

Pulling and Pushing Distressed Firms With a String: The Asymmetric Effects of Monetary Policy

Ander Perez-Orive ¹ Yannick Timmer¹

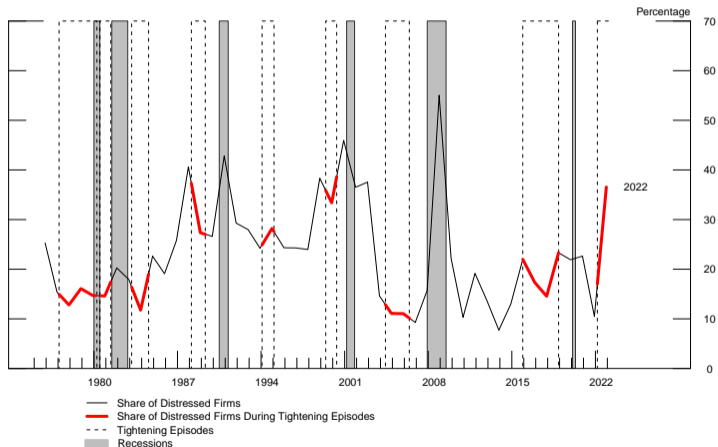
¹Federal Reserve Board

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Motivation (I): MP Tightening and Firms in Distress

- ▶ Stance of U.S. monetary policy has **tightened significantly** since March 2022
- ▶ High share of firms in **financial distress** compared to previous tightening episodes



Motivation (II): Asymmetric Effects of MP

- ▶ Macro-econometric literature: **tightening monetary policy shocks have larger effects** on economic activity than loosening shocks
 - ▶ Angrist et al. (2018); Barnichon et al. (2017, 2022); Debortoli et al. (2020); Jordà et al. (2020); Tenreyro and Thwaites (2016)
 - ▶ Based on macro data
- ▶ Some papers discuss potential channels informally (downward nominal wage rigidity, financial factors,....) but no empirical evidence

Research Questions

- ▶ **Asymmetry** in strength of effects of tightening and easing shocks on investment and employment?
 - ▶ *Yes: tightening transmits more strongly into investment and employment than easing*
 - ▶ **Heterogeneous response** of distressed vs healthy firms to contractionary and expansionary shocks?
 - ▶ *Yes, firm distress strengthens the transmission of monetary policy, but only for contractionary shocks*
 - ▶ Evidence of a **financial mechanism** to explain this asymmetry?
 - ▶ *Yes: credit constraints and external financing worsen following contractionary policy when firms are in distress, but barely respond for healthy firms or after easing shocks*
- ⇒ **Significant response only for distressed firms during contractionary shocks**

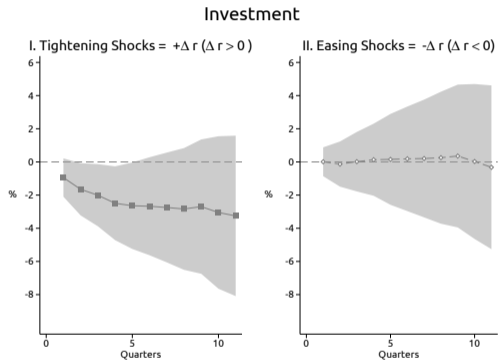
Literature

- ▶ Firm financial heterogeneity in the transmission of monetary policy
 - ▶ Cloyne et al. (2023); Gertler and Gilchrist (1994); Ottonello and Winberry (2020)
 - ▶ Financial factors matter significantly for transmission
 - ▶ Disagreement about the sign of effects
 - ▶ Empirical models are linear: no asymmetry in transmission
- ▶ Macro literature on the asymmetric transmission of monetary policy
 - ▶ Angrist et al. (2018); Barnichon et al. (2017, 2022); Debortoli et al. (2020); Jordà et al. (2020); Tenreyro and Thwaites (2016)
 - ▶ Monetary tightening has strong effects on economic activity
 - ▶ Monetary accommodation generates substantially less pronounced responses
 - ▶ Literature does not address financial channels behind asymmetry
- ▶ We combine the two literatures and reconcile some conflicting evidence

