The Role of Equity Financing Constraints in the Transmission of Monetary Policy

Heitor Almeida Timothy Johnson Sebastiao Oliveira Yucheng Zhou

University of Illinois at Urbana-Champaign

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Motivation

- Literature has found monetary policy impacts real economy in various ways
  - Key finding: constrationary shocks lead to $\downarrow$ investment at aggregate and firm level
- Financial accelerator is a potential channel
  - Firms foregoes positive NPV projects due to lack of financing
- MP $\rightarrow$ interest rate $\rightarrow$ cost of capital $\rightarrow$ constraint binding $\rightarrow$ investment
  - Financial constraint could amplify the impact of monetary policy
- Literature has focused on debt-related constraints (*"debt channel"*): leverage, age/size (collateral value), debt maturity (refinancing constraints)
  - Leverage is found to dampen the response of investment to MP in *Ottonello and Winberry (2020)*, but neutral in *Cao et al. (2023)*
  - Ozdagli (2017) finds that leverage is amplifying the response of stock prices to MP

Motivation

- It is not clear about firms relying on equity financing
  - Financial constrained firms might turn to equity financing for liquidity needs
- *Beyhaghi et. al. (2024)* show firms could issue equity to alleviate negative impact of contractionary shocks
- What if these firms have difficulty in raising equity?
  - They could be more sensitive as MP could also affect the cost of equity
- They rely on equity financing on the margin, changes in the cost of equity may be an important mechanism
  - Monetary policy may not transmit only through its impact on debt financing terms

This Paper

- What is the role of equity financing constraints in the transmission of monetary policy to the corporate sector?

- Distinguish between financial constraint on equity (*FCE*) or debt (*FCD*) financing

- A comprehensive analysis of the heterogeneous responses to MP
  - Stock price, investment policies, innovation output, and financing policies
  - Estimation of sensitivity are isolated from the Fed "information effect"

$\Rightarrow$ *Equity channel* of monetary policy transmission
  - Monetary policy could transmit through its impact on equity financing terms

Main Results

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- Firms with high *FCE* show a much larger decrease than unconstrained firms do
  - *FCE* significantly amplifies responses to MP (*equity channel*)
- Equity channel is dominant in the heterogeneous transmission of monetary policy
  - It prevails after controlling for the "debt channel" and other debt-related characteristics
  - *FCD* magnifies with a much smaller economic magnitude

Main Results

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- Equity channel is dominant in the heterogeneous transmission of monetary policy
  - It prevails after controlling for the "debt channel" and other debt-related characteristics
  - *FCD* magnifies with a much smaller economic magnitude
- Equity channel is supported by financing/issuance policies
  - Firms with high *FCE* issue much less equity after contractionary shocks

Literature Review

- Monetary policy transmission to investment
  - *Bernanke et. al. (1999)*, *Fazzari et. al. (1988)*, *Gertler and Gilchrist (1994)*, *Ippolito et. al. (2018)*, *Ottonello and Winberry (2020)*, *Jeenas (2019)*, *Lakdawala et. al. (2021)*, *Durante et al. (2022)*, *Cao et. al. (2023)*, *Cloyne et al. (2023)* ...
  - Equity channel matters more, and it plays a potentially critical role for the long-term growth due to its impact on R&D and innovation

- The effect of monetary policy on stock market
  - *Bernanke and Kuttner (2005)*, *Lamont et al. (2001)*, *Ozdagli (2017)*, *Chava and Hsu (2020)*, *Bianchi et al. (2022)*, *Pflueger and Rinaldi (2022)*, *Kekre and Lenel (2022)*, *Bauer and Swanson (2023)* ...
  - Financing constraints and capital structure affect stock price sensitivity to MP, consistent with the financial accelerator mechanism

- The role of equity in the transmission of monetary policy
  - *Beyhaghi et. al. (2024)*, *Jeenas and Lagos (2024)*
  - Constraint in accessing equity financing has an amplification effect to MP

Data

Firm-level Data

- Text-based measure of financial constraint
- COMPUSTAT Quarterly: Balance sheet information
- CRSP Daily: Stock return
- SDC Platinum: SEO issuance
- USPTO: Patent filings
- Sample period: 1991-2019

▸ summary statistics

Financial Constraint Measure

- A firm is considered equity-focused constrained if it mentions in 10-K that
  - its investments/projects get *"abandon"*,*"curtail"*, or *"postpone"* etc.
  - AND it intends to issue *"equity"* financing for liquidity needs ▸ example

- Debt-focused constraint is defined in a similar way but the firm attempts to issue *"debt"* financing

- Each firm-year is given a continuous score on each dimension, constructed from similarity of the text in each firm's 10-K with firms identified as constrained
  - Constructed by *Hoberg and Maksimovic (2015)*, extended by *Linn and Weagley (2023)*
  - LW2023 also show this measure can better capture financial constraint behavior, than traditional accounting measures

Financial Constraint Measure

- *FCE* and *FCD* denote equity-focused and debt-focused constraint, respectively
- We sort firms into terciles each year on each dimension, end up with 9 groups
- Focus on these two
  - FCE firms: firms that are in the top tercile of *FCE* and in the bottom tercile of *FCD*
  - FCD firms: firms that are in the top tercile of *FCD* and in the bottom tercile of *FCE*
- To to isolate the effect of *FCE* and control for the other dimension *FCD*

