



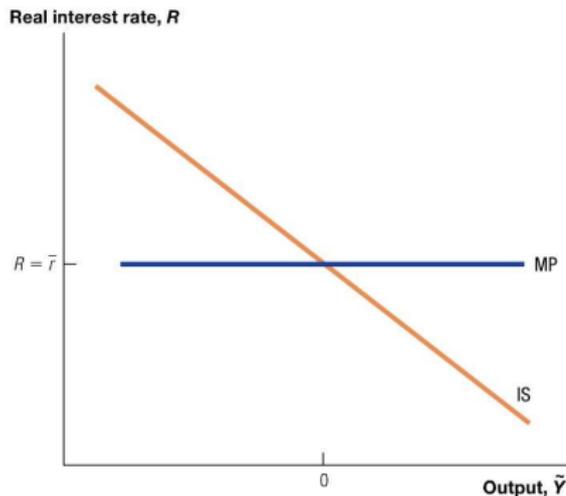
Session 12: Stabilization Policy and Expectations

Sebastian Di Tella and Christopher Tonetti
Stanford GSB

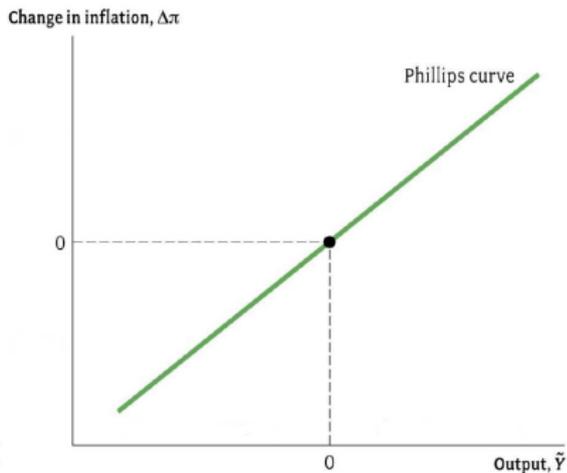
Outline: Stabilization Policy and Expectations

- Monetary policy rules
- Expectations
- The Taylor Rule
- Understanding inflation in the past decade

The Short-Run model: IS-MP + Phillips Curve



Demand Shocks + MP $\implies \tilde{Y}$



Expectations + $\tilde{Y} + \bar{o}$ $\implies \Delta\pi$

Monetary Policy Rules

- Until now we considered a very simple monetary policy: set R_t
- When the Fed wants to stimulate the economy...
- When the Fed wants to reduce inflation...
- Can we create a more systematic policy response?
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- A **monetary policy rule** is...

a set of instructions that systematically details how monetary policy responds to situations that might arise

A Simple Monetary Policy Rule

$$R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$$

R_t is the real interest rate

\bar{r} is the marginal product of capital

π_t is the inflation rate

$\bar{\pi}$ is a **target inflation rate** ($\approx 2\%$)

\bar{m} central bank's willingness to fight inflation

European Central Bank

... in the pursuit of price stability, it aims to maintain inflation rates below, but close to, 2% over the medium term.

ECB Governing Council, 2003

Inflation Targeting: $\bar{\pi}$

- An increasing number of countries have formal, explicit inflation targets
- Some examples:
 - U.S. = 2% (as of 2012)
 - U.K. = 2%
 - Japan = 2% (as of 2013, part of “Abenomics”)
 - Euro area = below, but “close to” 2%
 - India = 4% \pm 2%
 - China = around 3%
 - Brazil = 3.75% \pm 1.5%
 - Mexico = 3% \pm 1%

<http://www.centralbanknews.info/p/inflation-targets.html>

Monetary Policy Rule: What and Why?

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 - Automatically raise interest rates when inflation rises
- Why is it useful?

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- What does our simple rule do?
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- Why is it useful?
 - Automates Paul Volcker!
 - Whenever inflation rises above the inflation target, policy tightens automatically
 - Slows the economy — the Phillips curve brings inflation back down

A good monetary policy rule commits the central bank to keeping inflation close to its target rate.



Expectations

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$$\pi_t^e = \pi_{t-1}$$

- Is this a reasonable assumption?
 - In 1979 when inflation was accelerating out of control?
 - When central banks have inflation targets and policy rules?

