

Brothers in Arms

Monetary–Fiscal Interactions Without Ricardian Equivalence

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North London Forever

Current policy issues

- ▶ 2021–2023 inflation surge. How much was driven by pandemic-era fiscal transfers — what role did monetary policy play?
- ▶ UK, September 2022. Why did an *unfunded* fiscal package trigger a gilt sell-off severe enough to force emergency BoE intervention?
- ▶ Defence build-up. Debt-financed military spending is coming. How should central banks respond to the inflationary pressure?
- ▶ Geopolitics. Cost-push shocks are more likely.

Common thread

Each turns on the **interaction** between monetary and fiscal policy — and on whether **government debt matters for aggregate demand**.

Key issue: Ricardian Equivalence

The monetary economics literature has given us:

- ▶ the Taylor principle;
- ▶ the active vs. passive policy dichotomy.

But it almost always imposes **Ricardian Equivalence**.

The evidence (surveys, MPC estimates, aggregate data) says otherwise.

If Ricardian Equivalence fails...

Aggregate demand depends *directly* on government debt. What happens to the familiar policy concepts?

HANK can address this...

...but is typically too rich for *analytical* answers that let us see the mechanisms.

This paper

Approach

A standard New Keynesian economy with nominal government debt, plus a **Blanchard–Yaari perpetual-youth** household block — a tractable shortcut for incomplete markets. We call it **HANK-OLG**.

Finite horizons \Rightarrow non-trivial MPCs out of wealth & **government debt is net wealth**.

We deliver, analytically:

- ▶ the full **determinacy boundary**;
- ▶ closed-form **equilibrium dynamics**;

And we show robustness: the results survive many extensions and a full **medium-scale model with capital**.

Key results

1. **Taylor principle** neither necessary nor sufficient; active/passive gone.
2. Transitory shocks have **persistent**, *policy-dependent* effects.
3. **Deficits are inflationary**, persistently.
4. **Hawkish** monetary policy tames deficit-inflation *only* if debt is long-term.
5. **Debt maturity** reshapes impact and can flip the sign of monetary policy.

The environment

Households (Blanchard–Yaari):

- ▶ survival probability q ; mass $1 - q$ newborns each period;
- ▶ actuarially fair life insurance + a social fund redistributes to newborns \Rightarrow steady-state $(1 + \bar{r}) = 1/\beta$ as in RANK;
- ▶ save in nominal bonds.

Supply side: standard New Keynesian (Calvo) Phillips curve.

Policy: simple feedback rules for the nominal rate and the primary surplus. The government issues **nominal** government debt, which may be **one-period** ($\xi = 0$) or **long-term** ($\xi > 0$).

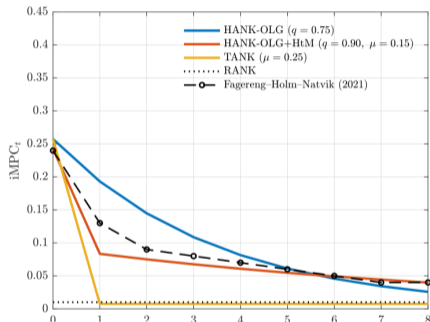
The household problem and the consumption function

Cohort s Euler equation and consumption function:

$$\frac{1}{c_{s,t}} = \beta \mathbb{E}_t \left[\frac{1}{c_{s,t+1}} \frac{1+i_t}{\pi_{t+1}} \right],$$

$$c_{s,t} = (1 - \beta q) \left[\underbrace{v_{s,t-1}}_{\text{net wealth, incl. debt}} + \mathbb{E}_t \sum_{j \geq 0} R_{t,t+j} \tilde{y}_{s,t+j} \right].$$

- ▶ MPC = $1 - \beta q > 1 - \beta$ (the RANK level).
- ▶ Future income discounted at $1/(\beta q) > 1/\beta \Rightarrow$ government debt is net wealth.



Intertemporal MPCs: $iMPC_t = q^t(1 - \beta q)$

decays smoothly, matching

Fagereng-Holm-Natvik (2021).

Aggregate Euler equation

Aggregating across cohorts gives an **aggregate Euler equation**:

$$1 = \beta \mathbb{E}_t \left[\frac{c_t}{c_{t+1}} + \chi \left(\frac{v_t}{\Pi_{t+1}} - v_{ss} \right) \right] \frac{1 + i_t}{\Pi_{t+1}}$$

where $\chi = \frac{(1-q)(1-q\beta)}{q} \geq 0$ is the **non-Ricardian wedge** ($\chi = 0$ recovers RANK).