▸ comparison

Summary Statistics by Groups

	Equity-Focused Constrained Firms			Debt-Focused Constrained Firms			Unconstrained Firms		
	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
CAPX/Assets	65,934	0.028	0.057	58,472	0.015	0.022	30,056	0.014	0.022
R&D/Assets	32,598	0.044	0.064	20,948	0.007	0.013	15,902	0.018	0.022
Size	65,934	4.948	1.857	58,472	5.917	1.518	30,056	6.183	1.930
Q	62,688	2.607	3.442	54,304	1.414	0.794	27,855	2.074	1.498
Duration	21,311	92.41	106.1	36,725	51.79	52.91	21,816	49.08	43.09
Age	65,934	9.474	8.441	58,472	17.40	11.84	30,056	20.77	12.49
Book Leverage	63,887	0.149	0.269	56,860	0.306	0.205	29,000	0.146	0.178
Cash holdings	65,742	0.294	0.242	58,099	0.056	0.080	30,023	0.196	0.164

Identification of Monetary Policy Shocks

- We employ a high frequency identification (HFI) strategy to construct *mps*
  - Following *Gürkaynak, Sack, and Swanson (2005)* and *Bernanke and Kuttner (2005)*
- The price change of Fed Funds Rate futures contracts in the 30-minute window around the FOMC announcement
  - It captures market-based unexpected changes in the Federal funds rate
- Identifying assumption: this narrow window contains no other information that may affect the interest rate expectations

Separate “Pure” Monetary Policy Shocks

- Fed “Information effect”: an unexpected monetary tightening might be interpreted as a signal of a strong economy

- Follow *Jarocinski and Karadi (2020)* to separate the “pure” *mps* ▸ figure and sum stats

- Conceptually simple exercise
  - “Pure” *mps*: leads to negative comovement between stock price and interest rate expectations
  - “Information” shock: leads to positive comovement between stock price and interest rate expectations

Methodology and Results

Stock Price Response

$$r_{ij,t} = \alpha + \beta mps_t + \gamma I_{ij,t} + \delta[mps_t \times I_{ij,t}] + Controls_{ij,t} + FE_{j,y} + e_{ij,t}$$

- $r_{ij,t}$: daily stock returns of firm i in industry j on day of FOMC announcement t
- mps_t: standardized "pure" monetary policy shock
- $I_{ij,t}$: 1 if in the group of (lagged) *FCE*, 0 otherwise
  - Other groups are included in the regression, except for unconstrained group
- δ: response to *mps* (standardized) of *FCE* firms relative to unconstrained firms
- Controls: size, book-to-market, leverage, profitability, cash holding, and their interactions with *mps*, industry-year FE
- Return window: (0, 0), (+1, +1), (+2, +2), (0, +1), (0, +2), (0, +5) ▸ average response

Heterogeneous Stock Price Response

Window:	(0,0) (1)	(+1,+1) (2)	(+2,+2) (3)
mps × *equity_focused*	-0.179***	-0.026	-0.119***
	(0.039)	(0.041)	(0.038)
mps × *debt_focused*	-0.110***	0.035	-0.102***
	(0.032)	(0.033)	(0.030)
Observations	844,031	795,949	728,257
R^2	0.020	0.016	0.015
Industry-year FE	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes

- One unit of shock (6bps) leads to 17.9bps lower return for *FCE* firms relative to unconstrained firms
- 11bps lower return for *FCD* firms on the day of FOMC

Equity Channel Amplifies Stock Price Response

Cumulative Window:	(0,+1) (1)	(0,+2) (2)	(0,+5) (3)
mps × *equity_focused*	-0.201***	-0.292***	-0.481***
	(0.055)	(0.063)	(0.081)
mps × *debt_focused*	-0.077*	-0.183***	-0.153**
	(0.043)	(0.048)	(0.062)
Observations	843,764	843,501	842,718
R^2	0.025	0.023	0.030
Industry-year FE	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes

- One unit of shock (6bps) leads to 48.1bps lower return for *FCE* firms relative to unconstrained firms
- 15.3bps lower return for *FCD* firms in the 5-day cumulative window
- For comparison, average stock price response in the 5-day window is 1.05%

Investment Policy

- Instrumental variable local projection for impulse response functions
  - 1-year Treasury rate instrumented by *mps*, controlling for macroeconomic variables (*Dottling and Ratnovski, 2023*) ▸ first stage

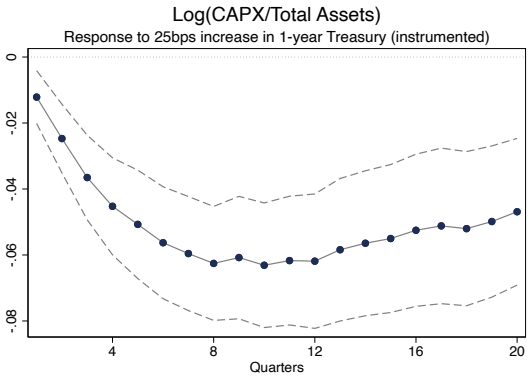
- The instrumented 1-year Treasury rate ($\hat{yt}$) represents the monetary policy stance which firms make decisions on ▸ figure
  - Because the adjustment of investment policy is slow-moving, with long and uncertain lags, and measured at quarterly frequency
  - The economy was in ZLB for a long time (*Gertler and Karadi, 2015*)

