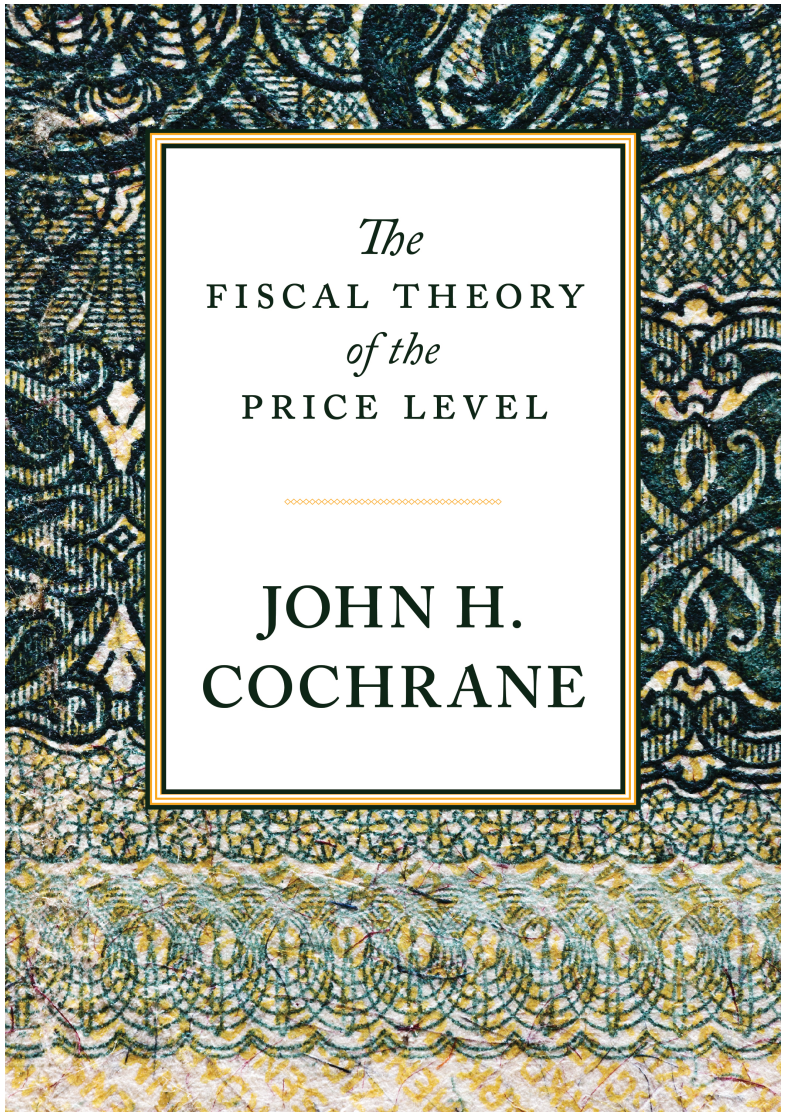
Fiscal theory of the price level (update)

Also

- “Fiscal Histories” (mostly)
- “Expectations and the neutrality of interest rates”
- “Debt and the euro” (With Luis Garicano and Klaus Masuch)

Point: Make fiscal theory *useful.*

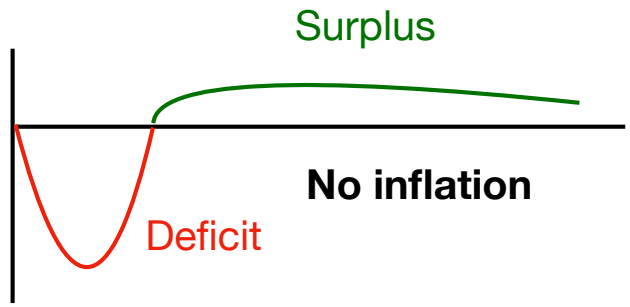


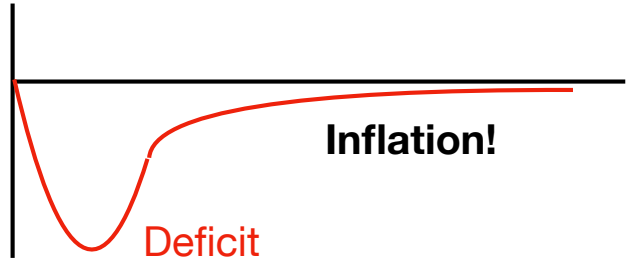
John H. Cochrane
Hoover Institution
Papers at https://www.johnhcochrane.com

Fiscal theory of the price level

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

- Mechanism: Debt vs. long run ability/will to repay. Soak up money. Like stocks.
- Inflation is not linked to *today's* deficits or debt. "Stock" vs. Keynesian "flow."
- Lots of debt/deficit possible with no inflation. Inflation can come as a surprise.
- Expectations? Institutions. Like stocks/ financial crises. Hard to predict. (It is!)
- Discount rates / interest costs on the debt matter. Higher real interest = higher costs = more inflation & vice versa.

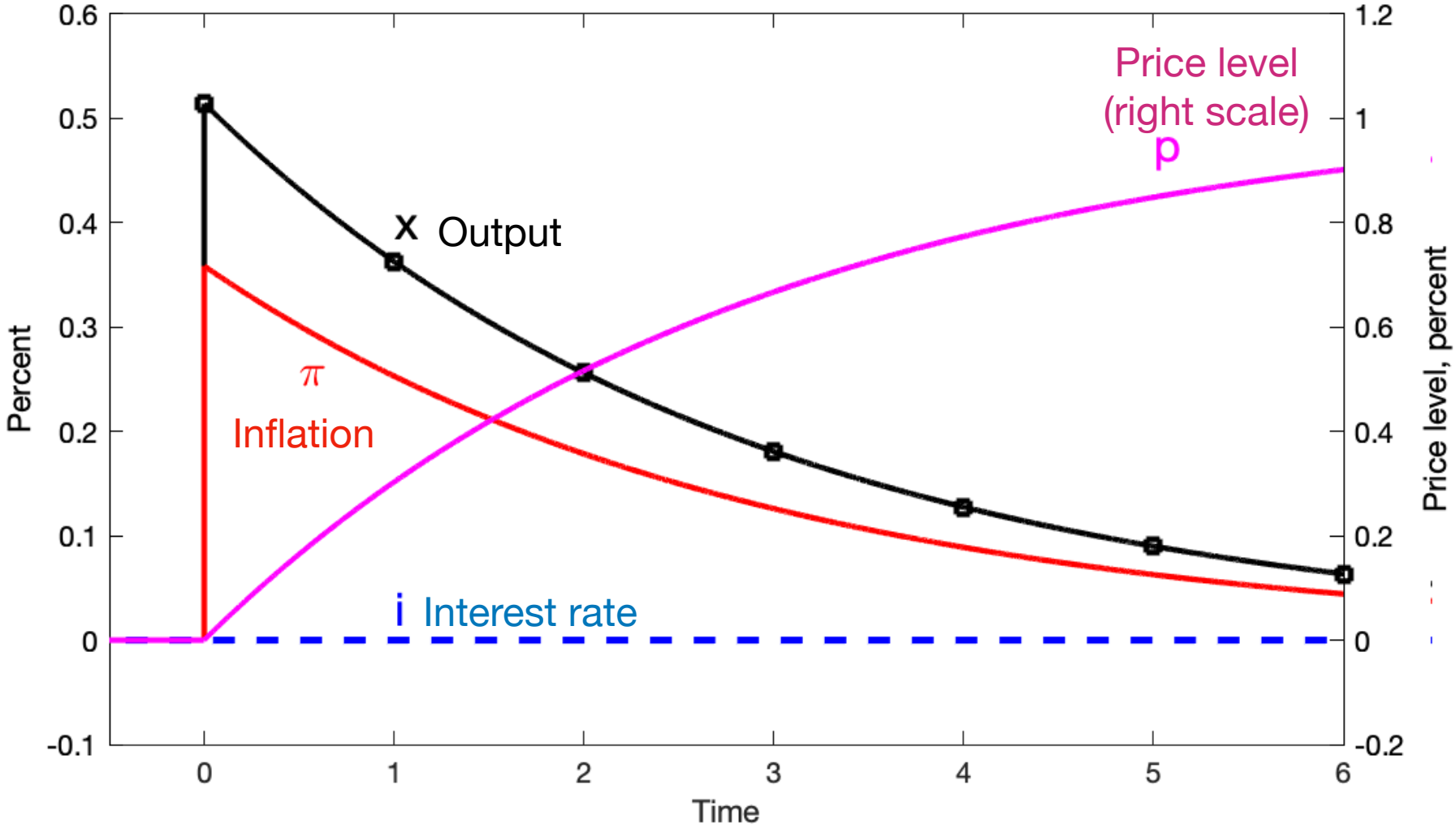




What about money?

- “Inflation results from too much money chasing too few goods”
- We agree: Money (or debt) from helicopters causes inflation. Printing money to finance deficits causes inflation.
- We disagree: More money but less bonds? Inside money? Wealth vs. composition, total vs. liquidity of assets.
- Central banks set interest rates, pay interest on huge reserves, do not control money supply. MV=PY is a correct theory, but does not apply to our economy.
- We need a theory of inflation under interest rate targets, with ample liquidity (huge interest-paying reserves).

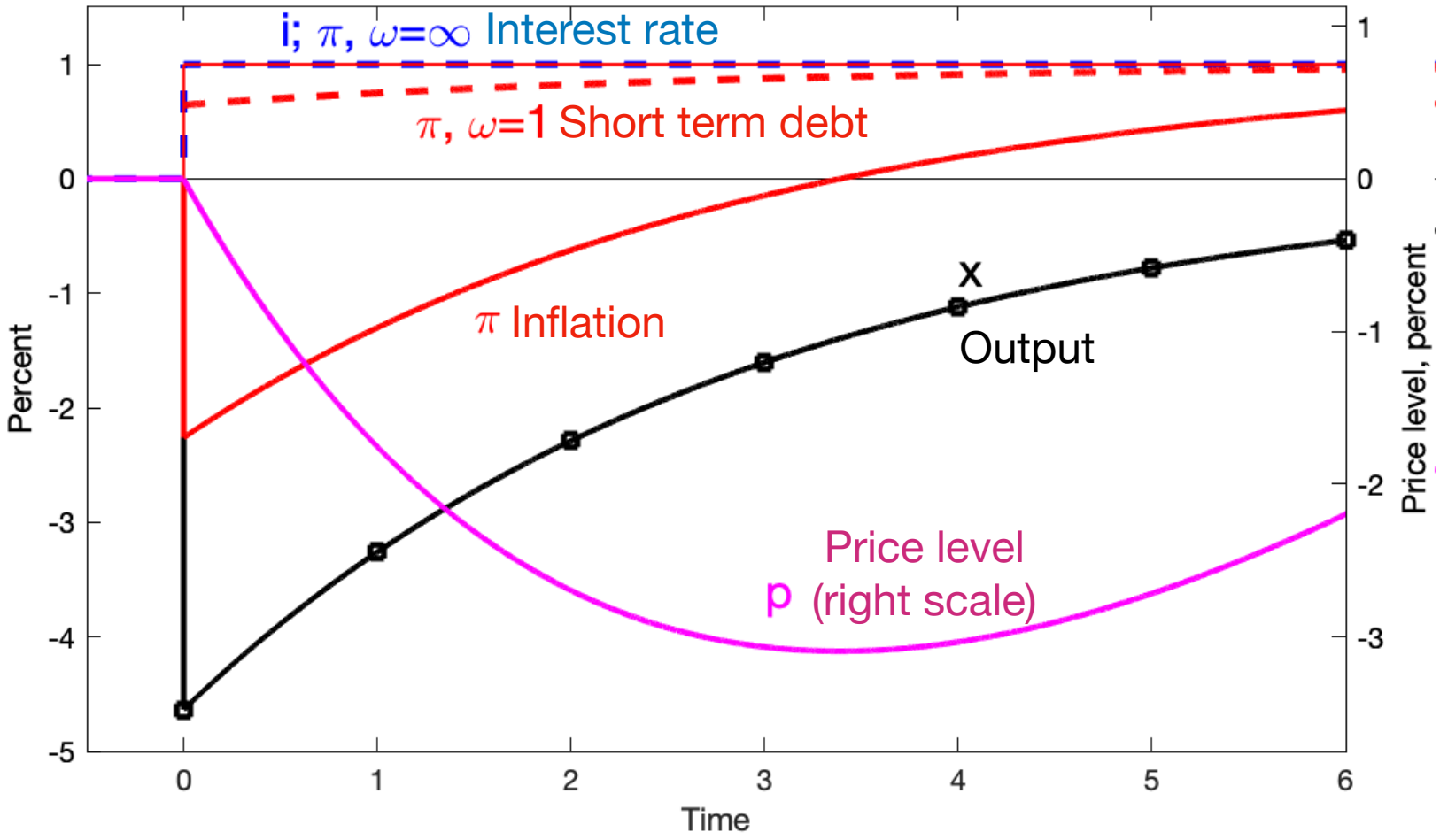
FTPL with interest rate target, sticky prices. Fiscal shock.



1% of GDP fiscal shock, no change in interest rate.

- Slowly inflate away debt to pay for fiscal shock. ($\pi > i$.) 2021-2022!
- Inflation eventually goes away even with no central bank response.
- Inflation is *stable.*

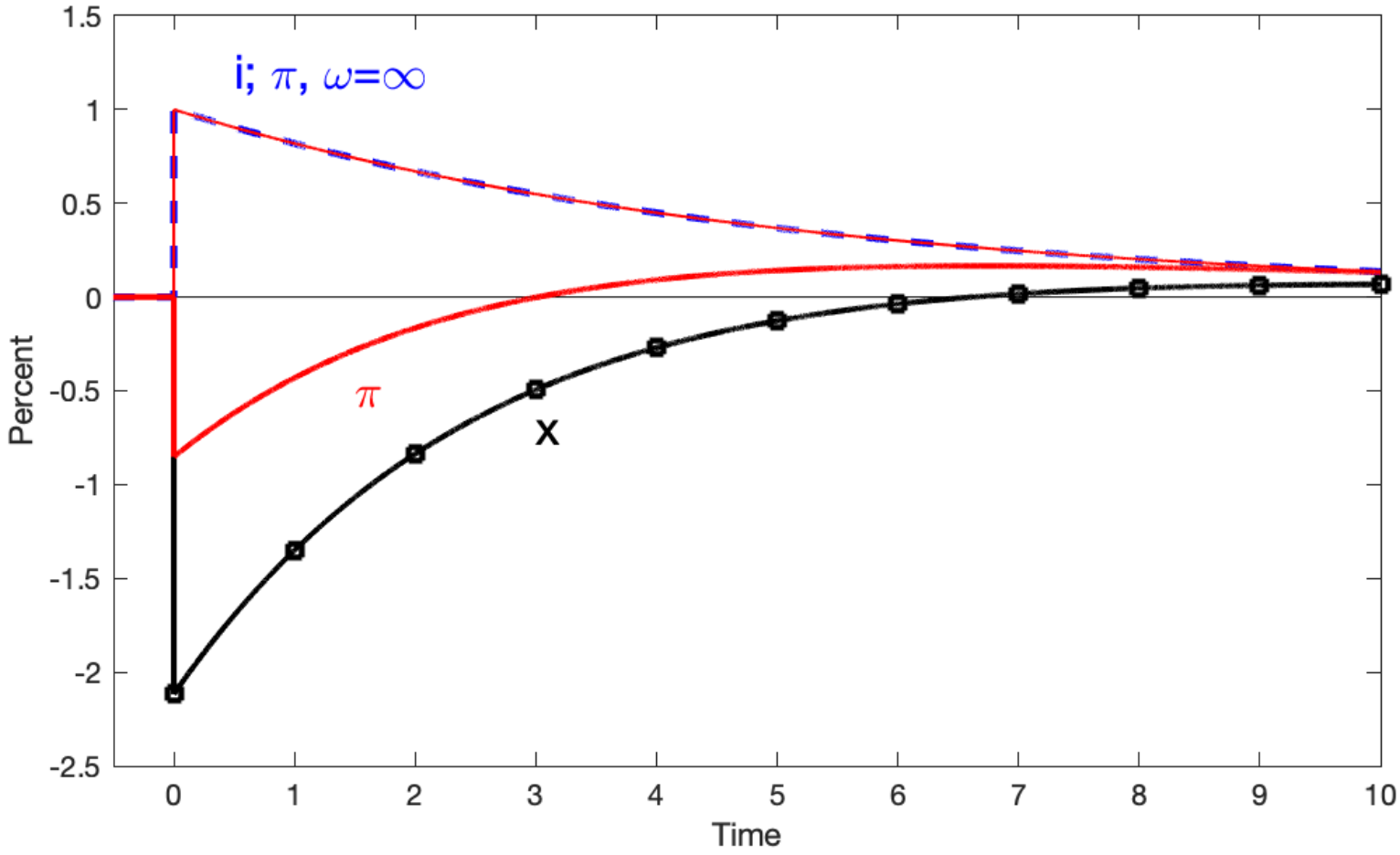
FTPL with sticky prices & long debt. Monetary policy shock.



