Are Financial Constraints Priced? Evidence from Firm Fundamentals and Stock Returns

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ABSTRACT

Using comprehensive firm- and aggregate-level data, this paper studies the real and financial implications of capital market imperfections. We first examine whether financially constrained firms' business fundamentals (capital spending and operating earnings) are more sensitive to macroeconomic movements than unconstrained firms' fundamentals. We then examine whether financial constraint "return factors" respond to macroeconomic shocks in tandem with the responses from business fundamentals. The evidence in this paper points to financial constraints affecting both fundamental quantities and asset returns.

JEL Classification: E44, E32, G12.

Key Words: Financial constraints, macroeconomic shocks, systematic risk, equity returns.

I. Introduction

Theoretical research proposes that financing imperfections can lead to heterogeneous firm responses to macroeconomic shocks (see Bernanke and Gertler (1989), Calstrom and Fuerst (1997), Bernanke et al. (1999), and Livdan et al. (2009)). The main intuition behind those theories is that real-world frictions such as asymmetric information, agency problems, and incomplete contractibility may lead some firms — typically small and young — to pay higher interest rates and rely more on collateral when raising funds. Shocks to the aggregate economy might affect firms' ability to borrow as well as firms' investment demand, and these combined effects would generate cross-sectional differences in real firm behavior over the business cycle.[1]

Recent empirical work has examined whether financial constraints affect firm values. Researchers disagree, however, on how those constraints should affect valuation (Gomes et al. (2003)) and whether they should bind more during downturns or expansions (Gomes et al. (2006)). Researchers also disagree on how to measure financial constraints. Perhaps not surprisingly, the evidence on the pricing effects of financial constraints is mixed and puzzling. Taking size as a proxy for constraints, Perez-Quiros and Timmermann (2000), for example, find that small firms' stock returns are more sensitive to credit tightening than large firms' returns. Lamont et al. (2001), in contrast, study the pricing implications of constraints holding firm size constant (i.e., expunging the "size factor"). They find that financially constrained firms do not earn higher returns than unconstrained firms and that the return differences between the two groups of firms do not respond to aggregate credit shocks. Based on these findings they propose a "financial constraint puzzle:" financial constraints are not systematically priced in the capital market; if anything, they obtain the wrong sign (constrained firms have lower returns).

This paper explores joint evidence from real and financial asset markets to identify the economic effects of financial constraints. The proposed real–financial approach is new and contributes to the literature by more fully characterizing the effects of financial constraints and differentiating competing stories.[2] To understand Lamont et al.'s (2001) financial constraint puzzle, for example, one needs to look at firms' business performance (which could be affected by financing imperfections) as well as firms' equity valuation (which should reflect firms' performance). Likewise, simply showing an empirical correlation between financing constraint risk factors and macroeconomic movements is insufficient to characterize the impact of constraints on firm valuation. This correlation would still support multiple interpretations. One can argue, for example, that during recessions investment opportunities are generally poorer and external financing does not represent a binding constraint. Under this argument, it is during expansions — when there are many positive NPV projects in the economy — that financing frictions hinder the performance of constrained firms the most. This story is also consistent with evidence on differential stock return cyclicality across constrained and unconstrained firms. To differentiate this story from one in which financial constraints bind more in recessions because of a credit deterioration, one needs to look at the cyclicality of constrained firms' real business activity in conjunction with their market valuation. The current paper does so. The paper also adds to the literature through its comprehensive approach to the empirical characterization of the central elements of theories linking real and financial effects of credit constraints.

The main results of the paper can be summarized as follows. We first look at how the business performance of constrained and unconstrained firms responds to macroeconomic shocks. These tests shed light on the question of whether financially constrained firms are fundamentally riskier. Consistent with the notion that credit constraints bind more in bad times, the results suggest that financially constrained firms' operating earnings and capital expenditures are disproportionately affected by negative macro shocks (higher credit spreads, higher interest rates, lower demand, and higher unemployment). The analysis differs from the existing literature (e.g., Gertler and Gilchrist (1994) and Kashyap et al. (1994)) in that it examines firm-level data (as opposed to aggregate data), looks at key variables previous studies have not investigated (such as operating earnings and fixed investment), covers a large cross-section of the economy (as opposed to only a few sectors), and considers new, multiple measures of financial constraints.

