

The Macro Impact of the Debt-Inflation Channel on Investment

Zixing Guo

Oct 3, 2025

Boston University

Motivation: Inflation and Real Economy

- Key transmission from inflation to the real economy: **Debt-inflation (Fisher (1933)) channel**.
 - Unexpected inflation redistributes wealth from creditors to debtors.
 - If higher MPC/MPI for borrowers $\Rightarrow$ real macro consequences.

Motivation: Inflation and Real Economy

- Key transmission from inflation to the real economy: **Debt-inflation (Fisher (1933)) channel**.
 - Unexpected inflation redistributes wealth from creditors to debtors.
 - If higher MPC/MPI for borrowers $\Rightarrow$ real macro consequences.
- Modern literature shows modest Fisher channel effects on consumption.

Motivation: Inflation and Real Economy

- Key transmission from inflation to the real economy: **Debt-inflation (Fisher (1933)) channel**.
 - Unexpected inflation redistributes wealth from creditors to debtors.
 - If higher MPC/MPI for borrowers $\Rightarrow$ real macro consequences.
- Modern literature shows modest Fisher channel effects on consumption.
- A priori, firms are likely to be critical in this channel.
 1. Substantial nominal debt $\approx 72\%$ GDP.
 2. Rich heterogeneity in indebtedness across firms.
- No existing quantitative framework captures these two simultaneously.

Motivation: Inflation and Real Economy

- Key transmission from inflation to the real economy: **Debt-inflation (Fisher (1933)) channel**.
 - Unexpected inflation redistributes wealth from creditors to debtors.
 - If higher MPC/MPI for borrowers $\Rightarrow$ real macro consequences.
- Modern literature shows modest Fisher channel effects on consumption.
- A priori, firms are likely to be critical in this channel.
 1. Substantial nominal debt $\approx 72\%$ GDP.
 2. Rich heterogeneity in indebtedness across firms.
- No existing quantitative framework captures these two simultaneously.
- **Quantify the macroeconomic impact of this channel on investment?**

Main Contributions

Empirical Evidence:

- Document new micro evidence of the Fisher channel on investment.
- Highly indebted firms invest significantly more after inflation surprises.
- Robust across specifications and persistent pattern over time.

Main Contributions

Model Quantification:

- A heterogeneous firm GE model with financial frictions and fixed nominal debt.
 - Real interest rate channel dampens aggregate investment.
 - Reproduce heterogeneous responses and micro moments.
- 1% inflation $\Rightarrow$ 0.8% $\uparrow$ aggregate investment.
 - The firm-side effect is more significant than household-side.
- Explain up to 70% of the post-COVID investment surge.

Contribution to the Literature

- **Debt-Inflation (Fisher) Channel:**

- **Households:** Doepke and Schneider (2006), Auclert (2019), Fagereng et al. (2023), Schnorpfeil et al. (2023); **Firms:** Gomes et al. (2016), Fabiani and Fabio Massimo (2023), Brunnermeier et al. (2025).
- Macro quantification of **investment** with rich firm **heterogeneity**.

- **Investment & Financial Frictions:**

- Bernanke et al. (1999), Khan and Thomas (2013), Ottonello and Winberry (2020), Durante et al. (2022), Jeenas (2023).
- Fisher channel can relax financial constraints and drive dynamics.

- **Nominal Debt Contract:**

- Sheedy (2014), Garriga et al. (2017), Alpanda and Zubairy (2017), Alpanda and Zubairy (2019), Wang and Bai (2025)
- Nominal debt contract rigidity has real effects.

Roadmap

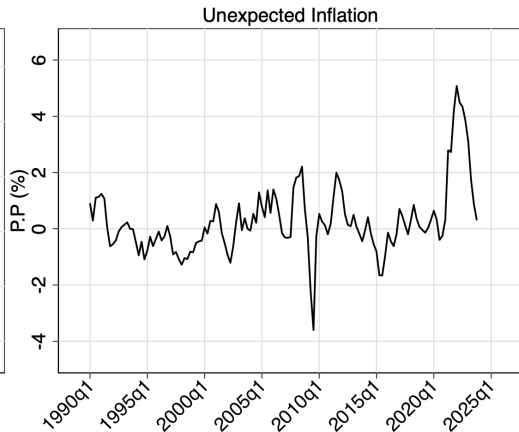
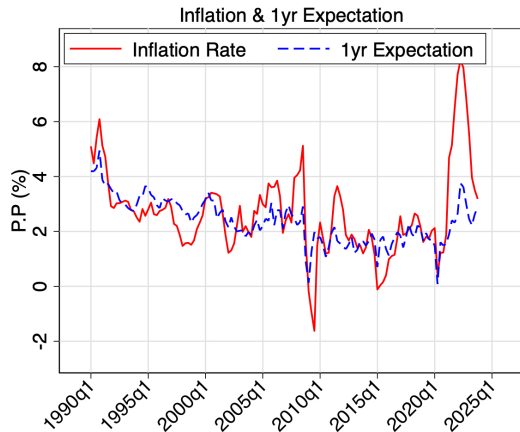
1. Empirical Analysis
2. Heterogeneous Firm GE Model
3. Quantitative Analysis
4. Conclusion

