

Appendix

Table A.1: Summary Statistics of Firm Characteristics

	Low Leverage		High Leverage	
	mean	std. dev.	mean	std. dev.
Leverage (Debt-to-Capital)	0.211	0.120	0.562	0.146
Firm age	31.52	14.18	37.62	13.03
Book value of assets (\$, millions)	15,577	36,128	21,613	47,465
Market capitalization (\$, millions)	24,623	51,290	18,898	37,891
Real sales growth (% , YoY)	4.424	21.029	2.010	21.858
Price-to-cost margin	0.439	0.246	0.353	0.221
Receivables-minus-payables to sales	0.268	0.368	0.245	0.677
Depreciation to assets	0.012	0.007	0.011	0.006
Current assets to total assets	0.451	0.185	0.298	0.172

The table shows summary statistics for the firm-level controls. The sample is divided into firms below (“Low Leverage”) and firms above (“High Leverage”) the sample mean debt-to-capital ratio. All variables are measured quarterly at the firm level. Sample is non-financial firms in the S&P 500 between Jul-1991 and Dec-2017, excluding the financial crisis dates of Jul-2008 to Jul-2009.

Table A.2: Response of firm-level stock returns to monetary shocks w/ control interactions

	(1a)	(1b)
	Pre-Crisis	Post-Crisis
MP shock x Leverage	-3.665** (1.786)	1.001** (0.437)
MP shock x Current to total assets	13.676* (8.058)	-4.722 (4.593)
MP shock x Real sales growth	0.004 (0.044)	0.021 (0.064)
MP shock x Firm size	2.792 (1.769)	0.776 (1.668)
MP shock x Price-to-cost margin	5.369 (6.225)	2.314 (4.384)
MP shock x Rec-minus-Pay to sales	0.488 (1.040)	-1.669** (0.769)
MP shock x Depreciation-to-Assets	176.975 (177.487)	-62.448 (122.824)
MP shock x Firm age	-0.236 (0.181)	0.055 (0.050)
MP shock x Market capitalization	-2.217 (1.636)	-1.204 (2.068)
MP shock x 1st fiscal quarter	-3.209 (4.643)	2.206 (1.719)
MP shock x 2nd fiscal quarter	-0.595 (2.199)	-0.291 (2.362)
MP shock x 3rd fiscal quarter	1.993 (3.344)	-1.774 (2.794)
Observations	47,872	24,516
R-squared	0.184	0.343
Firm controls	yes	yes
Firm FE	yes	yes
Time FE	yes	yes

Results from estimating $s_{it} = \alpha_i + \alpha_t + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, α_t is an FOMC day fixed-effect, l_{it-1} is four-quarter moving average leverage normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of the baseline firm-level controls and firm's sector (and their interactions with the MP shock). The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Pre-crisis is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in S&P 500 on date of FOMC announcement. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.3: Response of firm-level stock returns to monetary shocks: Without a time fixed effect

	(1)	(2)	(3)
MP shock	6.943*		
	(3.912)		
Post-Crisis x MP shock	-0.829		
	(7.333)		
FFR shock		2.369	
		(1.990)	
10 yr shock		5.936***	
		(2.144)	
Post-Crisis x FFR shock		6.896	
		(10.656)	
Post-Crisis x 10 yr shock		-2.636	
		(4.593)	
2 yr shock			6.639***
			(2.243)
Post-Crisis x 2 yr shock			7.483
			(5.373)
Observations	76,599	76,599	76,599
R^2	0.021	0.027	0.038
Firm controls	yes	yes	yes
Firm FE	yes	yes	yes
Time FE	no	no	no

Results from estimating $s_{it} = \alpha_i + \beta\epsilon_t^m + \delta\epsilon_t^m D_t^{post} + \Gamma'Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, ϵ_t^m is the monetary policy shock, D_t^{post} is an indicator for the post-crisis period and Z_{it-1} is a vector of firm-level controls. The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Sample is Jul-1991 to Dec-2017 with post-crisis sample of Aug-2009 to Dec-2017. Sample is non-financial firms in S&P 500 on the date of FOMC announcement. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.4: Response of firm-level stock returns to monetary shocks (Pre. vs. Post 1SD leverage outliers removed)