We then examine whether the stock prices of financially constrained and unconstrained firms respond to macroeconomic conditions in tandem with what is observed for firm fundamentals. Following standard asset pricing methodology, we construct financial constraint return factors as the differences of returns between financially constrained and unconstrained firms. Differently from previous studies, we find that the constraint factors respond to macroeconomic movements in a statistically and economically significant way. In particular, the returns of constrained firms' stocks decline more than those of unconstrained firms during aggregate downturns and tight credit conditions. Conversely, constrained firms' returns go up more than unconstrained firms' returns during expansions and credit easings. The paper empirically characterizes a macroeconomy–equity valuation channel that works along the lines of the arguments of Bernanke and Gertler (1989), Calstrom and Fuerst (1997), and Bernanke et al. (1999). The results also help reconcile the financial constraint puzzle of Lamont et al. (2001).

The paper is organized as follows. Section 2 describes the data and discusses various measures of financial constraints. Section 3 compares the real-side performance of financially constrained and unconstrained firms over business and credit cycles. Section 4 examines the return characteristics of constrained and unconstrained firms, relating those returns to the macroeconomy. Section 5 concludes.

II. Data and Methods

We collect information from non-financial firms with available return data and non-negative book equity values from the Center for Research in Security Prices and COMPUSTAT's P/S/T, Full Coverage, and Research tapes from fiscal years 1963 through 2006. Our baseline sample consists of an unbalanced panel containing data from 12,170 individual firms. All of the macroeconomic series used in the analysis are obtained from the Federal Reserve Board.

We classify the sample firms according to the degree of financial constraints that they are likely to face. There are a number of plausible approaches to assigning firms into "constrained" and "unconstrained" categories. Differently from previous studies, we use various alternative schemes to classify firms, with an emphasis on schemes that are based on multiple (rather than single) characteristics.

- Scheme #1: KZ Index. In June of each year, we construct an index of financial constraints based on Kaplan and Zingales (1997) and classify firms according to this measure (known as the "KZ Index"). Specifically, following Lamont et al. (2001), we construct an index of the likelihood that a firm faces constraints by applying the following linearization to the data:[3]

$$\begin{aligned} KZIndex &= -1.002 \times Cash\ Flow/Assets + 0.283 \times Q + 3.139 \times Leverage \\ &\quad -39.368 \times Dividends/Assets - 1.315 \times Cash\ Holdings/Assets. \end{aligned} \tag{1}$$

Based on the KZ Index, we rank and classify firms into three groups using 30% and 70% cutoff points. Firms in the highest (lowest) ranked group are considered financially constrained (unconstrained), while the other firms are neither constrained nor unconstrained.[4]

- SCHEME #2: FIRM SIZE. In June of each year, we classify firms based on that month's market capitalization into three groups using 30% and 70% cutoff points. Firms in the lowest (highest) ranked group are financially constrained (unconstrained), while the other firms are neither constrained nor unconstrained. For comparability with prior asset pricing studies, we use the firm size cutoffs of Fama and French (1992), which are based on the distribution of NYSE-listed companies.[5] The size-based categorization approach resembles that of Gertler and Gilchrist (1994), Perez-Quiros and Timmermann (2000), and Almeida et al. (2004).

- SCHEME #3: COMPOSITE MEASURE I. In June of each year, we separately sort firms based on four different criteria: the KZ Index, size, coverage ratio, and dividend payout ratio. Next, we rank firms in quintiles and assign a score of 1 to 5 to each of those four rankings, with a higher number indicating lower degree of financing constraints (except for the KZ Index, where rankings work in the opposite direction). We also assign a score of 5 to firms with commercial paper ratings and a score of 1 to those without such ratings, as well as a score of 5 to firms with bond ratings and 1 otherwise. We then add the total score for each firm based on all six characteristics. Using this composite index, we sort firms into three groups using 30% and 70% cutoff points. Firms in the lowest (highest) ranked group are financially constrained (unconstrained), while the other firms are neither constrained nor unconstrained.