Empirical Analysis

Data and Measurement

- **Firm Data:** Quarterly Compustat, 1990Q1 - 2023Q4.
 - **Indebtedness:** $b_{j,t-1}$, Log of total nominal debt (residualized).
 - **Capital Stock:** $k_{j,t}$, PIM follows Ottonello and Winberry (2020).
 - **Investment Rate:** $inv_{j,t} = i_{j,t}/k_{j,t-1}$.
- **Inflation Data:**
 - Realized Inflation: Consumer Price Index (CPI) from BLS.
 - Expected Inflation: 1-year ahead from FRB Cleveland.
 - **Unexpected Inflation** ($\epsilon_t^\pi \equiv \Delta\pi = \pi_t^{\text{realized}} - \mathbb{E}_{t-4}\pi_t$)

Unexpected Inflation Series



Key episode: large inflationary surprises in 2021-22.

Empirical Strategy

- Two-Way Fixed Effect model to estimate investment responses

$$inv_{j,t} = \alpha_j + \alpha_{s,t} + \beta(b_{j,t-1} \times \epsilon_t^\pi) + \gamma b_{j,t-1} + \mathbf{\Gamma}'_A(b_{j,t-1} \times \mathbf{A}_t) + \mathbf{\Gamma}'_Z \mathbf{Z}_{j,t-1} + e_{j,t}$$

- α_j : Firm FE; $\alpha_{s,t}$: Sector $\times$ Time FE.
 - $b_{j,t-1} \times \mathbf{A}_t$ Interaction with GDP growth, FFR.
 - $\mathbf{Z}_{j,t-1}$ Standard firm level controls.
 - Two-way clustering standard errors.
-
- Debt-inflation channel predicts: $\beta > 0$.

Main Result: Heterogeneous Responses

$inv_{j,t}$	(1)	(2)	(3)	(4)
$b_{j,t-1} \times \epsilon_t^\pi$	0.116*** (0.029)	0.124*** (0.029)		
$b_{j,t-1} \times \pi_t$			0.089*** (0.023)	0.091*** (0.023)
Firm Ctrl	No	Yes	No	Yes
Observations	268757	268757	268757	268757
R^2	0.118	0.125	0.118	0.124

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses; two-way clustering by firm and time. Firm, sector-time FE and aggregate controls included.

- **Magnitude:** A 1% inflation surprise $\Rightarrow$ 0.35% $\uparrow$ investment rate for a firm with 1 std. (2.99) $\uparrow$ indebtedness.

Robustness

- Controlling earnings, liquidity, size, age cohort interactions.
- Excluding the Great Recession and COVID periods.
- Using alternative measures of indebtedness (e.g., leverage ratio).
- Persistent effects over time using Local Projection.

Takeaway: Significant and robust empirical support for the firm-side Fisher channel on heterogeneous investment responses.

Heterogeneous Firm GE Model

Quantitative Model: Features

- Flexible price economy in terms of goods and wages.
 - Isolate pure Fisher channel effects.
- Continuum of mass 1 heterogeneous firms indexed by i .
- One-period safe **nominal bond** predetermined in last period.
- Financial frictions: borrowing and non-negative dividend constraints.
- Exogenous entry and exit with prob. π_d .

Quantitative Model: Heterogeneous Firms

- Decreasing return to scale technology for firm i

$$y_{i,t} = z_{i,t} k_{i,t}^{\alpha} n_{i,t}^{\nu}, \quad \alpha + \nu < 1$$

$$\log(z_{i,t+1}) = \rho \log(z_{i,t}) + \sigma \varepsilon_{i,t+1}, \quad \varepsilon_{j,t+1} \sim N(0, 1)$$

with goods sold at real price p_t

- Capital Accumulation

$$k_{i,t+1} = i_{i,t} + (1 - \delta)k_{i,t}$$

$$AC(i_{i,t}, k_{i,t}) = \frac{\gamma}{2} \frac{i_{i,t}^2}{k_{i,t}}$$

Quantitative Model: Firm's Problem

$$V_t(z, k, b) = (1 - \pi_d) V_t^c(z, k, b) + \pi_d V_t^d(z, k, b)$$

$$V_t^c(z, k, b) = \max_{k', b'} \left\{ d_t(z, k, b, k', b') + \mathbb{E}_t[\Lambda_{t+1} V_t(z', k', b' | z)] \right\}$$

$$s.t. \quad \text{Dividend} \quad d_t = p_t z k^\alpha n^\nu - w_t n - i - AC(i, k) - (1 + R_t) \frac{b}{1 + \pi_t} + b' \geq 0$$

$$\text{Borrowing} \quad b' \leq \frac{1 + \pi_{t+1}}{1 + R_{t+1}} (p_{t+1} z' k'^\alpha n'^\nu - w_{t+1} n' + (1 - \delta) k')$$