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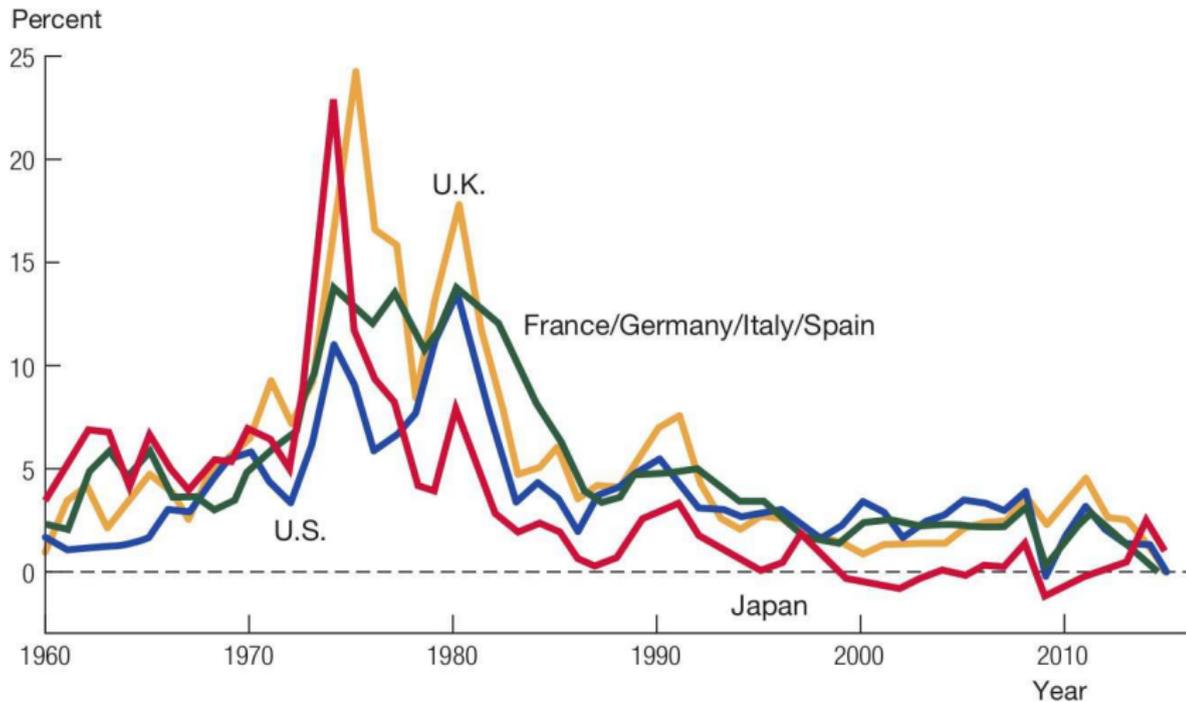
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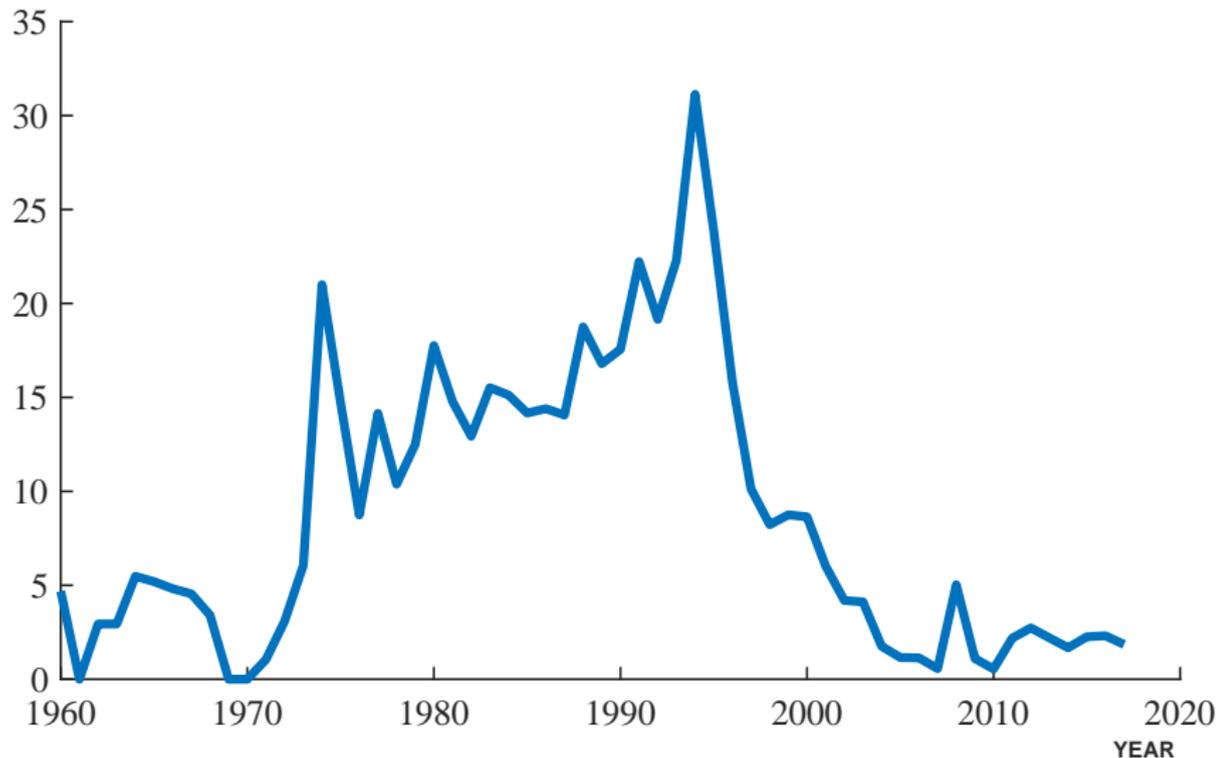
- Is this a reasonable assumption?
 - In 1979 when inflation was accelerating out of control? **Yes**
 - When central banks have inflation targets and policy rules? **No!**