1 % permanent interest rate rise, *no change in fiscal surpluses.*.

- Higher interest rates *raise long run* inflation; long run *stable & neutral*.
- *Short run negative sign* from long-term bond effect.
- Unpleasant interest rate arithmetic. Lower inflation now, by raising later.
- *Not* standard Keynesian intuition (higher rates lower demand, Phillips curve).

FTMP with sticky prices & long debt. Monetary policy shock.

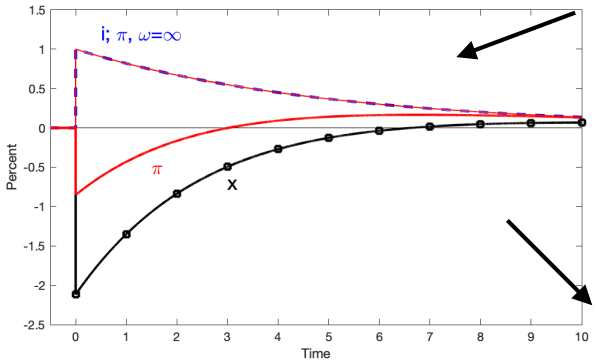


- Permanent inflation is not necessary. CB sets long run inflation $i_t = E_t\pi_{t+1}$.
- Weird? Remember, effect of interest rate rise *without* fiscal policy.
- Actual rate hikes: Fiscal changes at same time, and in response.
- For data, history, policy, we *want* fiscal responses. But we want to know if it's monetary policy or just induced fiscal responses that lower inflation.

Taylor rule

1% fiscal shock, No interest rate movement.

Add higher rates to offset inflation?



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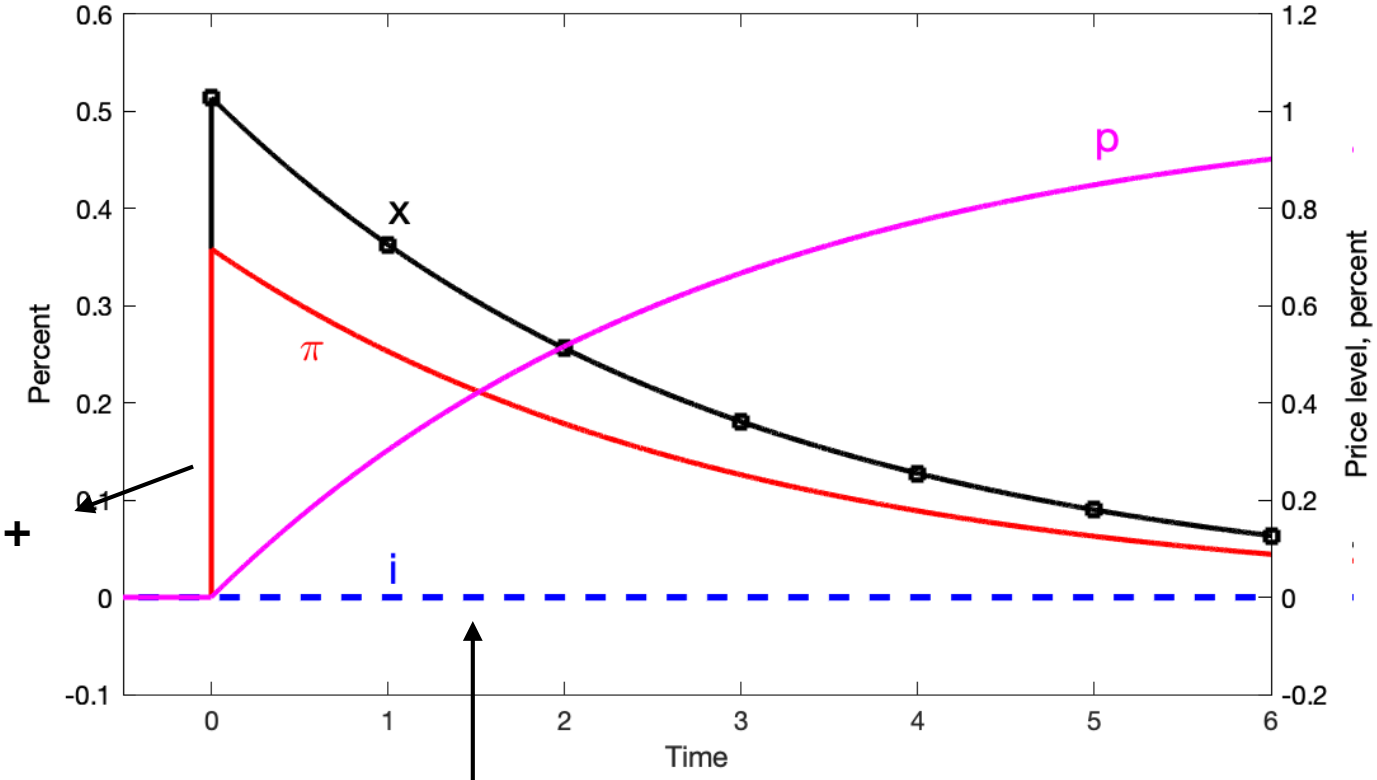

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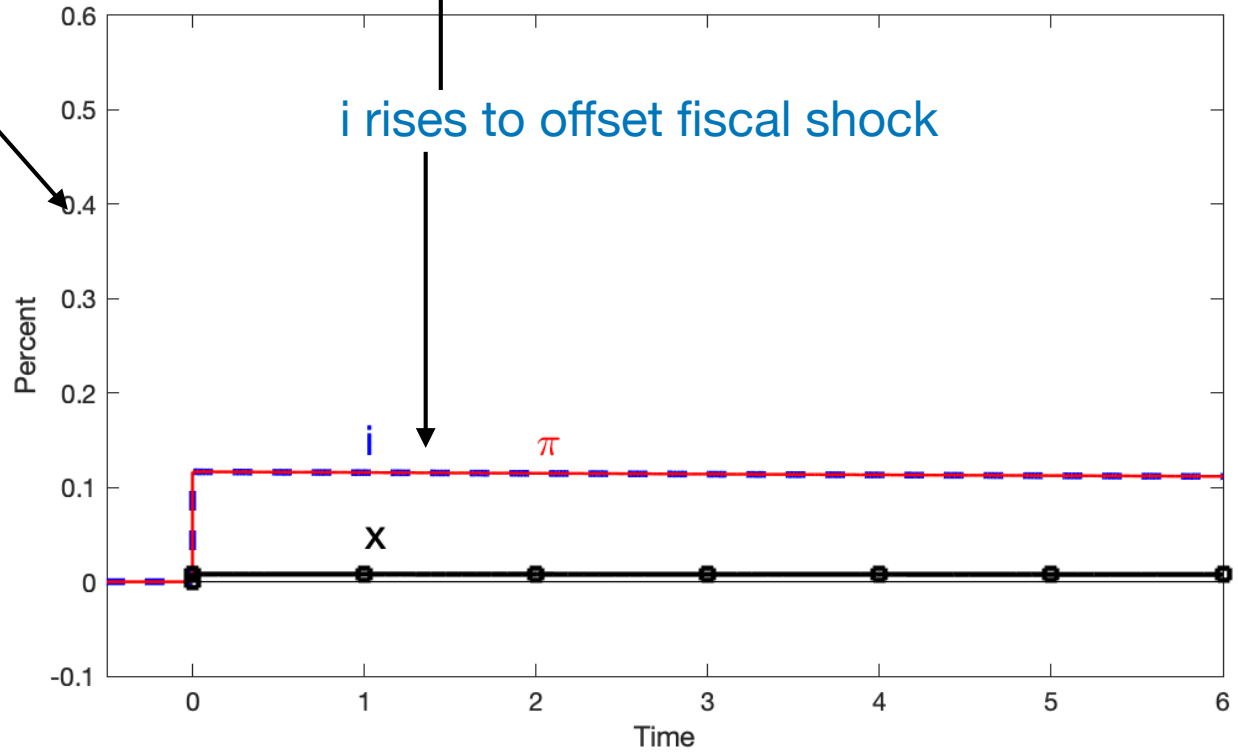
1% fiscal shock,
Policy rule $i_t = \theta\pi_t, \theta = 1$ adds higher rates automatically

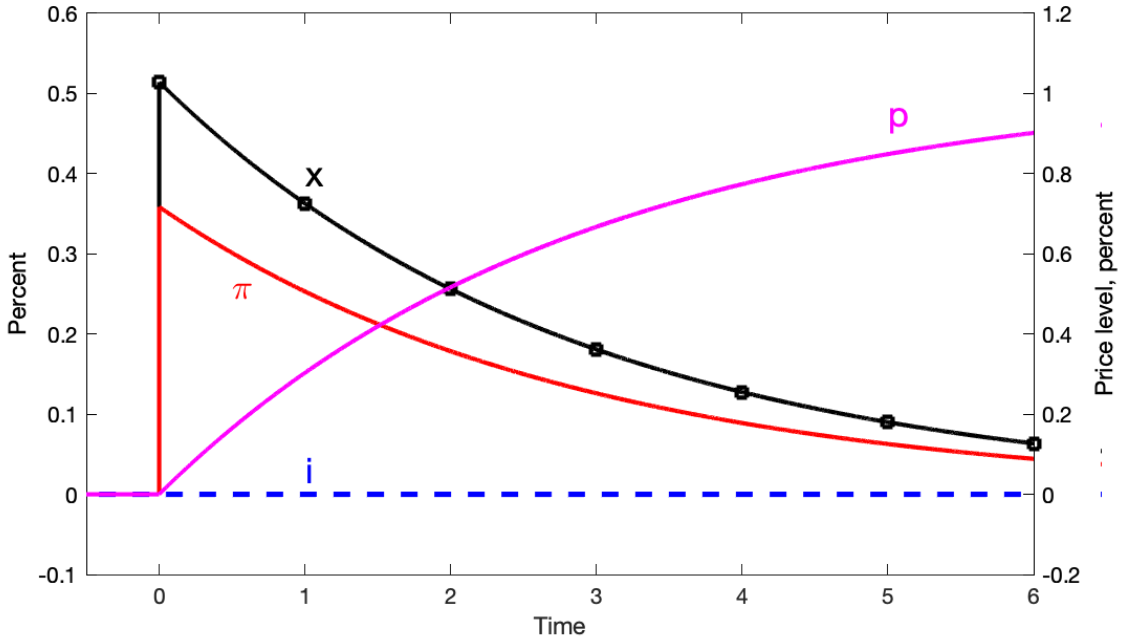
Exploits unpleasant arithmetic to smooth inflation, output.

