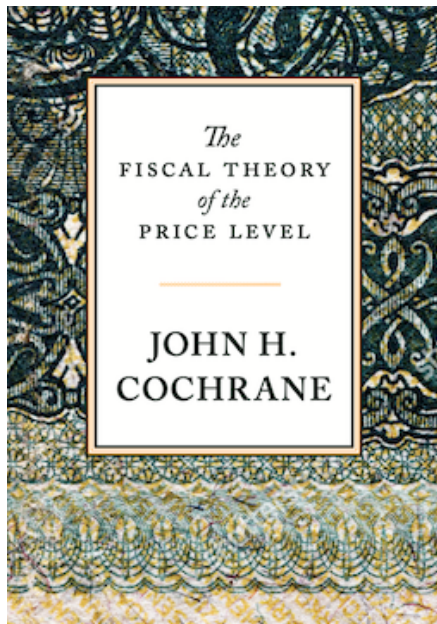
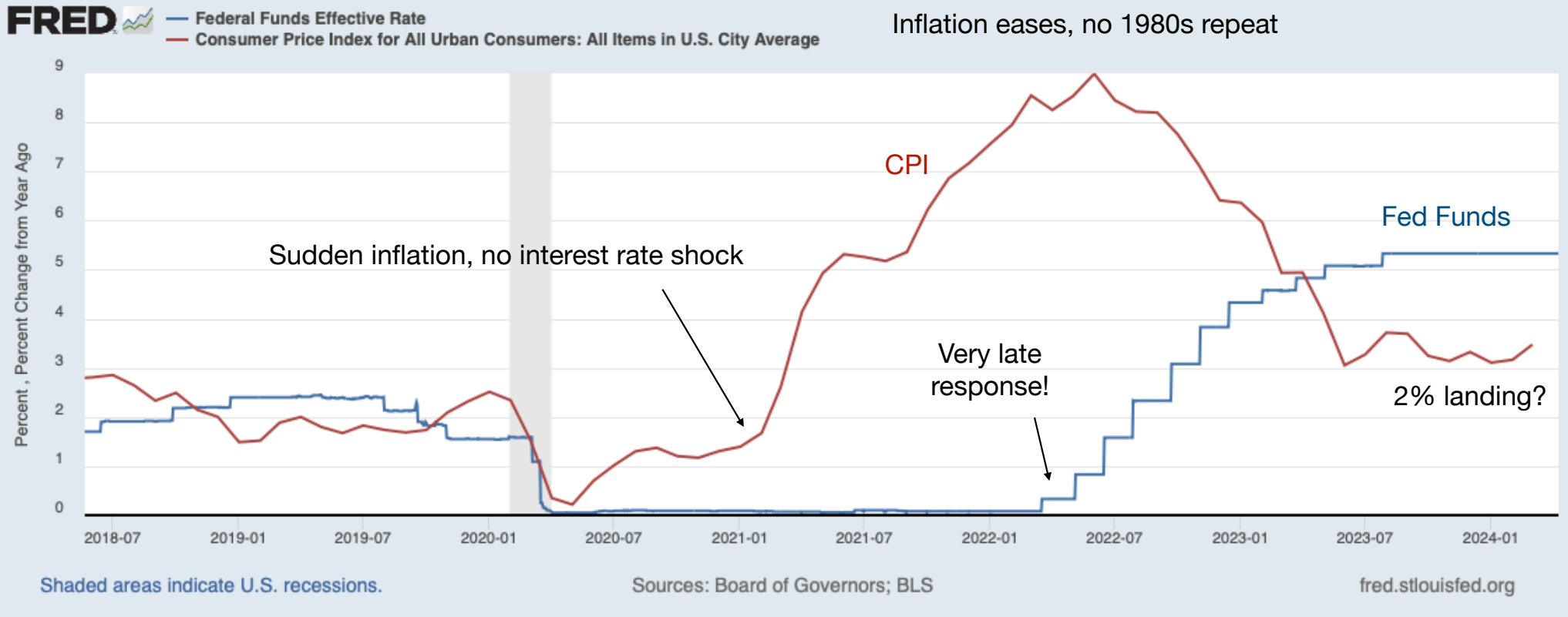


Monetary-Fiscal Interactions

John H. Cochrane
Hoover Institution

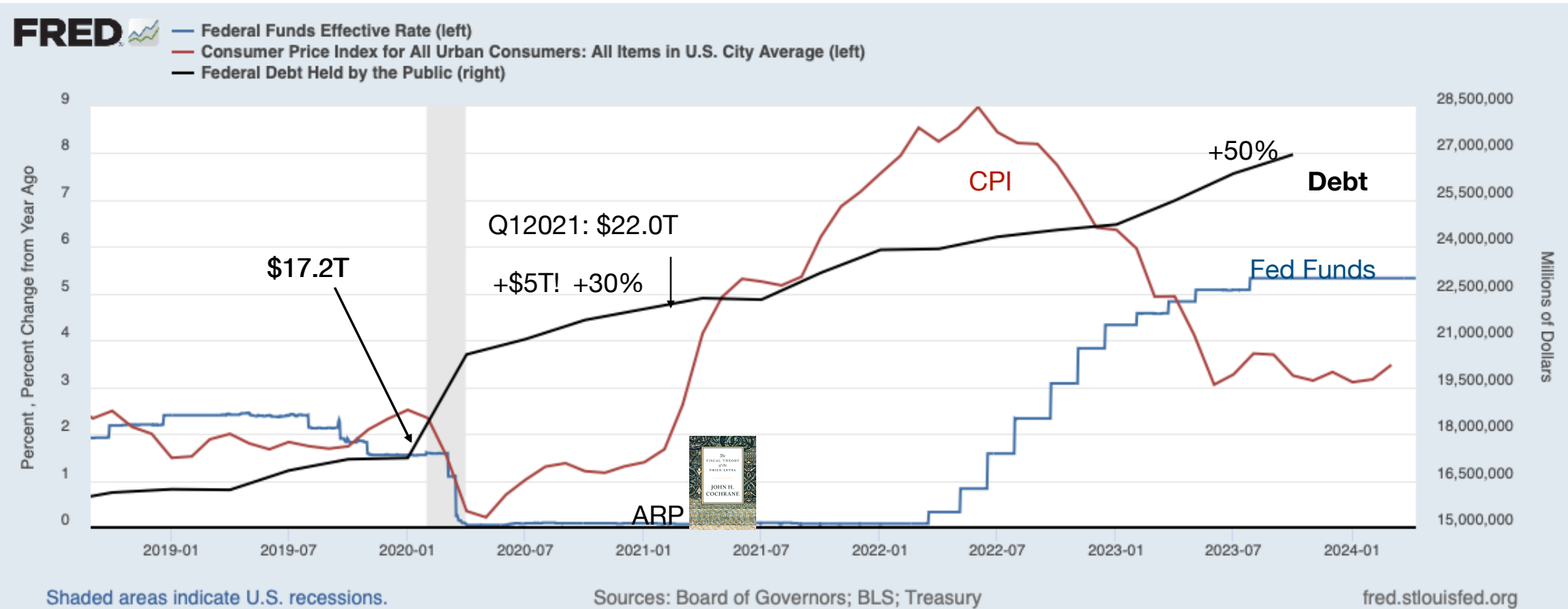


2021-2024 Inflation



- Why did inflation start?
- Why did inflation plateau and ease? No spiral? No recession?
- What happens next?

