Inflation Past, Present, and Future: Fiscal Shocks, a Slow Response, and Fiscal Limits.

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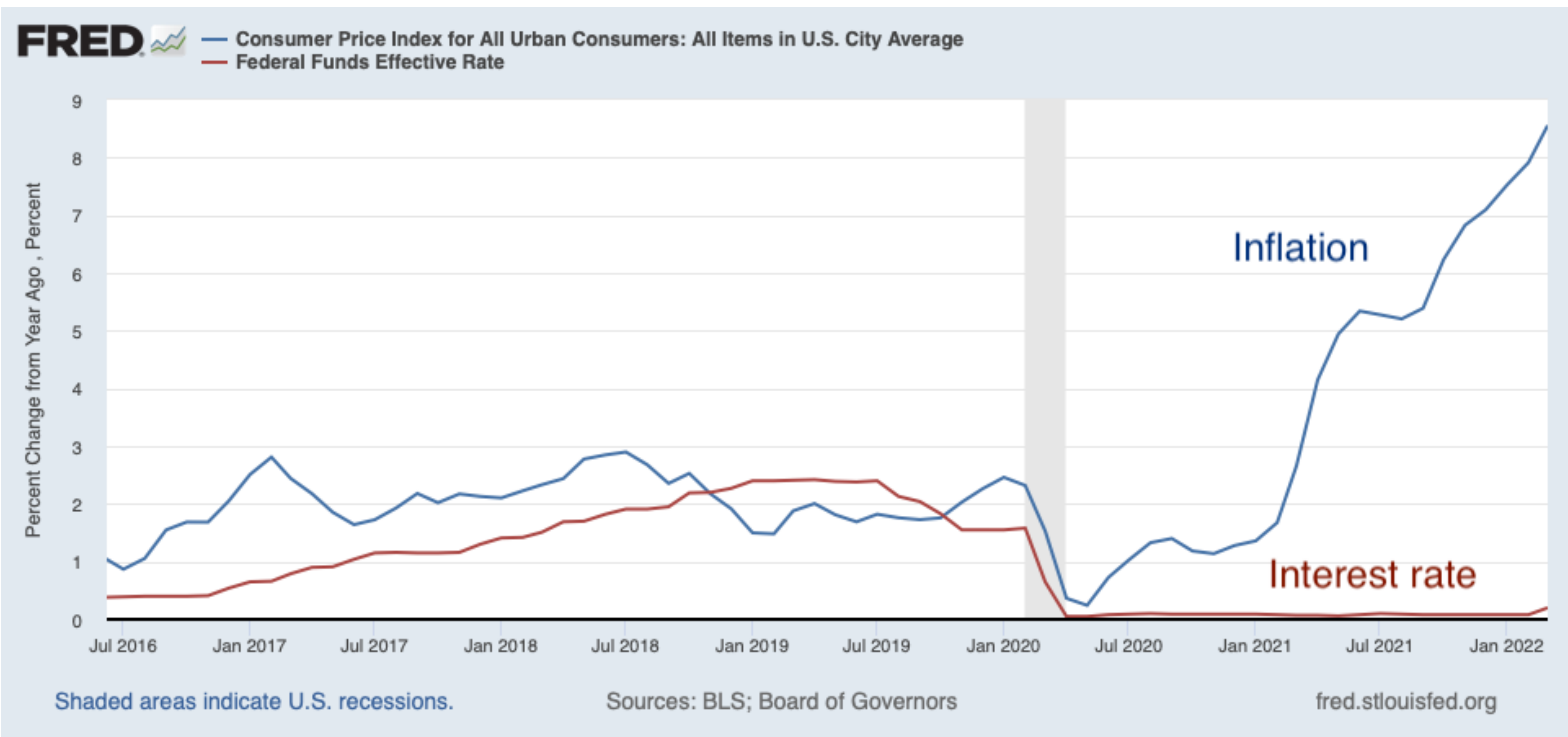
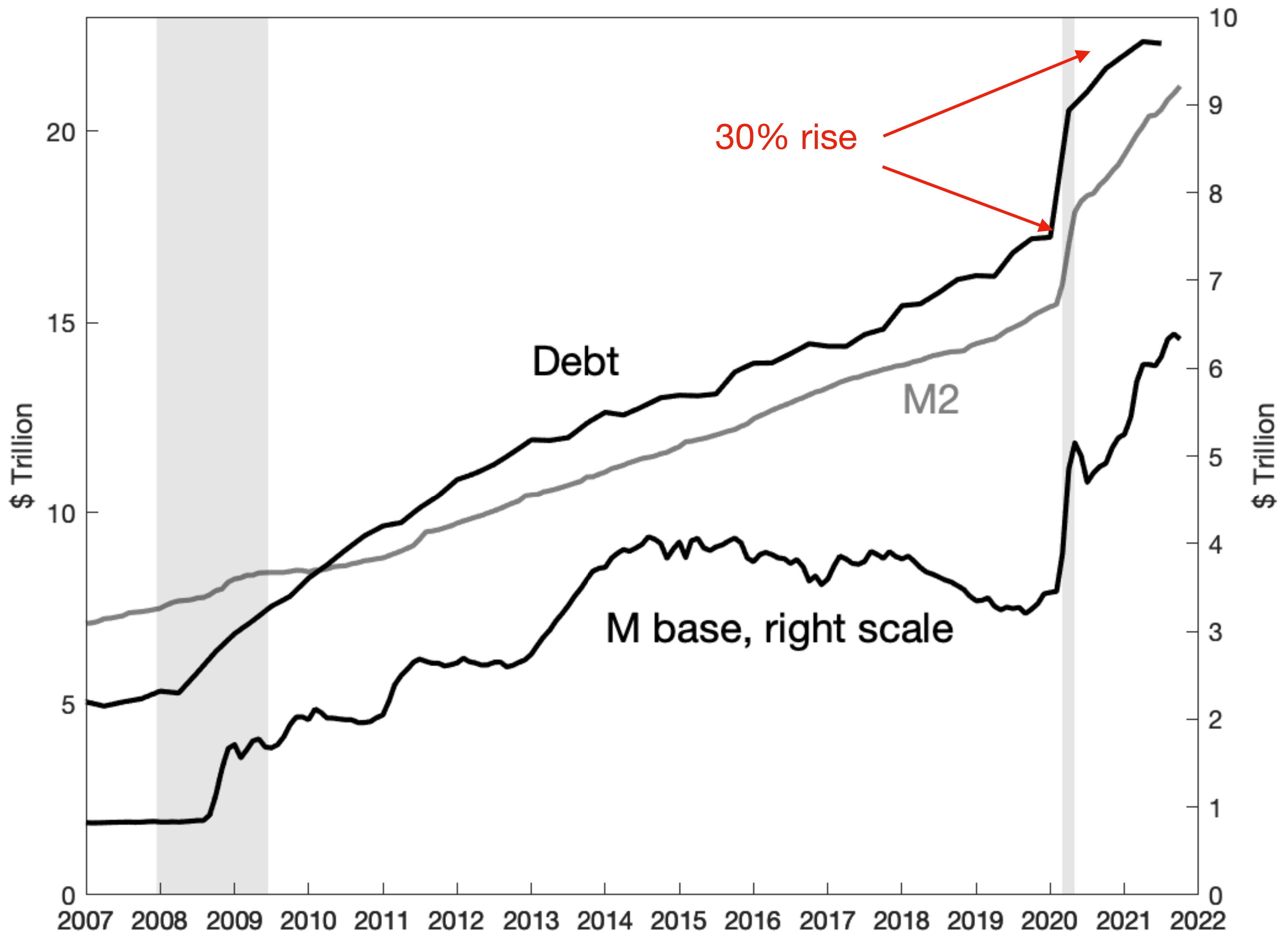
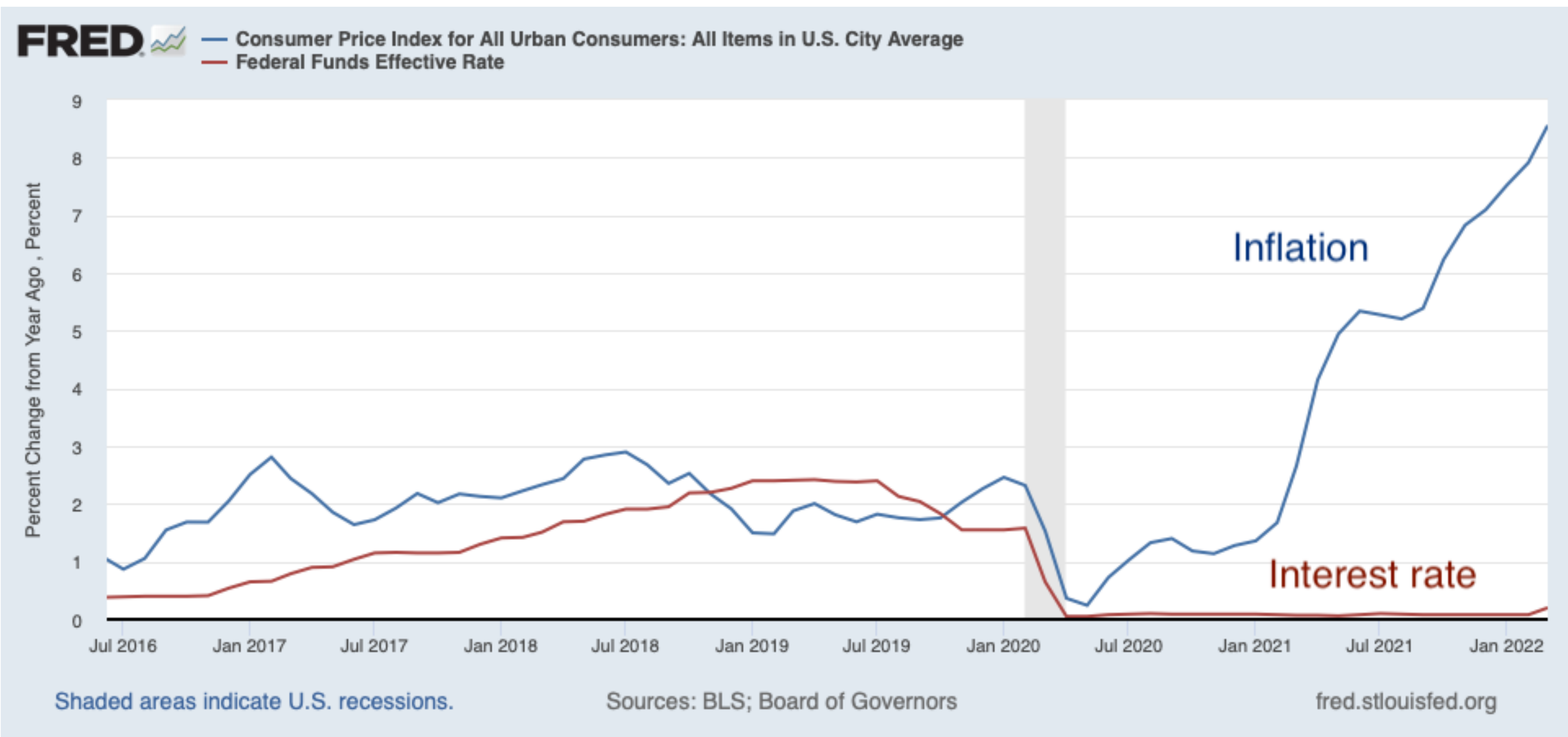
Our topic: Inflation emerges, slow Fed reaction



Where did inflation come from?