i rises to offset fiscal shock

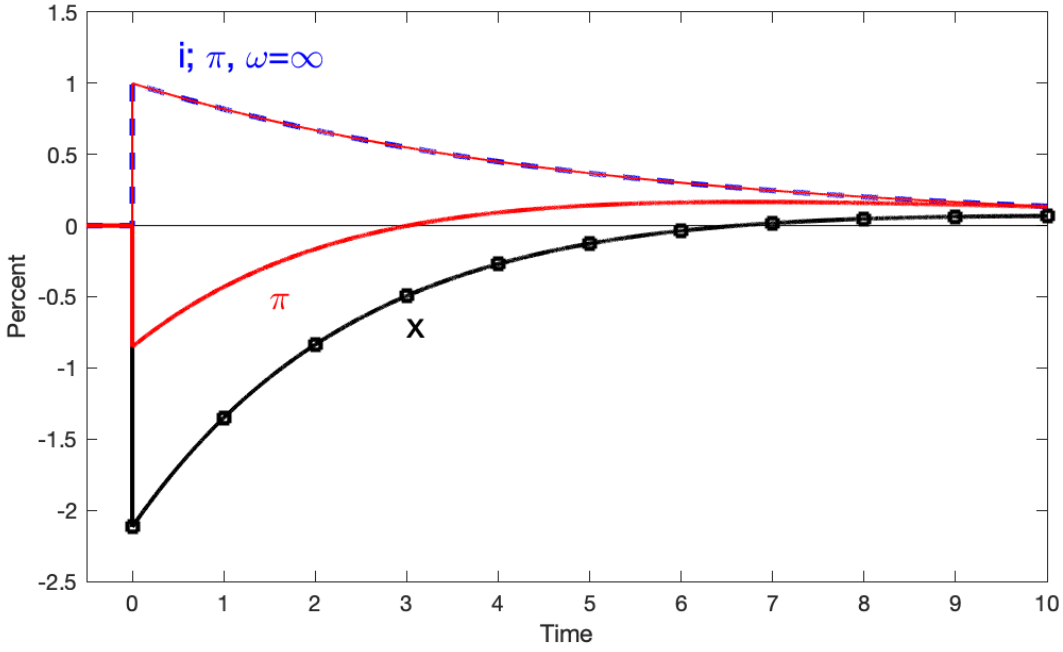


Fiscal theory summary

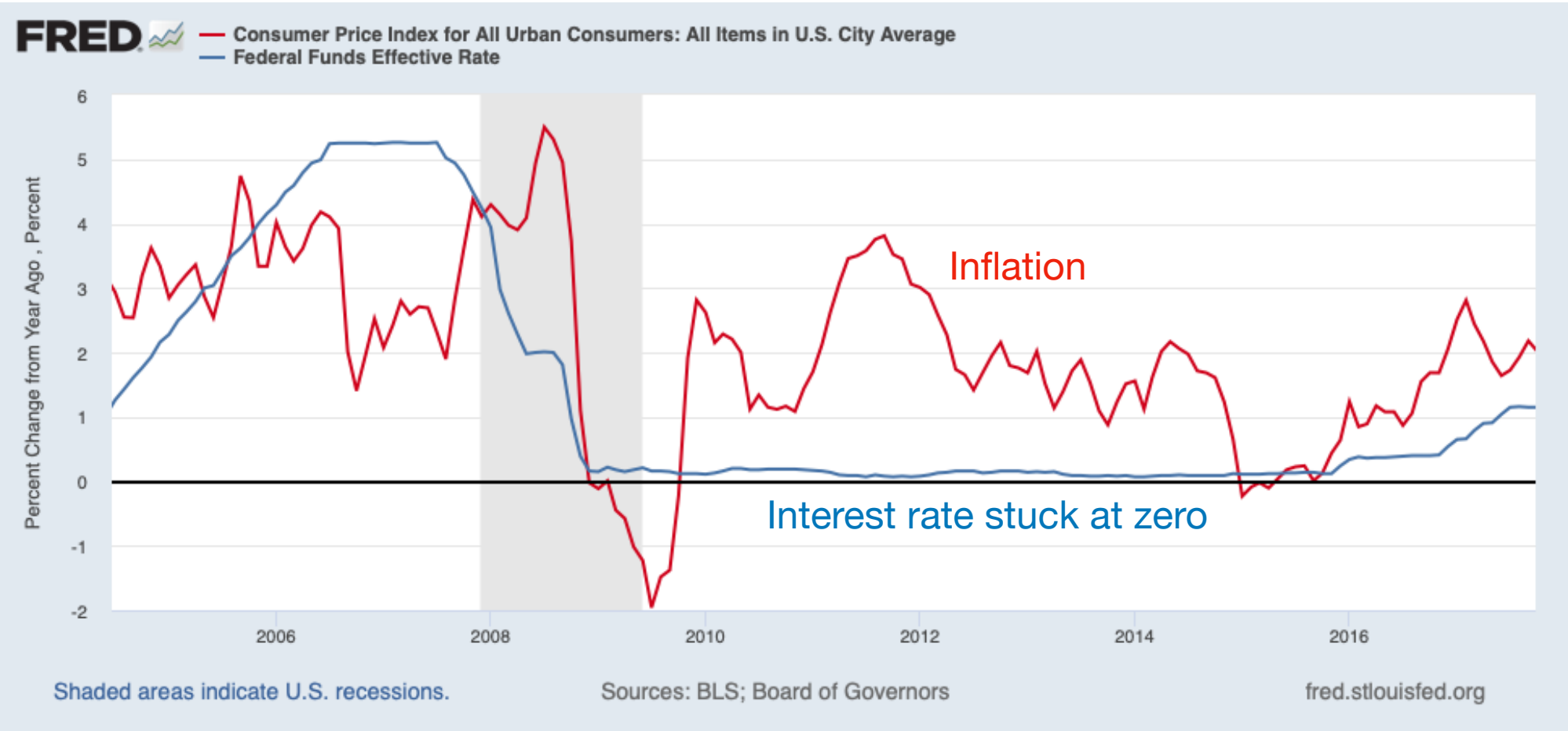
1. Effect of a deficit, that won't be repaid (or printing money)



2. Effect of a rate hike, no change in fiscal policy.

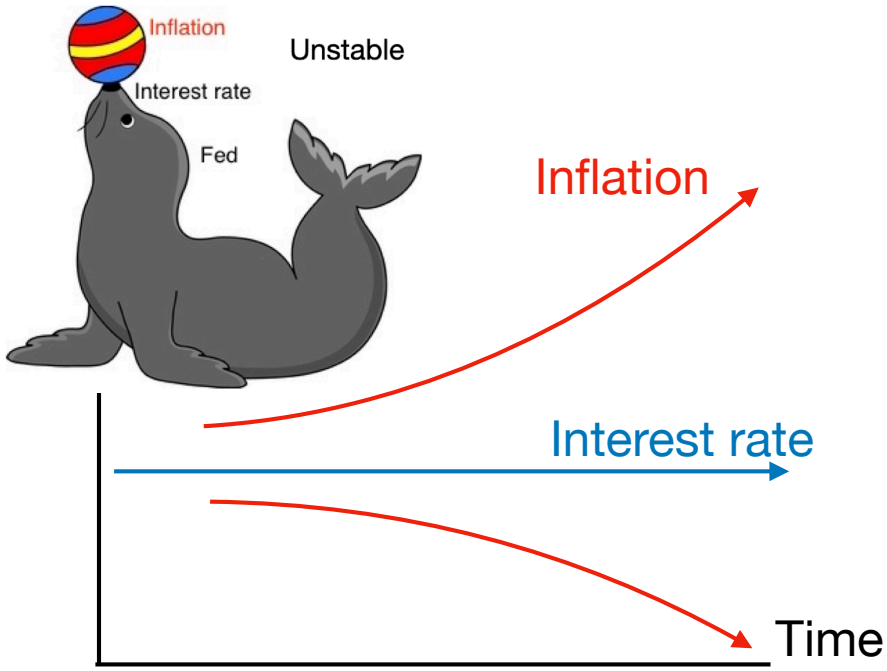


The zero bound era



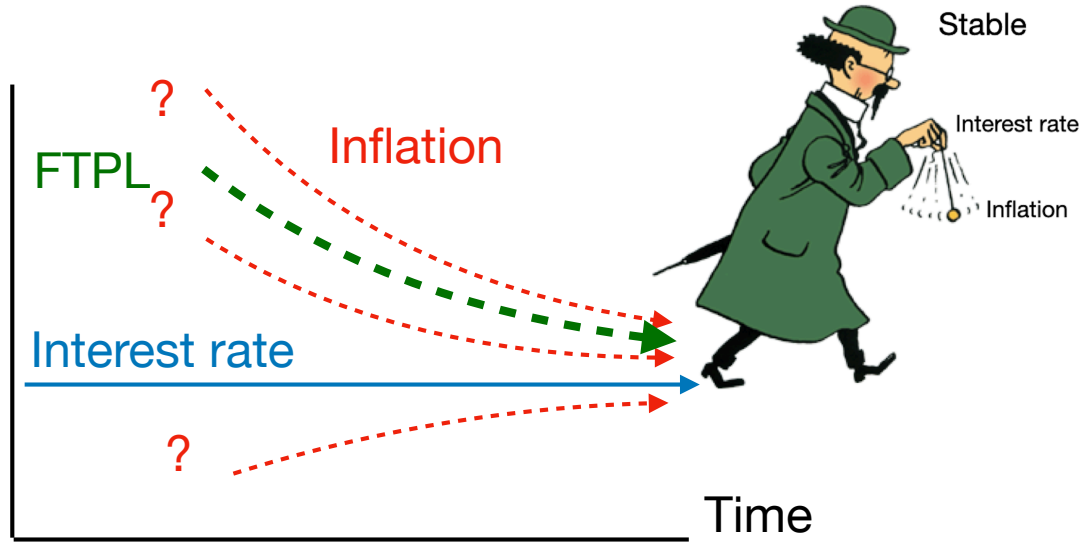
A test of theories: expectations and stability

Adaptive expectations



- (Standard view) Inflation is *unstable, spirals.*
- Higher interest rates lower inflation.
- Higher interest rates lower output. Inflation = past inflation + output, so inflation < past inflation.
- Unless central bank moves interest rates >1-1.
- ZLB? Clear prediction: Spiral.

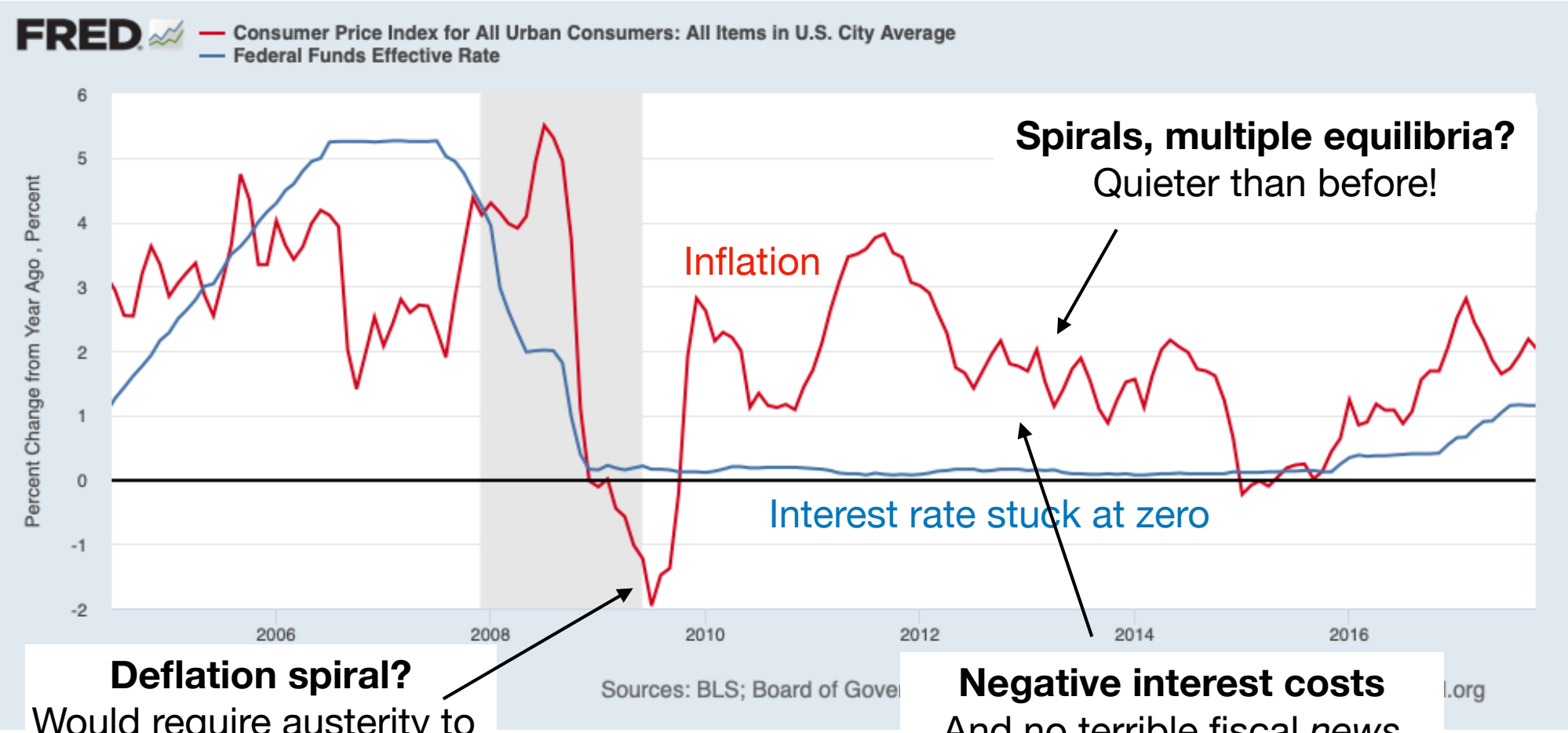
Rational (forward looking, consistent)



- Inflation is *stable*. Goes away.
- →Higher rates *eventually* raise inflation.
- Lower output, inflation = *future* inflation + output, inflation *declines*.
- Temporary opposite sign is ok.
- New-Keynesian: “Multiple equilibria” offset by CB threats. CB don’t do it. Predicts *volatile* inflation at ZLB.
- FTPL: One equilibrium. Stable and quiet at ZLB (without more fiscal shocks!)

History: ZLB era

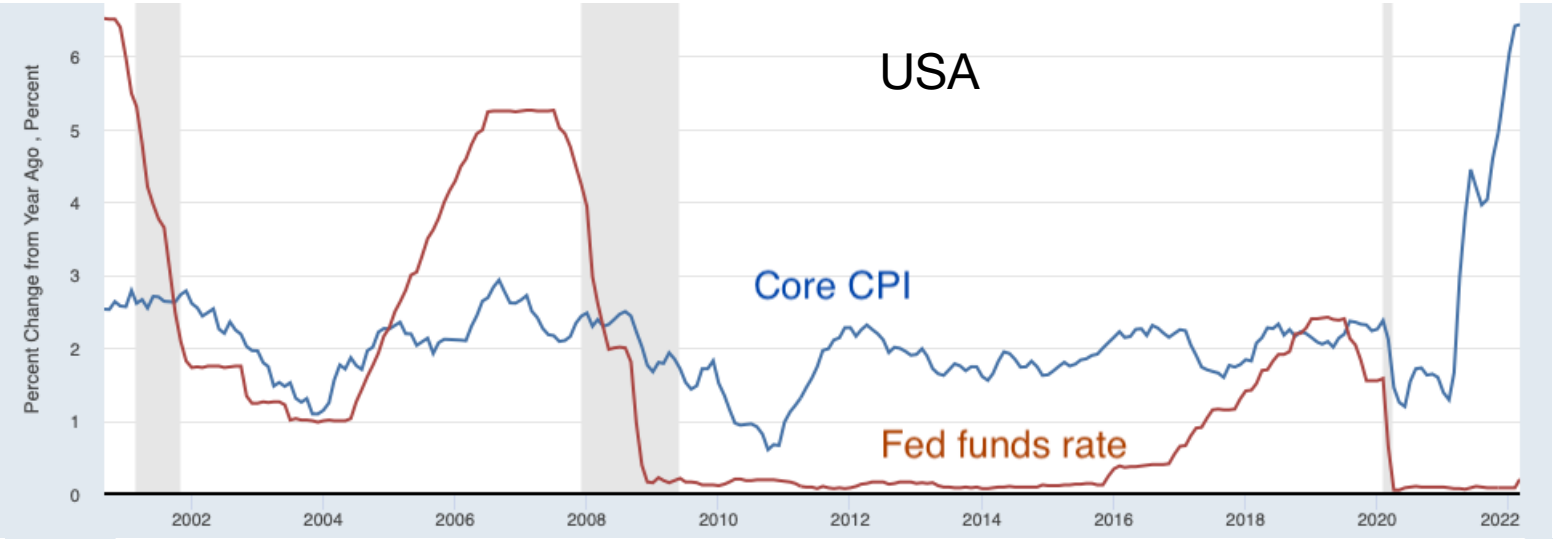
Inflation is stable and determinate under an interest rate peg.
Neither instability (deflation spirals) nor volatility (multiple equilibrium sunspots).
About as good an experiment as you can ask for in economics!
If a peg is stable, then raising the peg must raise inflation. *Eventually.*



Deflation spiral?
Would require austerity to pay bondholder winfdall.

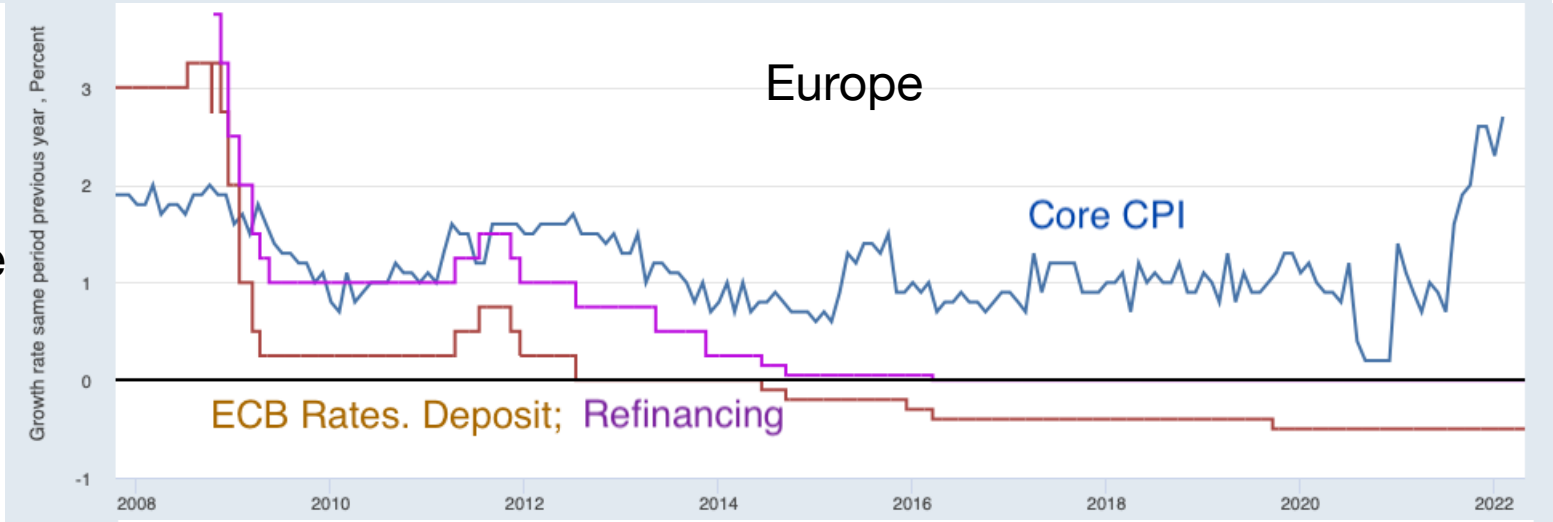
Negative interest costs
And no terrible fiscal *news*

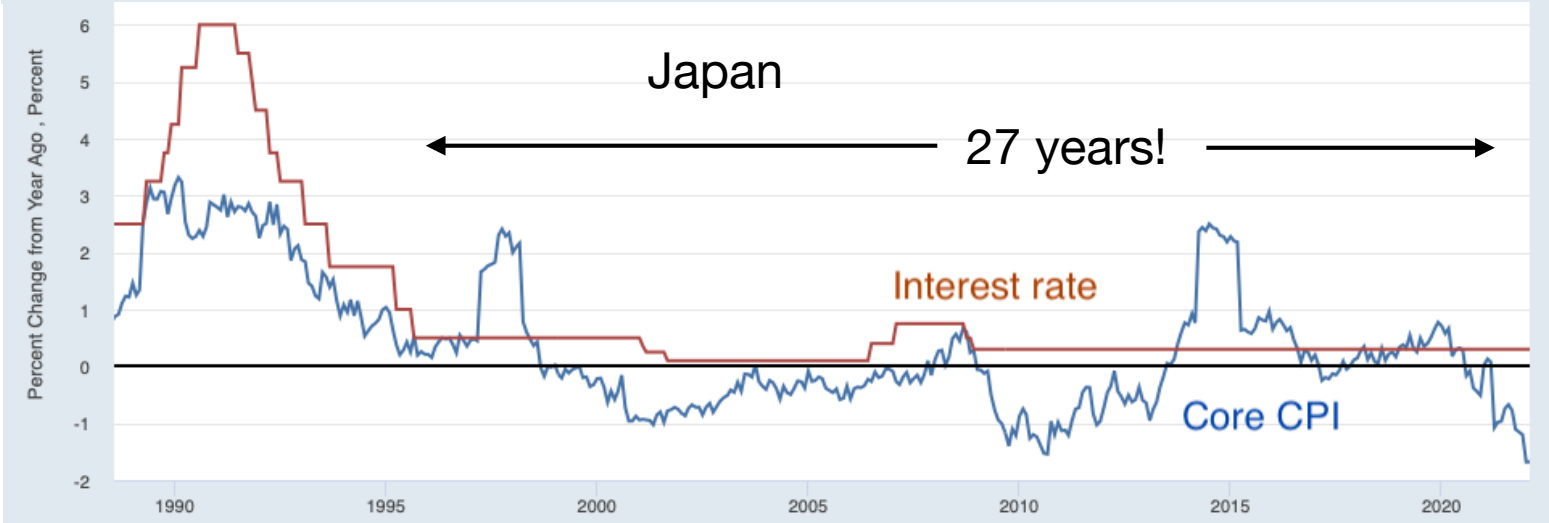
Stable, quiet inflation at a long zero bound — US, Europe, Japan



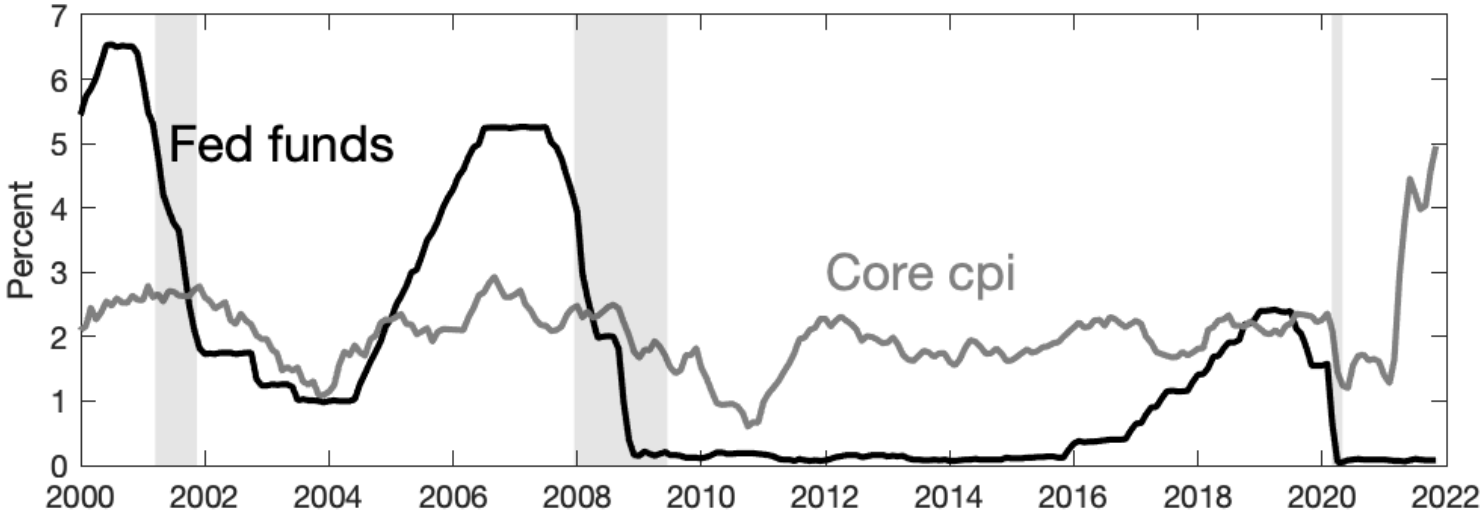
No spirals, no multiple equlibrium volatility.

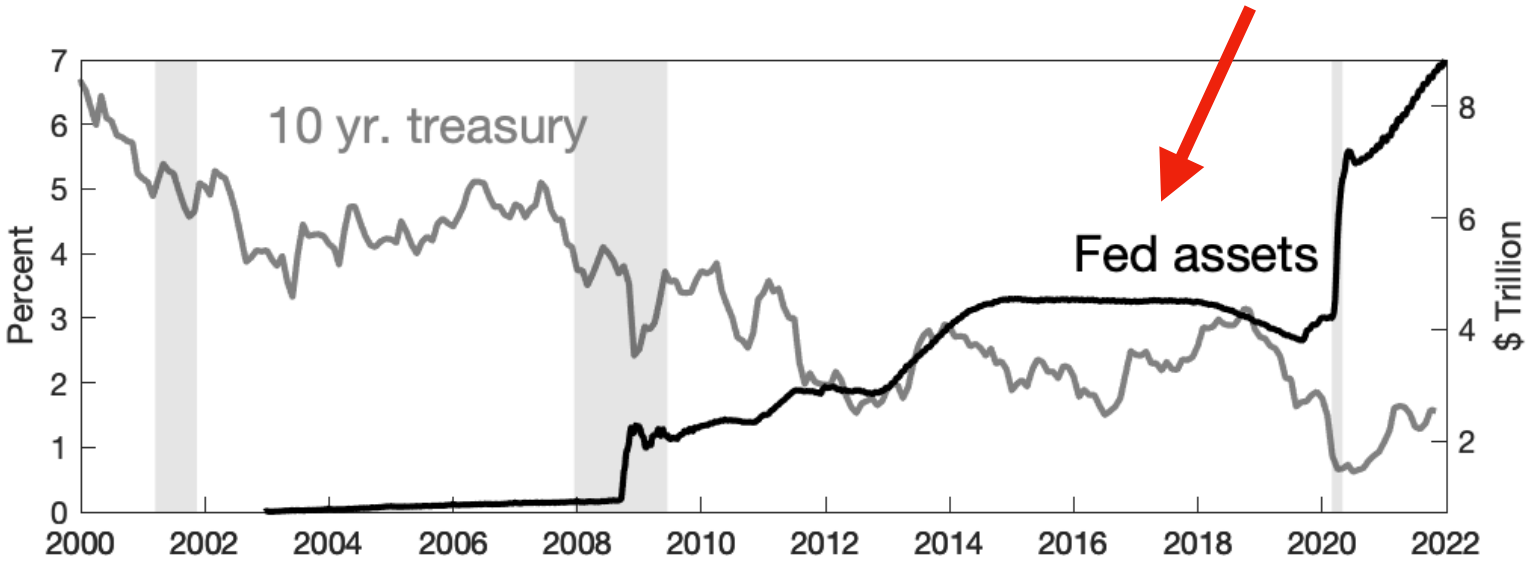
Failed pegs? Turkey? Fiscal problems. (Pegging because of fiscal problems!)





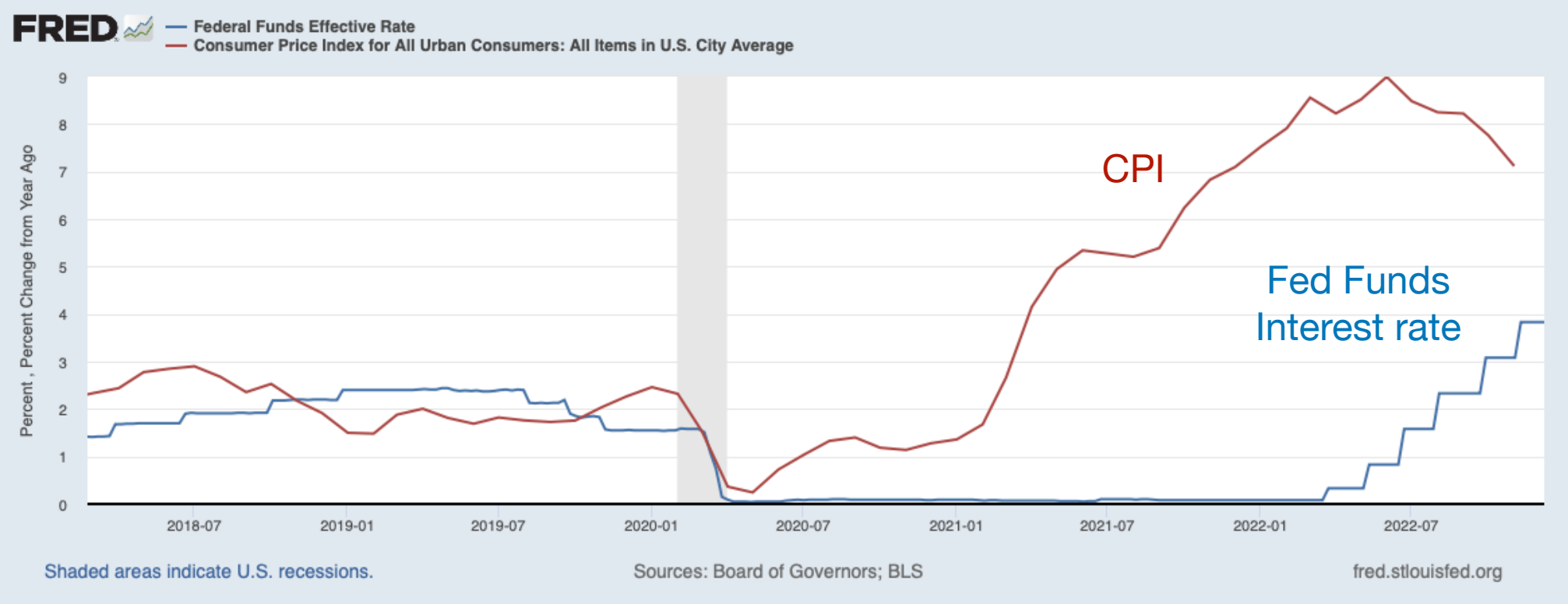
QE and M in the ZLB era?



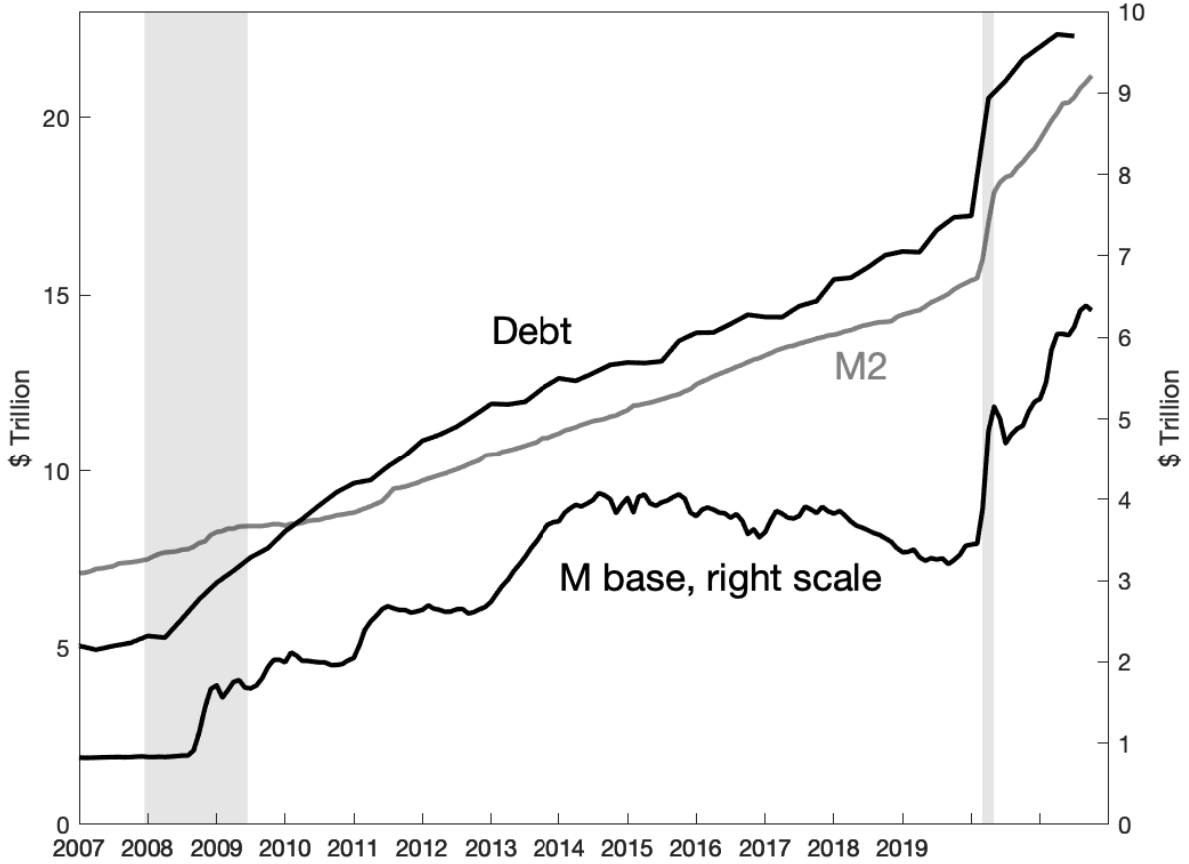


- $4 trillion increase in base. 3,000% increase in reserves! MV=PY: Hyperinflation!
- FTPL: M=B, exchange has no first order effect. Up or down (QT too).
- Another clear experiment!

