securities offered, the quality and structure of the securities used to raise capital also potentially vary, depending on macroeconomic conditions. Table 3 breaks down the public debt issues more finely and documents 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.[6] We define a bond as short term if the time to maturity of the issue is less than five years.[7] 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 consider the observation to be secured if the proceeds raised from the secured bond are at least half of the total proceeds raised.

The first column of Table 3 indicates that the relative proceeds raised through short-term debt significantly increase during recessions and weak credit supply. However, the results for secured debt in the second column of Table 3 are more ambiguous, with the proportion of secured debt being somewhat higher in good economic times than it is in downturns. The remaining columns in Table 3 present the fraction of capital that is raised by public debt, with different credit quality across varying macroeconomic conditions. The pattern here is clear: Lower-quality and unrated debt issues substantially decline 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

[6] 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 3.

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

Table 3
Macroeconomic conditions and types of public debt issues

Panel A: Full Sample Period

	Number of months	Average of Relative Proceeds within Month (%)						
		Short-term	Secured	Nonrated	C′s(C to Caal)	Speculative B′s	Investable B′s	A′s (A3 to Aaa)
Expansion	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 (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 (difference)		1.53	1.65	−2.09	−1.88	−3.31	−0.52	4.40

Panel B: 1990 2nd Quarter to December 2007

	Number of months	Average of Relative Proceeds within Month (%)						
		Short-term	Secured	Nonrated	C′s(C to Caal)	Speculative B′s	Investable B′s	A′s (A3 to Aaa)
Expansion	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 (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 Suply	105	18.9	3.5	2.3	1.8	25.9	24.3	45.7
t (difference)		3.98	−0.61	−2.35	−3.41	−4.94	0.87	4.54

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 five 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 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.

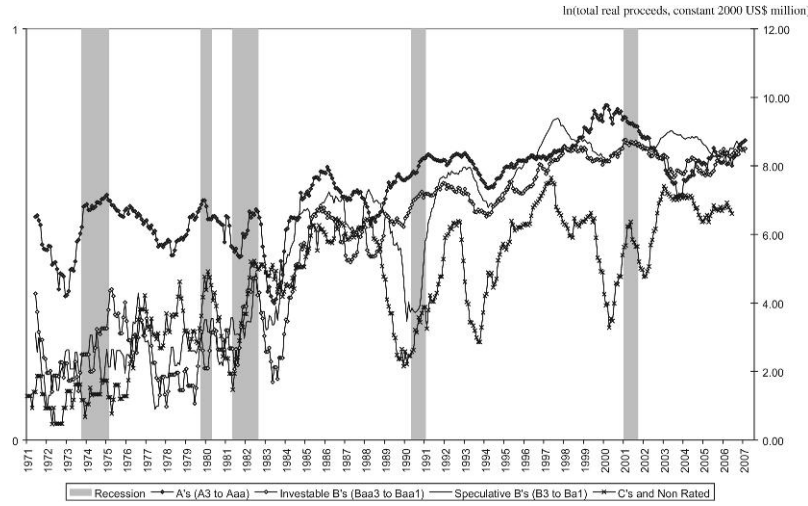

Figure 2
Proceeds raised from public bonds by credit quality over time
This figure presents the log of proceeds raised in real terms (constant 2000 US$ million) by public bonds of various quality for each calendar month from 1971 to 2007. To smooth out the series, we plot the eleven-month moving averages around a specific calendar month. The shaded areas correspond to recessions as defined by the NBER.

B-rated issues is about the same, which leads 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 graphically illustrates this pattern. The vertical axis measures the natural logarithm of proceeds raised (in constant 2000 US$ million) through public bonds of various quality. 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 nonrated debt issues significantly drops, while highly rated bonds remain relatively constant or even rise.

2. Firm Characteristics

In addition to market-level characteristics, firm-level characteristics affect both the likelihood of a firm's ability to raise capital and, conditional on raising capital, the method in which the firm raises the capital. To illustrate how firm-level differences vary, with the frequency of capital raising, the first two columns of Table 4 compare characteristics of firms in months in which some type of security was offered, with months in which no security was issued. These characteristics are firm age, firm size (natural logarithm of total assets), market leverage, market-to-book, fixed asset ratio, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, past stock return,

Table 4
Firm characteristics by security issues: Univariate analysis

	Averages per Firm-Months Observations							
	No Issue	Issue	SEOs	CBs	Bonds	Loans	Private Placements	
							Equity	Debt
Firm Age	13.283	16.229	9.862	15.963	21.997	16.289	9.804	17.932
Log(Total Assets)	4.541	5.700	4.337	6.076	7.520	5.492	3.214	6.390
Leverage	0.278	0.323	0.278	0.305	0.395	0.321	0.247	0.331
Market to Book	1.711	1.751	2.468	2.199	1.261	1.443	3.860	1.356
Fixed Asset Ratio	0.308	0.344	0.316	0.275	0.429	0.322	0.242	0.419
Cash Flow	−0.028	−0.002	−0.010	0.014	0.070	0.036	−0.507	0.017
Cash	0.155	0.120	0.187	0.209	0.059	0.093	0.324	0.078
Inverse Interest Coverage	0.182	0.235	0.183	0.155	0.306	0.245	0.039	0.300
Rated Firm Dummy	0.164	0.439	0.163	0.547	0.834	0.409	0.087	0.394
Sales Growth	0.180	0.268	0.500	0.362	0.191	0.232	0.299	0.186
Stock Return	0.174	0.357	0.970	0.582	0.221	0.193	0.416	0.174
Term Spread	1.065	1.214	1.158	1.325	1.242	1.186	1.402	1.221
Recession Dummy	0.109	0.078	0.074	0.078	0.087	0.068	0.081	0.108
Low Growth Dummy	0.248	0.215	0.194	0.222	0.215	0.213	0.258	0.223
Weak Credit Dummy	0.490	0.472	0.437	0.526	0.482	0.464	0.518	0.489
N	1,585,431	45,980	7,170	2,546	10,400	20,322	2,957	4,547

This table presents the averages of firm characteristics for each non-issuing month as well as issuing months over the entire sample period. We also report the results separately for six security types. These characteristics are firm age, natural logarithm of the total assets, market leverage, market-to-book, fixed asset ratio, cash flow, cash, the inverse of interest coverage, a debt-rating dummy, sales growth, stock return, and the term spread. Inverse interest coverage is defined as the natural logarithm of (1 + interest/EBIT), and stock return is calculated over the previous twelve months. Detailed definition of each characteristic is provided in the Appendix Table A1. Sample period is between 1971 and 2007 for SEOs, convertibles, and other public bonds, 1988–2007 for private loans, and 1981–2007 for private placements.

and term spread. Inverse interest coverage is defined as the natural logarithm of (1+interest/EBIT), and stock return is calculated over the previous twelve months.[8] The reported accounting variables 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 0.27 during the whole sample period compared with 0.18 for non-issuing months. The stock return over the previous twelve months is 0.36 for issuing months compared with 0.17 for non-issuing months. In most cases, issuances are less likely during market downturns, regardless of which measure of financial conditions one uses.

The remaining columns of Table 4 summarize differences in firm characteristics across issuers of alternative securities. Equity issuers tend to be the smallest, youngest, and have the highest market-to-book ratios. Public debt issuers are substantially larger and have higher fixed asset ratios than do issuers of other types of securities. In contrast, issuers of private loans and private placements of debt are noticeably smaller than are 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, which is 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.

3. 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 that firms raise capital. However, to identify the effect of macroeconomic conditions on the issuance of the firms' funding choices, it is important to estimate this relation in a multivariate setting, while controlling for firm-level factors and time trends. Consequently, 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, to issue private placements of either equity or debt, 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.

3.1 A multinomial logit approach

Multinomial logit models provide one way to estimate systems in which independent variables affect the choice among a finite number of alternative

[8] Appendix Table A1 contains detailed definitions of all variables.

outcomes. Thus, it provides a natural way of modeling a firm's choices of how to raise capital, given alternative financing methods, or to not raise capital at all.[9] Specifically, we estimate the following model:

$$\Pr(\text{security type} = j) = \frac{e^{\beta_j' x}}{\sum_{k=0}^{6} e^{\beta_k' x}}, \tag{1}$$

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, 4 for an SEO, 5 for a private placement of equity, and 6 for a private placement of debt. 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.