- SCHEME #4: COMPOSITE MEASURE II. The algorithm used to compute Composite Measure II is similar to that of Composite Measure I, except that we only use four sets of firm observables (coverage ratio, dividend payout ratio, commercial paper rating, and bond rating). We exclude the KZ Index and size from Composite Measure II because they are considered separately above.

We adopt multiple classification schemes because researchers have long debated about the types of firm characteristics one should use to identify financing constraints. For example, size is a standard constraint measure (e.g., Gertler and Gilchrist (1994)). However, because it depends on the market price, size is also a natural proxy for missing risk factors (e.g., Berk (1995)). In comparison with size, firm characteristics such as coverage ratio, dividend payout ratio, commercial paper rating, and bond rating are naturally related to external borrowing costs.

Table 1 reports the number of firm-years under each of our four financial constraint categorizations. According to the size scheme, for example, there are 74,726 financially constrained firm-years and 17,249 financially unconstrained firm-years. The disproportionately large fraction of size-constrained observations stems from the high NYSE-based cutoff points that we use. In contrast, the numbers of constrained and unconstrained firm-years across the other criteria are more evenly distributed as we classify firms using COMPUSTAT-based sortings. More interestingly, the table also reports the correlation among the various classification schemes. For instance, out of the 38,160 firm-years considered constrained according to Composite Measure II (see row 4 in the table), 20,850 (or 55% of the observations) are also constrained according to the KZ Index, 33,061 (87%) are constrained according to size, and 29,803 (78%) are constrained according to Composite Measure I.

TABLE 1 ABOUT HERE

In general, there is a positive, but imperfect correlation among the measures of constraints considered. Table 1 suggests caution with conclusions about the pricing of financial constraints when only one criterion is used to characterize firms as constrained or unconstrained. We only draw inferences about the economic effects of financial constraints after considering result consistency across multiple constraint measures.

III. Financial Constraints and Real Firm Performance over the Business and Credit Cycles

We first look at the effects of financial constraints in the production market. If financial constraints work according to the arguments of Bernanke and Gertler (1989), Calstrom and Fuerst (1997), and Bernanke et al. (1999), one should expect constrained firms' fundamentals to fare particularly poorly during downturns and credit contractions, when financial constraints are more likely to bind. By the same token, constrained firms should fare relatively better during expansions and credit easings. On the flip side, if constraints bind more in good times, then we should see constrained firms underperforming unconstrained ones during periods of economic growth and easy credit.

The test of the proposition that financial constraints affect real business risk is regression-based. In a time series context, we examine differences in the evolution of operating earnings and capital expenditures over business and credit cycles across groups of financially constrained and unconstrained firms. Specifically, on an annual basis, we form two separate sets of firm portfolios according to each of the financial constraint criteria described above (see Table 1) and compute the portfolios' median real earnings growth and real investment growth. We then regress each of those firm measures (denoted by π) on a proxy for macroeconomic or credit market conditions (*MACRO*). The proxies for the state of the economy are the industrial production growth rate (*Ind Prod*) and the nonfarm employment rate (*Employ*). The proxies for credit market conditions are the commercial paper rate over the three-month Treasury-bill rate spread (*CP Spread*) and the bank prime loan rate over the three-month Treasury-bill rate spread (*Loan Spread*). Since macroeconomic movements and changes in the stance of monetary policy often coincide, we also include changes in the basic interest rate — the Fed funds rate — as a proxy for monetary policy (*MP*).[6] All specifications include a time trend (*Trend*) and a constant term.

The empirical model of business fundamentals of a firm j during year t has the form

$$\pi_{j,t} = \eta + \phi MACRO_t + \lambda MP_t + \rho Trend_t + u_{j,t}. \tag{2}$$

The economic and the statistical significance of the macro variables of interest are gauged from the estimated ϕ and the associated p-value (computed via Newey and West (1987)). Tests for differences between the ϕ coefficients across financially constrained and unconstrained firms are also reported. Standard errors for these cross-equation "difference coefficients" are estimated via a SUR system.