The Fed is behind the curve, by historical standards



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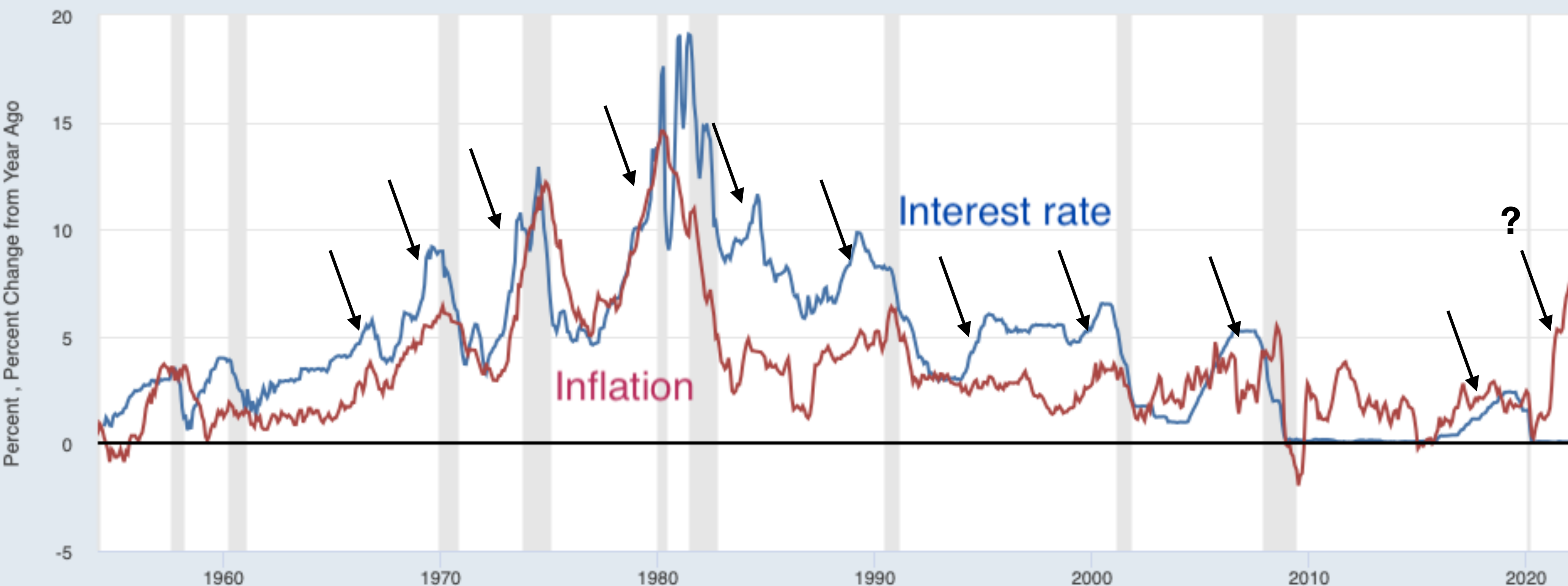
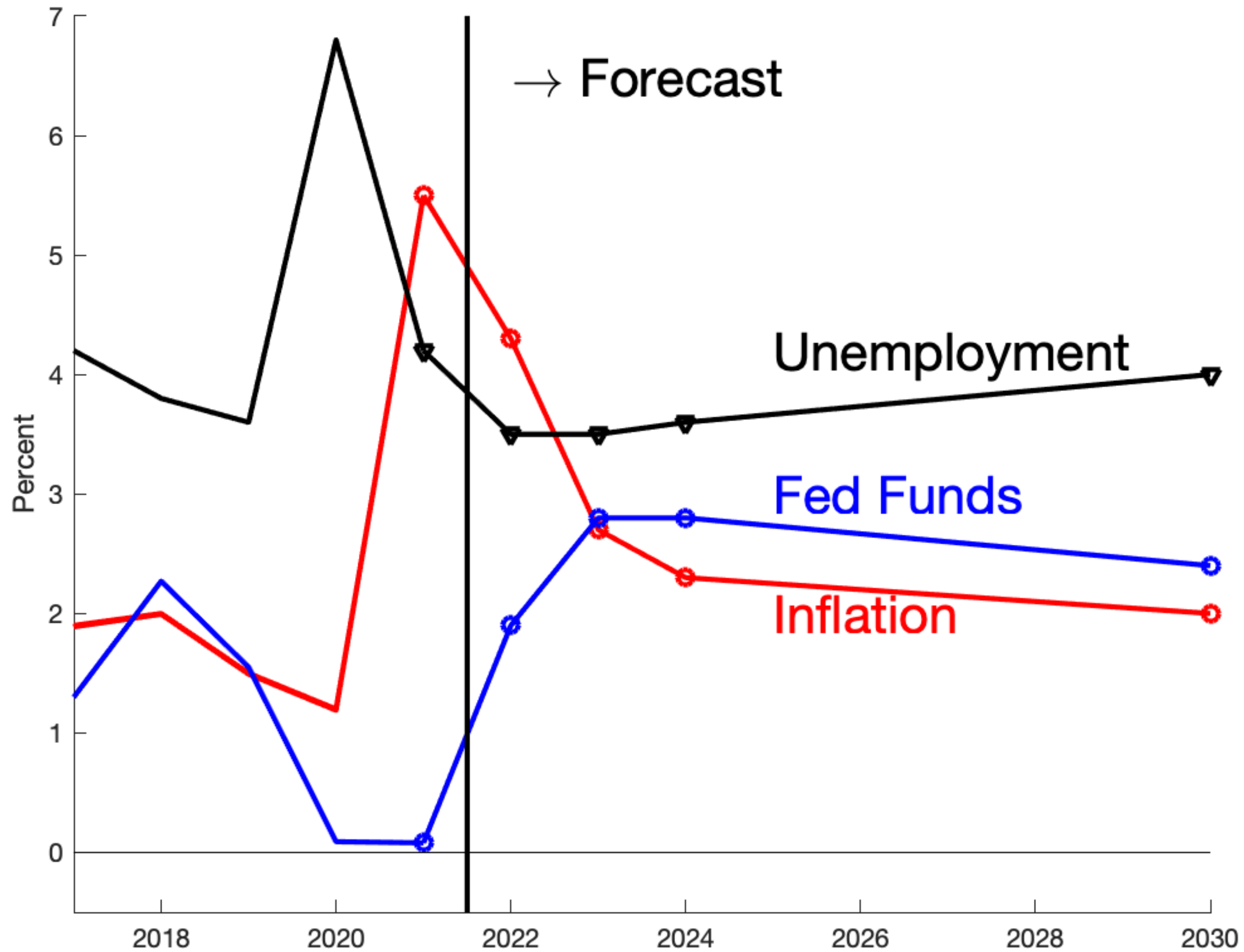


Federal Reserve Projections

The Fed believes inflation will go away without any period of high real interest rates.



Markets seem to agree with the Fed

Consumer Price Index for All Urban Consumers: All Items in U.S. City Average
Federal Funds Effective Rate
Market Yield on U.S. Treasury Securities at 5-Year Constant Maturity
5-Year Breakeven Inflation Rate

Inflation
5 year breakeven
5 year Treasury
FF

Percent Change from Year Ago , Percent
9
8
7
6
5
4
3
2
1
0

2019-07
2020-01
2020-07
2021-01
2021-07
2022-01

Sources: BLS; Board of Governors; St. Louis Fed

Inflation and Unemployment if the Fed Funds rate follows Fed projections

Adaptive Expectations / old Keynesian model

$$x_t = -\sigma(i_t - r - \pi_{t-1}); \;\; \pi_t = \pi_{t-1} + \kappa x_t;$$

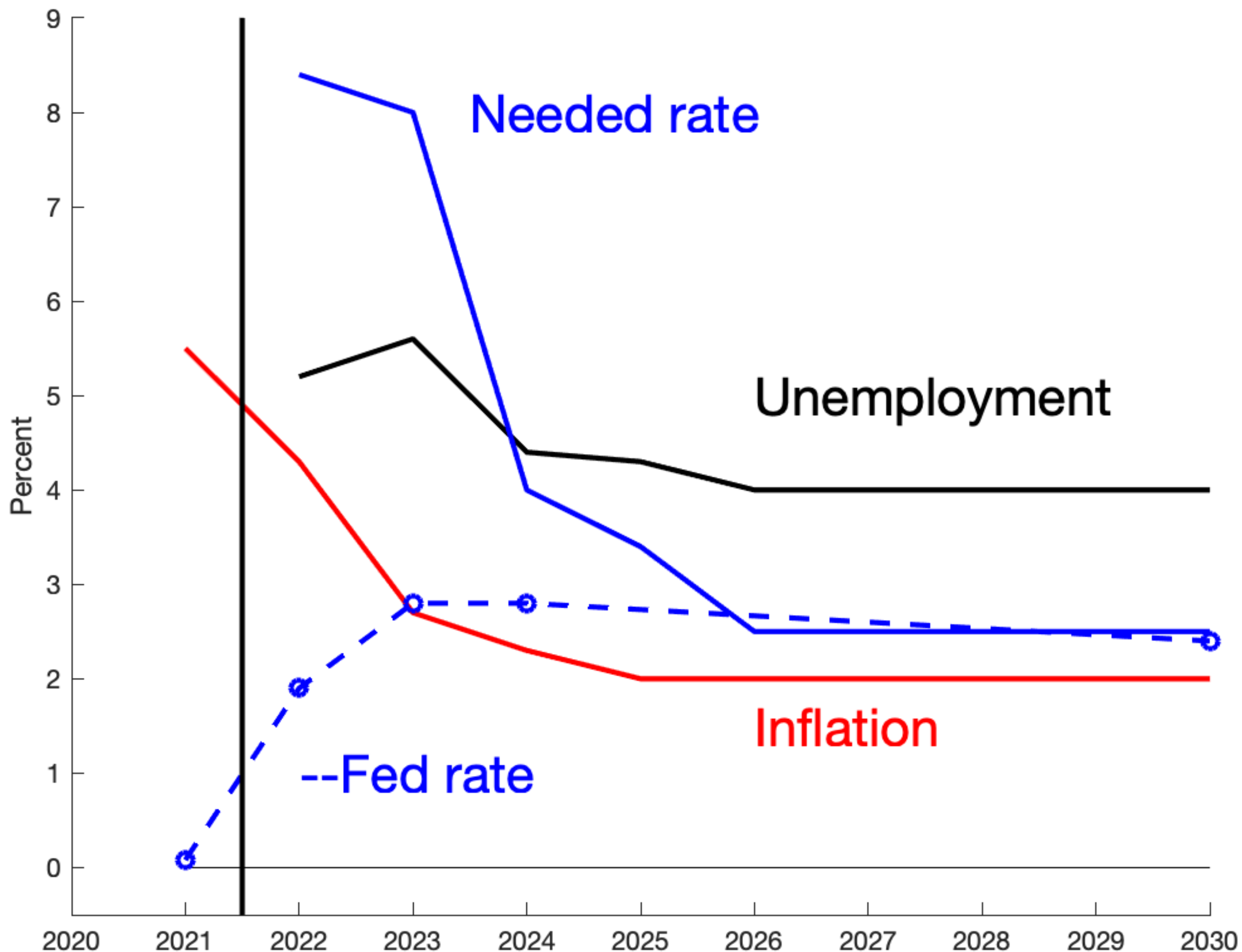
Inflation and Unemployment if the Fed Funds rate follows Fed projections

Rational Expectations / new Keynesian model

Model
Fed Forecast
Unemployment
Inflation
Fed funds
Percent
0 1 2 3 4 5
2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

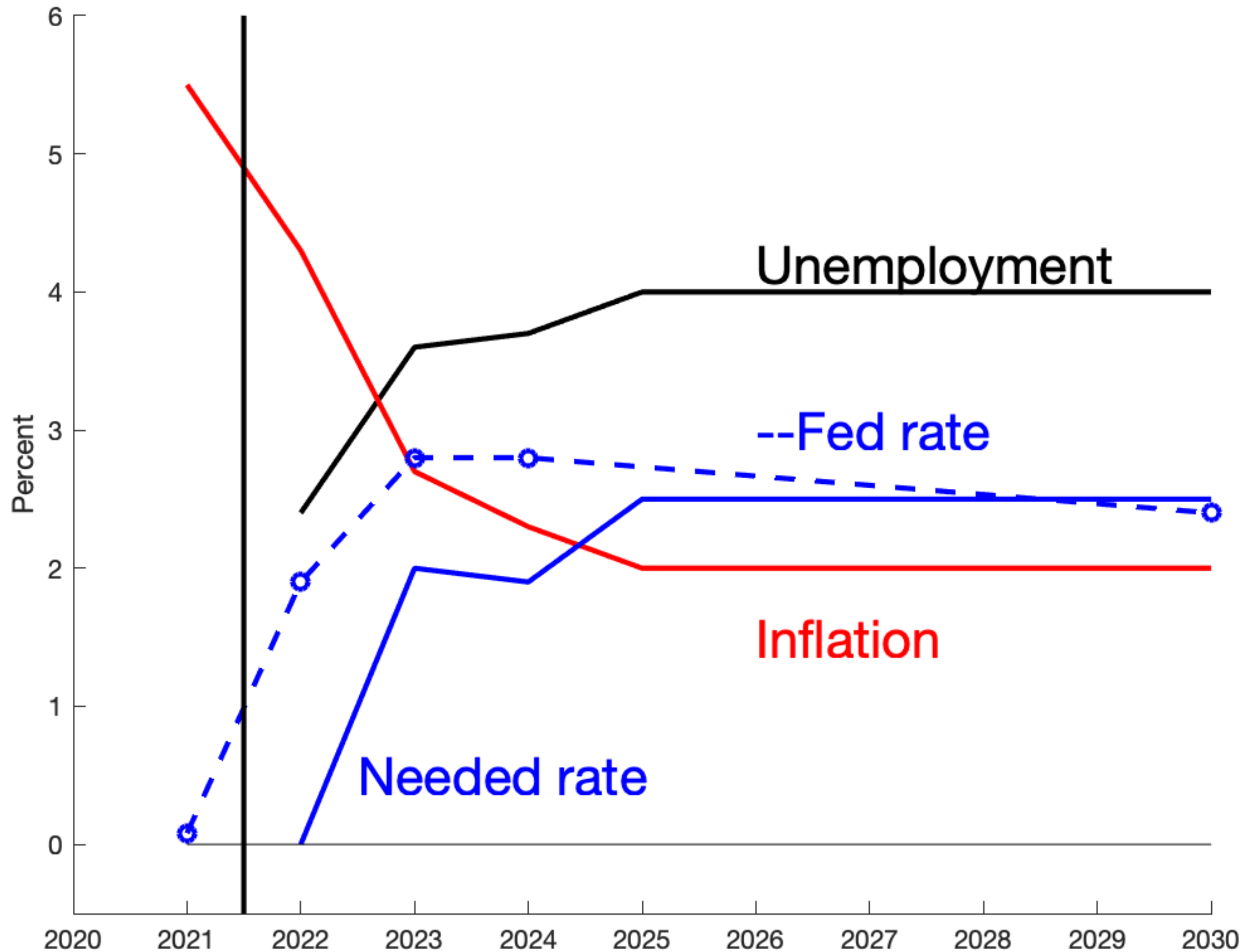
$$x_t = -\sigma(i_t - r - E_t\pi_{t+1});\ \ \pi_t = E_t\pi_{t+1} + \kappa x_t;\ \ \sigma = 1;\ \ \kappa = 0.5$$

Interest rate and unemployment path needed to produce the Fed's inflation forecast. Adaptive expectations / old Keynesian Model



$$x_t = -\sigma(i_t - r - \pi_{t-1}); \;\; \pi_t = \pi_{t-1} + \kappa x_t;$$

Interest rate and unemployment path needed to produce the Fed's inflation forecast. Rational expectations / new Keynesian Model



$$x_t = -\sigma(i_t - r - E_t\pi_{t+1});\ \ \pi_t = E_t\pi_{t+1} + \kappa x_t$$

Summary:

The Fed's projections are consistent with a standard new-Keynesian model. The model has been around 30 years and is the basis of essentially all modern macro theory. It may be wrong or right, but it's not nutty.

Core questions:

1) *How forward-looking are expectations?* Bond market, economy, Phillips curve:

$$i_t = r_t + E_t \pi_{t+1} ?$$

$$c_t = E_t c_{t+1} - \sigma(i_t - E_t \pi_{t+1}) ?$$

$$\pi_t = E_t \pi_{t+1} + \kappa x_t ?$$ Output high when inflation is high relative to future inflation?

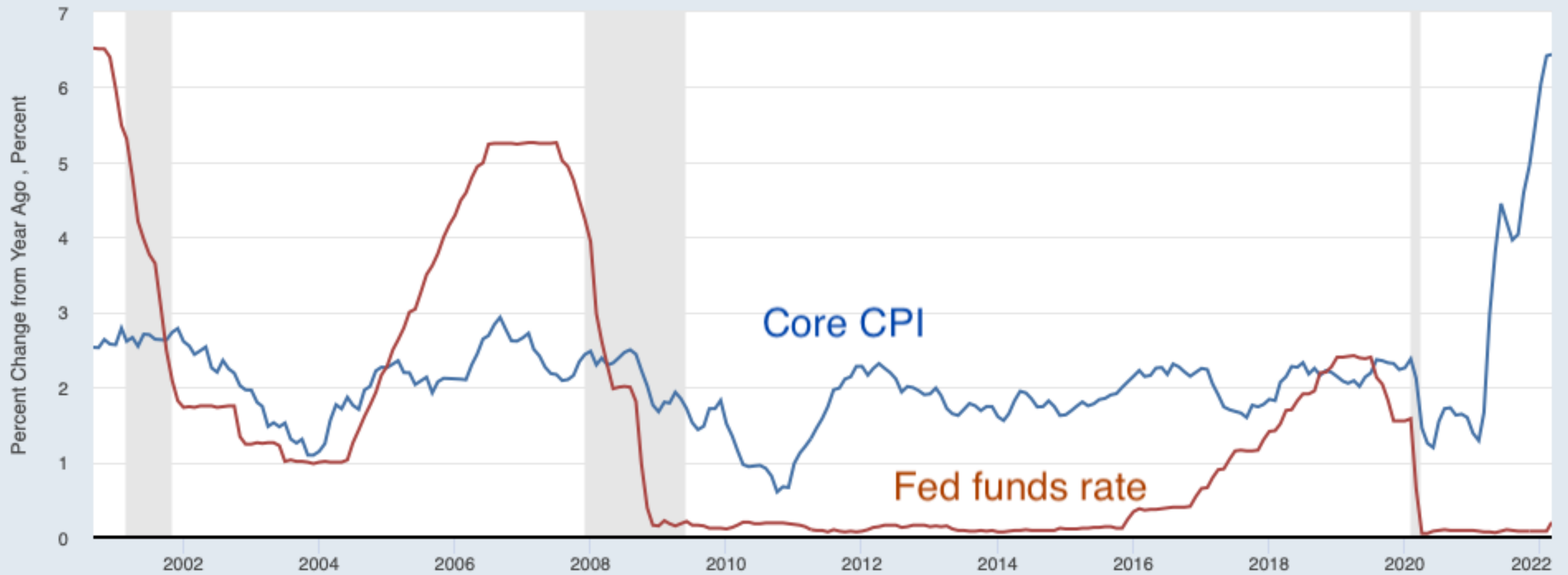
Backward-looking (adaptive)? Forward-looking? Somewhere in between, sometimes more and sometimes less, short vs. long run? (Adaptive through spiral?)

2) *Is the economy stable or unstable with an interest rate that reacts less than 1-1 to past inflation?*

Is the Taylor principle necessary for *stability* (non-explosive dynamics), or does it just reduce *volatility* (variance)? That's not so nutty either…

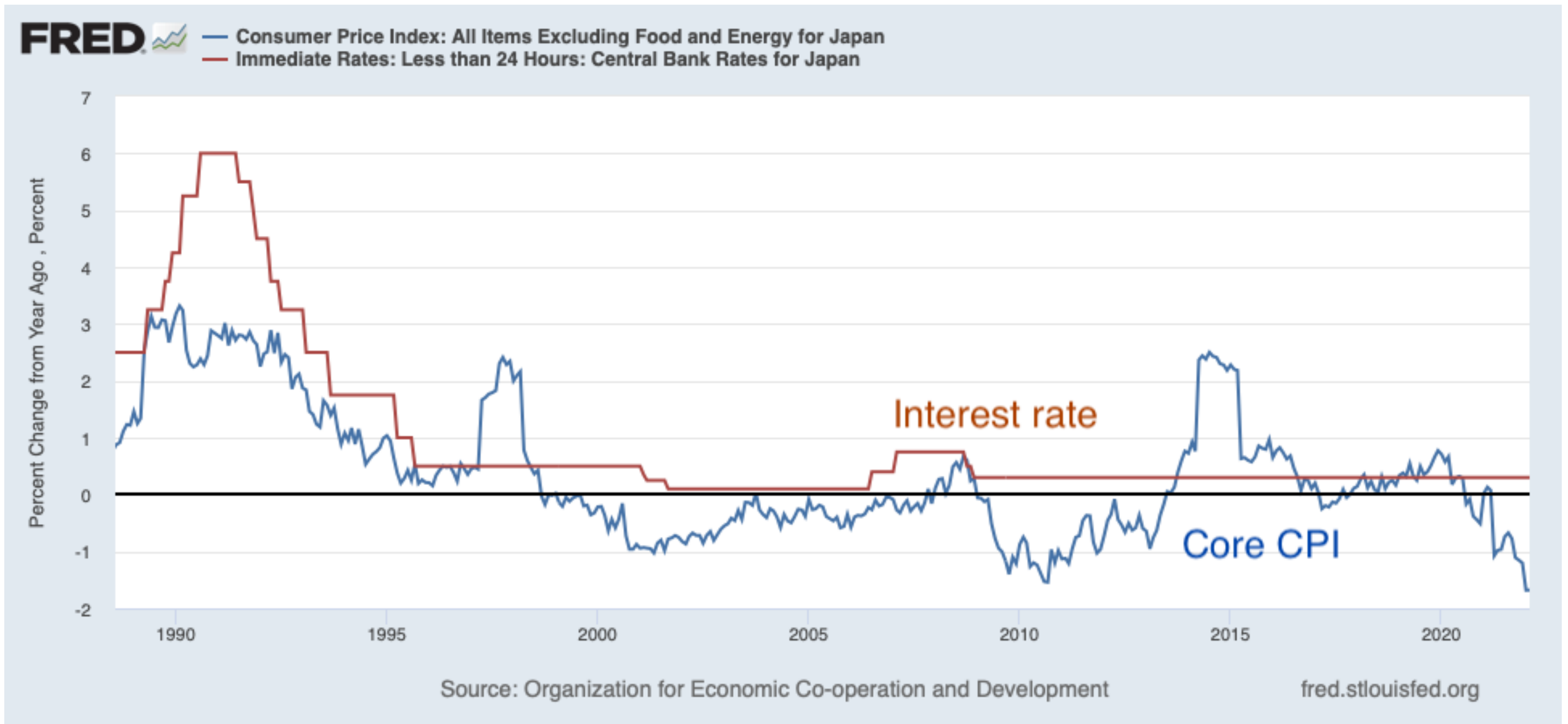
3) *Are prices as flexible, Phillips curve as steep, as the Fed's projections imply?*

No spirals at the zero bound



No spirals at the zero bound—Europe

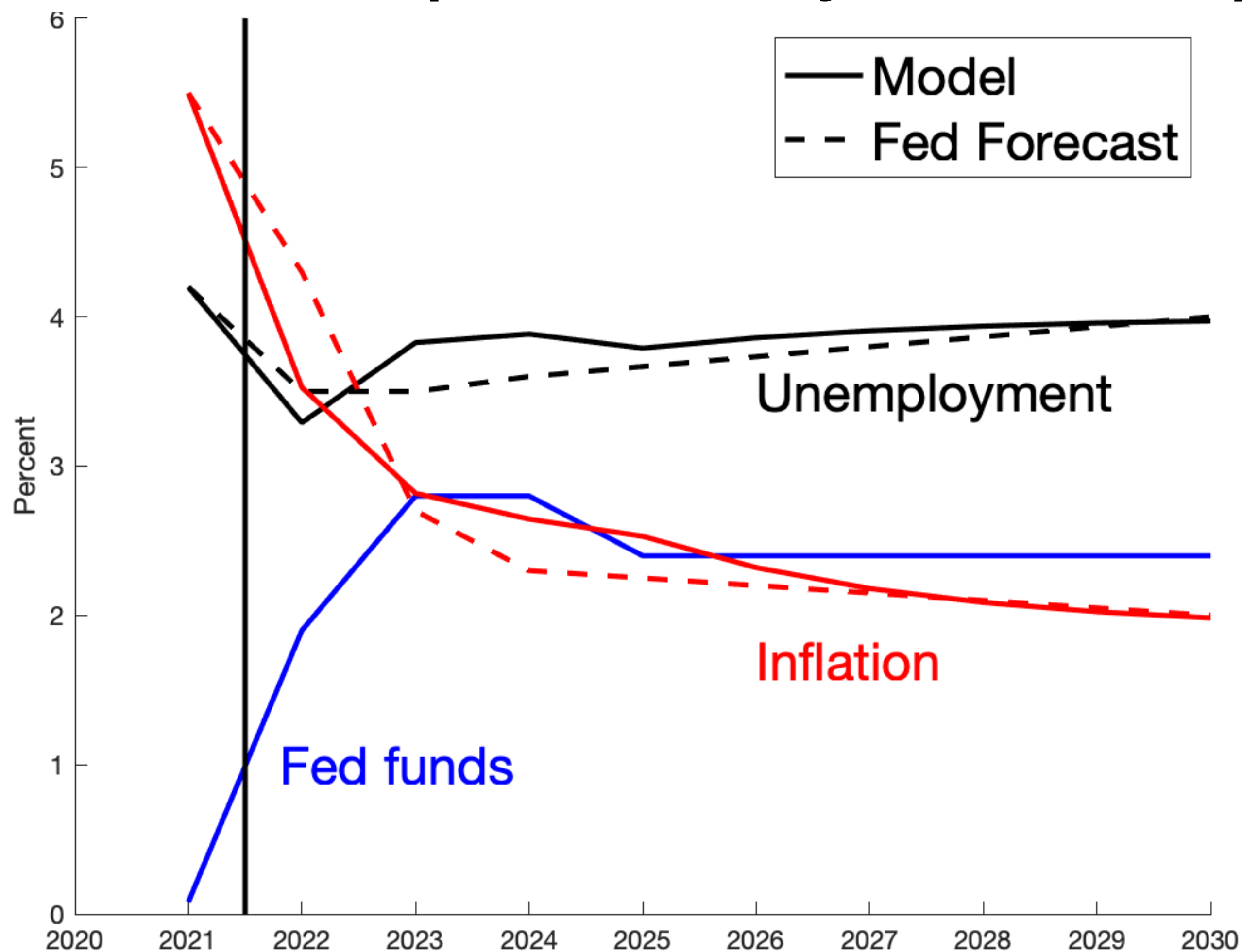
No spirals at the zero bound—Japan



25 years!

Part II:
Explore (the Fed's) simple new-Keynesian model, with fiscal constraints: A fiscal shock starts inflation, fiscal constraints on monetary policy.

Fed projections assume prices are very flexible/Phillips curve steep



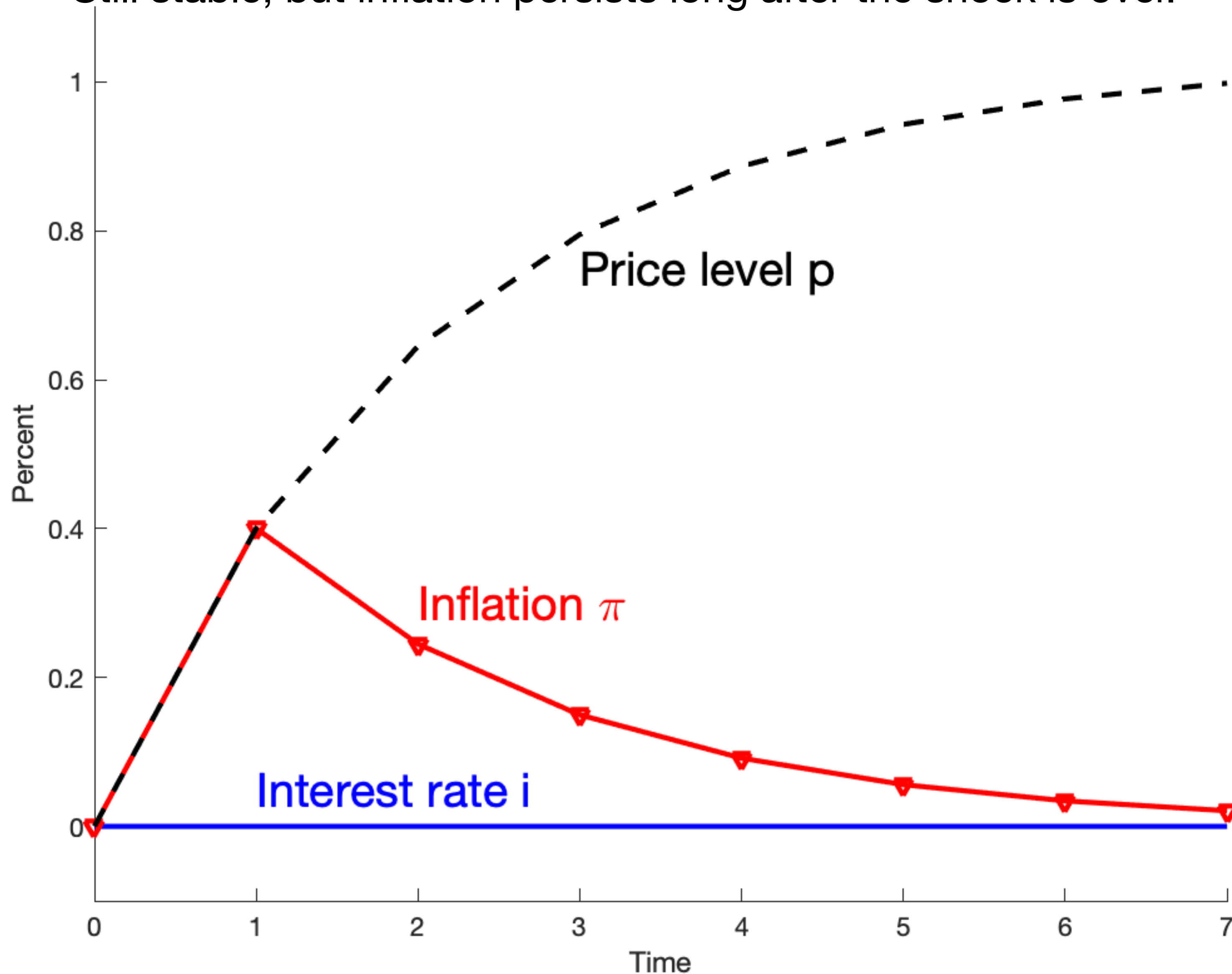
$$x_t = -\sigma(i_t - r - E_t\pi_{t+1});\ \pi_t = E_t\pi_{t+1} + \kappa x_t;\ \sigma = 1;\ \kappa = 0.5$$

1% output gap = 0.5% unemployment = 0.5% inflation

- 2008-2014: Lots of unemployment movement, small inflation movement: flat.
- 2021-2022: lots of inflation movement, small unemployment movement: steep!

New-Keynesian model response to a fiscal shock

Still stable, but inflation persists long after the shock is over.

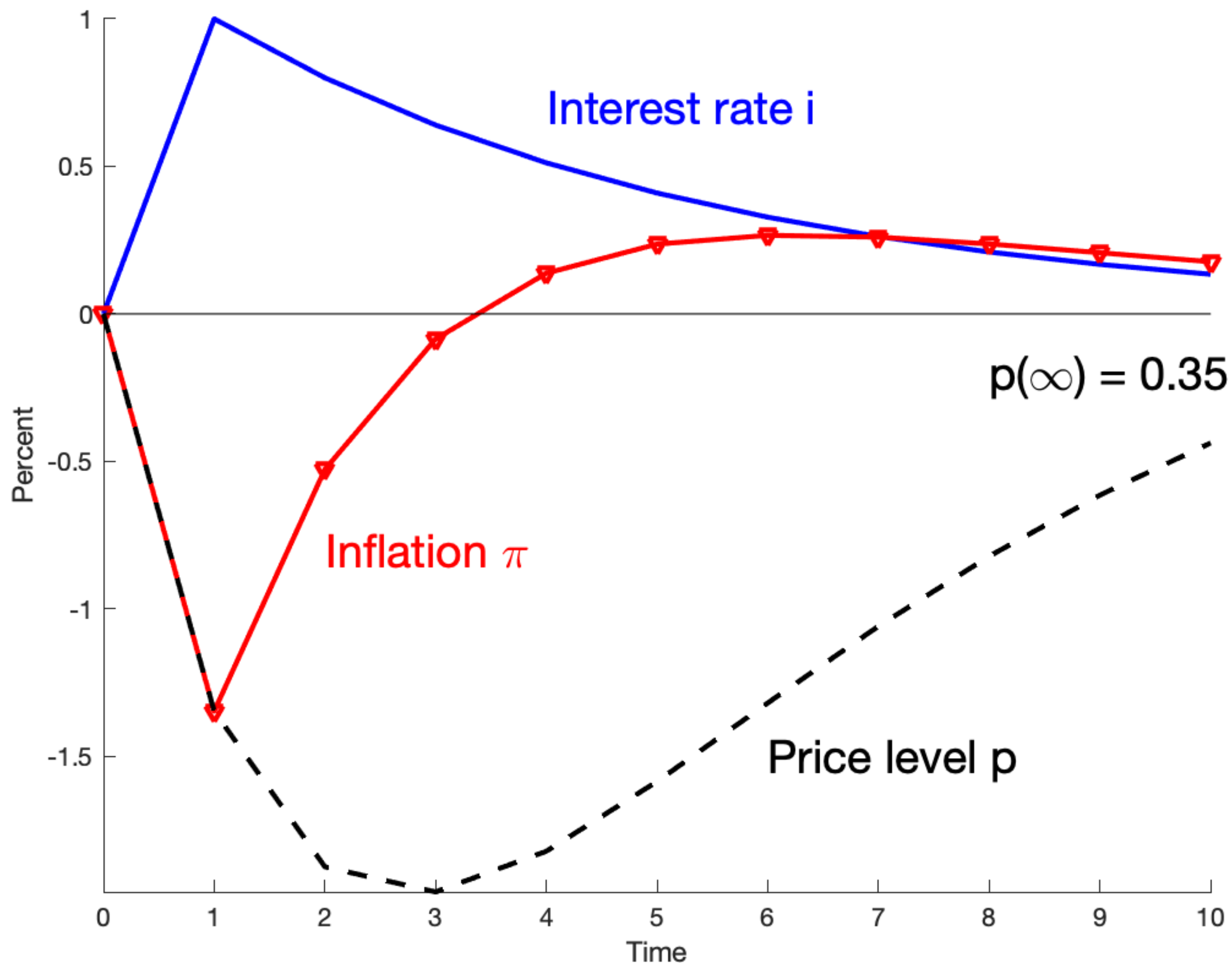


$$x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1});\ \ \pi_t = E_t \pi_{t+1} + \kappa x_t;\ \ \rho v_{t+1} = v_t + (i_t - \pi_{t+1}) - \tilde{s}_{t+1}$$

$\sigma = 1$; $\underline{\kappa = 0.25}$ 1% output gap = 0.5% unemployment = 0.25% inflation

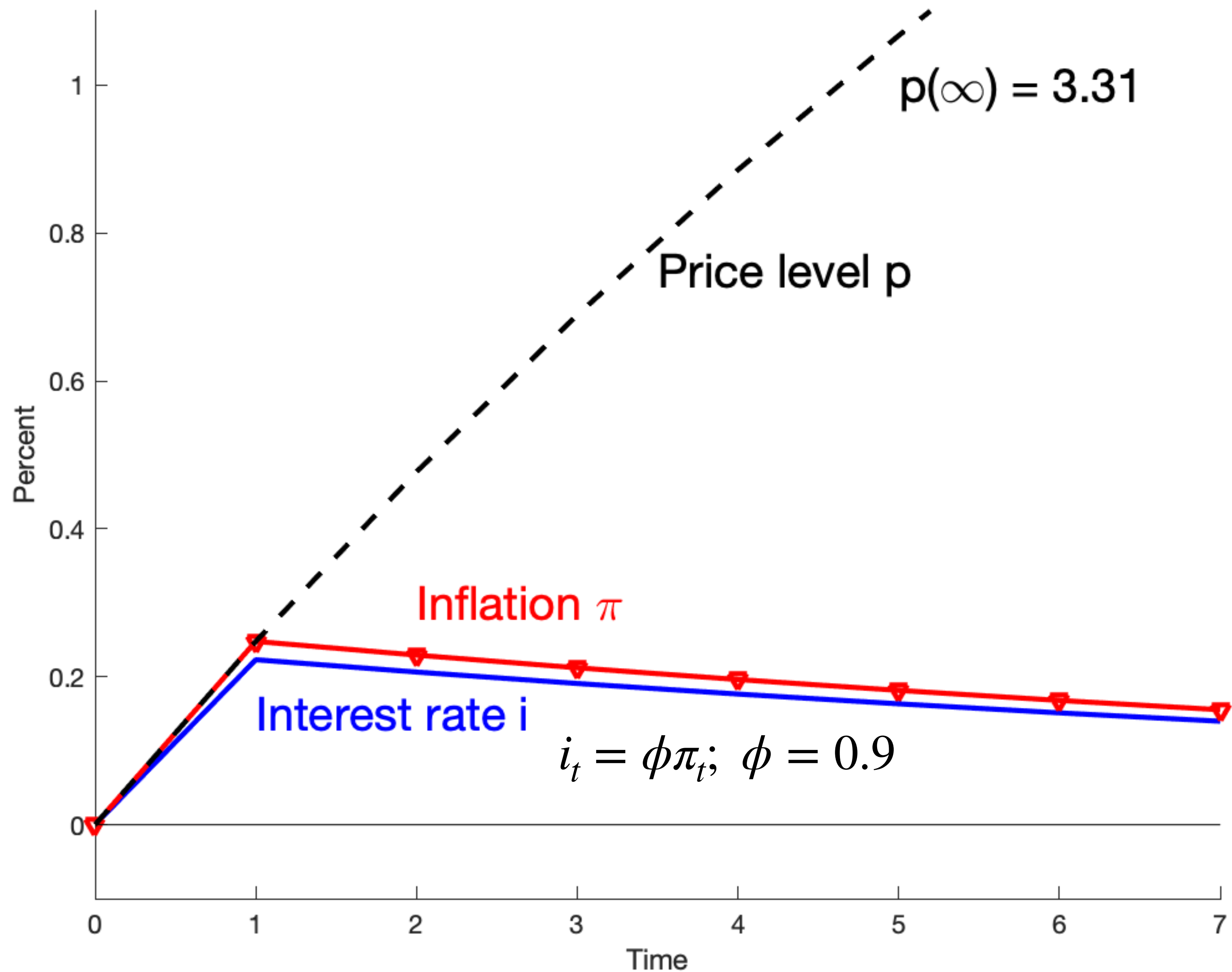
Unpleasant interest-rate arithmetic

Response to a monetary policy shock with no change in fiscal surplus. (Long term debt)



A fiscal shock must be absorbed by inflating away government debt.
The Fed can choose short vs. long-term debt, inflation now or inflation later

Fiscal shock: A rule reduces initial inflation, but draws it out.