2021-2024 Inflation

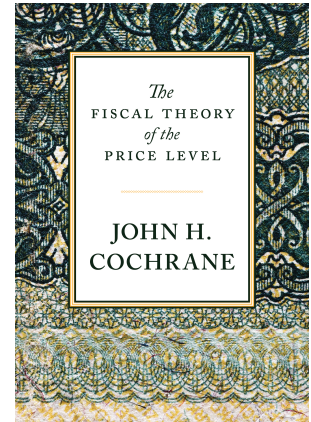


Why did inflation break out?

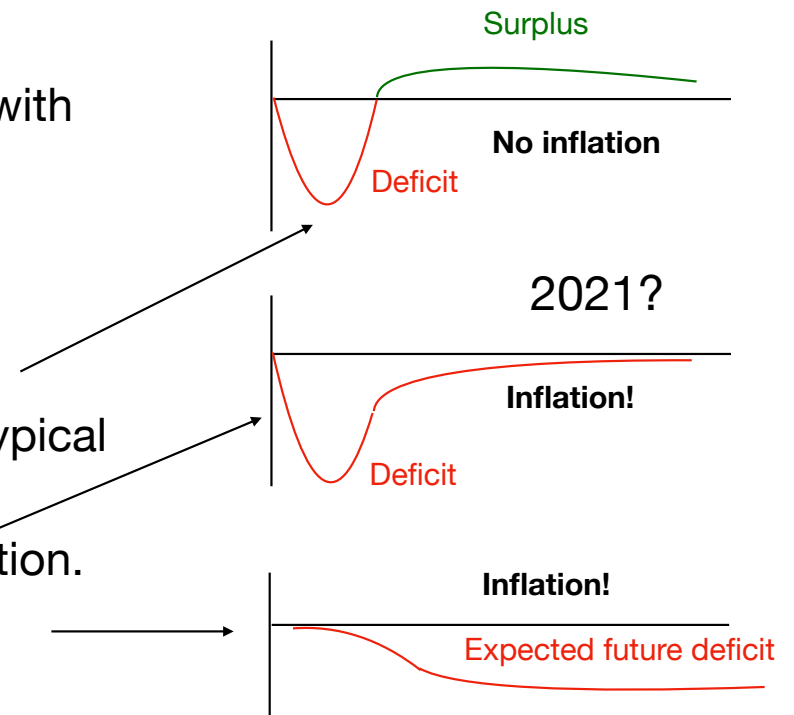
- +\$5T debt to public. (\$3T monetized). Checks to people, businesses.

Fiscal theory of the price level

$$\frac{\text{Nominal government debt}}{\text{price level}} = \text{Present value of primary government surpluses}$$



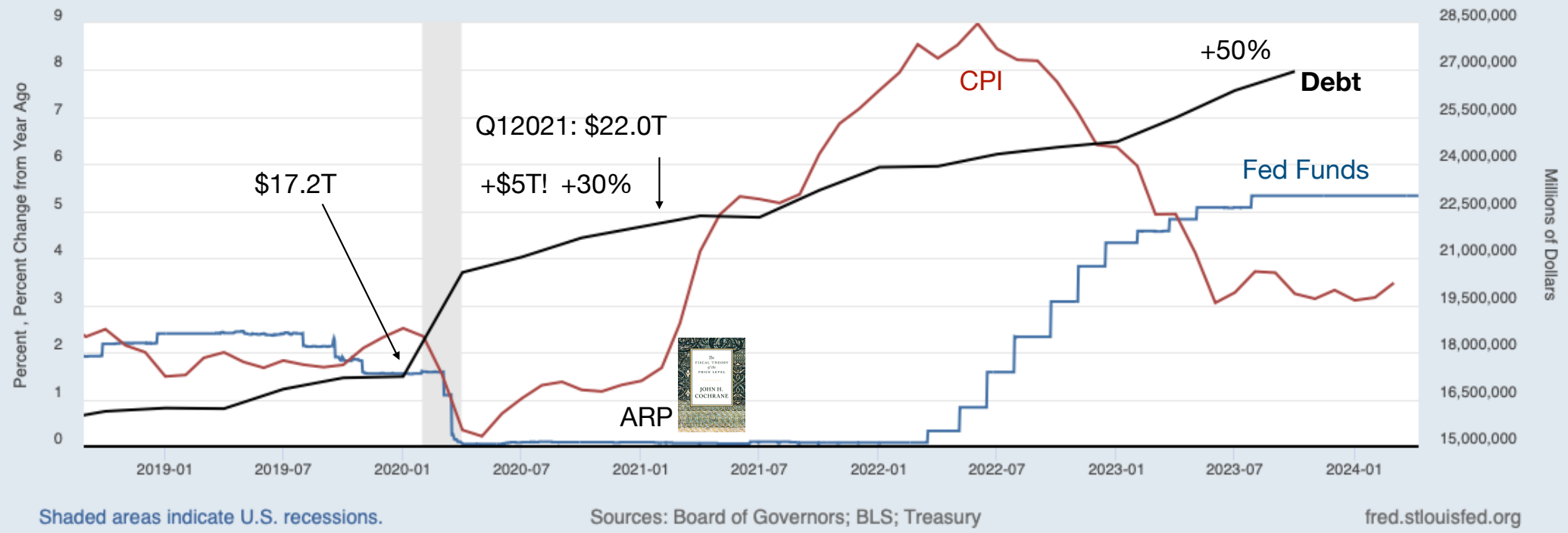
- Inflation: too much money chasing too few goods.
- “Too much?” Soak up with taxes-spending. Soak up with debt? Debt = future taxes-spending.
- Debt and money are like stock in the government.
- Debt vs. *long run* ability/will to repay.
- Not necessarily *today’s* deficits or debt.
- Lots of debt/deficit possible with no inflation. That’s typical and good (!) policy.
- Deficits/debt *without* expected repayment cause inflation.
- Or, inflation can be a surprise with little current deficit.





— Federal Funds Effective Rate (left)
 — Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (left)
 — Federal Debt Held by the Public (right)

2021-2024 Inflation



Debt vs. *expected* repayment. Why this time, not 2008?

- No talk of repayment. Spending rules suspended. “Go big, interest costs are low.” $r < g$, MMT. ARA, IRA. Return to normal fiscal policy?
- Surprise -1% interest cost 2008-2021. Not again!
- Is money and debt good to hold and save? No inflation. Spend now? Inflation!