Data

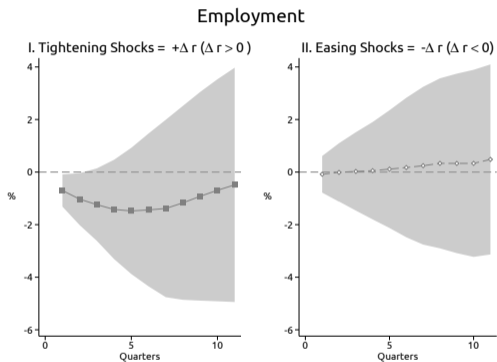
- ▶ Micro data allows us to shed light on channels
- ▶ Firm-level balance sheet
 - ▶ Compustat sample, U.S. nonfinancial firms, quarterly between 1995 and 2019
- ▶ Firm-level distress
 - ▶ CRSP
 - ▶ Distance to Default (D2D): Merton distance to default model, which takes as inputs the firm's equity valuations and leverage.
 - ▶ Distress: 25th percentile of D2D distribution; otherwise healthy
- ▶ Monetary policy
 - ▶ Monetary policy shocks from Miranda-Agrippino and Ricco (2021)
 - ▶ High-frequency market surprises around monetary policy announcements
 - ▶ Abstract from new information from the Federal Reserve regarding the economy
 - ▶ Separate the shocks series into accommodative and contractionary shocks

Aggregate Asymmetry– Investment



- ▶ Investment drops following tightening shocks but is unresponsive to easing shocks

Aggregate Asymmetry– Employment



- ▶ Employment drops following tightening shocks but is unresponsive to easing shocks

Channels

- ▶ Downward Nominal Wage Rigidity (Debortoli et al., 2020)
 - ▶ Expansionary monetary shock stimulates aggregate demand putting upward pressure on nominal wages → small effect on output
 - ▶ Contractionary shock reduces aggregate demand and makes the downward wage rigidity binding → larger reduction in output
- ▶ Financial Channel
 - ▶ Tightening → access to external financing deteriorates more for firms in distress
 - ▶ Easing → external financing conditions do not change appreciably enough for the two groups of firms
 - ▶ Test by exploiting heterogeneity across firms in terms of their ex-ante level of distress

Empirical Specification

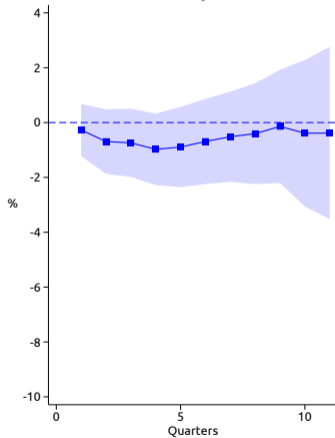
$$\Delta_h \log Y_{i,t+h} = \left(\rho^h + \lambda^{h+} \Delta r_t^+ + \lambda^{h-} \Delta r_t^- \right) (Distressed_{i,t-1} + Healthy_{i,t-1}) + \alpha^h \mathbf{controls}_{i,t-1} + \eta_i + \epsilon_{i,t+h}, \quad (1)$$

- ▶ $\Delta_h \log Y_{i,t+h}$ is the change in the log of the real stock of capital/employment between the end of quarter $t - 1$ and the end of quarter $t + h$ and Δr_t
- ▶ Δr_t is the monetary surprise in quarter t
 - ▶ We decompose Δr_t into tightening and easing shocks (Δr_t^+ and Δr_t^-)
 - ▶ Standardized with zero mean and standard deviation of one (≈ 8 bp)
- ▶ We classify firms into financially distressed firms and healthy firms