- ▶ When $\chi > 0$: **real government debt drives consumption growth**.
- ▶ Wealth is *nominal*: **expected inflation revalues debt**.

Policy implication

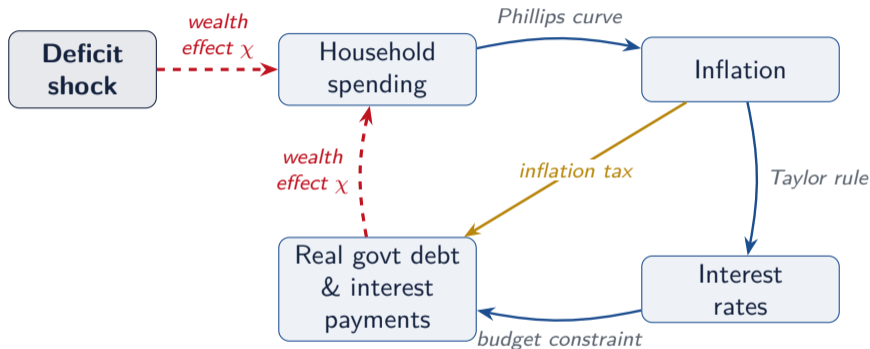
The model has a built-in **fiscal channel of demand** that is entirely absent under Ricardian Equivalence — and it operates through debt *and* the inflation tax on debt.

The log-linear system

$$\begin{aligned}\hat{y}_t &= \mathbb{E}_t \hat{y}_{t+1} - \hat{i}_t + \chi \hat{v}_t + (1 - \chi\gamma) \mathbb{E}_t \hat{\pi}_{t+1} && \text{(aggregate Euler)} \\ \hat{\pi}_t &= \beta \mathbb{E}_t \hat{\pi}_{t+1} + \kappa \hat{y}_t + e_t^{cp} && \text{(NK Phillips curve)} \\ \hat{v}_t &= \frac{1}{\beta} (\hat{v}_{t-1} - \hat{s}_t) + \gamma (\hat{i}_t - \frac{1}{\beta} \hat{i}_{t-1}) + \frac{\gamma}{\beta} (\xi\beta \hat{p}_t^n - \hat{p}_{t-1}^n - \hat{\pi}_t) && \text{(govt budget)} \\ \hat{s}_t &= \alpha_v \hat{v}_{t-1} + (1 - \alpha_v) \tilde{e}_t^s && \text{(surplus rule)} \\ \hat{i}_t &= \phi_\pi \hat{\pi}_t + e_t^i && \text{(Taylor rule)} \\ \hat{i}_t &= \xi\beta \mathbb{E}_t \hat{p}_{t+1}^n - \hat{p}_t^n && \text{(short/long arbitrage)}\end{aligned}$$

- ▶ γ = steady-state debt/GDP; κ = Phillips-curve slope; ξ = debt duration.
- ▶ The non-Ricardian terms are governed by χ and $\chi\gamma$.

The mechanism: a feedback loop closed by wealth

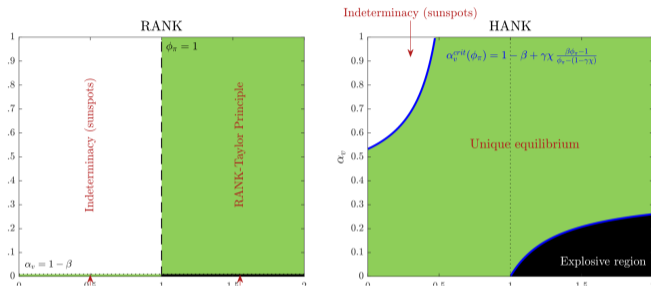


Missing in RANK

With $\chi = 0$ the red links vanish: debt and deficits do not affect demand, the loop is broken, and transitory shocks leave *no persistent footprint*.

Determinacy in HANK-OLG

(Proposition 1)



Left: RANK. Right: HANK-OLG ($q = 0.75$, debt/GDP = 100%).

$$\alpha_v^{\text{crit}}(\phi_\pi) = 1 - \beta + \frac{\gamma\chi(\beta\phi_\pi - 1)}{\phi_\pi - 1 + \gamma\chi},$$

with a pivot at $\phi_\pi = 1 - \gamma\chi$.