- Distribution evolves following

$$\begin{aligned} \mu_{t+1}(z', k', b') &= \int (1 - \pi_d) \mathbf{1}\{k' = k^*(z, k, b)\} \mathbf{1}\{b' = b^*(z, k, b)\} \\ &\quad \times g(z' | z) d\mu_t(z, k, b) + m_{\text{ent}} \mu_{\text{ent}}(z') \mathbf{1}\{k' = k_0\} \mathbf{1}\{b' = 0\} \end{aligned}$$

Quantitative Model: Other Agents

- Representative Households
 - Maximize expected utility subject to budget constraint:

$$E_0 \sum_{t=0}^{\infty} \beta^t (\log C_t - \chi N_t)$$

$$s.t. \quad P_t C_t + S_{t+1} = W_t N_t + (1 + R_t) S_t + D_t$$

- Stochastic Discount Factor Λ_{t+1} follows $\beta \frac{C_t}{C_{t+1}}$.
- Retailers and Final Goods Producer
 - Linear technology to produce differentiated goods.
 - CES Technology to produce final goods using differentiated goods.
- Central Bank
 - Control inflation π_t .

Quantitative Model: Equilibrium

Equilibrium The steady state equilibrium for the flexible price economy is given by a set of value functions $V_t(z, k, b)$, decision rules k', b', n for capital, debt and labor, a measure of firms $\mu_t(z, k, b)$, and a set of prices $w_t, r_t, p_t, \Lambda_{t+1}$ such that:

1. given prices, all firms optimize: V solves bellman equation with associated policy rules;
2. household optimizes;
3. goods market, labor market and asset market all clear;
4. the distribution of firms μ is stationary.

Quantitative Analysis

Calibration

Description	Parameter	Value	Source
<i>Household</i>			
Discount factor	β	0.99	Quarterly Standard
<i>Firm</i>			
TFP persistence	ρ_z	0.90	O&W 2020
SD of TFP innovations	σ_z	0.10	Literature 0.03 – 0.15
Depreciation rate	δ	0.025	Annual Rate 10%
Capital coefficient	α	0.25	O&W 2020
Labor coefficient	ν	0.60	O&W 2020
Borrowing limit	ϕ	1.00	Gross Leverage
Exogenous exit probability	π_d	0.02	Annual Rate 8%
Investment adj. cost	γ	1.00	Literature 0.04 – 2.5
Entrant initial capital	k_0	0.20	Employment Size

Model Fit

Description	Moment	Data	Model
Mean Gross Leverage	$\mathbb{E}\left[\frac{b}{k}\right]$	0.316	0.286
Mean Investment Rate (p.p.)	$\mathbb{E}\left[\frac{i}{k}\right]$	3.936	4.398
SD Investment Rate (p.p.)	$\sigma\left(\frac{i}{k}\right)$	10.263	8.27
Leverage Auto-correlation	$\text{Corr}(lev_t, lev_{t-1})$	0.938	0.989
Share of Positive Net Debt	$\text{Frac}(b > 0)$	0.708	0.632
Annual Exit Rate	$\mathbb{E}[\text{Exit}]$	0.08	0.08
Employment Size Ratio	$\frac{N_{\text{age} < 1\text{yr}}}{N_{\text{age} > 10\text{yr}}}$	0.022	0.02

