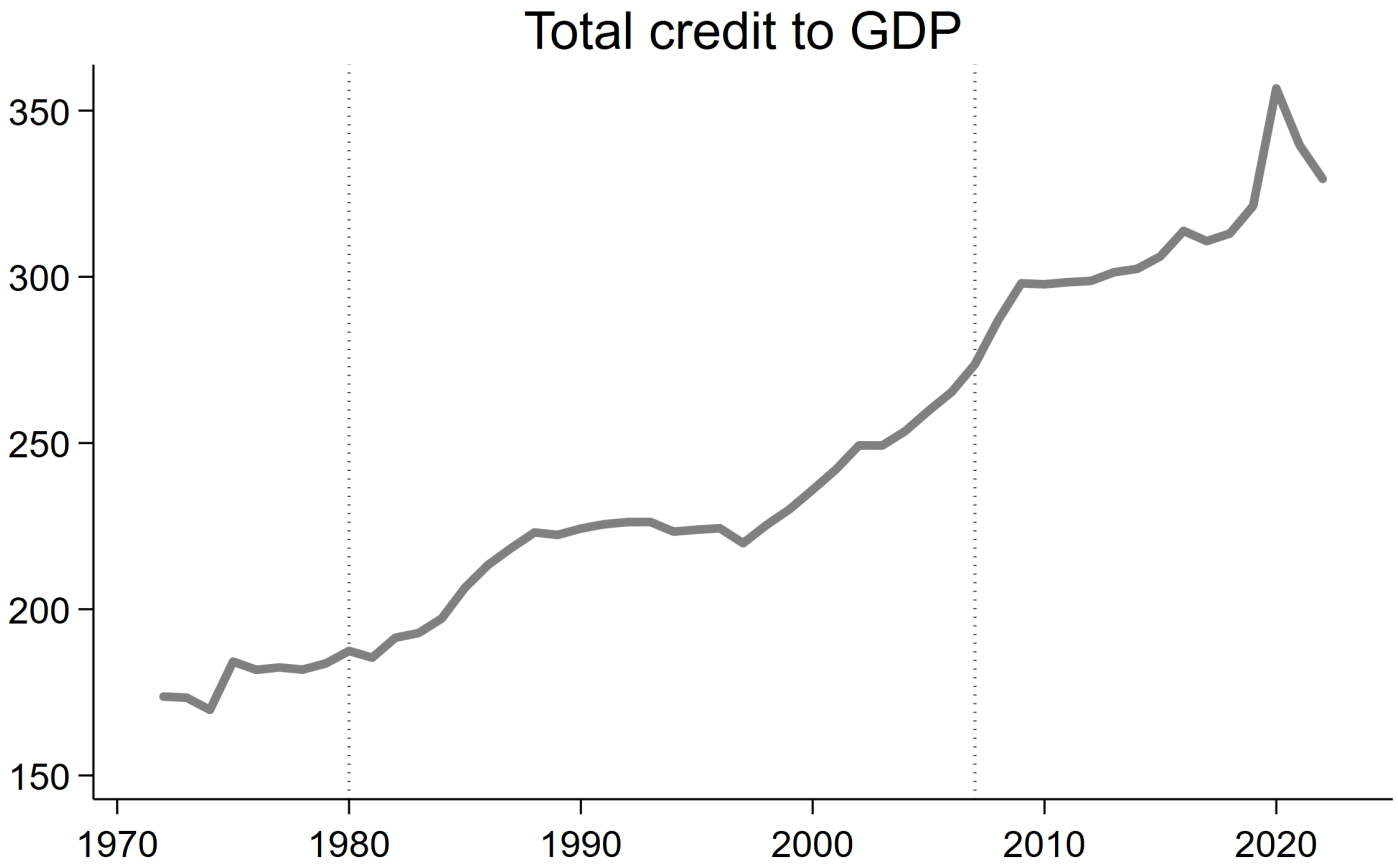
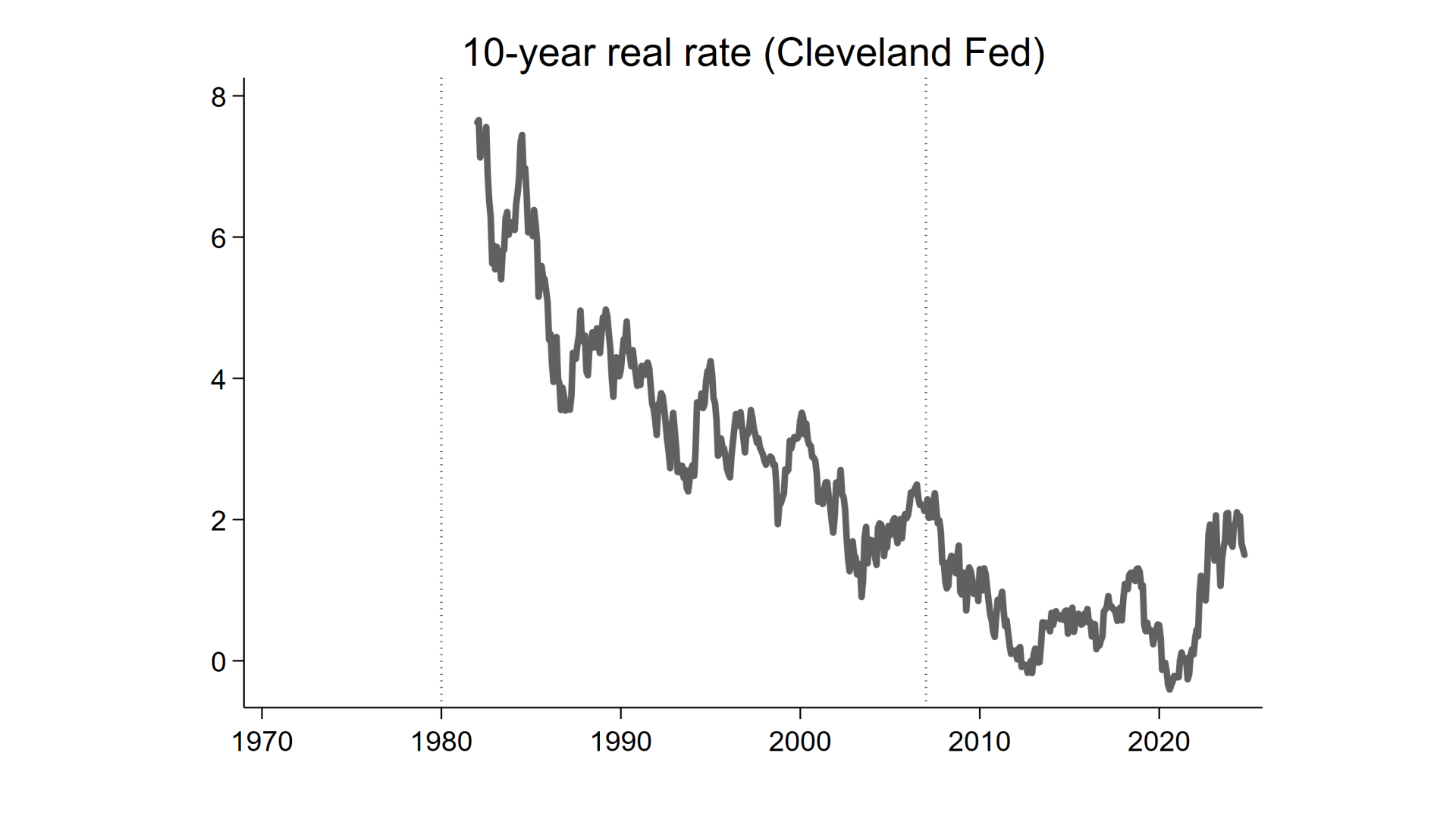
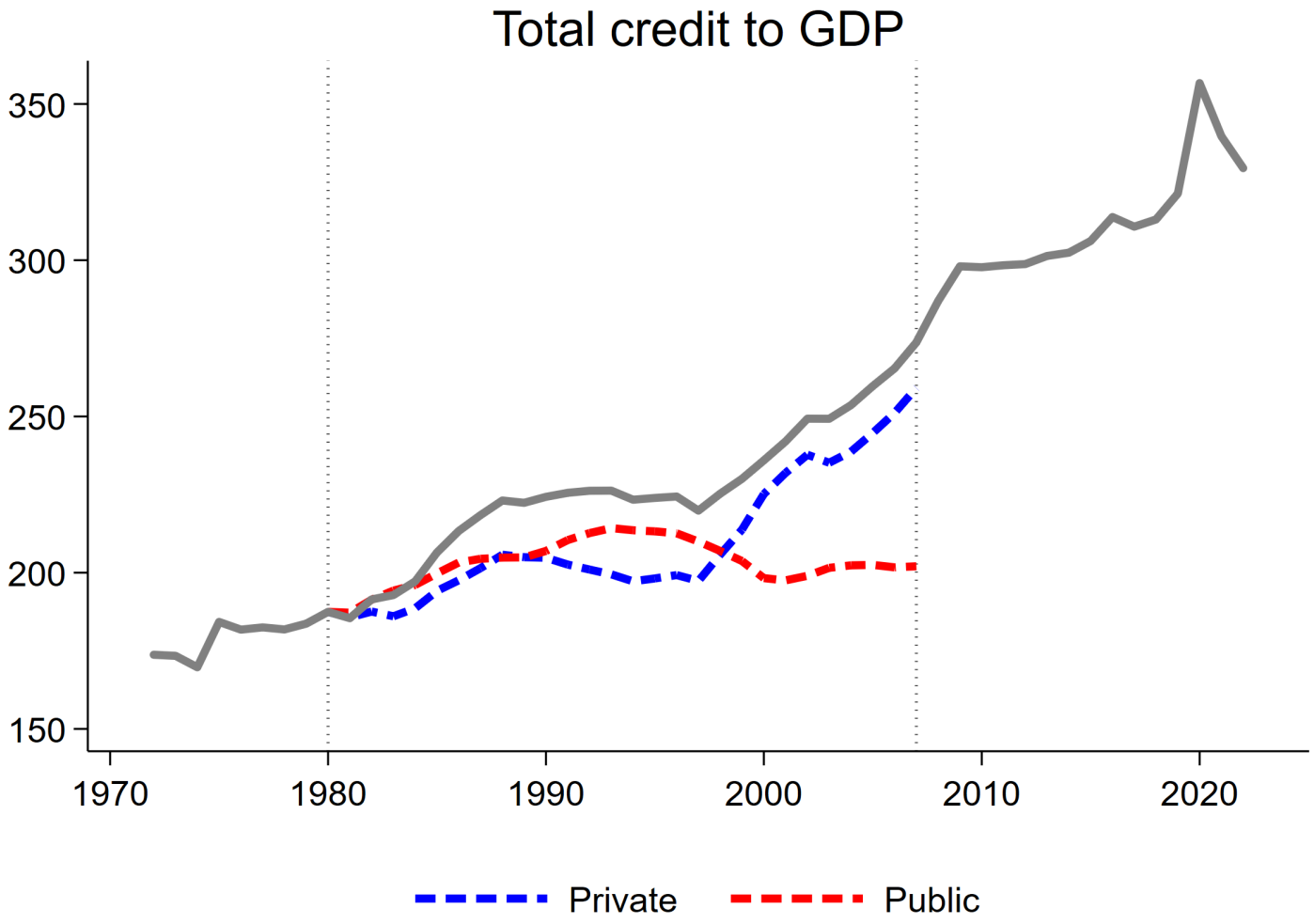
Long-run interest rates: past, present and future

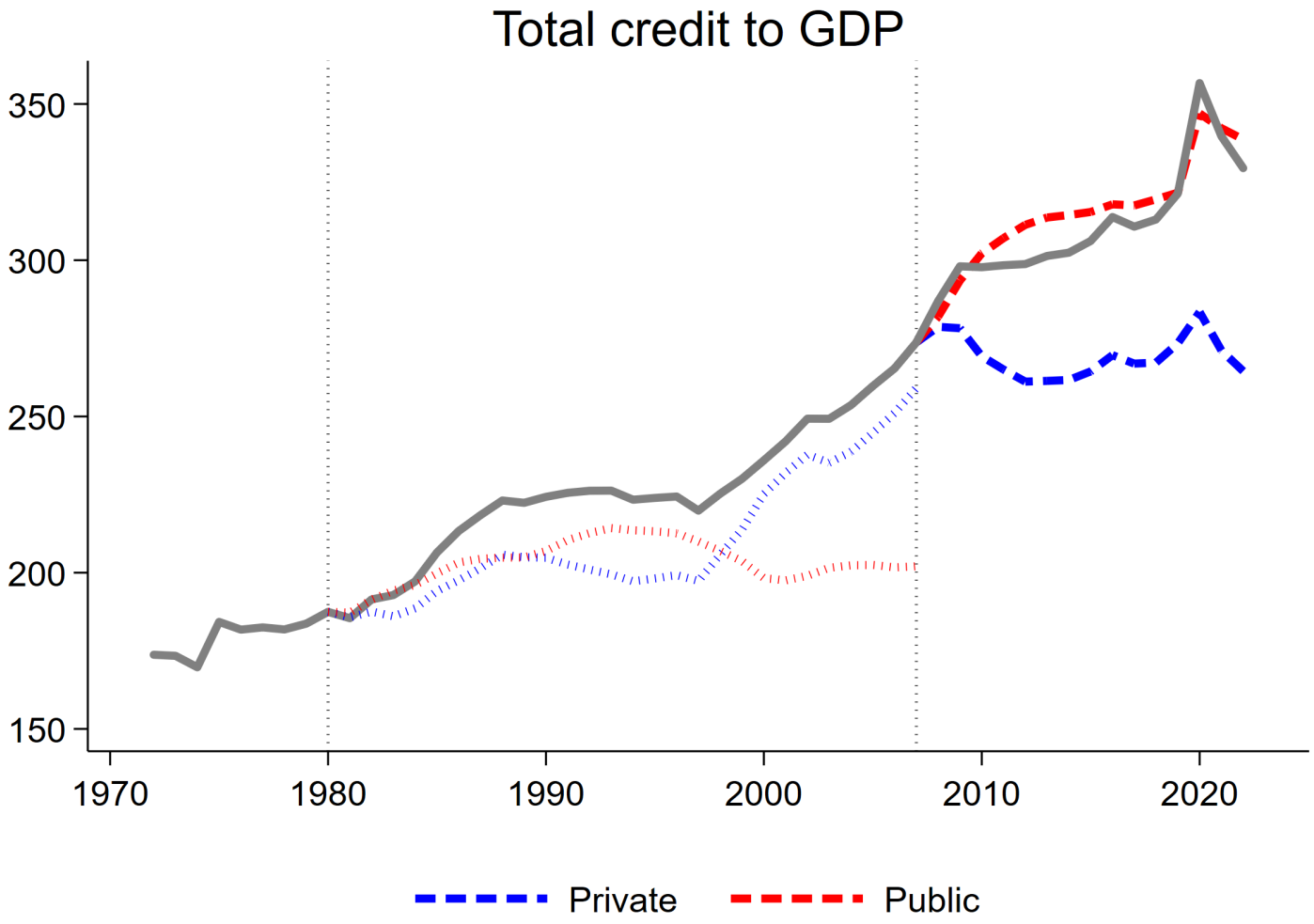
Atif Mian (Princeton University)

XXVII Annual Conference of the Central Bank of Chile, 2024


Total credit to GDP
350
300
250
200
150
1970
1980
1990
2000
2010
2020


10-year real rate (Cleveland Fed)
8
6
4
2
0
1970
1980
1990
2000
2010
2020


Total credit to GDP
350
300
250
200
150
1970
1980
1990
2000
2010
2020
Private
Public


Total credit to GDP
350
300
250
200
150
1970
1980
1990
2000
2010
2020
Private
Public

Price and Quantity of Debt

- After post-WWII, total debt to GDP is flat, but starts to rise in the post Bretton Woods era significantly after 1980

  … total credit to GDP rises by 142pp of GDP, two sub-eras
  … 1980-2007: rise of private debt (mostly household) of 50pp of GDP out of total of 72pp
  … 2007-present: rise of public debt of 65pp of GDP out of total of 56pp of GDP (household plus non-financial corporate de-lever on net)

- Switch from primary deficit of 0.02% of GDP during 1980-2006, to 4.3% of GDP during 2007-2022

- Price of debt, real interest rate, falls from 8pp in 1980 to zero, before rising back to 2pp post-pandemic

Price and Quantity of Debt

- After post-WWII, total debt to GDP is flat, but starts to rise in the post Bretton Woods era significantly after 1980

  … total credit to GDP rises by 142pp of GDP, two sub-eras
  … 1980-2007: rise of private debt (mostly household) of 50pp of GDP out of total of 72pp
  … 2007-present: rise of public debt of 65pp of GDP out of total of 56pp of GDP (household plus non-financial corporate de-lever on net)

- Price of debt, real interest rate, falls from 8pp in 1980 to zero, before rising back to 2pp post-pandemic

- **Need a single framework to tie these facts together: one primitive – rising saving rate out of permanent income (… long-run structural shocks: rising inequality and rising "financialization") [(i) "Saving glut of the rich" (ii) "Indebted Demand" (iii) "Goldilocks theory of fiscal policy" (Mian, Straub, Sufi)]**

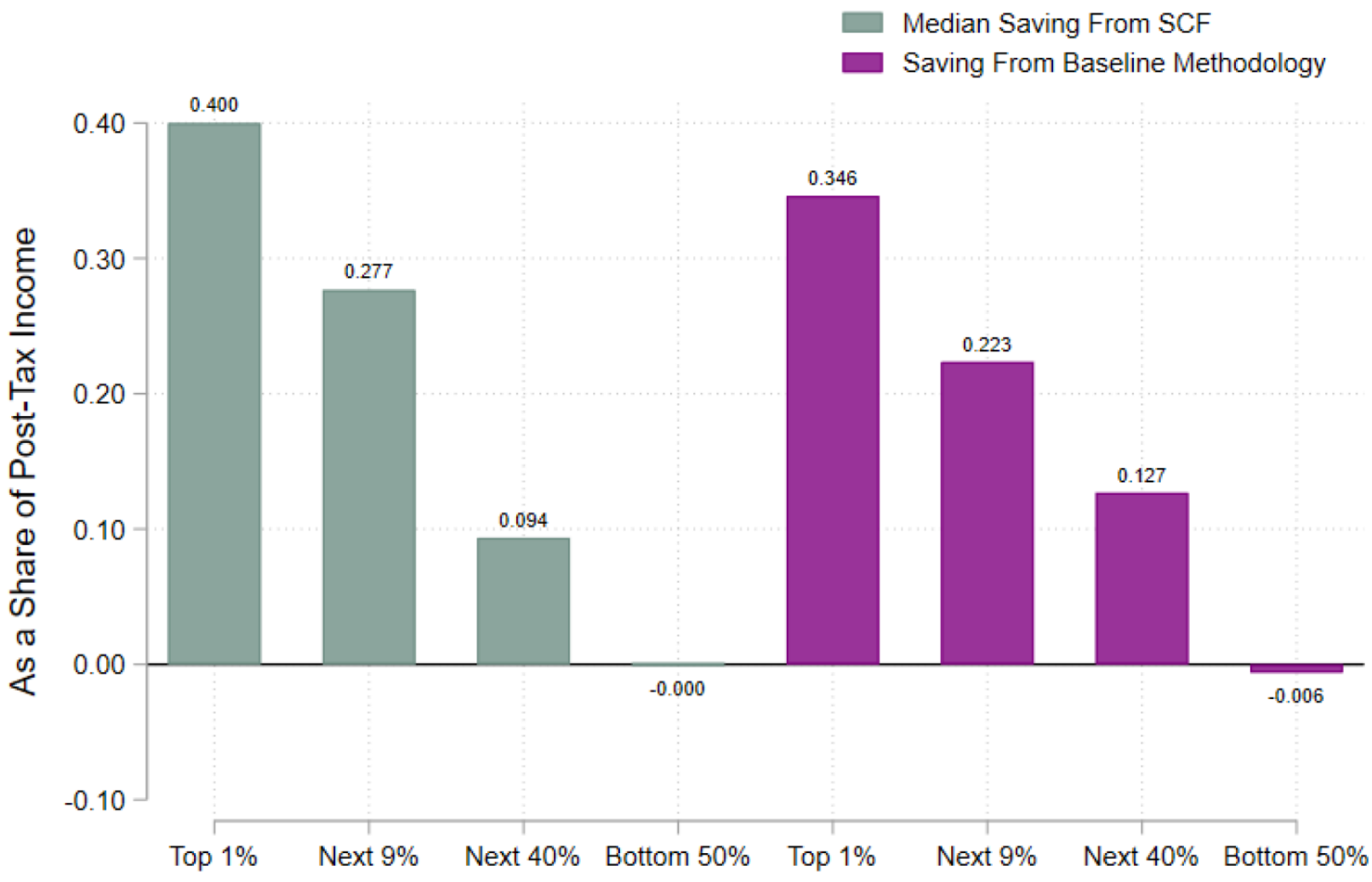
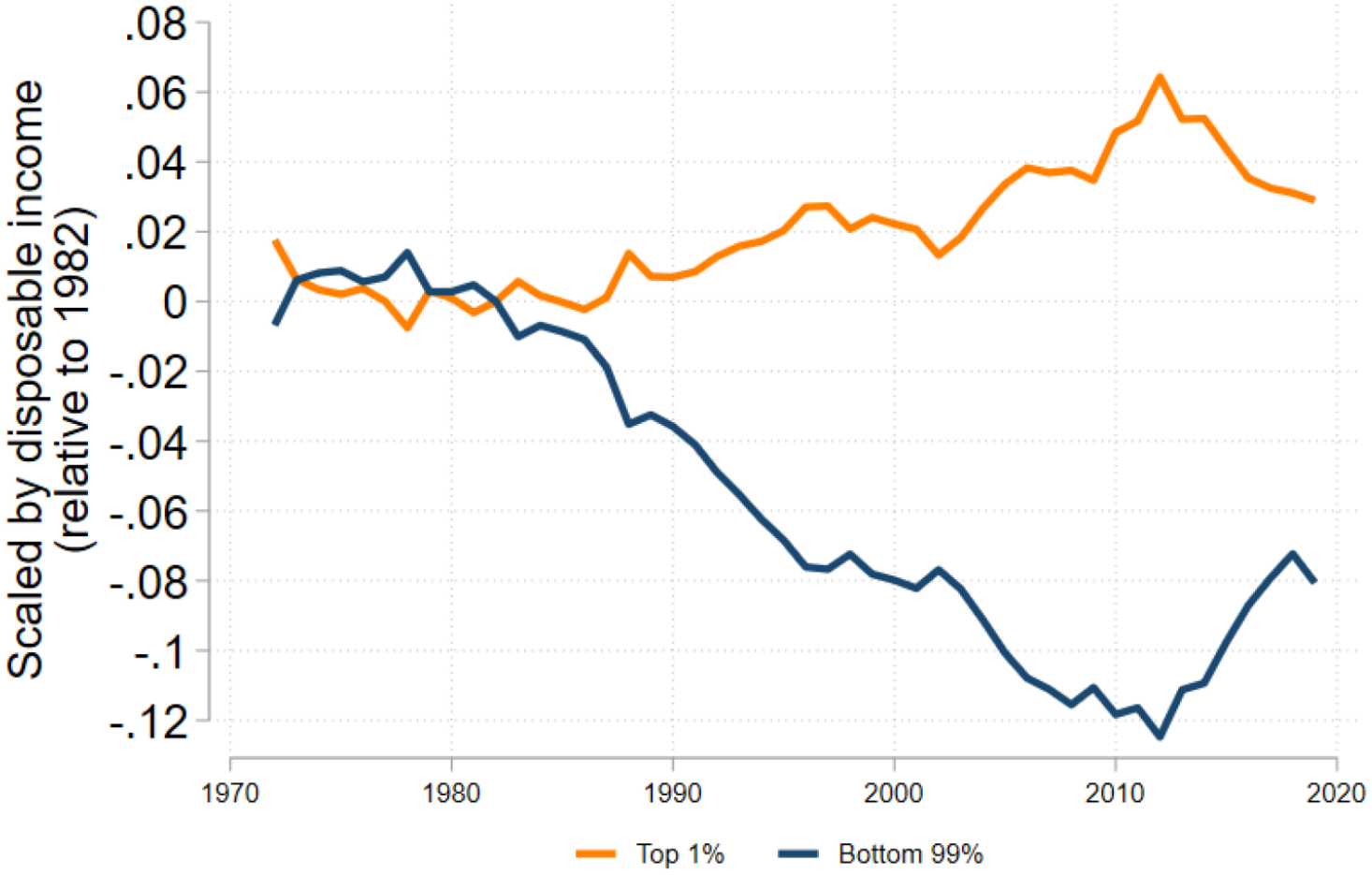

Median Saving From SCF
Saving From Baseline Methodology
As a Share of Post-Tax Income
0.40
0.30
0.20
0.10
0.00
-0.10
0.400
0.277
0.094
-0.000
0.346
0.223
0.127
-0.006
Top 1%
Next 9%
Next 40%
Bottom 50%
Top 1%
Next 9%
Next 40%
Bottom 50%

Figure 5: Savings by the top 1% and bottom 99%



Indebted Demand

- When rich save more out of lifetime income, and extreme inequality rises

  … need to stimulate demand today through debt creation: rich save/lend, non-rich borrow

  … but that reduces demand in the future when borrowers have to repay the debt

  … only solution is for interest rate to fall, so non-rich could borrow even more!

  … this **indebted demand** cycle continues, until interest rate hits zero lower bound (ZLB)

  … if extreme inequality persists, remain stuck in **perpetual debt trap**

Indebted Demand model

- Non-homothetic preferences
  … people derive greater utility from accumulating wealth (*a*) as they get richer

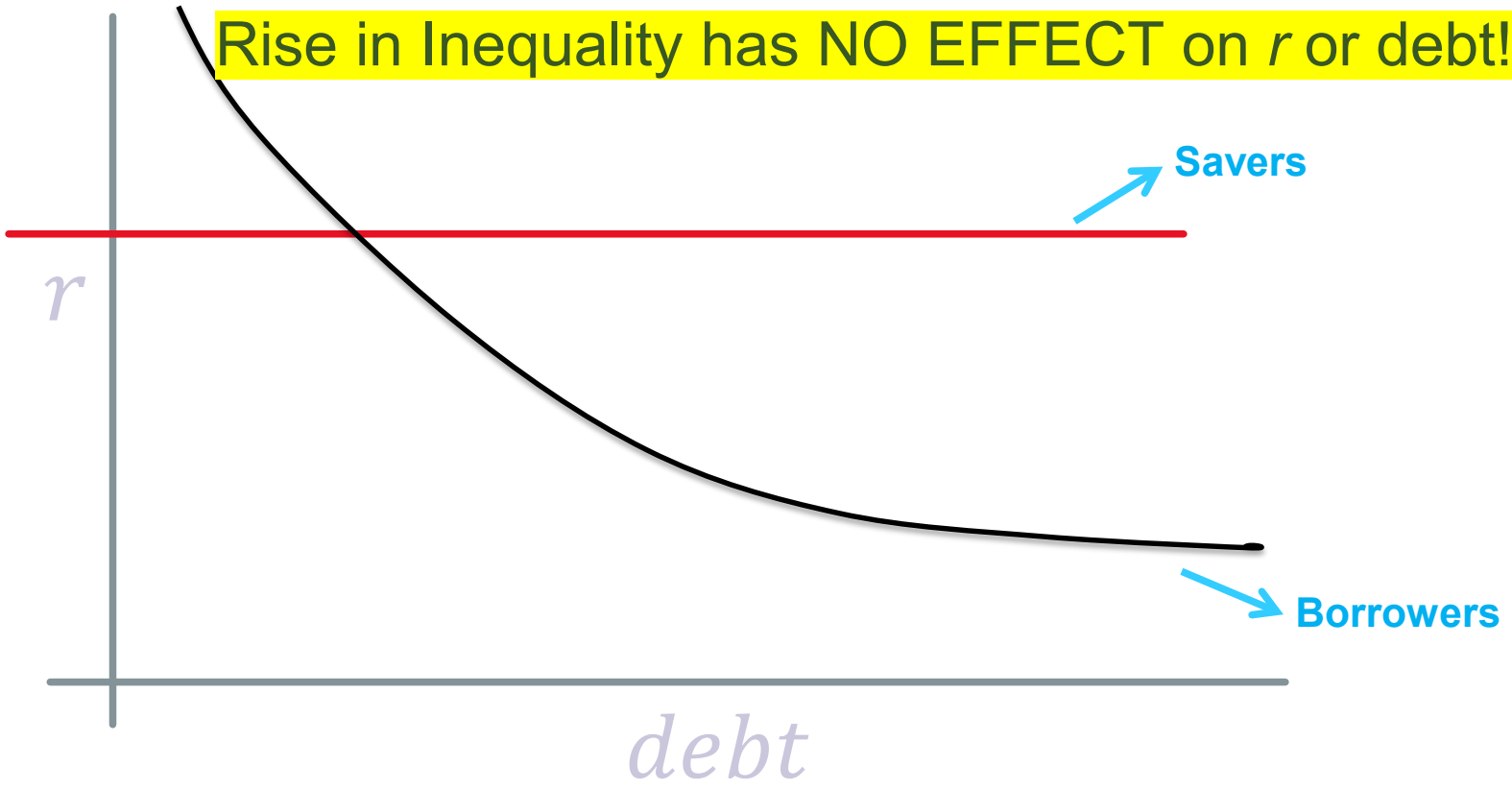
$$\int_0^{\infty} e^{-(\rho+\delta)t} \left\{ \log c_t^i + \frac{\delta}{\rho} . v(a_t^i) \right\} dt$$

- Euler equation in steady-state for the rich
  … determines the long-run saving supply schedule

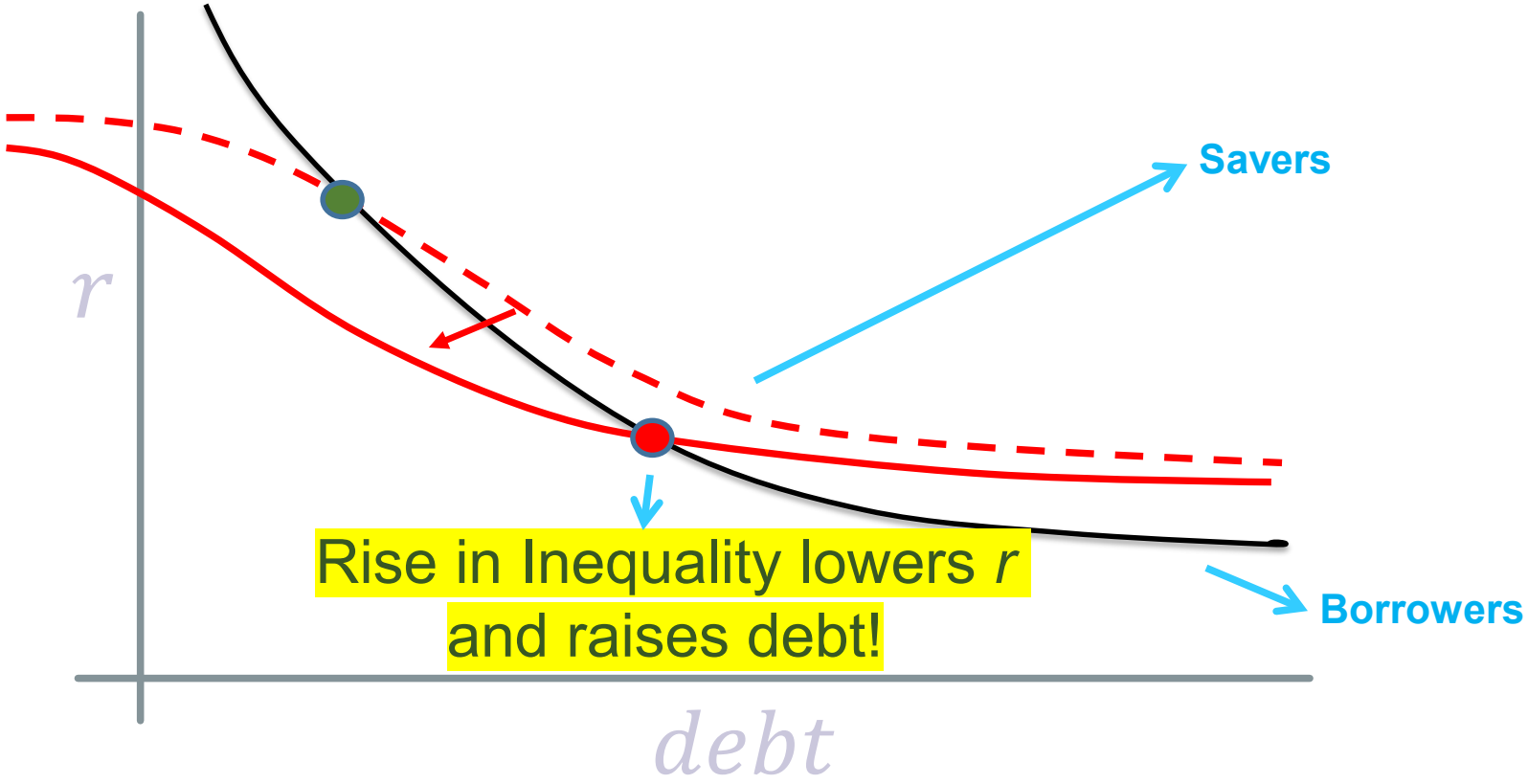
$$r = \rho . \frac{1 + \rho/\delta}{1 + \frac{\rho}{\delta} . av'(a)}$$

See Mian, Sufi and Straub (2021) for formal details

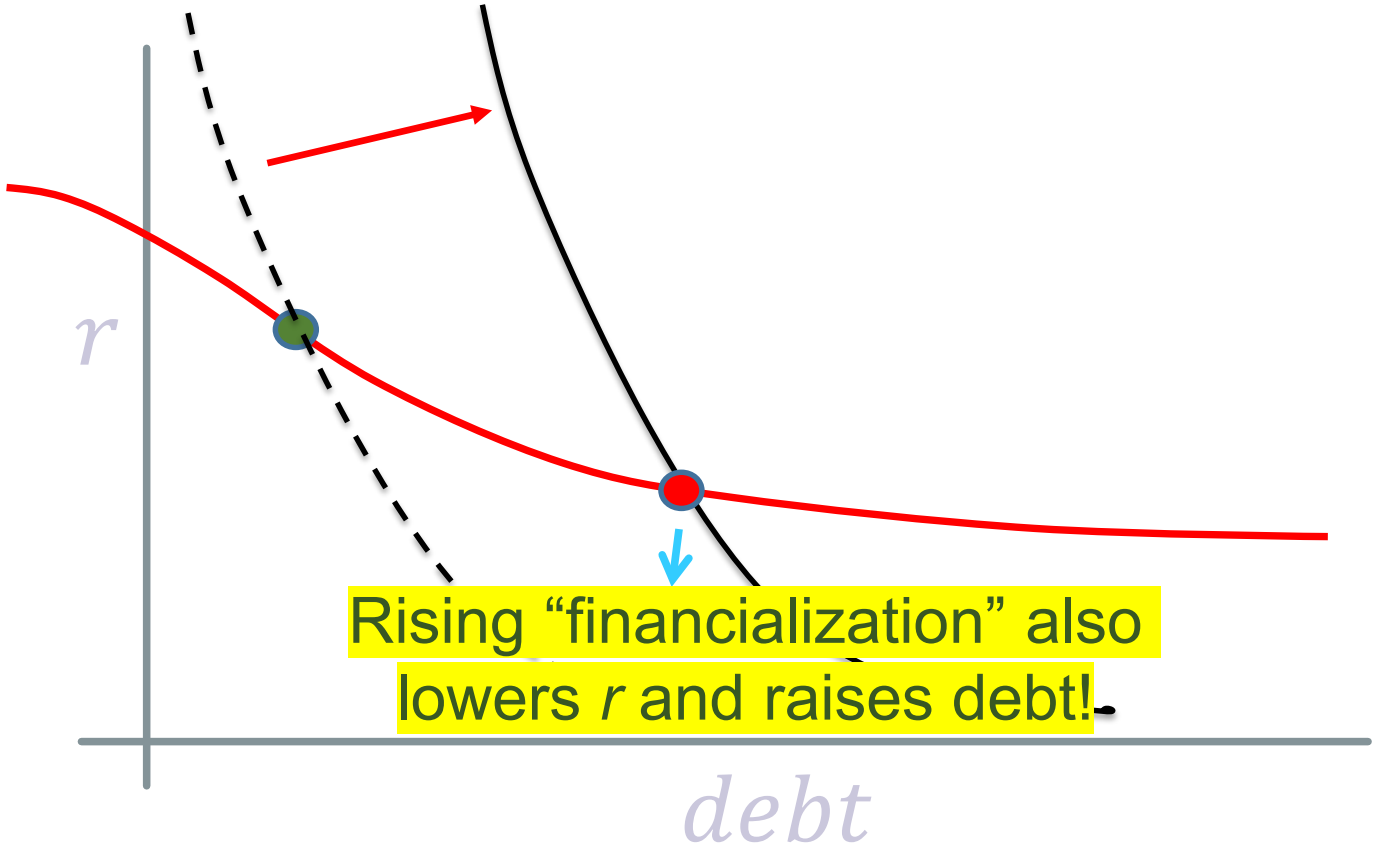
Standard homothetic models



Indebted Demand model



Indebted Demand model



Implications for monetary policy

- Rising inequality forces the hand of monetary policy by lowering r*

  … reduces space for monetary policy to operate

- Easy monetary policy often raises demand through debt creation

  … but that creates indebted demand, putting downward pressure on future rates: monetary policy has limited ammunition.

  “the sustainability of debt burdens depends on interest rates remaining low” – Mark Carney

- Persistent extreme inequality pushes monetary policy against ZLB, and economy stagnates inside a debt trap

Key Factor:
$R_{PRIV} > G$

Is there any hope?

What if R < G for some agent? We could reverse indebted demand!

Enter fiscal policy, i.e. wealth tax by stealth!

Fiscal policy

- With “specialness”, such as “convenience yield”, of government debt, $R < G$ for government borrowing when aggregate demand is weak … fiscal policy is like a wealth tax!
- Rising inequality expands fiscal space (with monetary dominance)
- There is an MMTesque “free lunch” when $R < G - \psi$, i.e. government can increase primary deficit permanently without ever having to raise taxes
- The design of tax policy is really important for moving and staying away from the ZLB

See Mian, Sufi and Straub “A Goldilocks Theory of Fiscal Policy”

Household problem

- Fraction $1-\mu$ savers solve (de-trended) problem

$$\max_{\{c_t, b_t\}} \int_0^\infty e^{-\rho t} \{\log c_t + v(b_t)\} dt$$

$$c_t + \dot{b}_t \leq (R_t - G_t) b_t + (1-\mu) y_t - \tau_t$$

- $b_t =$ government debt to potential GDP
- $v(b_t)$ captures convenience benefits of government bonds

  [Krishnamurthy Vissing-Jorgensen 2012, Greenwood Hansen Stein 2015]

  - increasing and concave
- Spenders consume constant share of income μy_t
- $y_t =$ labor endowment, sold to repr. firm. If rationed, $y_t < 1$

Government

- Fiscal policy consists of $\{x, b_t, \tau_t\}$ that satisfy

$$x + (R_t - G_t)\, b_t \leq \dot{b}_t + \tau_t$$

$$\text{primary deficit:} \qquad z_t \equiv x - \tau_t$$

- Monetary dominance, natural rate implemented whenever possible

$$R_t = \max\{R_t^*, 0\}$$

- Simple downward nominal wage rigidity [easily generalized]

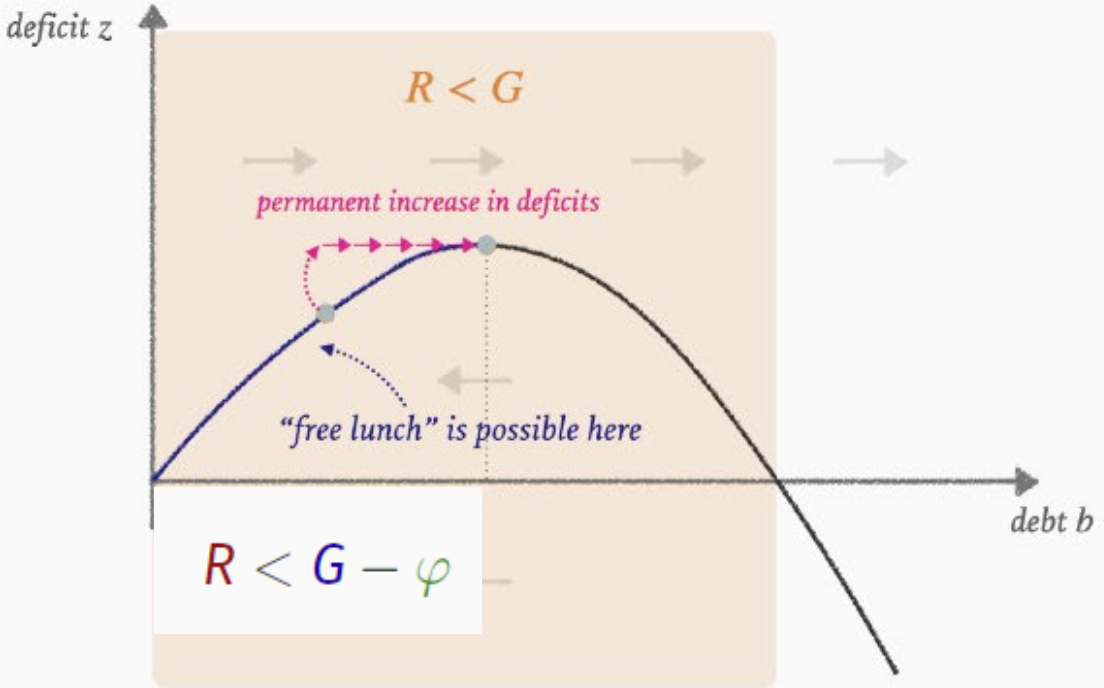
$$\pi_t = \dot{W}_t / W_t \geq \pi^* - \kappa(1 - y_t)$$

When demand is low, $y_t < 1$ and $\pi_t < \pi^*$

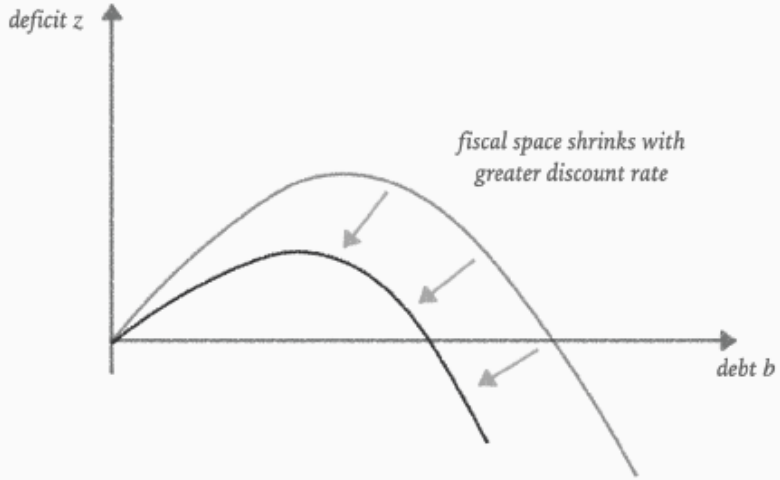
[$\kappa < v'(0)$ avoids Benhabib Schmitt-Grohe Uribe (2001) issues, as in Michaillat Saez (2019)]

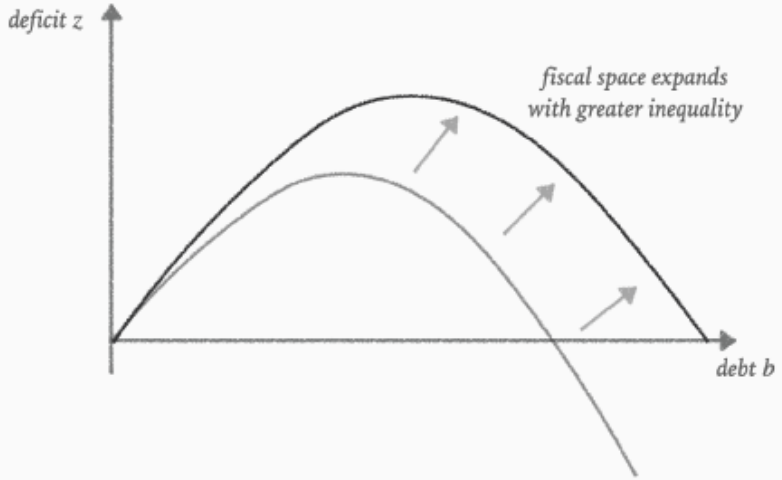
Fiscal space without ZLB

Free lunch in the deficit debt diagram



What determines fiscal space?





- Fiscal space shrinks with greater discount rate ρ
  - more “aggregate demand” shrinks fiscal space
- Fiscal space rises with greater inequality $1 - \mu$
  - conflict between large deficit-financed programs and reducing inequality?

Fiscal risks?

- Goldilocks: Too cold (enough to avoid ZLB)
  About right $(0 < R < G - \varphi)$ with s.s. primary deficit
  Too hot $(R > G - \varphi)$ with unsustainable primary deficit

- Future risks:
  … Will monetary dominance break?
  … Will U.S. lose exorbitant privilege / convenience yield? (financial repression?)
  … Falling inequality + bequests / inter-generational mobility – and implied fiscal consolidation?
  … War + Climate risk?

- Where are we today?
  … Goldilocks calibration
  … Forwards
  … Market long-forward housing yield **[Backer-Peral, Hazell and Mian]**