The taming of inflation around the world



Percent of countries with inflation rates above 25%

PERCENT OF COUNTRIES



Expectations

- Central banks dislike inflation and have the power to bring it down by inducing recessions
- But then shouldn't people expect (temporary) inflation to come down?
 - Credibility
 - How are expectations formed?

Rational Expectations

- What are rational expectations?

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People use all available information to form the best forecast

- Statements by the central bank (e.g. inflation target)
 - Credibility and reputation
 - State of the economy
 - History
- Lucas 1995 Nobel Prize (also Friedman, Phelps, Sargent)

Managing Inflation Expectations

- How can the central bank reduce inflation by **managing expectations**?

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- How can the central bank reduce inflation by **managing expectations**?
- With rational expectations and a central bank's commitment to a low stable inflation rate, price-setters will themselves keep inflation close to the target!
- **Example:**
 - An explicit monetary policy rule helps people form expectations
 - What if there is an explicit 2% inflation target? ($\bar{\pi}$)
 - Or central bank has a strong reputation as an inflation hawk? (\bar{m})

Costless Disinflation by Coordinating Expectations

- Recall the Phillips curve

$$\pi_t = \pi^e + \bar{v} \tilde{Y}_t + \bar{o}$$

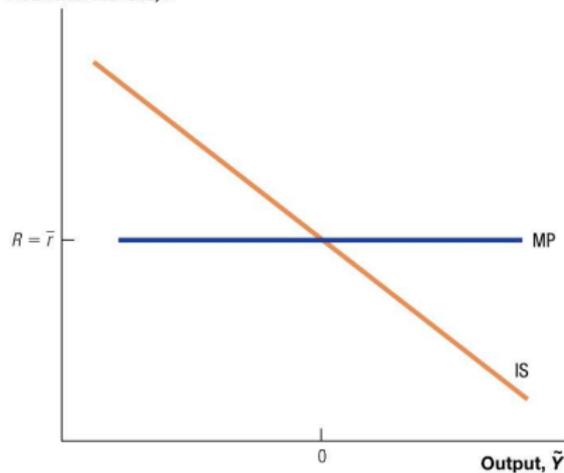
- What happens if
 - $\bar{\pi} = 4\%$ initially (and $\pi_t = 4\%$ for past several years)
 - Central bank announces a **new inflation target** $\bar{\pi}' = 2\%$
- On next two slides:
 - First with **adaptive expectations** (e.g. 1980s)
 - Then with **rational expectations** and a **credible central bank**

Disinflation with Adaptive Expectations

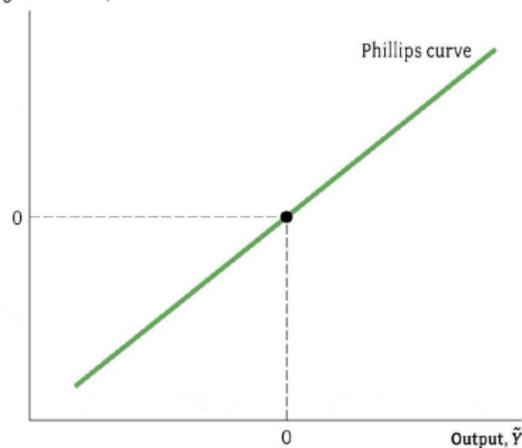
- This is the same as the Volcker disinflation studied previously
- Logic
 - Monetary policy rule says $\uparrow R$ since inflation is above its new target
 - Causes a recession
 - Brings inflation down via the Phillips curve

Disinflation with Adaptive Expectations

Real interest rate, R



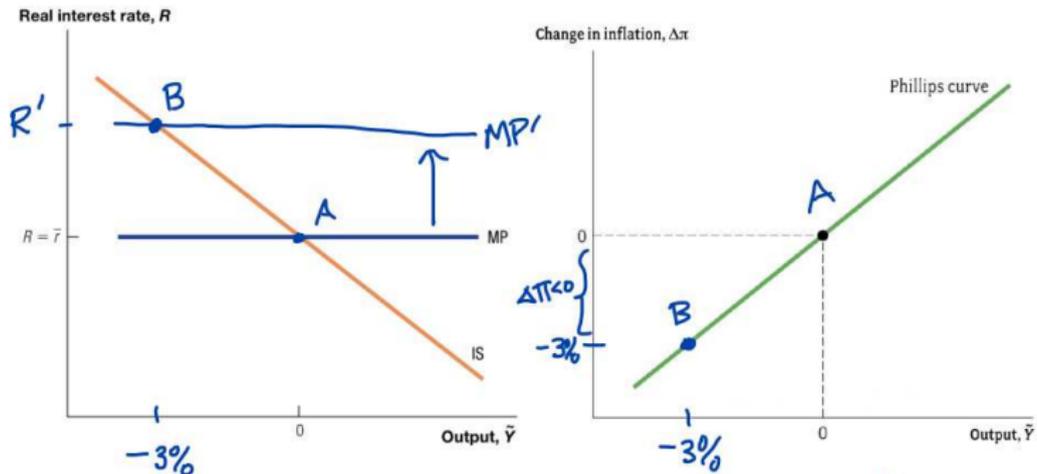
Change in inflation, $\Delta\pi$



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

$$\text{MPR: } R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$$

Disinflation with Adaptive Expectations



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- If everyone believes the central bank is fully committed to the new target inflation rate and will achieve it...
 - Then let expectations do the work: $\pi_t^e = 2\%$!
 - If everyone expects 2% inflation, the Phillips curve implies they raise their prices by 2% instead of 4% $\Rightarrow \pi_t = 2\%$
 - No recession is required!!!!

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 - If everyone expects 2% inflation, the Phillips curve implies they raise their prices by 2% instead of 4% $\Rightarrow \pi_t = 2\%$
 - No recession is required!!!!
- This is like the “adoption of the euro” example in Session 9 on Inflation in the Long Run

*Central bank credibility can lead expectations to adjust quickly,
limiting the need for a recession!*

Costless Disinflation by Coordinating Expectations

- Phillips curve with expectations term:

$$\pi_t = \pi^e + \bar{v} \tilde{Y}_t + \bar{o}$$

- **Suppose expectations managed by inflation target: $\pi^e = \bar{\pi}$**

Costless Disinflation by Coordinating Expectations

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- **Suppose expectations managed by inflation target: $\pi^e = \bar{\pi}$**

Initial: $\pi_t = 4\% + \bar{v} \tilde{Y}_t + \bar{o}$

New: $\pi_t = 2\% + \bar{v} \tilde{Y}_t + \bar{o}$

- Important: In “new” equation above, Fed is happy with $\pi_t = 2\%$, so it doesn't need a recession:
 - No change in interest rates, so that $\tilde{Y} = 0$

Argentina: How costly was the end of hyperinflation?



New peso pegged 1 for 1 to the dollar in 1991.

→ Inflation in 1994 was 4%!

Argentina: How costly was the end of hyperinflation?



GDP fell by 10% between 1987 and 1990, recovered all in 1991!

Summary

- If a central bank has a credible commitment to an explicit inflation target...
- ... then this **anchors** the inflation expectations of businesses and workers
- ... which reduces the need for the central bank to cause recessions to fight inflation

*A reputation for fighting inflation and keeping it on target
means fewer recessions are needed!*



The Taylor Rule

An inflation targeting monetary policy rule

- Recall our simple policy rule for the fed funds rate:

$$R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$$

- Rearranging and adding inflation (to get the nominal rate):

$$i_t = R_t + \pi_t = \bar{r} + \pi_t + \bar{m}(\pi_t - \bar{\pi})$$

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- What if we use “2” in picking every parameter:

John Taylor's choice: $\bar{r} = 2\%$, $\bar{\pi} = 2\%$, $\bar{m} = 1/2$

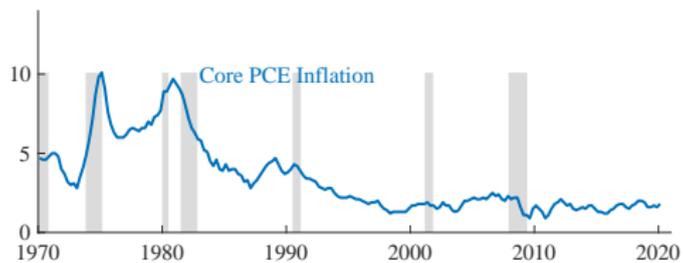
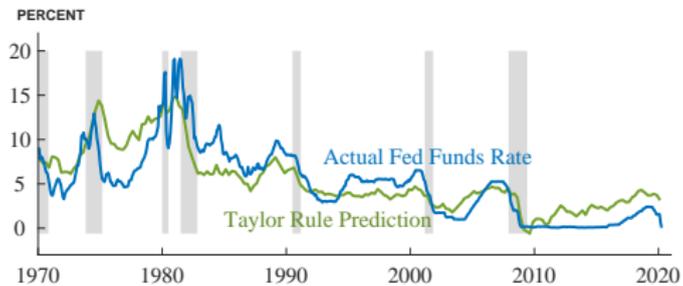
$$i_t = 1\% + 1.5\pi_t$$

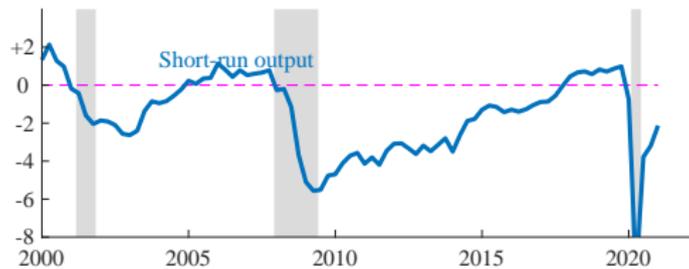
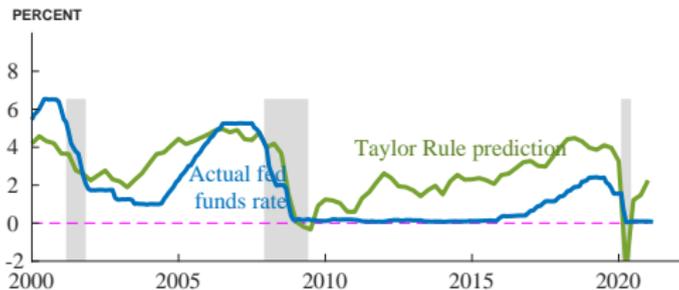
The Taylor Rule

- John Taylor (Stanford) adds \tilde{Y} :

$$i_t = 1\% + 1.5\pi_t + 0.5\tilde{Y}_t$$

- Why add \tilde{Y} ?
- Why is the coefficient on inflation larger than one?
- What does this imply about the value of the fed funds rate in normal times?





Deviations since 2010

- John Taylor is somewhat critical of Fed, saying they should have returned to “normal” sooner
 - If you include financial frictions, the Taylor Rule comes down a bit
 - Would have created “ammunition” for this recession
- Has \bar{r} changed?
 - “Secular Stagnation”
 - Maybe 1% instead of 2% (e.g. because of growth slowdown)
 - Lowers long-run FF rate to 3% instead of 4%



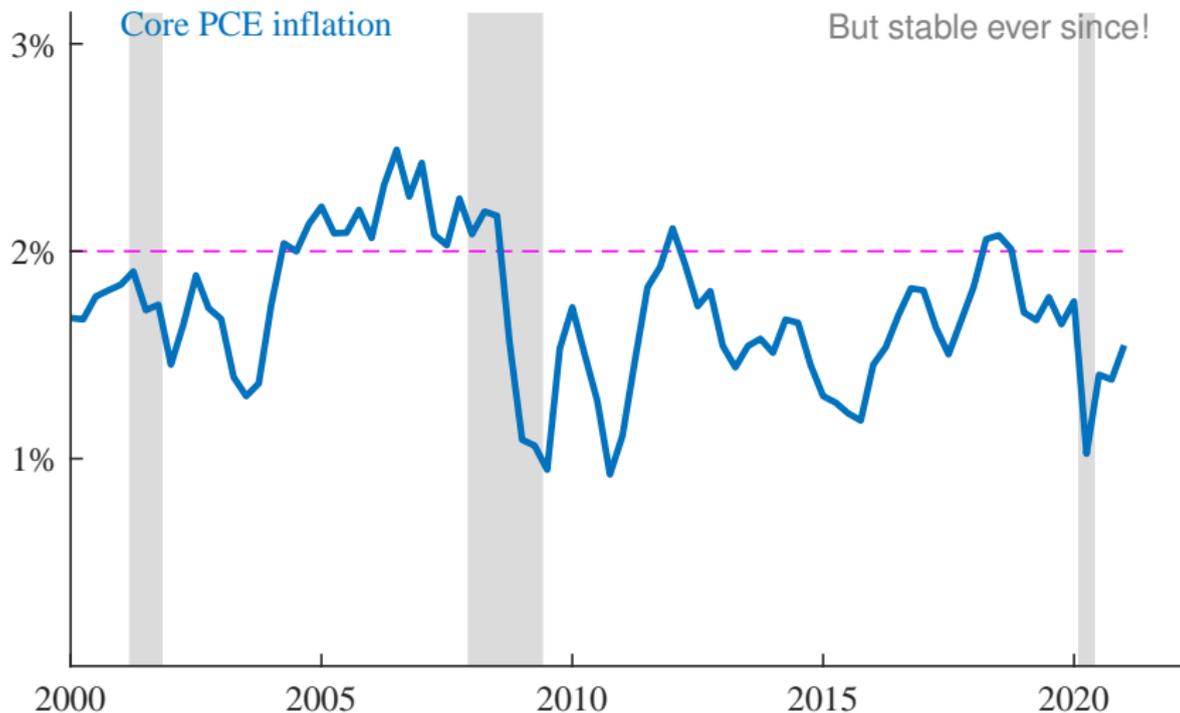
Inflation and Expectations Recently

Puzzle: Why didn't inflation fall more in 2009 and 2020?

2007Q4 = 2.3%

2010Q4 = 0.9%

But stable ever since!



