Lecture 17:
Monetary Policy

Macroeconomics (Quantitative)
Economics 101B

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Where Do We Stand?

- Money Market (LM Curve):

$$\Delta \log M_t - \pi_t = -\phi i_t + \phi i_{t-1} + \tilde{Y}_t - \tilde{Y}_{t-1} + \Delta \log v_t$$

- Goods Market (IS Curve): $\tilde{Y}_t = \bar{a} - \bar{b}\,(R_t - \bar{r})$
- Phillips curve: $\pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o}_t$
- Fisher Equation: $R_t = i_t - E_t\pi_{t+1}$
- Okun's Law: $u_t - u^n = -\frac{1}{2}\tilde{Y}_t$
- Next: "Modernize" monetary policy

Monetary Policy

- In medieval economy, monetary "shocks" create inefficient booms and busts
- Example:
  - 25% of time: $\Delta \log M_t = 1\%$
  - 50% of time: $\Delta \log M_t = 3\%$
  - 25% of time: $\Delta \log M_t = 5\%$
- What do people expect?
- What happens when $\Delta \log M_t = 5\%$?
- What happens on average?

Optimal Monetary Policy

- Monetary authority can't systematically fool people
  => can't systematically lower unemployment
- Random variation in money reduces welfare
- What is optimal monetary policy?
  - Can't possibly be to create inefficient fluctuations
- Milton Friedman: "Monetarism"
  - Fed should conduct policy such that money growth is constant (i.e. eliminate any monetary surprises)
  - Set money growth rate to be consistent with stable prices

Monetarism

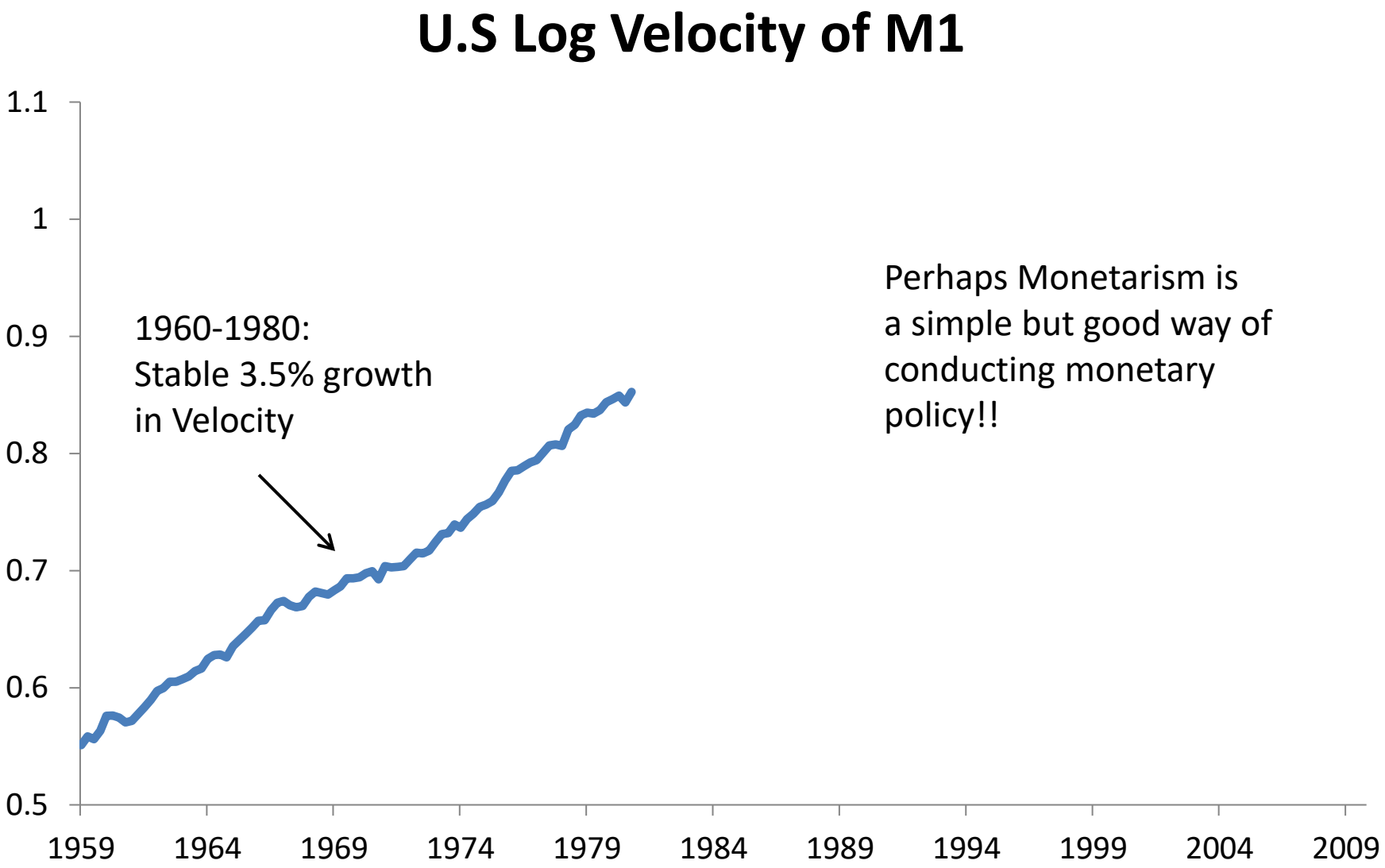
- Starting point:

$$\log M_t + \log V_t = \log P_t + \log Y_t$$

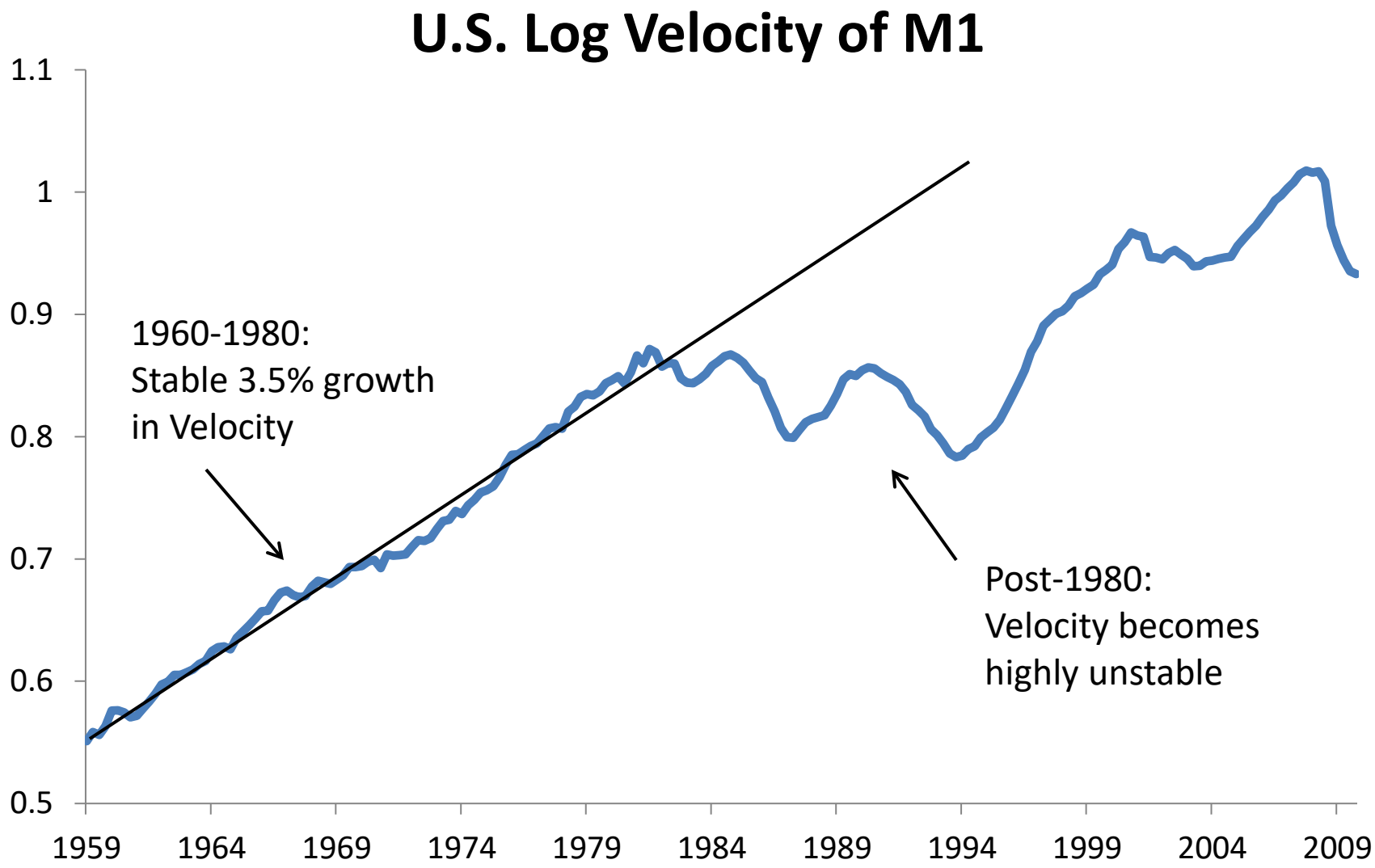
$$\Delta \log M_t + \Delta \log V_t = \pi_t + \Delta \log Y_t$$

- Here we allow for changing velocity of money
- Friedman argued $\Delta \log V_t$ was close to constant
- Suppose we want $\pi_t = 0$ (stable prices)
- Good policy: $\Delta \log M_t = -\Delta \log V_t + \Delta \log Y_t$ (actually $\Delta \log \bar{Y}_t$)

Monetarism in Practice

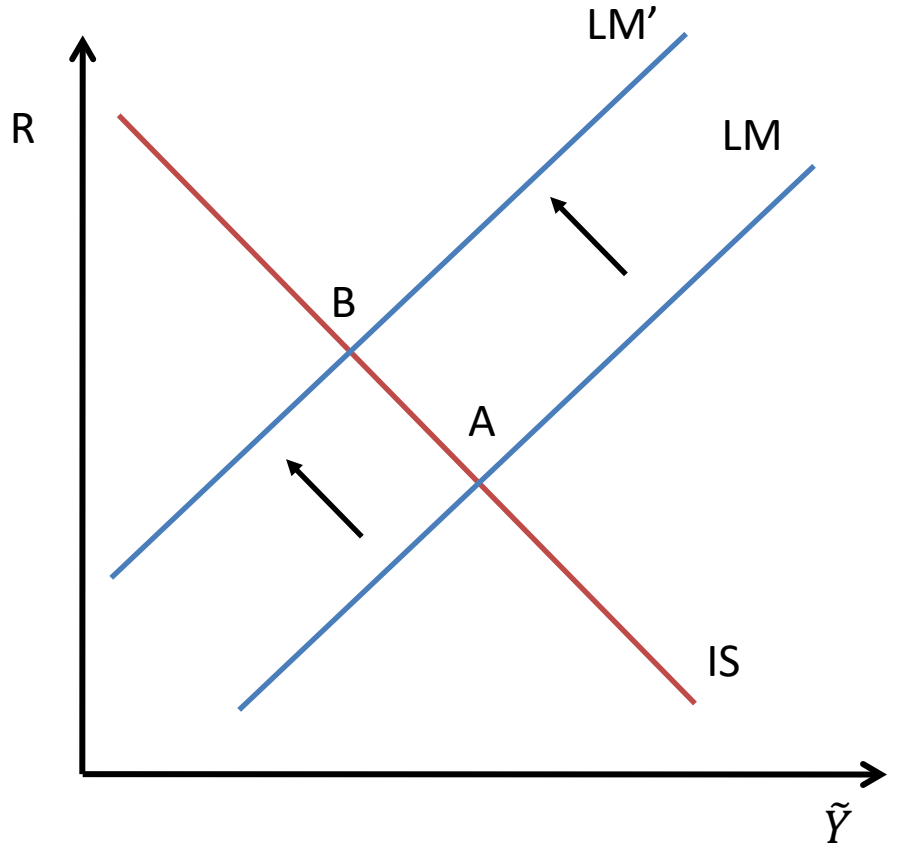


Monetarism in Practice



Money Demand Shocks

- Suppose central bank fixes the money supply (or money growth)
- Money demand shocks will affect output and inflation
- Increase in money demand shifts LM curve back
- Decrease in money demand shifts LM curve down



Money Demand Shocks

- Makes no sense to have money demand shocks affect output and inflation
- Good monetary policy should
  - "Accommodate" money demand shocks
  - Vary money supply to completely offset changes in money demand
- Doing this will insulate economy from money demand shocks

Money Demand Shocks

$$\log M_t - \log P_t = -\phi i_t + \log Y_t + v_t$$

- Suppose central bank fully accommodates money demand shocks (varies money supply one-for-one with money demand shocks)
- What does this imply about the interest rate?