Panel A of Table 5 reports estimates of this equation. In each specification, "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. Specification (1) uses the NBER-defined recession as our measure of market conditions, while (2) uses the level of GDP growth. We also report results of a model, using the Senior Loan Officer Opinion survey on lending standards in Table A2 (see Appendix). Each specification also includes a number of variables designed to capture the firm's financial condition and demand for capital (e.g., market-to-book, cash flow, and sales growth). Other firm-level controls are firm age, natural logarithm of the total assets, market leverage, fixed asset ratio, cash, natural logarithm of the inverse of interest coverage,[10] 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, 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. Finally, all equations include industry fixed effects.[11] The equations are 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 728,639 observations.[12] We calculate the

[9] 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. 857–62 and pp. 875–79, for more discussion of the estimation and properties of multinomial logit.)

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

[11] One exception is in Panel C below, for which the multinomial logit model does not converge when we include industry fixed effects. We also ran the regressions reported in Panel B for noninvestment-grade borrowers without industry fixed effects and found similar results.

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

Table 5
A multinomial logit model of security choice

Panel A: All Firms

	(1)						(2)					
					Private Placements						Private Placements	
	Loan	Bond	Convert	SEO	Equity	Debt	Loan	Bond	Convert	SEO	Equity	Debt
Firm Age	−0.00351***	0.00773***	−0.0188***	−0.0444***	−0.0196***	−0.00853***	−0.00342***	0.00773***	−0.0189***	−0.441***	−0.0199***	−0.00860***
	(0.00111)	(0.00229)	(0.00386)	(0.00288)	(0.00409)	(0.00273)	(0.00111)	(0.00230)	(0.00387)	(0.00288)	(0.00409)	(0.00272)
In(Total Assets)	0.137***	0.365***	0.316***	0.0329**	−0.168***	0.409***	0.138***	0.366***	0.316***	0.0344**	−0.170***	0.410***
	(0.00977)	(0.0260)	(0.0268)	(0.0135)	(0.0246)	(0.0196)	(0.00978)	(0.0259)	(0.0268)	(0.0135)	(0.0246)	(0.0196)
Market Leverage	−0.122**	0.549***	−0.0301	−0.138	0.00635	0.141	−0.116**	0.566***	−0.0186	−0.141	0.0112	0.166
	(0.0556)	(0.161)	(0.178)	(0.0959)	(0.168)	(0.144)	(0.0556)	(0.161)	(0.178)	(0.0960)	(0.168)	(0.144)
Market-to-Book	0.00476	0.0972***	0.00993	0.0567***	−0.0104	0.000887	0.00503	0.0991***	0.0108	0.0574***	−0.0100	0.00248
	(0.00749)	(0.0224)	(0.0131)	(0.00701)	(0.0101)	(0.0200)	(0.00751)	(0.0224)	(0.0131)	(0.00700)	(0.0101)	(0.0201)
Fixed-Assets Ratio	−0.414***	0.571***	−0.762***	0.237*	0.116	0.8880***	−0.420***	0.563***	−0.760***	0.233*	0.124	0.882***
	(0.0696)	(0.173)	(0.235)	(0.121)	(0.224)	(0.166)	(0.0696)	(0.172)	(0.235)	(0.121)	(0.224)	(0.166)
Cash Flow	0.392***	0.0368	−0.0663	0.152**	−0.954***	−0.827***	0.391***	0.0467	−0.0614	0.148**	−0.948***	−0.830***
	(0.0743)	(0.237)	(0.124)	(0.0679)	(0.0474)	(0.0867)	(0.0743)	(0.239)	(0.124)	(0.0679)	(0.0475)	(0.0872)
Cash	−2.314***	−2.855***	1.066***	−0.0342	0.586***	−2.182***	−2.308***	−2.851***	1.064***	−0.0309	0.582***	−2.189***
	(0.0945)	(0.426)	(0.192)	(0.109)	(0.151)	(0.264)	(0.0944)	(0.426)	(0.193)	(0.109)	(0.151)	(0.264)
Inverse Interest Coverage	0.0132	−0.0667	−0.174**	0.112***	−0.122**	0.0790*	0.0129	−0.0676	−0.175**	0.112***	−0.122***	0.0787*
	(0.0189)	(0.0430)	(0.0697)	(0.0405)	(0.0480)	(0.0459)	(0.0189)	(0.0431)	(0.0701)	(0.0405)	(0.0479)	(0.0460)
Debt Rating Dummy	0.349***	2.742***	1.087***	0.150**	−0.268**	−0.435***	0.347***	2.739***	1.085***	0.149**	−0.264***	−0.438***
	(0.0306)	(0.111)	(0.119)	(0.0596)	(0.128)	(0.0879)	(0.0306)	(0.111)	(0.119)	(0.0596)	(0.128)	(0.0879)
Sales Growth	0.306***	0.573***	0.316***	0.375***	0.106***	0.325***	0.305***	0.570***	0.315***	0.374***	0.106***	0.321***
	(0.0156)	(0.0423)	(0.0343)	(0.0175)	(0.0341)	(0.0407)	(0.0156)	(0.0422)	(0.0343)	(0.0175)	(0.0341)	(0.0410)
Stock Return	0.0349***	0.162***	0.200***	0.234***	0.148***	−0.0114	0.0321***	0.0156***	0.198***	0.235***	0.147***	−0.0246
	(0.0104)	(0.0205)	(0.0213)	(0.0128)	(0.0141)	(0.0416)	(0.0105)	(0.0211)	(0.0214)	(0.128)	(0.0140)	(0.0431)
Term Spread	0.0111	0.0828***	0.172***	0.146***	0.278***	0.000944	0.0252	0.0747***	0.179***	0.131***	0.293***	0.00200
	(0.00695)	(0.0158)	(0.0266)	(0.0151)	(0.0284)	(0.0229)	(0.00711)	(0.0167)	(0.0262)	(0.0154)	(0.0280)	(0.0228)
Recession Dummy	−0.0371	0.0624	0.203**	−0.300***	0.254***	0.275***						
	(0.0293)	(0.0552)	(0.0988)	(0.0786)	(0.0935)	(0.0770)						
Low Growth Dummy							−0.123***	−0.130***	0.0512	−0.204***	0.214***	−0.0599
							(0.0194)	(0.0371)	(0.0577)	(0.0440)	(0.0600)	(0.0519)
Constant	−4.159***	−9.723***	−8.896***	−5.138***	−7.436***	−8.911***	−4.128***	−9.692***	−8.902***	−5.103***	−7.481***	−8.877***
	(0.165)	(0.315)	(0.680)	(0.335)	(0.977)	(0.526)	(0.165)	(0.315)	(0.680)	(0.335)	(0.976)	(0.526)
Observations	728,639						728,639					
Pseudo R^2	0.093						0.093					

(*continued*)

