Fiscal Backing and Heterogeneous Household Portfolios

Fangzhou Sha

Southern Methodist University

SMU Brown Bag

Motivation and research question

COVID-19

Large fiscal transfers, rising public debt, and the subsequent inflation surge.

Research question

When do fiscal deficits become inflationary,
and how do household portfolios shape the response?

Methodology

A stylized model and a quantitative two-asset HANK model.

Liquid assets and real capital with limited adjustment opportunities.

Compare funded and unfunded transfers and government purchases.

Contribution

Fiscal backing is central to fiscal inflation.

Recent HANK work

Household differences in marginal propensities to consume (MPCs).

This paper

Unbacked deficits generate much larger inflation and output responses than reallocating transfers across households with different MPCs.

Portfolio channel

Households can shift wealth between nominal assets and real capital.

Capital adjustment opportunities shape the response to fiscal backing.

Fiscal backing

Households maximize utility subject to a budget constraint

Consumption today + Saving for tomorrow

A debt-financed transfer today

Funded

Future taxes rise

↓

Lifetime resources unchanged

Consumption unchanged

(Ricardian benchmark)

Unfunded

No matching fiscal backing

↓

Price level ↑ Real bond wealth $\frac{B}{P}$ ↓

An implicit tax on bondholders

Household portfolios

Where to save?

Liquid government bonds

Fixed nominal payments

Inflation erodes purchasing power

Illiquid real capital

Real returns

Occasional trading opportunities

Desired reallocation

Only possible when capital can be traded

Most existing work: households save only in bonds

(Angeletos, Lian & Wolf (2026); Kaplan (2025); Kaplan, Nikolakoudis & Violante (2026))

Results overview

	Funded	Unfunded
Fiscal policy design	Effects depend on recipients and fiscal instrument	Effects depend mainly on the total deficit
More frequent capital adjustment	**Weaker response**	**Stronger response**
Where the transfer goes	Mostly additional liquid saving	Mostly consumption and capital purchases

Related literature

Fiscal backing and price-level determination
(Leeper, 1991; Sims, 1994; Woodford, 1995; Cochrane, 2023; Bianchi, Faccini & Melosi, 2023)

Fiscal policy with heterogeneous households
(Kaplan, Nikolakoudis & Violante, 2026; Angeletos, Lian & Wolf, 2026; Kaplan, 2025; Kwicklis, 2025; Kaplan & Miyahara, 2026)

Household portfolios and consumption
(Kaplan & Violante, 2014; Kaplan, Moll & Violante, 2018; Luetticke, 2021)

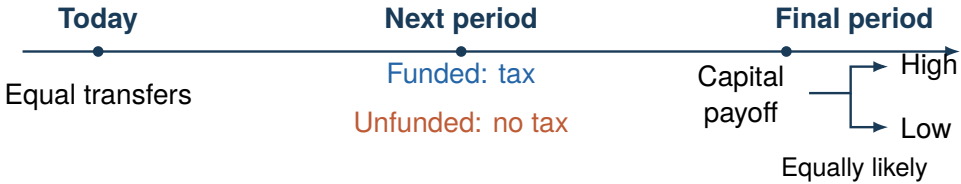
Asset liquidity and fiscal transmission
(Bayer, Born & Luetticke, 2023; Cantore & Leonardi, 2025; Hänsel, 2026)

Inflation and nominal wealth redistribution
(Doepke & Schneider, 2006; Auclert, 2019; Diamond, Landvoigt & Sánchez, 2025)

Toy model: setting

Endowment economy: equal-sized Low (L) and High (H) household types

Today's income and bond holdings: L $<$ H



Bonds
Safe

Always tradable

Capital
Risky

Occasionally tradable

Holdings of either asset cannot be negative.

Toy model: funded transfers

Transfer today → **Taxes tomorrow**

Frictionless benchmark:

lifetime resources and consumption unchanged

With liquidity frictions

L wants to borrow against future income, but cannot

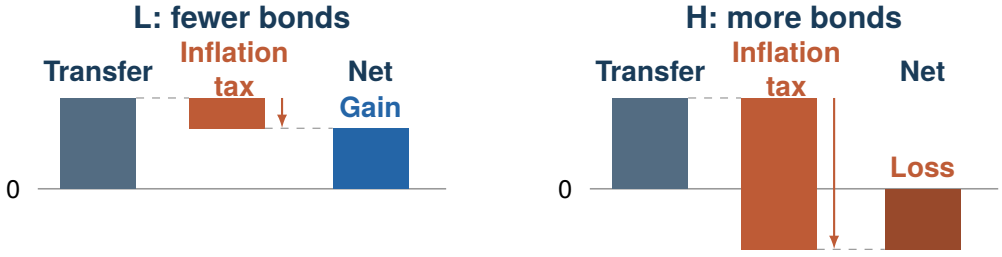
Capital locked	**Capital tradable**
No borrowing or capital sales	Capital sales already provide cash
Transfer finances consumption today	Transfer goes into liquid saving
↓	↓
Transfer raises L's consumption more	**Transfer raises L's consumption less**

Toy model: unfunded transfers

Government budget constraint

$$\text{Inherited nominal debt} \times \Delta\left(\frac{1}{P}\right) + \Delta\text{Transfer} = \underbrace{\Delta\text{PV}(\text{future taxes})}_{=0 \text{ at given real returns}}$$

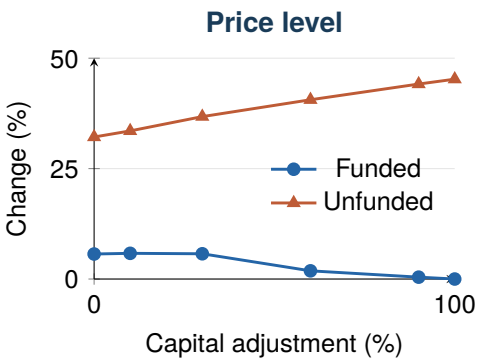
$$\Delta\textbf{Transfer} > 0 \longrightarrow \Delta P > 0 \longrightarrow \textbf{Inflation tax}$$

