

Online Appendix: Uncovering Financial Constraints

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This online appendix contains additional results.

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Table 1: **Equity Recycling by Financial Constraint Classification [Debt Constraint Classifications]**

This table examines the difference in equity recycling behavior between the most debt constrained firms (top 20%) and the least debt constrained firms (bottom 20%). We follow the procedure of Farre-Mensa and Ljungqvist (2016). We regress the yearly change ($t - 1 \rightarrow t$) in payouts to shareholders on the yearly change in equity issuance proceeds (Δ Equity Issuance). We control for the change in other funding sources (Δ Other Funding) and change in firm size (Δ Size). All variables are scaled by the beginning-of-year ($t - 1$) total assets except size. We include industry-by-year fixed effects. Standard errors are clustered at the firm-level. Panel A presents our baseline tests with payouts to shareholders including both dividends and repurchases and financial constraints classified in year $t - 1$. In Panel B, financial constraints are classified in year t . In Panel C, the dependent variable is the change in share repurchases (i.e., dividends are not included in the payouts to shareholders). In the first six columns we present results for the random forest measure in different time periods. In the last two columns of each table we present the results for the Hoberg and Maksimovic (2015) equity constraint measure. Standard errors are clustered at the firm level. We report the results of a Wald test comparing the coefficient of interest for constrained and unconstrained firms. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

	Entire Period		Pre-1997		Post-1997		HM Measure	
	Constrained (1)	Unconstrained (2)	Constrained (3)	Unconstrained (4)	Constrained (5)	Unconstrained (6)	Constrained (7)	Unconstrained (8)
Δ Equity Issuance	0.033*** (0.00)	0.006*** (0.00)	0.035*** (0.01)	0.006*** (0.00)	0.033*** (0.01)	0.006*** (0.00)	0.028*** (0.01)	0.010*** (0.00)
Δ Other Funding	0.012*** (0.00)	0.004*** (0.00)	0.014*** (0.00)	0.003* (0.00)	0.011*** (0.00)	0.004*** (0.00)	0.009*** (0.00)	0.007*** (0.00)
Δ Size	-0.007*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.004* (0.00)	-0.008*** (0.00)	-0.003*** (0.00)	-0.010*** (0.00)	-0.005*** (0.00)
Wald Test:	35.31***		10.02***		25.11***		12.42***	
Observations	14630	16860	4459	5048	10171	11812	6245	6907
R^2	0.054	0.036	0.058	0.029	0.052	0.037	0.055	0.055

Table 2: **Dividend Tests [Debt Constraint Classifications]**

This table examines the difference in behavior between the most debt constrained firms (top 20%) and the least debt constrained firms (bottom 20%). In Panel A, the dependent variable is a dividend omission dummy equal to one if the firm did not pay a dividend during the year and paid a dividend the previous year ($t - 1 \rightarrow t$). In Panel B, the dependent variable is a dividend increase dummy equal to one if a firm increased its dividend between the previous and current year ($t - 1 \rightarrow t$). The main independent variable of interest (Constrained Dummy) is a dummy variable equal to one (zero) if the firm is in the most (least) constrained quintile in year $t - 1$. We control for the logarithm of market capitalization (year $t - 1$), logarithm of book-to-market (year $t - 1$) Winsorized at the 1% level, a negative earnings dummy (year $t - 1$) and the firm's equity return in excess of the market in the previous year ($t - 2 \rightarrow t - 1$). We only include firm-year observations in which the firm paid a dividend in year $t - 1$. We include industry and year fixed effects. Standard errors are clustered at the industry and year level. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Panel A: Dividend Omissions