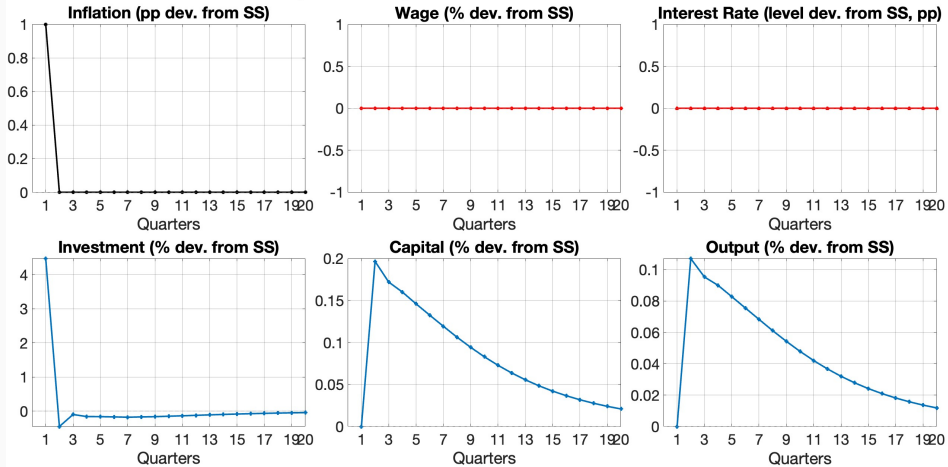
Solution Method

- Difficulty in solving heterogeneous agent with aggregate uncertainty.
 - Traditional method in state space $\Rightarrow$ **Curse of Dimensionality**.
- Sufficient Statistic: **Sequence Space Jacobians**, Auclert et al. (2021).
 - Linear equations in perfect foresight sequence space.
- One of a few SSJ applications in firms side studies.

► Simulated Regression

PE Impulse Response

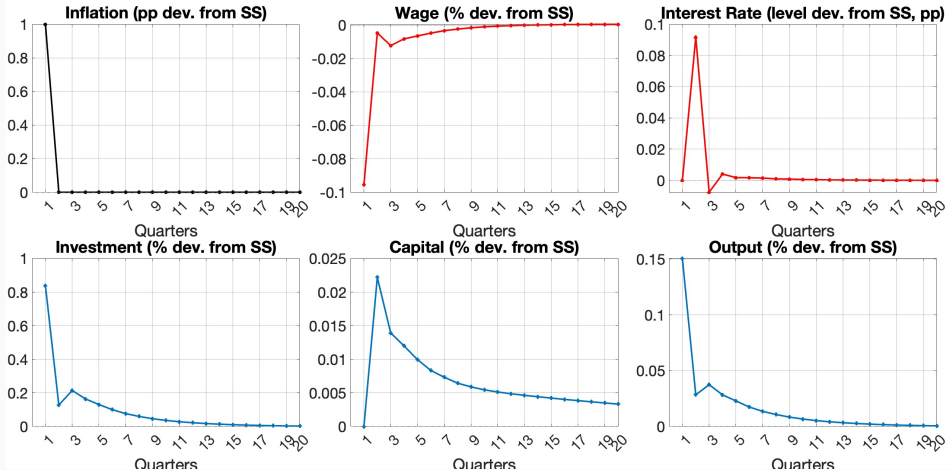
PE Impulse Responses to a 1% Inflation Shock



- Strong PE effects: 1% $\uparrow$ inflation $\Rightarrow$ 4.5% $\uparrow$ aggregate investment.

GE Impulse Response

GE Impulse Responses to a 1% Inflation Shock



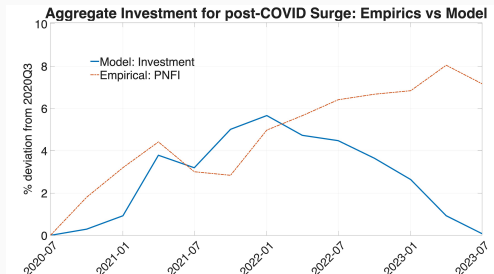
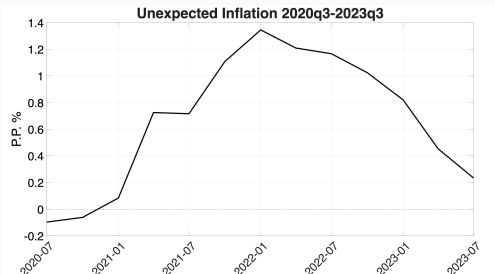
- Fisher channel effect on aggregate investment dampened to **0.83%**.

Significant Effect: Firm vs. Household

- Fisher channel effect on household is modest.
 - Auclert (2019): "fairly small" redistribution elasticity for price.
- In contrast, firm side effect is **significant**.
 - PE effect large on impact; GE effect quantitatively meaningful.
 - **Shifting the Fisher channel focus from households to firms.**

Application: Post-COVID Investment Surge

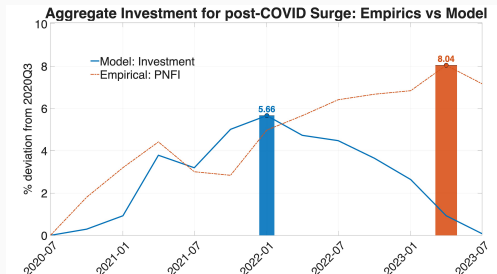
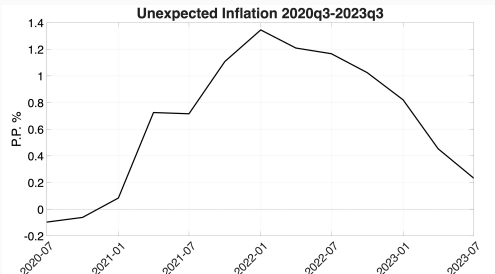
- How much does the channel explain?