Table 2 summarizes the results from the estimation of Eq. (2). The table has two panels. Panel A collects the ϕ estimates that are returned for each of the 8 group regressions (4 constraint criteria $\times$ 2 constraint categories) when we use earnings growth as the left-hand side variable in Eq. (2). Panel B is similarly defined for investment growth as the left-hand side variable in (2). Each panel has four columns, allowing for variations in the proxy for aggregate activity and credit conditions. To facilitate comparisons across estimations, we sign the macro variables so that a positive shift in *MACRO* indicates either a deterioration of macroeconomic conditions or a tightening of credit conditions. To ease the interpretation of the estimates presented, the right-hand side variables are normalized so that they have zero mean and standard deviation equal to one.

In all, Table 2 displays 32 pairs of estimated responses of firm fundamentals to shocks to macroeconomic and credit market conditions (i.e., the ϕ's in Eq. (2)) along with the associated SUR differences in responses across groups (i.e., the constrained ϕ's minus the unconstrained ϕ's).

Table 2 about here

Nearly all of the constrained firm regressions show significant, negative responses of firm business fundamentals to unfavorable movements in macroeconomic and credit conditions. In particular, 27 (30) out of the 32 constrained group coefficients are statistically significant at the 1% (5%) test level. For our purposes, the most interesting estimates of Table 2 are those regarding the differential impact of aggregate conditions across financially constrained and unconstrained firms (see the diff. (C) – (U) row). All but one of the "difference coefficients" of Table 2 have a negative sign; 17 (21) are statistically significant at the 1% (5%) test level.

The estimates in Table 2 are economically significant. Most difference coefficients suggest that the responses of constrained firms' fundamentals to macro shocks are between around 50 and 150% more procyclical than those of unconstrained firms. In Panel A, for example, the coefficient for industrial production (see column 1, row 1) equals –0.10 for financially constrained firms and –0.06 for unconstrained firms. These numbers imply that for a one-standard deviation decline in industrial production, the decline in earnings growth of financially constrained firms is 10% per year, while for unconstrained firms that number is just 6% — i.e., constrained firms' EBIT is nearly two times more procyclical. While point estimates from reduced-form models like Eq. (2) should be interpreted with caution, the contrasts reported in Table 2 provide evidence of heterogeneous firm behavior over business and credit cycles.

To sum up, the results in this section show that during economic downturns and credit tightenings financially constrained firms observe significantly lower earnings and investment growth than financially unconstrained firms. In expansionary periods, those outcomes are reversed. The patterns we report are consistent with theories that emphasize the role of credit frictions in amplifying firms' real-side responses to negative macro shocks.

IV. Financial Constraints and Stock Returns

A. Financial Constraint Factors

We turn to the valuation effects that are associated with the real-side results just presented. To this end, we calculate the difference between the stock returns of financially constrained firms and unconstrained firms — a financial constraint "return factor." In particular, for each of the financial constraint classification schemes described in Section 2, we calculate the monthly equal-weighted stock portfolio returns of constrained (C), middle (M), and unconstrained (U) firm groups. As is standard in the asset pricing literature, we also consider book-to-market portfolios. Specifically, we also sort firms into three book-to-market portfolios — high (H), middle (M), and low (L) — using 30% and 70% cutoffs. The book value of equity used in the book-to-market calculation is taken from the previous fiscal year and the market equity is from the previous December's capitalization (see, for example, Fama and French (1993)).

For each constraint criterion, we construct two constraint factors. The first, the 'one-way' version, is calculated as the return difference between the most and the least financially constrained groups among five (quintile) portfolios; i.e., $C-U$. The second, the 'book-to-market-neutralized' version, is calculated based on three-sorted portfolios. In particular, using methodology that is similar to Lamont et al. (2001), we interact the constraint categories (C, M, U) with the book-to-market categories (H, M, L), thereby creating 9 portfolios for each financial constraint criterion.[7] Formally, the risk premium of a book-to-market-neutralized constraint factor, FC, is computed as $((CH+CM+CL)-(UH+UM+UL))/3$, where CH represents the equity return of a portfolio that belongs to the C and H categories, with the other portfolios defined in a similar fashion.

The results from Section 3 suggest that financial constraints affect the responses of firm fundamentals to macroeconomic movements. One would expect this difference to show up in the equity prices through the financial constraint factor. Consistent with our findings on firm fundamentals, asset pricing theory would predict the following patterns associated with the constraint return factor:

1. The financial constraint factor should earn a positive risk premium. Since financially constrained firms are systematically riskier than unconstrained firms, investors should demand a risk premium for holding them.