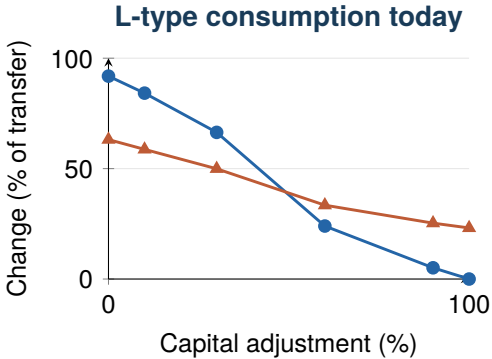


L's gain = H's loss

More resources for L: higher L-type consumption today

Toy model: prices and household consumption





Toy model and full model

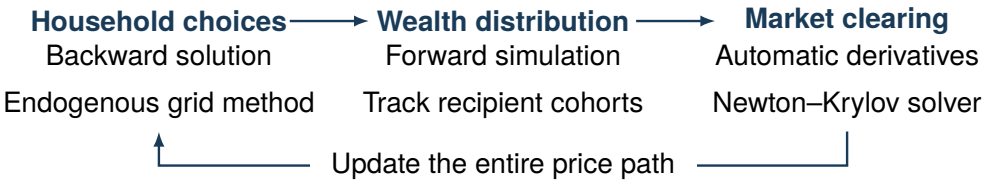
	Toy model	Full HANK model
Households	Two types	Workers and entrepreneurs Income and wealth heterogeneity
Resources	Fixed endowments	Production and investment
Prices	Flexible	Sticky prices and wages

Household responses can now change aggregate income.

Full model: computation

50,400 household grid points

60 liquid-asset nodes $\times$ 60 capital nodes $\times$ 14 income grid points



Validation: equilibrium residuals, transition horizon, and shock scaling

Full model: the quantitative experiment

A one-time fiscal injection

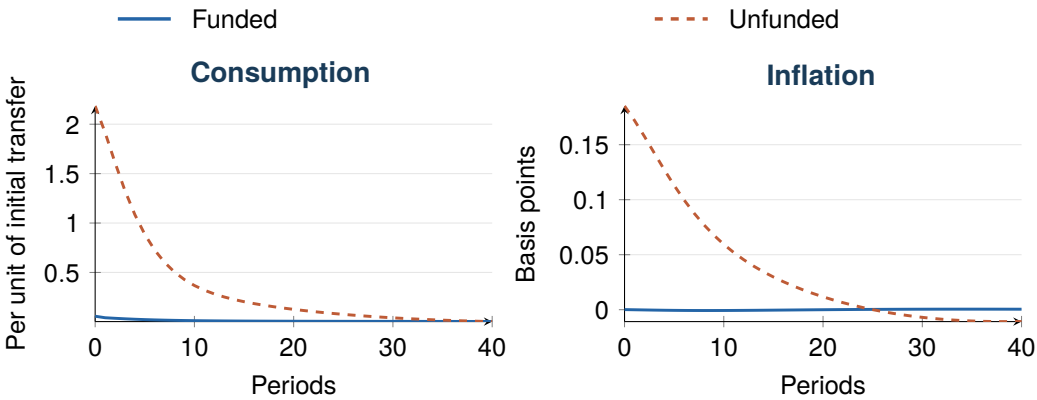
Same initial size across policy comparisons

Fiscal backing	Instrument	Recipients
Funded / Unfunded	Transfers / Purchases	All / Lower / Higher wealth

Then compare more and less frequent capital adjustment

The direct injection is one-off; fiscal feedback can continue.

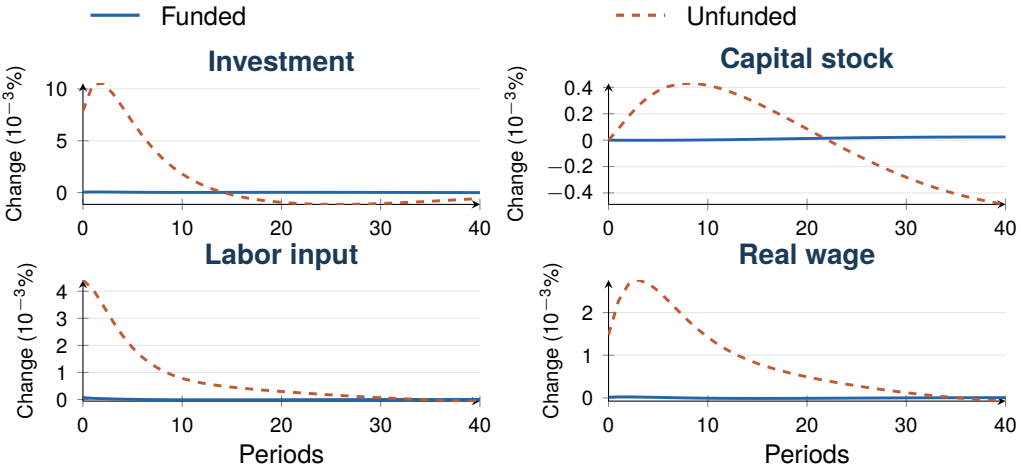
Full model: funded versus unfunded transfers