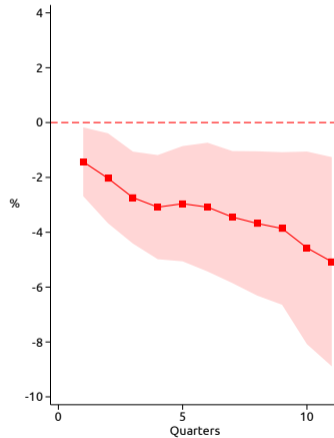
Investment Results – Tightening

I. Tightening Shocks = $+\Delta r$ ($\Delta r > 0$)

A. Healthy Firms

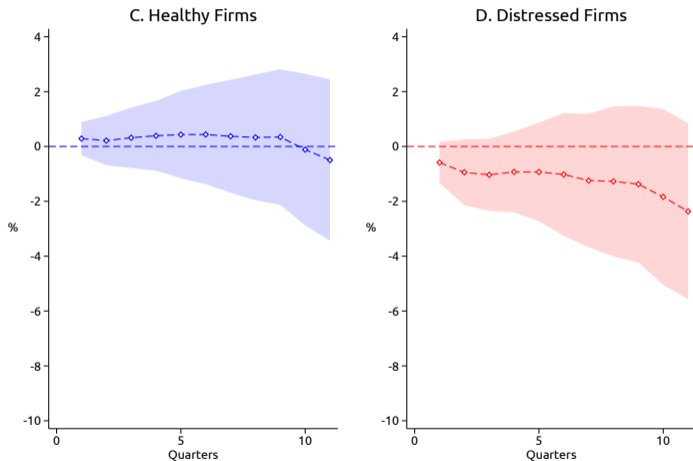


B. Distressed Firms



Investment Results – Easing

II. Easing Shocks = $-\Delta r$ ($\Delta r < 0$)



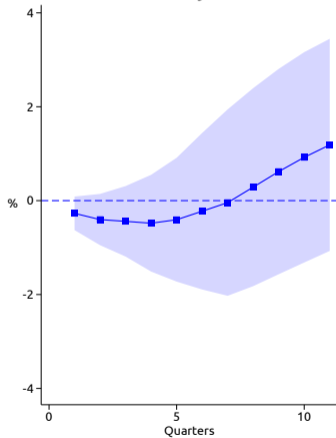
Investment Results – Triple Interaction

	$\text{Log}(\text{Capital})_{t+8} - \text{Log}(\text{Capital})_{t-1}$		
	(1)	(2)	(3)
Shock	-1.218*** (0.154)		
Shock × Stress	0.295*** (0.038)	0.227*** (0.041)	0.086* (0.046)
Shock × Contr.	-0.613* (0.319)		
Shock × Stress × Contr.	-0.447*** (0.066)	-0.380*** (0.073)	-0.118* (0.070)
R-squared	0.333	0.368	0.413
N	172,634	174,634	147,918
Firm FE	Y	Y	Y
Time FE	-	Y	-
Industry-Time FE	N	-	Y
Industry-Quarter FE	Y	-	-
Agg Controls Int.	N	N	Y