Covid inflation and current events



Inflation? A textbook fiscal (helicopter) shock



$$\frac{\text{Debt}}{\text{Price Level}} = \text{EPV(surplus)}$$

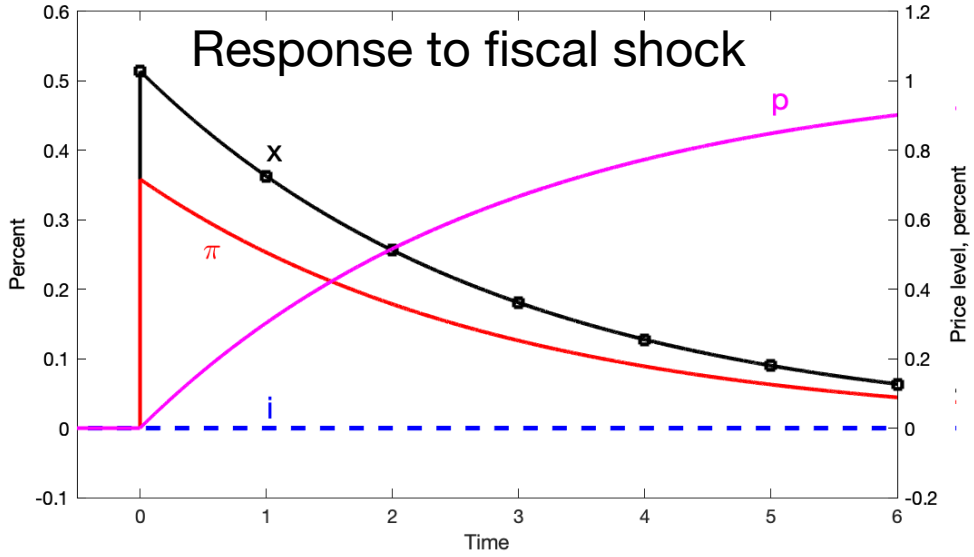
$5 trillion, +30% =
$3 trillion reserves +
$2 trillion debt.
Sent as checks!

- What about supply shocks, energy shocks, greed, monopoly, etc?
- Relative prices vs. inflation!

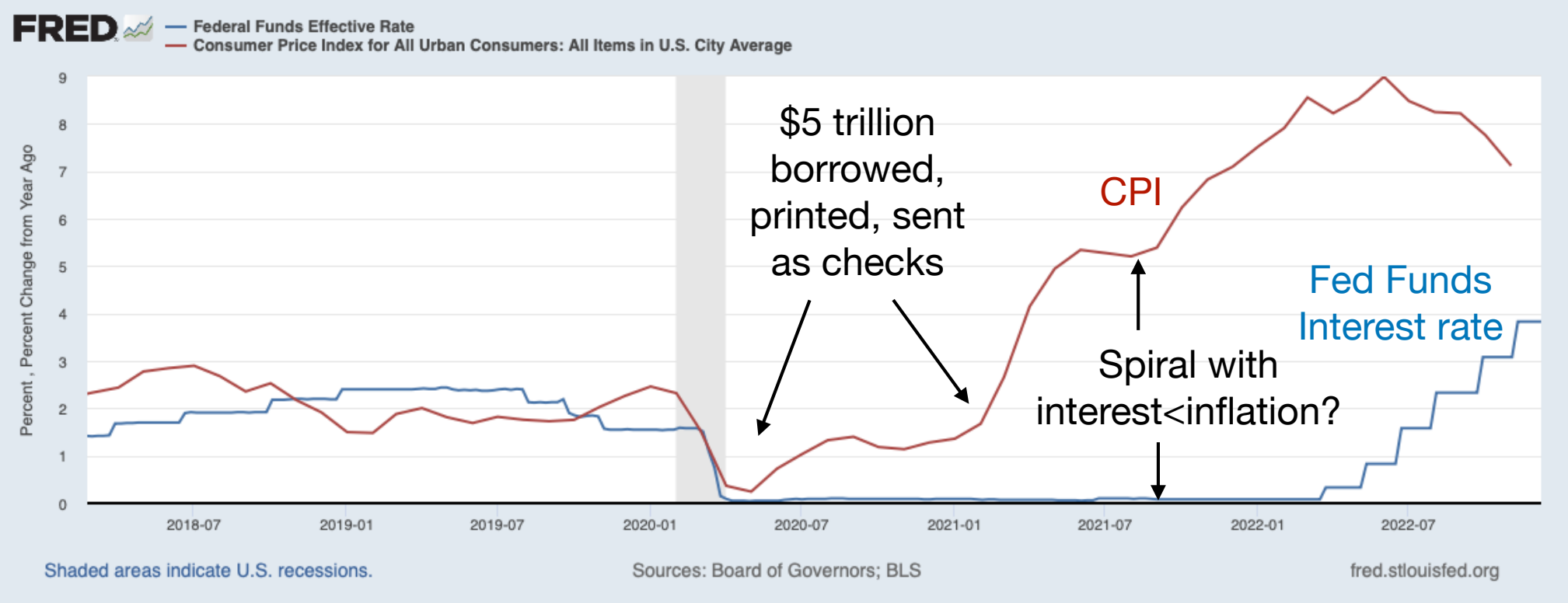
Why don't people trust repayment?
Why this time not 2008?

- Statements?
- Lower rates?
- Heterogeneity?
- Cash is ``not repaid?''

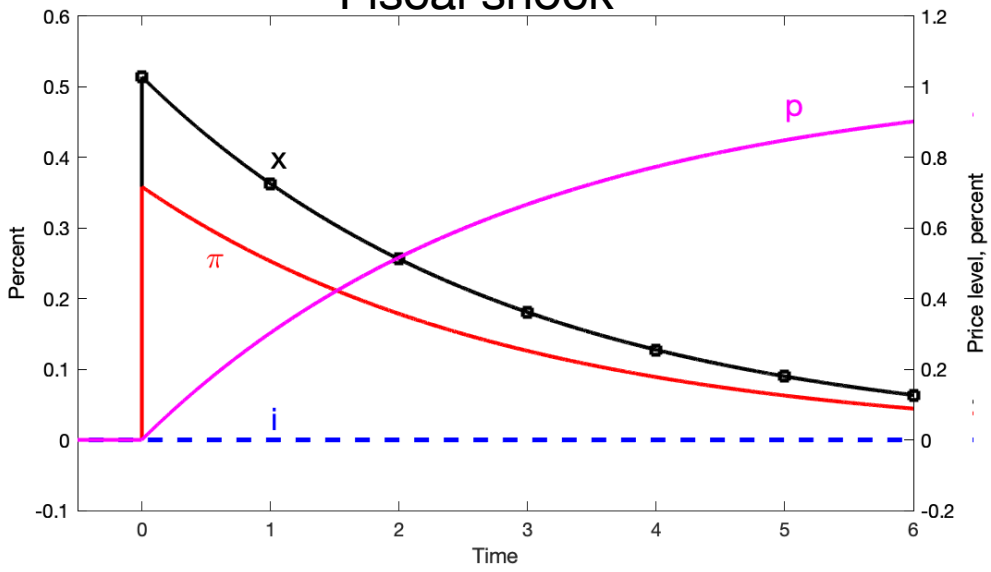
Money or fiscal?
ISLM flow vs. FTPL present value?



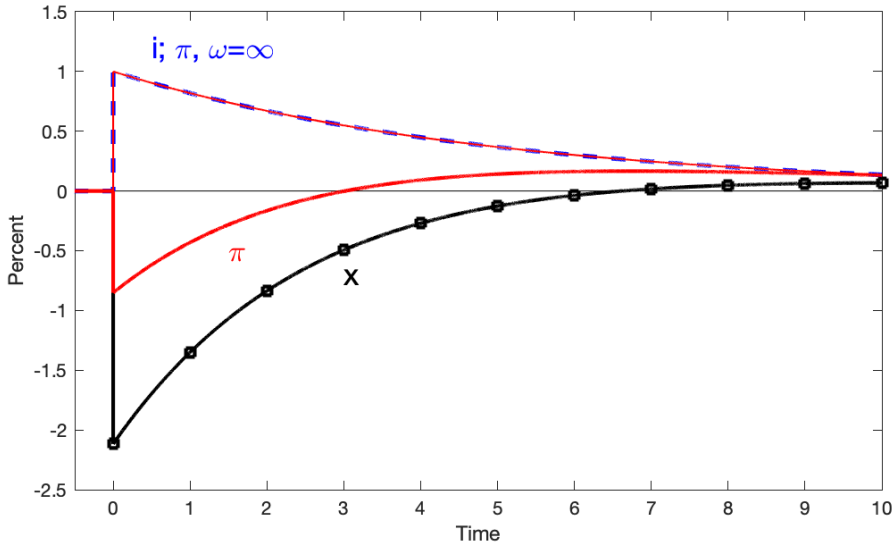
Current events



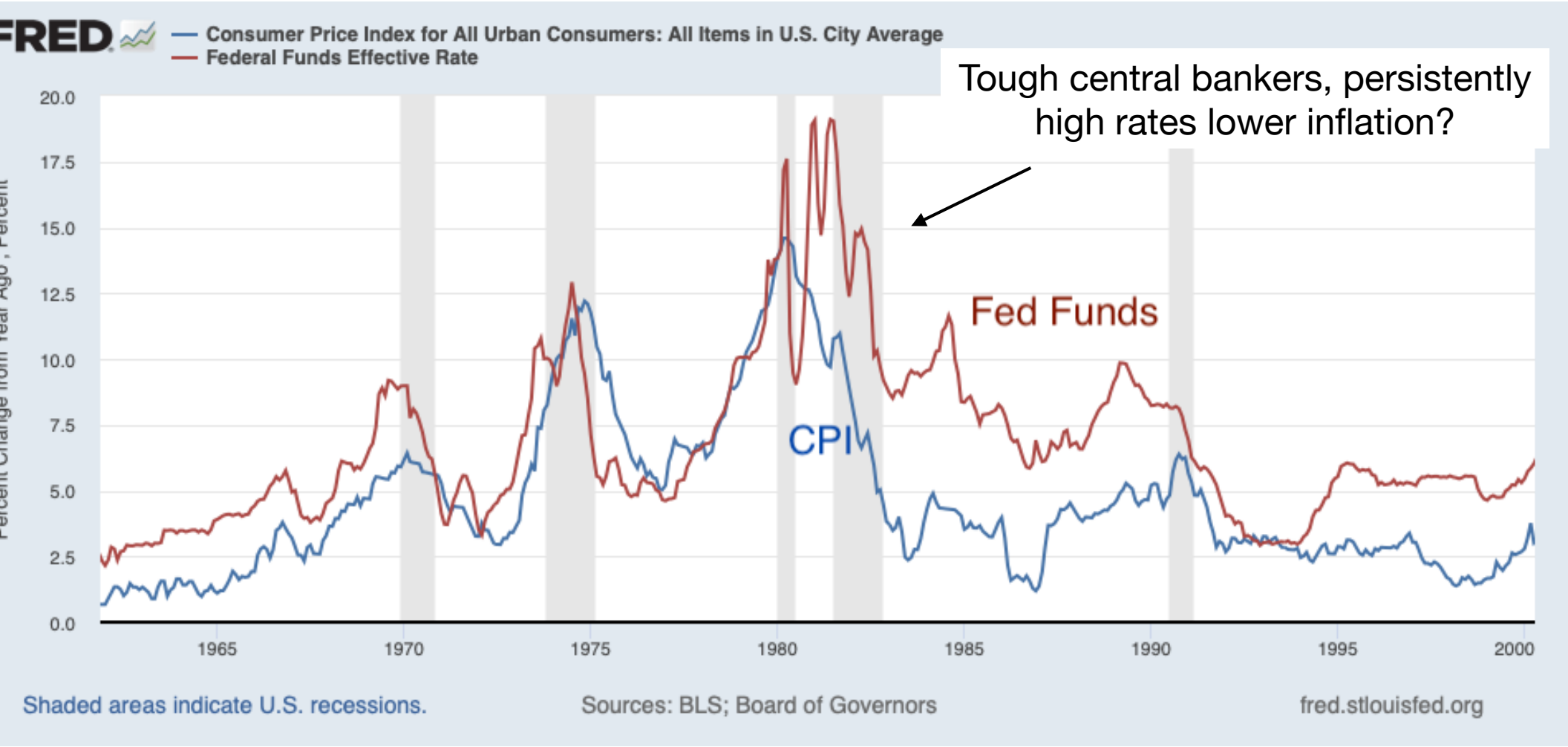
Fiscal shock



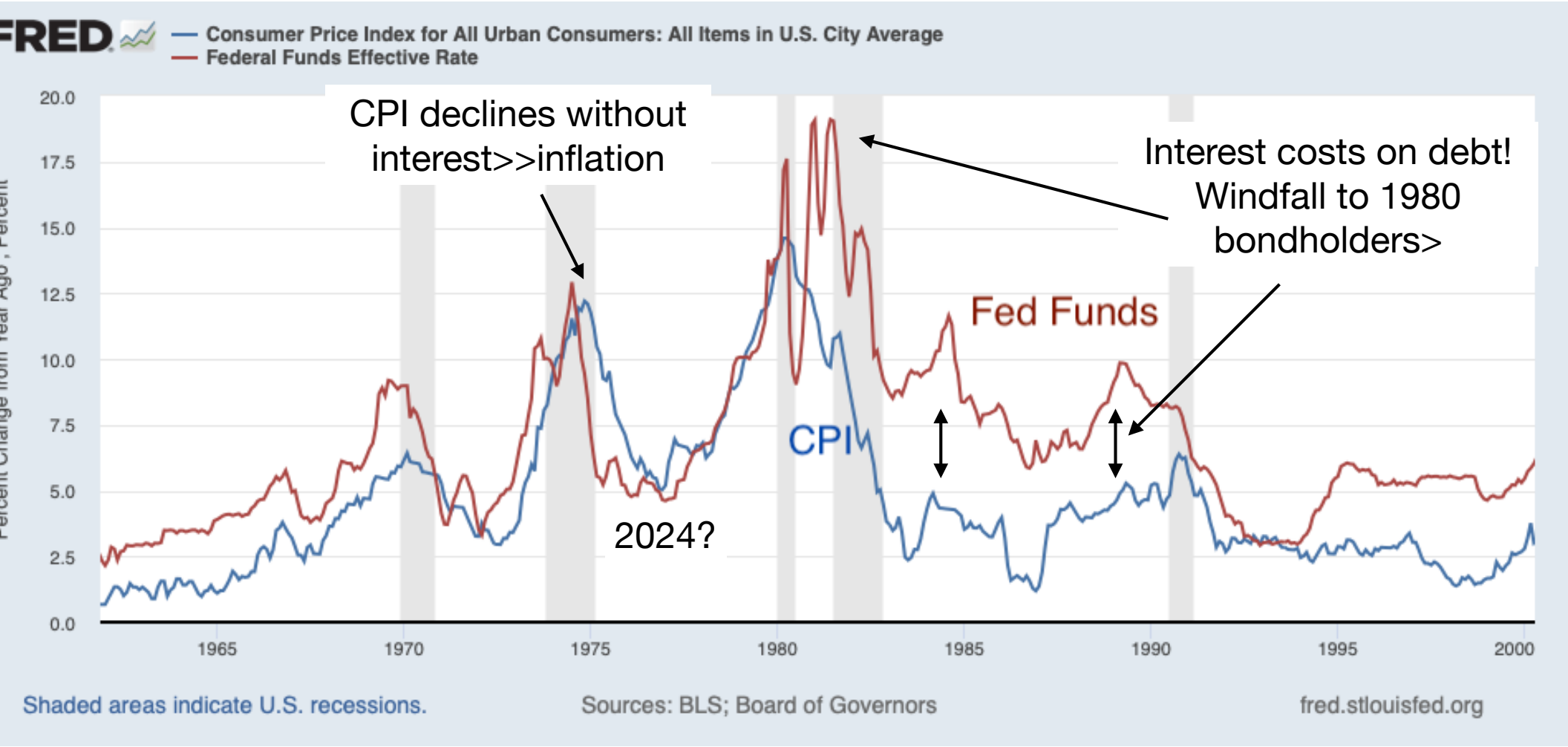
Monetary shock



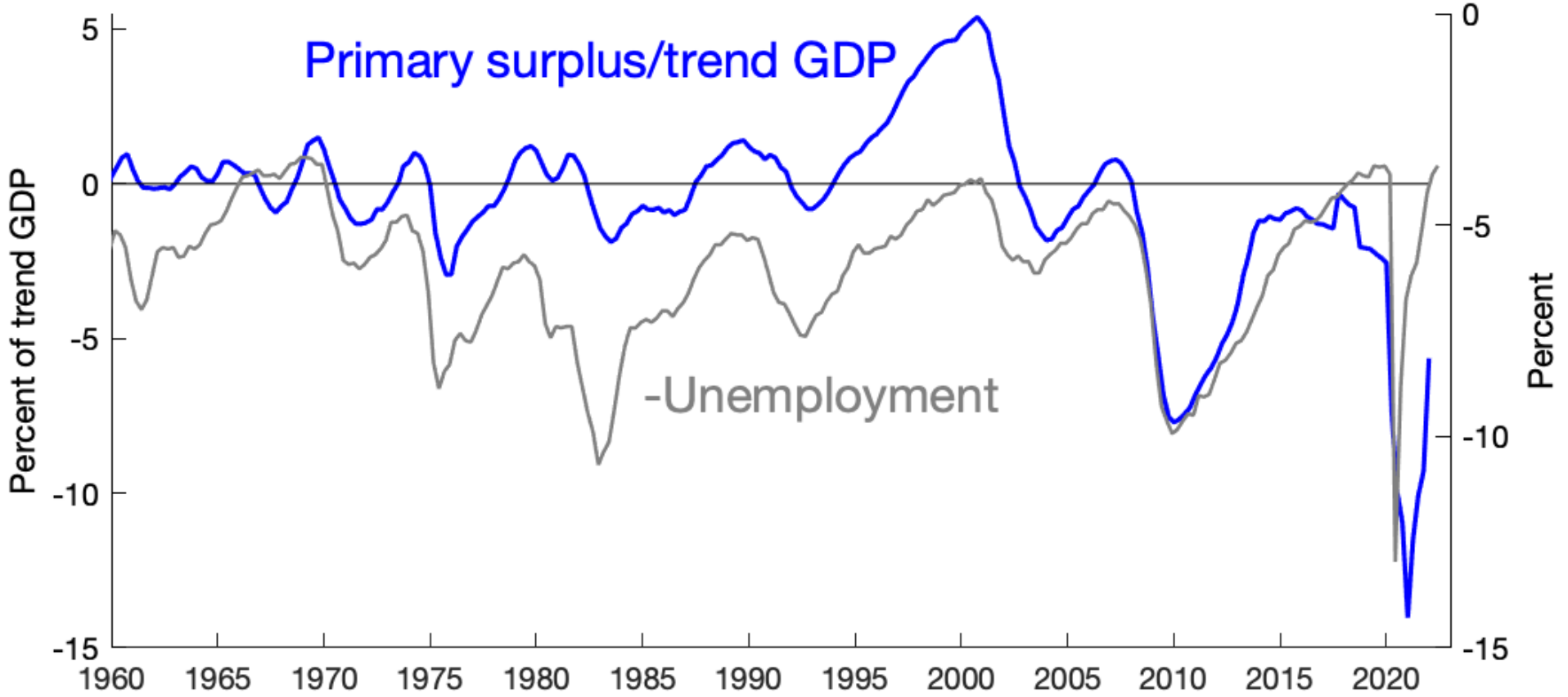
The 1970s and 1980s
Triumph of traditional view?



The 1970s and 1980s

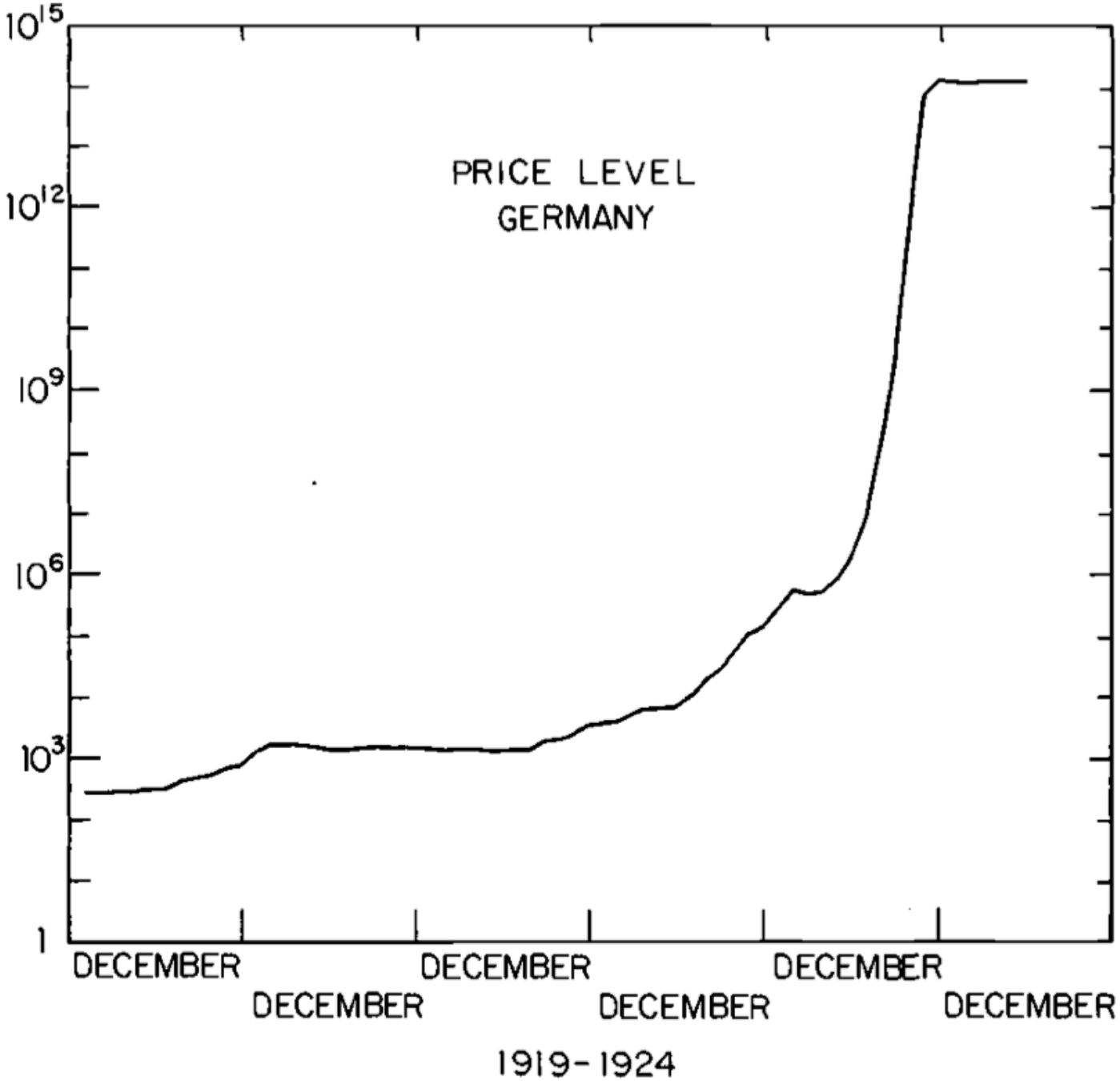


A joint fiscal - monetary stabilization

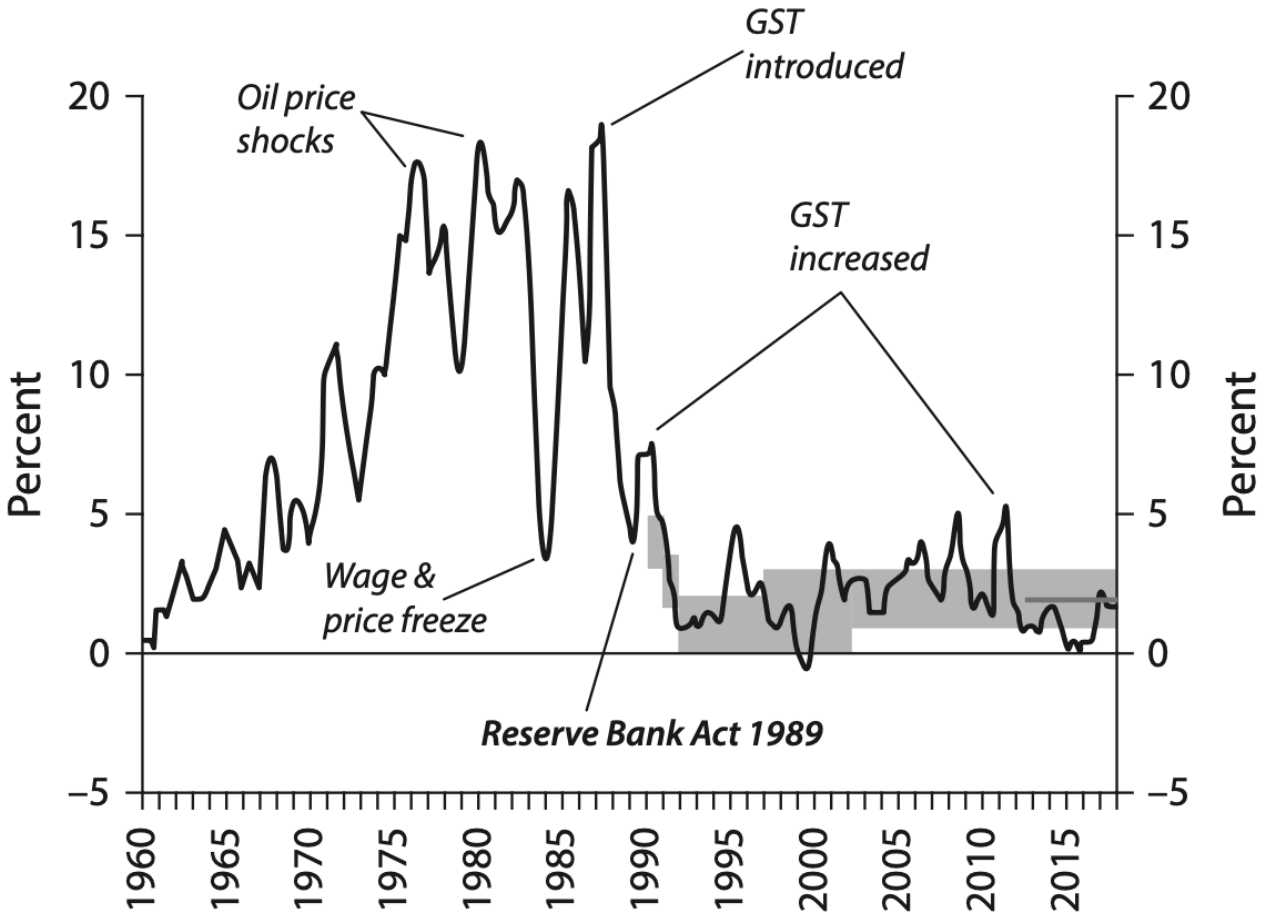


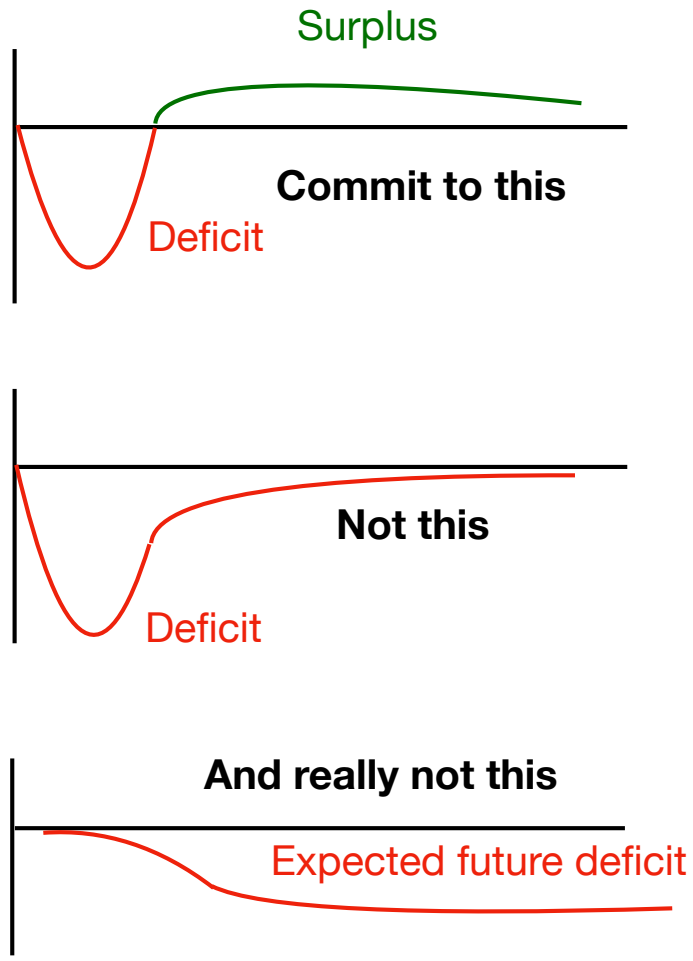
1970: War, great society, gold, Bretton Woods.
1975: Slowdown, biggest deficit since WWII, long run? Malaise?
1980: “Reagan deficits” were mostly interest on debt, not primary (defense).
1982-1986: Tax rate from 70% to 28%. Social security reform. Deregulation. Growth!
1990s: Huge surpluses. PV of surpluses did repay debt, pay higher interest costs and windfall
(2000s?: Seduction of low rates?)
2024? Higher rates → recession, bailout, stimulus. Debt/GDP 100% not 25%, 4x higher interest costs. (Italy?)
Models: Higher rates without fiscal policy, at least to pay interest costs, do not lower inflation.