Unfunded transfers generate a much larger aggregate response

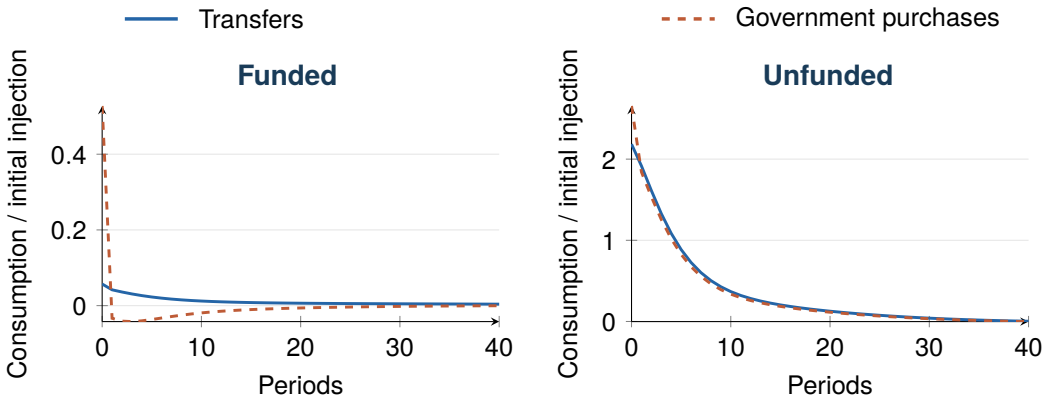
Inflation: initial transfer of 0.001% of reference output.

Full model: investment and the labor market



Initial transfer: 0.001% of reference output; capital is predetermined on impact.

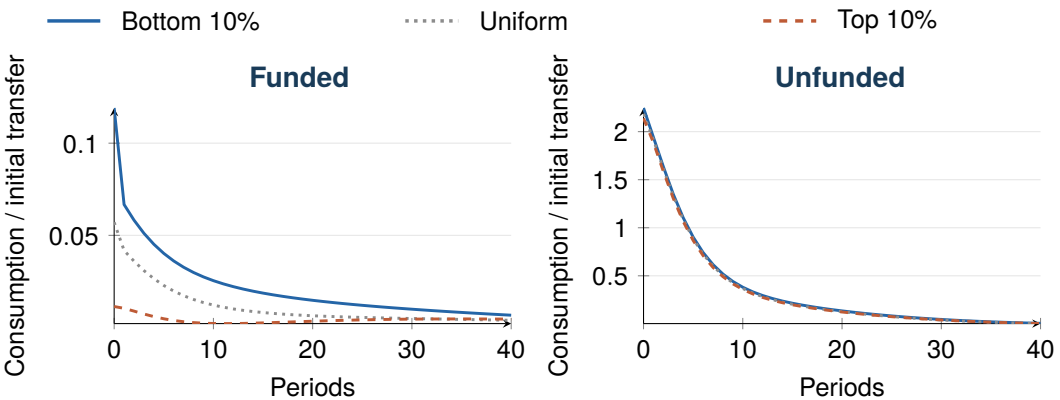
Full model: transfers versus government purchases



Instrument differences are relatively smaller when unfunded

Equal initial injections; vertical scales differ.

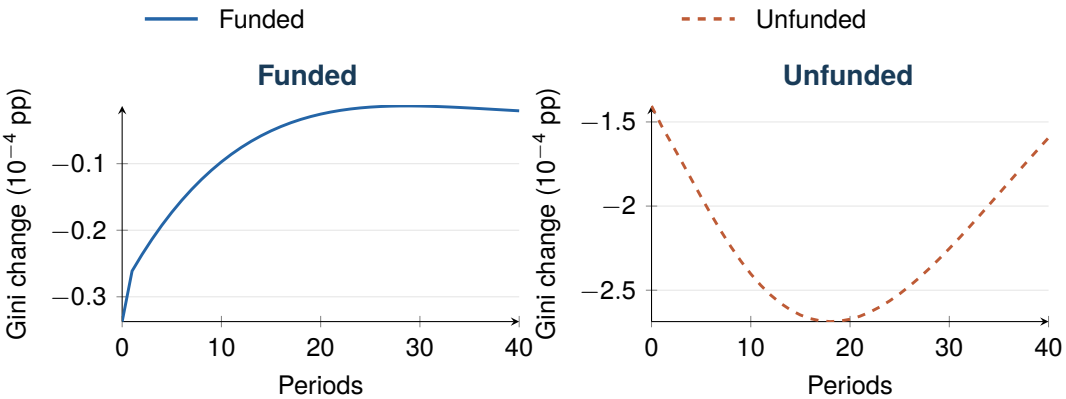
Full model: does targeting change the response?



The recipient gap is smaller relative to the unfunded expansion

Same aggregate transfer; vertical scales differ.

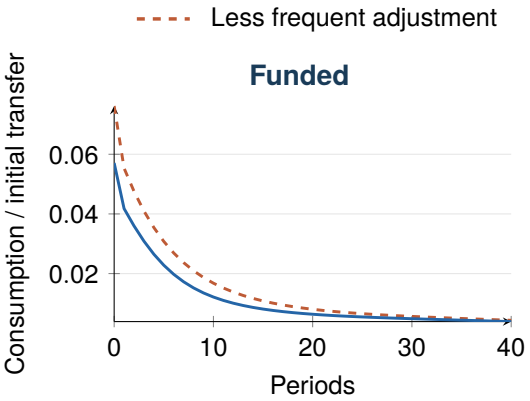
Full model: consumption inequality



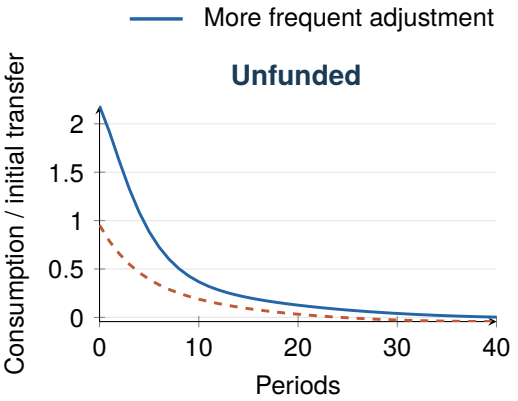
Uniform transfers reduce inequality more on impact when unfunded

Full-population consumption Gini; vertical scales differ.

Full model: the role of capital adjustment

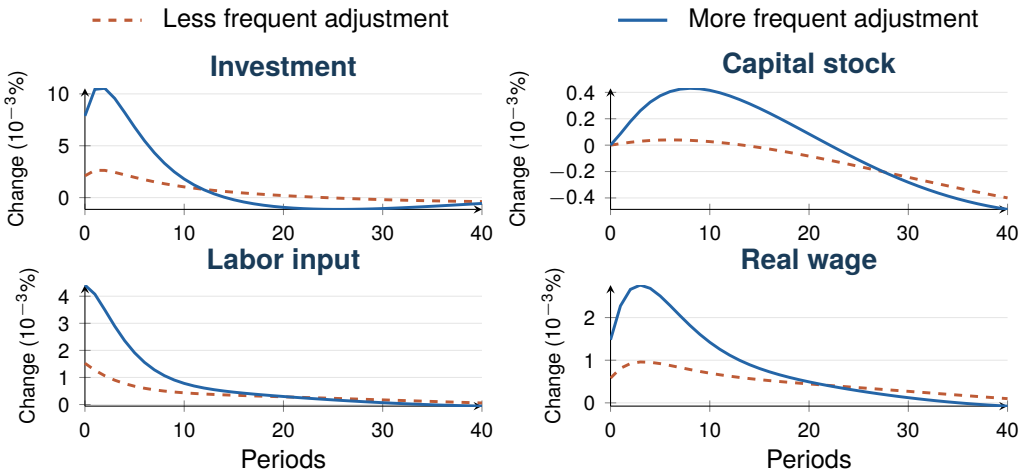


More frequent: weaker response

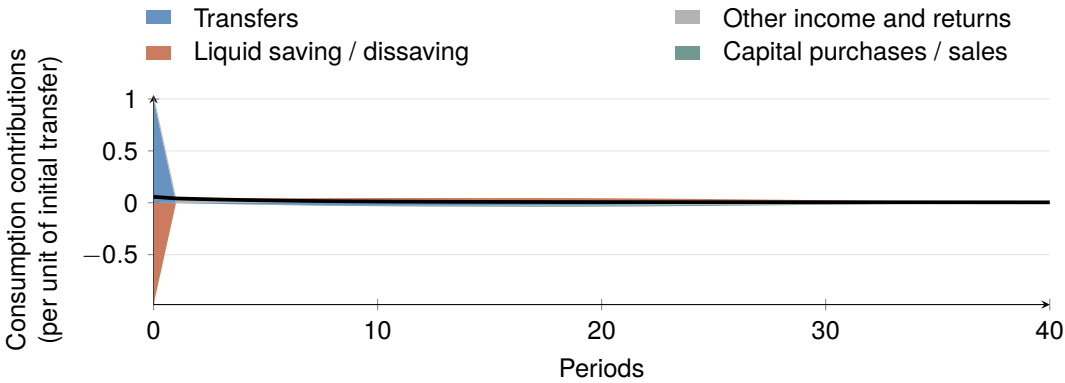


More frequent: stronger response

Unfunded: capital adjustment and production



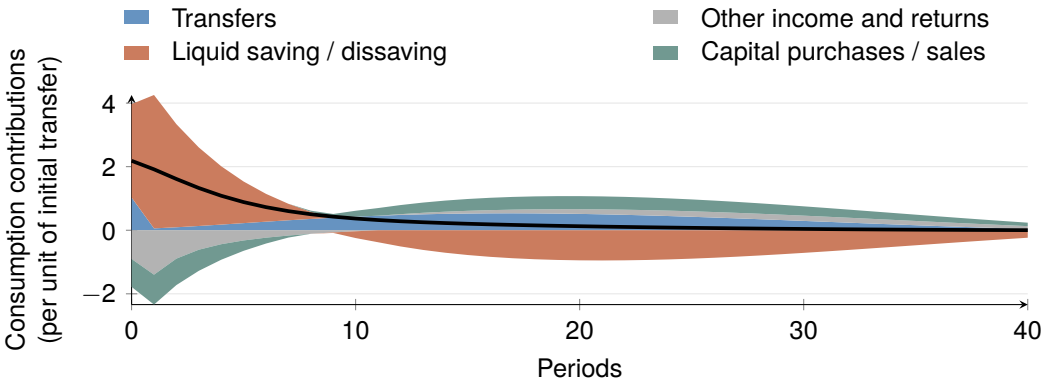
Household budget decomposition: funded transfers



Additional liquid saving nearly offsets the initial transfer

All households; changes relative to the no-shock path.

Household budget decomposition: unfunded transfers



Consumption and capital purchases rise; liquid asset holdings fall

All households; changes relative to the no-shock path.

Additional results

Debt maturity ▸ Results	Longer maturity dampens initial unfunded responses; funded responses change little.
Payment arrival ▸ Results	Later payment lowers consumption today. Low-liquid-wealth households are more sensitive.
Partial fiscal backing ▸ Results	A larger funded share reduces initial consumption and inflation responses.

Conclusion

Fiscal backing and household portfolios jointly shape deficit transmission

Unfunded policy produces much larger aggregate responses.

Instrument and recipient differences are relatively smaller when unfunded.

More frequent adjustment widens the funded–unfunded response gap.