2. The stock prices of financially constrained firms are more negatively (positively) affected by negative (positive) macro shocks. As a result, the financial constraint factor, as the return differential, should covary with the same set of macro shocks that affect business fundamentals.

We examine these hypotheses jointly, using a long time series.

B. The Financial Constraint Premium

Table 3 reports the average realized return associated with the financial constraint factor. Following Lamont et al. (2001), Panel A reports results for a time window that starts in January 1968 and ends in April 2001. Using the KZ Index as a measure of constraint status, Lamont et al. find that the financial constraint factor does not earn a significantly positive return. Their finding is confirmed in Panel A of Table 3.

Table 3 about here

Panel B reports results for our full sample (January 1963 to December 2006). Differently from Panel A, two of the one-way sorted constraint factors — based on size and Composite Measure I — are economically and statistically significant. The average constraint factor return based on size in Panel B is 0.70% per month (8.4% annual). The book-to-market-neutralized size factor is also significant. If one takes size as a measure of financial constraint, then the evidence in Table 3 implies that financially constrained firms earn a significantly positive risk premium. At the same time, however, we note that size has been thought of as a proxy for other sources of risk in asset pricing.

C. Macroeconomic Shocks and Stock Returns

This section examines whether the financial constraint factor is correlated with macroeconomic indicators. We use the variables used in Section 3 to proxy for macroeconomic and credit market conditions: the industrial production growth rate, the employment rate, the commercial paper rate spread, and the prime rate spread. We again sign all of the macro variables so that a positive change signals a deterioration in aggregate activity or credit conditions. The equity return data allow us to work with monthly frequency.

The following model of factor returns is estimated:

$$FC_t = a + \sum_{j=0}^{2} \beta_j \times \triangle MACRO_{t-j} + \varepsilon_t. \tag{3}$$

FC is the financial constraint return factor and $\triangle MACRO$ represents the change of the macro variable under examination. For each estimation of Eq. (3), we report the sum of the macro variable lag coefficients ($\sum \beta$) and the associated p-values. The results are shown in Table 4.

Table 4 about here

In the first four columns of Table 4 we report the results using the one-way sorted constraint factors. In the last four columns, following Lamont et al. (2001), the constrained factors are neutralized with size. The procedure used to calculate the size-neutralized constraint factor is similar to that used to calculate the book-to-market-neutralized factor (described earlier), except that we replace the book-to-market portfolios with the size portfolios.

The results in Table 4 imply that the financial constraint factor responds negatively to deteriorating macroeconomic and credit conditions. All of the 28 $\sum \beta$ estimates are negative, while 20 estimates are statistically significant at the 5% test level. Intuitively, since financially constrained firms' fundamentals are affected the most by negative macro shocks, those firms' equity prices must drop more, causing a negative response in the financial constraint factor.

The KZ Index-size-neutralized constraint factor (see last four columns of row 1) has mostly statistically insignificant results. Notably, this is the same constraint factor that Lamont et al. have studied in their paper, leading them to propose a "financial constraint puzzle." The more comprehensive analysis presented in this paper suggests that those authors' conclusions can be attributed to their focus on a particular approach to measuring financial constraints.

In general, the size-neutralized financial constraint factors respond much less to aggregate shocks than the one-way sorted constraint factors. This is consistent with Livdan et al.'s (2009) theoretical prediction that financially constrained firms are systematically riskier and should earn higher expected returns. In particular, the financial constraint factor should be redundant since its effect is absorbed by endogenous variables such as size and book-to-market. Consistent with those authors' model, our results show that (1) the size factor is highly correlated with other non-size financial constraint factors and (2) neutralizing other financial constraint factors by size largely mitigates their responses to macroeconomic shocks.

The results in Table 4 are stronger than those in Table 3. Merton (1980) points out that the first moment (the constraint premium in our case) is much harder to be precisely estimated and is much more sample-dependent than the second moment of the return generating process (see also Elton (1999)). Consistent with this notion, we show that the financial constraint puzzle only appears in tests that revolve around the average constraint premium (as in Table 3). The puzzle disappears in regression-based tests that revolve around higher return moments, that is, covariances (Table 4).