- Up to **70%** (peak share) investment surge.

Application: Post-COVID Investment Surge

- How much does the channel explain?



- Up to **70%** (peak share) investment surge.

Conclusion

Conclusion

- **Empirically Heterogeneous.**
 - Evidence for the debt-inflation (Fisher) channel on investment.
 - High indebted firms increase investment relatively more.
- **Quantitatively Significant.**
 - Develop a heterogeneous firm model to quantify macro impacts.
 - 1% inflation surprise $\implies$ **0.83%** aggregate investment.
 - More significant Fisher effects on firms than households.
 - Reproduce 70% post-COVID investment surge.

A 2-Period Model: Setup

- Two periods $t = 1, 2$.
- Firm produces with $y_t = k_t^\alpha$.
- Initial capital k_1 , fully depreciate.
- Fixed nominal debt B_1 , with $R = r$.
- Let real debt $b_t = B_t/P_{t-1}$, period 1 net worth is:

$$nw_1 = k_1^\alpha - \frac{(1+r)b_1}{1+\pi_1}$$

- Unexpected Inflation $\pi_1 \uparrow \implies$ Net Worth $nw_1 \uparrow$

A 2-Period Model: Constrained Optimality

- Firm chooses (k_2, b_2) to maximize discounted dividends

$$\max_{k_2, b_2} \left\{ d_1 + \frac{d_2}{1+r} \right\}$$

- Two financial frictions
 - **Non-negative Dividend**

$$d_1 = nw_1 - k_2 + b_2 \geq 0$$

$$d_2 = k_2^\alpha - (1+r)b_2 \geq 0$$

- **Borrowing Constraint**

$$\phi k_2^\alpha - (1+r)b_2 \geq 0$$

From Theory to Empirics

- Constrained k_2^* relates b_1, π_1 , and define $inv_1 = \frac{k_2}{k_1}$

$$\Delta inv_1^* = \Delta \left(\frac{k_2^*}{k_1} \right) = \underbrace{\frac{1}{1 - \frac{\phi \alpha (k_2^*)^{\alpha-1}}{1+r}} \frac{(1+r)}{(1+\pi_1)^2}}_{\text{Elasticity } \beta} \times b_1 \times \Delta \pi_1$$

- Testable Prediction $\beta > 0$:
 - Stronger Δinv_1^* to $\Delta \pi_1$ for firms with higher b_1

2-Period Model: Feasibility

Single feasibility inequality

$$h(k_2) \equiv k_2 - \frac{\phi}{1+r} k_2^\alpha \leq nw_1$$

Unconstrained benchmark. optimum k_2^{FB} satisfies

$$1 = \frac{1}{1+r} \alpha (k_2^{FB})^{\alpha-1} \quad \implies \quad k_2^{FB} = \left(\frac{\alpha}{1+r} \right)^{\frac{1}{1-\alpha}}$$

Evaluate the feasibility function at k_2^{FB} :

$$h(k_2^{FB}) = k_2^{FB} - \frac{\phi}{1+r} (k_2^{FB})^\alpha = k_2^{FB} \left[1 - \frac{\phi}{\alpha} \right], \quad \text{since } \frac{1}{1+r} (k_2^{FB})^\alpha = \frac{k_2^{FB}}{\alpha}.$$

2-Period Model: Feasibility

Implication. The sign of $h(k_2^{FB})$ depends only on $\alpha - \phi$:

- If $\boxed{\alpha > \phi}$, then $h(k_2^{FB}) > 0$.
 - Net worth $nw_1 \geq h(k_2^{FB}) > 0 \Rightarrow k_2^{FB}$
 - $nw_1 \in [0, h(k_2^{FB})) \Rightarrow$ on the boundary $k_2 - \frac{\phi}{1+r}k_2^\alpha = nw_1 \Rightarrow$ Nonempty constrained region
- If $\alpha \leq \phi$, then $h(k_2^{FB}) \leq 0$.
 - Feasible firms satisfy $nw_1 \geq 0 \Rightarrow nw_1 \geq h(k_2^{FB}) \Rightarrow$ choose k_2^{FB} (unconstrained) $\Rightarrow$ no constrained region