- ▶ **Green:** unique equilibrium.
- ▶ **White:** indeterminacy.
- ▶ **Black:** no stable equilibrium (debt/inflation spiral).

The economics: monetary and fiscal policy work together

When $\phi_\pi < 1$: *fiscal tightening* helps depress demand and eliminate sunspots.

When $\phi_\pi > 1$: Fiscal authority must be sufficiently responsive to debt to avoid debt-inflation spirals.

- ▶ There are **always** fiscal aspects of monetary policy, and monetary aspects of fiscal policy.
- ▶ Monetary reform *cannot* be undertaken without considering the fiscal framework — and conversely.

Policy implication

The **Taylor principle** is **neither necessary nor sufficient**. The relevant risk shifts from *indeterminacy* to **explosive debt** — a fiscal, not a sunspot, problem.

A new property: persistence from transitory shocks

The solution is $Z_t = P Z_{t-1} + Q \varepsilon_t$ with $Z_t = (\hat{v}_t, \hat{\pi}_t, \hat{y}_t)'$.

Proposition 7: P has rank one

$$P = \begin{pmatrix} \lambda & 0 & 0 \\ \chi_\pi & 0 & 0 \\ \chi_y & 0 & 0 \end{pmatrix}$$

Government debt is the **only state variable**.

- ▶ χ_y and χ_π analytical, depend on λ and ϕ_π .
- ▶ RANK-TP, $\chi_\pi = \chi_y = 0$: debt is a state only for itself.
- ▶ *In HANK-OLG it introduces persistent impact on output, inflation, interest rates.*
- ▶ Persistence λ is the stable root — set jointly by $\phi_\pi, \alpha_v, \chi, \gamma, \kappa$.

Persistence is a policy choice

Approximately,

$$\lambda \approx \frac{1 - \alpha_v}{\beta} \left[1 + \underbrace{\chi}_{\text{debt} \rightarrow \text{demand}} \cdot \underbrace{\kappa}_{\text{demand} \rightarrow \pi} \cdot \underbrace{\gamma(\phi_\pi - \frac{1}{\beta})}_{\pi \rightarrow \text{debt}} \frac{1}{G(\phi_\pi)} \right]$$

Proposition 8

Debt persistence *rises* with central-bank hawkishness: $\frac{d\lambda}{d\phi_\pi} > 0$.

Policy implication

A more hawkish stance raises interest payments, slows debt stabilisation, and makes the demand expansion **smaller but more persistent**. Policy faces a **trade-off between impact and propagation**.

Why long-term debt matters — and for what

Why. Real-world debt is long (US average maturity ≈ 6 years).

$$\hat{p}_t^n = - \sum_{j \geq 0} (\xi\beta)^j \mathbb{E}_t \hat{i}_{t+j}.$$

In HANK-OLG short rates move **persistently**, so shocks generate large **capital gains and losses** on household bond portfolios — a wealth channel that is *absent under one-period debt*.

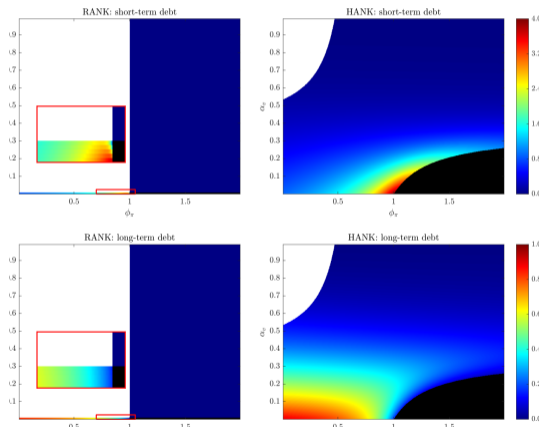
For what. Maturity is *neutral* for some objects, *decisive* for others:

- ▶ **Determinacy** — invariant to ξ .
- ▶ **Persistence** — invariant to ξ .
- ▶ **Impact responses** — rescaled by one statistic $F \in (0, 1]$.

So maturity decides whether:

- ▶ hawkish mp **tames** deficits or not;
- ▶ monetary easing is **inflationary**;
- ▶ fiscal announcements trigger **long-bond sell-offs**.

Deficits are inflationary — everywhere



RANK: deficits are neutral under the Taylor principle, inflationary in FTPL corner.