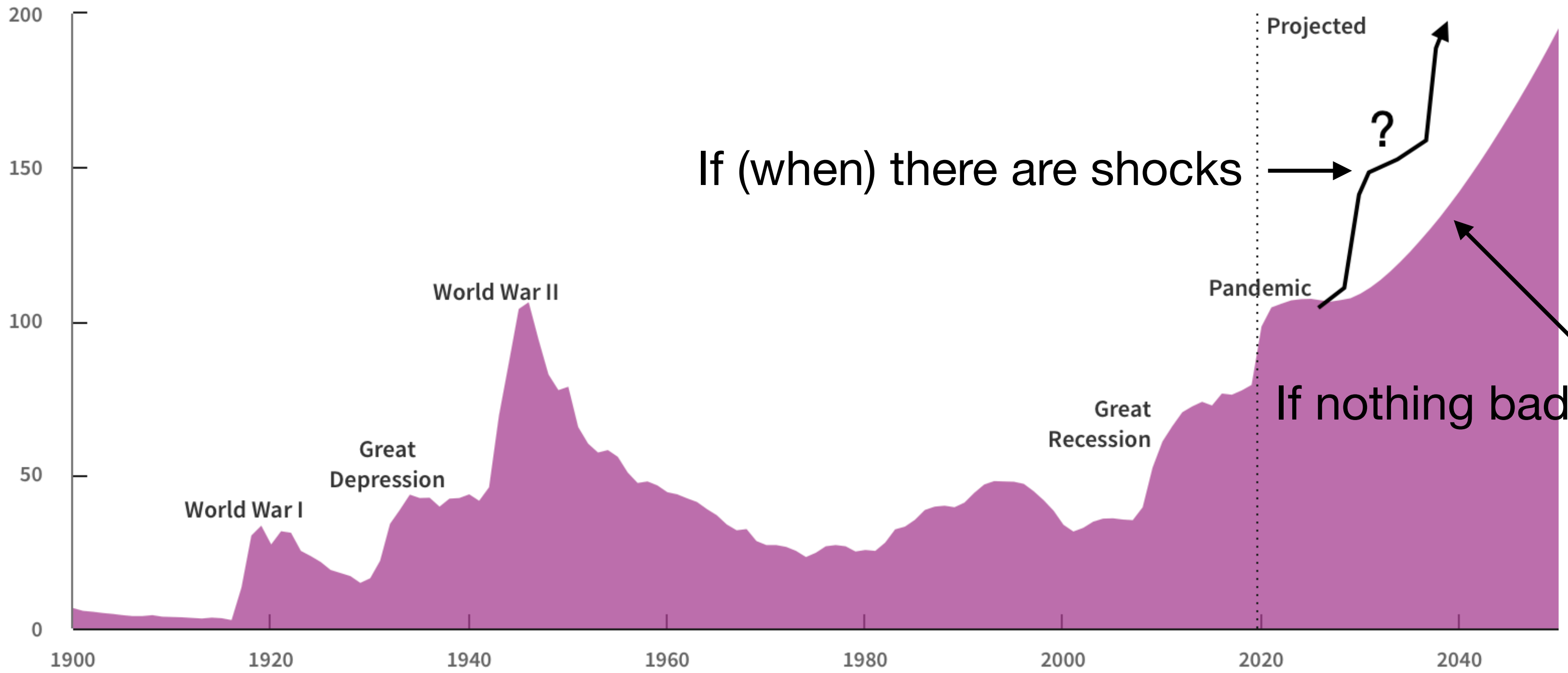


- Taylor rule smooths shocks.
- A fiscal shock can have a long drawn out response, not one-period price level jump.

Part III. The future.
Inflation and monetary policy in the shadow of debt

Federal Debt Held by the Public, 1900 to 2050

Percentage of Gross Domestic Product



5
0
-5
-10
-15
-20
Projected
5% GDP primary deficits
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Total Deficit
Net Interest
Primary Deficit

Monetary policy in the shadow of debt

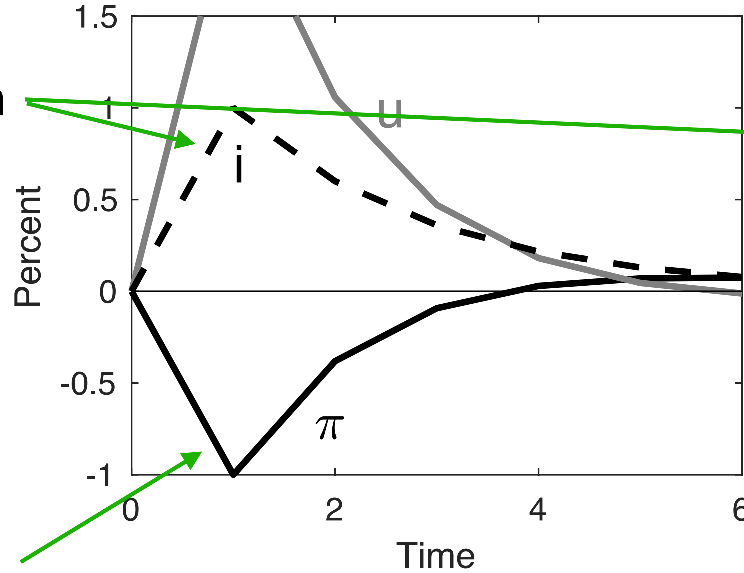
1. The inflationary shock was fiscal.
2. The future has fiscal constraints: 100% debt/GDP + 5% structural deficits + big deficits to bailout/stimulate in each crisis. (1980: 25% debt/GDP). *Monetary policy without fiscal coordination (tightening)?*
   A. 100% debt / GDP + 5% interest rate = 5% of GDP additional interest cots on debt — needs 5% of GDP more surplus.
   B. 100% debt/GDP + 10% disinflation = 10% of GDP windfall paid to bondholders — needs 10% of GDP more surplus.
   C. Without that fiscal coordination, a monetary tightening will fail to stop inflation.
   D. Latin American possibility. Raise interest rates without solving the fiscal problem, interest costs rise, deficit gets worse, inflation *rises*.

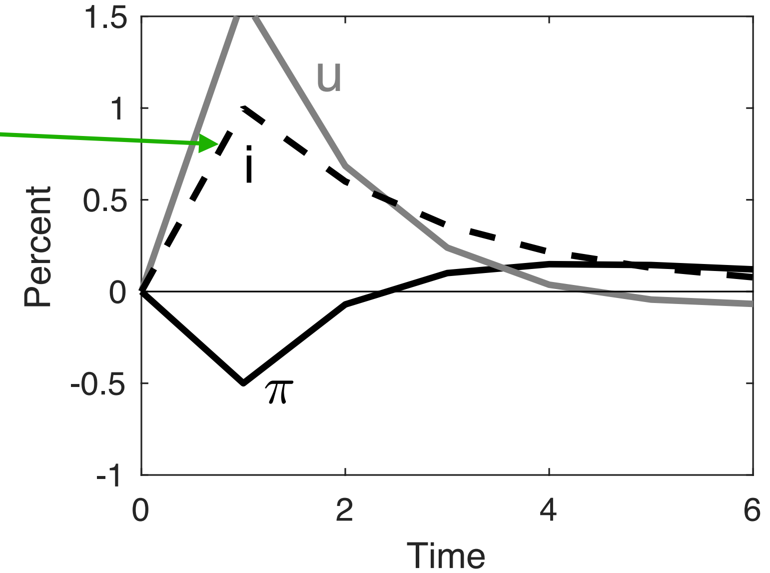
Without a fiscal contraction, higher interest rates do not lower inflation