V. Concluding Remarks

Financing constraints have been proposed as an explanation for why some firms exhibit greater sensitivity to aggregate shocks. The argument is that financially constrained firms are riskier because of the excessive procyclicality of their business fundamentals. These risks cannot be diversified away by market investors; financially constrained firms' stocks should thus price this dimension of risk. Along these arguments, our study tackles a number of questions that are not fully addressed in the literature: (1) Are financially constrained firms' fundamentals systematically riskier? (2) Is the financial constraints-led procyclicality of firm fundamentals linked to equity returns, and thus, is financial constraint risk priced?

We find evidence suggesting that financially constrained firms have higher systematic risk and that the constraint risk is priced in the financial markets. In particular, financially constrained firms' business fundamentals are significantly more sensitive to macroeconomic movements than unconstrained firms' fundamentals. A financial constraint factor, calculated as the return difference between financially constrained and unconstrained firms, correlates with macroeconomic movements as predicted by existing theories: the stock returns of financially constrained firms underperform those of unconstrained firms when financial constraints are more likely to bind (downturns and tight credit conditions) and outperform when constraints are likely to be relaxed. These results mitigate the "pricing puzzles" discussed in the previous literature.

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Notes

[1]On the other hand, the notion that credit constraints have first-order effects on aggregate investment and corporate behavior has been challenged by a number of studies (e.g., Kocherlakota (2000) and Cordoba and Ripoll (2004)).

[2]A number of recent papers re-examine Lamont et al.'s work (e.g., Whited and Wu (2006) and Hahn and Lee (2008)). Like Lamont et al., those studies find that there exists a financial constraint factor (the stock returns of financially constrained firms move together). However, those studies do not reconcile Lamont et al.'s pricing puzzle since they do not characterize a connection between financial constraint return comovement and aggregate credit shocks.

[3]Lamont et al. apply the KZ Index exclusively to manufacturing firms that report positive real sales growth in the previous year. To be consistent with our other financial constraint measures, we do not constrain our sample to the manufacturing sector, nor do we impose a positive sales growth restriction. However, our results do not change if we use the same sample selection criteria of Lamont et al.

[4]We also classify firms based on quintiles of the KZ Index, doing the same for the other constraint measures described next. As will be clear below, sorting with different numbers of groups follows different practices in the literature.

[5]Our conclusions are the same if we use COMPUSTAT-based rankings, similarly to what we do in the other partition schemes.

[6]As an extra robustness check we experimented with other measures of monetary policy (such as M2 and nonborrowed reserves), but these alternative proxies produced no changes in our conclusions. We also run our tests without the proxy for monetary policy (MP), as it can be colinear with proxies such as *Loan Spread.* Finally, as an alternative proxy for credit conditions, we used the Baa over the Aaa yield spread. Our results hold steadily.

[7]This neutralization is meant to isolate the impact of the financial constraint factor from that of the book-to-market factor; otherwise, the confounding effects of the latter factor could allow for alternative interpretations.

Table 1: Cross-Classification of Financial Constraint Types

This table displays firm-year cross-classification for the various criteria used to categorize firms as either financially constrained or unconstrained. NYSE, NASDAQ, and AMEX firms from January 1963 to December 2006 are ranked independently every June based on previous accounting and equity capitalization information. The financial constraint criteria are KZ Index, size, Composite I, and Composite II. See text for definitions and sorting procedures.

Financial Constraints		KZ Index		Size		Composite I		Composite II	
Criteria		(C)	(U)	(C)	(U)	(C)	(U)	(C)	(U)
1. KZ Index									
Constrained	(C)	31,638							
Unconstrained	(U)		34,043						
2. Size									
Constrained	(C)	23,812	2,541	74,726					
Unconstrained	(U)	19,978	5,537		17,249				
3. Composite I									
Constrained	(C)	21,639	1,924	30,059	4,785	32,315			
Unconstrained	(U)	1,574	13,444	157	11,566		26,124		
4. Composite II									
Constrained	(C)	20,850	2,970	33,061	8,476	29,803	0	38,160	
Unconstrained	(U)	3,757	13,151	1,001	10,728	1	23,073		29,164