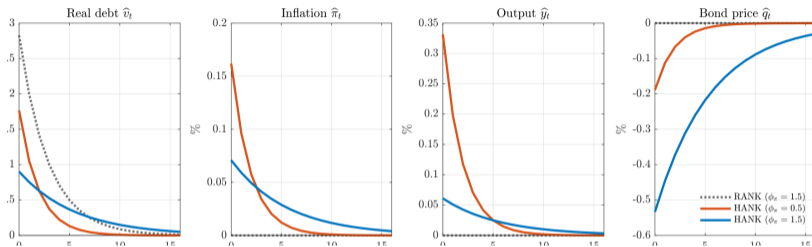
HANK-OLG: deficits are **inflationary everywhere** — the direct non-Ricardian demand stimulus.

Role of debt maturity

A *more hawkish* stance **worsens** inflation when debt is *short-term*, but **dampens** it when debt is *long-term*.

Cumulative 4-quarter inflation after a 1%-of-GDP deficit.

Hawkish monetary policy with long-term debt

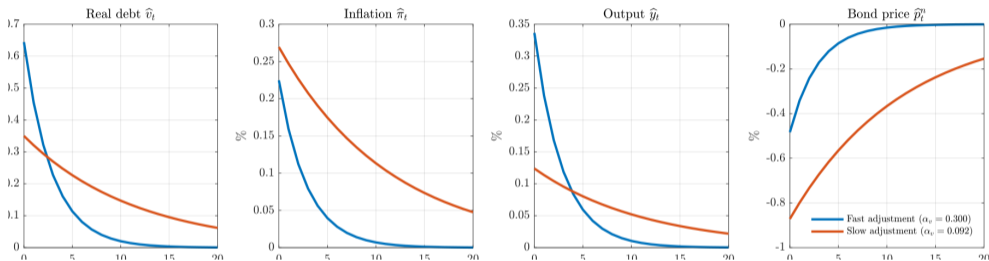


IRFs to a 1% deficit, 6-year debt, $\alpha_v = 0.3$. Grey: RANK ($\phi_\pi = 1.5$). Red: HANK ($\phi_\pi = 0.5$). Blue: HANK ($\phi_\pi = 1.5$).

Policy implication

With empirically relevant maturity, hawkish monetary policy stabilises deficit-driven inflation: a hawkish stance triggers a large fall in long-bond prices.

The horizon of financing: a Covid lens



Same 1%-of-GDP impact stimulus, financed fast (half-life 2q, blue) vs. slow (half-life 8q, red). $\phi_\pi = 1/\beta$.

Policy implication

Deficits financed over **longer horizons can be more inflationary** — *with no change in the monetary stance*. An alternative reading of the Covid-19 transfers.

Monetary policy shocks in RANK

RANK + Taylor principle

A rate cut lowers the real rate \Rightarrow **intertemporal substitution** \Rightarrow demand and inflation rise.

Conventional: easing is **inflationary**. Debt is irrelevant for demand (Ricardian).

RANK-FTPL

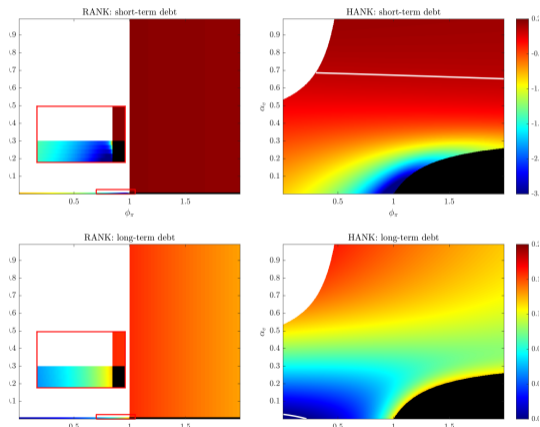
Price level moves to clear the budget constraint, $v = PV(\text{surpluses})$. A rate cut \Rightarrow *lower* price level.

Unconventional: easing is **deflationary**.

Bridge

HANK-OLG with *short-term* debt inherits the FTPL-like sign. Does it survive once debt is *long-term*? \rightarrow next slide.

Monetary policy shocks in HANK-OLG



Short-term debt: a rate *cut* \Rightarrow demand can *fall*. Easing is **deflationary**.