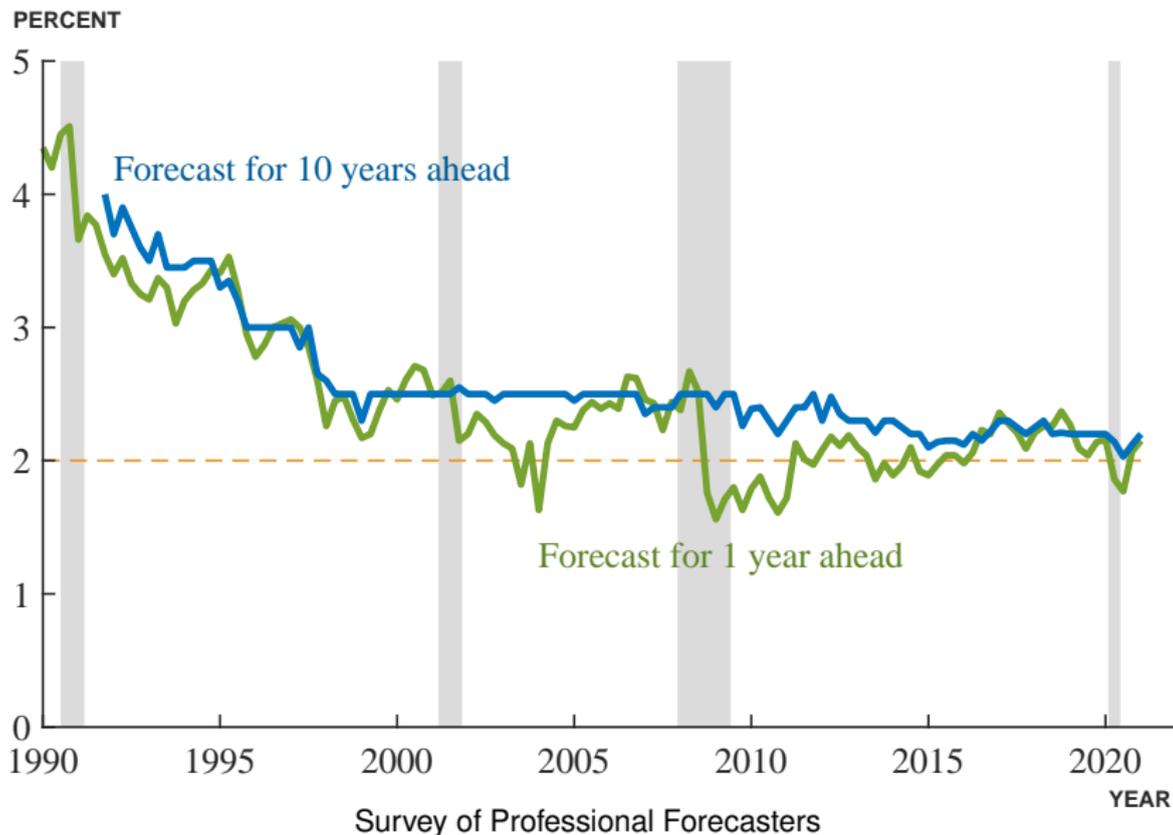
Why didn't U.S. inflation keep falling given very weak economy?

- One possible explanation: **Anchored inflation expectations**
 - Suppose $\pi_t^e = \bar{\pi} \approx 2\%$.
 - Then the Phillips curve becomes (ignoring shocks):