FTPL exercise 1

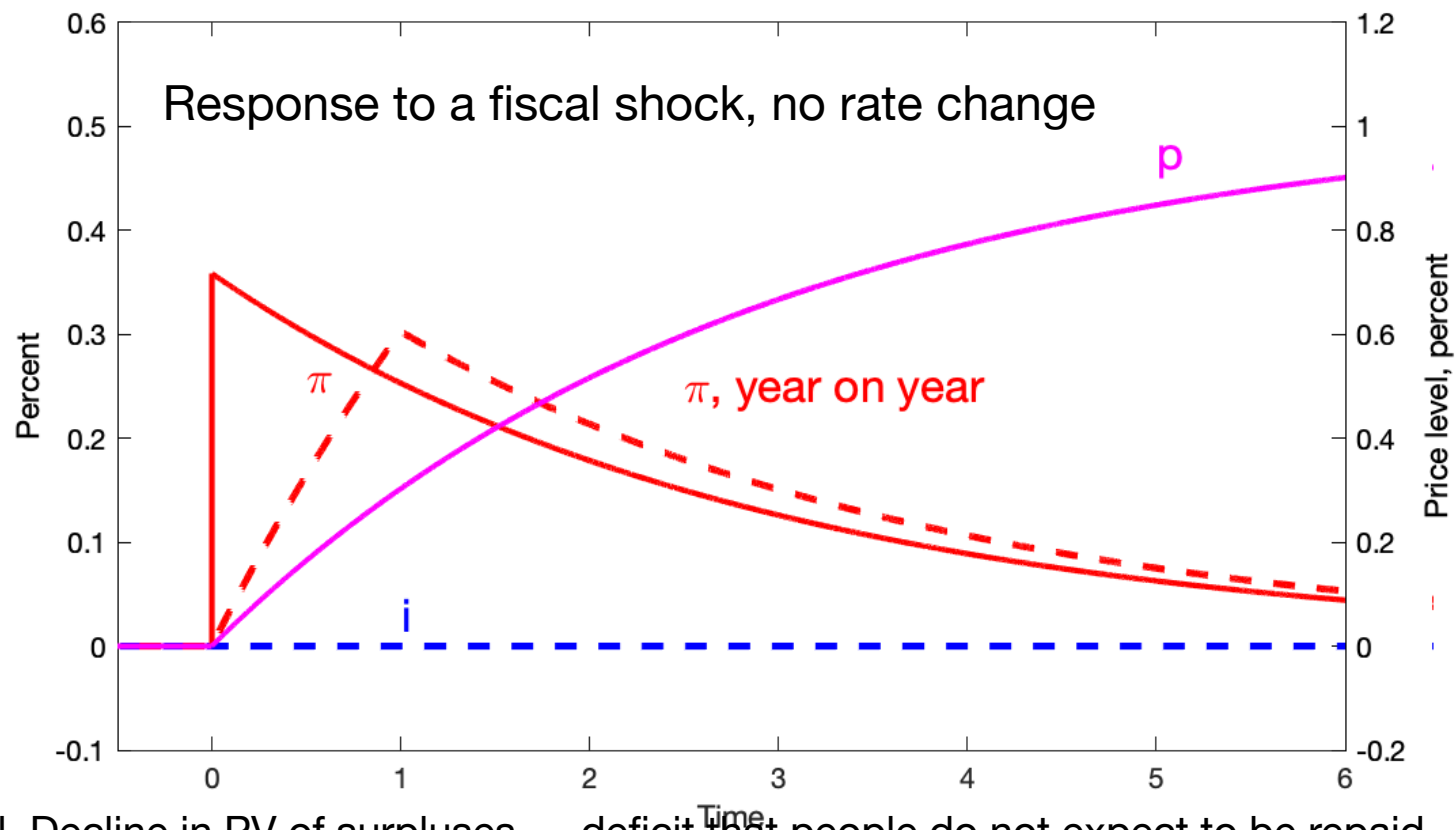
$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$

$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$

$$\rho v_{t+1} = v_t + r_{t+1}^n - \pi_{t+1} - \tilde{s}_{t+1}$$

$$E_t r_{t+1}^n = i_t$$

$$r_{t+1}^n = \omega q_{t+1} - q_t$$



- Standard NK+FTPL model. Decline in PV of surpluses — deficit that people do not expect to be repaid.
- Result: Inflation surge. Inflation above interest inflates away debt.
- $\frac{B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \beta^j s_{t+j}$ reduction in s raises P . Sticky prices draw out dynamics.
- Lesson: When $PV(s)$ declines, inflation must eat away debt. The Fed cannot avoid this inflation.
- Inflation eases, with no Fed action, no high real rates, no recession.

Money?

Agree, a helicopter drop (money financed deficit) causes inflation.

- Does an *exchange* of money for bonds have the same effect?
- Does a rise in inside money have exactly the same effect?
- $MV=PY$: Yes. FTPL: No. Portfolio/liquidity vs. wealth effect.

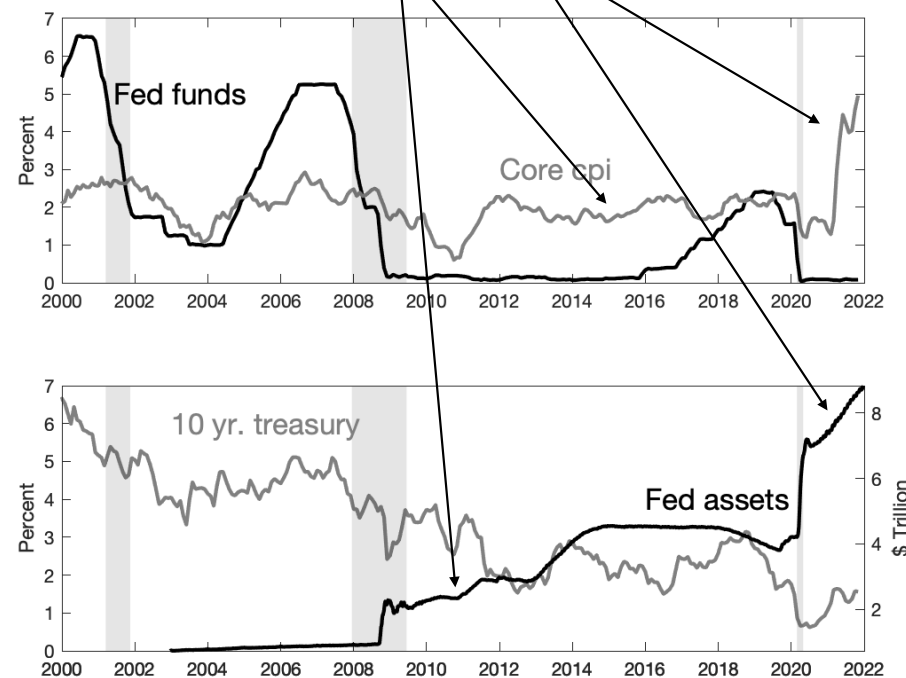
Friedman examples? Money to finance deficits.

Was monetization in 2021 key? QE vs. Covid a nearly perfect test.

Theory: Fed does not control money supply.



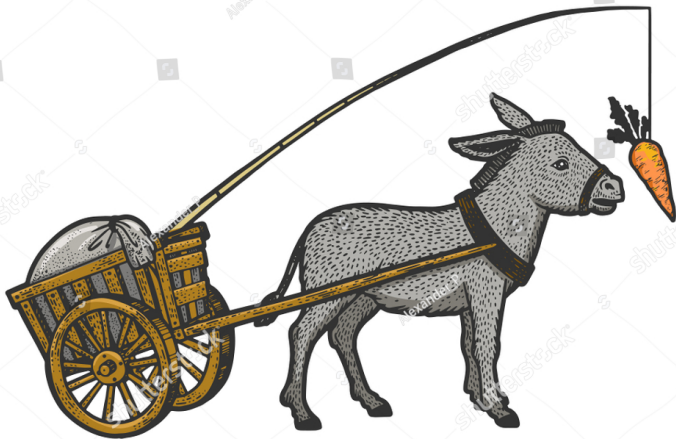
Bond purchase
Without/with extra deficit



Other stories

Monopoly, greed, price-gouging, “supply shocks?”

- *Relative* price unless they induce monetary or fiscal response.
- All “supply shock” models rely on induced fiscal or monetary policy to raise demand.
- Agree: supply shock caused the government to do war finance, with war inflation.



Monetary-fiscal interaction, robust across theories of inflation

History: (?) Has there ever been a substantial inflation that did not come from printing money to cover deficits, i.e. in a country with good growth, steady primary surpluses, reasonable debt, but a central bank made a mistake with interest rates or open market operations? Every successful disinflation has combined monetary, fiscal, and microeconomic policy reform.

Fact: Tighter monetary policy that reduces inflation imposes fiscal costs.

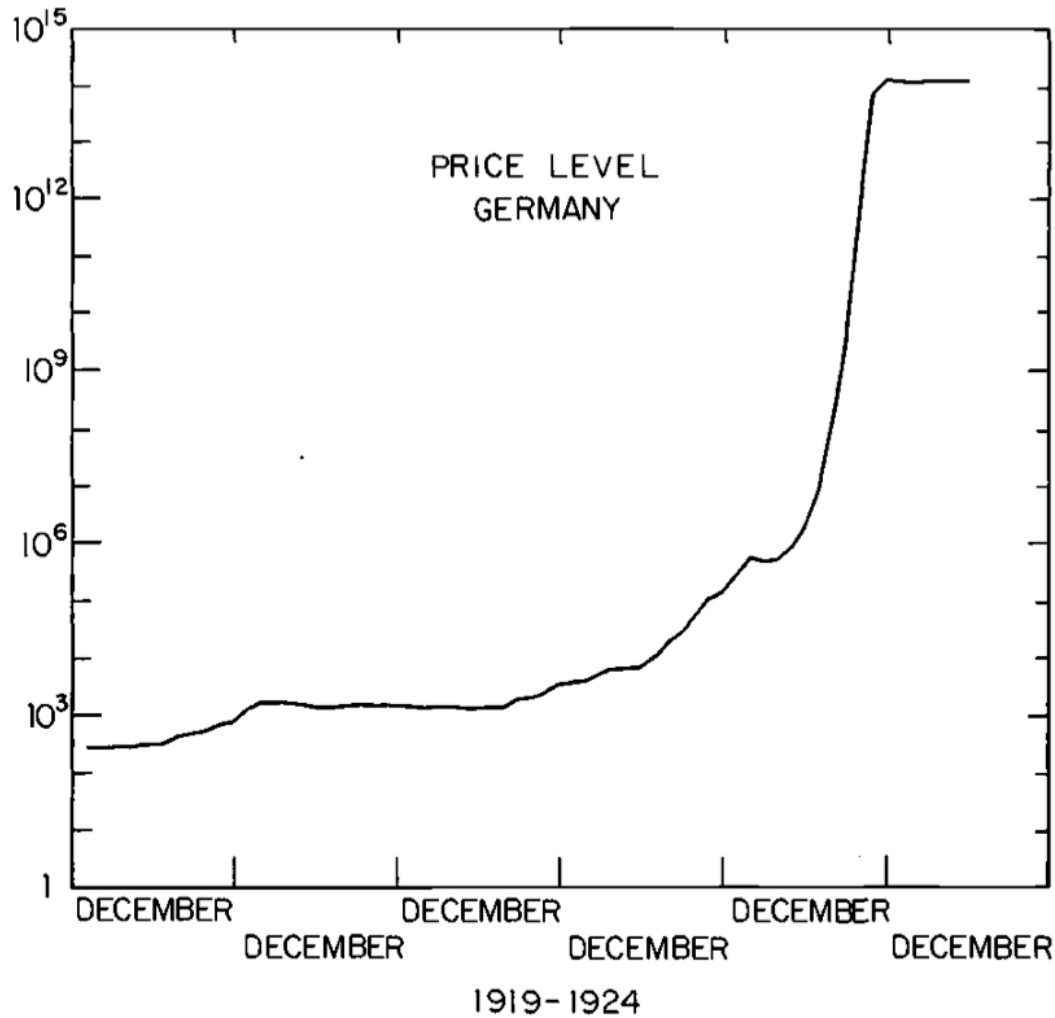
- Higher interest costs on the debt (100% D/Y: 1% r means 1% s/Y).
- (Faster with shorter maturity structure, made worse by QE)
- Windfall to bondholders.
- Softer economy: less tax revenue, “automatic stabilizers,” stimulus, bailout.

Theory: Higher interest rates that *do not* include tighter current or future fiscal policy to pay these costs do not permanently lower inflation.

True of all known (to me) models. Monetarist, FTPL, ISLM, New-Keynesian.

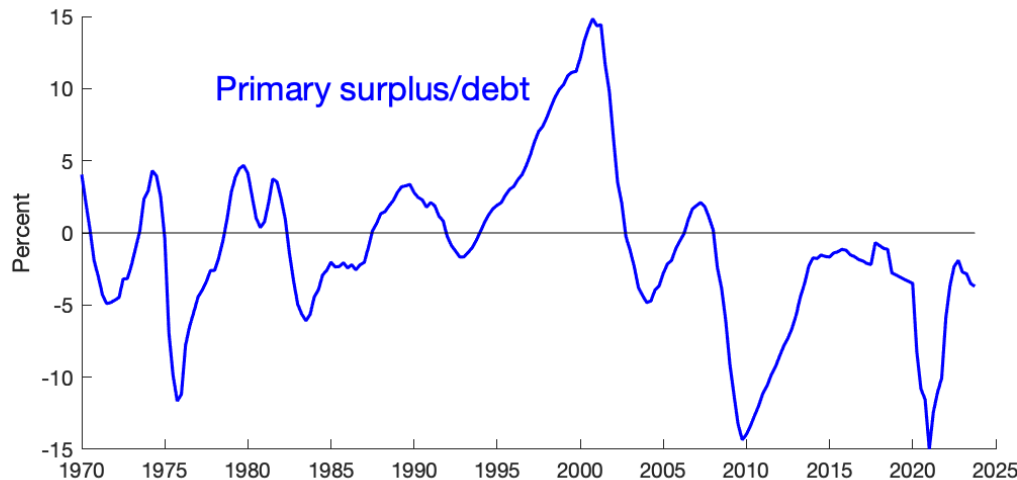
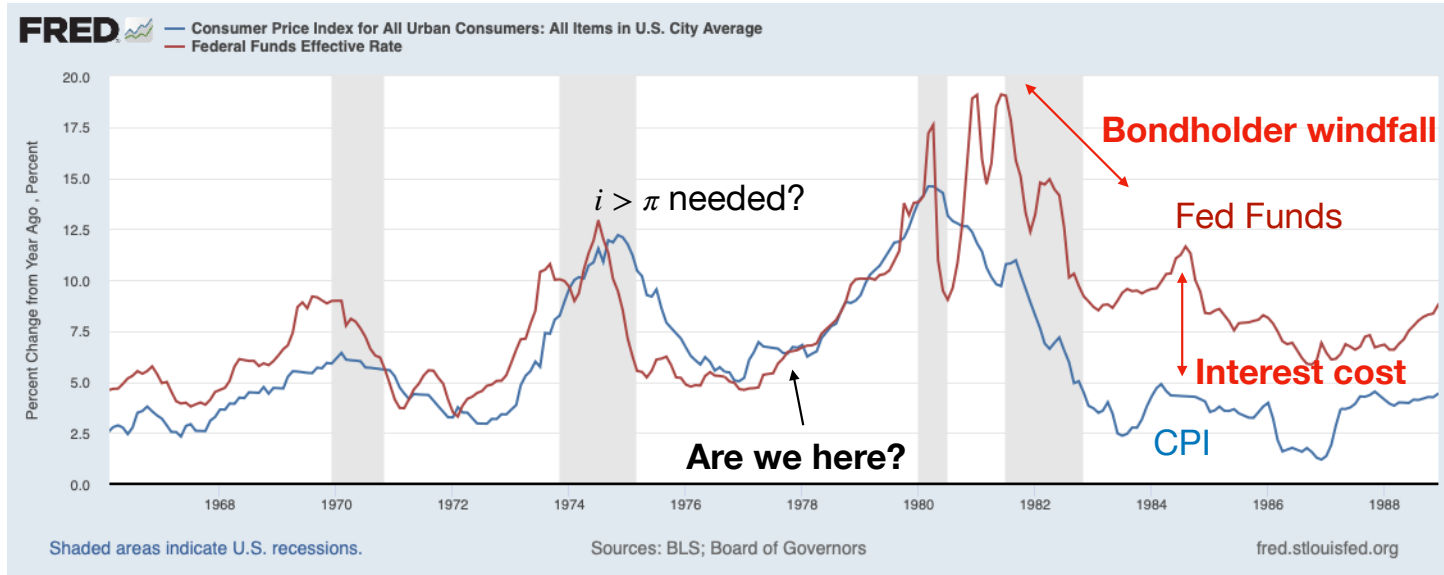
Worry: What if monetary policy today cannot count on contemporaneous fiscal tightening?

History: The classic end of inflation



- Sargent (1982)
- Inflation ends with long-run *fiscal* reform.
- Interest rates *decline*.
- Money growth *rises*.
- Economy *booms*.

1980s were a joint monetary, fiscal, and microeconomic disinflation

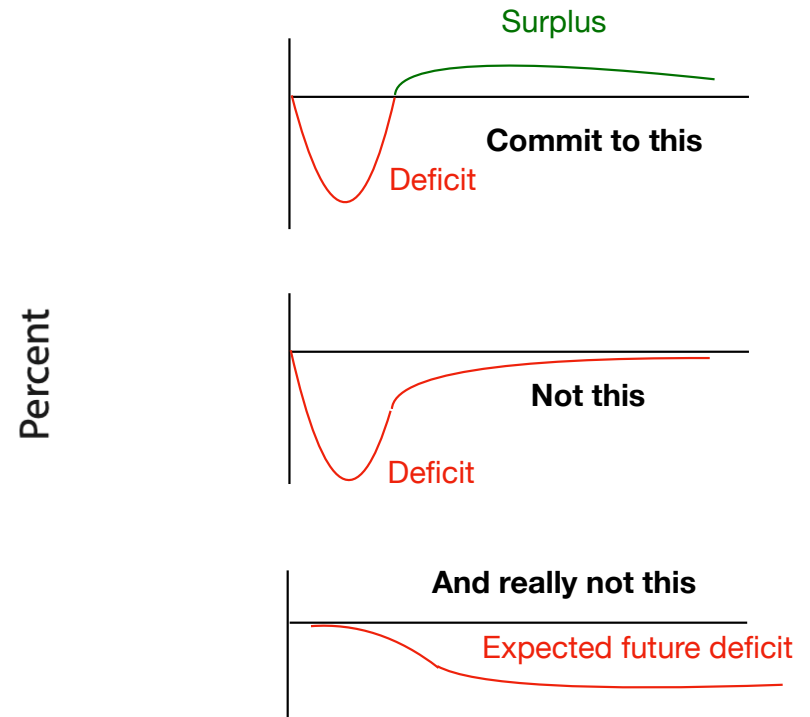
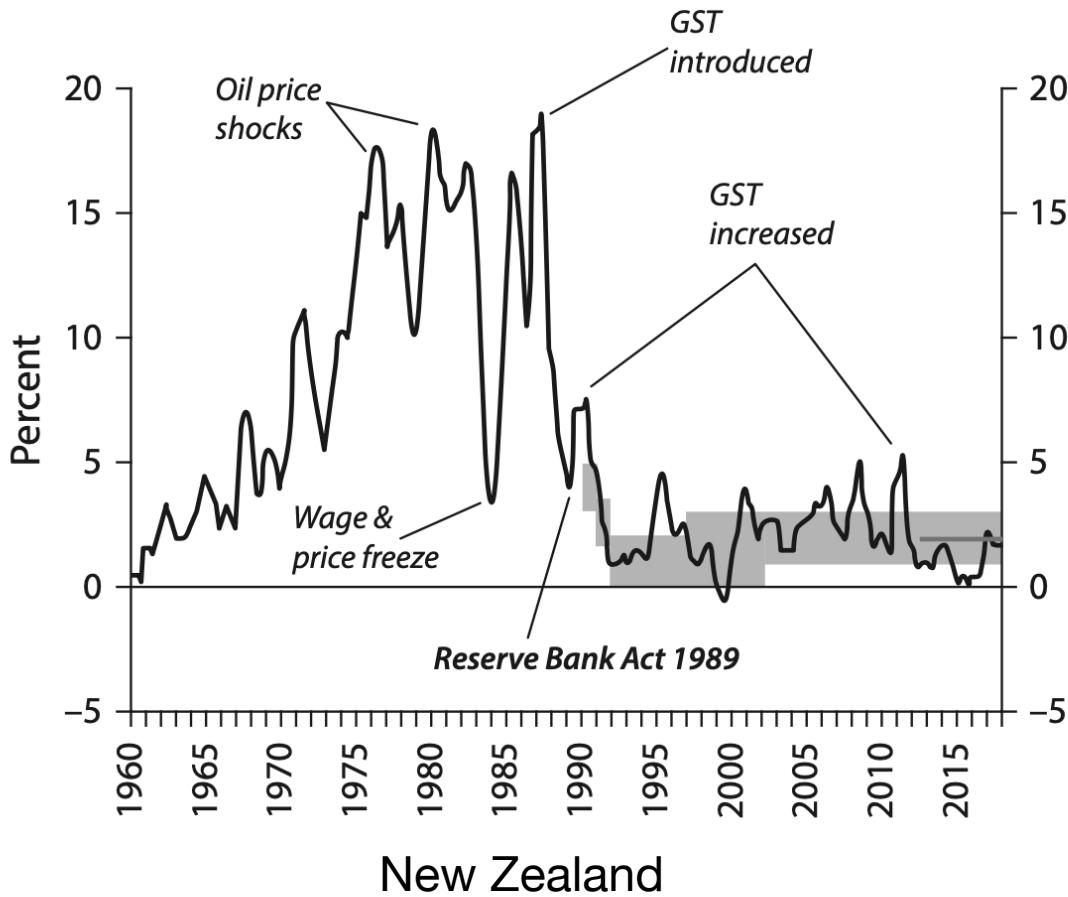


1960s: Great Society, war, Bretton Woods collapse

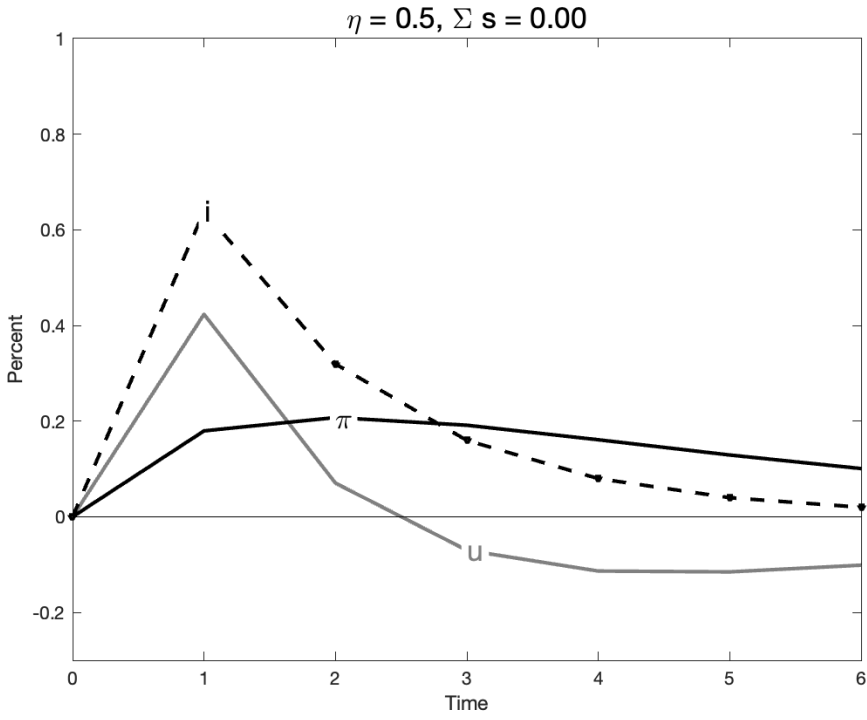
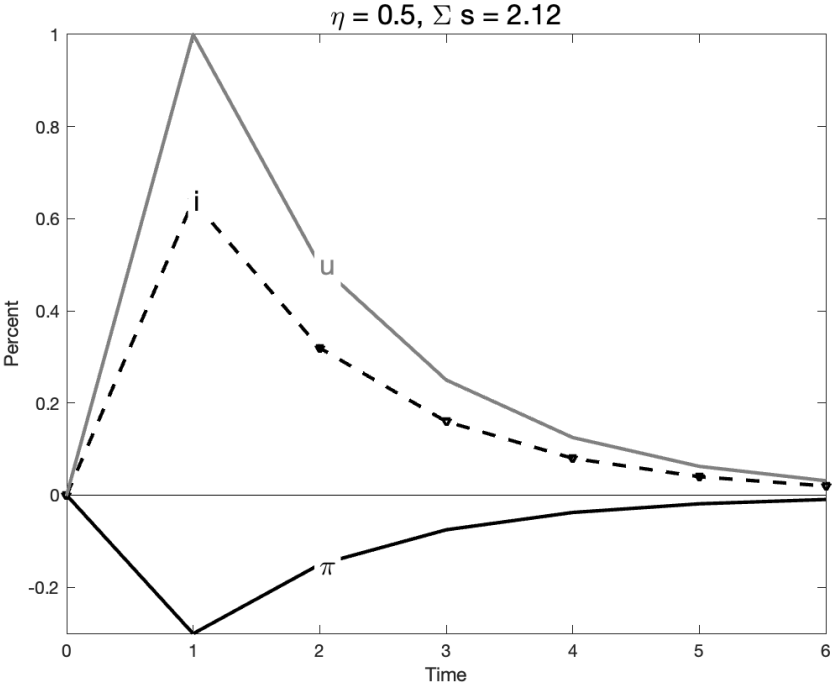
1970s: Big deficits relative to debt.

1982-1986: Tax, ss reform, deregulation, Growth! PV of surpluses did pay for disinflation.

Inflation targets as a joint fiscal, monetary, micro reform. And painless disinflation.



Theory: Higher interest rates without tighter fiscal policy do not permanently lower inflation.



Model: Completely standard NK model. $i_t = \phi\pi_t + u_t$. Fact: multiple $\{u_t\}$ produce the same $\{i_t\}$.

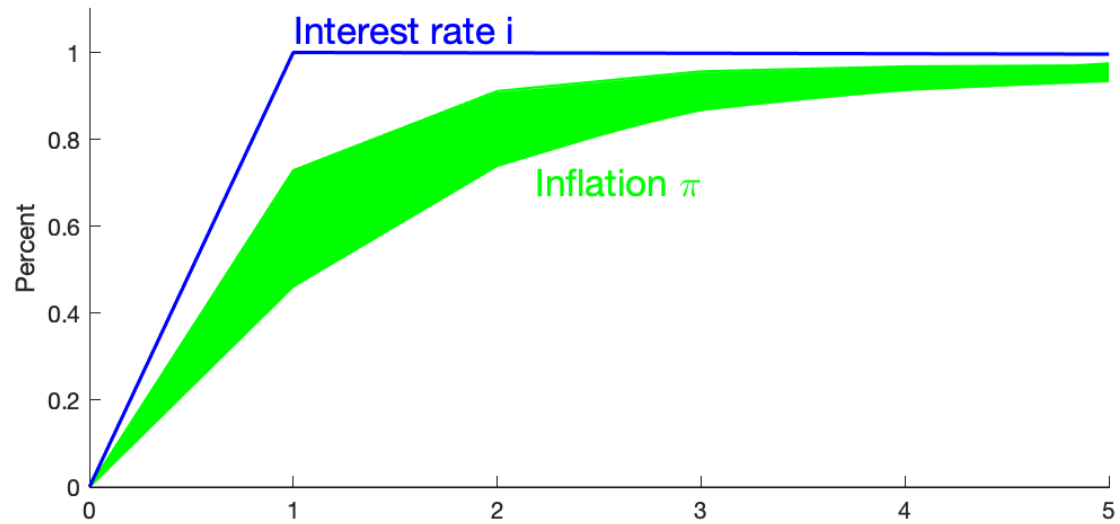
Left: $\{u_t\}$ is an AR(1). Compute the “passive” rise in PV of surpluses.

Right: Find $\{u_t\}$ that produces *the same* $\{i_t\}$, but does not require any change in surplus.

Point: If fiscal policy does not “passively” implement austerity, higher interest rates do not lower inflation, even in the completely standard new-Keynesian model.

Theory: Higher interest rates without tighter fiscal policy do not permanently lower inflation.

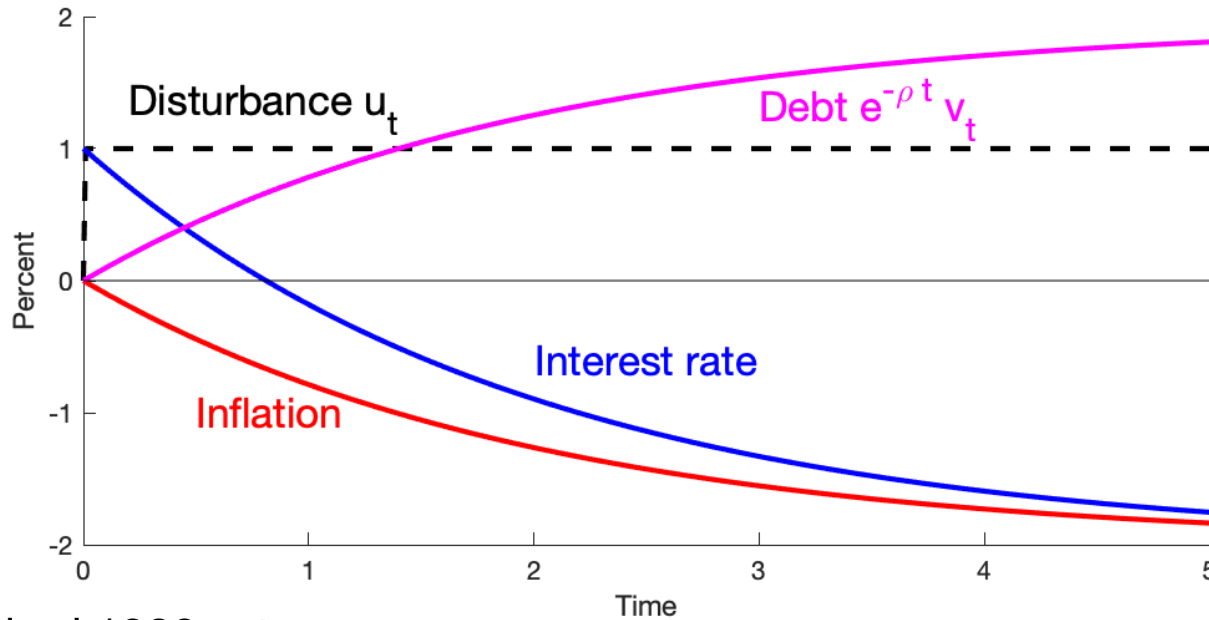
Response to a monetary policy shock with no change in fiscal policy
 NK model, all possible parameters.