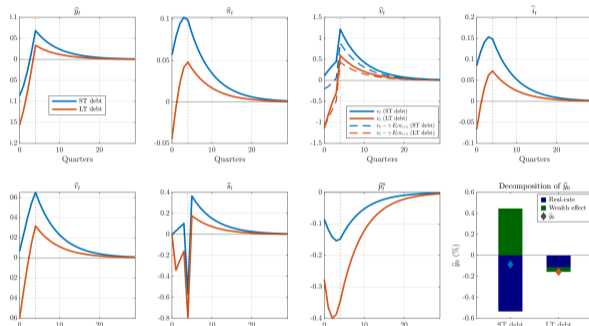
Long-term debt: the cash-flow channel shrinks ($\times(1 - \xi)$) and easing delivers **capital gains** on long bonds.

Policy implication

Long-term debt **restores orthodox monetary transmission**.

Cumulative 4-quarter inflation after a 1pp rate *cut*. Top:

Prospective deficits: the Truss 2022 experiment



Deficit announced 1 year ahead. Blue: short-term debt; red: long-term debt. Last panel decomposes the impact output response.

Inflation **jumps up on announcement**. Output *falls* — higher inflation and **capital losses** erode private wealth and reduce demand.

Policy implication

Pre-announced unfunded deficit is **stagflationary pre-implementation** and triggers an immediate **long-bond sell-off** — consistent with the counterproductive UK “mini-budget” of Sept. 2022.

Summary of policy implications

1. **Forget active/passive.** Policies work together to avoid sunspots but **debt-inflation spirals** can be concern.
2. **Hawkishness has a fiscal cost.** It can reduce inflation but requires *long-term debt*.
3. **Deficits are inflationary** — and *slow-financed* deficits more so.
4. **Maturity is a policy variable.** It governs the revaluation channel, the sign of monetary transmission, and the cost of fiscal announcements.
5. **Announcements bite immediately** — forward-looking inflation and long-bond repricing (the Truss lesson).

Policy implication

Monetary and fiscal authorities are **brothers in arms**.

Conclusion

- ▶ Once government debt is **net wealth**, a **two-way interdependence** between monetary and fiscal policy emerges.
- ▶ We characterise it **in closed form**: the determinacy boundary, the propagation matrices, and the maturity sufficient statistic F .
- ▶ Transitory shocks have **endogenously persistent** effects — a trade-off between stabilising impact and shaping propagation.
- ▶ **Long-term debt** is a first-order ingredient: it restores the conventional effects of monetary policy.

Open question

What do these mechanisms imply for the **design of optimal** monetary and fiscal policy?
(Future work.)

Thank you. ■ Comments welcome.

Backup slides

Extra results, derivations, and figures

Backup: where we sit in the literature

- ▶ FTPL / determinacy: Sargent–Wallace (1981), Leeper (1991), Woodford, Cochrane, Bassetto, Bigio–Caramp–Silva. We derive the *full* boundary in closed form.
- ▶ Perpetual-youth HANK: Angeletos–Lian–Wolf (self-financing deficits; HANK \equiv FTPL with a real-rate peg); Richter (2015) (fiscal limits); Dupraz–Rogantini Picco (2025) (debt limits). We add a unified characterisation + the persistence–impact trade-off.
- ▶ HANK monetary–fiscal: Kaplan–Moll–Violante, Bayer–Born–Luetticke, Auclert–Rognlie–Straub, Wolf, Kaplan. We provide the analytics behind their numerical findings (e.g. duration \equiv single statistic F).
- ▶ Empirics of fiscal inflation: Bianchi–Faccini–Melosi, Barro–Bianchi (up to 80% of 2020–23 OECD expansions inflation-financed). Our framework helps discipline such inferences.

Backup: RANK benchmark — a clean dichotomy

With $\chi = 0$, the characteristic roots *separate*:

- ▶ one root depends only on **fiscal policy** (α_v);
- ▶ two depend only on **macro dynamics / monetary policy** (ϕ_π).

⇒ the textbook map: **active money + passive fiscal** (Taylor principle) *or* **passive money + active fiscal** (FTPL). Two disconnected regions.

What we ask

What happens to this map once government debt is *net wealth* ($\chi > 0$)?

Backup: what the determinacy boundary tells us

1. One connected determinacy region (RANK-TP and RANK-FTPL merge).
2. Determinacy is possible **even when $\phi_\pi < 1$** (Taylor principle violated).
3. **Policies are interdependent**: α_v threshold depends on ϕ_π , and vice versa.
4. Very hawkish $\phi_\pi > 1/\beta$: **non-existence is pervasive** — fiscal must adjust more.