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	Pre-Crisis	Post-Crisis	Pre-Crisis	Post-Crisis	Pre-Crisis	Post-Crisis
Leverage (Debt-to-Capital)	0.015 (0.047)	0.001 (0.051)	0.015 (0.048)	0.001 (0.052)	-0.022 (0.051)	-0.013 (0.052)
MP shock x Leverage	-5.709* (3.365)	4.428*** (1.010)				
FFR shock x Leverage			-2.170* (1.232)	0.462 (1.078)		
10 yr shock x Leverage			-0.683 (1.241)	2.855*** (0.658)		
2 yr shock x Leverage					-1.625 (0.999)	2.254*** (0.599)
Observations	22,731	13,699	22,731	13,699	22,731	13,699
R-squared	0.205	0.382	0.205	0.382	0.202	0.381
Firm controls	yes	yes	yes	yes	yes	yes
Firm FE	yes	yes	yes	yes	yes	yes
Time FE	yes	yes	yes	yes	yes	yes

Results from estimating $s_{it} = \alpha_i + \alpha_t + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, α_t is an FOMC day fixed-effect, l_{it-1} is four-quarter moving average leverage normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of firm-level controls. The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Pre-crisis is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in S&P 500 on date of FOMC announcement. We exclude 111 firms with a change in leverage from pre-crisis to post-crisis greater than 1 standard deviation and 485 firms without an observation in either the pre- or post-crisis sample. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.5: Robustness of baseline results to alternative measure of leverage: Debt-to-Assets

	(1a)	(1b)	(2)	(3)
	Firm Share Price		Expected Volatility	Investment
	Pre-Crisis	Post-Crisis	Pre & Post	Pre & Post
Leverage (Debt-to-Assets)	0.004 (0.034)	-0.009 (0.026)	-0.94** (0.412)	-5.59* (3.014)
MP shock x Leverage	-4.732* (2.850)	2.159*** (0.542)		-12.94*** (4.315)
D_t^{post} x Leverage			1.87*** (0.365)	1.97 (4.710)
D_t^{post} x MP shock x Leverage				25.26*** (6.701)
Observations	48,169	24,594	42,655	19,441
R^2	0.180	0.341	0.786	0.147
Firm controls	yes	yes	yes	yes
Firm FE	yes	yes	yes	yes
Time FE	yes	yes	yes	yes

Columns (1a) and (1b) are the results from estimating $s_{it} = \alpha_i + \alpha_t + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, α_t is an FOMC day fixed-effect, l_{it-1} is four-quarter moving average debt-to-assets normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of firm-level controls. Column (2) is the result from estimating $ivol_{i,t-1} = \alpha_i + \alpha_t + \delta l_{i,t} + \beta l_{i,t-1} D_t^{post} + \Gamma Z_{i,t-1} + e_{i,t}$. Column (3) is the result from estimating $\Delta \ln(y_{it}) = \alpha_i + \alpha_t + \sum_{n \in N} \beta_{1n} l_{i,t-n-1} \epsilon_{t-n}^m + \beta_{2n} l_{i,t-n-1} \epsilon_{t-n}^m D_{t-n}^{post} + \Gamma' Z_{i,t-1} + e_{it}$, where y_{it} is the value of firm i 's capital stock in quarter t . The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. The pre-crisis sample is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in S&P 500 on date of FOMC announcement. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.6: Robustness of baseline results to alternative measure of leverage: 1-quarter lagged debt-to-capital

	(1a)	(1b)	(2)	(3)
	Firm Share Price		Expected Volatility	Investment
	Pre-Crisis	Post-Crisis	Pre & Post	Pre & Post
Leverage (Debt-to-Capital)	0.014 (0.040)	0.012 (0.029)	-0.58 (0.385)	0.88* (0.483)
MP shock x Leverage	-4.990 (3.058)	2.127*** (0.599)		-3.78** (1.601)
D_t^{post} x Leverage			1.75*** (0.362)	-1.02 (0.656)
D_t^{post} x MP shock x Leverage				7.12** (2.804)
Observations	48,895	24,928	43,255	18,488
R^2	0.181	0.341	0.786	0.160
Firm controls	yes	yes	yes	yes
Firm FE	yes	yes	yes	yes
Time FE	yes	yes	yes	yes

Columns (1a) and (1b) are the results from estimating $s_{it} = \alpha_i + \alpha_t + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is the firm-level daily stock return, α_i is a firm fixed-effect, α_t is an FOMC day fixed-effect, l_{it-1} is one-quarter lagged leverage normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of firm-level controls. Column (2) is the result from estimating $ivol_{i,t-1} = \alpha_i + \alpha_t + \delta l_{i,t} + \beta l_{i,t-1} D_t^{post} + \Gamma Z_{i,t-1} + e_{i,t}$. Column (3) is the result from estimating $\Delta \ln(y_{it}) = \alpha_i + \alpha_j t + \sum_{n \in N} \beta_{1n} l_{i,t-n-1} \epsilon_{t-n}^m + \beta_{2n} l_{i,t-n-1} \epsilon_{t-n}^m D_{t-n}^{post} + \Gamma' Z_{i,t-1} + e_{it}$, where y_{it} is the value of firm i 's capital stock in quarter t . The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Pre-crisis is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in S&P 500 on date of FOMC announcement. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.7: Robustness of baseline results to time-sector FE