Table 5
Continued

Panel B: Noninvestment-Grade Firms

	(1)						(2)					
					Private Placements						Private Placements	
	Loan	Bond	Convert	SEO	Equity	Debt	Loan	Bond	Convert	SEO	Equity	Debt
Firm Age	−0.00912***	−0.00851*	−0.0109**	−0.0468***	−0.0189***	−0.00480	−0.00897***	−0.00819*	−0.0107**	−0.0464***	−0.0193***	−0.00481
	(0.00139)	(0.00460)	(0.00501)	(0.00350)	(0.00444)	(0.00320)	(0.00139)	(0.00461)	(0.00501)	(0.00349)	(0.00444)	(0.00320)
In(Total Assets)	0.162***	0.459***	0.542***	0.0699***	−0.190***	0.319***	0.163***	0.464***	0.543***	0.0720***	−0.191***	0.320***
	(0.0104)	(0.0290)	(0.0264)	(0.0133)	(0.0255)	(0.0195)	(0.0104)	(0.0293)	(0.0265)	(0.0132)	(0.0255)	(0.0195)
Market Leverage	−0.0328	2.038***	0.0209	−0.365***	−0.159	−0.360**	−0.0315	2.053***	0.0144	−0.372***	−0.150	−0.344**
	(0.0581)	(0.170)	(0.196)	(0.101)	(0.170)	(0.152)	(0.0581)	(0.170)	(0.196)	(0.101)	(0.170)	(0.152)
Market-to-Book	0.00207	0.0574***	0.0268*	0.0594***	−0.0112	0.0153	0.00226	0.0616***	0.0263*	0.0601***	−0.0107	0.0160
	(0.00789)	(0.0200)	(0.0139)	(0.00699)	(0.0101)	(0.0190)	(0.00792)	(0.0200)	(0.0139)	(0.00700)	(0.0100)	(0.0191)
Fixed-Assets Ratio	−0.395***	0.0903	−0.569**	0.168	0.0815	0.872***	−0.400***	0.0709	−0.571**	0.163	0.0896	0.867***
	(0.0757)	(0.220)	(0.280)	(0.124)	(0.234)	(0.180)	(0.0758)	(0.222)	(0.280)	(0.125)	(0.233)	(0.180)
Cash Flow	0.400***	0.314	−0.150	0.156**	−0.932***	−0.765***	0.396***	0.305	−0.156	0.151**	−0.926***	−0.769***
	(0.0775)	(0.231)	(0.127)	(0.0696)	(0.0470)	(0.0857)	(0.0775)	(0.232)	(0.126)	(0.0696)	(0.0472)	(0.0861)
Cash	−2.335***	−1.139***	0.851***	−0.153	0.519***	−2.167***	−2.330***	−1.135***	0.853***	−0.150	0.514***	−2.166***
	(0.0986)	(0.419)	0.213	(0.109)	(0.153)	(0.269)	(0.0985)	(0.417)	0.213	(0.109)	(0.152)	(0.269)
Inverse Interest Coverage	0.0318	−0.00941	−0.152*	0.101**	−0.133***	0.0564	0.0315	−0.00933	−0.151*	0.101**	−0.133***	0.0564
	(0.0199)	(0.0442)	(0.0793)	(0.0421)	(0.0470)	(0.0532)	(0.0199)	(0.0440)	(0.0791)	(0.0421)	(0.0470)	(0.0535)
Sales Growth	0.291***	0.529***	0.302***	0.363***	0.0998***	0.282***	0.290***	0.523***	0.303***	0.362***	0.100***	0.279***
	(0.0162)	(0.0374)	(0.0363)	(0.0178)	(0.0342)	(0.0445)	(0.0162)	(0.0374)	(0.0363)	(0.0178)	(0.0342)	(0.0447)
Stock Return	0.0420***	0.191***	0.194***	0.229***	0.145***	−0.0484	0.0405***	0.189***	0.195***	0.231***	0.144***	−0.0578
	(0.0105)	(0.0182)	(0.0223)	(0.0126)	(0.0139)	(0.0509)	(0.0106)	(0.0187)	(0.0223)	(0.0126)	(0.0139)	(0.0522)
Term Spread	−0.000214	−0.00341	0.153***	0.124***	0.294***	0.00996	−0.0112	−0.0461*	0.144***	0.106***	0.309***	0.00815
	(0.00825)	(0.0266)	(0.0300)	(0.0158)	(0.0289)	(0.0271)	(0.00844)	(0.0279)	(0.0301)	(0.0161)	(0.0283)	(0.0271)
Recession Dummy	−0.0964***	−0.305***	−0.203	−0.352***	0.288***	0.184*						
	(0.0370)	(0.114)	(0.136)	(0.0857)	(0.0940)	(0.0996)						
Low Growth Dummy							−0.147***	−0.627***	−0.0884	−0.236***	0.216***	−0.0840
							(0.0230)	(0.0674)	(0.0678)	(0.0467)	(0.0608)	(0.0657)
Constant	−4.282***	−8.427***	−9.102***	−4.934***	−7.260***	−9.126***	−4.246***	−8.301***	−9.086***	−4.894***	−7.303***	−9.096***
	(0.211)	(0.711)	(0.507)	(0.327)	(0.969)	(1.032)	(0.211)	(0.706)	(0.506)	(0.327)	(0.969)	(1.031)
Observations	616,184						616,184					
Pseudo R^2	0.072						0.072					

(*continued*)

Table 5
Continued

Panel C: Investment-Grade Firms

	(1)						(2)					
					Private Placements						Private Placements	
	Loan	Bond	Convert	SEO	Equity	Debt	Loan	Bond	Convert	SEO	Equity	Debt
Firm Age	0.00629***	0.00546*	−0.00799	−0.0251***	−0.0385***	−0.0170***	0.00624***	0.00533*	−0.00907	−0.0252***	−0.0381***	−0.0173***
	(0.00238)	(0.00315)	(0.00582)	(0.00571)	(0.00946)	(0.00457)	(0.00238)	(0.00315)	(0.00577)	(0.00570)	(0.00940)	(0.00454)
In(Total Assets)	0.168***	0.465***	0.185***	−0.155***	0.343***	0.313***	0.168***	0.465***	0.180***	−0.155***	0.346***	0.311***
	(0.0231)	(0.0387)	(0.0479)	(0.0501)	(0.124)	(0.0387)	(0.0231)	(0.0388)	(0.0475)	(0.0500)	(0.124)	(0.0389)
Market Leverage	0.187	0.682**	0.384	1.403***	1.405	1.572**	0.204	0.689**	0.489	1.411***	1.357	1.622***
	(0.159)	(0.295)	(0.456)	(0.364)	(1.031)	(0.357)	(0.159)	(0.294)	(0.452)	(0.364)	(1.027)	(0.354)
Market-to-Book	0.00258	0.113***	0.0376	−0.0666	−1.117***	−0.365**	0.00368	0.114***	0.0480	−0.0655	−1.101***	−0.365***
	(0.0242)	(0.0316)	(0.0379)	(0.0728)	(0.388)	(0.177)	(0.0242)	(0.0315)	(0.0371)	(0.0728)	(0.381)	(0.118)
Fixed-Assets Ratio	−0.239*	0.607***	−0.467	1.191***	1.165**	0.600**	−0.243*	0.606***	−0.478	1.187***	1.207**	0.581**
	(0.144)	(0.182)	(0.403)	(0.324)	(0.549)	(0.282)	(0.144)	(0.182)	(0.401)	(0.324)	(0.545)	(0.283)
Cash Flow	−0.184	0.535	−2.072***	−2.115***	2.777	4.375**	−0.161	0.552	−1.935***	−2.100***	2.590	4.516***
	(0.382)	(0.735)	(0.594)	(0.614)	(2.447)	(1.256)	(0.384)	(0.735)	(0.587)	(0.613)	(2.421)	(1.251)
Cash	−1.955***	−4.935***	1.264**	0.0375	3.031**	−2.082**	−1.954***	−4.963***	1.209**	0.0270	3.070**	−2.151***
	(0.325)	(0.661)	(0.509)	(0.910)	(1.372)	(0.803)	(0.325)	(0.660)	(0.515)	(0.911)	(1.344)	(0.807)
Debt Rating Dummy	−0.0710	−0.0341	−0.372**	0.181	0.268*	0.158	−0.0708	−0.0339	−0.375**	0.180	0.270*	0.157
	(0.0501)	(0.0898)	(0.183)	(0.168)	(0.152)	(0.129)	(0.0500)	(0.0898)	(0.178)	(0.168)	(0.154)	(0.126)
Sales Growth	0.483***	0.467***	0.616***	0.851***	1.078***	0.566**	0.478***	0.462***	0.617***	0.849***	1.106***	0.546***
	(0.0714)	(0.0869)	(0.178)	(0.139)	(0.290)	(0.199)	(0.0710)	(0.0869)	(0.172)	(0.140)	(0.287)	(0.119)
Stock Return	0.0128	0.0799	0.519***	0.595***	0.421**	0.0786	0.0312	0.0827	0.499***	0.595***	0.448***	0.0537
	(0.0388)	(0.0611)	(0.0639)	(0.0618)	(0.173)	(0.0948)	(0.0395)	(0.0607)	(0.0656)	(0.0621)	(0.166)	(0.0965)
Term Spread	0.0286**	0.0931***	0.231***	0.334***	−0.168	−0.0120	0.0262*	0.100***	0.267***	0.339***	−0.170	−0.00699
	(0.0133)	(0.0202)	(0.0553)	(0.0529)	(0.155)	(0.0421)	(0.0135)	(0.0212)	(0.0516)	(0.0532)	(0.163)	(0.0414)
Recession Dummy	0.0935**	0.134**	1.030***	0.183	−1.320	0.405**						
	(0.0457)	(0.0648)	(0.149)	(0.200)	(1.023)	(0.124)						
Low Growth Dummy							−0.0505	0.0758*	0.453***	0.105	0.157	−0.0160
							(0.0364)	(0.0430)	(0.113)	(0.134)	(0.352)	(0.0850)
Constant	−4.582***	−7.547***	−7.155***	−5.425***	−9.428***	−7.509**	−4.563***	−7.559***	−7.180***	−5.438***	−9.573***	−7.464***
	(0.193)	(0.321)	(0.429)	(0.467)	(1.133)	(0.365)	(0.193)	(0.322)	(0.421)	(0.465)	(1.155)	(0.367)
Observations	112,512						112,512					
Pseudo R^2	0.044						0.044					