$$\begin{aligned}
 x_t &= E_t x_{t+1} - \sigma (i_t - E_t \pi_{t+1}) \\
 \pi_t &= (1 - \alpha) E_t \pi_{t+1} + \alpha \pi_{t-1} + \kappa x_t \\
 \rho v_{t+1} &= v_t + i_t - \pi_{t+1} \\
 i_{t+1} &= i_t + \varepsilon_{i,t+1}
 \end{aligned}$$

All parameters σ, κ, α that give real eigenvalues (no zig-zag, sine waves)

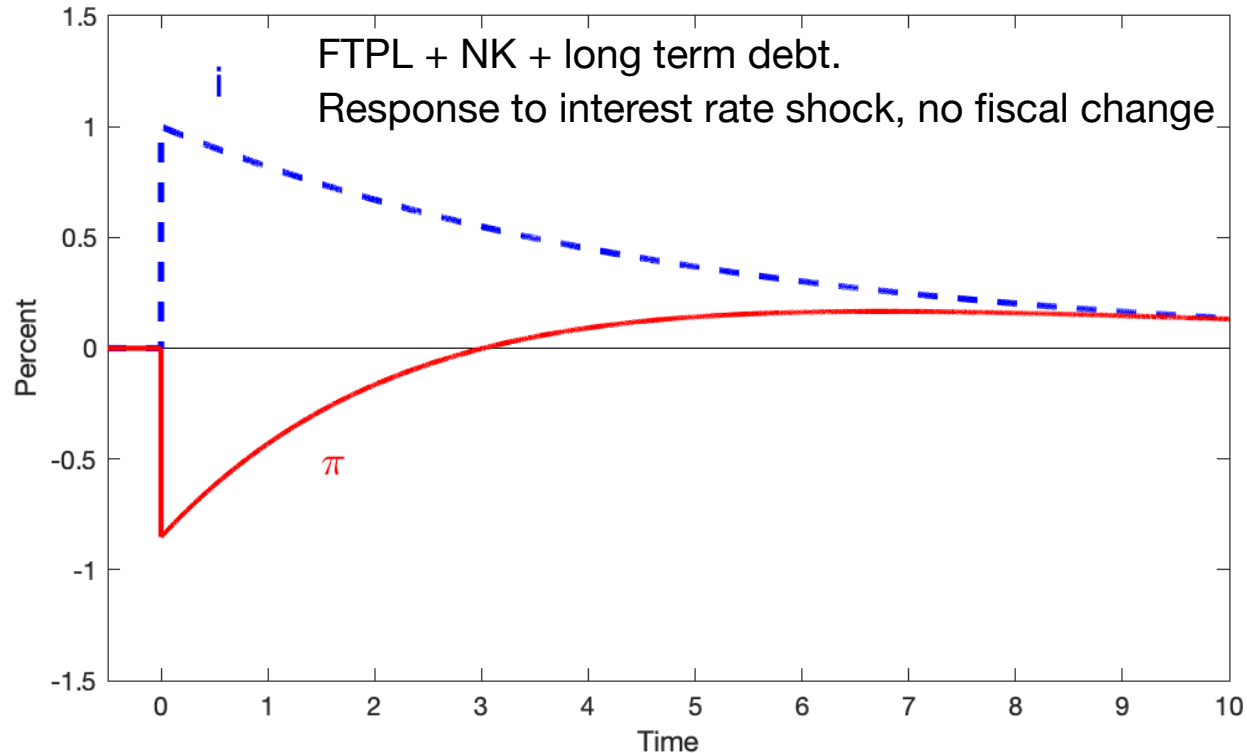
Adaptive expectations / ISLM



- Standard 1980s story.
- Disinflation requires interest costs on debt/surpluses to pay bondholders in more valuable currency.
- Paper: Interest rates with no change in fiscal policy *cannot* change long-run inflation. Intuition: average real interest cost on debt = 0 implies average real interest to shove inflation around = 0.

$$\begin{aligned}
 x_t &= -\sigma(i_t - \pi_{t-1}) && \text{Adaptive} \\
 \pi_t &= \pi_{t-1} + \kappa x_t \\
 \rho v_{t+1} &= v_t + i_t - \pi_{t+1} \\
 i_t &= \phi \pi_t + u_t \\
 \sigma \kappa &= 1; \quad \phi = 1.5 \quad \rho = 0.99 \\
 & \text{(Continuous time)}
 \end{aligned}$$

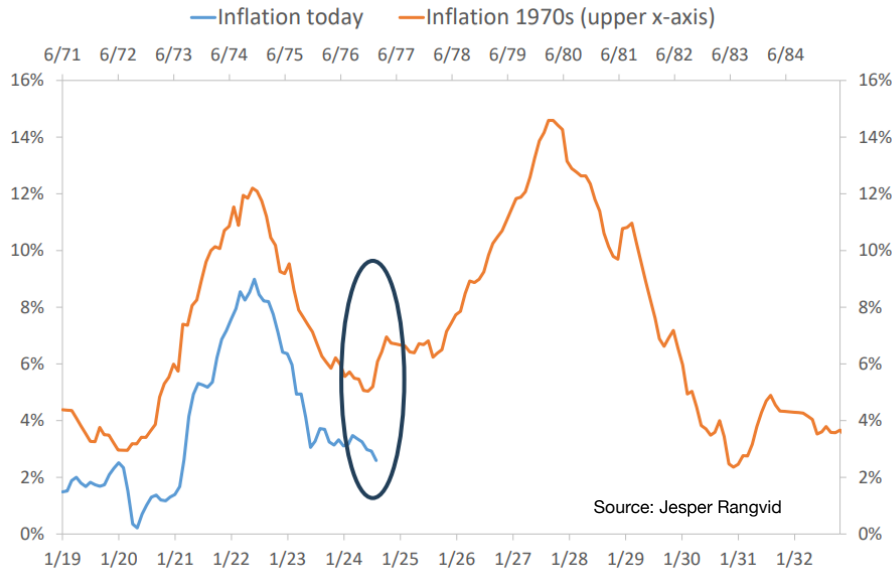
The Best I Can Do



- Fed raising rates in 2022 did help to bring down inflation, but at the cost of more persistent inflation (unless it induces a fiscal tightening).
- With a fiscal shock, inflation must devalue debt, but the Fed can choose *when* inflation happens, and completely control long run inflation.
- The Fed can choose less inflation now, more later. “Unpleasant interest rate arithmetic.”
- Good policy, reduces output volatility. The Taylor rule is always the answer! The questions change!

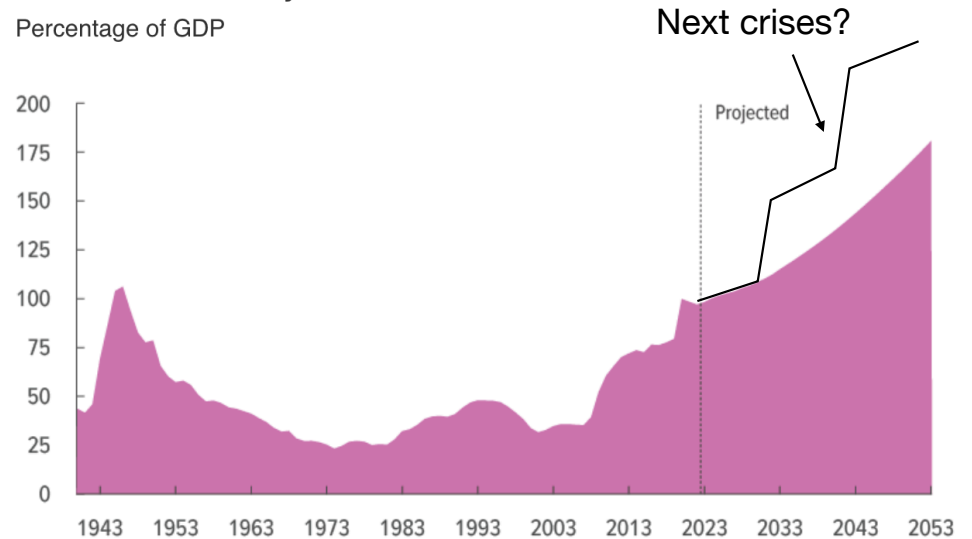
The Future

- CBO *projections*. Optimistic.
- Room for Fed to ask for higher surpluses?
- Next shock? Faster inflation?
- Inflation / default will not solve the fiscal problem.
- Not yet? Doesn't have to happen.



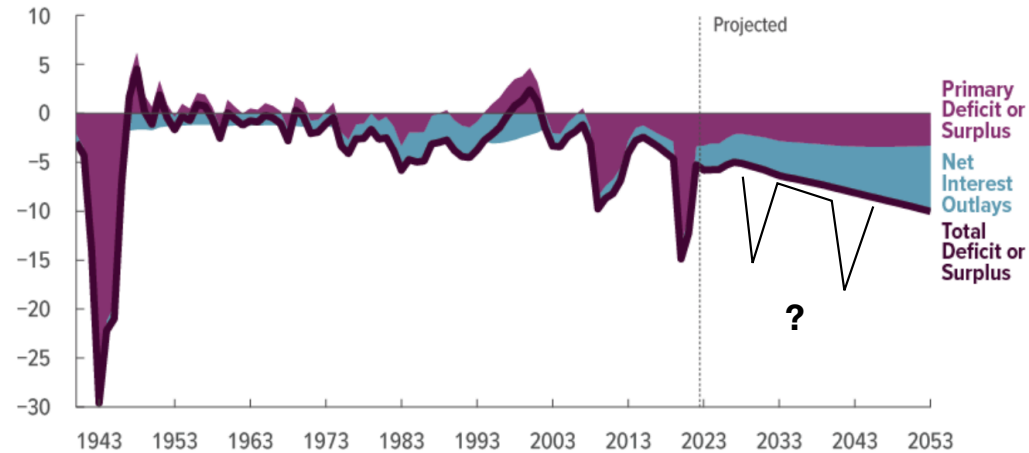
Federal Debt Held by the Public

Percentage of GDP

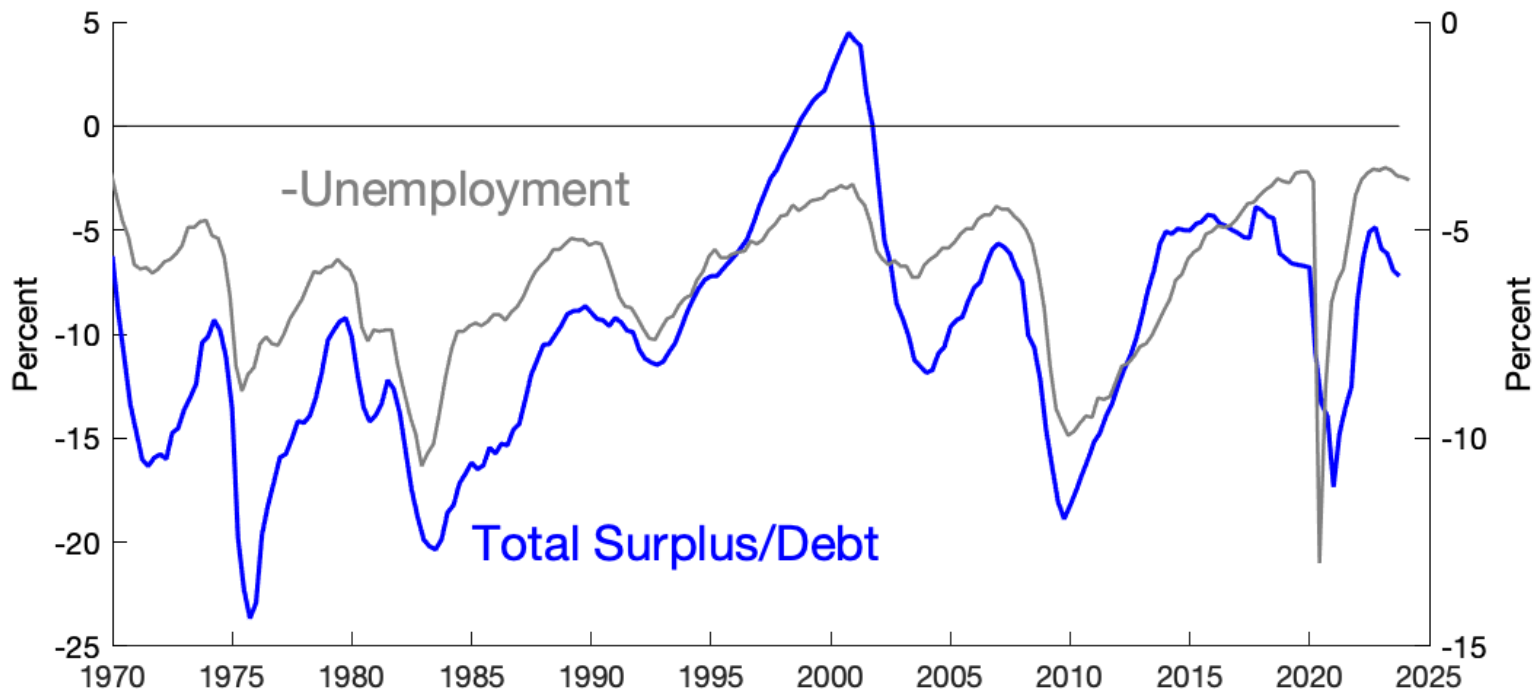


Deficits

Percentage of GDP



Solution: Growth!



- Distorting taxes vs. painful spending cuts? Growth!
- Tax revenue = tax rate x GDP. More GDP!
- Economy is the major determinant of government finances.
- Also spend more effectively, tax less distortingly.

Solution: Growth!

(Which is a more important problem anyway).