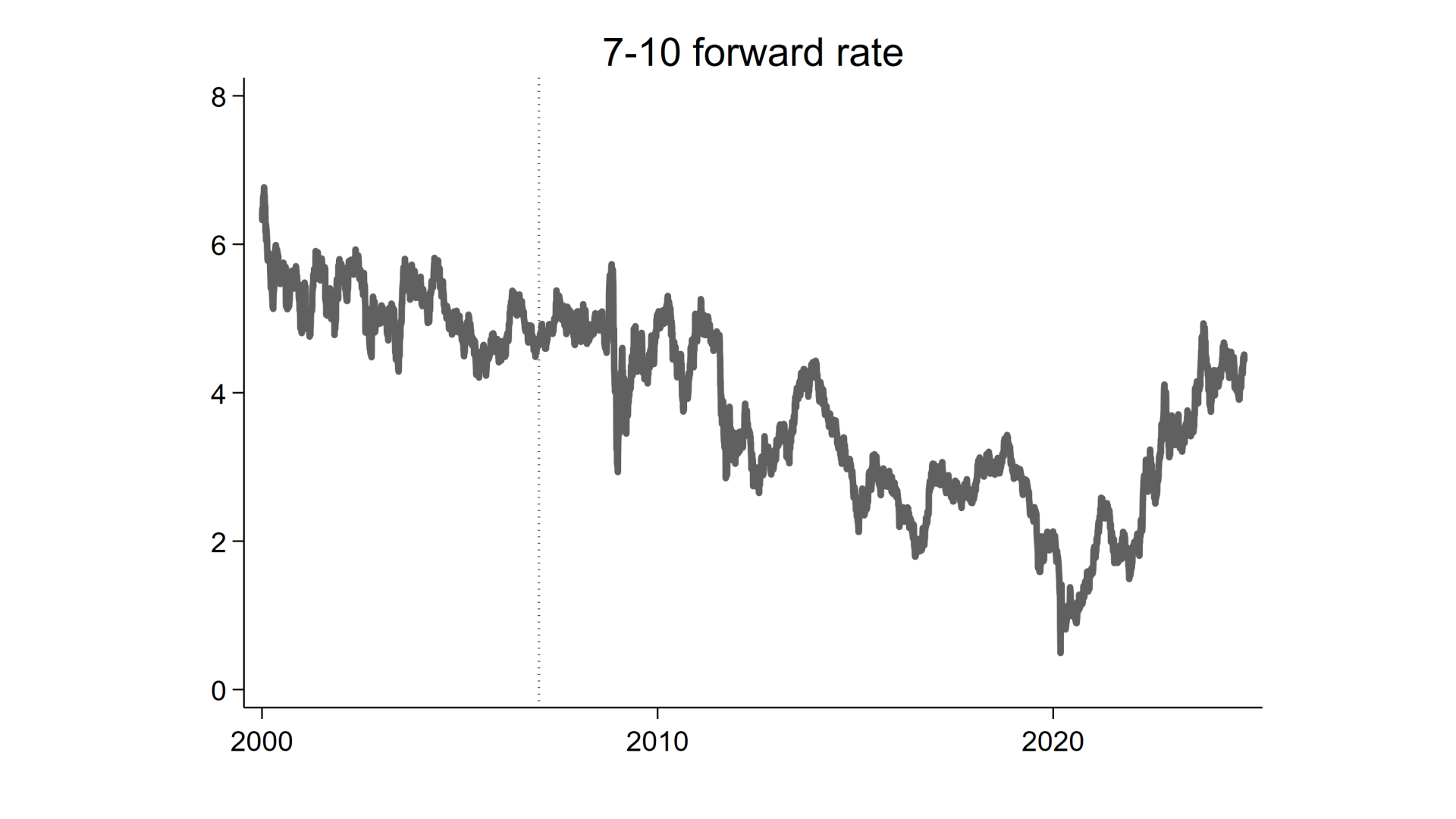
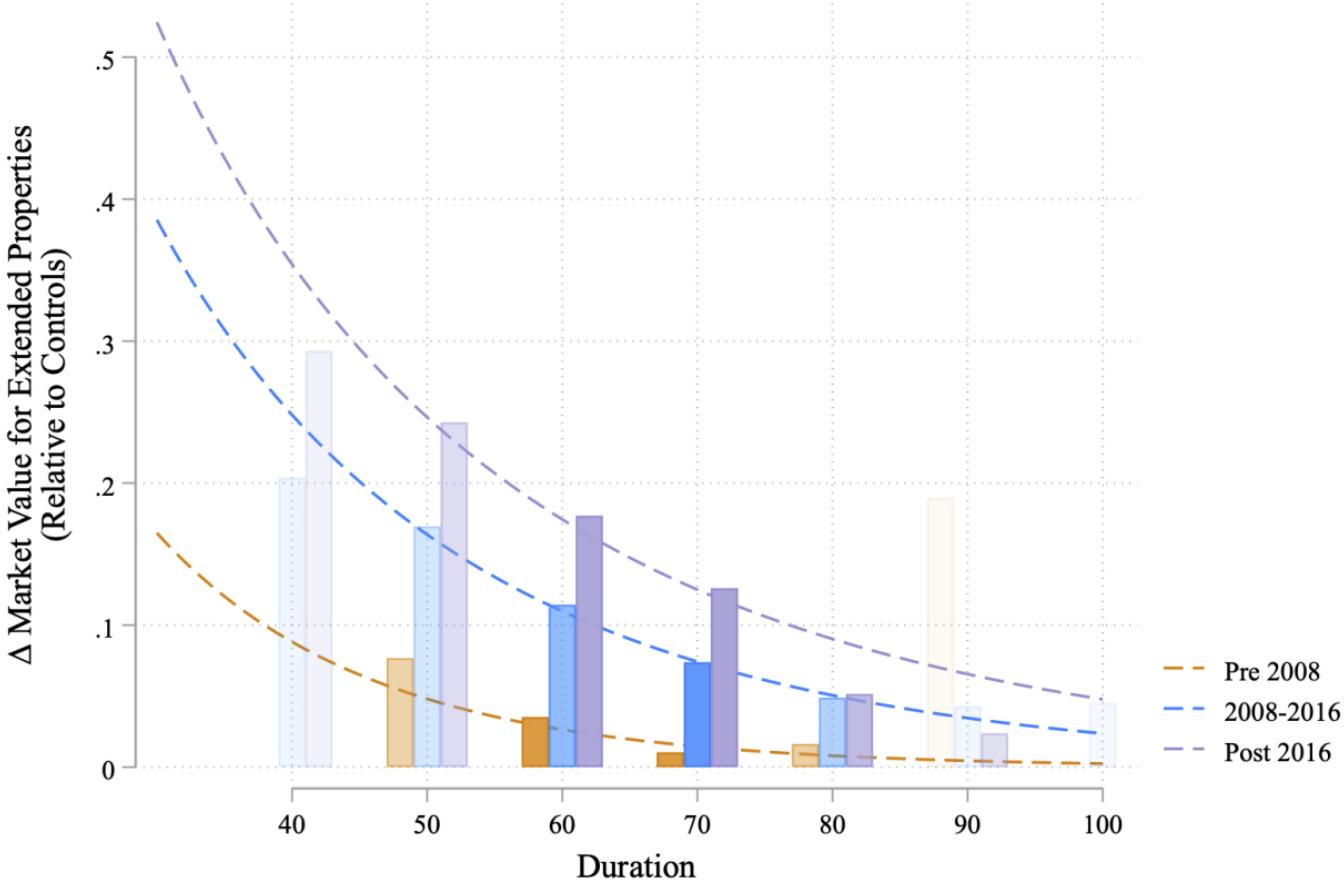
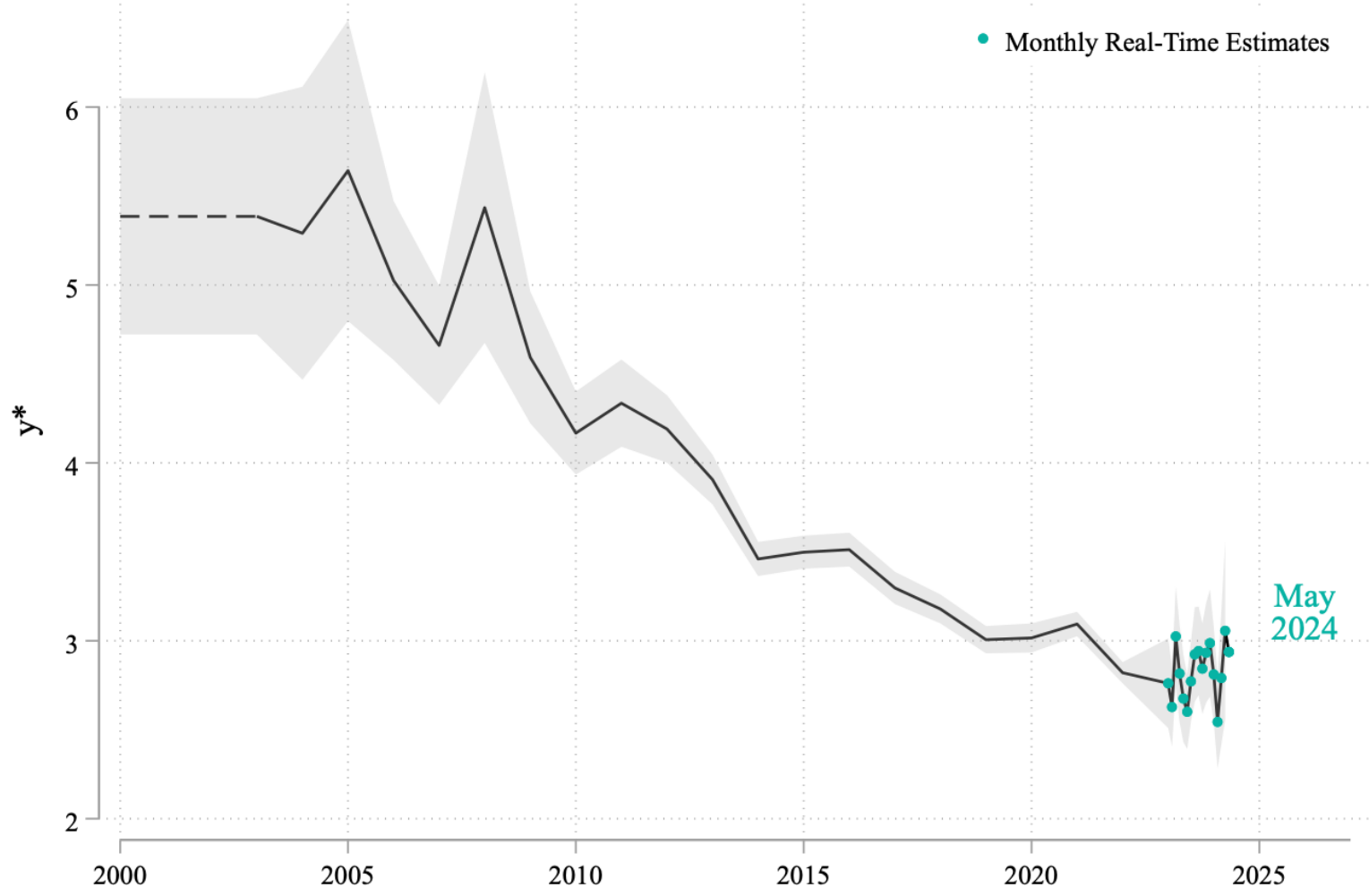

7-10 forward rate
8
6
4
2
0
2000
2010
2020

Figure 8: Price Change From Extension, Over Time




Monthly Real-Time Estimates
y*
6
5
4
3
2
2000
2005
2010
2015
2020
2025
May
2024