This table reports coefficient estimates for a multinomial logit model. The dependent variable includes six different types of security issuance: bank loan, public bond, convertible debt, SEO, and private placements of equity and debt. The base outcome is not issuing any type of security. Variables are defined in Appendix Table 1. The sample period is from 1988 to 2007. Panel A is for all firms; Panel B is for noninvestment-grade firms only; and Panel C is for investment-grade firms only. We define noninvestment-grade firms as those that never issued an investment-grade public bond during the entire sample period based on Moody's ratings. All regressions, except for the ones in Panel C, include industry fixed effects. Standard errors, corrected for clustering of observations at the firm level, are in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

standard errors in these equations allowing for clustering of observations at the firm level.

In Panel A of Table 5 (and Table A2, Panel A; see Appendix), the coefficient on the variable that indicates poor macroeconomic conditions is negative and statistically significantly different from zero for SEOs, using all measures of the downturns. Additionally, the SEO coefficient is statistically significantly different from the coefficients on the other securities in the specifications, using the recession dummy and the weak credit market dummy variable as our measures of financial conditions. This result indicates that a recession lowers the likelihood of SEO issuance, relative to no issuance of any security or an issuance of any other type of security, and the result is consistent with the notion that as financial conditions worsen, firms are less likely to issue public equity. As such, it confirms the findings of Hickman (1953), Moore (1980), and Choe, Masulis, and Nanda (1993), who find similar patterns of security issuances over earlier time periods (1900–1938, 1946–1970, and 1971–1991, respectively).

Convertible bonds appear to be more likely to occur during poor economic times, holding other factors constant. All three coefficients on the variables that indicate poor financial conditions are positive (see Table 5, Panel A; Table A2, Panel A, Appendix), and two of them are statistically significantly different from zero. These results provide evidence for the argument that, during market downturns, firms that would otherwise issue public equity choose to issue a convertible bond. Given that asymmetric information likely 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.

The other coefficients in the equations in Panel A of Table 5 are consistent with the view, implicit in the Holmstrom and Tirole (1997) model, that the firms issuing public debt are the lowest-quality risks to a lender. These coefficients indicate that, relative to firms that issue other types of securities (or none at all), public debt issuers are oldest and most likely to have a debt rating. In addition, debt issuers in general are larger than firms that issue equity either publicly or privately.

Because the supply of capital arguments implies that recessions should affect poorly rated firms' access to capital more than that of highly rated ones, we reestimate these equations on subsamples of noninvestment- and investment-grade borrowers in Panels B and C of Table 5 as well as in Panels B and C of Table A2 (see Appendix).[13] The results from these panels imply that a firm's quality leads to very different capital-raising patterns over the business cycle. The coefficient on the issuance of public equity remains negative and

[13] We define investment-grade firms as those that ever issued at least one investment-grade public bond during the whole sample period. We have also estimated these equations classifying firms as investment grade only after their first investment-grade issue, with very similar results to those reported below.

significant for noninvestment-grade borrowers in all specifications. However, for investment-grade borrowers, it is consistently positive although not statistically significant. In addition, issuances of convertible bonds do not appear to be countercyclical for noninvestment-grade firms, while they are strongly countercyclical for investment-grade firms.

In the estimates using the entire sample in Panel A of Table 5, we do not observe an increase in the quantity of public bonds and bank loans during economic downturns. This pattern is difficult to reconcile with the behavior of issuers shifting toward less information-sensitive financing sources, as predicted by the demand-based theory. However, in Panels B and C of Table 5 and Table A2 (see Appendix), when we break down our estimates into noninvestment- and investment-grade firms, it becomes clear that combining firms of different qualities masks important differences in the borrowing behavior between noninvestment- and investment-grade firms over the business cycle. In particular, these estimates imply that private loans significantly decline for noninvestment-grade borrowers, which is consistent with the view that capital available to intermediaries goes down and, consequently, intermediaries tighten lending standards during down cycles. We see a similar pattern for public bonds: The coefficient on issues of public bonds is negative and statistically significant for noninvestment-grade borrowers, while it is positive and statistically significant for investment-grade borrowers.

Both the credit crunch and flight-to-quality (supply-based arguments) predict that we should observe better-quality firms issuing debt during recessions than during expansions. The credit crunch arguments suggest that capital is rationed from the poorly rated firms and that only the highly rated ones can receive financing. In addition, the flight-to-quality arguments compound this effect because they imply that financiers will prefer to lend to highly rated firms during recessions. This argument is commonly made by practitioners, who often claim that one reason for having a high bond rating is to avoid getting shut out of the debt market during poor economic times (see Passov 2003; Graham and Harvey 2001). Thus, a clear prediction of the supply of capital arguments is that a higher fraction of issuances of debt should be of high quality during recessions than during expansions.

Our findings provide strong support for these commonly discussed arguments of practitioners, as well as the credit crunch and flight-to-quality arguments. During bad economic times, poor-quality borrowers appear to be shut out of the bond market. The only bonds that are not affected by poor economic times are highly rated ones. In other words, the fact that the quality of bonds issued is strongly countercyclical is evidence that is consistent with the view that financial constraints are exacerbated during recessions. This finding is similar to the pattern documented by Kahle and Stulz (2010), who report that large investment-grade firms' capital raising was not substantially affected by the financial crisis of 2008.

Could changing demand for capital be responsible for these effects? In other words, could it be possible that poorly rated firms simply demand less capital during recessions than during expansions? This pattern of demand seems unlikely, since poorly rated firms are typically and relatively highly cyclical and require more outside funding during poor economic times. The fact that poorly rated firms often require a Chapter 11 reorganization in order to obtain Debtor In Possession financing during recessions is strongly suggestive of the notion that they have trouble in raising outside capital at these times. Consistent with the prior literature (e.g., Hertzel and Smith 1993**)** that argues that firms under information asymmetry choose private placements, lower-quality firms in our sample seem to rely more on private placements, especially of equity, during downturns (see Panels B of Table 5 and Table A2, Appendix, for the positive and significant coefficient for noninvestment-grade borrowers).

In addition, it is implausible that the demand for capital explanations could lead to the observed *increase* in borrowing by high-quality firms during poor economic times. In contrast, the flight-to-quality explanation predicts these patterns. Since investors' preference for safer investments goes up during poor economic times, the marginal cost of raising additional capital for high-quality firms decreases, which leads to an increase in these firms' borrowing during these periods.

Consistent with this logic is the strong negative relation between cash holdings and the probability of issuing investment-grade debt. As argued by Almeida, Campello, and Weisbach (2004, 2011), more financially constrained firms are likely to save a higher percentage of cash from their cash flows. Firms with low bond ratings are more likely to face financial constraints, so they will tend to save more cash, which leads to a negative relation between firms' cash holdings and the ratings of the bonds they issue. During recessions, poorly rated firms use up their cash reserves, since they cannot raise capital. Consequently, the relation between business conditions and the quality of issuances is likely driven by supply of capital rather than demand for capital considerations.[14] In the next section, we analyze the uses of funds for borrowers with different credit ratings in detail.