Investment Policy

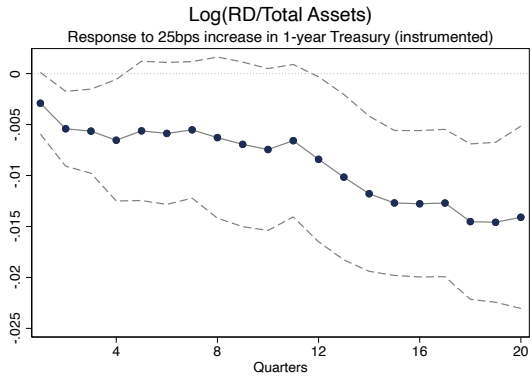
$$
\begin{aligned}
y_{ij,t+h} - y_{ij,t-1} = {} & \beta_1^h \, FCE_{ij,t-1} + \beta_2^h \, FCD_{ij,t-1} \\
& + \beta_3^h \, FCE_{ij,t-1} \times \hat{yt}_t + \beta_4^h \, FCD_{ij,t-1} \times \hat{yt}_t \\
& + \gamma_1^{h'} \, Z_{ij,t-1} \times \hat{yt}_t + \gamma_2^{h'} \, Z_{ij,t-1} + \alpha_i + \eta_{jt} + \mu_{fq} + \epsilon_{ij,t}
\end{aligned}
$$

- $y_{ij,t+h}$: CAPX or R&D in logs at h quarters after the *mps* at time t for firm i in industry j
- $\hat{yt}$: instrumented 1-year Treasury rate
- β_3^h and β_4^h: the heterogeneous impulse response to *mps*
- Firm level controls and their interactions with $\hat{yt}$, firm FE, fiscal quarter FE, and industry-time FE

Average Response: CAPX and R&D



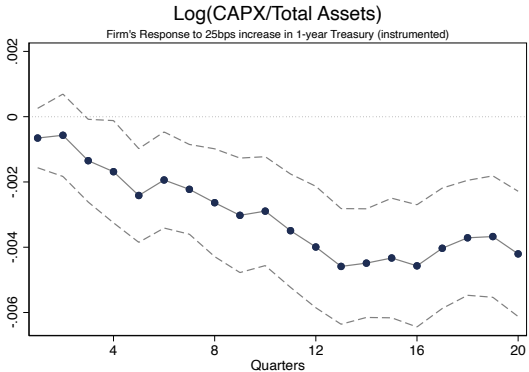
CAPX



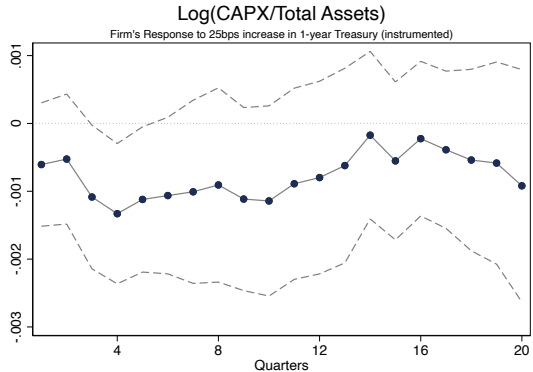
R&D

- 25bps higher rate leads to ↓ CAPX by 5.2% and R&D by 1.3% over 3-5 years

FCE Amplifies Response of CAPX



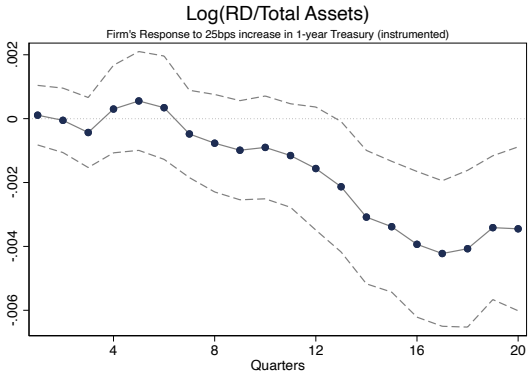
FCE



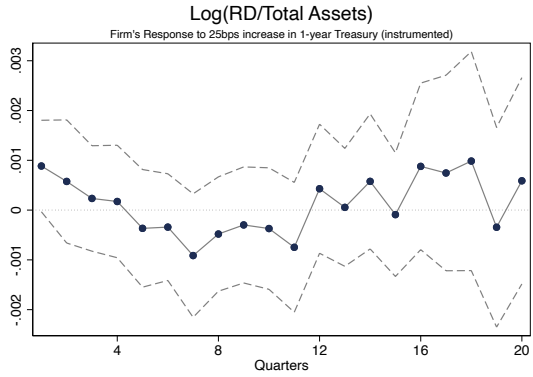
FCD

- One s.d. increase in *FCE*: 5% amplification relative to the average response
- One s.d. increase in *FCD*: 1.5% amplification relative to the average response

FCE Amplifies Response of R&D



FCE



FCD

- One s.d. increase in *FCE*: 17% amplification relative to the average response
- No amplification effect of *FCD* on R&D ▸ robustness

