



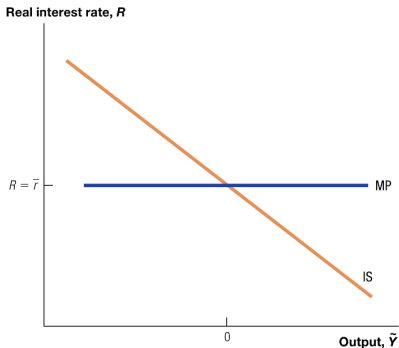
Session 13: Stabilization Policy and Expectations

Chad Jones
Stanford GSB

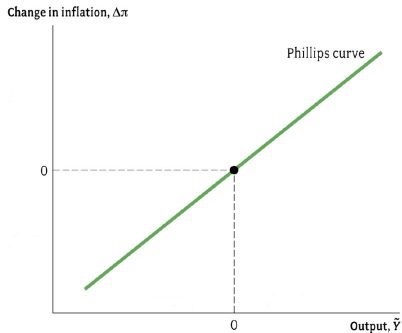
Outline: Stabilization Policy and Expectations

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

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



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



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

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?
- A **monetary policy rule** is...

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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

“... 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?

- What does our simple rule do?
 - Automatically raise interest rates when inflation rises
- Why is it useful?

Monetary Policy Rule: What and Why?

- What does our simple rule do?
 - Automatically raise interest rates when inflation rises
- 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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- Up to now we have assumed *adaptive expectations*

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

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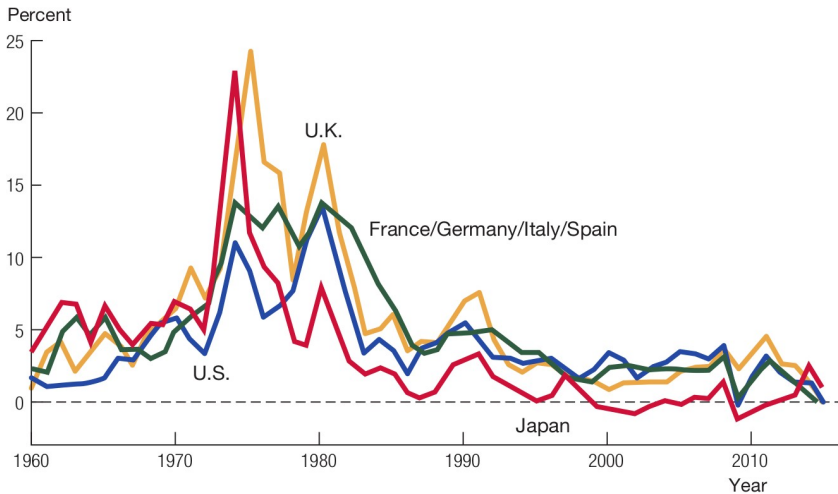
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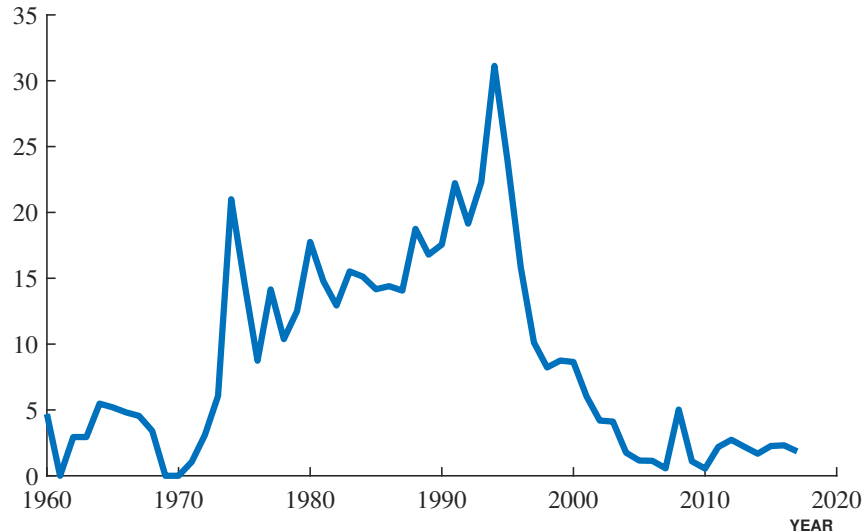
- Is this a reasonable assumption?
 - In 1979 when inflation was accelerating out of control? **Yes**
 - When central banks have inflation targets and policy rules? **No!**

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 high 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

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

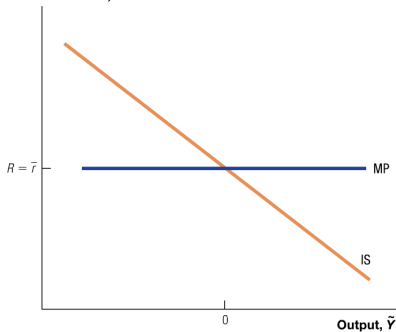
- What happens if
 - $\bar{\pi} = 4\%$ initially (and $\pi_t = 4\%$ for past several years)
 - Central bank announces a new inflation target $\bar{\pi}' = 2\%$
- On next two slides:
 - First with adaptive expectations (e.g. 1980s)
 - Then with rational expectations and a credible central bank

Disinflation with Adaptive Expectations

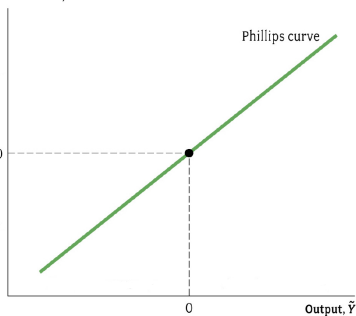
- This is the same as the Volcker disinflation studied previously
- Logic
 - Monetary policy rule says $\uparrow R$ since inflation is above its new target
 - Causes a recession
 - