

The Macroeconomic Effects of Sovereign Risk:

New Evidence from U.S. Debt Ceiling Episodes

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3rd International Conference on the Climate-Macro-Finance Interface (3CMFI)

SAFE – Goethe University Frankfurt

March 23–24, 2026

Sovereign risk is no longer confined to emerging economies:

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- U.S. debt-ceiling impasses (2011, 2013, 2023)
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- Leverage **U.S. debt ceiling** as source of variation + **high-frequency** financial data
- Use as **instrument** to estimate dynamic causal effects of **sovereign risk shocks**

The U.S. Debt Ceiling: Relevance to Sovereign Risk

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Ceiling Reached

Treasury halts
debt issuance



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Extraordinary Measures

Funds reallocated
to avoid default



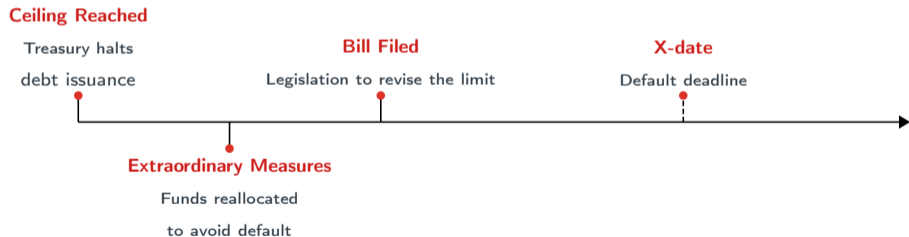
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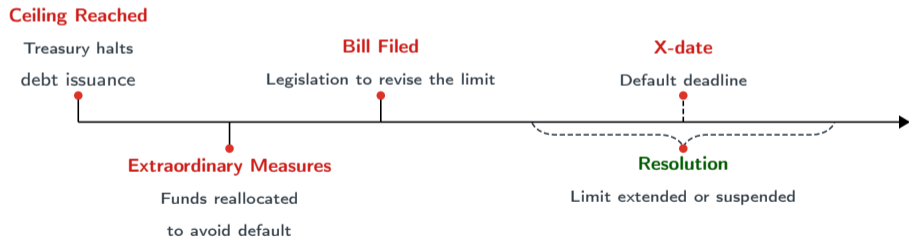
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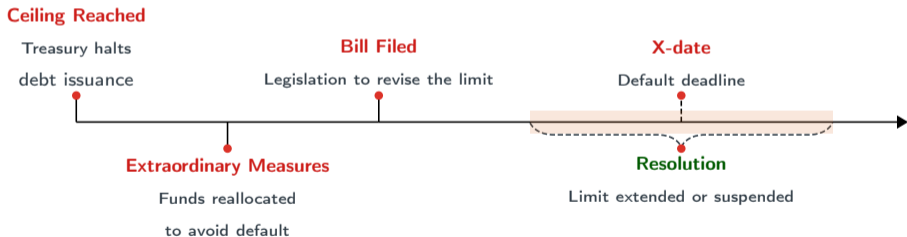
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► Contributed to sovereign downgrades (S&P 2011; Fitch 2023; Moody's 2025)

► CDS Evidence

► Historical Revisions

Idea: identify **sovereign risk surprises** using market reactions to debt ceiling events

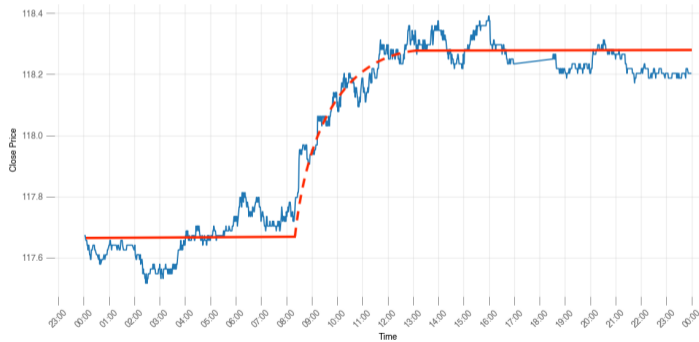
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Identification Strategy

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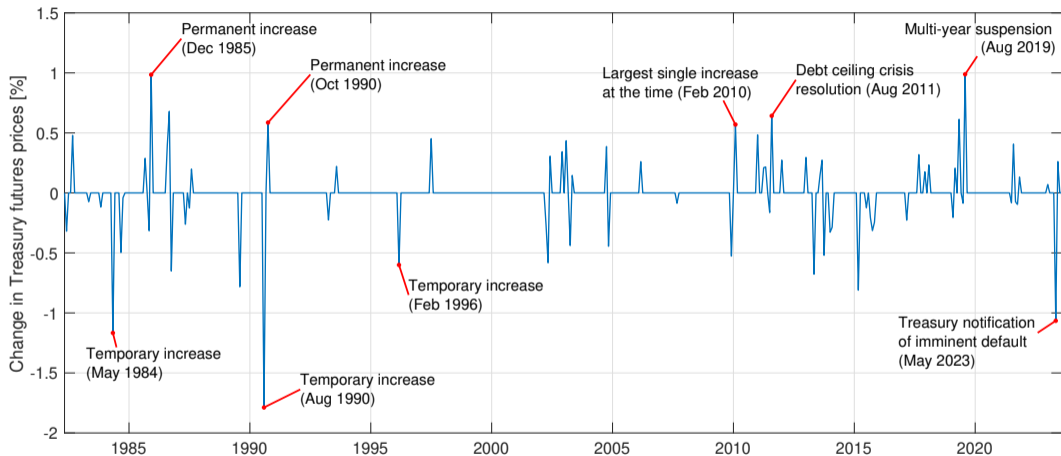
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- 10-year Treasury futures
- ~200 debt ceiling events:
 - ▷ Congressional votes
 - ▷ Treasury letters



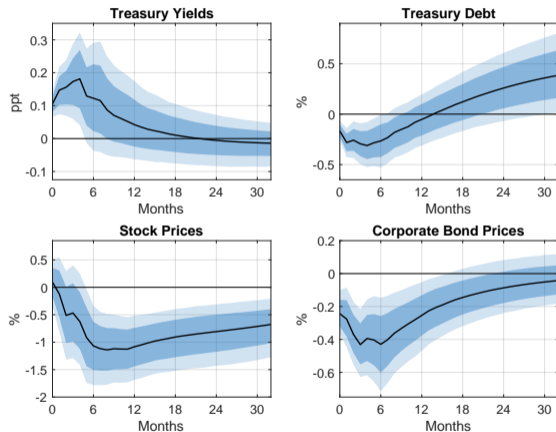
10-Year Treasury Futures Prices (Feb 4, 2010)

Sovereign Risk Surprise Series



Effects on Financial and Macroeconomic Variables

Financial variables



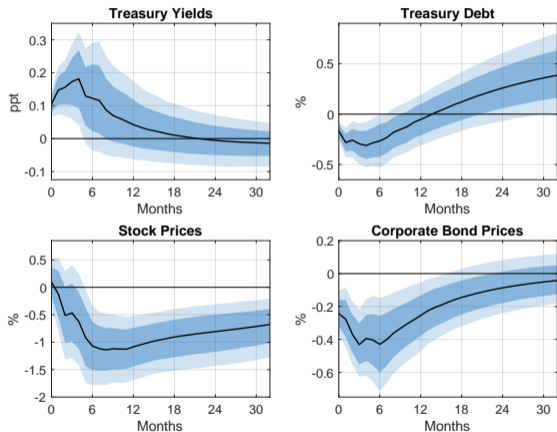
F-statistic: 18.48, robust F-statistic: 17.27

Notes: 1-s.d. sovereign risk shock. Shaded: 68% and 90% bands.

► SVAR-IV

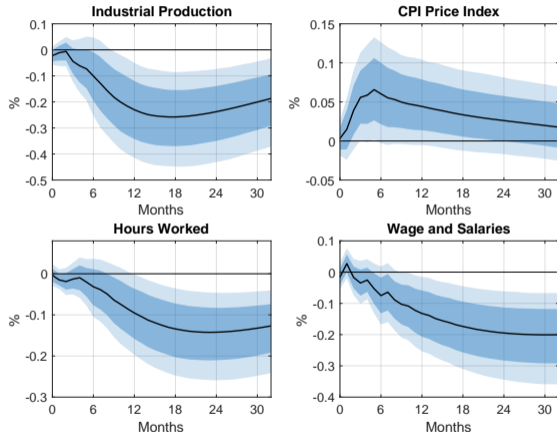
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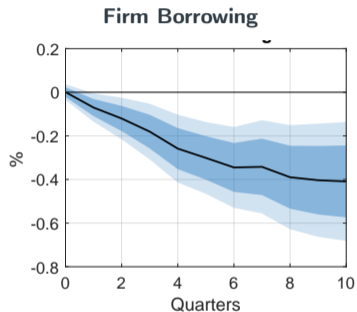
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Propagation: Banks \rightarrow Firms \rightarrow Households



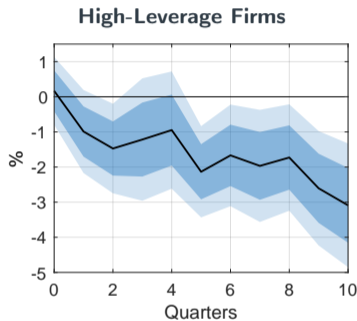
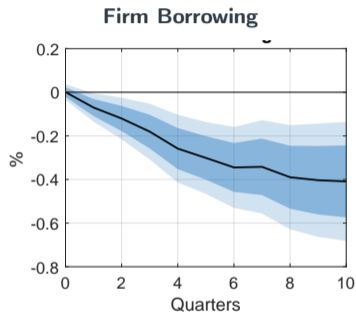
1. Banks cut lending
after bond losses

▷ Banks

▷ Production

▷ Households

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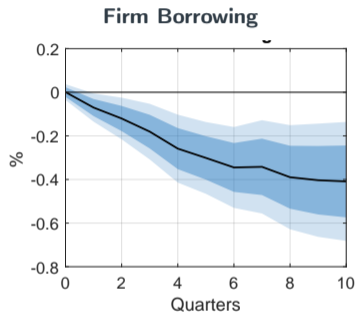
2. Credit contraction
depresses investment

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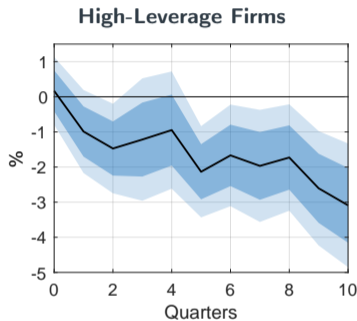
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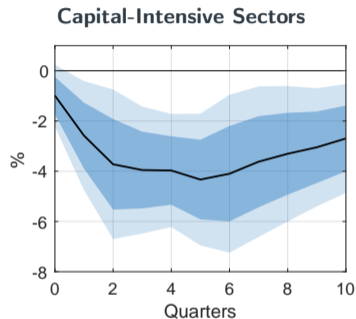
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1. Banks cut lending
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2. Credit contraction
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3. Effects extend to
job creation

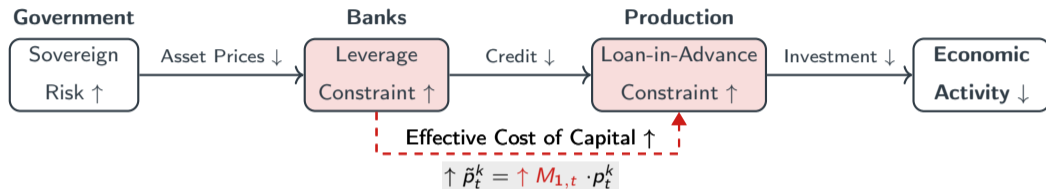
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Model and Transmission Mechanism



▶ Model Details

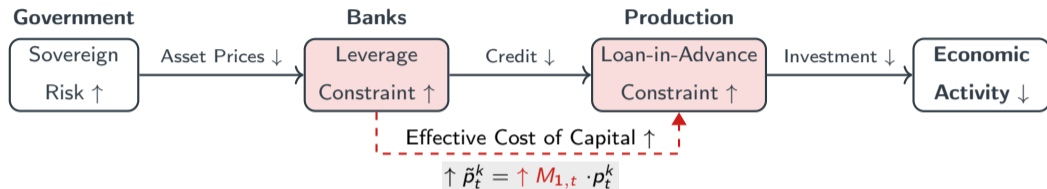
Model and Transmission Mechanism



- Sovereign risk amplifies an **investment wedge** \propto **govt bond spread**:

$$\hat{M}_{1,t} \propto \mathbb{E}_t \sum_{j=0}^{\infty} (\kappa\beta)^j \left[\hat{R}_{t+j+1}^B - \hat{R}_{t+j}^d \right]$$

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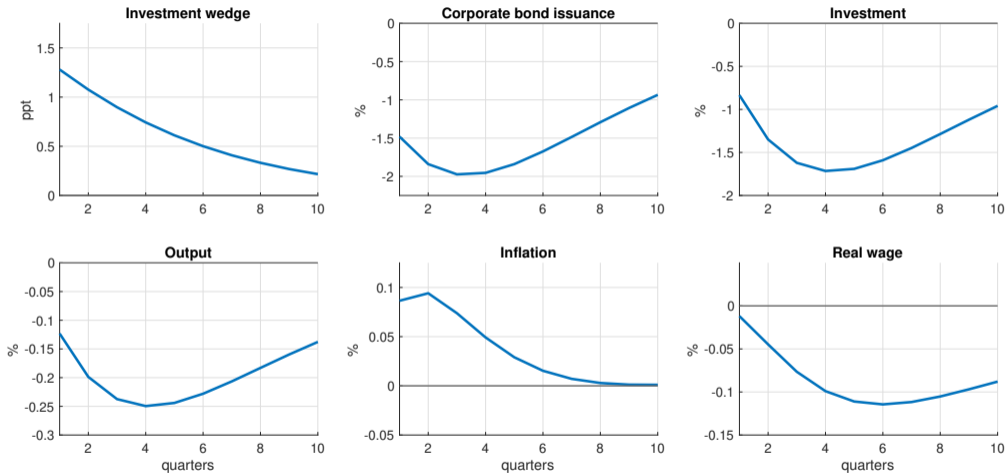


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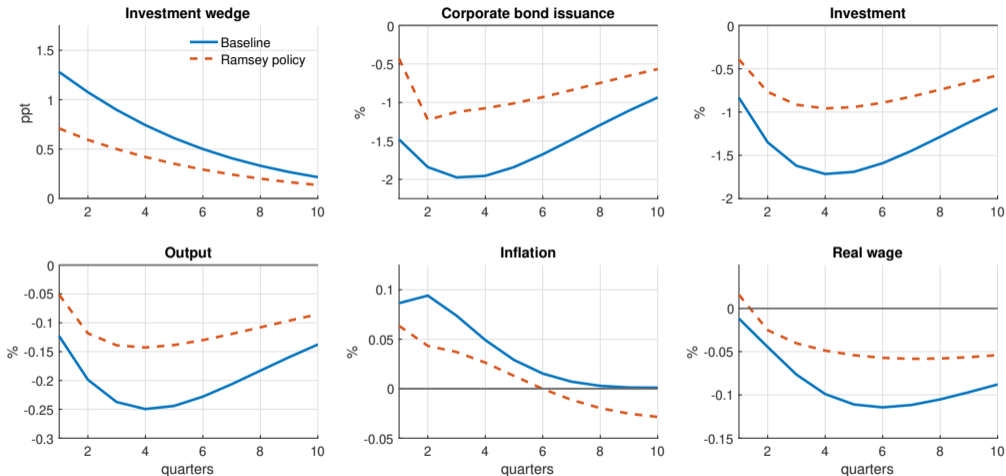
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- **Policy:** **Interest rate** can stabilize the spread

Optimal Policy: Ramsey vs. Simple Rule

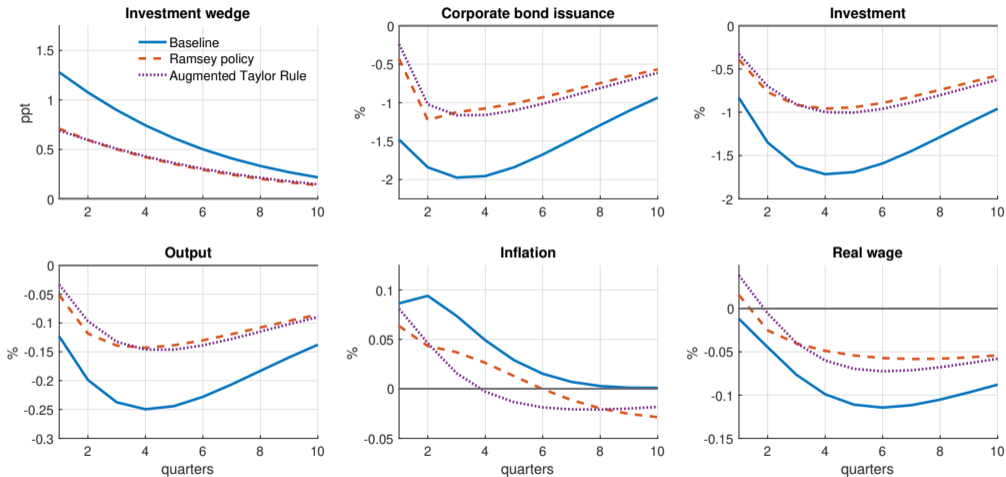


Optimal Policy: Ramsey vs. Simple Rule



(!) Full stabilization not optimal \longleftrightarrow amplifies NK distortions

Optimal Policy: Ramsey vs. Simple Rule

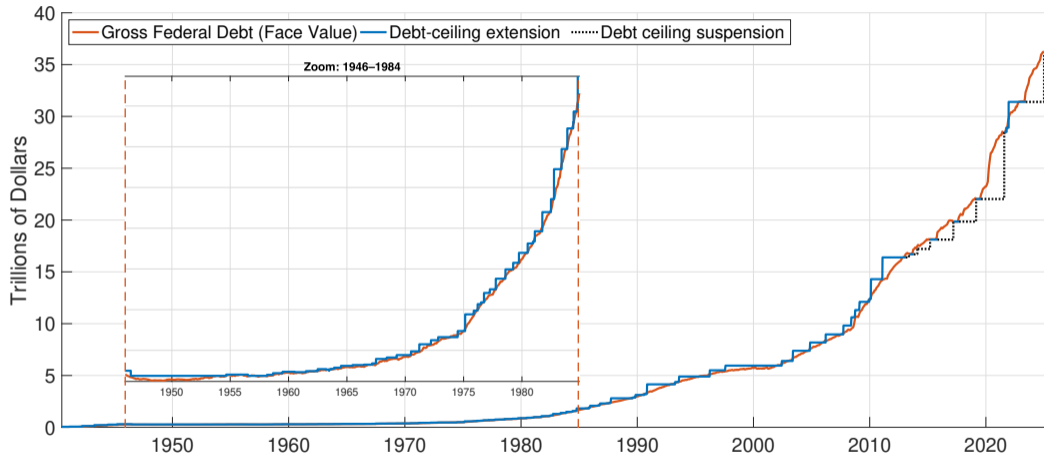


Result: Augmented Taylor rule responding to **govt bond returns** \approx Ramsey

Thank you!

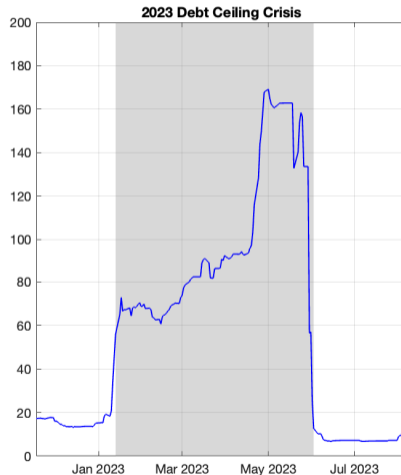
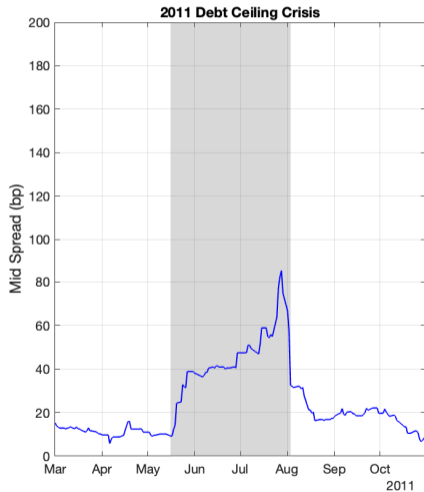
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Historical Debt Ceiling Revisions



Debt-Ceiling Episodes and U.S. Sovereign CDS

U.S. 1YR Credit Default Swaps



Granger Causality Test

Variables	<i>p</i> -value
Level of the yield curve	0.7839
Marketable Treasury debt	0.8857
Stock market index	0.2111
Corporate bond return index	0.8725
Industrial production	0.8045
Consumer price index	0.7416
Weekly hours	0.6718
Wages and salaries	0.7740
Joint	0.6677

Correlation with Other Shocks

Surprise/Shock/Index	Source	Corr.	<i>p</i>-val
Carbon policy shocks	Känzig (2021)	-0.010	0.880
Oil supply news shocks	Känzig (2023)	-0.061	0.199
Debt supply shocks	Phillot (2025)	-0.023	0.710
Debt ceiling EPU	Baker et al. (2016)	0.070	0.150
Geopolitical risk	Caldara & Iacovello (2022)	-0.066	0.175
Partisan conflict index	Azzimonti (2018)	-0.008	0.872
MP surprises (MAR)	Miranda-Agrippino & Ricco (2021)	0.048	0.470
MP surprises (BS)	Bauer & Swanson (2023)	0.034	0.506
MP surprises (RR)	Romer & Romer (2004) (ext.)	-0.076	0.188

- **Internal SVAR-IV:** Augment VAR(p) with instrument z_t and order it first

$$\begin{bmatrix} z_t \\ \bar{y}_t' \end{bmatrix} = y_t = b + B_1 y_{t-1} + \dots + B_p y_{t-p} + u_t, \quad u_t \sim (0, \Sigma)$$

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- **Goal:** Recover the structural impact vector s_1 identifying the **sovereign risk shock** $\epsilon_{1,t}$

$$u_t = \begin{bmatrix} s_1 & S_{2:n} \end{bmatrix} \epsilon_t, \quad \epsilon_t \sim (0, I)$$

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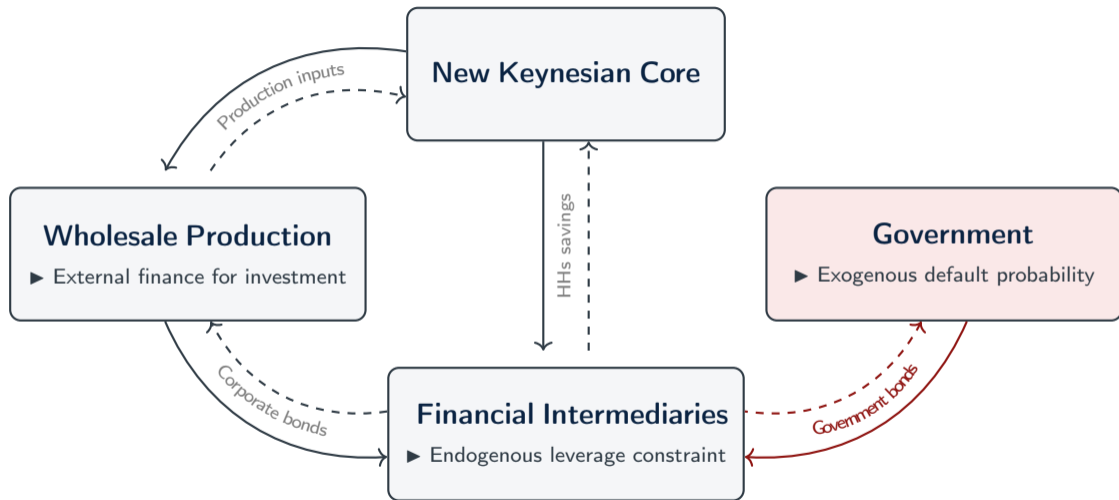
- ▶ Plagborg-Møller and Wolf (2021):

$$s_1 \propto [\text{chol}(\Sigma)]_{\cdot,1}$$

Baseline Specification

- **Variables (8):**
 - **Financial:** Yield curve level, Treasury debt market value, equity and corporate bond indices
 - **Macro:** Industrial production, CPI, aggregate weekly hours, wages and salaries
- **Sample:** 1982M05 – 2019M12
 - Extended to 2023M08 for robustness
- **Lag order:** 6 lags
 - Robust to alternative lag lengths

Model Summary



Financial Intermediaries

- Borrow deposits from households and extend long-term credit to firms and government

$$\underbrace{Q_t f_t}_{\text{corporate bonds}} + \underbrace{Q_{B,t} b_t}_{\text{govt bonds}} = \underbrace{d_t}_{\text{deposits}} + \underbrace{n_t}_{\text{net worth}} \quad (\text{Balance sheet})$$

$$n_{t+1} \Pi_{t+1} = R_{t+1}^F \cdot Q_t f_t + R_{t+1}^B \cdot Q_{B,t} b_t - R_t^d \cdot d_t \quad (\text{Net worth accumulation})$$

- Leverage subject to **enforcement constraint**

$$V_t \geq \theta (Q_t f_t + Q_{B,t} b_t)$$

leads to **excess returns** on long-term bonds $i \in \{B, F\}$

$$\mathbb{E}_t \tilde{\Lambda}_{t,t+1} (R_{t+1}^i - R_t^d) \Pi_{t+1}^{-1} = \frac{\lambda_t}{1 + \lambda_t} \theta \quad (\text{No-arbitrage})$$

Wholesale Firms

- Accumulate capital K_t and hire labor $L_{d,t}$ to produce wholesale output:

$$Y_{m,t} = K_t^\alpha L_{d,t}^{1-\alpha}$$

- Loan-in-advance constraint:**

$$\underbrace{p_t^k \cdot \hat{I}_t}_{\substack{\text{Investment} \\ \text{(price} \times \text{ qty)}}} \leq \underbrace{Q_t \cdot cf_t}_{\substack{\text{net bond issuance} \\ \text{(price} \times \text{ qty)}}$$

- Optimal capital accumulation with **loan-in-advance constraint**:

$$p_t^k M_{1,t} = \mathbb{E}_t \Lambda_{t,t+1} [R_{t+1}^K + p_{t+1}^k M_{1,t+1}]$$

where $M_{1,t}$ is an **investment wedge**: $M_{1,t} \uparrow$ leads to $\hat{I}_t \downarrow$

- Subject to **binding statutory limit** → fixed supply of government debt
- Expected return on debt subject to **exogenous default risk** (e.g., debt ceiling standoff)

$$R_t^B = \begin{cases} \tilde{R}_t^B & \text{with probability } 1-p_t^D & (\tilde{R}_t^B = \text{risk-free return}) \\ \tilde{R}_t^B \cdot (1-D) & \text{with probability } p_t^D & (\text{default on fraction } D) \end{cases}$$

- **Sovereign risk shock** modeled as a shock to probability p_t^D

$$p_t^D = (1 - \rho^D) p^D + \rho^D p_{t-1}^D + \varepsilon_t^D$$

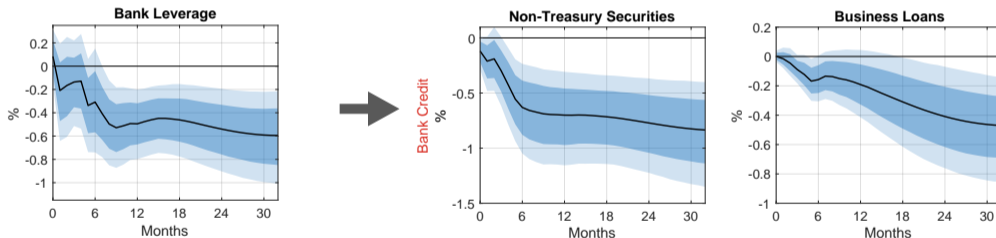
Augmented Taylor Rule

- Planner limits **pass-through of sovereign risk** by stabilizing investment wedge $\hat{M}_{1,t}$
 - (!) Full stabilization not optimal \leftrightarrow amplifies NK distortions
- **Question:** How well can a **simple interest rule** approximate Ramsey?
- Consider an **augmented Taylor rule** responding to **government bond returns**

$$\ln R_t^d = (1 - \rho_r) \ln R^d + \rho_r \ln R_{t-1}^d + (1 - \rho_r) \left[\phi_\pi \ln \left(\frac{\Pi_t}{\bar{\Pi}} \right) + \phi_y \ln \left(\frac{Y_t}{\bar{Y}} \right) + \phi_B \ln \left(\frac{R_t^B}{R^B} \right) \right] + \varepsilon_{r,t}$$

Propagation: Banking Sector

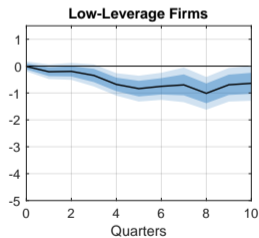
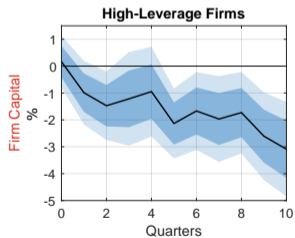
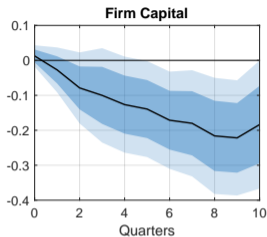
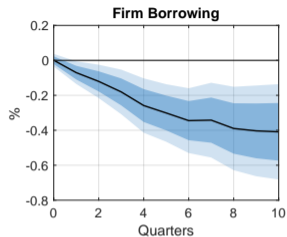
- **Empirical Fact:** Banks hold large quantities of sovereign debt (US: \sim \$4.4tn in 2025Q1)
 - ▶ Revaluation of government bonds can affect **bank capital** and **lending capacity**



Notes: Shaded areas are 68% and 90% confidence bands

- Banks deleverage mainly via **non-Treasury assets sales** and tighter credit to firms [back](#)

Propagation: Production Sector



Notes: Shaded areas are 68% and 90% confidence bands

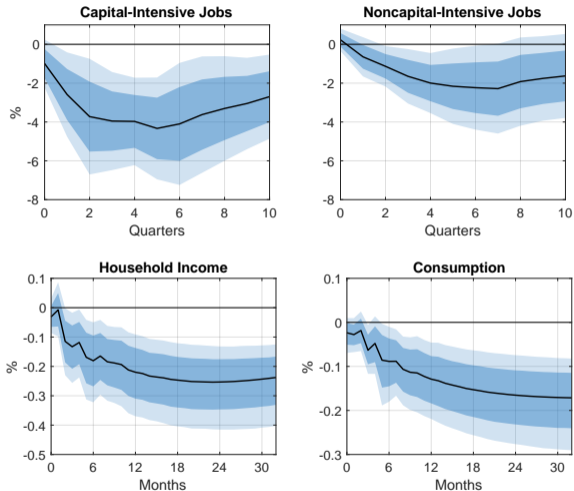
Aggregate-Level Responses

- Persistent decline in **borrowing**
- Slower **capital accumulation**

Firm-Level Responses

- **High leverage** firms invest $\sim 3\times$ less
- **Financing needs** amplify shock propagation

Propagation: Household Sector



Notes: Shaded areas are 68% and 90% confidence bands

Job Openings

- \downarrow Investment \Rightarrow \downarrow Hiring decisions
- **Capital-intensive** jobs most affected

Disposable Income & Spending

- Persistent drop in **income**
- Strong decline in **consumption**