Impact Translated into Patents

	Log(Number of Patents Filed)	
	$h = 17$	$h = 20$
$mps \times FCE$	-0.011*	-0.017***
	(0.006)	(0.006)
$mps \times FCD$	-0.003	-0.004
	(0.007)	(0.007)
Observations	39,634	36,079
Firm Controls	Yes	Yes
Firm FE	Yes	Yes
Fiscal Quarter FE	Yes	Yes
Industry $\times$ Time	Yes	Yes

- One s.d. increase in *FCE*: 9.3% amplification relative to the average response
- No amplification effect of *FCD* on patents

Impact Translated into Patents

	Log(Number of Patents Filed)	
	$h = 17$	$h = 20$
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	(0.006)	(0.006)
$mps \times FCD$	-0.003	-0.004
	(0.007)	(0.007)
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Firm Controls	Yes	Yes
Firm FE	Yes	Yes
Fiscal Quarter FE	Yes	Yes
Industry $\times$ Time	Yes	Yes

- Equity channel is potentially important for long-term growth

Financing Decisions

- If the equity channel is quantitatively important, *FCE* firms might issue less equity after contractionary shocks

$$\Delta y_{ij,t} = \beta_1 \times \hat{yt}_t + \beta_2 \times I_{ij,t} + \beta_3 \times I_{ij,t} \times \hat{yt}_t + \gamma_1 \times Z_{ij,t-1} + \gamma_2 \times X_{t-1} + \alpha_i + \mu_{fq} + \lambda_{q,j} + \epsilon_{it}$$

- $y_{ij,t}$: equity, public SEO, and debt issuance scaled by assets at time t for firm i in industry j
- $\hat{yt}$: instrumented 1-year Treasury rate
- $I_{ij,t}$: 1 if in the group of (lagged) *FCE*, 0 otherwise
  - Other groups are included in the regression, except for unconstrained group
- β_3 captures the heterogeneous response to *mps* relative to unconstrained firms
- Firm level controls and their interactions with $\hat{yt}$, firm FE, fiscal quarter FE, and industry-time FE

Financing Decisions Support the Equity Channel

	Equity issuance (1)	Public SEO issuance (2)	Debt issuance (3)
mps	-0.0024***	-0.001*	-0.0002
	(0.0005)	(0.0006)	(0.0004)
mps × *equity_focused*	-0.0023***	-0.002***	-0.001**
	(0.0007)	(0.0007)	(0.0004)
mps × *debt_focused*	0.0002	-0.000	0.0003
	(0.0004)	(0.0004)	(0.0004)
Observations	306,279	314,614	293,471
R^2	0.038	0.013	0.014
Firm Controls	Yes	Yes	Yes
Aggregate Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes
Quarter × Sector FE	Yes	Yes	Yes

- After a 25bps contractionary shock, *FCE* firms issue less equity, of which the magnitude is 6.9% of average
- Measured by SEO issuance, the magnitude is 10% of average

Financing Decisions Support the Equity Channel

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	(0.0005)	(0.0006)	(0.0004)
mps × *equity_focused*	-0.0023***	-0.002***	-0.001**
	(0.0007)	(0.0007)	(0.0004)
mps × *debt_focused*	0.0002	-0.000	0.0003
	(0.0004)	(0.0004)	(0.0004)
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Firm Controls	Yes	Yes	Yes
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Fiscal Quarter FE	Yes	Yes	Yes
Quarter × Sector FE	Yes	Yes	Yes

- The drop in debt issuance for *FCE* firms is 0.9% of average

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Firm Controls	Yes	Yes	Yes
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Fiscal Quarter FE	Yes	Yes	Yes
Quarter × Sector FE	Yes	Yes	Yes

- We do not see significant heterogeneous response among *FCD* firms

What Happens to Cash Holding

	Δ Cash	
mps	-0.0029***	-0.0029***
	(0.0003)	(0.0004)
mps × *equity_focused*		0.0014**
		(0.0006)
mps × *debt_focused*		-0.0002
		(0.0003)
Observations	316,593	316,593
R^2	0.0783	0.0797
Firm Controls	Yes	Yes
Aggregate Controls	Yes	Yes
Firm FE	Yes	Yes
Fiscal Quarter FE	Yes	Yes
Quarter × Sector FE	Yes	Yes

- Contractionary shocks lead to ↓ cash holdings
- *FCE* firms are reluctant to run down cash holding (precautionary), likely due to increased difficulty in raising new equity to replenish cash (*McLean, 2011*)
- Help explain why *FCE* firms cut real investments by more than other firms

Rule Out Debt Channel

- *FCE* firms issue less debt after a contractionary shock, albeit to a lesser extent
- Potential oncern: transmission could still operate through the debt channel
- How do we rule out
  - Estimate the impact of financing shocks on investment policies
  - Aggregate level financing shocks in equity (*EIS*) and debt (*DIS*) markets from *Belo et. al. 2024* ▸ financing shock
  - Interaction of these shocks with *FCE* and *FCD* firms
- If investment policies of *FCE* firms mainly react to *EIS* NOT *DIS*
  - It is unlikely MP affects *FCE* firms' investment decisions via the debt channel