Backup: calibrating the non-Ricardian channel

What pins down χ

$$\chi = \frac{(1-q)(1-q\beta)}{q}, \quad \text{MPC} = 1 - q\beta.$$

Baseline $q = 0.75 \Rightarrow \text{MPC} \approx 0.26$, $\chi \approx 0.086$,
and at debt/GDP = 100% ($\gamma = 4$) the wedge
 $\gamma\chi \approx 0.30$.

- ▶ Targets the iMPC evidence (Kaplan–Moll–Violante; Parker et al.).
- ▶ Appendix A.1: partial-equilibrium iMPCs match the data well.

Regularity conditions (Prop. 1)

1. $\gamma\chi < 1$ — non-Ricardian effect not too large (rules out -1 as a root). Easily met (≈ 0.3).
2. A complex-pair condition; can fail only if the Phillips curve is *extremely* flat. A refinement rules out oscillatory equilibria.

Backup: heuristic derivation of α_v^{crit}

Iterate the Euler equation forward; output in the long run obeys

$$\hat{y}_{t+j} = \underbrace{\mathbb{E}_t \hat{y}_{t+j+1}}_{\text{Keynesian cross}} - \underbrace{(\hat{i} - \mathbb{E}_t \hat{\pi})}_{\text{intertemp. subst.}} + \underbrace{\chi\gamma(\hat{i} - \mathbb{E}_t \hat{\pi})}_{\text{real-rate} \rightarrow \text{wealth}} - \underbrace{\frac{\chi\gamma}{\beta} \hat{\pi}}_{\text{inflation} \rightarrow \text{wealth}} + \underbrace{\chi\gamma \sum_s \left(\frac{1-\alpha_v}{\beta}\right)^s (\phi_\pi - \frac{1}{\beta}) \hat{\pi}}_{\text{inflation-tax rebate}}$$

- ▶ $\phi_\pi < 1$: the inflation-tax rebate dominates; endogenous fiscal tightening after a sunspot pins down a unique equilibrium.
- ▶ $\phi_\pi > 1$: shocks raise debt and loosen fiscal policy; existence requires the fiscal authority to rebate *less* of the loosening.

Setting the convergent path internally consistent yields $\alpha_v^{\text{crit}}(\phi_\pi)$ of Prop. 1.

Backup: strength of the non-Ricardian channel

Corollary 1 — comparative statics in $\gamma\chi$

$$\frac{\partial \alpha_v^{\text{crit}}}{\partial(\gamma\chi)} \begin{cases} > 0 & \phi_\pi > 1/\beta \\ < 0 & 1 < \phi_\pi < 1/\beta \\ > 0 & \phi_\pi < 1 \end{cases}$$

- ▶ Higher debt levels and stronger financial frictions **amplify** the consequences of failing Ricardian Equivalence.
- ▶ The non-Ricardian shift in the boundary is largest exactly where debt is high — a state many economies are now in.

Backup: the determinacy results are robust

The closed-form boundary $\alpha_v^{\text{crit}}(\phi_\pi)$ — and “the Taylor principle is neither necessary nor sufficient” — survives every extension we have tried, each solved **analytically** (propositions in the paper):

1. Output in the interest-rate rule — ϕ_π is replaced by an effective coefficient ϕ_π^{eff} .
2. Targeting expected inflation — same boundary, plus an upper bound on ϕ_π .
3. Automatic stabilisers in the fiscal rule — the indeterminacy and explosive regions both shrink.
4. Long-term debt — determinacy is *invariant* to maturity ξ .
5. Hand-to-mouth households — act like a higher debt ratio, $\tilde{\gamma} \geq \gamma$.

Backup: determinacy extensions (all closed-form)

The boundary is robust

- ▶ Output in the Taylor rule (Prop. 2): replace ϕ_π by $\phi_\pi^{\text{eff}} = \phi_\pi + \phi_y(1 - \beta)/\kappa$. Inconsequential.
- ▶ Expected-inflation rule (Prop. 3): same boundary, plus a Bullard–Mitra-type upper bound on ϕ_π .
- ▶ Automatic stabilisers $\alpha_y > 0$ (Prop. 4): both the indeterminacy *and* the explosive regions shrink.
- ▶ Hand-to-mouth share μ (Prop. 5): acts like a higher debt ratio, $\tilde{\gamma} \geq \gamma$ — equivalent to raising γ .
- ▶ Long-term debt (Prop. 6): determinacy is *invariant* to maturity ξ (arbitrage equalises expected returns).