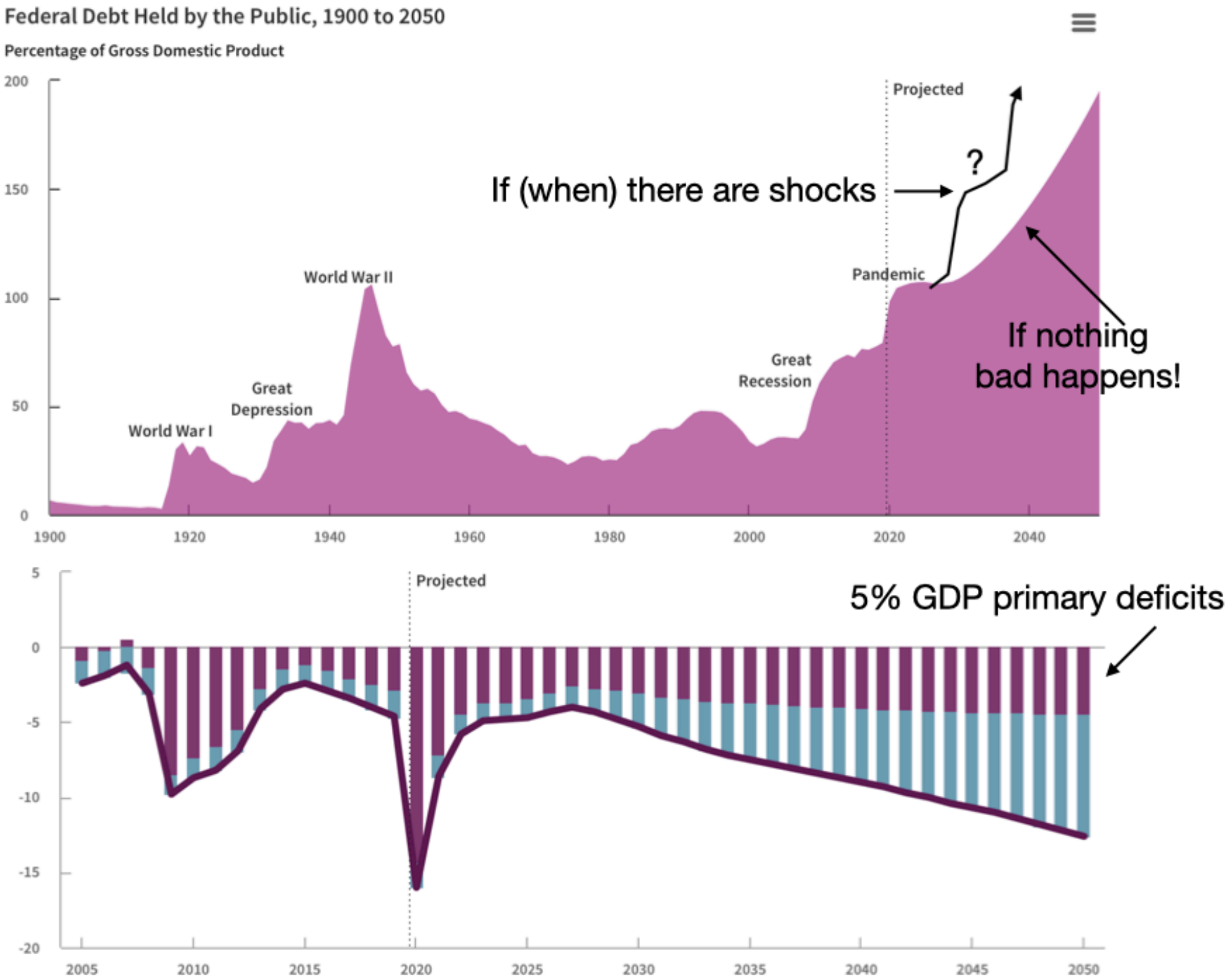
Painless disinflation is possible with joint fiscal-monetary and usually micro reform



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



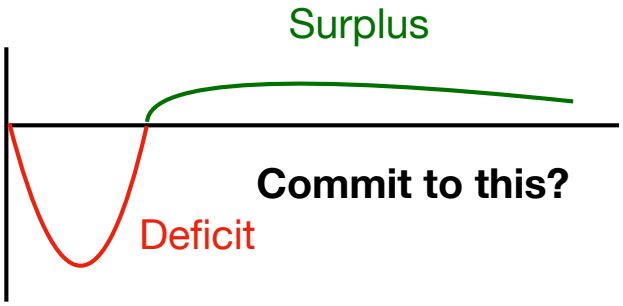




And..even inflation will not help!

FTPL and the Euro

Fiscal monetary interactions:



- ECB raises rates
  - Higher interest costs on debt?
  - Recession → deficits, stimulus, bailouts.
  - Unless repaid by subsequent surpluses, inflation!
- Sovereign debt trouble → temptation to monetize
  - Well recognized in ECB setup. Maastricht rules.
  - "Whatever it takes" with conditionality (new lending =PV(s)). Effective?
  - Large sovereign assets and renewed sustainability questions.

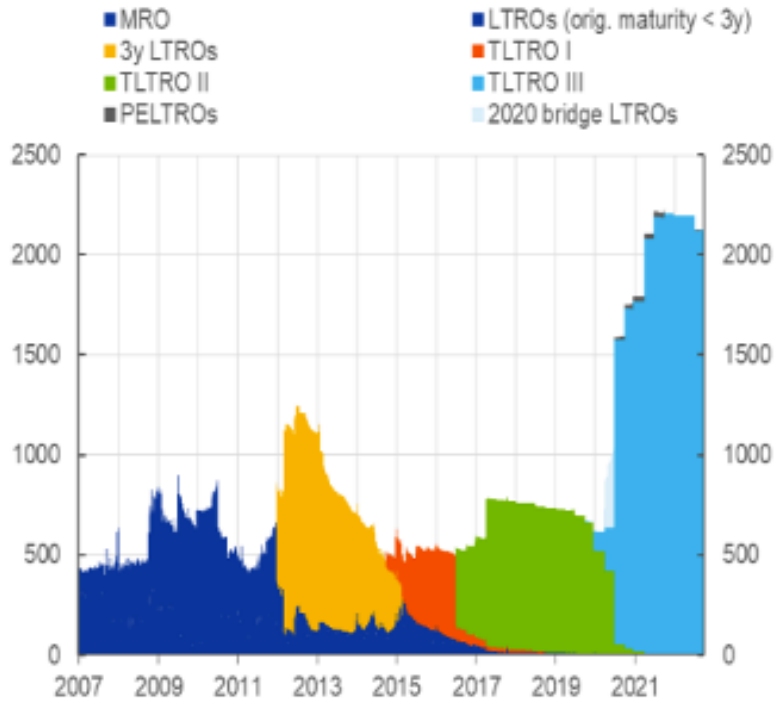
Yes, FTPL applies to euro:

- A separate balance sheet walled off from government finances is useful.
- In the end, FTPL inflation comes from creating money to pay off debt, money not soaked up by PV(s). Credibly commit against that, force PV(s) or default; no inflation.
- Balance sheet: always enough to soak up money if people don't want it.
- Separate classes of debt? Real debt? Fiscal commitment to top up CB assets (only).
- Allow sovereign default! Remove the hostage (banks). If default is unthinkable ex post, no commitment works ex ante.
- "Currency union without fiscal union" is easy — if sovereigns default like companies. (And let companies default too!)

ECB Balance sheet

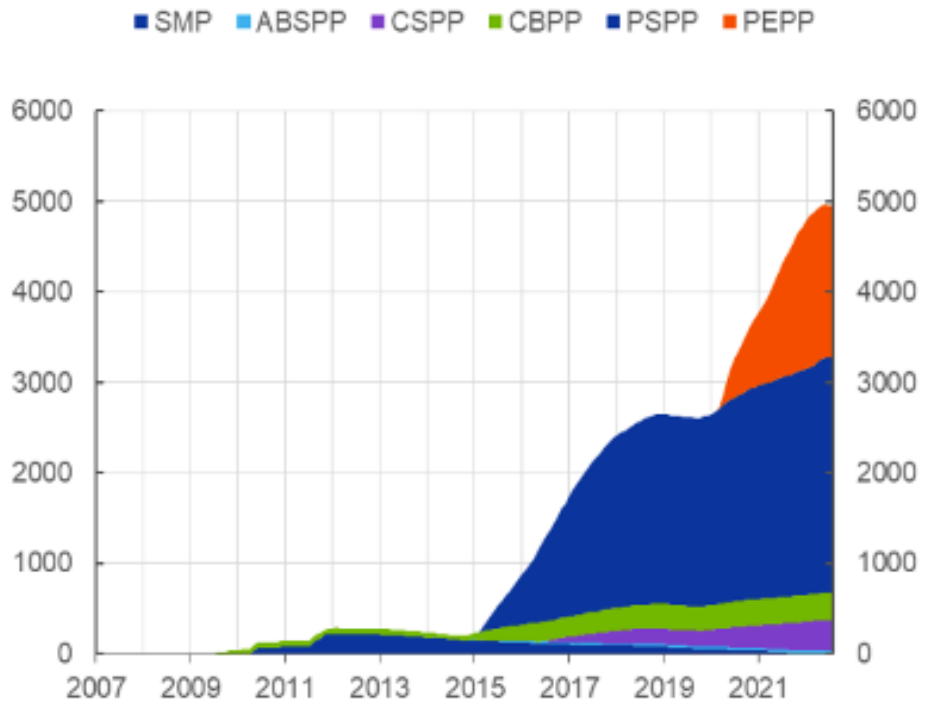
Chart 3. Borrowing from the Eurosystem

(EUR billions)



Sources: ECB and ECB calculations.

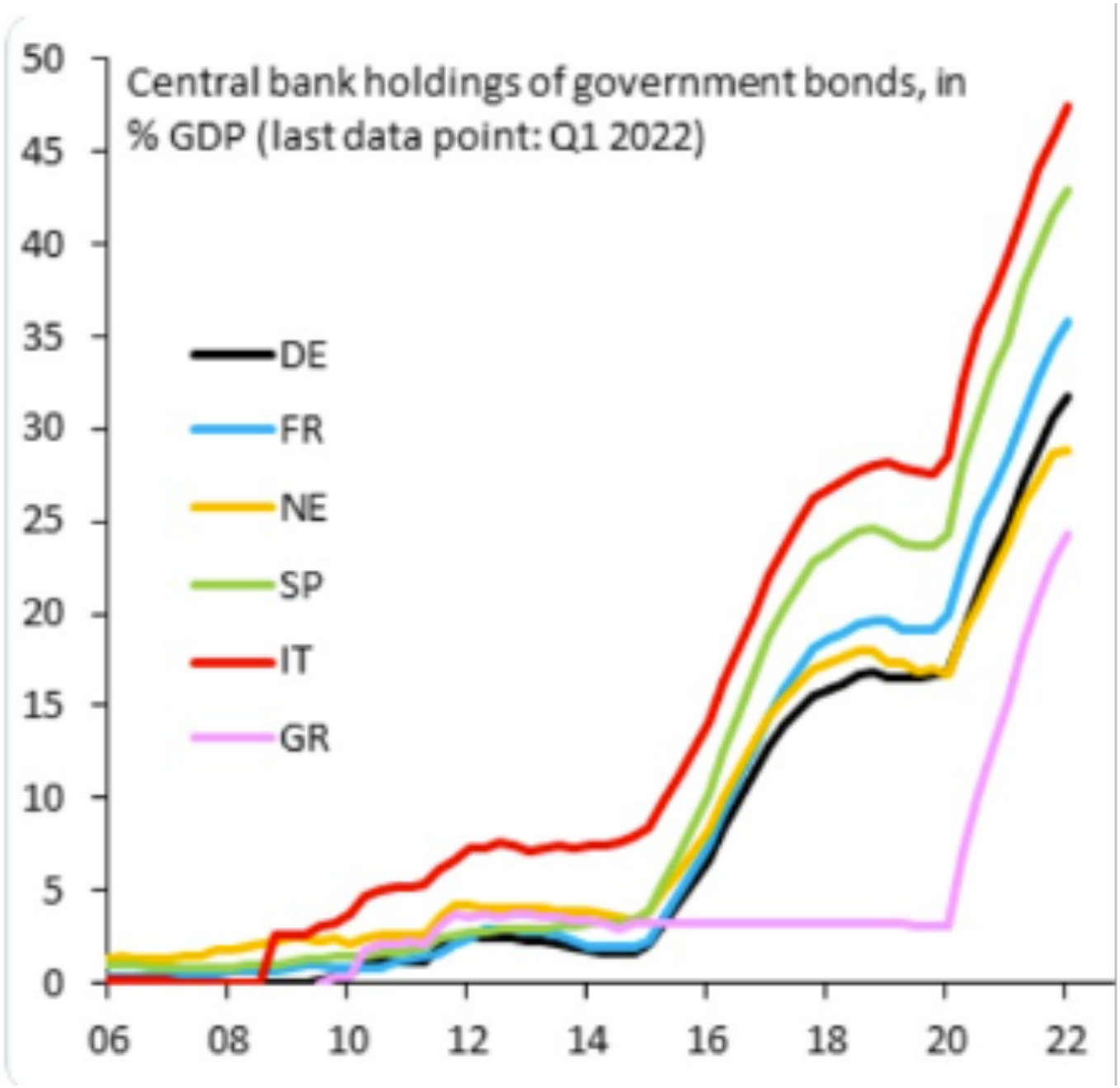
(EUR billions)



Sources: ECB and ECB calculations.