2-Period Model: Optimality Conditions

- Unconstrained maximizer k_2^{FB} is

$$k_2^{FB} = \left(\frac{\alpha}{1+r} \right)^{\frac{1}{1-\alpha}}$$

when $nw_1 \geq k_2^{FB} - \phi \frac{(k_2^{FB})^\alpha}{1+r}$

- Constrained optimal k_2^* solves otherwise

$$k_2^* - \phi \frac{(k_2^*)^\alpha}{1+r} = nw_1$$

2-Period Model: Core Mechanism

- Unconstrained Firms (Low Debt):

- Low $b_1 \iff$ High nw_1
- $k_2 = k_2^{FB}$ unchanged, independent of net worth

- Constrained Firms (High Debt):

- High $b_1 \iff$ Low nw_1
- Investment (k_2^*) is increasing in net worth (nw_1).

$$\frac{\partial k_2^*}{\partial nw_1} > 0 \quad \text{and} \quad \frac{\partial nw_1}{\partial \Pi_1} > 0$$

- Unexpected inflation $\Pi_1 \uparrow \implies$ Real Debt $\frac{b_1}{\Pi_1} \downarrow \implies$ Net worth $nw_1 \uparrow \implies$ Constraint relaxes $\implies$ Investment $k_2 \uparrow$

2-Period Model: Core Mechanism

- Constrained Firm cross derivative

$$\frac{\partial^2 k_2^*}{\partial \pi_1 \partial b_1} = \underbrace{\frac{1 + i_1}{(1 + \pi_1)^2} \cdot \frac{1}{D}}_{(i)} + \underbrace{\frac{\phi \alpha (1 - \alpha)}{1 + r} \cdot \frac{(1 + i_1)^2 b_1 (k_2^*)^{\alpha - 2}}{(1 + \pi_1)^3} \cdot \frac{1}{D^3}}_{(ii)}$$

where

$$D \equiv 1 - \frac{\phi \alpha (k_2^*)^{\alpha - 1}}{1 + r}.$$

Summary Statistics

Statistic	$\Delta \log k_{j,t}$	$i_{j,t}$	$\Delta \log(ppe)_{j,t+1}$	$capx_{j,t}$	$b_{j,t-1}$
Mean	0.362	3.936	0.315	8.673	3.984
Median	-0.443	2.723	-0.464	4.115	4.149
S.D.	8.729	10.263	13.707	588.098	2.993
95th Percentile	11.182	14.997	15.066	19.788	8.520
Observations	268757	268757	268362	266708	268757

Different Specifications

	2Way FE	No GDP, FFR	TobinsQ	Sales InterAct
$b_{j,t-1} \times \epsilon_t^\pi$	0.117*** (0.035)	0.126*** (0.036)	0.120*** (0.029)	0.115*** (0.032)
Observations	268757	268757	255045	268757
R^2	0.118	0.124	0.125	0.125
Firm Control	No	Yes	Yes	Yes
Agg InterAct	No	No	Yes	Yes
Sales InterAct	No	No	No	Yes

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses; two-way clustering by firm and time. Firm, sector-time FE and aggregate controls included.

Different Specifications

	NetDebt	Liquidity	Size	Age	LongDebt	Div
$b_{j,t-1} \times \epsilon_t^\pi$	0.065** (0.028)	0.082*** (0.030)	0.109*** (0.032)	0.109*** (0.027)	0.127*** (0.033)	0.119*** (0.029)
Observations	179450	254991	255045	255045	255045	255045
R^2	0.140	0.128	0.126	0.129	0.126	0.126

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses; two-way clustering by firm and time. Firm, sector-time FE and aggregate controls included. Net debt and long debt columns replace the debt in the main specification. All controls the interaction with GDP growth and federal funds rate.

Sample Selection

	(1)	(2)	(3)	(4)	(5)	(6)
$b_{j,t-1} \times \epsilon_t^\pi$	0.124*** (0.029)	0.108*** (0.029)	0.129*** (0.031)	0.127*** (0.032)	0.126*** (0.029)	0.076* (0.042)
Observations	268757	244950	251150	255870	264037	232390
R^2	0.125	0.129	0.127	0.126	0.126	0.136
Firm Control	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Column (1) is the main result. Column (2) considers post-1994 sample. Column (3) excludes the Great Recession and COVID period. (4) and (5) exclude two recessions respectively. (6) considers the pre-COVID sample and excludes the Great Recession.