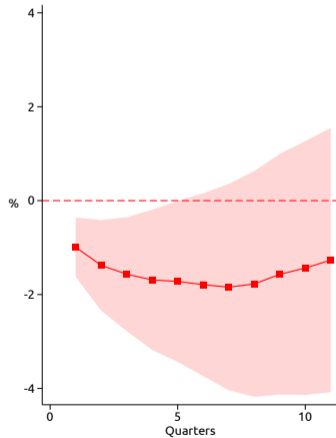
Employment Results – Tightening

I. Tightening Shocks = $+\Delta r$ ($\Delta r > 0$)

A. Healthy Firms



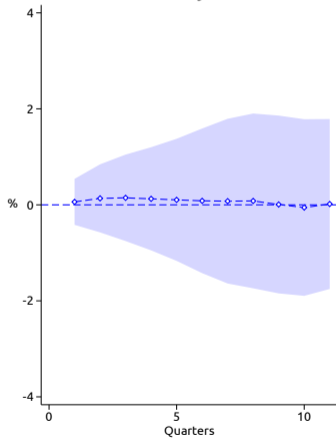
B. Distressed Firms



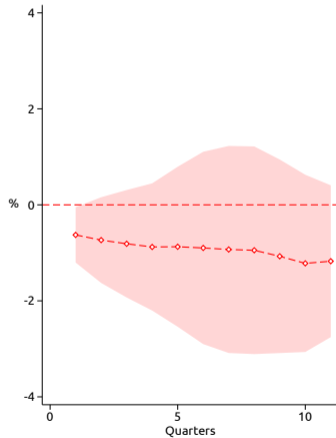
Employment Results – Easing

II. Easing Shocks = $-\Delta r$ ($\Delta r < 0$)

C. Healthy Firms



D. Distressed Firms

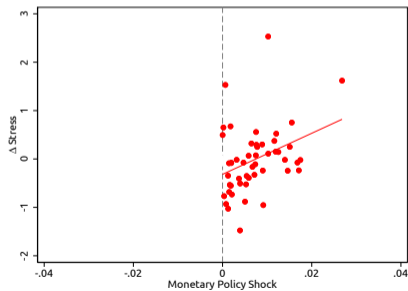


Employment Results – Triple Interaction

	$\text{Log}(\text{Emp})_{t+8} - \text{Log}(\text{Emp})_{t-1}$		
	(1)	(2)	(3)
Shock	-0.970*** (0.103)		
Shock × Stress	0.227*** (0.026)	0.155*** (0.027)	0.063* (0.032)
Shock × Contr.	-1.198*** (0.238)		
Shock × Stress × Contr.	-0.424*** (0.046)	-0.319*** (0.050)	-0.138*** (0.052)
R-squared	0.358	0.399	0.438
N	171,089	173,051	146,967
Firm FE	Y	Y	Y
Time FE	-	Y	-
Industry-Time FE	N	-	Y
Industry-Quarter FE	Y	-	-
Agg Controls Int.	N	N	Y

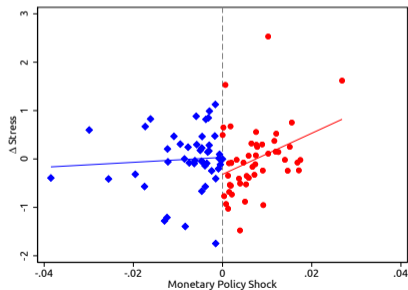
Potential Channel

- ▶ Policy tightening \rightarrow access to external financing deteriorates and stress increases



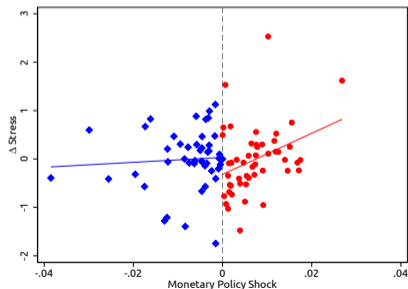
Potential Channel

- ▶ Policy tightening → access to external financing deteriorates and stress increases
- ▶ Policy easing → access to external financing does not improve much



Potential Channel

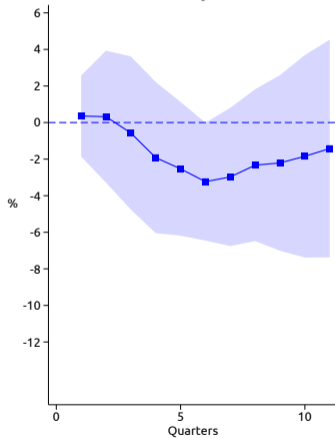
- ▶ Policy tightening → access to external financing deteriorates and stress increases
 - ▶ Distressed firms borrow less
 - ▶ Healthy firms' financial stress increases but not enough to hit borrowing constraint
- ▶ Policy easing → access to external financing does not improve much
 - ▶ No appreciable improvement for either group and insignificant effect on borrowing