- Nominal interest rate remains fixed!
- A policy of varying money supply so as to keep nominal interest rate fixed will fully insulate economy from money demand shocks

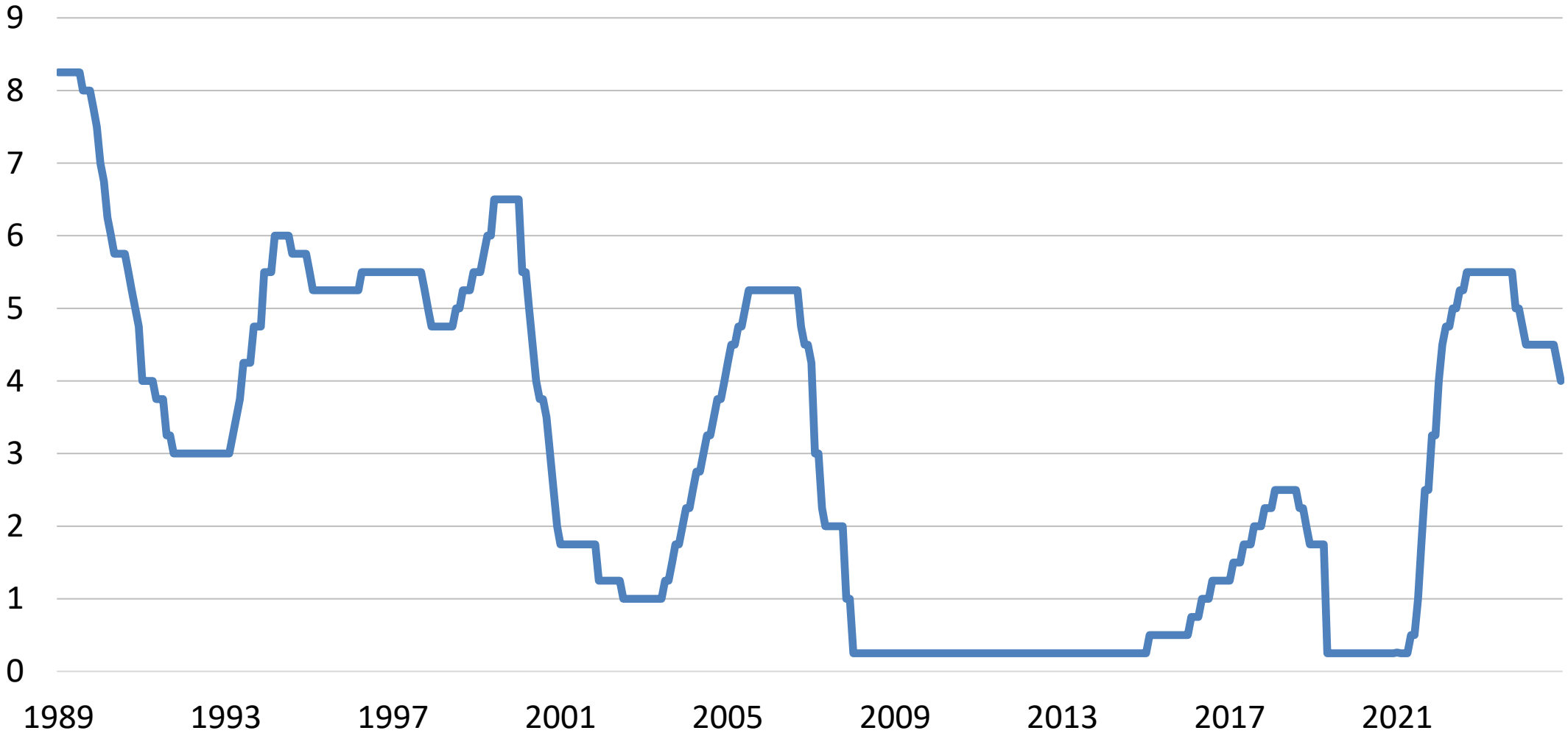
Monetary Policy

- What does it mean for monetary policy to “do nothing”?
- Traditional view: Not change the money supply (or money growth rate)
- Alternative view: Maintain a fixed value of the nominal interest rate
  - I.e., vary money supply in response to variation in money demand such that nominal interest rate is fixed

Monetary Policy

- Central Bank can choose the money supply to achieve any nominal interest rate it wants
- We can think of the Central Bank as directly choosing the nominal interest rate
- In the real world monetary policy is actually conducted in this way:
  - Federal Reserve thinks of its policy variable as the Federal Funds Rate (the over-night nominal interest rate on the interbank market)
  - European Central Bank thinks of its policy variable as the rate on one week repurchase agreements

Federal Funds Rate Target

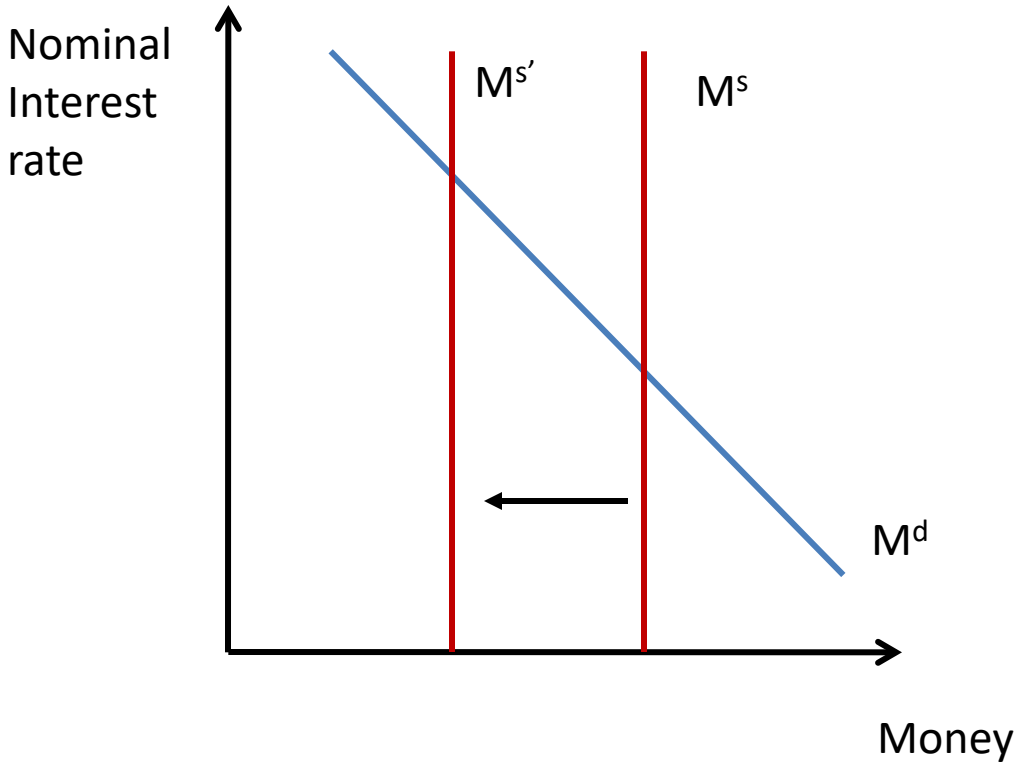


FOMC

- Federal Open Market Committee of Federal Reserve sets monetary policy in the United States
- 7 Governors + 12 Presidents of Regional Feds
  (only 5 Presidents vote at each time)
- 8 scheduled meeting per year
  - Sometimes unscheduled meeting (e.g., in crisis)
- Set target range for federal funds rate and interest on reserves
- Make statement about future course of economy and monetary policy (forward guidance)

Open Market Operations

- How does the Federal Reserve go about setting the federal funds rate?
- Traditionally, it would conduct "open market operations"
  - If it wished to increase the fed funds rate it would sell Treasury bills on the "open market" in exchange for money
  - This would reduce the amount of money in circulation and increase the interest rate



Interest on Reserves

- Since 2008, the Fed has paid interest on bank reserves
- Fed floods the system with reserves
  (i.e., banks have more reserves than they want)
- Banks are thus forced to hold excess reserves at the Fed
- Interest on reserves then determines interest rate on safe, short-term assets in the economy (Why?)

Determination of Interest Rates

- Two assets banks can hold:
  - Reserves
  - Treasury bills
- Both safe and short term
- Must pay (roughly) the same return
  - Suppose Treasuries paid a higher interest rate
  - Everyone would want them rather than reserves
  - This would bid up their price and thereby bid down their return
- Slight difference in returns can arise due to differences in liquidity

Monetary Policy

- Bottom line:
  - When thinking about the modern conduct of monetary policy, we ignore the money market and just assume that the Central Bank sets the nominal interest rate directly

The MP Curve

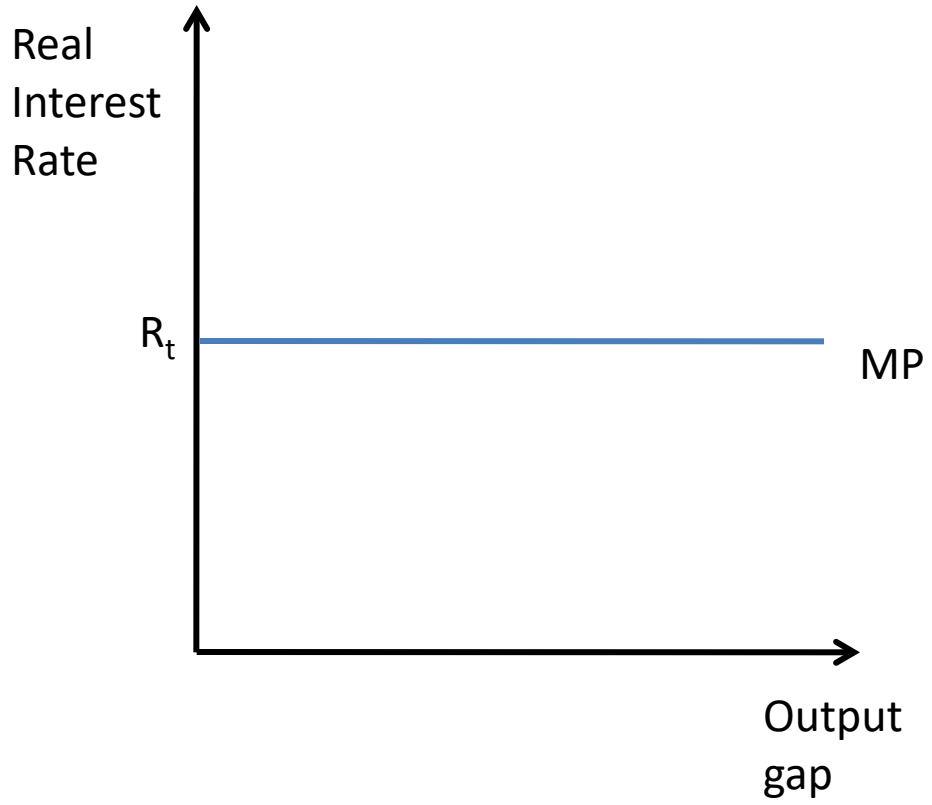
- With adaptive expectations:

$$R_t = i_t - E_t\pi_{t+1} \quad \rightarrow \quad R_t = i_t - \pi_t$$

- Prices (and inflation) are "sticky" in our model
  - Prices partially set in advance
  - Inflation sluggish in the short run (usually)
- Changing the nominal interest rate thus changes the real interest rate
- We can think of the central bank as effectively "setting" the real interest rate

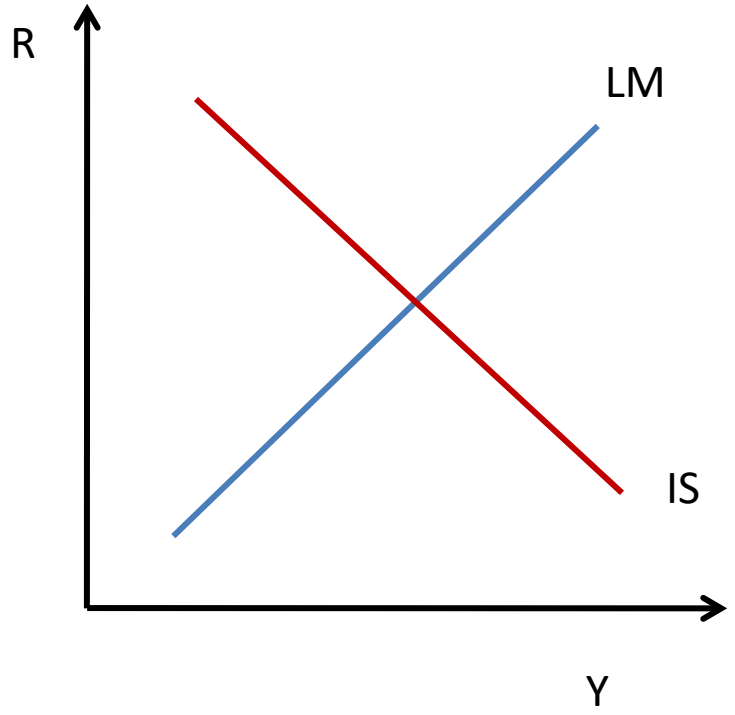
The MP Curve

- We think of central bank as setting real interest rate
- A horizontal line in “real interest rate –output gap” space
- We call this curve the MP curve (stands for monetary policy)
- Replaces the LM curve

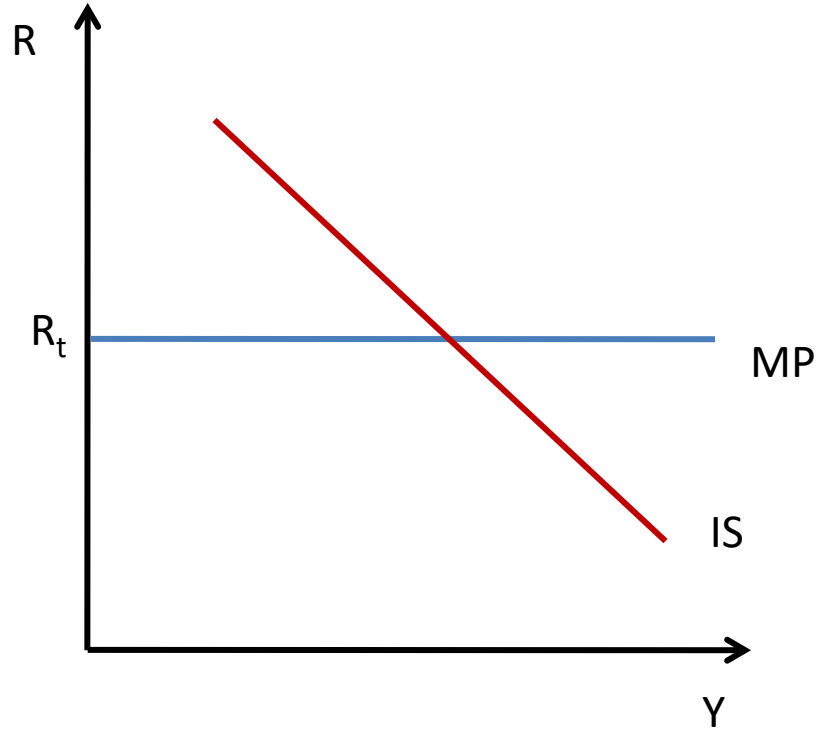


Two Ways to Think about Monetary Policy

- Fix money supply:

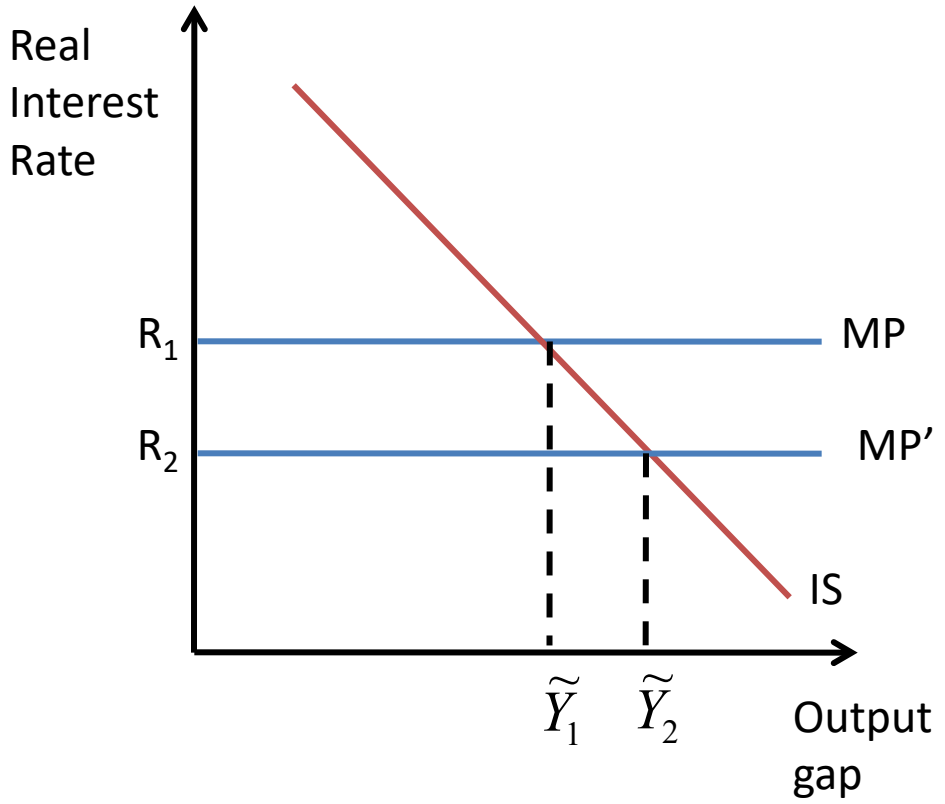


- Fix interest rate:



Short Run: IS-MP Diagram

- Together, IS curve and MP curve determine output and the real interest rate
- Central Bank can “choose” output gap by varying real interest rate



The Full Modern Business Cycle Model

The Equations:

- Monetary Policy
  - Sets R_t
- IS Curve:

$$\tilde{Y}_t = \bar{a} - \bar{b}\,(R_t - \bar{r})$$

- Phillips Curve:

$$\pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o}_t$$

- Okun's Law:

$$u_t - u^n = -\frac{1}{2}\tilde{Y}_t$$

The Logic:

Central Bank sets real interest rate (MP curve)

⇓ (IS Curve)

Affects output gap

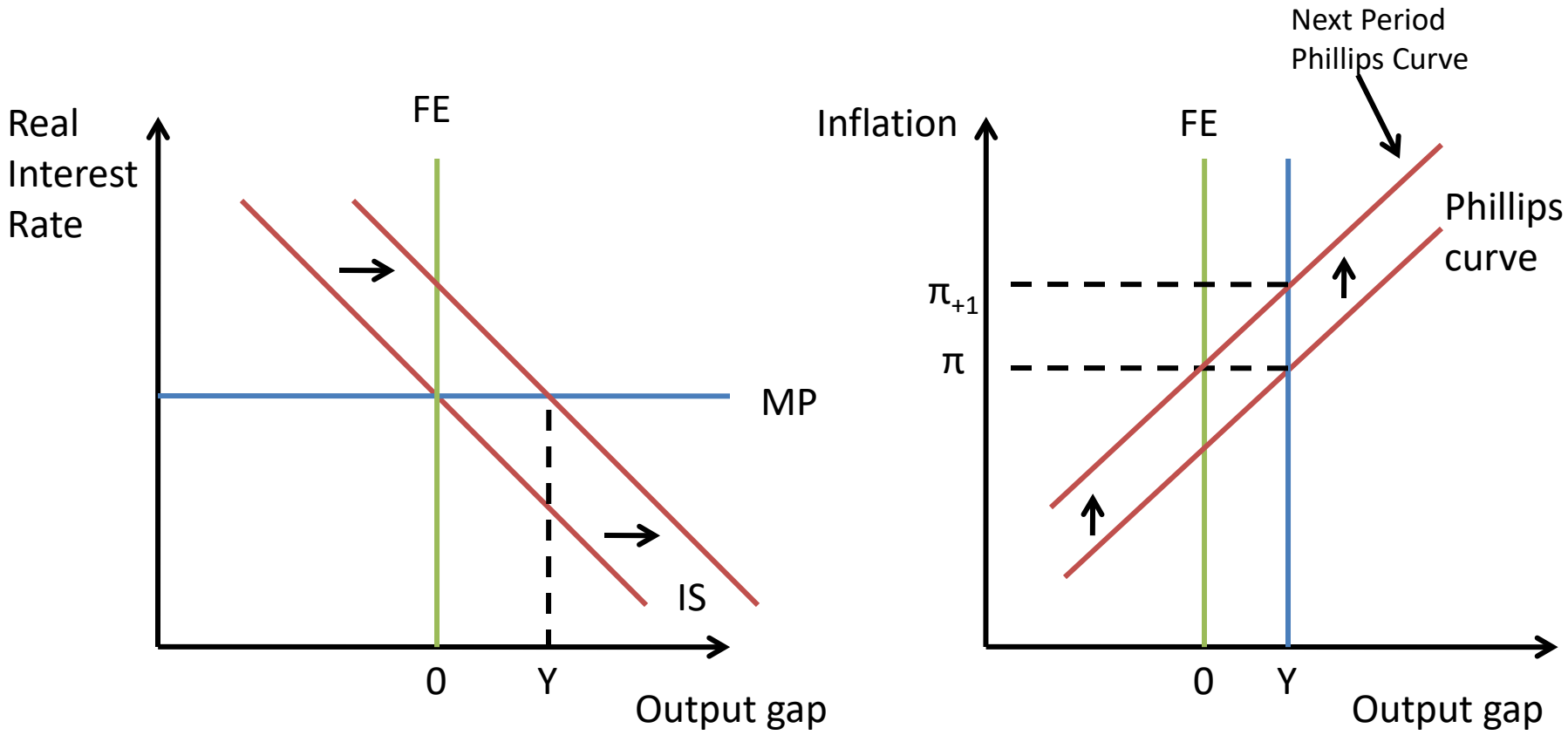
⇓ (Phillips Curve)

Affects Inflation

(and shifts next period Phillips curve)

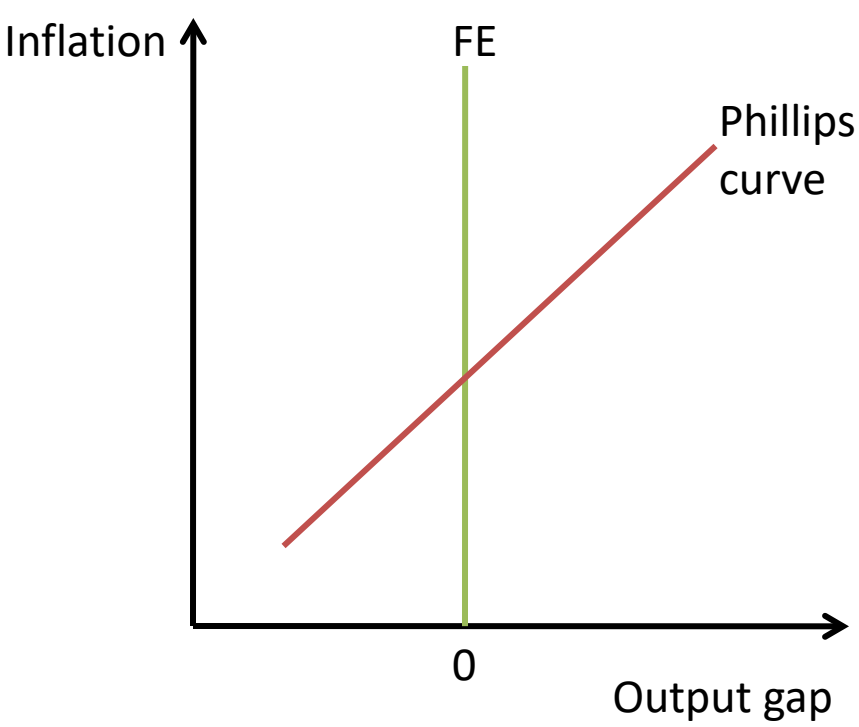
Okun's law just allows us to go back and forth between output and unemployment

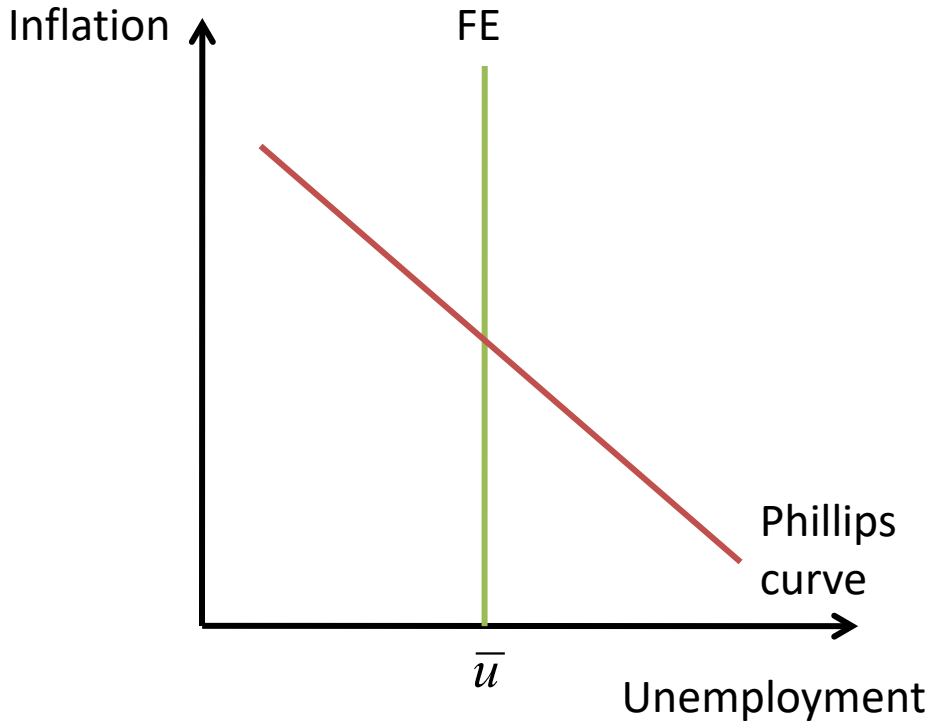
Modern Business Cycle Model



FE: Full Employment

Two Views of Phillips Curve





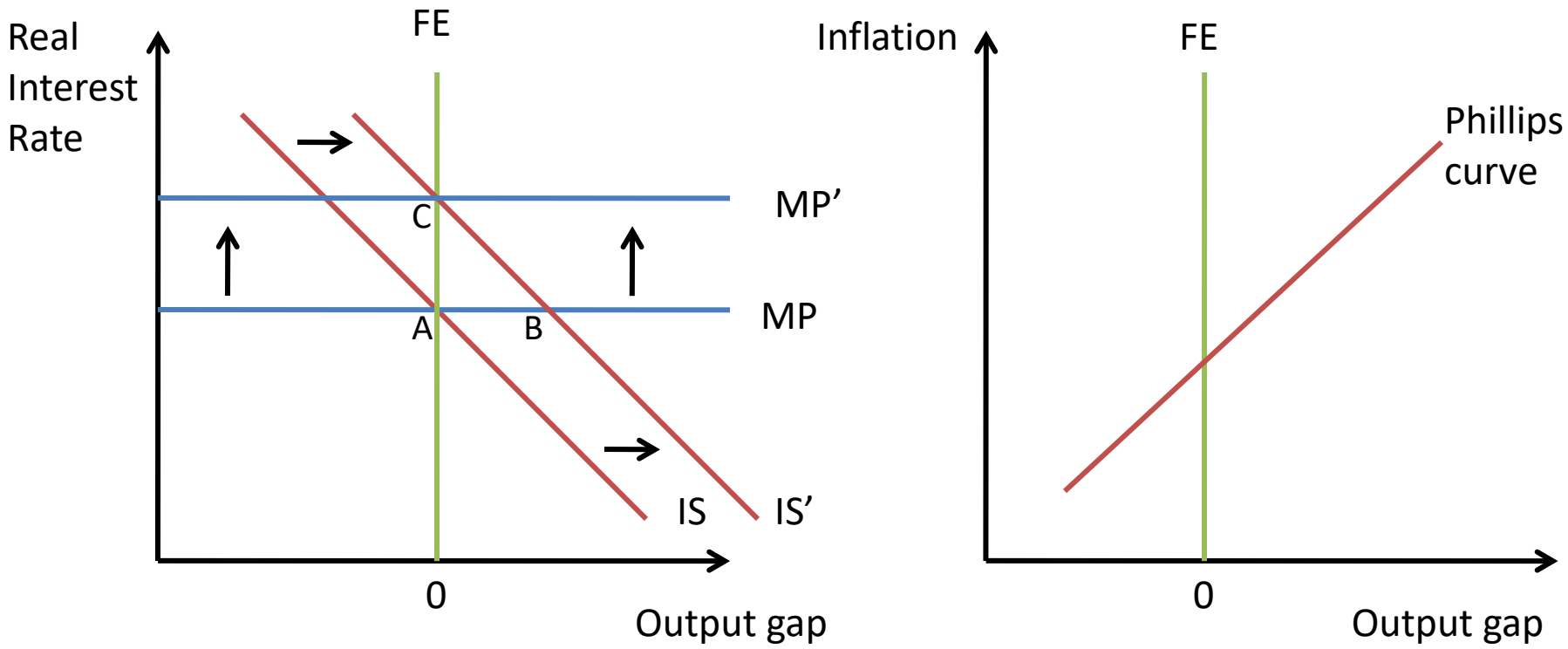
$$\pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o} \longrightarrow \pi_t = \pi_{t-1} - 2\bar{v}(u_t - \bar{u}) + \bar{o}$$

$$\tilde{Y}_t = -2(u_t - \bar{u}) \nearrow$$

Optimal Monetary Policy

- Friedman's View/Neo-Classical View:
  - Avoid destabilizing surprises
  - All monetary policy can hope to do is avoid creating inefficient instability
- Keynesian view:
  - Monetary policy can do more!!
  - Monetary policy should actively "undo" other shocks
    - Money demand shocks, "aggregate demand shocks", shocks to expectations about the future (animal spirits)
  - Monetary policy should aim to stabilize economy

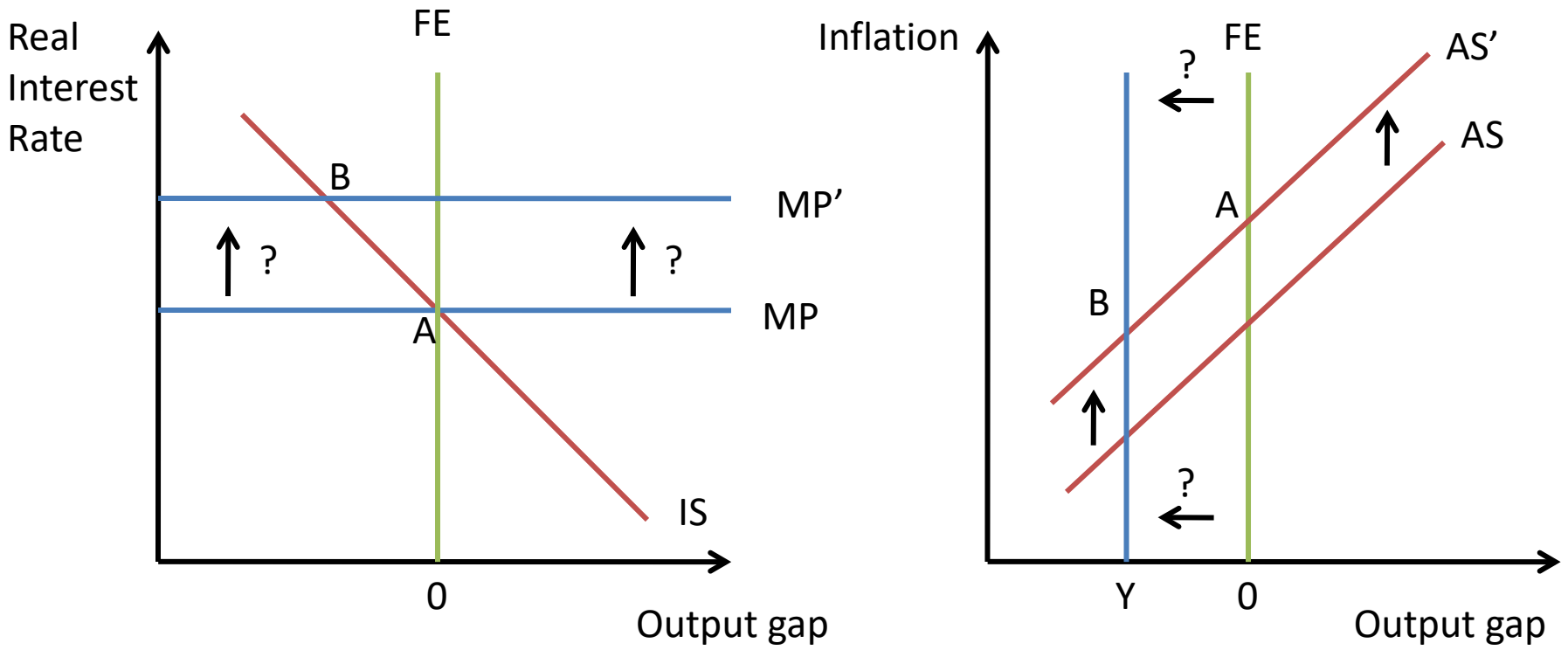
Stabilization of Demand Shock



FE: Full Employment

In response to demand shocks, monetary policy can (in principle) stabilize both output and inflation

Stabilization of Supply Shock



FE: Full Employment

AS: Aggregate Supply (Phillips Curve)

In response to supply shock, monetary policy faces a trade-off: Either high inflation (point A) or a recession (point B)

Optimal Stabilization Policy

- Demand shocks:
  - Offset aggressively
  - No trade-off between output and inflation stabilization
- Supply shocks:
  - Less clear. May want to act less aggressively ("look through") (Why?)
  - Because there is a trade-off between output and inflation stabilization.
  - Optimal reaction depends on weight placed different objectives
  - Optimal reaction also depends on degree of anchoring of inflation expectations

Goals of Monetary Policy

- U.S.: Dual mandate:
  - Maximum employment
  - Stable prices
- ECB: Stable prices primary objective

Goals of Monetary Policy

U.S. Federal Reserve:

"(…) maintain long-run growth of the monetary and credit aggregates commensurate with the economy's long-run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices and moderate long term interest rates."

Humphrey-Hawkins Act (1978)

European Central Bank:

" ... the primary objective of the ESCB shall be to maintain price stability ..." (Year-on-year increase in the harmonized index of consumer prices of below 2% for the euro area as a whole)

" Without prejudice to the objective of price stability, it shall support the general economic policies in the Community..."

Goals of Monetary Policy

- Why such an emphasis on stable prices?
- What are the costs of inflation?

What Are the Costs of Inflation?

- Typical Layman's view:
  - "Rising prices mean that I can buy less and less stuff. … Inflation is making me poorer."
  - What is wrong with this argument?
  - Wages also go up
  - "Every year I get a raise, but prices go up and that takes some of my raise away."
  - Implicit assumption: Would get same raise even if there was no inflation

Money Illusion

- Money Illusion:
  - Tendency of individuals to pay primary attention to nominal prices rather than real prices
  - Notion that inflation affects real wages and real prices
- Most people:
  - Sell very few goods. Acutely aware of price (wage).
  - Regard rise in them as just reward as opposed to part of general inflation of prices and wages

Costs of Inflation

- Most people believe costs of inflation are large
- Many economists believe costs of moderate inflation are small (although views differ quite a bit)

Shiller (1997) survey:

- "biggest gripe about inflation" was "inflation hurts my real buying power, it makes me poorer"
  - 77% of public agrees
  - 12% of economists agree

Costs of Inflation

Shiller (1997) survey:

- "Do you agree that preventing high inflation is an important national priority, as important as preventing drug abuse or preventing deterioration in the quality of our schools
  - 52% of public but 18% of economists agree fully
- "I think that if my pay went up I would feel more satisfaction in my job, more sense of fulfillment, even if prices went up just as much."
  - 49% of public but 8% of economists agree fully or partially

Cost of Expected Inflation

- Say every year the price level rose by 10% (expected and stable)
- People will incorporate expected inflation into contracts they right
- Interest rates will reflect expected inflation
- Wage contracts and wage negotiations will reflect expected inflation
- So, perhaps this is just a wash?

Cost of Expected Inflation

- What are the costs of steady expected inflation?
  1. Real value of money falling. People economize on money holdings. Need to make more trips to the ATM ("Shoe leather costs")
  2. Firms must change their price tags and menus more often (Menu costs). Pay more attention to prices.
  3. If prices and wages are sticky, relative prices (and wages) get out of whack. Relative prices/wages fall between changes.
  4. Many provisions of tax law ignore inflation. (e.g., capital gains tax and interest deductions)
  5. Some people's wages will fall (if they were "too high" to begin with, e.g., because their productivity or effort had fallen). (Individual cost, not societal cost)

Cost of Expected Inflation

- Many economists are skeptical that it is possible to have moderate inflation that is stable
- Friedman: “Zero inflation is a politically feasible objective; 10 percent inflation is not. That is the verdict of history.”
- High inflation has tended to be volatile
- But is this a law of nature or simply because high inflation periods have been associated with wars and bad economic policies

Costs of Unexpected Inflation

1. Uncertainty makes financial planning difficult
2. Real value of nominal contracts becomes risky
3. Could write contracts in real terms (index the payments to inflation). This is costly.
4. People are risk averse and dislike uncertainty
5. Redistributes wealth arbitrarily

Inflation and Wealth Redistribution

- Many contracts specify nominal payments
- Inflation affects real value of these payments
- Bonds:
  - Promise to pay $1 in a year
  - How much is this worth in terms of “stuff”
- Redistribution:
  - Those that own nominal assets (are “long” nominal assets) loose from inflation
  - Those that owe nominal assets (are “short” nominal assets) gain from inflation

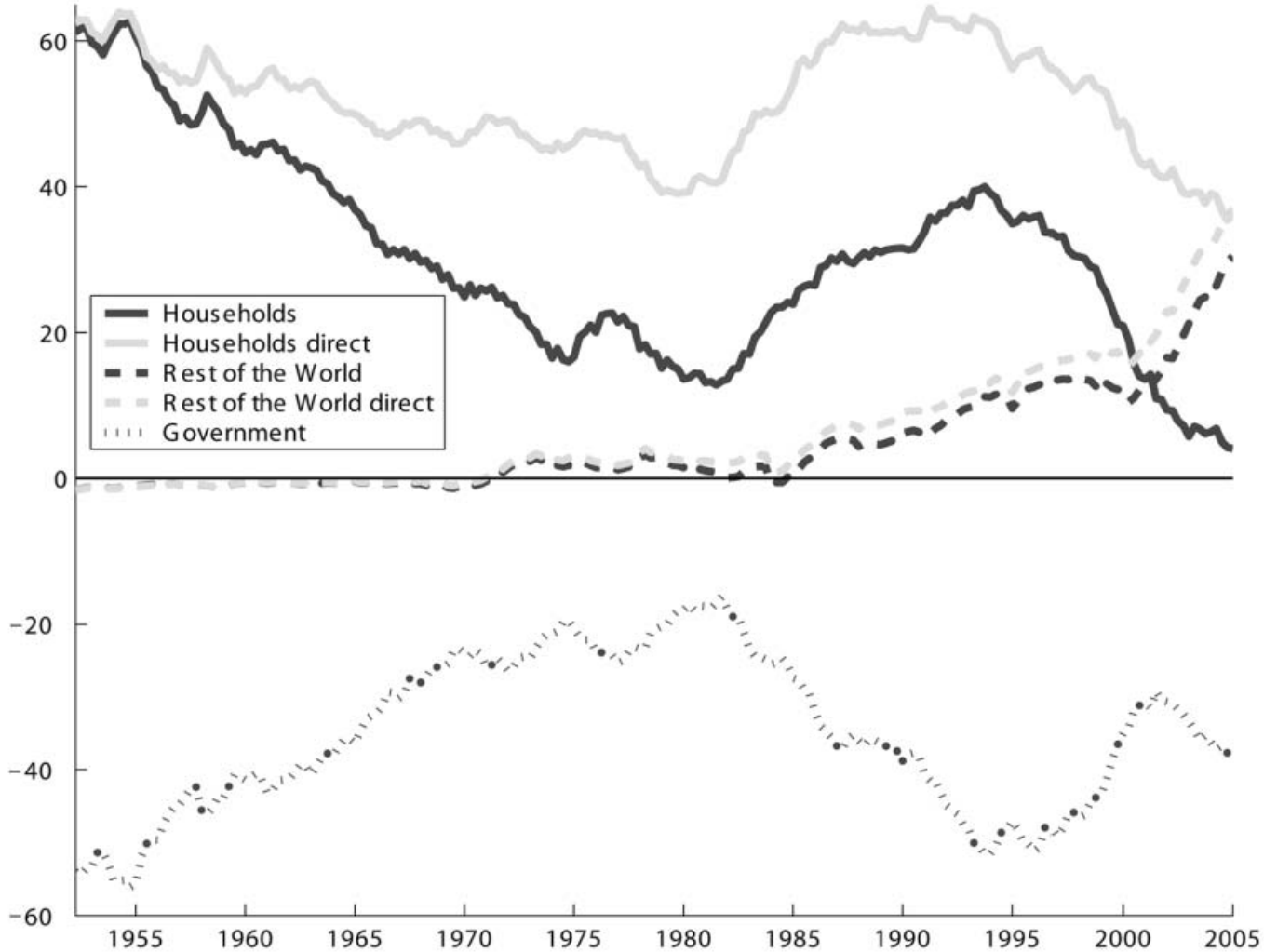


FIG. 1.—NNPs in the United States by sector from 1952 to 2004, as a percentage of GDP. Black lines: total NNP for households (solid), government (dotted), and the rest of the world (dashed). Grey lines: DNP for households (solid) and the rest of the world (dashed).

Doepke and Schneider (2006): Inflation and the Redistribution of Nominal Wealth

TABLE 1
NET NOMINAL POSITIONS OF U.S. HOUSEHOLDS IN 1989

TYPE OF INSTRUMENT	AGE COHORT					
	≤ 35	36–45	46–55	56–65	66–75	> 75
	A. All Households					
Short-term	−2.3	4.4	5.5	10.8	12.4	18.1
Bonds	11.7	13.2	11.4	12.6	12.4	16.4
Mortgages	−47.5	−23.4	−10.5	−4.7	−1.4	−.4
Equity	−4.5	−4.3	−4.1	−3.5	−4.0	−3.5
Total NNP	−42.6	−10.1	2.3	15.2	19.4	30.6
	B. Poor					
Short-term	−35.9	−10.3	.5	8.9	17.7	25.0
Bonds	15.3	5.4	3.0	3.7	5.8	2.0
Mortgages	−13.2	−24.9	−6.5	−3.5	−5.9	−.1
Equity	−2.8	−4.0	−2.5	−1.6	−.1	−.5
Total NNP	−36.6	−33.8	−5.5	7.5	17.5	26.4
	C. Middle Class					
Short-term	−14.6	2.0	6.2	11.0	17.6	31.7
Bonds	14.9	13.7	11.5	13.4	11.2	8.6
Mortgages	−112.6	−45.4	−20.8	−8.7	−2.3	−.9
Equity	−1.7	−1.9	−1.7	−1.7	−1.3	−1.3
Total NNP	−114.0	−31.6	−4.8	14.0	25.2	38.1
	D. Rich					
Short-term	3.6	6.5	5.2	10.8	9.7	11.8
Bonds	10.3	13.4	11.6	12.5	13.2	20.5
Mortgages	−22.2	−10.4	−4.8	−2.5	−.8	−.1
Equity	−5.7	−5.7	−5.4	−4.5	−5.4	−4.7
Total NNP	−14.0	3.8	6.6	16.3	16.7	27.5

NOTE.—Breakdown of NNP by type of instrument held for different groups of U.S. households in 1989. Value for each group as a percentage of average net worth in the group. In each group, components sum to total NNP.

Doepke and Schneider (2006)

Monetary Framework

- How should central banks go about attaining its goals?
- Frameworks tried in the past:
  - Commodity standard (e.g., gold standard)
  - Fixed exchange rate
  - Monetarism
- By late 80's clear that all of these have significant downsides
- New idea: Inflation targeting

Inflation Targeting

- Key idea: Vary interest rates so as to bring inflation to a pre-announced target level in the medium run
- Early inflation targeting countries:
  - New Zealand, Australia, Canada, Sweden
- Now many, many countries practice inflation targeting
- Fed formally adopted a 2% inflation target in 2012

Inflation Targeting

- Goal to achieve stability (stable growth) of overall level of prices rather than one particular price
  (such as gold or foreign exchange)
- More flexible than gold standard or fixed exchange rate
  - Only meant to be achieved over the medium term
  - So, after a supply shock central bank can balance competing objectives (unemployment and inflation)

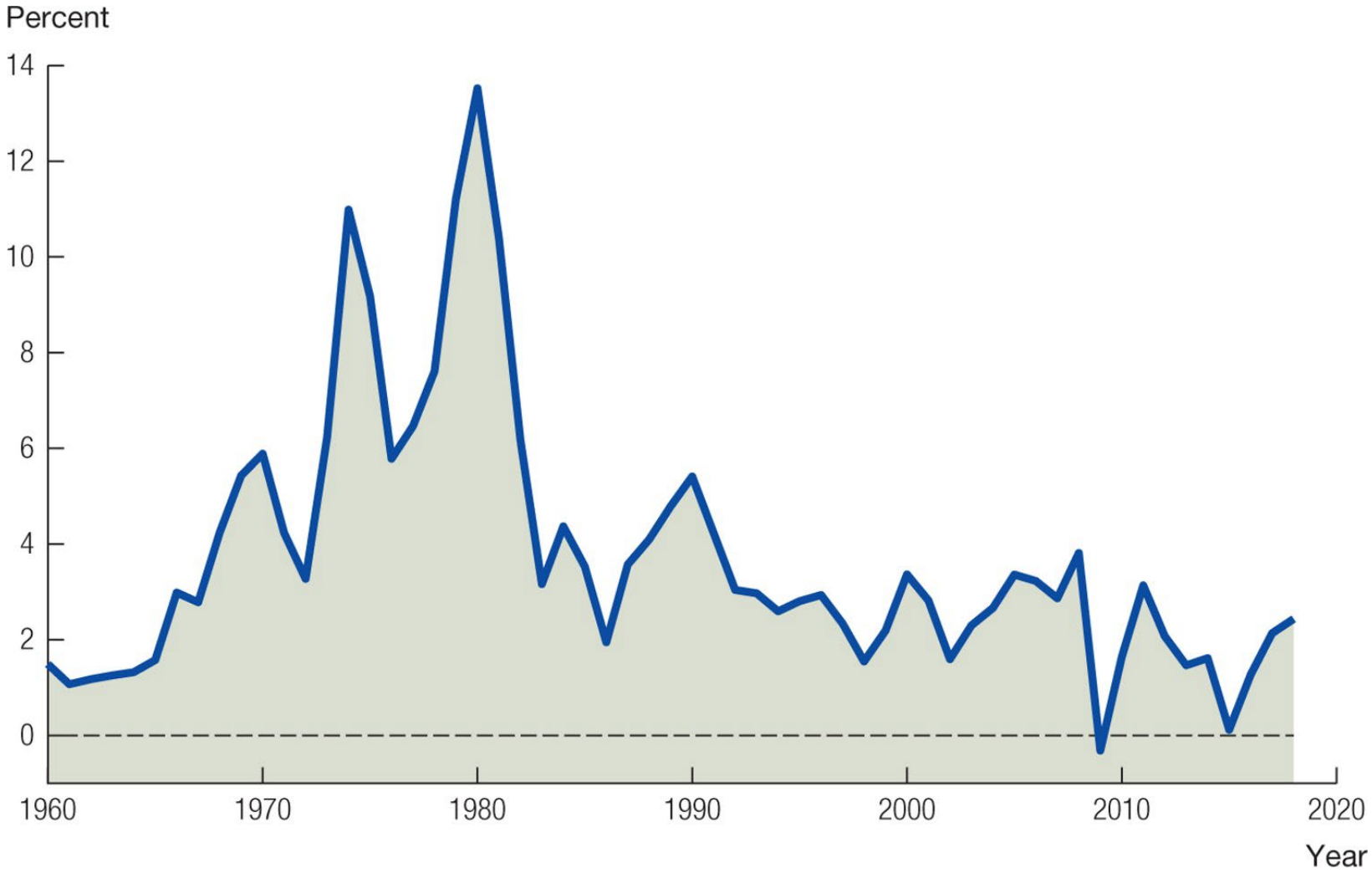
Why Target 2% Inflation?

- Most inflation targeting countries target 2% inflation (or something close to that). Why?
  1. Measures of inflation are likely biased upward by something like 2%
  2. A little inflation gives more room to bring about negative real rates if needed without hitting zero lower bound on nominal interest rates (more on this below)
  3. A little inflation may “grease the wheels of the labor market”

Inflation Greases the Wheels of the Labor Market

- Suppose wages are downward rigid and inflation is zero
- Suppose, furthermore, that firms are overly optimistic and set wages too high (or economy hit by bad shock that requires wages to fall)
- Since wages can’t fall, result will be unemployment
- Inflation would erode real wages and solve problem over time

Inflation in the U.S.



Source: World Bank, Inflation, consumer prices for the United States [FPCPITOTLZGUSA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FPCPITOTLZGUSA, October 16, 2019.

Inflation Bias of Monetary Policy

- Why was inflation high in the 1970s?
  1. Mistaken belief that policy makers could exploit a permanent Phillips curve trade-off
  2. Political pressure to create a short-term boom
     - Suppose central bank creates surprise boom
     - Short term gain: boom
     - Long term cost: Higher inflation forever
     - Very tempting for politicians facing reelection
     - Government may also want lower interest rates to reduce interest payments on government debt

Government's Temptation

- Government faces following temptation:
  - Create boom today (with loose monetary policy)
  - Promise to maintain low inflation in the future
- If promise is believed
  - inflationary expectations will not change
  - Short term boom, but no shift in Phillips curve
- But is promise credible?
  - No. Tomorrow, govt wants to do the same thing again
  - So, government faces a commitment problem (aka a "time inconsistency problem")

Overcoming Inflation Bias

- How do we overcome Government's commitment problem?