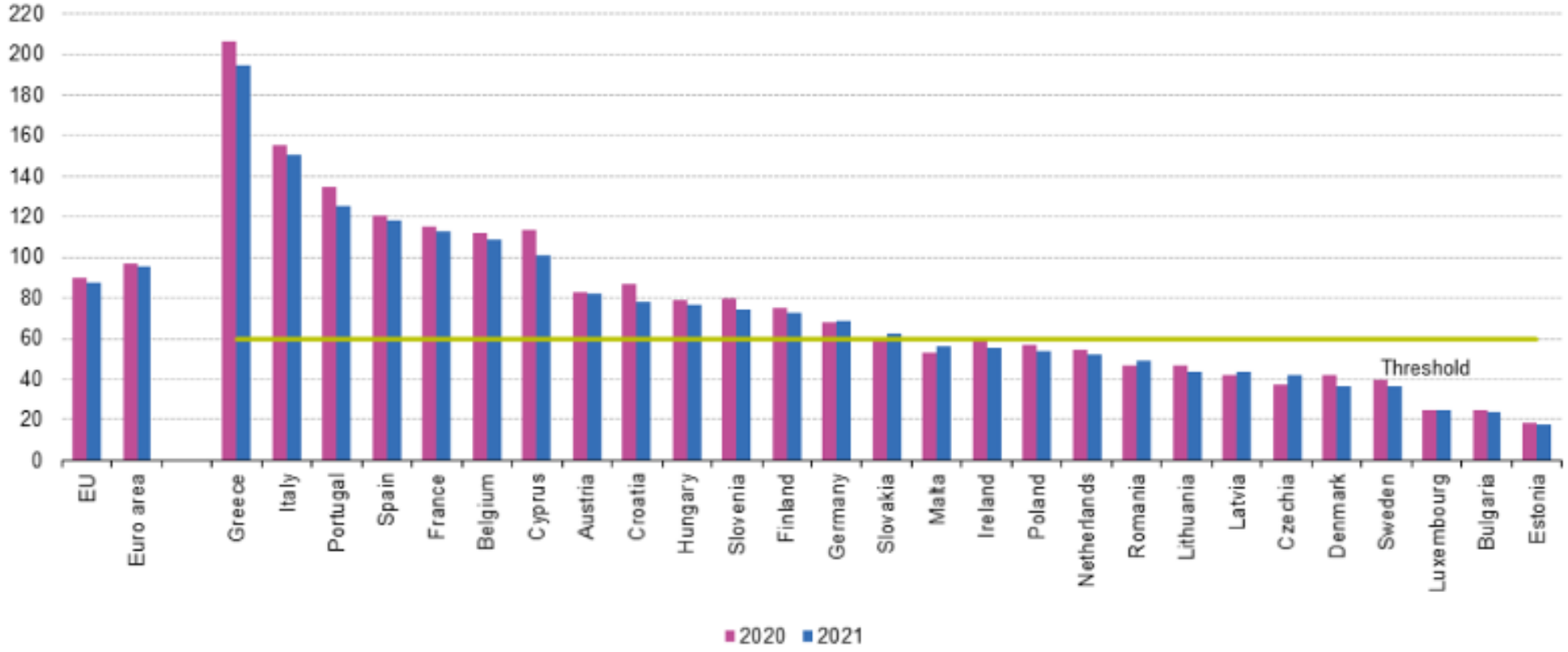
Liabilities (reserves)

Assets


Central bank holdings of government bonds, in % GDP (last data point: Q1 2022)
50
45
40
35
30
25
20
15
10
5
0
DE
FR
NE
SP
IT
GR
06
08
10
12
14
16
18
20
22

General government debt, 2020 and 2021 (1)

(General government consolidated gross debt, % of GDP)



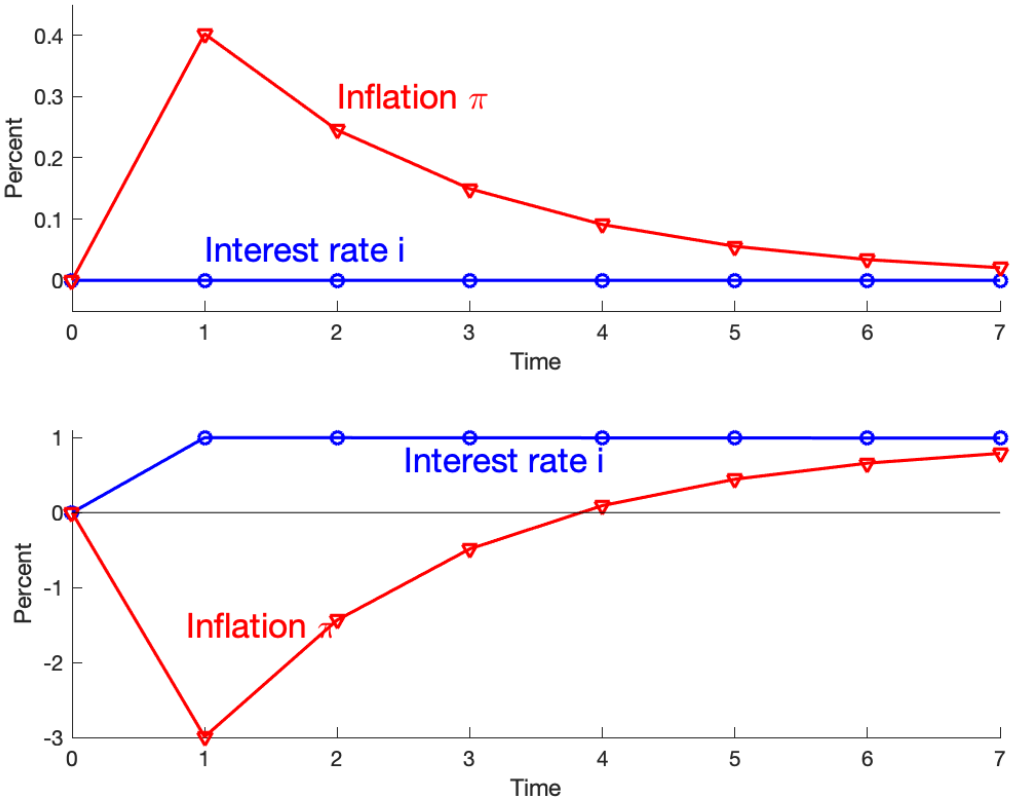
(1) Data extracted on 20.10.2022

Source: Eurostat (gov_10dd_edpt1)

eurostat

Summary and directions

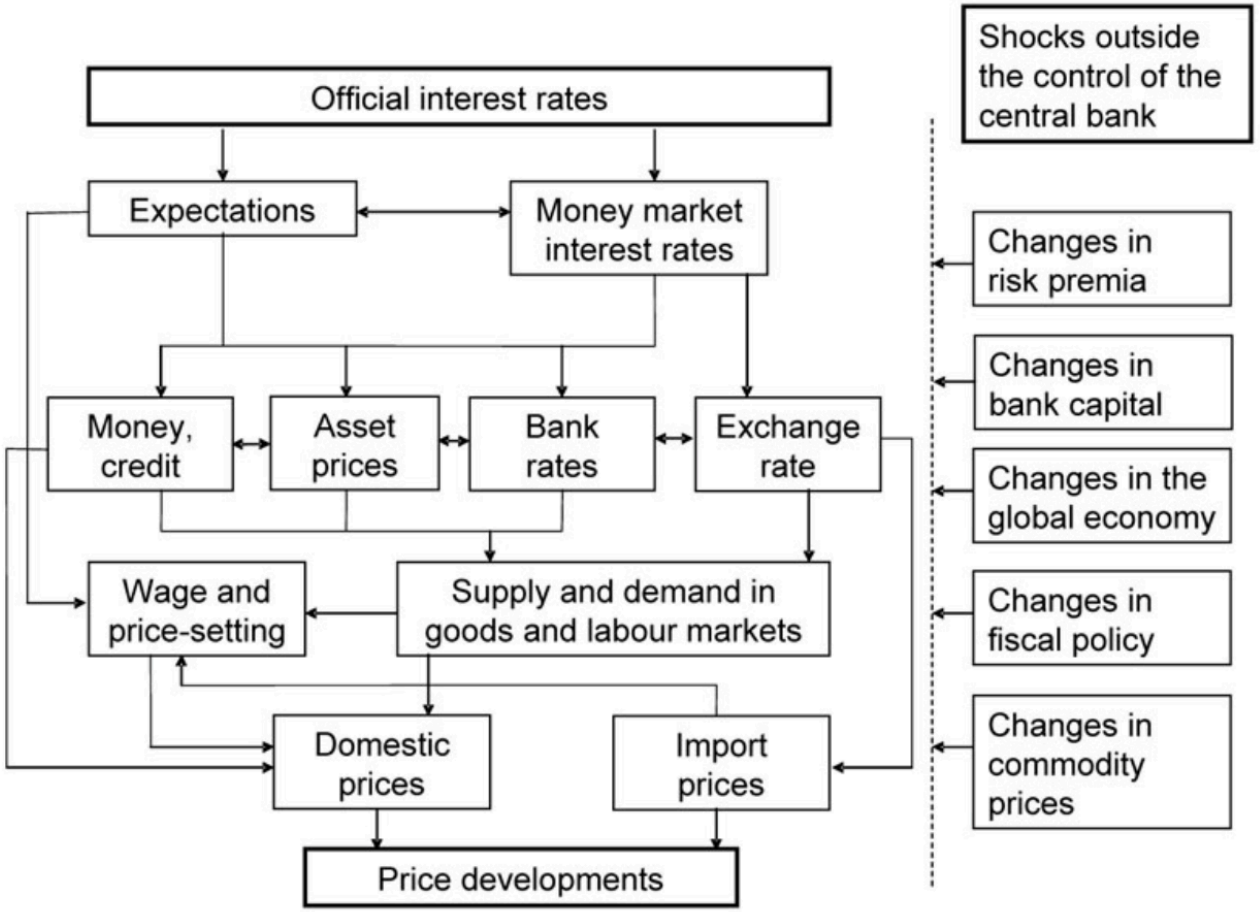
- Fiscal theory with interest rate targets
  - Fiscal shock
  - Monetary shock
- Other shocks?
- Easy extension to NK/DSGE models
- Better model of a negative effect?
- Empirical: Effect of interest rates without fiscal changes?
- Understand history/episodes?
- Better design of fiscal/monetary institutions?
- Lots to do!
- Humility: we don't really have a consensus theory of inflation under interest rate targets, and this one needs much elaboration. Do interest rates (without fiscal help) raise or lower inflation? How? When?



A little humility.

Do higher nominal interest rates *without fiscal policy change*, raise or lower inflation? Long run? Short run? We don't really know! Not this:

> The chart below provides a schematic illustration of the main transmission channels of monetary policy decisions.



Source: https://www.ecb.europa.eu/mopo/intro/transmission/html/index.en.html

The End
Extra slides follow

Fiscal theory of monetary policy with sticky prices, long term debt.

$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$ ← Standard NK model IS and Phillips curves

$$\pi_t = \beta E_t \pi_{t+1} + \kappa x_t$$ (Generalize $i_t = E_t \pi_{t+1}$.)

$$i_t = \theta_{i\pi} \pi_t + \theta_{ix} x_t + u_{i,t}$$ ← Policy rule

$$\rho v_{t+1} = v_t + r^n_{t+1} - \pi_{t+1} - \tilde{s}_{t+1}$$ ← Government debt

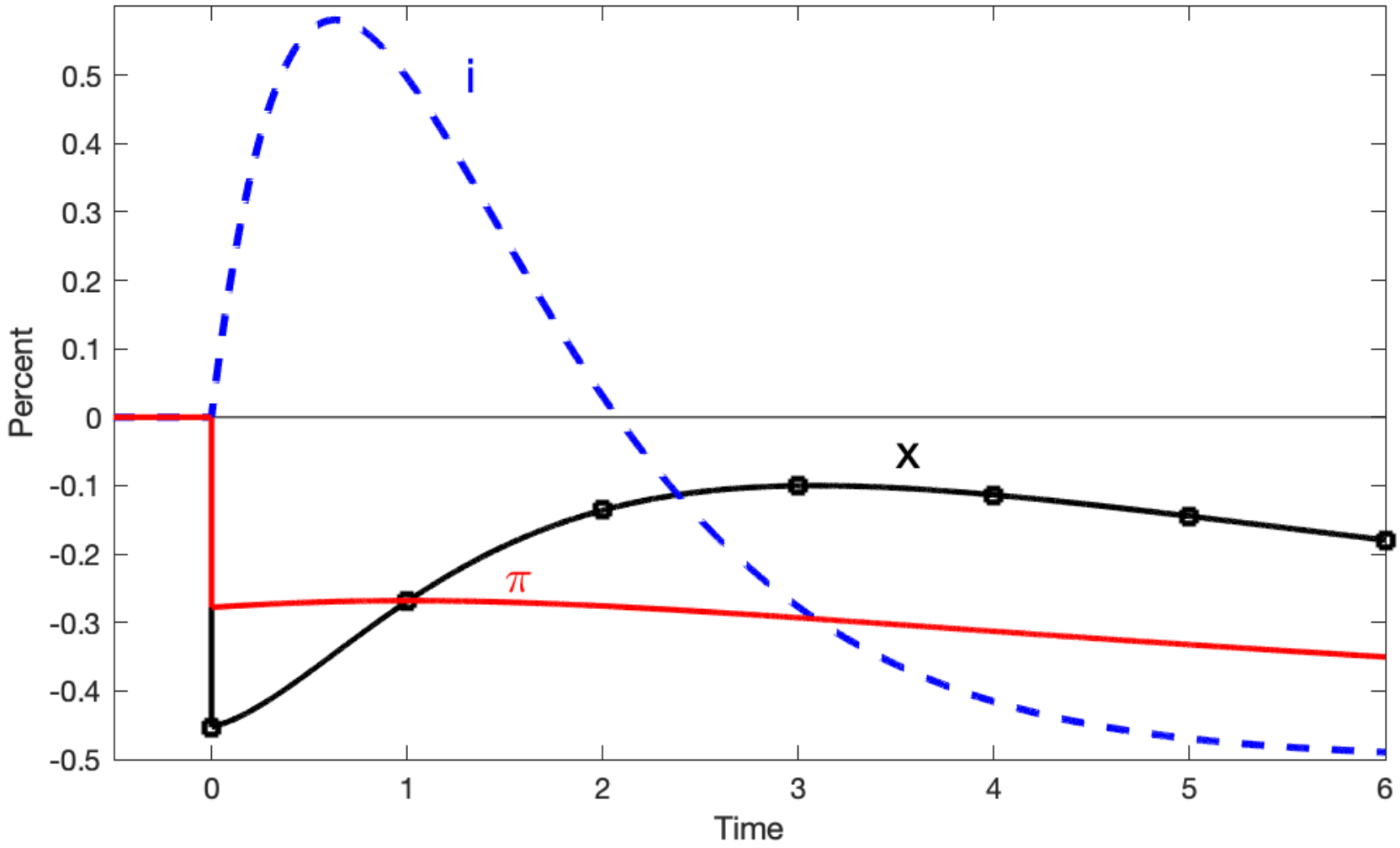
$$E_t r^n_{t+1} = i_t$$ ← Expectations hypothesis

$$r^n_{t+1} = \omega q_{t+1} - q_t$$ ← Bond price and return

Geometric maturity structure $B^{(j)} = \omega^j B$

- Solve: standard matrix / Dynare method.
- Recipe: It's really easy to turn any NK/DSGE model into FTPL!

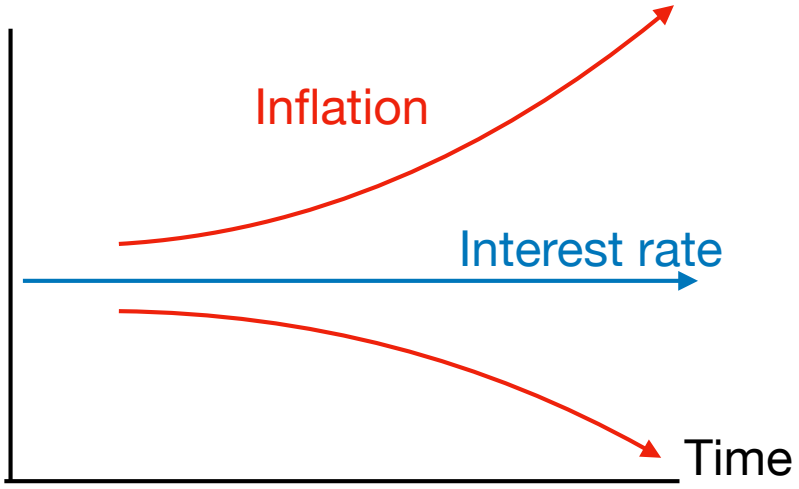
FTMP with sticky prices, short debt. Monetary shock.



Interest rate shock, with no change in fiscal policy, short term debt

- The completely false appearance of a negative effect is possible.
- Future negative interest rates drag down today's inflation
- Inflation declines *despite*, not *because of* high rates
- Are we so sure higher rates with no fiscal change lowers inflation?

Unstable (adaptive expectations)



Stable (rational expectations)