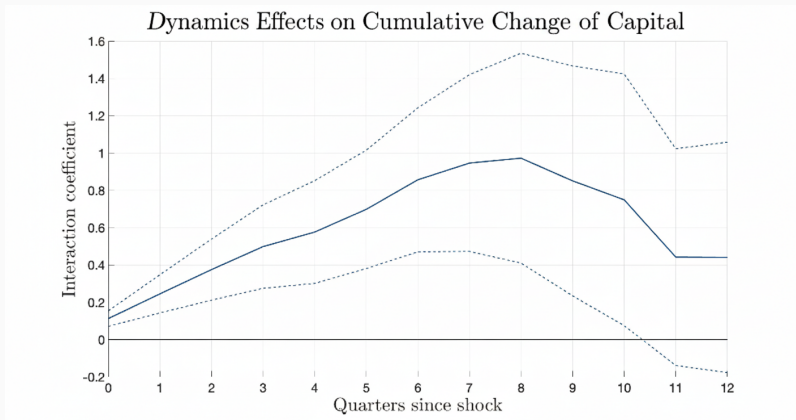
Leverage Ratio

Investment Rate	(1)	(2)	(3)	(4)
$b_{j,t-1} \times \epsilon_t^\pi$	0.055* (0.030)	0.056* (0.030)		
$b_{j,t-1} \times \pi_t$			0.052** (0.024)	0.054** (0.024)
Observations	316147	316147	316147	316147
R^2	0.110	0.117	0.110	0.117
Firm Control	No	Yes	No	Yes

Dynamic Effects

- Local projection to trace dynamic effects:

$$\Delta \log k_{j,t+h} = \alpha_j + \alpha_{s,t} + \beta_h (b_{j,t-1} \epsilon_t^\pi) + \gamma_h b_{j,t-1} + \mathbf{\Gamma}'_{Ah} (b_{j,t-1} \mathbf{A}_t) + \mathbf{\Gamma}'_{Zh} \mathbf{Z}_{j,t-1} + e_{j,t,h}$$



Retailer and Final Goods Producer

- Retailer j
 - Linear technology $\tilde{y}_j = y$
- Final Goods Producer
 - Constant elasticity of substitution (CES) technology

$$Y_t = \left(\int_0^1 \tilde{y}_{jt}^{\frac{\epsilon_p - 1}{\epsilon_p}} dj \right)^{\frac{\epsilon_p}{\epsilon_p - 1}}$$

- Price index $P_t = \left(\int_0^1 \tilde{P}_{jt}^{1 - \epsilon_p} dj \right)^{\frac{1}{1 - \epsilon_p}}$
- SS real price of wholesale goods is $p = \frac{\epsilon_p - 1}{\epsilon_p}$.

Market Clearing Conditions

- Goods Market

$$\int y_{jt} d\mu_t = Y_t = C_t + (1 - \pi_d) \int (i_{jt} + AC_{jt}) d\mu_t + \mu_{ent} k_0 - \pi_d(1 - \delta) K_t$$

- Asset Market

$$\int b_{i,t} d\mu_t = \frac{S_t}{P_{t-1}}$$

- Labor Market

$$\int n_{i,t} d\mu_t = N_t$$

Model vs. Empirics: Reproducing the Heterogeneity

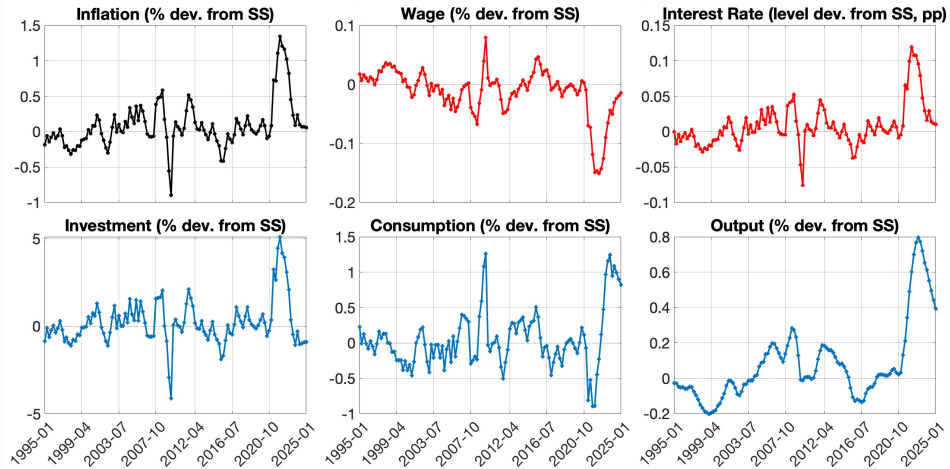
- Run the same regressions on the model-simulated panel.