	(1) RF All	(2) RF Pre-1997	(3) RF Post-1997	(4) HM
Constrained Dummy	-0.004 (0.01)	0.003 (0.00)	-0.011 (0.01)	-0.003 (0.01)
Log(Mkt Cap)	-0.014*** (0.00)	-0.014*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)
Log(Book-to-Market)	0.003 (0.00)	-0.005 (0.01)	0.012* (0.01)	0.002 (0.01)
Neg. Earnings Dummy	0.155*** (0.01)	0.168*** (0.01)	0.134*** (0.02)	0.123*** (0.02)
Past Excess Return	-0.002 (0.01)	-0.008 (0.01)	0.005* (0.00)	0.006 (0.01)
Observations	24460	15612	8848	5710
R^2	0.104	0.104	0.099	0.105

Panel B: Dividend Increases

	(1) RF All	(2) RF Pre-1997	(3) RF Post-1997	(4) HM
Constrained Dummy	-0.017* (0.01)	-0.025** (0.01)	0.032** (0.01)	0.038*** (0.01)
Log(Mkt Cap)	0.051*** (0.00)	0.057*** (0.00)	0.041*** (0.00)	0.043*** (0.00)
Log(Book-to-Market)	-0.047*** (0.01)	-0.056*** (0.01)	-0.036*** (0.01)	-0.018** (0.01)
Neg. Earnings Dummy	-0.265*** (0.02)	-0.326*** (0.02)	-0.184*** (0.02)	-0.171*** (0.03)
Past Excess Return	0.044*** (0.01)	0.067*** (0.02)	0.018* (0.01)	0.016** (0.01)
Observations	24467	15612	8855	5715
R^2	0.175	0.215	0.135	0.148

Table 3: **Pension Underfunding Tests [Equity Constraint Classifications]**

This table examines the difference in pension funding behavior between more equity constrained firms (top 30%) and less equity constrained firms (bottom 30%). The dependent variable is a pension underfunded dummy equal to one if a firm's pension is underfunded in year t . The main independent variable of interest (Constrained Dummy) is a dummy variable equal to one (zero) if the firm is in the most (least) constrained 30% of firms in year $t - 1$. We control for the lagged dependent variable (year $t - 1$). We control for the logarithm of market capitalization (year $t - 1$), logarithm of book-to-market (year $t - 1$) Winsorized at the 1% level, a negative earnings dummy (year $t - 1$) and the firm's equity return in excess of the market in the previous year ($t - 2 \rightarrow t - 1$). We only include firm-year observations in which the firm had pension obligations in the year $t - 1$. We include industry and year fixed effects. Standard errors are clustered at the industry and year level. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

	(1)	(2)	(3)	(4)
	RF All	RF Pre-1997	RF Post-1997	HM
Constrained Dummy	0.007** (0.00)	0.012 (0.01)	0.005 (0.00)	0.002 (0.01)
Lag Underfund Dummy	0.577*** (0.03)	0.609*** (0.02)	0.543*** (0.04)	0.517*** (0.05)
Log(Mkt Cap)	-0.004** (0.00)	-0.012** (0.00)	-0.001 (0.00)	-0.002 (0.00)
Log(Book-to-Market)	-0.011* (0.01)	-0.035** (0.02)	-0.002 (0.01)	-0.007 (0.01)
Neg. Earnings Dummy	-0.004 (0.01)	-0.015 (0.02)	0.001 (0.01)	-0.002 (0.01)
Past Excess Return	0.004 (0.00)	-0.002 (0.02)	0.006 (0.00)	0.003 (0.00)
Observations	15939	5187	10751	6551
R^2	0.635	0.422	0.486	0.468

Table 4: Stock Returns, Financial Constraints and Funding Costs Shocks (Hoberg and Maksimovic (2015) Constraint Measures)