Table 2: Responses of Business Fundamentals to Macroeconomic Shocks

We conduct time series regressions of the growth rates of business fundamentals (earnings and investment) on macroeconomic and credit market conditions. The macroeconomic and credit market variables include the growth rate of industrial production (Ind Prod), the employment rate (Employ), the commercial paper rate over the three-month T-bill rate spread (CP Spread), and the bank prime loan rate over the three-month T-bill rate spread (Loan Spread). All four explanatory variables are signed so that a positive number represents either a worsening of macroeconomic conditions or a tightening of credit conditions. The table displays (in parentheses) the p-values for the impact of the macro proxy on business activity computed via Newey-West (1987). A time trend and the change of the Fed funds rate are also included as control variables. Differences in coefficients across regressions are estimated via a SUR system. We use "***" to denote significance at the 1% level, and "**" to denote significance at the 5% level.

Panel A: Earnings Growth

	Macroeconomic Variables			
	Ind Prod	Employ	CP Spread	Loan Spread
Financial Constraints Criteria				
1. KZ Index				
Constrained (C)	-0.10***	-0.07***	-0.07***	-0.09***
	(0.00)	(0.01)	(0.00)	(0.00)
Unconstrained (U)	-0.06***	-0.04***	-0.05***	-0.07***
	(0.00)	(0.00)	(0.00)	(0.00)
Diff. (C) − (U)	-0.04***	-0.02	-0.03	-0.03**
	(0.01)	(0.16)	(0.10)	(0.05)
2. Size				
Constrained (C)	-0.09***	-0.06***	-0.07***	-0.09***
	(0.00)	(0.01)	(0.00)	(0.00)
Unconstrained (U)	-0.05***	-0.04***	-0.03**	-0.05***
	(0.00)	(0.00)	(0.02)	(0.00)
Diff. (C) − (U)	-0.04***	-0.02	-0.04***	-0.04***
	(0.00)	(0.12)	(0.00)	(0.00)
3. Composite I				
Constrained (C)	-0.14***	-0.10***	-0.11***	-0.12***
	(0.00)	(0.01)	(0.00)	(0.00)
Unconstrained (U)	-0.06***	-0.04***	-0.04***	-0.06***
	(0.00)	(0.00)	(0.01)	(0.00)
Diff. (C) − (U)	-0.08***	-0.06**	-0.07***	-0.06***
	(0.00)	(0.02)	(0.00)	(0.00)
4. Composite II				
Constrained (C)	-0.12***	-0.09***	-0.11***	-0.12***
	(0.00)	(0.00)	(0.00)	(0.00)
Unconstrained (U)	-0.06***	-0.04***	-0.04***	-0.06***
	(0.00)	(0.00)	(0.00)	(0.00)
Diff. (C) − (U)	-0.06***	-0.04	-0.07***	-0.06***
	(0.00)	(0.06)	(0.00)	(0.00)

Table 2: – Continued

Panel B: Investment Growth

	Macroeconomic Variables			
	Ind Prod	Employ	CP Spread	Loan Spread
Financial Constraints Criteria				
1. KZ Index				
Constrained (C)	-0.05***	-0.05***	-0.03	-0.03**
	(0.00)	(0.00)	(0.09)	(0.02)
Unconstrained (U)	-0.05***	-0.07***	-0.02	-0.03**
	(0.00)	(0.00)	(0.24)	(0.03)
Diff. (C) − (U)	-0.00	0.02	-0.02	-0.00
	(0.89)	(0.23)	(0.20)	(0.78)
2. Size				
Constrained (C)	-0.07***	-0.08***	-0.03***	-0.05***
	(0.00)	(0.00)	(0.00)	(0.00)
Unconstrained (U)	-0.02	-0.04***	0.02	0.01
	(0.06)	(0.00)	(0.12)	(0.59)
Diff. (C) − (U)	-0.05***	-0.05***	-0.05***	-0.05***
	(0.00)	(0.00)	(0.00)	(0.00)
3. Composite I				
Constrained (C)	-0.07***	-0.08***	-0.05**	-0.05***
	(0.00)	(0.00)	(0.04)	(0.01)
Unconstrained (U)	-0.03**	-0.05***	-0.00	-0.01
	(0.02)	(0.00)	(0.87)	(0.38)
Diff. (C) − (U)	-0.04***	-0.03	-0.05***	-0.04**
	(0.01)	(0.07)	(0.00)	(0.02)
4. Composite II				
Constrained (C)	-0.06***	-0.08***	-0.03	-0.04**
	(0.00)	(0.00)	(0.10)	(0.02)
Unconstrained (U)	-0.03***	-0.05***	-0.01	-0.02
	(0.00)	(0.00)	(0.50)	(0.11)
Diff. (C) − (U)	-0.03***	-0.03**	-0.02	-0.02
	(0.01)	(0.04)	(0.11)	(0.14)