3.2 Uses of funds from capital-raising activities over the business cycle

The flight-to-quality hypothesis shares many of the same predictions as the demand for capital-driven information hypothesis. In particular, both suggest that the distribution of external financing choices shifts toward securities of less information sensitivity or lower risk during a downturn. The flight-to-quality hypothesis, however, contains the additional prediction that investors' demand

[14] One objection to this "constraints" view is that there must be *some* interest rate at which poorly rated firms can issue public debt during recessions. But that rate must be sufficiently high so that the firms choose to draw down their cash and lines of credit rather than paying it. If this were the case, it is nonetheless the limited supply of capital that ends up leading to poorly rated firms not issuing public debt during recessions.

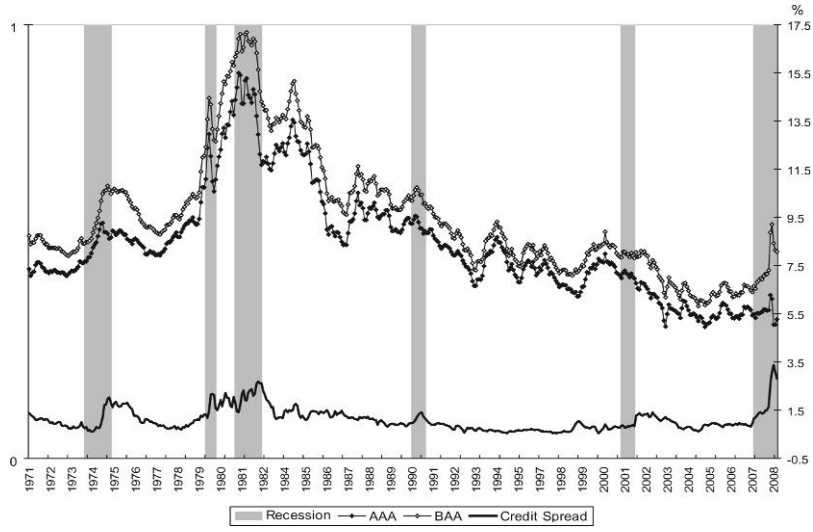

Figure 3
Credit spread over time
This figure presents the yields of AAA and BAA corporate bonds as well as the spread between the two for each calendar month from 1971 to 2008. The shaded areas correspond to recessions as defined by the NBER.

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

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

To examine the effect of macroeconomic conditions on the *ex post* uses of funds from new capital raised, we first aggregate all proceeds raised from different security types within a calendar quarter. We then match the most recent fiscal quarter, i.e., the one prior to the issuing quarter, to the most adjacent fiscal quarter, i.e., the one after the issuing quarter.[15] We then estimate equations similar to those reported in Kim and Weisbach (2008), using the following specification:

$$Y = \beta_0 + \beta_1 \ln\left[\left(\frac{\text{capital raised}}{\text{total assets}_0}\right) + 1\right] + \beta_2 \ln\left[\left(\frac{\text{capital raised}}{\text{total assets}_0}\right) + 1\right] \times \text{RecessionDummy} + \beta_3 \ln\left[\text{total assets}_0\right] + \varepsilon, \quad (2)$$

where $Y = \ln\left[\left(V_t - V_0\right/\text{total assets}_0\right) + 1\right]$, V is quarterly cash and short term investments, and t is the number of fiscal quarters subsequent to the issuing quarter. We estimate the uses of capital from proceeds raised, depending on both firm quality and macroeconomic conditions. We classify a firm as noninvestment grade if it never issued an investment-grade public bond during the whole sample period based on Moody's ratings. We define a calendar quarter as being in a recession if that quarter includes a recession month based on NBER's classification. We estimate Equation (2) for intervals of one quarter, four quarters, and eight quarters, following the issuing quarter.

We present separate estimates of Equation (2) for noninvestment- and investment grade issuers in Table 6. The first 4 columns report the coefficient estimates and t-statistics for noninvestment-grade firms, and the remaining columns present the corresponding numbers for investment-grade firms. The results reported in the first 3 rows aggregate all sources of external capital raised in a given calendar quarter. The remaining lines separately report the results for each different source of financing. The coefficient β_1 measures the proportion of proceeds raised in an issue used to increase cash (including short-term investments) during expansions, while β_2 captures the incremental impact of a recession on the fraction held in cash.[16]

A direct implication of the flight-to-quality arguments comes from the effect of proceeds raised on increases in cash and short-term investments. During expansion, lower-quality firms save a substantially higher portion of raised capital than do high-quality firms, which is consistent with the usual precautionary savings motive. That is, in most cases, β_1 for noninvestment-grade firms are higher than those for investment-grade firms. However, during a recession, low-quality firms save much less of the capital they raise for all sources of financing taken together, as well as for the vast majority of different financing sources, regardless of the intervals. In contrast, during

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

[16] Cash excluding short-term investments is often missing in quarterly Compustat, which is the main reason why we resort to cash including short-term investments.

Table 6
Cash holdings from capital-raising activities

Dependent Variable: Cash and Short-term Investments		Speculative Grade Firms				Investment Grade Firms			
		β_1		β_2		β_1		β_2	
		Coeff	t	Coeff	t	Coeff	t	Coeff	t
All Sources	1Q	0.318	101.48	−0.077	−7.14	0.089	18.42	−0.015	−1.17
	4Q	0.324	69.01	−0.064	−4.70	0.069	12.43	0.050	3.30
	8Q	0.285	50.45	−0.086	−5.36	0.084	13.61	0.079	4.66
SEOs	1Q	0.917	103.31	−0.013	−0.57	0.822	28.48	0.008	0.12
	4Q	0.816	66.95	0.027	0.84	0.653	14.14	0.869	8.62
	8Q	0.647	38.32	−0.005	−0.12	0.716	14.34	0.471	4.35
CBs	1Q	0.637	27.15	0.152	2.83	0.275	8.44	−0.101	−2.16
	4Q	0.568	19.35	0.029	0.42	0.187	4.85	−0.055	−1.00
	8Q	0.525	13.93	−0.139	−1.60	0.168	3.20	−0.061	−0.82
Bonds	1Q	0.475	38.87	−0.145	−3.81	0.076	11.30	−0.029	−2.22
	4Q	0.472	36.13	−0.160	−3.84	0.102	10.52	−0.004	−0.20
	8Q	0.485	29.66	−0.166	−3.20	0.116	9.36	0.093	3.81
Loans	1Q	0.097	28.64	−0.057	−5.41	0.087	10.41	−0.019	−0.69
	4Q	0.072	13.94	−0.054	−3.40	0.053	6.25	0.022	0.80
	8Q	0.074	12.06	−0.075	−4.06	0.062	6.74	0.030	1.01
Private Placements: Equities	1Q	0.688	52.52	−0.187	−6.35	0.378	4.18	−1.239	−3.98
	4Q	0.621	30.41	−0.146	−3.16	1.303	7.98	−0.223	−0.40
	8Q	0.530	20.66	−0.139	−2.46	0.878	6.98	−0.624	−1.46
Private Placements: Debt	1Q	0.161	18.18	−0.064	−2.42	0.078	4.84	0.004	0.11
	4Q	0.097	8.86	−0.070	−2.06	0.031	1.36	−0.134	−2.61
	8Q	0.094	6.23	−0.125	−2.80	0.014	0.50	0.288	4.59

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

$$Y = \beta_0 + \beta_1 \ln\left[\left(\frac{\text{capital raised}}{\text{total assets}_0}\right) + 1\right] + \beta_2 \ln\left[\left(\frac{\text{capital raised}}{\text{total assets}_0}\right) + 1\right] \times \text{RecessionDummy} + \beta_3 \ln\left[\text{total assets}_0\right] + \varepsilon,$$

where $Y = \ln\left[\left(V_t - V_0\right/\text{total assets}_0) + 1\right]$, and $V =$ quarterly cash and short-term investments. $t = 1, 4, 8$ corresponds to the fiscal quarter following the issuing quarter. In the first three rows, all new issues regardless of type of security are aggregated within a calendar quarter and these quarters are matched with the NBER's expansion/recession dates. In the remaining rows, we estimate the result separately for each of the security types. We report the results separately for noninvestment- and investment-grade firms. Noninvestment-grade firms are defined as those that never issued an investment-grade public bond during the entire sample period.

down cyles, investment-grade firms save substantially more from all financing sources as a whole and especially from SEOs and public bonds over the following two years than they do in expansions. This pattern is consistent with the flight-to-quality arguments: During a recession, the cost for low-quality firms of raising capital is relatively high, so they raise capital only when it is absolutely necessary to fund investments. In contrast, during a recession, the price of capital is abnormally low for high-quality issuers, so they increase their issuances beyond what is necessary in order to fund investments and save the proceeds as cash.