This table reports results of regressions demonstrating the relationship between shocks to funding costs and the returns of financially constrained firms. The regression is as follows:

$$r_{i,t}^e = \alpha + \beta_1 1_{i,t}^C + \beta_2 \Delta F_t^m + \beta_3 1_{i,t}^C \times \Delta F_t^m + \beta_4 M r k t_t + \Gamma \times \chi_{i,t} + \Lambda \times \Delta F_t^m \times \chi_{i,t} + \epsilon_{i,t},$$

where $1_{i,t}^C$ is an indicator variable equal to one if the firm is classified as being in the most constrained group according to the Hoberg and Maksimovic (2015) measures at month t (constraint is measured in year -2 if month ≤ 6 , year -1 otherwise), ΔF_t^m denotes monthly changes in funding costs, $M r k t_t$ denotes the market factor, and $\chi_{i,t}$ denotes firm-level controls (omitted for brevity). Firm-level controls are interacted with the funding costs as well. In Panel A, we present results for debt funding cost shocks (monthly change in the Gilchrist and Zakrajšek (2012) excess bond premium). In Panel B, we present results for equity cost shocks (-ICS from Belo et al. (2019)). We denote below whether control variables and firm fixed effects are included. We also denote below whether the sample is all firms, the largest 50% of firms in terms of market value, or the smallest 50%. Robust standard errors clustered by year-month are reported in parentheses.

Panel A: Debt Funding Costs (EBP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Equity Constraints				Debt Constraints			
ΔEBP	-2.53** (1.179)	-3.19 (3.562)	-4.97 (3.965)	-1.63 (5.785)	-3.19* (1.649)	-7.02* (3.841)	-7.51* (3.838)	-8.83 (5.825)
Constrained $\times \Delta EBP$	-1.66 (1.387)	-1.75 (1.349)	-0.44 (1.201)	-2.54 (1.831)	0.17 (1.358)	0.50 (1.409)	-0.11 (1.316)	1.20 (1.672)
$r_m - r_f$	1.09*** (0.065)	1.10*** (0.064)	1.15*** (0.050)	1.07*** (0.084)	1.40*** (0.085)	1.39*** (0.086)	1.44*** (0.078)	1.34*** (0.106)
Constrained $\times (r_m - r_f)$	0.48*** (0.095)	0.45*** (0.090)	0.43*** (0.123)	0.46*** (0.082)	-0.28*** (0.087)	-0.26*** (0.079)	-0.25*** (0.090)	-0.28*** (0.078)
Constrained	0.14 (0.437)	-0.07 (0.352)	0.26 (0.316)	-0.56 (0.501)	0.16 (0.354)	0.76*** (0.234)	0.64*** (0.219)	0.92** (0.357)
Sample:	All	All	Largest 50%	Smallest 50%	All	All	Largest 50%	Smallest 50%
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Firm FEs	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	210115	207582	90577	116812	223147	220959	102757	117992
R^2	0.09	0.13	0.20	0.12	0.09	0.14	0.22	0.12

Panel B: Equity Funding Costs (ICS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Equity Constraints				Debt Constraints			
ICS	-0.08* (0.047)	0.09 (0.157)	0.11 (0.208)	0.25 (0.239)	0.09 (0.076)	0.20 (0.208)	0.24 (0.192)	0.35 (0.300)
Constrained×ICS	0.21*** (0.070)	0.16** (0.077)	0.18*** (0.062)	0.13 (0.102)	-0.22*** (0.059)	-0.19*** (0.061)	-0.19*** (0.061)	-0.17** (0.072)
$r_m - r_f$	1.14*** (0.058)	1.13*** (0.058)	1.14*** (0.042)	1.11*** (0.079)	1.48*** (0.080)	1.46*** (0.084)	1.46*** (0.072)	1.45*** (0.108)
Constrained×($r_m - r_f$)	0.54*** (0.084)	0.52*** (0.084)	0.48*** (0.101)	0.53*** (0.088)	-0.31*** (0.081)	-0.30*** (0.079)	-0.27*** (0.085)	-0.32*** (0.081)
Constrained	0.13 (0.422)	-0.11 (0.348)	0.24 (0.311)	-0.52 (0.498)	0.12 (0.329)	0.76*** (0.235)	0.63*** (0.228)	0.88** (0.340)
Sample:	All	All	Largest 50%	Smallest 50%	All	All	Largest 50%	Smallest 50%
Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Firm FEs	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	216143	213635	92982	120458	229596	227428	105807	121417
R^2	0.08	0.13	0.20	0.12	0.09	0.13	0.22	0.12

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