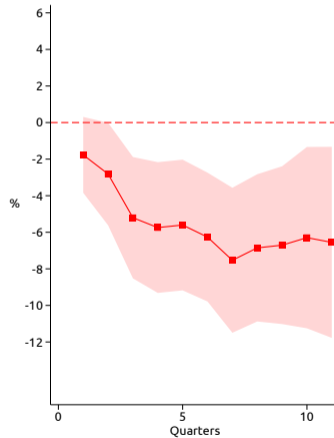
Debt Results –Tightening

I. Tightening Shocks = $+\Delta r$ ($\Delta r > 0$)

A. Healthy Firms

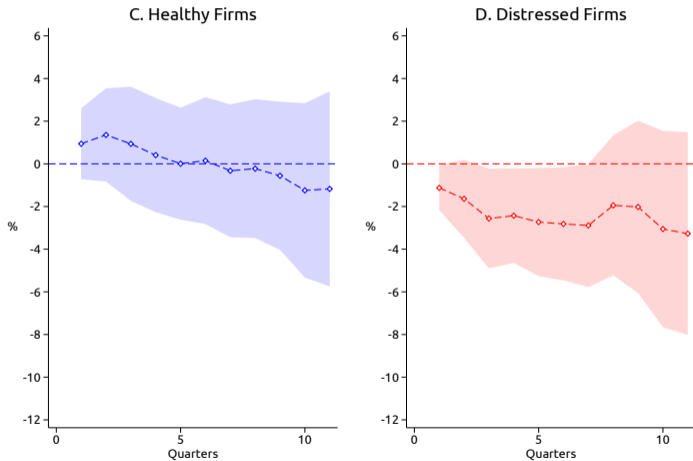


B. Distressed Firms



Debt Results –Loosening

II. Easing Shocks = $-\Delta r$ ($\Delta r < 0$)



Theoretical Mechanisms

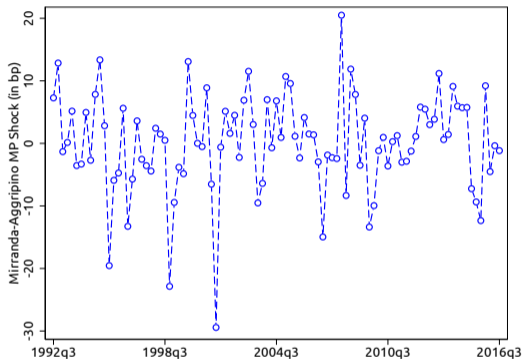
- ▶ Models with occasionally binding financial constraints
 - ▶ Contractionary policy pushes firms closer to binding constraints
 - ▶ Mendoza (2010), He and Krishnamurthy (2012, 2013), Brunnermeier and Sannikov (2014), Guerrieri and Iacoviello (2017)
- ▶ Theories of credit rationing
 - ▶ Supply curve of credit bends backward when rates are high
 - ▶ Jaffee and Stiglitz (1990), Freixas and Rochet (2008), Walsh (2010)
- ▶ Models with costly debt default and costly equity issuance
 - ▶ Contractionary policy pushes firms closer to default
 - ▶ Hennessy and Whited (2007), Gomes, Jermann, and Schmid (2016), Bolton, Wang, and Yang (2021)

Conclusion

- ▶ Strong empirical support for hypothesis that financial frictions in nonfinancial firms are important to explain monetary policy asymmetry
- ▶ Strength of transmission of monetary policy depends on aggregate distribution of firm financial distress.
- ▶ In current context of high share of distressed firms → potency of recent interest rate increases by Federal Reserve could be high

APPENDIX

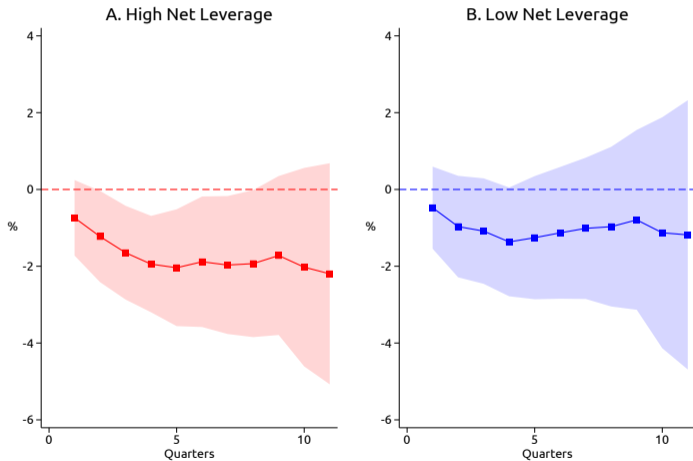
Monetary Policy Shocks



- ▶ Similar average size of easing and tightening shocks
- ▶ State-independence of shocks

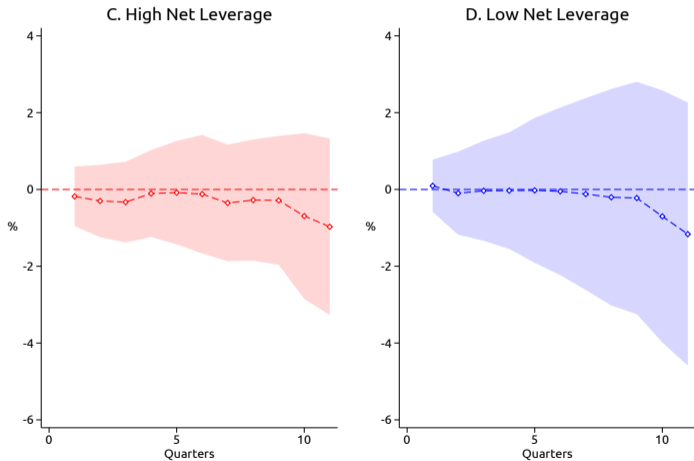
Robustness— Alternative Measure of Distress

Tightening Shocks = $+\Delta r$ ($\Delta r > 0$)



Robustness— Alternative Measure of Distress

II. Easing Shocks = $-\Delta r$ ($\Delta r < 0$)



Back

References

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