Next steps

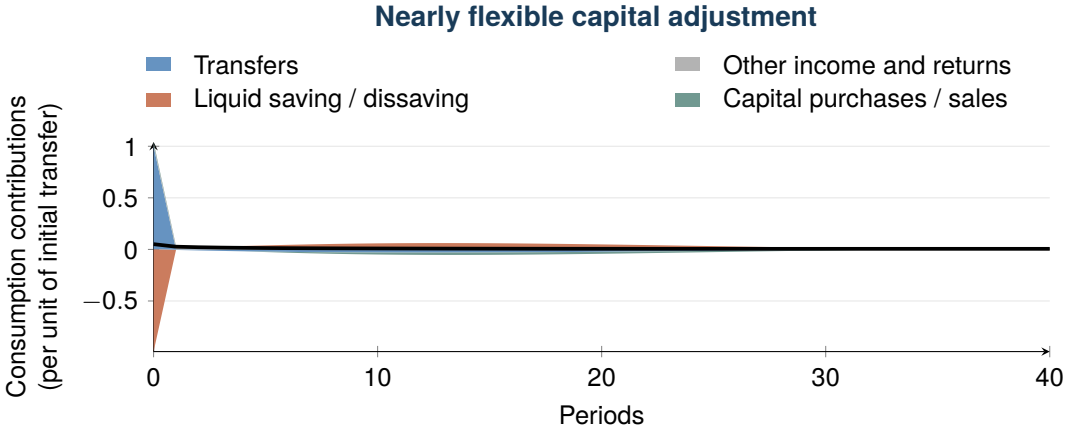
Estimation

Estimate the model using household portfolio data.

Discipline capital adjustment frictions and portfolio choices.

Reassess fiscal transmission with the estimated model.

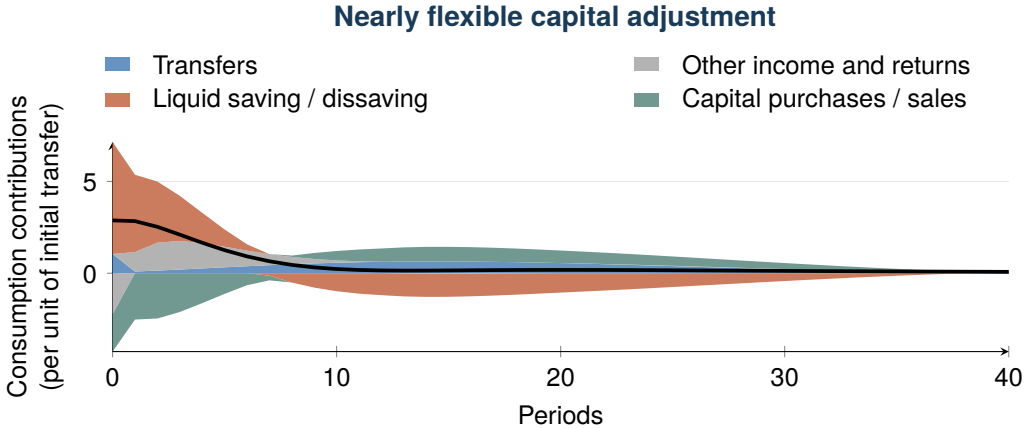
Household budget decomposition: funded transfers



Additional liquid saving nearly offsets the initial transfer

Complementary experiment; calibration and liquid asset supply differ.

Household budget decomposition: unfunded transfers

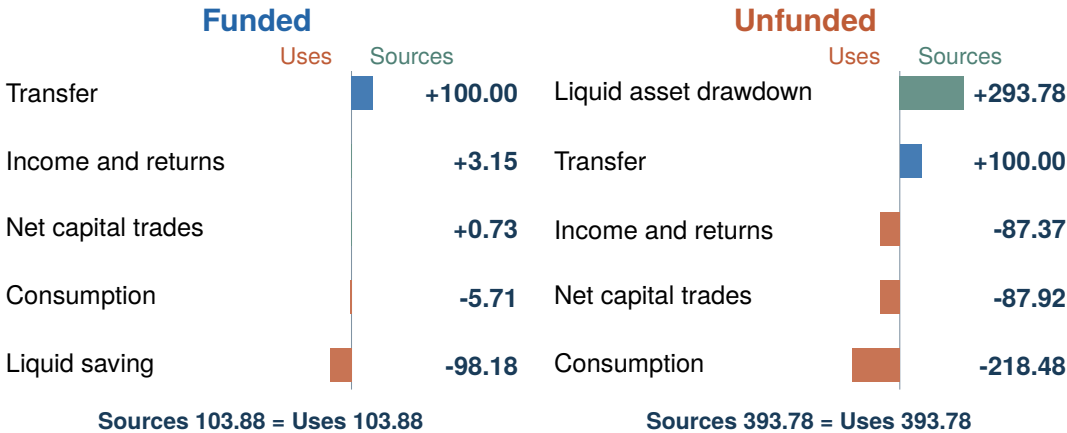


Consumption and capital purchases rise; net liquid accumulation falls

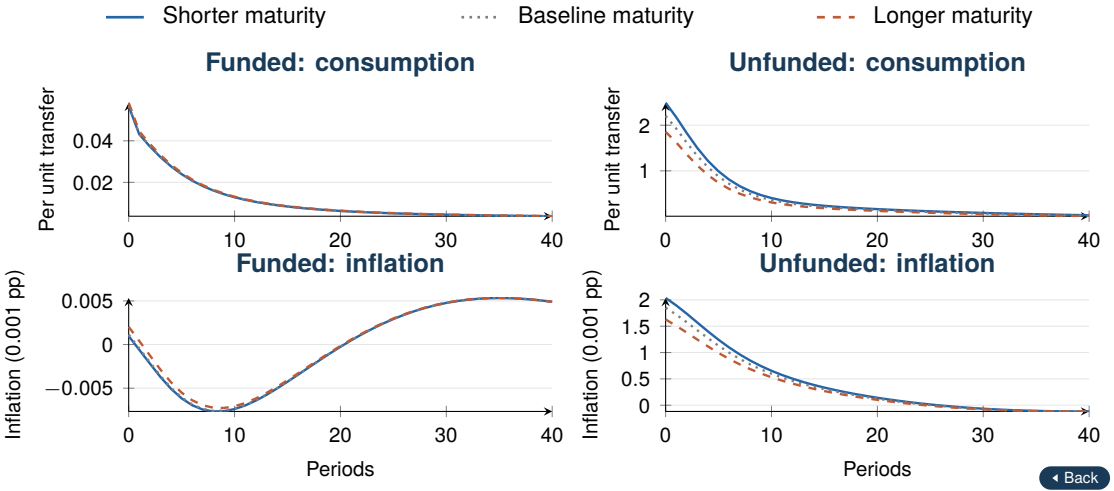
Complementary experiment; calibration and liquid asset supply differ.

A 100 transfer: sources and uses of funds

Baseline: impact changes relative to no policy shock

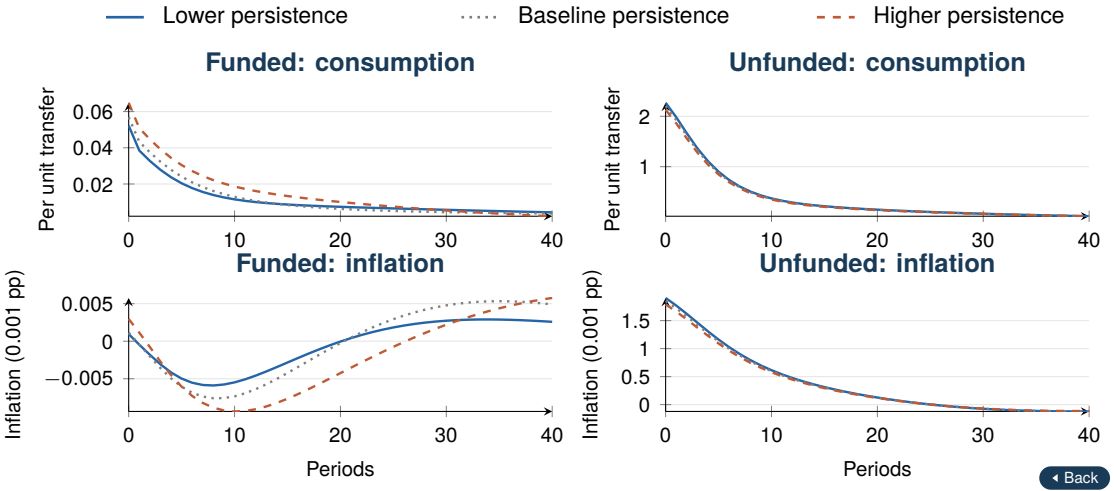


Additional results: debt maturity



Local first-order GE; same initial debt market value.

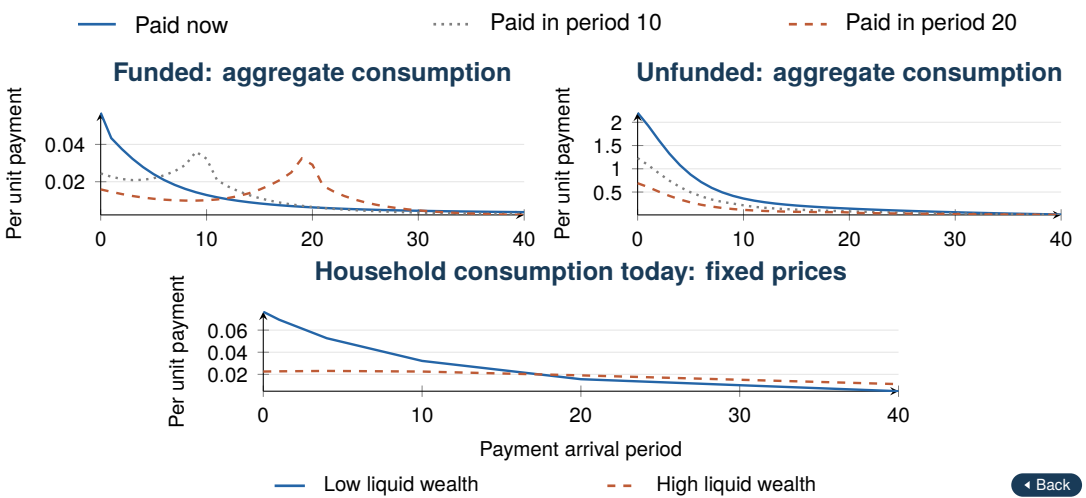
Additional results: policy-rule persistence



Same one-time payment; vary the shocked policy rule only.