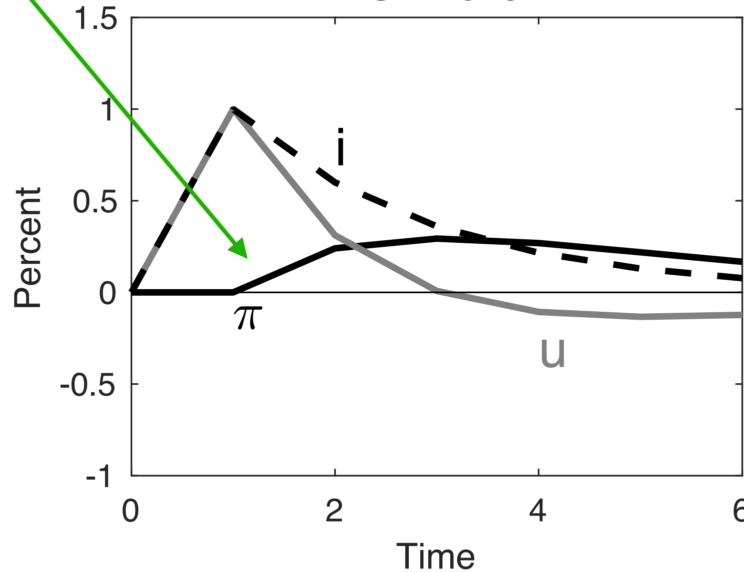
“Passive” fiscal surplus

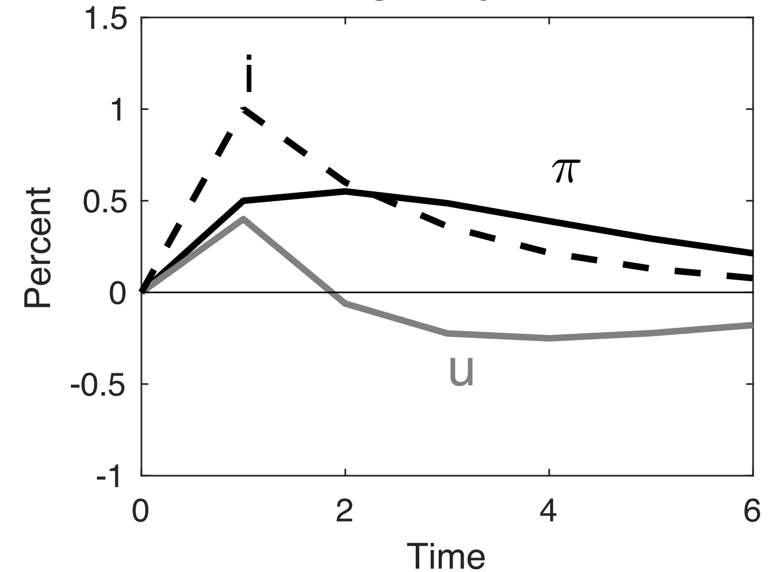
Same i path

Less s means
less disinflation
for same i path



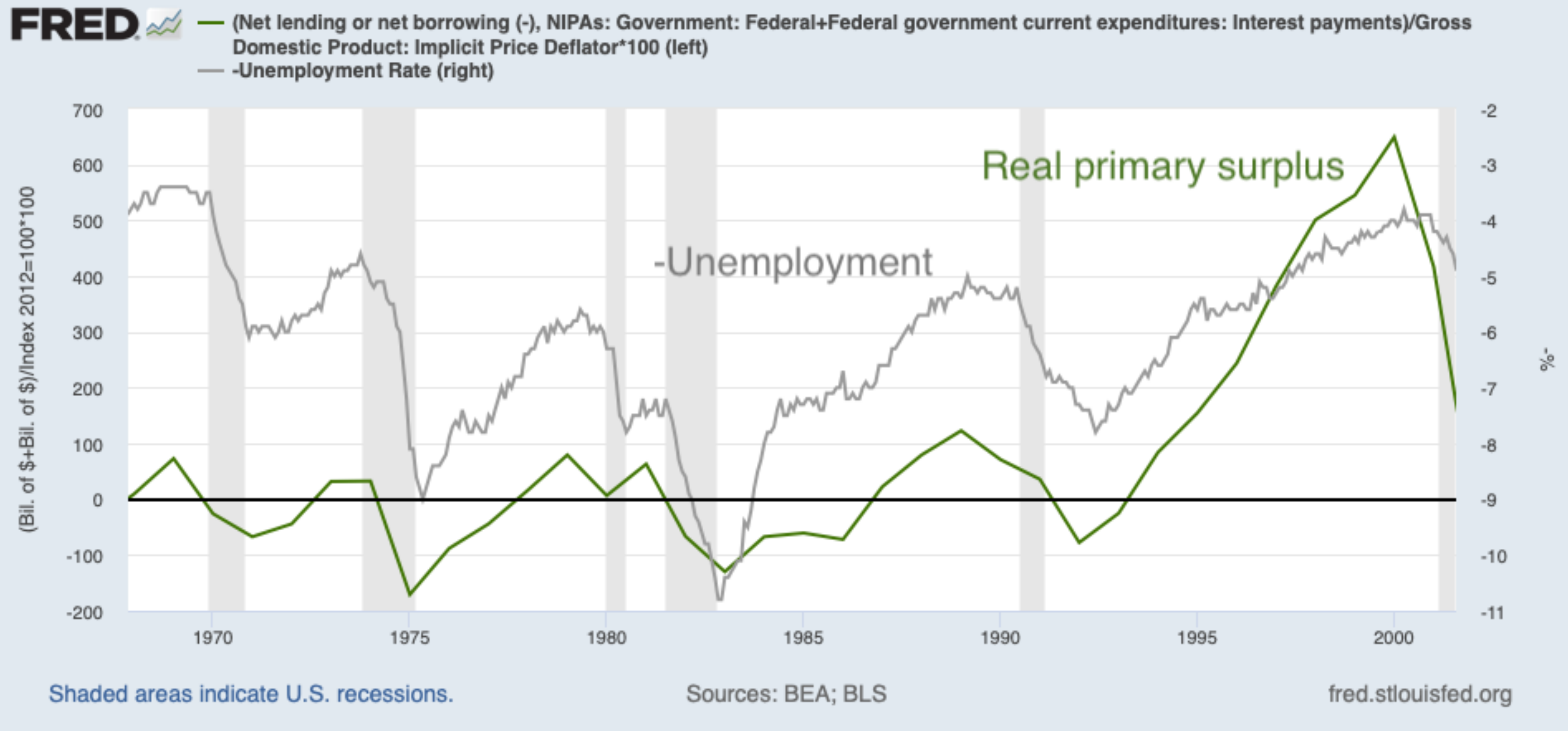




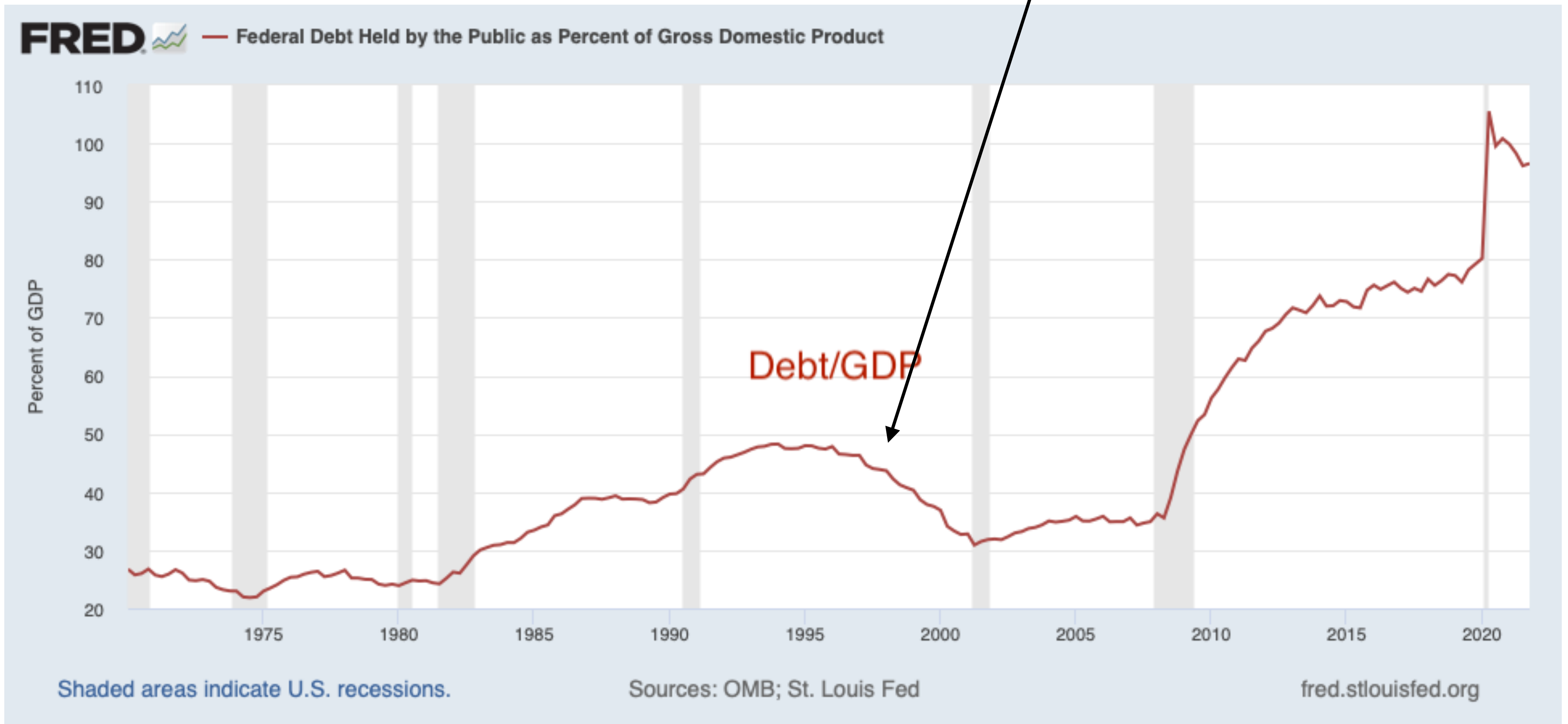


Standard 3 equation NK model. $i_t = \phi \pi_t + u_t;\ \phi = 1.5$. Passive fiscal policy induces a contraction, lowers inflation. Different u give the same i path but different fiscal contraction

1980 stabilization was a joint monetary, fiscal and microeconomic reform

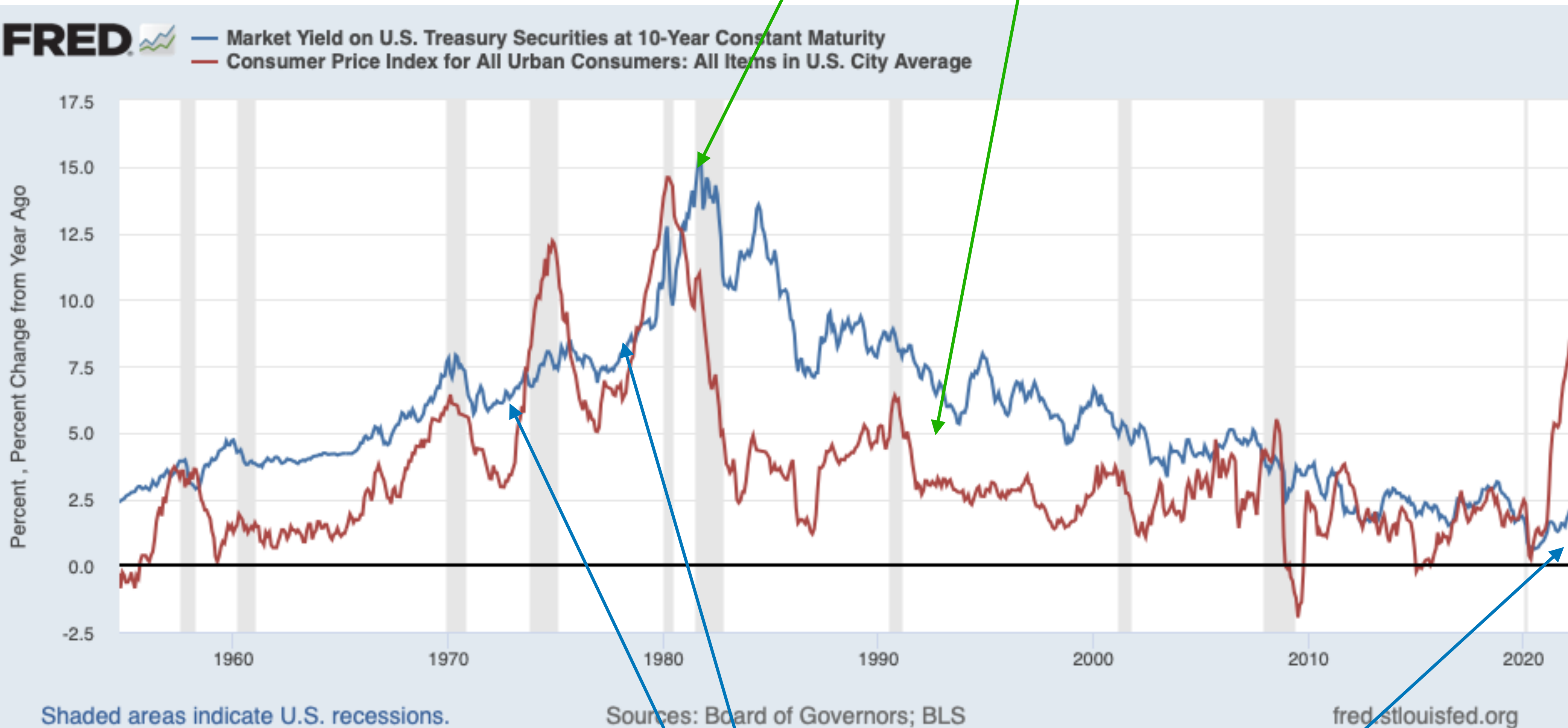


Higher growth, higher surpluses, paid down debt even with higher interest costs.