4. Market Conditions and the Design of Debt Contracts

An additional testable implication provided by both demand-based and supply-based hypotheses is that, conditional on the *type* of security used, firms

will alter the *structure* of those securities, depending on macroeconomic conditions. Regardless of the type of security used, we expect to observe that, as market wide conditions weaken, firms will adjust the design of their securities either to minimize their sensitivity to information or in response to relative price changes as investors' demand for safer assets increases.[17]

4.1 Publicly traded bonds

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

We estimate equations by predicting whether the bond is short term and whether the bond is secured, conditional on an issuance of public debt. We restrict the sample to those firm-months for which there is a bond issue, so there are two possible outcomes—either short term or long term and either secured or non-secured—and we estimate the logit models that follow:[18,19]

$$\Pr\left(bond\ maturity = short\ term\right) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} \tag{3}$$

$$\Pr\left(bond\ security = secured\right) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} \quad , \tag{4}$$

where β is a vector of coefficients for short-term debt in Equation (3) and secured debt in Equation (4), and X is a vector of firm characteristics and financial conditions.

Panel A of Table 7 contains estimates of these equations. The first 3 columns of this table report the estimates for Equation (3). The results suggest that financial conditions and the maturity of publicly traded bonds are negatively related. The coefficients on the variables that represent poor conditions are all positive and statistically significant. This finding is consistent with the notion that weak macroeconomic conditions exacerbate asymmetric information

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

[18] There are some months for which a firm issues more than one bond. In these cases, 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.

[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.

problems, since shorter maturity securities' value fluctuates less with changes in information about firm value than do longer maturity securities' value. However, to the extent that short-term bonds are less risky than are long-term bonds, the results can also be explained by a flight-to-quality within this asset class.

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

Columns 4, 5, and 6 report estimates of Equation (4), which contains the factors that affect the likelihood that a particular bond is secured. These estimates for bond security are more difficult to interpret than are 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 Panel A of Table 7 document the firm-level 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 are 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 indicates that firms issuing secured debt are concerned about liquidity constraints in the future. These findings are consistent with the "banking" view of secured debt (Berger and Udell 1990), which focuses more on the effect of (limited) supply of capital and catering to investors' demands on financial choices. Here, poor-quality firms have little choice but to issue secured debt, as investors are more likely to require direct collateral when the firm is nearing bankruptcy. On the other hand, they do not support the traditional demand-driven "corporate finance" view, in which high-quality firms issue secured debt to avoid underinvestment problems associated with the priority of existing debt claims (Stulz and Johnson 1985; Smith and Warner 1979; Berkovitch and Kim 1990).

4.2 Private loans

We next 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 ≥ 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 Equations (3) and (4) 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.

Panel B of Table 7 presents estimates of these equations. The first 3 columns report estimates of the factors that affect the choice between short- 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, which is consistent with the hypothesis that firms turn away from more information-sensitive or risky loans during downturns. In addition, firms that get short-term private loans tend to be smaller, have lower debt levels, and

Table 7
Factors affecting the maturity and security of public bonds and bank loans: Logit model

Panel A: Public Bond Issues

	Short-term vs. Long-term Bond			Secured vs. Unsecured Bond		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.0166***	0.0159***	0.0183***	−0.00681	−0.00666	0.00138
	(0.00489)	(0.00487)	(0.00489)	(0.0124)	(0.0124)	(0.0130)
ln(Total Assets)	0.275***	0.275***	0.254***	−0.244**	−0.263***	−0.543***
	(0.0396)	(0.0396)	(0.0420)	(0.0972)	(0.102)	(0.120)
Leverage	0.183	0.205	0.199	4.471***	4.482***	4.233***
	(0.516)	(0.509)	(0.575)	(0.679)	(0.681)	(0.697)
Market-to-Book	0.218***	0.228***	0.186***	−0.185	−0.180	−0.187
	(0.0571)	(0.0565)	(0.0621)	(0.270)	(0.263)	(0.243)
Fixed-Assets Ratio	−0.765**	−0.772**	−0.766**	2.987***	3.024***	1.126
	(0.352)	(0.351)	(0.382)	(0.790)	(0.789)	(1.127)
Cash Flow	−1.431**	−1.414**	−1.302*	−0.591	−0.652	−0.825
	(0.668)	(0.658)	(0.680)	(1.131)	(1.099)	(1.124)
Cash	−1.615*	−1.714**	−1.524*	2.688**	2.879***	2.845**
	(0.858)	(0.858)	(0.871)	(1.066)	(1.061)	(1.125)
Inverse Interest Coverage	−0.00550	−0.00796	0.00675	−0.0682	−0.0761	0.00699
	(0.149)	(0.147)	(0.148)	(0.154)	(0.156)	(0.185)
Debt Rating Dummy	−0.343	−0.335	−0.510*	−0.270	−0.178	0.363
	(0.232)	(0.232)	(0.293)	(0.203)	(0.212)	(0.428)
Sales Growth	−0.376*	−0.390**	−0.490**	0.160	0.159	0.228
	(0.195)	(0.196)	(0.223)	(0.197)	(0.189)	(0.202)
Stock Return	−0.384***	−0.384***	−0.249**	−0.566***	−0.527***	−0.562***
	(0.139)	(0.139)	(0.125)	(0.138)	(0.134)	(0.149)
Term Spread	−15.38***	−13.55***	−13.85***	6.016	8.957	15.94
	(4.667)	(4.622)	(5.038)	(8.991)	(8.753)	(9.745)
Recession Dummy	0.405***			−0.362		
	(0.124)			(0.228)		
Low Growth Dummy		0.148*			0.373**	
		(0.0844)			(0.157)	
Weak Credit Dummy			0.430***			0.123
			(0.102)			(0.203)
Constant	−3.676***	−3.696***	−3.632***	−4.489***	−4.597***	−2.843***
	(0.553)	(0.550)	(0.603)	(1.181)	(1.193)	(1.061)
Observations	7,523	7,523	6,664	8,314	8,314	6,664
Pseudo R^2	0.111	0.110	0.120	0.250	0.251	0.287

(*continued*)

Table 7
Continued

Panel B: Bank Loans

	Short-term vs. Long-term Bond			Secured vs. Unsecured Bond		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Age	0.0224	0.00211	0.00237	−0.0143***	−0.0146***	−0.0143***
	(0.00214)	(0.00214)	(0.00220)	(0.00319)	(0.00320)	(0.00325)
In(Total Assets)	−0.0569***	−0.0566***	−0.0497**	−0.778***	−0.784***	−0.800***
	(0.0205)	(0.0205)	(0.0211)	(0.0327)	(0.0330)	(0.0338)
Leverage	0.0427	0.729	−0.111	3.498***	3.497***	3.429***
	(0.134)	(0.133)	(0.138)	(0.232)	(0.233)	(0.232)
Market-to-Book	0.0693***	0.0722***	0.0517**	−0.0506**	−0.0528**	−0.0423
	(0.0237)	(0.0238)	(0.0238)	(0.0257)	(0.0256)	(0.0262)
Fixed-Assets Ratio	−0.227	−0.230	−0.181	−0.688***	−0.686***	−0.717***
	(0.150)	(0.150)	(0.155)	(0.228)	(0.228)	(0.230)
Cash Flow	−1.564***	−1.555***	−1.687***	−3.366***	−3.360***	−4.096***
	(0.287)	(0.285)	(0.279)	(0.512)	(0.516)	(0.434)
Cash	−0.0667	−0.0857	0.0257	0.721**	0.721**	0.651*
	(0.210)	(0.210)	(0.218)	(0.327)	(0.327)	(0.337)
Inverse Interest Coverage	−0.0947**	−0.0941**	−0.0804*	0.137**	0.139**	0.156**
	(0.0426)	(0.0426)	(0.0450)	(0.0682)	(0.0684)	(0.0710)
Debt Rating Dummy	−0.403***	−0.406***	−0.462***	0.442***	0.451***	0.463***
	(0.0663)	(0.0663)	(0.0687)	(0.0960)	(0.0960)	(0.0985)
Sales Growth	−0.195***	−0.209***	−0.200***	0.129	0.141*	0.145*
	(0.0476)	(0.0476)	(0.0495)	(0.0807)	(0.0816)	(0.0853)
Stock Return	−0.105***	−0.108***	−0.0872***	0.0832**	0.0923**	0.0787*
	(0.0242)	(0.0243)	(0.0245)	(0.0395)	(0.0398)	(0.0408)
Term Spread	26.80***	28.78***	29.18***	1.069	3.220	2.560
	(1.811)	(1.860)	(1.928)	(2.675)	(2.725)	(2.744)
Recession Dummy	0.655***			0.0961		
	(0.0839)			(0.109)		
Low Growth Dummy		0.102**			0.302***	
		(0.0437)			(0.0701)	
Weak Credit Dummy			0.599***			0.130**
			(0.0397)			(0.0569)
Constant	0.823**	0.815**	0.677*	4.856***	4.807***	4.987***
	(0.336)	(0.344)	(0.366)	(0.631)	(0.629)	(0.646)
Observations	15,356	15,356	14,627	10,149	10,149	9,798
Pseudo R^2	0.0634	0.0602	0.0741	0.296	0.296	0.306