Investment Rate	Empirical Estimate		Model Implied Results	
	(1)	(2)	(3)	(4)
$b_{j,t-1} \times \epsilon_t^\pi$	0.116*** (0.029)	0.124*** (0.029)	0.048* (0.026)	0.024*** (0.005)
Firm Control	No	Yes	No	Yes
Observations	268757	268757	192801	192801
R^2	0.118	0.125	0.272	0.968

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses; two-way clustering by firm and time. Column (1) and (2) include firm, sector-time FE and aggregate controls; (3) and (4) exclude sector-time FE.

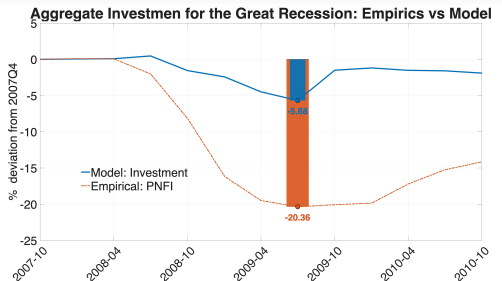
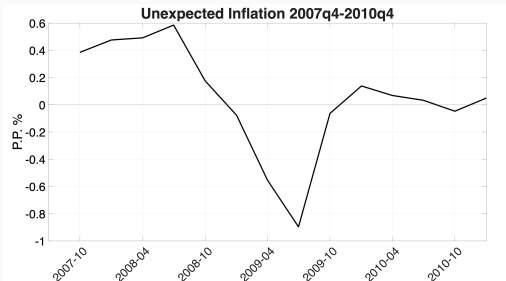
Full Historical Application

GE Responses to Real Inflation Surprises



Application: the Great Recession

- How about deflationary scenario?



- Explain 25% investment decline.

References

- Sami Alpanda and Sarah Zubairy. Addressing household indebtedness: Monetary, fiscal or macroprudential policy? *European Economic Review*, 92:47–73, 2017.
- Sami Alpanda and Sarah Zubairy. Household debt overhang and transmission of monetary policy. *Journal of Money, Credit and Banking*, 51(5):1265–1307, 2019.

References ii

- Adrien Auclert. Monetary policy and the redistribution channel. *American Economic Review*, 109(6):2333–2367, 2019.
- Adrien Auclert, Bence Bardóczy, Matthew Rognlie, and Ludwig Straub. Using the sequence-space jacobian to solve and estimate heterogeneous-agent models. *Econometrica*, 89(5):2375–2408, 2021.
- Ben S Bernanke, Mark Gertler, and Simon Gilchrist. The financial accelerator in a quantitative business cycle framework. *Handbook of macroeconomics*, 1:1341–1393, 1999.
- Markus Brunnermeier, Sergio Correia, Stephan Luck, Emil Verner, and Tom Zimmermann. The debt-inflation channel of the german (hyper) inflation. *American Economic Review*, 115(7):2111–2150, 2025.

References iii

Matthias Doepke and Martin Schneider. Inflation and the redistribution of nominal wealth. *Journal of Political Economy*, 114(6):1069–1097, 2006.

Elena Durante, Annalisa Ferrando, and Philip Vermeulen. Monetary policy, investment and firm heterogeneity. *European Economic Review*, 148: 104251, 2022.

Andrea Fabiani and Piersanti Fabio Massimo. Inflation, capital structure and firm value. *Bank of Italy Temi di Discussione (Working Paper) No*, 1434, 2023.

Andreas Fagereng, Magnus AH Gulbrandsen, Martin B Holm, and Gisle J Natvik. How does monetary policy affect household indebtedness? 2023.

References iv

Irving Fisher. The debt-deflation theory of great depressions.

Econometrica: Journal of the Econometric Society, pages 337–357, 1933.

Carlos Garriga, Finn E Kydland, and Roman Šustek. Mortgages and monetary policy. *The Review of Financial Studies*, 30(10):3337–3375, 2017.

Joao Gomes, Urban Jermann, and Lukas Schmid. Sticky leverage. *American Economic Review*, 106(12):3800–3828, 2016.

Priit Jeenas. Firm balance sheet liquidity, monetary policy shocks, and investment dynamics. 2023.

References v

- Aubhik Khan and Julia K Thomas. Credit shocks and aggregate fluctuations in an economy with production heterogeneity. *Journal of Political Economy*, 121(6):1055–1107, 2013.
- Pablo Ottonello and Thomas Winberry. Financial heterogeneity and the investment channel of monetary policy. *Econometrica*, 88(6):2473–2502, 2020.
- Philip Schnorpfel, Michael Weber, and Andreas Hackethal. Households' response to the wealth effects of inflation. Technical report, National Bureau of Economic Research, 2023.

Kevin D Sheedy. Debt and incomplete financial markets: A case for nominal gdp targeting. *Brookings Papers on Economic Activity*, 2014(1): 301–373, 2014.