Rule Out Debt Channel

$$y_{ij,t+h} - y_{ij,t-1} = \beta_1^h \, FCE_{ij,t-1} + \beta_2^h \, FCE_{ij,t-1} \times EIS_t + \beta_3^h \, FCE_{ij,t-1} \times DIS_t + \gamma_1^{h'} \, Z_{ij,t-1} \times EIS_t + \gamma_2^{h'} \, Z_{ij,t-1} \times DIS_t + \gamma_3^{h'} \, Z_{ij,t-1} + \alpha_i + \eta_{jt} + \epsilon_{ij,t}$$

- $y_{ij,t+h}$: CAPX or R&D in logs at h quarters after the *EIS* or *DIS* at time t for firm i in industry j
- *EIS* and *DIS*: aggregate level financing shocks in equity and debt markets
- $\beta_2^h (> 0)$ and $\beta_3^h (\approx 0)$: relative impulse response of *FCE* to *EIS* and *DIS*
  - *FCD* and its interactions with *EIS* and *DIS* are also included in the regression
- Firm level controls and their interactions with $\hat{y}t$, as well as firm, fiscal quarter, and industry-time FE

Rule Out Debt Channel

	$h = 4$		$h = 5$	
	CAPX	R&D	CAPX	R&D
EIS $\times$ *FCE*	0.011***	0.006*	0.007**	0.005*
	(0.004)	(0.003)	(0.003)	(0.002)
DIS $\times$ *FCE*	0.001	0.001	-0.0001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.4385	0.4580	0.4589	0.4967
Observations	50,581	18,911	44,707	16,657
Firm Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Industry $\times$ Time	Yes	Yes	Yes	Yes

- Shocks in equity market affect the investment of *FCE* firms
- The impact of debt market shocks is not significant $\longrightarrow$ unlikely transmission of monetary policy operates through the debt channel

Conclusion

Conclusion

- We provide new evidence that equity channel is quantitatively important in the heterogeneous transmission of monetary policy

- After a contractionary monetary policy shock, equity-focused constrained firms
  - Decrease significantly more CAPX and R&D than unconstrained firms do
  - Such decrease in investment is translated into innovation output
  - It is also reflected in stock price responses

- The equity channel is supported by the financing policies
  - These firms cut equity issuance by a significant magnitude and are reluctant to run down cash holdings

- The findings hold robustly after accounting for debt-focused constraint and other debt-related firm attributes

Appendix

Example: AMERIGON INC

- *…Should the Company not achieve profitability in the near future from the two abovementioned products, additional **equity financing** would be required. If additional funds are not obtained when needed, the Company will be required to significantly **curtail** its development activities, dispose of one or more of its technologies and/or cease operations and liquidate …*

▸ Back

Correlation

	FCE	*FCD*	KZ index	WW index	Size
FCD	-0.14				
KZ index	-0.10	0.19			
WW index	0.14	-0.16	-0.01		
Size	-0.09	0.174	0.08	-0.90	
Log age	-0.18	0.06	0.07	-0.29	0.36

▸ Back

Summary Statistics

	Obs	Mean	Std. Dev.
CAPX/Assets	451,559	0.021	0.043
R&D/Assets	178,272	0.020	0.038
Cash Flow	429,404	0.024	0.053
Cash holdings	468,193	0.139	0.176
Size	471,315	6.038	1.952
Q	395,554	1.892	2.154
Duration	210,848	62.24	67.64
Age	471,315	14.63	11.86
Dividend	471,315	0.086	0.281
FCE	401,639	-0.138	0.572
FCD	401,639	0.173	0.616
Book Leverage	452,275	0.272	0.286
Long-term Leverage	467,572	0.227	0.258
Long-term Debt/Assets	448,026	0.229	0.273
Short-term Debt/Assets	435,038	0.054	0.135
Maturity	393,388	0.743	0.314
RFC	386,617	0.032	0.129
Public SEO issuance/ Assets	386,256	0.0075	0.113
Debt issuance/ Assets	364,683	0.0342	0.135
Equity issuance/ Assets	377,086	0.0172	0.131
Repurchase/ Assets	360,848	0.0041	0.022

▸ Back

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R&D/Assets	32,598	0.044	0.064	15,902	0.018	0.022
Cash Flow	61,861	-0.011	0.085	28,219	0.038	0.035
Cash holdings	65,742	0.294	0.242	30,023	0.196	0.164
Size	65,934	4.948	1.857	30,056	6.183	1.930
Q	62,688	2.607	3.442	27,855	2.074	1.498
Duration	21,311	92.41	106.1	21,816	49.08	43.09
Age	65,934	9.474	8.441	30,056	20.77	12.49
Dividend	65,934	0.062	0.242	30,056	0.047	0.213
FCE	64,697	0.560	0.498	29,696	-0.681	0.290
FCD	64,697	-0.453	0.322	29,696	-0.442	0.395
Book Leverage	63,887	0.149	0.269	29,000	0.146	0.178
Long-term Leverage	65,475	0.118	0.219	29,743	0.122	0.167
Long-term Debt/Assets	65,475	0.118	0.232	29,743	0.123	0.177
Short-term Debt/Assets	64,053	0.040	0.162	29,146	0.028	0.060
Maturity	42,230	0.645	0.355	22,314	0.714	0.319
RFC	39,141	0.053	0.179	21,435	0.035	0.127