This table reports coefficient estimates for a logit model. Panel A 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. Panel B includes bank loans only, and the sample period is from 1988 to 2007. In columns 3 and 6 of both Panels A and B, where we include weak credit dummy, the sample period is from the second quarter of 1990–2007. The dependent variable is equal to one if the public debt or bank loan is short term in columns 1–3, or secured in columns 4–6. All regressions include industry fixed effects. Standard errors, corrected for clustering of observations at the firm level, are in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

are less likely to have obtained a credit rating than are firms that obtain long-term loans. These findings are in contrast to those for short-term bond issuers, who tend to be larger firms with credit ratings.

The last three columns of Panel B of Table 7 report estimates of equations that predict whether a given loan will be secured or unsecured. The coefficients on the three indicators of financial market conditions are positive and statistically significant. These results suggest that weak credit conditions are associated with a higher use of secured, relative to unsecured, loans.

The effect of macroeconomic conditions on security appears to be different for loans, where market downturns clearly increase the likelihood of security, than for bonds, where this effect is only significant for one of three measures of financial conditions. One possible explanation is that secured public debt is relatively rare, with only 5% 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 clear cut with regard to 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 also lead firms to use secured private loans. In particular, firms that obtain secured loans tend to be younger, smaller, and highly levered with low interest coverage and weak cash flows. Similar to the results from the public debt, this pattern strongly supports the supply of capital-driven "banking view" of secured debt, in which firms tend to use secured debt in times when lenders are unwilling to lend absent security. It is counter to the demand for capital-driven "corporate finance" view, in which firms use secured debt as a way of finessing future agency problems.

5. Discussion

Macroeconomic conditions are widely believed to affect the ways in which firms raise capital and indeed their very ability to do so. There are a number of theories that predict a relation between the ways in which firms raise capital and macroeconomic conditions. These theories can be broadly categorized into demand for capital-based theories, which are usually based on information asymmetries, and supply of capital-based theories, which argue that recessions decrease the supply of capital, especially to poorly rated firms, through a combination of a credit crunch and a flight-to-quality. Both demand- and supply-based theories have predictions for the types of securities that are offered at different points in the business cycle, the way in which securities are structured at different points in the business cycle, and the types of firms that issue securities at different points in the business cycle.

We evaluate the ways in which macroeconomic conditions affect capital raising, using a sample of capital-raising activities by U.S. corporations, including 7,746 seasoned equity offerings, 21,657 public debt offerings, 12,048 private placements of equity and debt, and 40,097 private loans. Using these data, we obtain a set of stylized facts about the types of securities issued at different points in the business cycle, the way these securities are structured at different times, and the financial soundness of the firms that issue at those times.

When interpreting these findings, there are two main questions to be asked: First, do macroeconomic conditions affect capital raising at all? Second, which theories best explain the observed patterns of particular types of capital raising?

The answer to the first question is clear: Macroeconomic conditions are an important determinant of capital raising. They impact the types of securities used by firms, the way these securities are structured and, perhaps most importantly, the types of firms that are able to receive financing at different points in time.

The effect of macroeconomic conditions on capital raising substantially differs, depending on the financial soundness of the firm in question. For lower-rated, noninvestment-grade firms, the likelihood that the 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 measured by a Federal Reserve Survey of bankers. For these firms, the likelihood that they receive a loan, issue a bond, or issue public equity all decline during poor macroeconomic conditions. The only manner of capital raising that increases in poor economic times for these firms is private placements of equity and debt. These results are consistent with the view that, when macroeconomic conditions worsen, the supply of capital shifts and relatively poor-quality firms cannot issue capital publicly but instead have to rely on private placements.

However, the supply of capital does not appear to decline for higher-rated firms during poor macroeconomic conditions. For higher-rated, investment-grade firms, public equity issues have no relation with the business cycle, while public bond issuances actually increase with poor financial conditions. These results are consistent with "flight-to-quality" arguments, in which uncertainty about the economic environment increases in downturns and leads investors to prefer lower-risk investments. In addition, they are consistent with "credit crunch" stories, such as Holmstrom and Tirole (1997), in which capital becomes scarce during an economic slowdown and is rationed to higher-quality firms.

An implication of these arguments is that, during poor economic times, the cost of capital for high-quality firms should be relatively low, and the firms should raise capital to replenish their liquidity. In contrast, lower-rated firms face substantial costs to raising capital in poor economic times, so they should only raise it when necessary and immediately spend whatever capital they raise. We examine these predictions, and find that, consistent with the flight-to-quality arguments, highly rated firms hold a relatively high proportion of proceeds from the issuance in the form of cash during recessions. In contrast, low-rated firms tend to spend most of the capital they raise during poor economic times right away.

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 macroeconomic conditions affect the maturity and security of the public and private debt issuances. Our results indicate that, holding other factors fixed, a downturn tends to decrease the expected maturity of both public bonds and private loans and increase the likelihood that these loans are secured.

These findings can be explained by both demand-based stories, in which less information-sensitive securities are issued during poor economic times, and supply-based ones, in which suppliers of capital require a shorter maturity and more security when macroeconomic conditions are worse.

Overall, our results are consistent with the view that macroeconomic conditions are important determinants of the structure of securities issued, and, equally important, of the ability of firms to raise capital at all. The supply of capital available to firms as well as investors' demand for certain types of securities appear to be important determinants of the manner in which firms raise capital. These findings appear to justify the concerns of Passov (2003) that firms without investment-grade bond ratings could be conceivably shut out of the capital markets during down cycles. Indeed, in the well-known Graham and Harvey (2001) survey of CFOs, 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, Kayhan, and Titman (forthcoming), who document that firms 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 are potentially shut out of the capital markets during downturns.

Appendix

Table A1

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 five years and zero otherwise	Mergent FISD
Bond Security Dummy	Set equal to one if the proceeds-weighted secured bond dummy in a given month is greater than 0.5 and 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 Logit Models	Classified as following for each firm-month: 0 - No issue, 1 - Loan, 2 - Bond, 3 - Convertible, 4 - Seasoned equity offering, 5 - Private placement of equity, 6 - Private placement of debt. In months with multiple issues, the classification is determined by the largest issue in terms of proceeds raised	Dealscan, Mergent FISD, SDC Global

(*continued*)

Table A1
Continued

Variable	Definition	Source
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
Loan Maturity Dummy	Set equal to one if the proceeds-weighted initial maturity of loans obtained in a given month is less than five years and 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 secured loan dummy in a given month is greater than 0.5 and 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 and zero otherwise	BEA
Market leverage	Long-term debt plus debt in current liabilities, scaled by the market value of assets (total assets - book value of equity + market value of equity)	Compustat
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 and 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 twelve-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 and zero otherwise	Federal Reserve

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

Table A2
A multinomial logit model of security choice using weak credit dummy for downturns