1980 paid a windfall to bondholders from taxpayers

Buy at 15% yield, repaid with <5% inflation

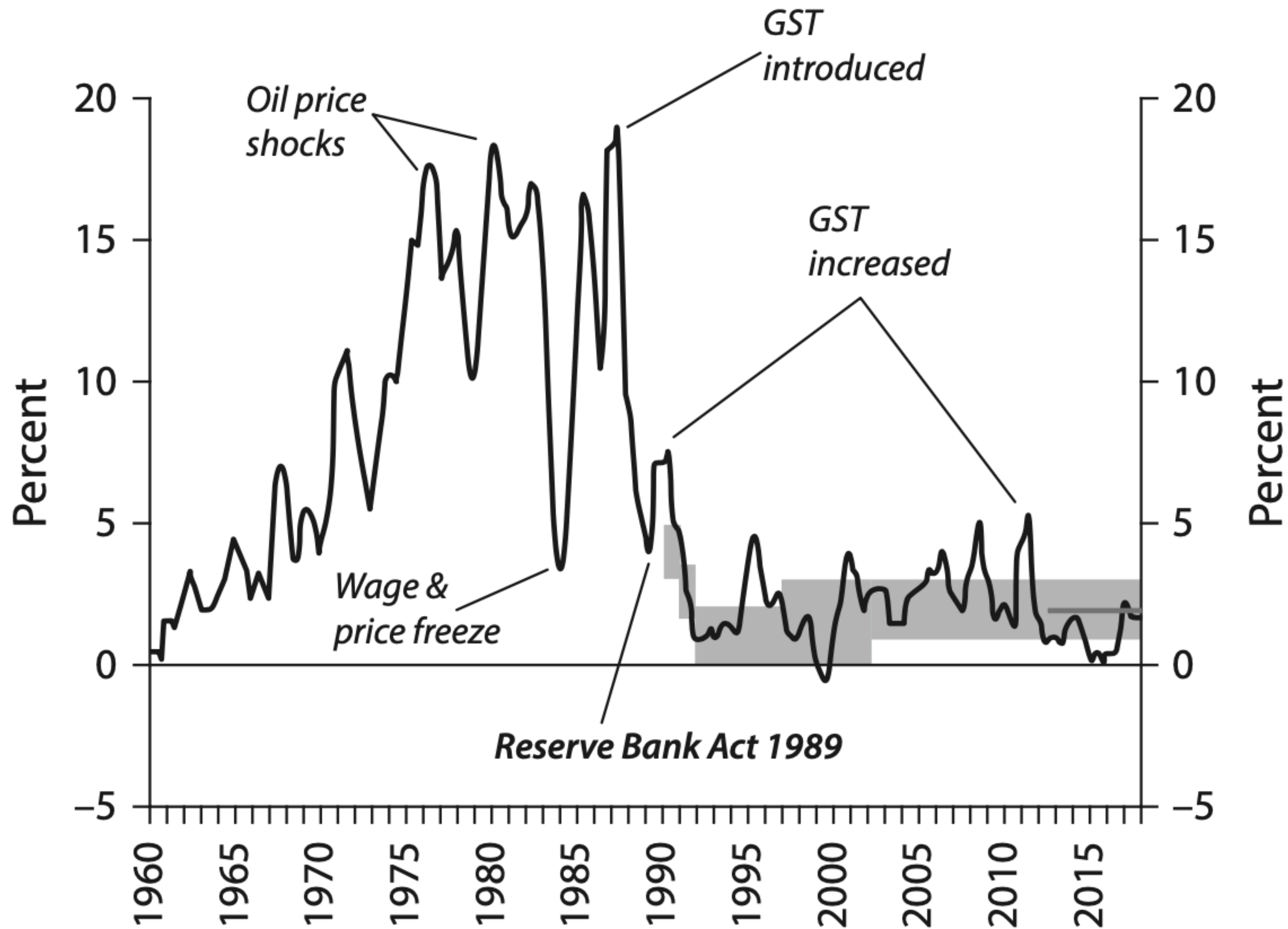


(Bond yields do not forecast inflation)

Good (forgotten) news. A joint monetary, fiscal, microeconomic stabilization, to a durable new regime, can reduce inflation painlessly.

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

(Bad news: speeches and “guidance” are not enough)



Source: McDermott and Williams (2018)

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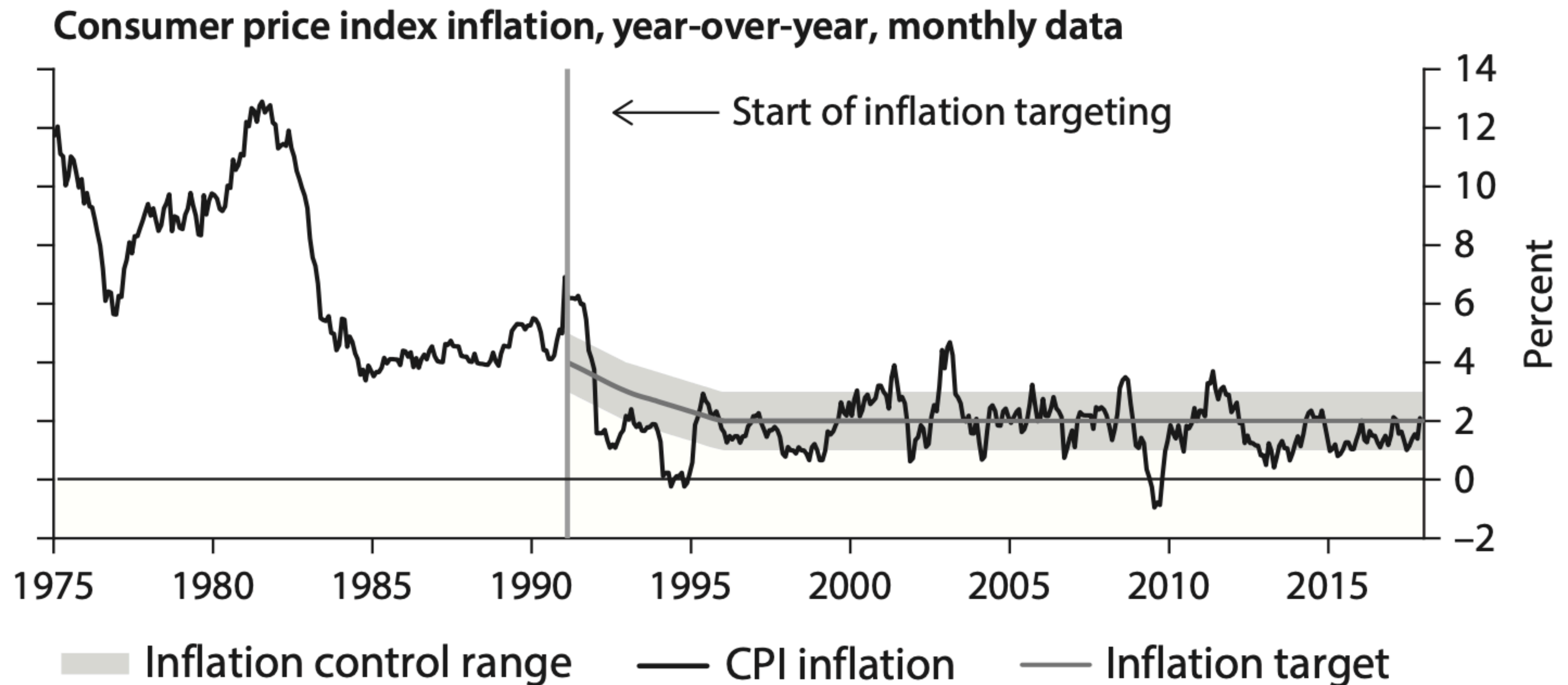

Source: Murray (2018).

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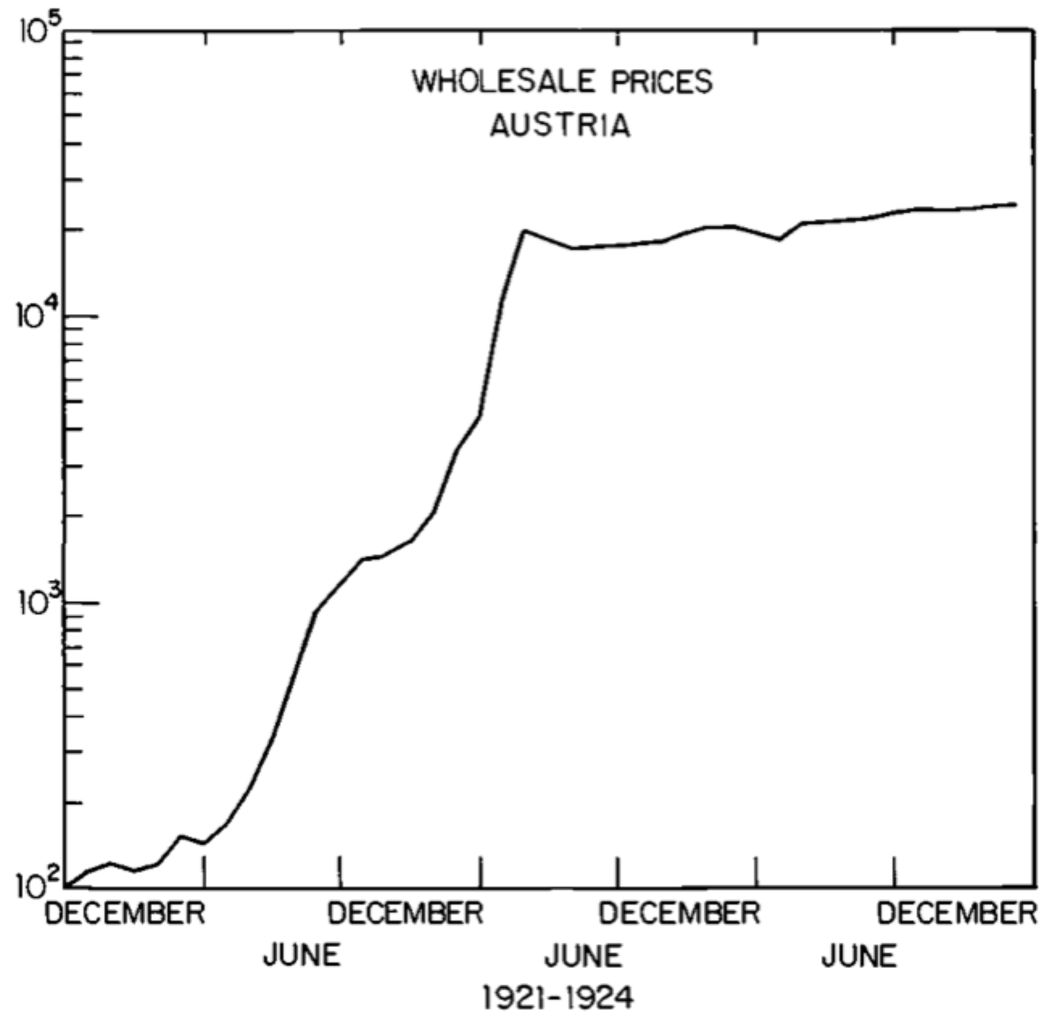

Fig. 2.1 Wholesale prices in Austria.

Source: Sargent (1982)

Fiscal/monetary summary

- All successful disinflations have been joint monetary, fiscal and often microeconomic. The clearer the change of regime, the less painful.
- A fiscal shock, economy with little fiscal space, means monetary/fiscal coordination are even more important now.
- Having once stepped over the line, are we at the fiscal limit? Will the next shock test fiscal space?
- Key question #2 (#1 was expectations): Is the fiscal limit a *flow* — too much deficit per year (Summers?), but future deficits / larger debt is ok? Or is the fiscal limit a *stock* — too much debt / people's expectations of repayment, we remain at fiscal limit without institutional changes?