In every case: **the Taylor principle is neither necessary nor sufficient.**

Backup: the impact matrix decomposition

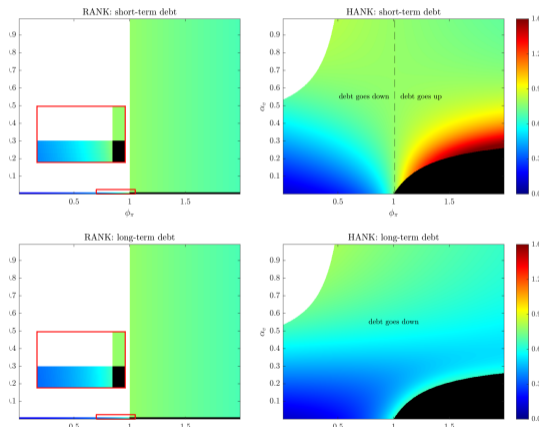
$$Q = \underbrace{Q^{\text{RANK}}}_{\text{intertemporal substitution}} + \underbrace{Q^{\text{non-Ric}}}_{\text{wealth channel}}, \quad Q^{\text{non-Ric}} = \frac{1}{\lambda_0} \begin{pmatrix} \lambda - \lambda_0 \\ \chi_\pi \\ \chi_y \end{pmatrix} (-\lambda_0, Q_i, Q_{cp})$$

- ▶ $Q^{\text{non-Ric}}$ is the *outer product* of (i) how each shock hits debt and (ii) how predetermined debt propagates to π, y .
- ▶ $\lambda - \lambda_0$ is the *extra* persistence over the RANK rate $\lambda_0 = (1 - \alpha_v)/\beta$.
- ▶ Even in RANK, monetary shocks always raise debt; cost-push shocks *lower* debt if money looks through, *raise* it if money is aggressive.

Why it matters

The decomposition isolates the **wealth-channel mechanism** explicitly — it can reinforce or oppose intertemporal substitution.

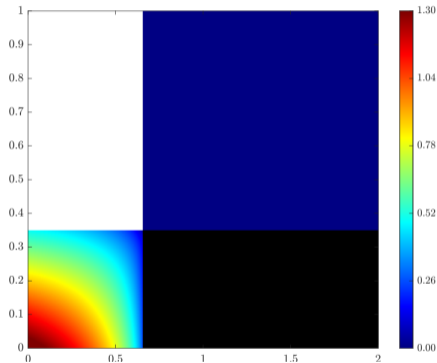
Backup: cost-push shocks



Cumulative 4-quarter inflation after a 1% cost-push

- ▶ Short-term debt: debt *rises* if $\phi_\pi > 1/\beta$, *falls* otherwise.
- ▶ Long-term debt shifts the threshold to $\frac{1}{\beta} \cdot \frac{1}{1-\xi}$: cost-push shocks devalue debt over a **much larger** region.
- ▶ Through the wealth channel this makes cost-push shocks **less inflationary** than in RANK across the policy space shown.

Backup: should the central bank target debt?



Determinacy + 4-quarter deficit-inflation with debt in the Taylor rule ($\phi_v = \chi$, 6-year debt).

Add $\phi_v \hat{v}_t$ to the rule. Setting $\phi_v = \chi$ *neutralises* the non-Ricardian demand effect of debt.

But there is no free lunch

Responding to debt raises the fiscal authority's interest costs when debt rises, so the requirement for stability becomes **more demanding**:

$$\alpha_v > 1 - (1 - \gamma\chi)\beta = \lim_{\phi_\pi \rightarrow \infty} \alpha_v^{\text{crit}}(\phi_\pi).$$

The non-existence (explosive) region **expands** sharply.

Backup: long-term debt — the revaluation channel

Maturity works through two channels:

1. Cash-flow channel — attenuated.

Only a fraction of bonds reprice when the short rate moves, so the interest-payment channel scales by $(1 - \xi)$.

2. Asset-price channel.

Once $\chi > 0$ the short rate moves persistently, so bondholders face **capital gains/losses**:

$$\hat{p}_t^n = -\sum_{j \geq 0} (\xi\beta)^j \mathbb{E}_t \hat{v}_{t+j}.$$

Prop. 9: one sufficient statistic

$$F = \frac{1}{1 + \frac{\beta\gamma\xi\phi_\pi\chi_\pi}{(1 - \alpha_v)(1 - \xi\beta\lambda)}} \in (0, 1]$$

scales *all* impact responses.