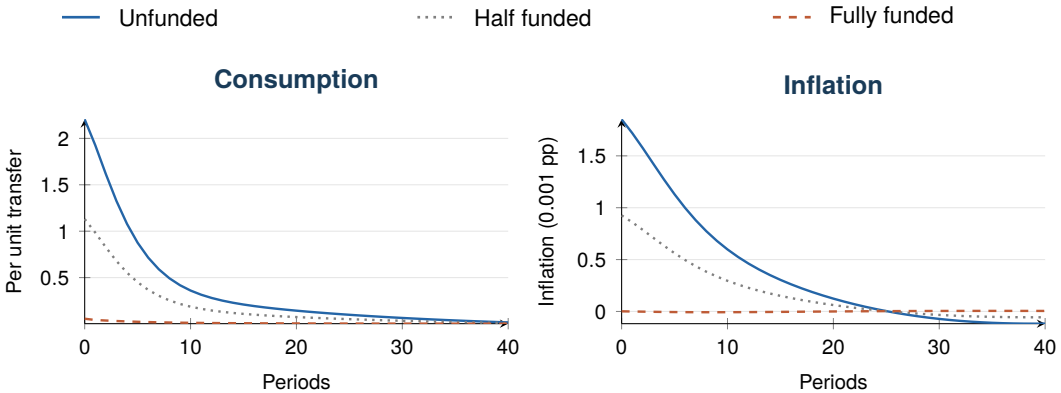
Back

Additional results: payment arrival



Announced today. Top: first-order GE. Bottom: fixed-price diagnostic.

Additional results: partial fiscal backing

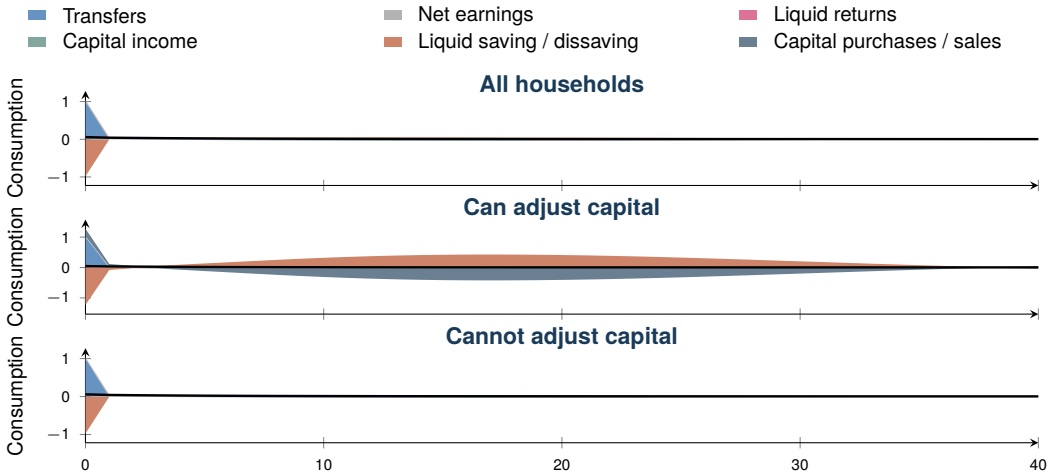


More fiscal backing lowers consumption and inflation responses.

First-order policy mix: intermediate paths average the two endpoints.

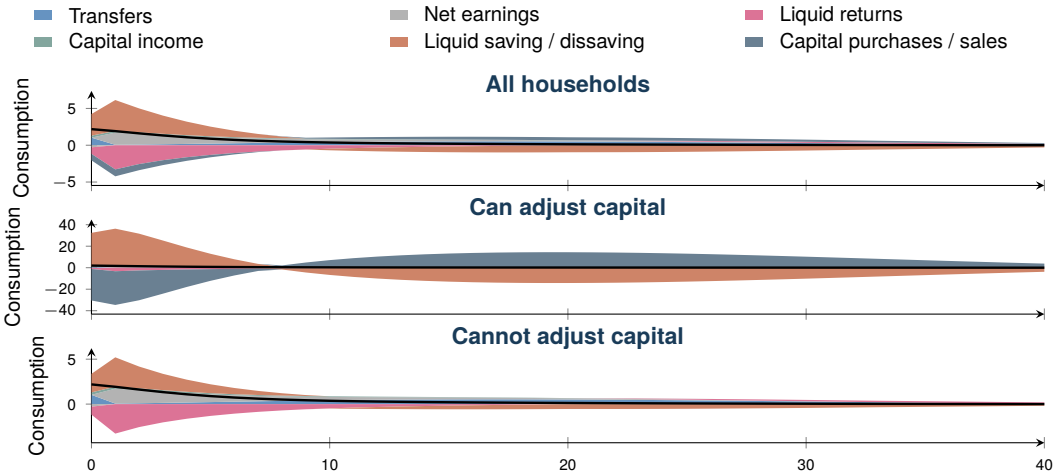
Back

Baseline budget decomposition: funded transfers



Periods 0–40. Per unit initial transfer; saving and purchases enter with minus signs.

Baseline budget decomposition: unfunded transfers



Periods 0–40. Per unit initial transfer; saving and purchases enter with minus signs.

Household choices and portfolio adjustment

p_{adj}: portfolio-adjustment probability per period.

State: $s = (m, k, z)$, with liquid assets m, capital k, and income state z.

$$c_t + m_{t+1} + q_t k_{t+1} = e_t(z) + \mathrm{TR}_t + R_t^m(m)m + (r_t - 1 + q_t)k.$$

$$a_t \sim \mathrm{Bernoulli}(p_{\mathrm{adj}}), \qquad \begin{cases} a_t = 1: & k_{t+1} \text{ can be chosen,} \\ a_t = 0: & k_{t+1} = k. \end{cases}$$

$$m_{t+1} \geq \underline{m}, \qquad k_{t+1} \geq 0.$$

e_t: net earnings in the household budget; $r_t - 1$: net capital income per unit; $R_t^m(m)$: effective liquid payoff, including the borrowing wedge. Transfers are lump sum in the reported experiments.

Model: household optimization

p_{adj}: portfolio-adjustment probability per period.