  1. Policy "rules" to tie central bank's hands

  2. Central bank independence

Policy Rules

- Examples of constraints on policy:
  - Fixed exchange rate
  - “Taylor rule” (discussed below)
- Limiting policy discretion was also an important motivation for inflation targeting
  - Public target (embarrassing to miss it)
  - Central bank must justify actions in terms of how they contribute to reaching target
  - In some cases, if they miss, need to send report to Parliament

Central Bank Independence

- Politicians are “too” myopic because of reelection risk (care too much about short run)
- Role of the Fed: “Take the punch bowl away when the party is starting to heat up”
- Easier if monetary policy is:
  - Isolated from political pressure
  - In the hands of technocrats that value good inflation outcomes (“conservative” central banker)

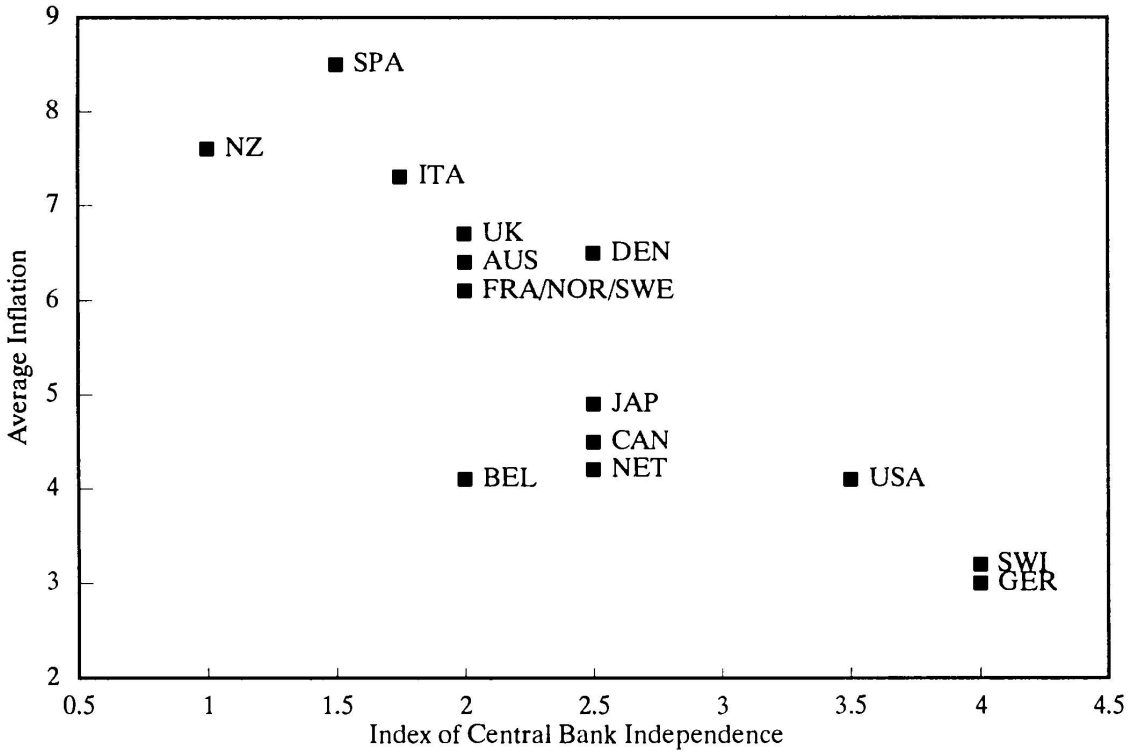


FIG. 1a. Average Inflation

Alesina and Summers (1993)

The Taylor Rule

$$i_t = 2\% + \pi_t + 0.5(\pi_t - 2\%) + 0.5\tilde{Y}_t$$

Equil. real interest rate: 2%

Target inflation rate: 2%

- **Example (Nov 2025):**
  - Inflation = 2.9% (Core PCE y-o-y%)
  - Output gap = -0.6% (based on Okun's law with u* = 4.0% and u = 4.3%)
  - Targeted interest rate:
    i = 2% + 2.9% + .5(0.9%) + .5(-0.6%) = 5.7%
  - Actual rate: 4.00% (upper limit of target range)

The Taylor Rule

$$i_t = 2\% + \pi_t + 0.5(\pi_t - 2\%) + 0.5\tilde{Y}_t$$

- John Taylor originally proposed this rule in a 1993 paper
- Showed impressive fit to the data over period 1987-1992
- Considered period of good policy

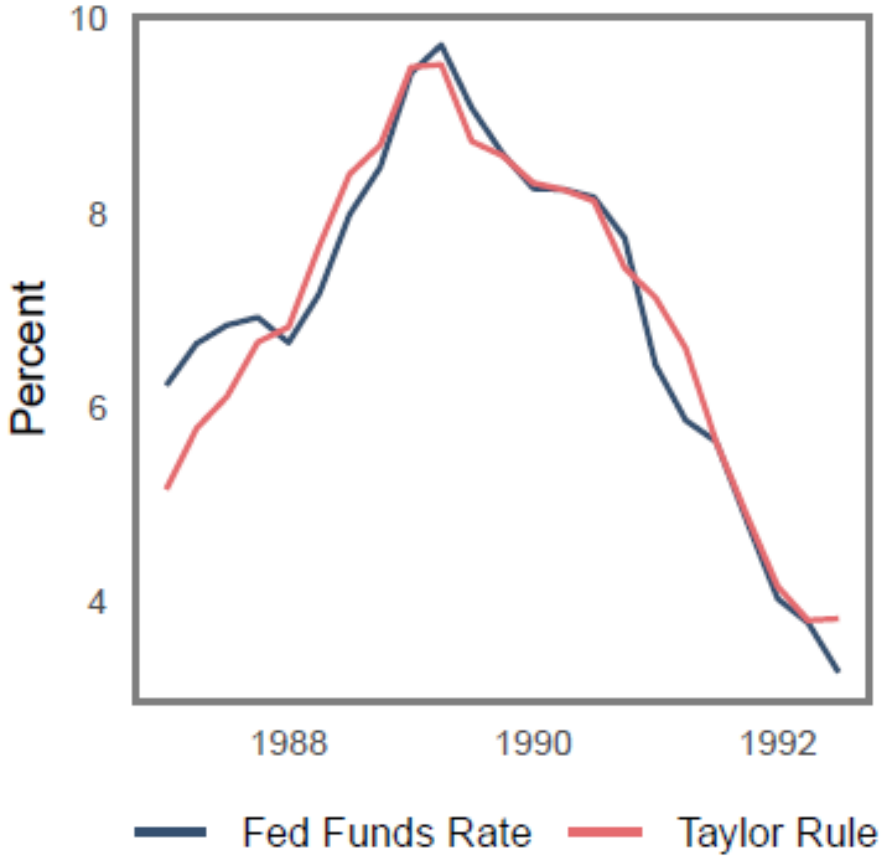


Figure 2: Fit of Original Taylor Rule, 1987-1992

The Taylor Rule

$$i_t = 2\% + \pi_t + 0.5(\pi_t - 2\%) + 0.5\tilde{Y}_t$$

- Key logic:
  - Raise nominal rate more than one-for-one with inflation
  - This raises the real rate when inflation rises
  - Need to raise the real rate to tighten policy
- Also raises rates when output rises relative to potential

The Taylor Rule

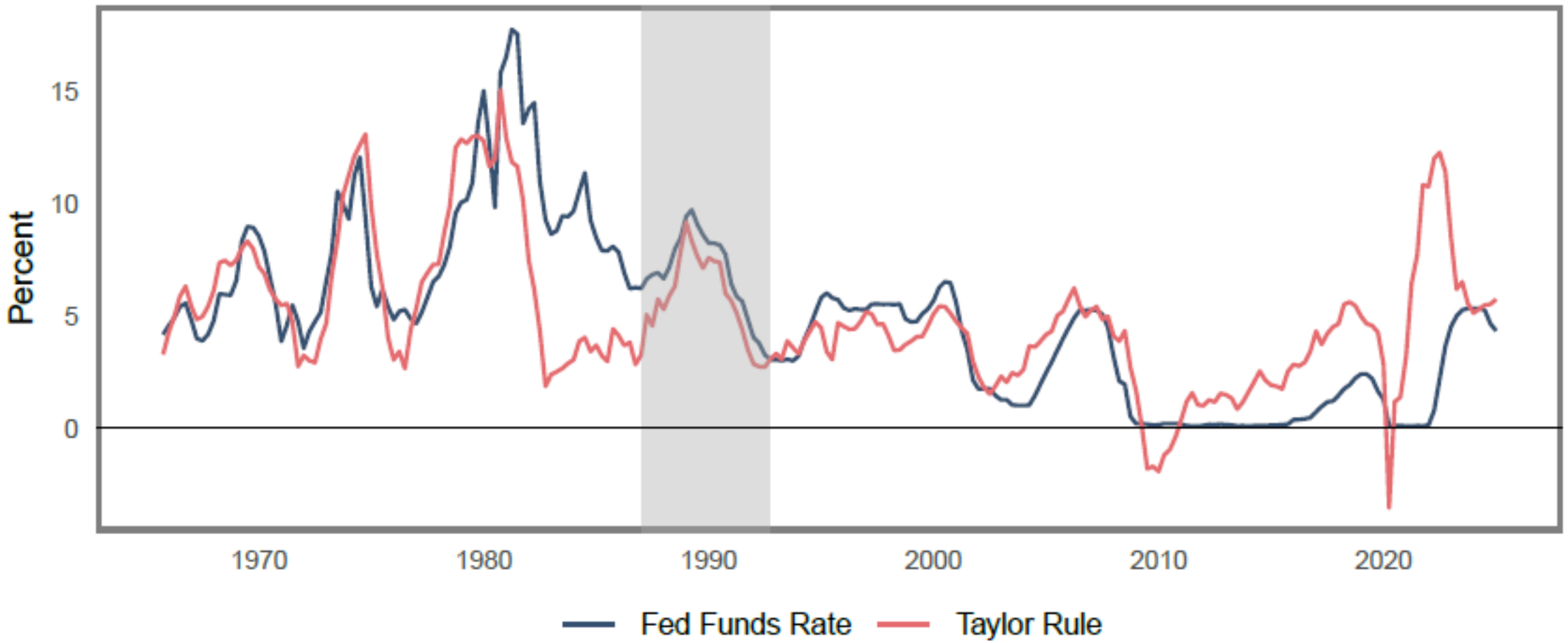


Figure 3: Original Taylor Rule with Real-Time Data

Source: Nakamura, Riblier, Steinsson (2025)

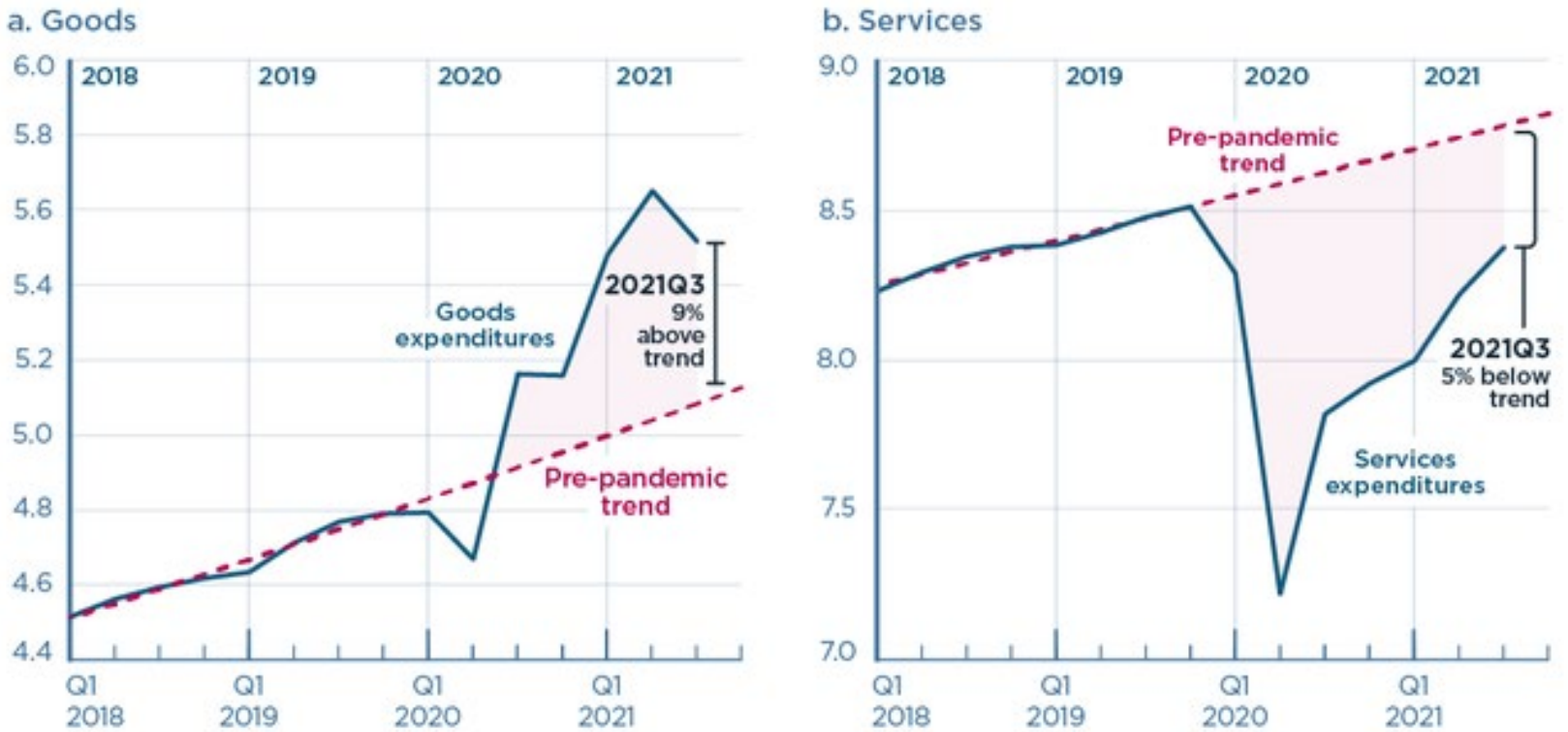
Why the Huge Taylor Rule Deviation after Covid?

- Large shift in demand from goods to services.
  - Acts like a shift in the Phillips curve
  - Fed “looked through” this supply shock
- Inflation expectations were quite well anchored
- Fed behind the curve

Figure 4

Consumers are spending more on goods and less on services than they were before the pandemic

Real personal consumption expenditures by type, trillions of dollars



PIIE

Note: Dollars are chained 2012 dollars. Pre-pandemic trend based on log-linear regression for 2018Q1 to 2019Q4.