- ▶ $F = 1$ at $\xi = 0$; *decreasing* in maturity and persistence λ .
- ▶ $\partial F / \partial \phi_\pi < 0$: hawkish \Rightarrow more dampening.
- ▶ **Determinacy & persistence untouched.**

Backup: long-term debt impact coefficients

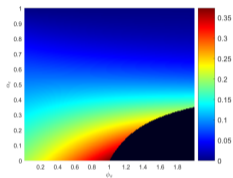
Proposition 9 — Q_{LT}

$$Q_i^{LT} = \frac{\gamma[(1 - \xi) + \kappa/\beta]}{1 + \kappa\phi_\pi}, \quad Q_{cp}^{LT} = \frac{\gamma[\phi_\pi(1 - \xi) - 1/\beta]}{1 + \kappa\phi_\pi}.$$

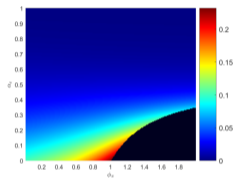
- ▶ Cash-flow channel is attenuated by $(1 - \xi)$: only a fraction of bonds reprice when the short rate moves.
- ▶ Asset-price channel enters through $F \in (0, 1]$, which is *strictly decreasing in persistence* λ — more persistent shocks \rightarrow larger revaluations \rightarrow stronger dampening.
- ▶ Determinacy and persistence (P_{LT}) are *independent* of ξ : maturity matters for *impact*, not propagation.

Backup: it survives a serious medium-scale model

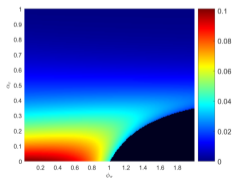
(a) Flexible Wages, No Capital, ST Debt



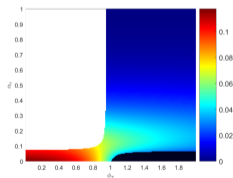
(b) Sticky Wages, No Capital, ST Debt



(c) Sticky Wages, No Capital, LT Debt



(d) Sticky Wages, Capital, LT Debt



4-quarter inflation after a 1% transfer, adding features

Adds capital, sticky wages, adjustment costs, rate smoothing, distortionary taxes, and government purchases; US calibration, 6-year debt.

What survives

- ▶ Analytical determinacy boundary (Prop. 10).
- ▶ Deficits inflationary everywhere.
- ▶ Hawkish money disinflates under long-term debt.
- ▶ Prospective deficits stagflationary.

Backup: medium-scale calibration

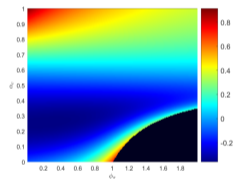
Households		Nominal rigidities	
β discount factor	$1.04^{-1/4}$	θ_p Calvo prices	0.75
\bar{n} steady hours	0.30	θ_w Calvo wages	0.75
$1/\nu$ Frisch elasticity	0.75	Technology	
$1 - q\beta$ MPC	25.7%	s_n output elast. to labour	0.65
Fiscal policy		ω_I adj.-cost elast.	10
\bar{g}/\bar{y} gov. spending	0.20	\bar{k}/\bar{y} capital-output	4
γ debt/GDP (quarterly)	5	Monetary policy	
debt duration	24q (6y)	ϕ_R rate smoothing	0.7
τ_y tax rate	0.25		

Calibrated to US debt level and maturity; capital is a *liquid* asset, $\bar{k}/\bar{y} = 4$ strikes a balance between fully liquid and fully illiquid capital.

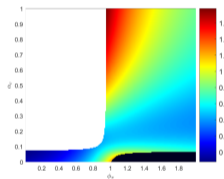
Backup: medium-scale monetary & anticipation results

Monetary easing (1pp cut)

(a) Sticky Wages, No Capital, LT Debt

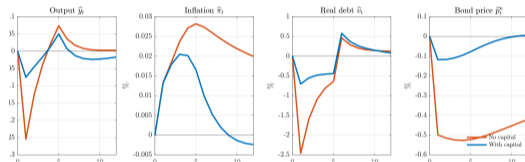


(b) Sticky Wages, Capital, LT Debt



(a) no capital, (b) capital. Easing is robustly inflationary once capital is included; non-monotone in hawkishness.

Pre-announced deficit (4q ahead)



Recessionary and inflationary *before* implementation;
long-bond prices drop on announcement. Holds
with/without capital.

The medium-scale model **preserves every headline result.**