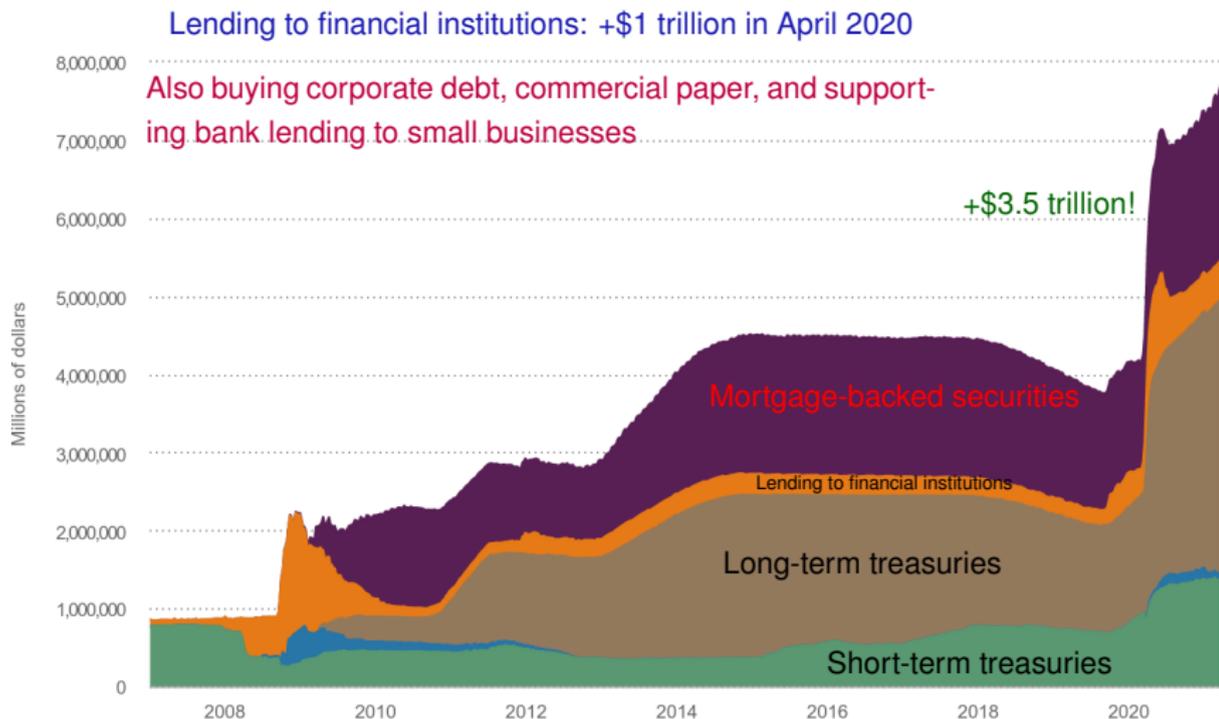
$$\underbrace{\pi_t}_{1.5\%} = \underbrace{\bar{\pi}}_{2\%} + \bar{v} \underbrace{\tilde{Y}_t}_{-3\%}$$

- Anchored inflation expectations help avoid the “slumping economy leads inflation to fall” logic of the Phillips curve with adaptive expectations
- We will contrast with the Great Depression in the next class

Expected CPI Inflation in the U.S.



Unconventional Monetary Policy: Quantitative Easing



Assets on the Fed Balance Sheet

Source: <https://www.clevelandfed.org/en/our-research/indicators-and-data/credit-easing.aspx>

More info: <https://www.brookings.edu/research/fed-response-to-covid19/>

Forward guidance

To support continued progress toward maximum employment and price stability, . . . a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens

– FOMC Statement September 13, 2012

*Forward guidance combined with the term structure
of interest rates can lower long-term rates*

Higher inflation target

- How does a higher $\bar{\pi}$ help stimulate the economy?
- In August 2020, Chairman Powell: "target average inflation of 2% over the long-run"
- How does this fit into current debates about inflation?

Covid as a Shock to Potential Output

- Think about COVID-19 in a Solow model?
 - Lower TFP: Shocks to supply chains and retail
 - “tax” on working and shopping
 - Lowers potential GDP
- How does this show up in our Short-Run Model?

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- Think about COVID-19 in a Solow model?
 - Lower TFP: Shocks to supply chains and retail
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 - Lowers potential GDP
- How does this show up in our Short-Run Model?
 - Lower \bar{Y} — but where is \bar{Y} in the SR Model?
 - A reduction in TFP lowers both Y and \bar{Y} , leaving \tilde{Y} unchanged
 - Explains why a 10% decline in GDP in 2020Q1/Q2 may not put huge downward pressure on inflation: most was a decline in \bar{Y} !
- What about the recent jobs numbers?

Questions for Review

- What is a monetary policy rule and an inflation target? Why are these important?
- Did Bernanke, Yellen, and Powell follow a Taylor Rule? What are the arguments for and against following such a rule?
- What are rational expectations?
- How is managing expectations a crucial part of monetary policy?