Sources: Bureau of Economic Analysis via Macrobond; authors' calculations.

Source: Furman (2021)

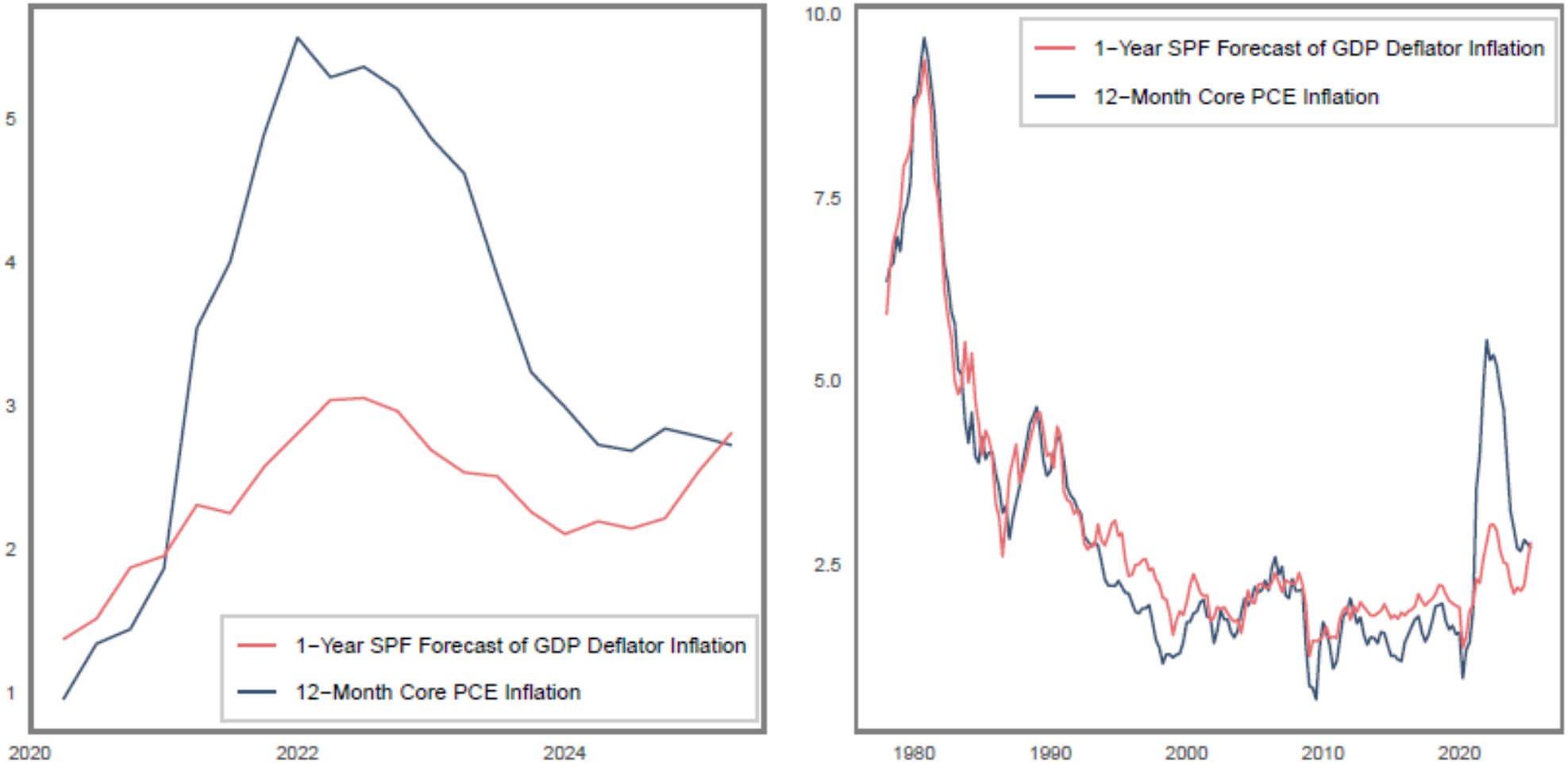


Figure 14: Core Inflation and One-Year Expected Inflation

Note: The figure plots core PCE inflation and one-year expected inflation for the GDP deflator from the Survey of Professional Forecasters. The sample period in the left can is 2020Q3 to 2025Q2. The sample period in the right panel is 1978Q1 to 2025Q2.

Source: Nakamura, Riblier, Steinsson (2025)

The Taylor Rule

- Desirable properties
  - Stabilizes the economy
  - Balances inflation and unemployment costs
  - Simple / Transparent
- But too rigid to be applied in practice?
  - Does not incorporate information about which shocks are hitting economy
  - Ignores problems at the zero lower bound

Zero Lower Bound

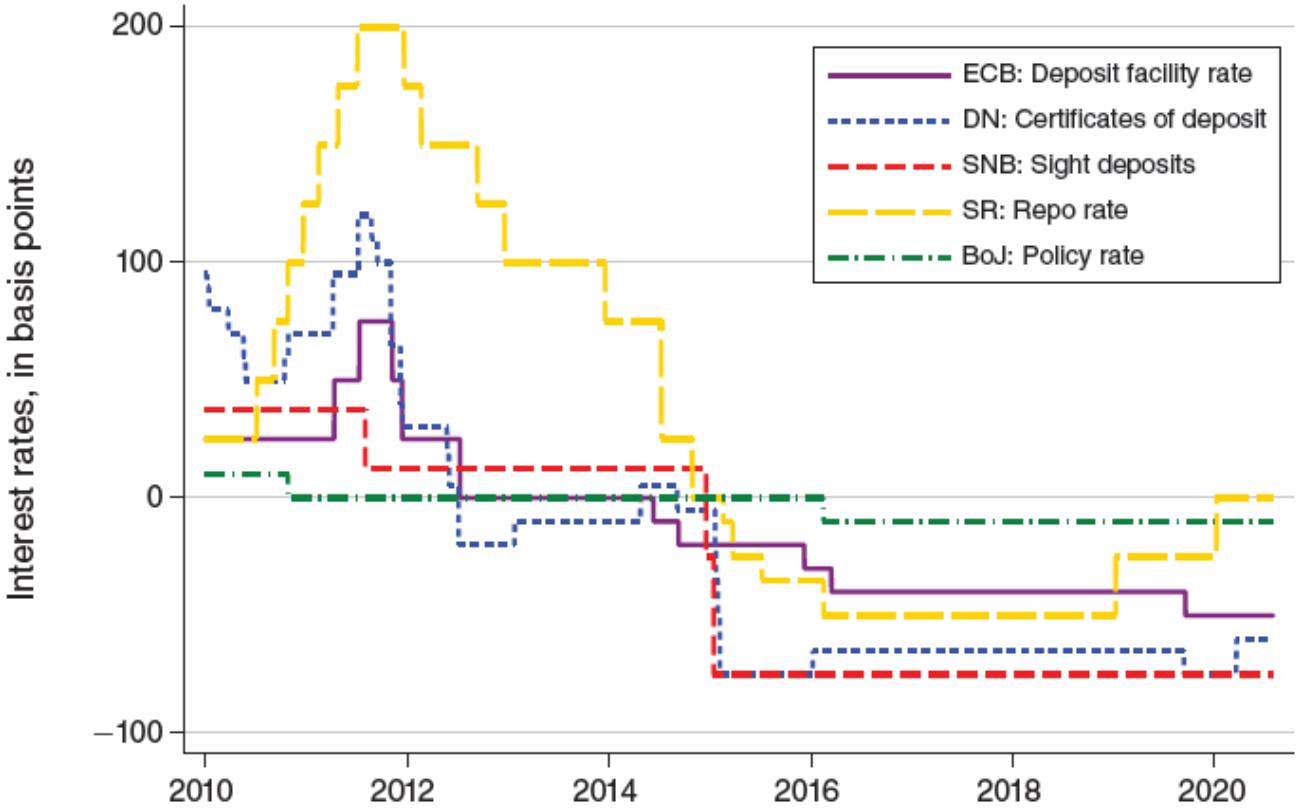
- Standard monetary policy in a recession:
  - Lower interest rates enough to bring about full employment
- Fall of 2008: Serious financial crisis and output falling rapidly
  - On Dec. 16 2008, Fed lowered nominal interest rates to 0-0.25% (essentially zero)
- Similar situation in March of 2020 due to Covid
- Nominal interest rates can't go below zero (Why?)

Zero Lower Bound

- Traditional argument:
  - Money pays zero interest
  - If interest rates are below zero, people will simply hold money (cash)
  - So, interest rates can't go below zero
- But it is inconvenient/costly to hold actual cash
  - Theft an important concern when amounts are large
  - Need warehouse, security, etc.
- In practice, several European countries pushed rates below zero in 2010s

Negative Rates in Europe/Japan

- Denmark, ECB, Switzerland, Sweden, and Japan lowered policy rate to negative territory for several years
- Lowest rate: -0.75%
- Perhaps there is an effective lower bound (ELB) at some rate
- We don't know how low rates can go



Source: Ulate (2021)

MP Curve at Zero Lower Bound

- Suppose for simplicity that interest rates can't go below zero
- Central bank can no longer set R_t freely
  - Need to be able to vary i_t in order to set R_t
- When $i_t = 0$ we have:

$$\begin{aligned} R_t &= i_t - E_t\pi_{t+1} \\ &= -E_t\pi_{t+1} \\ &= -\pi_t \end{aligned}$$

- The low is inflation, the higher is the real interest rate

MP Curve at Zero Lower Bound

- Phillips curve implies:

$$R_t = -\pi_t = -\left(\pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o}\right)$$

- Real rate is decreasing in the output gap
- The bigger the recession becomes, the larger the real interest rate becomes!!
- This is zero lower bound MP curve

MP Curve at Zero Lower Bound

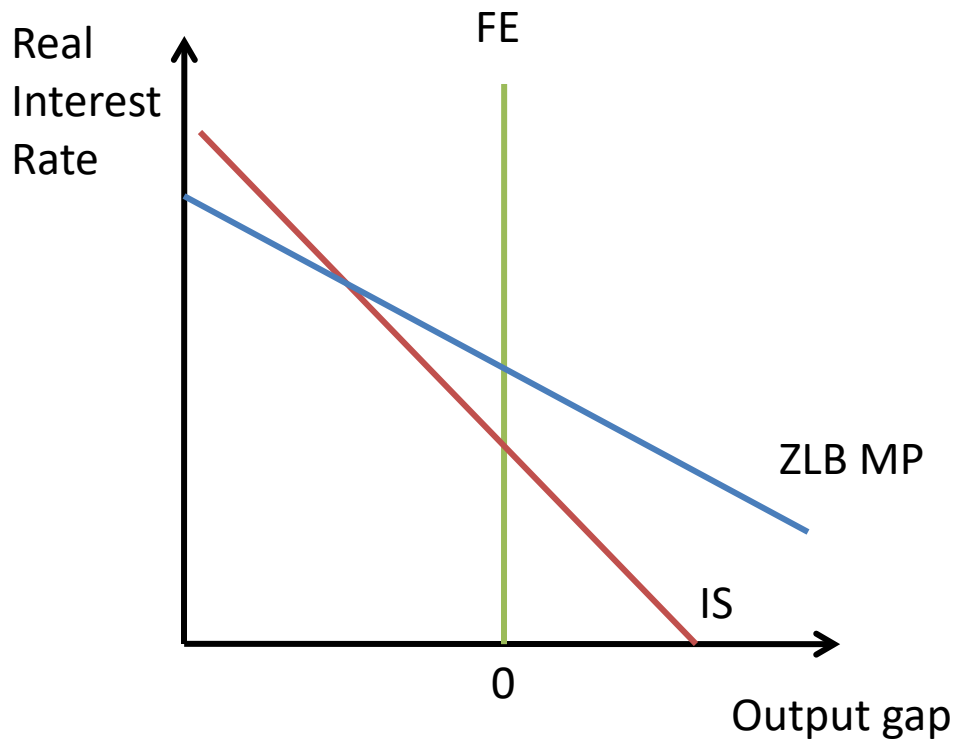
- IS Curve:

$$\tilde{Y}_t = \bar{a} - \bar{b}\,(R_t - \bar{r})$$

- Zero Lower Bound MP Curve

$$R_t = -\bar{v}\tilde{Y}_t - \pi_{t-1} - \bar{o}$$

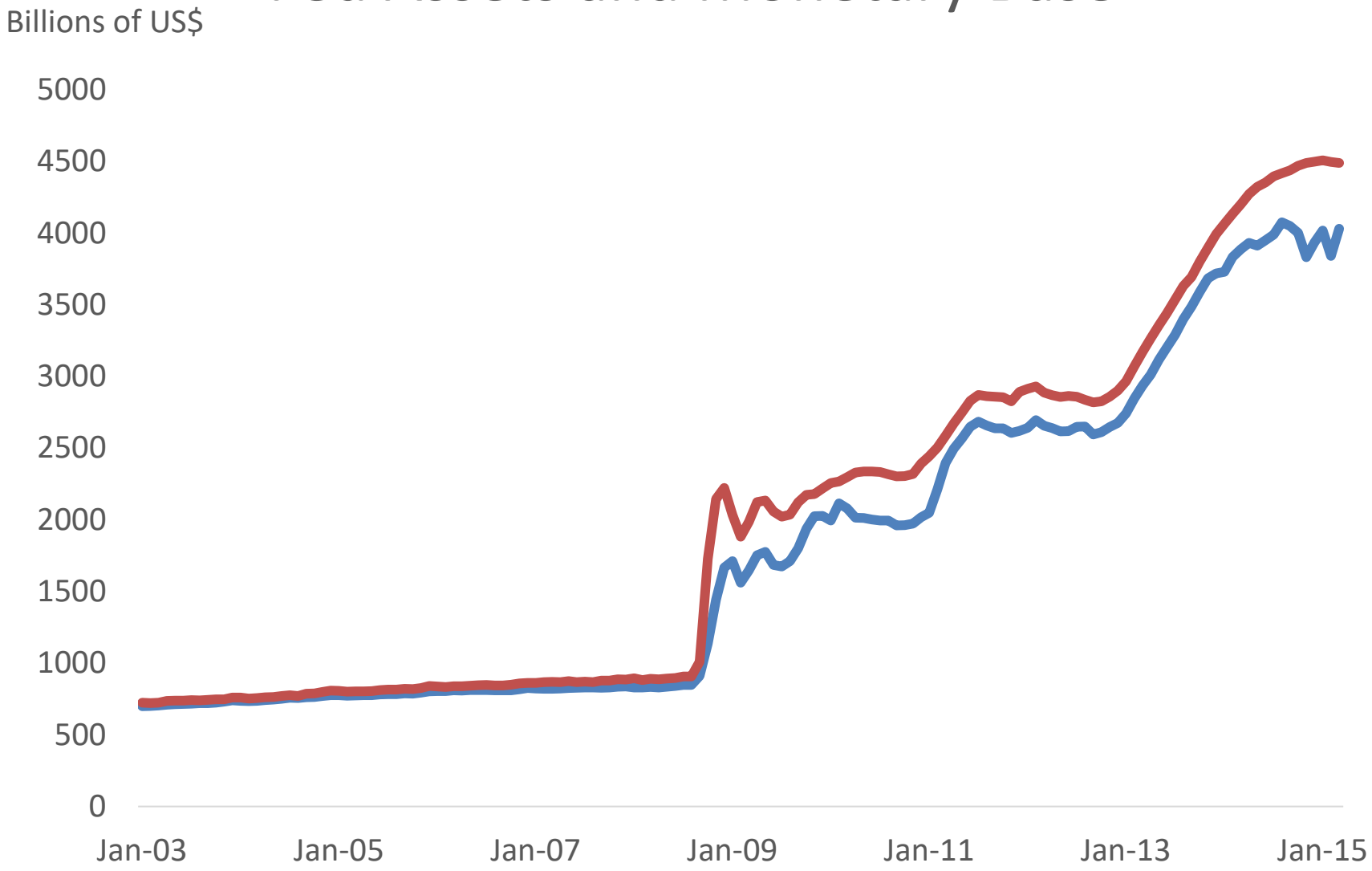
- Relative slope depends on $\bar{b}$ and $\bar{v}$
- Problem: ZLB MP curve cannot be shifted down!



Policy Options at Zero Lower Bound

1. Quantitative Easing
   - Normally Fed targets short term safe interest rate
   - In crisis interest rate spreads between safe and less safe bonds rose
   - Fed responded by purchasing riskier bonds to lower interest rates on these bonds (e.g., mortgage backed securities)
   - Lower interest rates on mortgage backed securities lower interest rates on mortgages and thereby stimulate spending

Fed Assets and Monetary Base



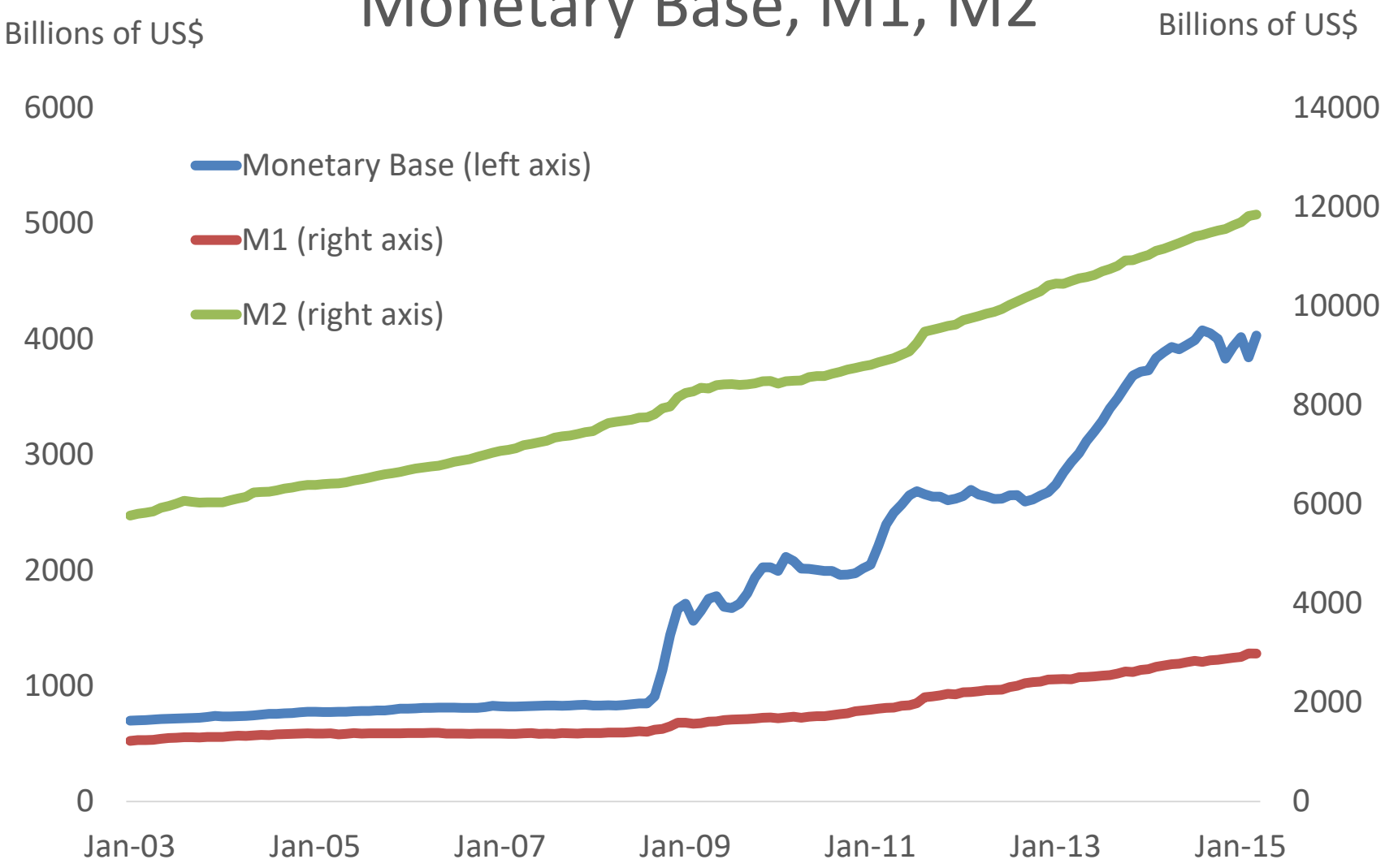
Huge Increase in Monetary Base

- Many people worried about inflation

$$M_t V_t = P_t Y_t$$

- Monetary base quadrupled, shouldn't this lead to huge amounts of inflation?
- Monetary economists were confident that this was NOT the case!

Monetary Base, M1, M2



Monetary base = currency + bank reserves at Fed

M1 = currency + deposits

M2 = M1 + savings accounts

Money in the Great Recession

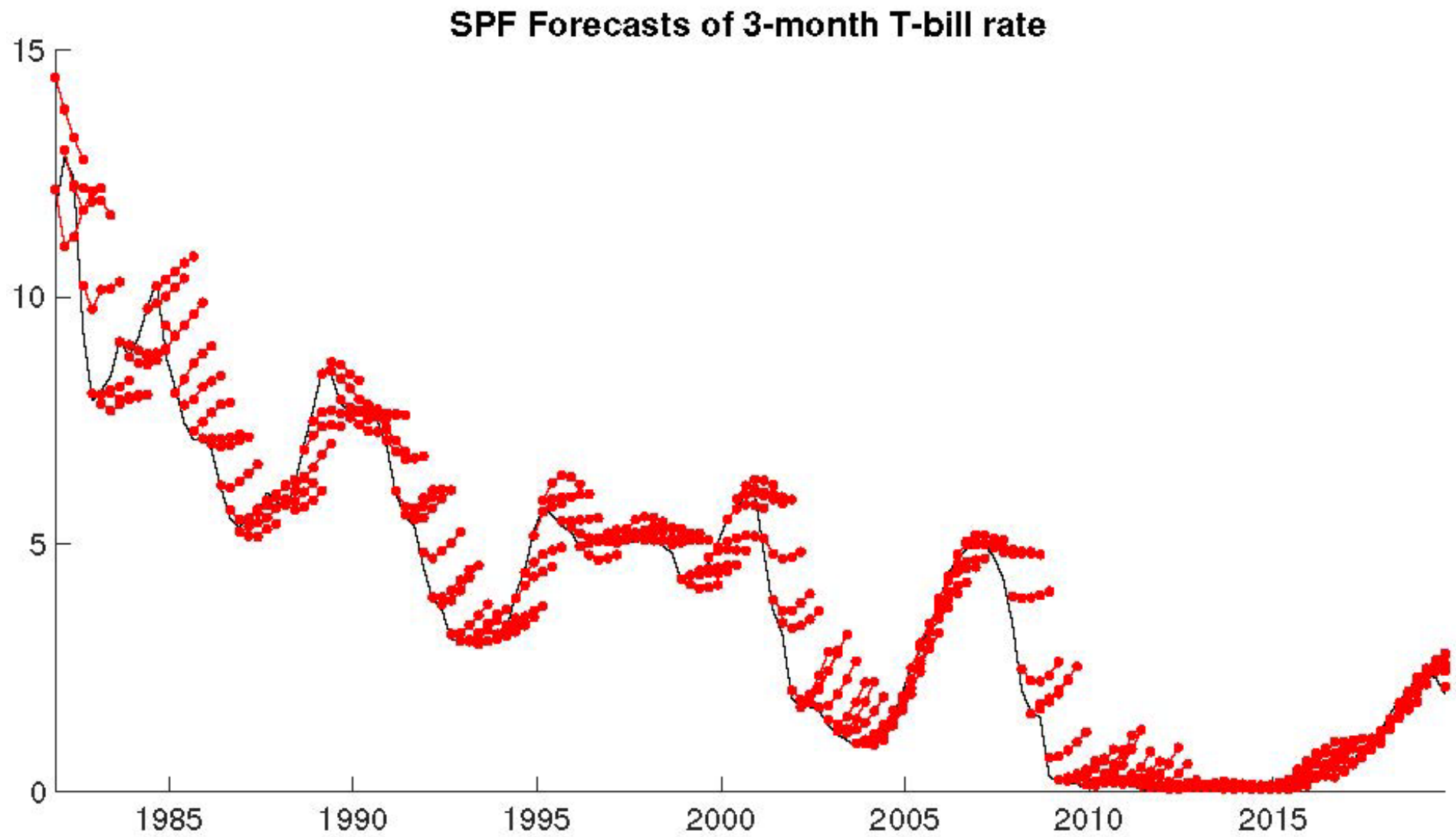
- Huge increase in monetary base reflection of Fed large scale asset purchases
- Did not lead to increase in the money supply (M1, M2) (Why?)
  - Banks happy to hold extra reserves at Fed
  - Reserves very safe asset
  - Interest rates on other safe assets close to zero. So why not?
  - Reserves now pay interest (since 10/6/2008)
  - Reserves no longer return dominated asset

Value of Theory

- Huge increase in monetary base caused lots of confusion on the part of many people (lots of worries about high inflation)
- Monetary economists (including Bernanke) saw through this an kept their cool

Policy Options at Zero Lower Bound

2. Forward Guidance
   - Statements about future path of policy
   - Intended to lower longer term interest rates
   - Lower long rates => lower mortgage rates => higher spending
   - Fed statement in August 2011: Keep rates close to zero “at least through mid-2013”
   - Fed statement in January 2012: Keep rates close to zero “at least through late 2014”


SPF Forecasts of 3-month T-bill rate
15
10
5
0
1985
1990
1995
2000
2005
2010
2015

Policy Options at Zero Lower Bound

3. Raise inflation target
   - Recall: $R_t = i_t - E_t\pi_{t+1}$
   - Promising higher inflation reduces real rates, which stimulates spending
   - Are such promises credible?
   - Not clear. When future comes, no longer optimal to carry through and have high inflation
   - How can Fed go about convincing people that they are serious about this?