	(1a)	(1b)	(2)	(3)
	Firm Share Price		Expected Volatility	Investment
	Pre-Crisis	Post-Crisis	Pre & Post	Pre & Post
Leverage (Debt-to-Capital)	0.001	0.007	-0.58	-2.08*
	(0.037)	(0.027)	(0.408)	(1.114)
MP shock x Leverage	-4.628*	1.461***		-3.94**
	(2.762)	(0.549)		(1.718)
D_t^{post} x Leverage			1.90***	2.97
			(0.368)	(2.616)
D_t^{post} x MP shock x Leverage				7.02**
				(3.212)
Observations	47,737	24,450	42,468	19,323
R^2	0.225	0.401	0.810	0.181
Firm controls	yes	yes	yes	yes
Firm FE	yes	yes	yes	yes
Time-Sector FE	yes	yes	yes	yes

Columns (1a) and (1b) are the results from estimating $s_{it} = \alpha_i + \alpha_{jt} + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, α_{jt} is a sector j by FOMC day fixed-effect, l_{it-1} is four-quarter moving average leverage normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of firm-level controls. Column (2) is the result from estimating $ivol_{i,t-1} = \alpha_i + \alpha_{jt} + \delta l_{i,t} + \beta l_{i,t-1} D_t^{post} + \Gamma Z_{i,t-1} + e_{i,t}$. Column (3) is the result from estimating $\Delta \ln(y_{it}) = \alpha_i + \alpha_{jt} + \sum_{n \in N} \beta_{1n} l_{i,t-n-1} \epsilon_{t-n}^m + \beta_{2n} l_{i,t-n-1} \epsilon_{t-n}^m D_{t-n}^{post} + \Gamma' Z_{i,t-1} + e_{it}$, where y_{it} is the value of firm i 's capital stock in quarter t . The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Pre-crisis is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in S&P 500 on date of FOMC announcement. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.8: Robustness of baseline results to full CRSP/Compustat sample: No firm entry/exit

	(1a)	(1b)	(2)
	Firm Share Price		Investment
	Pre-Crisis	Post-Crisis	Pre & Post
Leverage (Debt-to-Capital)	-0.004	0.046	-1.06***
	(0.038)	(0.054)	(0.258)
MP shock x Leverage	-2.336**	1.905**	-1.66
	(1.071)	(0.825)	(1.034)
D_t^{post} x Leverage			-0.25
			(0.390)
D_t^{post} x MP shock x Leverage			3.23*
			(1.747)
Observations	75,545	38,324	78,665
R^2	0.081	0.232	0.087
Firm controls	yes	yes	yes
Firm FE	yes	yes	yes
Time FE	yes	yes	yes

Columns (1a) and (1b) are the results from estimating $s_{it} = \alpha_i + \alpha_t + \beta l_{it-1} \epsilon_t^m + \delta l_{it-1} + \Gamma' Z_{it-1} + e_{it}$, where s_{it} is firm-level daily stock return, α_i is a firm fixed-effect, α_t is an FOMC day fixed-effect, l_{it-1} is four-quarter moving average leverage normalized to have mean 0 and variance 1, ϵ_t^m is the monetary policy shock and Z_{it-1} is a vector of firm-level controls. Column (2) is the result from estimating $\Delta \ln(y_{it}) = \alpha_i + \alpha_j t + \sum_{n \in N} \beta_{1n} l_{i,t-n-1} \epsilon_{t-n}^m + \beta_{2n} l_{i,t-n-1} \epsilon_{t-n}^m D_{t-n}^{post} + \Gamma' Z_{i,t-1} + e_{it}$, where y_{it} is the value of firm i 's capital stock in quarter t . The monetary policy shock is normalized to have a unit effect on the 2 year yield and a positive value represents an expansionary shock. Pre-crisis is Jul-1991 to Jun-2008 (153 obs.) and post-crisis is Aug-2009 to Dec-2017 (68 obs.). Sample is non-financial firms in the CRSP/Compustat sample for the entire sample period. Two-way clustered standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$