Summary Statistics

	Debt-Focused Constrained Firms			Unconstrained Firms		
	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
CAPX/Assets	58,472	0.015	0.022	30,056	0.014	0.022
R&D/Assets	20,948	0.007	0.013	15,902	0.018	0.022
Cash Flow	55,341	0.032	0.029	28,219	0.038	0.035
Cash holdings	58,099	0.056	0.080	30,023	0.196	0.164
Size	58,472	5.917	1.518	30,056	6.183	1.930
Q	54,304	1.414	0.794	27,855	2.074	1.498
Duration	36,725	51.79	52.91	21,816	49.08	43.09
Age	58,472	17.40	11.84	30,056	20.77	12.49
Dividend	58,472	0.056	0.231	30,056	0.047	0.213
FCE	57,639	-0.689	0.294	29,696	-0.681	0.290
FCD	57,639	0.857	0.457	29,696	-0.442	0.395
Book Leverage	56,860	0.306	0.205	29,000	0.146	0.178
Long-term Leverage	58,243	0.254	0.202	29,743	0.122	0.167
Long-term Debt/Assets	58,243	0.255	0.212	29,743	0.123	0.177
Short-term Debt/Assets	56,974	0.059	0.102	29,146	0.028	0.060
Maturity	54,806	0.773	0.295	22,314	0.714	0.319
RFC	54,318	0.024	0.103	21,435	0.035	0.127

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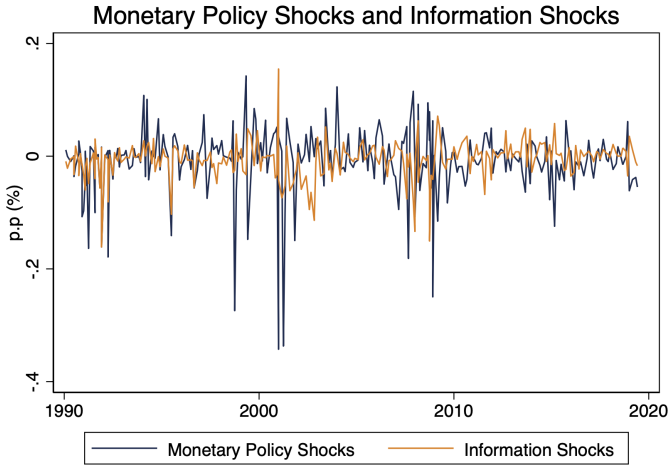
Separate “Pure” Monetary Policy Shocks



Summary Statistics for Shocks

	N	Mean	SD	Min	P25	Median	P75	Max
Monetary Policy Shock	261	-0.01	0.06	-0.34	-0.03	0.00	0.02	0.14
Information Shock	261	-0.01	0.03	-0.16	-0.02	0.00	0.01	0.15

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Average Response: Stock Price

Window:	(0,0) (1)	(+1,+1) (2)	(0,+1) (3)	(0,+2) (4)	(0,+5) (5)
mps	-0.514***	-0.272***	-0.787***	-0.770***	-1.05***
	(0.009)	(0.009)	(0.013)	(0.014)	(0.018)
Controls	Yes	Yes	Yes	Yes	Yes
Fixed-effects					
sic3-year	Yes	Yes	Yes	Yes	Yes
Fit statistics					
Observations	905,306	853,799	905,017	904,738	903,908
R^2	0.019	0.015	0.024	0.023	0.029

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First Stage Results

	1_{yt}
JK shock	3.37***
	(0.62)
Log CPI	16.0***
	(3.70)
Log Industrial Production	-9.75***
	(2.77)
Log Employment Ratio	54.5***
	(7.77)
Excess Bond Premium	-0.52***
	(0.18)
GDP Growth	26.5*
	(15.0)
Observations	112
F stat all	162
F stat IV	29.2

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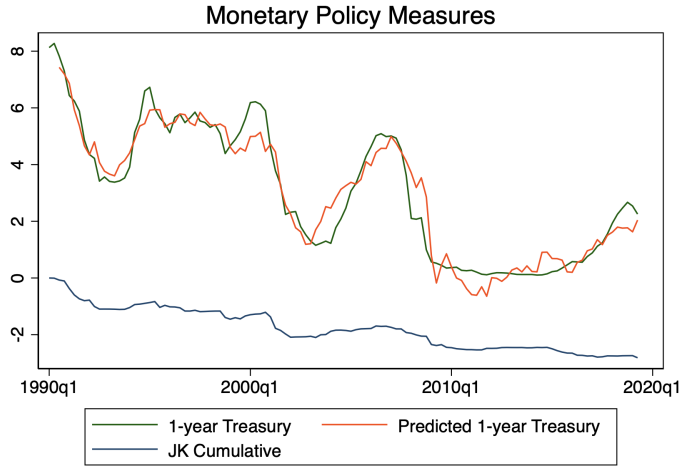
Instrumented Treasury Rate