Table 3: Summary Statistics of Financial Constraint Factors

We report the average return and t-statistic for the financial constraint factor under each criterion and for both one-way and book-to-market adjusted sorting. Panel A covers January 1968 – April 2001 following Lamont et al. (2001); Panel B covers January 1963 – December 2006. We use "***" to denote significance at the 1% level, and "**" to denote significance at the 5% level.

	One-Way Sorting				Neutralized with Book-to-Market			
	KZ Index	Size	Composite I	Composite II	KZ Index	Size	Composite I	Composite II
Panel A: January 1968 – April 2001 (Lamont et al. (2001) Window)								
Mean	0.05	0.45	0.29	0.17	-0.03	0.31	0.17	0.10
t-stat	0.30	1.82	1.04	0.65	-0.20	1.30	0.67	0.45
Panel B: January 1963 – December 2006 (Full Sample)								
Mean	0.18	0.70***	0.53**	0.33	0.08	0.53***	0.40	0.27
t-stat	1.37	3.45	2.30	1.52	0.72	2.70	1.92	1.45

Table 4: Macro Variables and the Financial Constraint Return Factor

This table reports results from regressions of the returns of financial constraint factors on variables representing macroeconomic shocks as follows:

$$FC_t = \alpha + \sum_{j=0}^{2} \beta_j \times \triangle MACRO_{t-j} + \varepsilon_t,$$

where FC is the realized equity premium of financial constraint and $\triangle MACRO$ represents the shocks to the macroeconomic or aggregate credit market conditions. The macroeconomic and credit market variables include, as in Table 2, the growth rate of industrial production (Ind Prod), the employment rate (Employ), the commercial paper rate over the three-month T-bill rate spread (CP Spread), and the bank prime loan rate over the three-month T-bill rate spread (Loan Spread). All four explanatory variables are signed so that a positive number represents either a worsening of macroeconomic conditions or a tightening of credit conditions. We separately present the cases for the one-way sorted financial constraint equity premium and for the size-neutralized financial constraint premium. All coefficients are Newey-West (1987) estimators adjusting for heteroskedasticity and autocorrelation (p-values in parantheses). We use "***" to denote significance at the 1% level, and "**" to denote significance at the 5% level.

	One-Way Sorting				Size-Neutral			
	Ind Prod	Employ	CP Spread	Loan Spread	Ind Prod	Employ	CP Spread	Loan Spread
1. KZ Index								
$\sum \beta$	-1.26***	-8.73**	-1.55***	-0.41***	-0.81	-6.24***	-0.27	-0.10
p-value	(0.01)	(0.03)	(0.01)	(0.01)	(0.07)	(0.01)	(0.52)	(0.75)
2. Size								
$\sum \beta$	-1.60	-13.05**	-3.63***	-1.50***				
p-value	(0.13)	(0.02)	(0.00)	(0.00)				
3. Composite I								
$\sum \beta$	-1.88	-13.75**	-3.96***	-1.40***	-0.60	-9.86**	-2.21***	-0.86**
p-value	(0.10)	(0.02)	(0.00)	(0.00)	(0.49)	(0.02)	(0.01)	(0.02)
4. Composite II								
$\sum \beta$	-1.73	-11.10**	-3.59***	-1.27***	-0.58	-5.72**	-1.81***	-0.77***
p-value	(0.08)	(0.03)	(0.00)	(0.01)	(0.34)	(0.05)	(0.00)	(0.01)