Let V_t^{adj} and V_t^{no} denote values after the adjustment draw.

$$V_t(s) = p_{\mathrm{adj}} V_t^{\mathrm{adj}}(s) + (1 - p_{\mathrm{adj}}) V_t^{\mathrm{no}}(s).$$

$$V_t^{\mathrm{adj}}(s) = \max_{c,m',k'} \left\{ U_t(c,z) + \beta \mathbb{E}_t[V_{t+1}(m',k',z') \mid z] \right\},$$

$$V_t^{\mathrm{no}}(s) = \max_{c,m'} \left\{ U_t(c,z) + \beta \mathbb{E}_t[V_{t+1}(m',k,z') \mid z] \right\}.$$

Both problems satisfy the household budget and borrowing constraint.

U_t denotes period utility after substituting the labor-supply choice; notation suppresses aggregate states.

Model: distributions and market clearing

p_{adj}: portfolio-adjustment probability per period.

Let $\mu_t(m,k,z)$ be the joint household distribution and $\mathcal{T}_t^j$ the transition operator under policy j.

$$\mu_{t+1} = \left[p_{\mathrm{adj}}\mathcal{T}_t^{\mathrm{adj}} + (1-p_{\mathrm{adj}})\mathcal{T}_t^{\mathrm{no}}\right]\mu_t.$$

$$\begin{aligned} C_t &= \int \left[p_{\mathrm{adj}}c_t^{\mathrm{adj}} + (1-p_{\mathrm{adj}})c_t^{\mathrm{no}}\right] d\mu_t, \\ K_{t+1} &= \int \left[p_{\mathrm{adj}}k_{t+1}^{\mathrm{adj}} + (1-p_{\mathrm{adj}})k\right] d\mu_t, \\ B_{t+1} &= \int \left[p_{\mathrm{adj}}m_{t+1}^{\mathrm{adj}} + (1-p_{\mathrm{adj}})m_{t+1}^{\mathrm{no}}\right] d\mu_t. \end{aligned}$$

$$B_t = B_t^g + (q_{t-1}^{\Pi} - 1).$$

Aggregate liquid assets combine government debt B^g and tradable profit claims valued at $q^{\Pi} - 1$. The joint wealth distribution evolves after the transfer.

Model: government debt and fiscal backing

With B_t^g the inherited debt position and q_t^B the nominal bond price:

$$B_{t+1}^g = \mathcal{R}_t^g B_t^g + G_t + \mathrm{TR}_t - T_t, \qquad \mathcal{R}_t^g = \frac{1 + (1 - \delta_B) q_t^B}{\pi_t q_{t-1}^B}.$$

$$G_t = G_t^F + G_t^U, \qquad \mathrm{TR}_t = \mathrm{TR}_t^F + \mathrm{TR}_t^U.$$

Funded: future primary-surplus adjustment provides fiscal backing.

Unfunded: no full fiscal backing; debt valuation adjusts in equilibrium.

T_t: tax revenue; $\pi_t = P_t / P_{t-1}$; $1 - \delta_B$: surviving bond fraction. The gross return includes coupon payments and bond-price revaluation.

Fiscal rules for one-time fiscal expansions

For transfers or purchases, separate the direct payment from fiscal feedback:

$$X_t^j = \widetilde{X}_t^j + D_t^j, \qquad D_0^j = D, \qquad D_t^j = 0 \quad (t \geq 1).$$

Funded: higher funded debt reduces future fiscal outlays.

$$\widehat{\widetilde{X}}_t^F = \rho_X^F \widehat{\widetilde{X}}_{t-1}^F + (1 - \rho_X^F)\gamma_{YX}^F \widehat{g}_t^Y - \phi_X^F \widehat{B}_t^F.$$

Unfunded: higher unfunded debt increases outlays in this specification.

$$\widehat{\widetilde{X}}_t^U = \rho_X^U \widehat{\widetilde{X}}_{t-1}^U + (1 - \rho_X^U)\gamma_{YX}^U \widehat{g}_t^Y + \phi_X^U \widehat{B}_t^U.$$

$\phi_X^F, \phi_X^U > 0$ may differ in magnitude; hats denote log deviations.

Model: production, investment, and resources

$$Y_t = Z_t (u_t K_t)^{\alpha} N_t^{1-\alpha},$$

$$K_{t+1} = [1 - \delta(u_t)] K_t + Z_t^I I_t \left[1 - \frac{\phi}{2} \left(\frac{I_t}{I_{t-1}} - 1 \right)^2 \right],$$

$$Y_t = C_t + I_t + G_t + \bar{R}\, BD_t \qquad (A_t = 1).$$

u_t: capital utilization; Z_t^I: investment efficiency; BD_t: aggregate household borrowing; $\bar{R}$: borrowing wedge. The resource constraint is shown for the fiscal experiments, with the spread shock fixed at $A_t = 1$.

Transfers enter household budgets but do not directly absorb final goods.

Model: nominal rigidities and monetary policy

Price and wage Phillips curves:

$$\widetilde{\pi}_t = \kappa \left(mc_t - \frac{1}{\mu_t^p} \right) + \beta \mathbb{E}_t \left[\widetilde{\pi}_{t+1} \frac{Y_{t+1}}{Y_t} \right],$$

$$\widetilde{\pi}_t^w = \kappa_w \left(mc_t^w - \frac{1}{\mu_t^w} \right) + \beta \mathbb{E}_t \left[\widetilde{\pi}_{t+1}^w \frac{w_{t+1} N_{t+1}}{w_t N_t} \right].$$

Interest-rate rule:

$$\widehat{R}_{t+1}^B = \rho_R \widehat{R}_t^B + (1 - \rho_R)(\theta_\pi \log \pi_t + \theta_Y \widehat{g}_t^Y) + \varepsilon_t^R.$$

$\widetilde{\pi}_t = \log(\pi_t / \bar{\pi})$, and similarly for wages; *mc* denotes the relevant marginal-cost wedge. μ^p, μ^w are desired markups. The rate dated $t+1$ is set at t.