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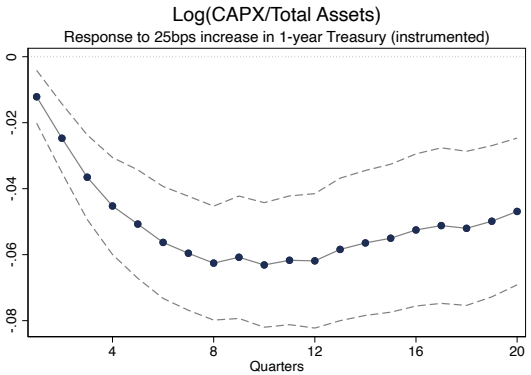
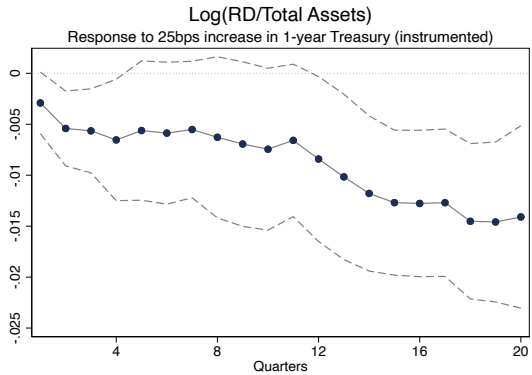
Average Response: CAPX and R&D



CAPX



R&D

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Robustness

- The equity channel is also robust to controlling for
  - Duration: firms with longer duration of cash flow might be more sensitive to monetary policy shocks ▸ duration
  - Refinancing constraints: refi-constraints might attenuate the equity channel ▸ refinancing
  - Cyclicality: the results could be driven by the business cycle
  - Information effect: *Hsu et. al. 2023* show that information effect also impacts firm investment
  - Alternative monetary policy shocks: *Bauer and Swanson (2023)* ▸ Bauer and Swanson (2023)

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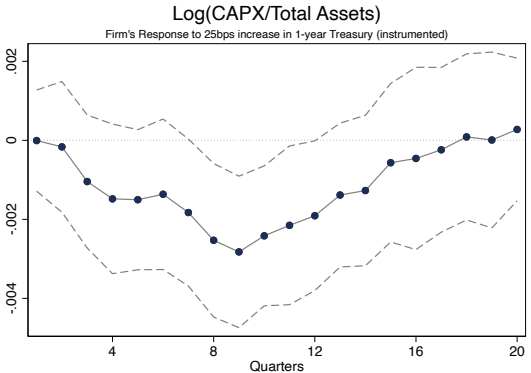
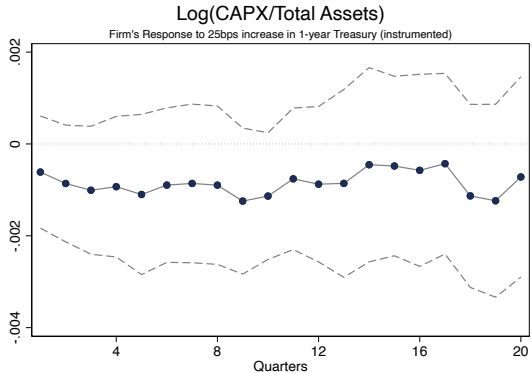
Robustness: CAPX, Controlling for Duration

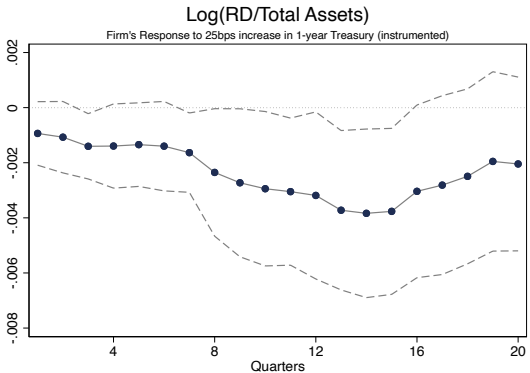


FCE



FCD

Robustness: R&D, Controlling for Duration



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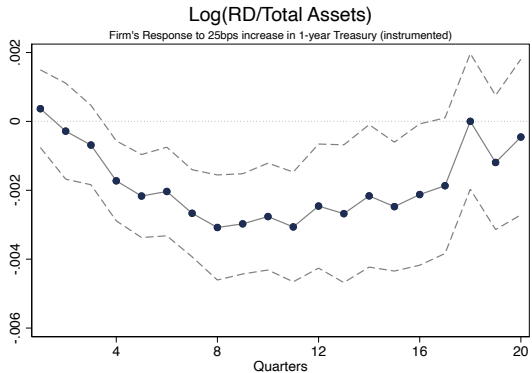

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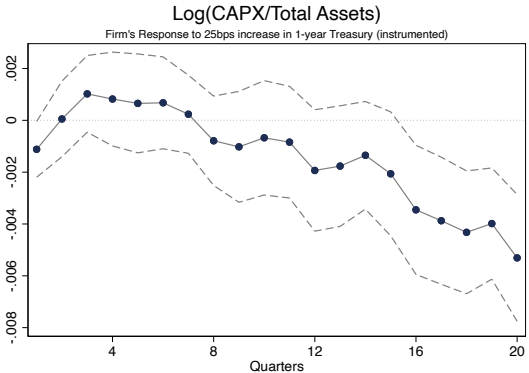
Robustness: CAPX, Controlling for Refinancing Constraints