	Panel A						Panel B						Panel C					
					Private Placements						Private Placements						Private Placements	
	Loan	Bond	Convert	SEO	Equity	Debt	Loan	Bond	Convert	SEO	Equity	Debt	Loan	Bond	Convert	SEO	Equity	Debt
Firm Age	−0.00400***	0.00746***	−0.0188***	−0.0444***	−0.0230***	−0.00603**	−0.00956***	−0.00821*	−0.0113**	−0.0471***	−0.0216***	−0.00425	0.00387*	0.00323	−0.00878	−0.0264***	−0.0445***	−0.00985*
	(0.00109)	(0.00227)	(0.00386)	(0.00294)	(0.00431)	(0.00296)	(0.00139)	(0.00450)	(0.00505)	(0.00360)	(0.00451)	(0.00350)	(0.00220)	(0.00303)	(0.00572)	(0.00565)	(0.0127)	(0.00546)
ln(Total Assets)	0.137***	0.351***	0.319***	0.0269*	−0.228***	0.392***	0.157***	0.451***	0.539***	0.0627***	−0.237***	0.294***	0.160***	0.448***	0.170***	−0.162***	0.444***	0.301***
	(0.00986)	(0.0262)	(0.0273)	(0.0141)	(0.0248)	(0.0211)	(0.0104)	(0.0287)	(0.0266)	(0.0138)	(0.0226)	(0.0208)	(0.0230)	(0.0389)	(0.0497)	(0.0528)	(0.185)	(0.0481)
Market Leverage	−0.102*	0.583***	0.0317	−0.0334	−0.0530	−0.205	−0.00778	2.135***	0.0696	−0.239**	−0.169	−0.680***	0.270*	0.746**	0.341	1.455***	0.118	0.918**
	(0.0566)	(0.166)	(0.183)	(0.0988)	(0.170)	(0.151)	(0.0592)	(0.169)	(0.201)	(0.105)	(0.171)	(0.164)	(0.162)	(0.306)	(0.491)	(0.369)	(1.239)	(0.366)
Market-to-Book	−0.00184	0.0908***	0.00429	0.0587***	−0.0129	0.0204	−0.00262	0.0514**	0.0236*	0.0618***	−0.0133	0.0201	−0.0217	0.0991***	0.00690	−0.0726	−0.932***	−0.262**
	(0.00781)	(0.0231)	(0.0134)	(0.00711)	(0.0101)	(0.0190)	(0.00822)	(0.0211)	(0.0141)	(0.00713)	(0.0101)	(0.0193)	(0.0246)	(0.0323)	(0.0389)	(0.0739)	(0.350)	(0.120)
Fixed-Assets Ratio	−0.362***	0.597***	−0.726***	0.268**	0.125	0.788***	−0.366***	0.103	−0.514*	0.207	0.121	0.879***	−0.204	0.625***	−0.476	1.140***	1.420*	0.565*
	(0.0692)	(0.174)	(0.241)	(0.125)	(0.231)	(0.190)	(0.0751)	(0.217)	(0.283)	(0.129)	(0.237)	(0.203)	(0.136)	(0.179)	(0.407)	(0.333)	(0.774)	(0.312)
Cash Flow	0.461***	0.0979	−0.00283	0.169**	−0.873***	−0.889***	0.463***	0.326	−0.120	0.171**	−0.864***	−0.805***	0.293	0.794	−1.682***	−1.869***	2.193	3.575***
	(0.0775)	(0.249)	(0.129)	(0.0689)	(0.0482)	(0.0793)	(0.0802)	(0.236)	(0.130)	(0.0706)	(0.0479)	(0.0823)	(0.416)	(0.762)	(0.620)	(0.622)	(3.436)	(1.417)
Cash	−2.285***	−2.750***	1.075***	−0.00523	0.537***	−2.441***	−2.324***	−1.126***	0.873***	−0.118	0.498***	−2.276***	−1.766***	−4.731***	1.480***	−0.0863	3.160**	−4.043***
	(0.0954)	(0.430)	(0.194)	(0.111)	(0.151)	(0.287)	(0.0995)	(0.423)	(0.214)	(0.111)	(0.152)	(0.284)	(0.324)	(0.669)	(0.526)	(1.000)	(1.565)	(0.964)
Inverse Interest Coverage	0.0161	−0.0596	−0.169***	0.111***	−0.137***	0.0510	0.0358*	−0.0134	−0.145*	0.102**	−0.144***	0.0100	−0.0713	−0.00829	−0.354*	0.175	0.385**	0.189
	(0.0194)	(0.0437)	(0.0753)	(0.0422)	(0.0486)	(0.0584)	(0.0204)	(0.0449)	(0.0832)	(0.0438)	(0.0480)	(0.0669)	(0.0509)	(0.0887)	(0.182)	(0.180)	(0.195)	(0.160)
Debt Rating Dummy	0.344***	2.750***	1.020***	0.166***	−0.302**	−0.587***												
	(0.0307)	(0.113)	(0.122)	(0.0612)	(0.141)	(0.0944)												
Sales Growth	0.307***	0.562***	0.318***	0.375***	0.104***	0.284***	0.291***	0.532***	0.301***	0.362***	0.0979***	0.249***	0.482***	0.437***	0.640***	0.824***	1.324***	0.392**
	(0.0159)	(0.0427)	(0.0348)	(0.0179)	(0.0340)	(0.0487)	(0.0166)	(0.0372)	(0.0370)	(0.0182)	(0.0342)	(0.0515)	(0.0706)	(0.0879)	(0.165)	(0.140)	(0.200)	(0.164)
Stock Return	0.0223**	0.156***	0.191***	0.230***	0.135***	−0.0649	0.0327***	0.189***	0.191***	0.227***	0.133***	−0.0874	−0.0328	0.0783	0.484***	0.566***	0.481**	0.0437
	(0.0109)	(0.0205)	(0.0121)	(0.0126)	(0.0143)	(0.0535)	(0.0110)	(0.0184)	(0.0222)	(0.0126)	(0.0142)	(0.0623)	(0.0410)	(0.0611)	(0.0660)	(0.0635)	(0.222)	(0.112)
Term Spread	−0.0209***	0.0592***	0.158***	0.120***	0.274***	0.147***	−0.0315***	−0.0654**	0.131***	0.0950***	0.274***	0.102***	−0.0150	0.0654***	0.237***	0.316***	0.408*	0.241***
	(0.00722)	(0.0171)	(0.0267)	(0.0158)	(0.0291)	(0.0240)	(0.00864)	(0.0285)	(0.0306)	(0.0165)	(0.0293)	(0.0283)	(0.0137)	(0.0227)	(0.0530)	(0.0579)	(0.214)	(0.0457)
Weak Credit Dummy	−0.100***	−0.0364	0.135**	−0.219***	0.248***	−0.0125	−0.109***	−0.310***	−0.0519	−0.264***	0.245***	−0.0564	−0.0803***	0.0737	0.802***	0.195*	0.365	0.117
	(0.0160)	(0.0386)	(0.0548)	(0.0367)	(0.0566)	(0.0538)	(0.0189)	(0.0548)	(0.0618)	(0.0387)	(0.0572)	(0.0631)	(0.0306)	(0.0518)	(0.123)	(0.112)	(0.402)	(0.101)
Constant	−4.010***	−9.580***	−8.823***	−4.976***	−7.081***	−9.806***	−4.140***	−8.246***	−8.946***	−4.759***	−6.976***	−8.882***	−4.322***	−7.328***	−7.306***	−5.324***	−11.60***	−7.993***
	(0.173)	(0.303)	(0.688)	(0.376)	(0.977)	(1.024)	(0.219)	(0.702)	(0.506)	(0.375)	(0.970)	(1.027)	(0.194)	(0.328)	(0.460)	(0.504)	(1.671)	(0.450)
Observations	658,727						559,147						99,634					
Pseudo R^2	0.094						0.062						0.041					

This table reports coefficient estimates for a multinomial logit model as in Table 5 but using weak credit dummy for downturns. The dependent variable includes six different types of security issuance: bank loan, public bond, convertible debt, SEO, and private placements of equity and debt. The base outcome is not issuing any type of security. Variables are defined in Appendix Table 1. The sample period is from the second quarter of 1990–2007. Panel A is for all firms; Panel B is for noninvestment-grade firms only; and Panel C is for investment-grade firms only. All regressions, except for the ones in Panel C, include industry FEs. Standard errors, corrected for clustering of observations at the firm level, are in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

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