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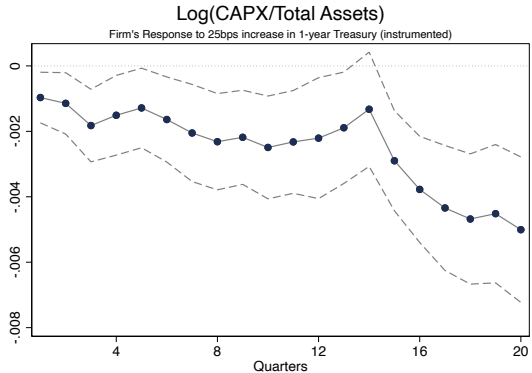

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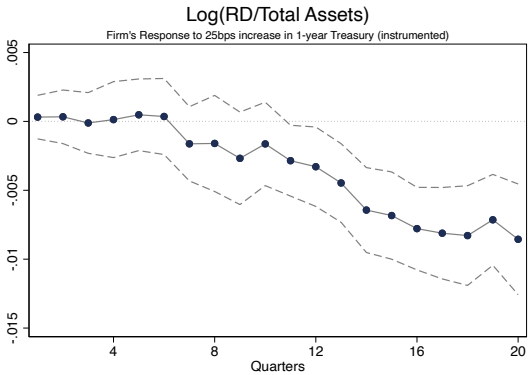
Robustness: R&D, Controlling for Refinancing Constraints



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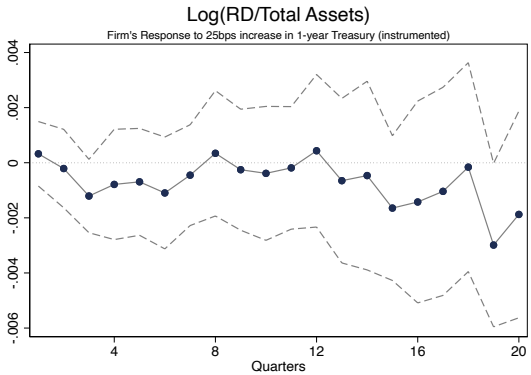

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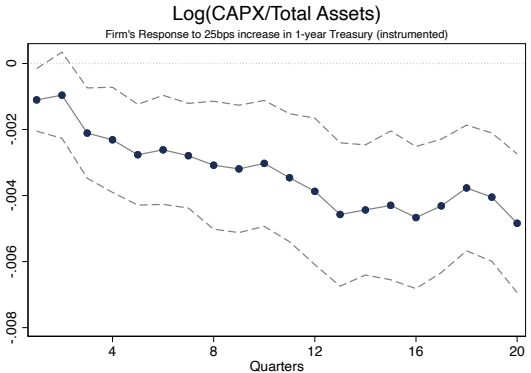
Robustness: Bauer and Swanson (2023) Shocks



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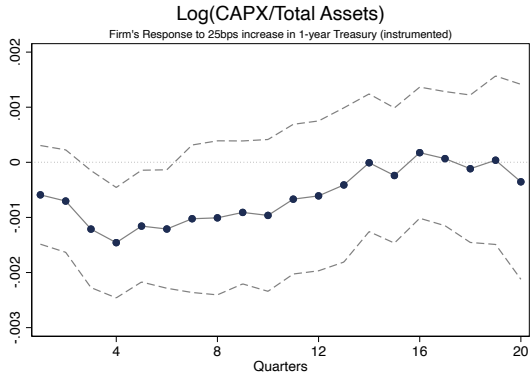

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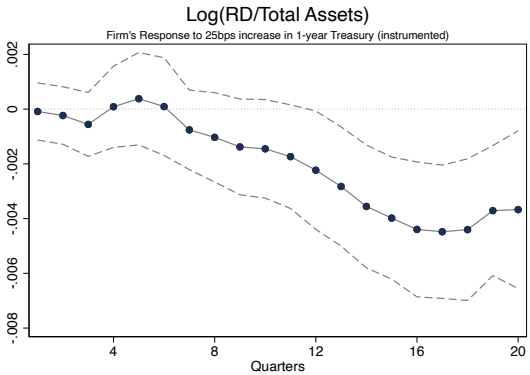
Robustness: Bauer and Swanson (2023) Shocks



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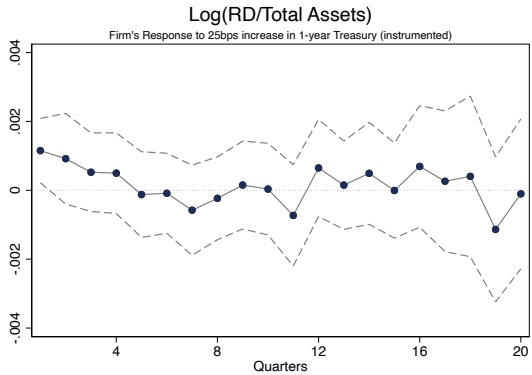

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Financing Shock from *Belo et. al. (2024)*

- Using micro moments, *Belo et. al. (2024)* measure the aggregate shocks to firms' equity and debt issuances as the unexpected change in the fractions of firms issuing equity and debt in the cross-section, after accounting for standard observable proxies that influence firm's issuance activity

- They model these fractions as autoregressive processes and include several aggregate variables to control for investment opportunities, and costs of equity and debt financing, thus capturing the expected normal variation in issuance activity

- The Equity Issuance Shocks (EIS) and Debt Issuance Shocks (DIS) are the residuals from these regressions

- That way, there are two financial shocks from the time series variation in the fractions of firms issuing equity and debt in the cross-section of U.S. publicly traded firms

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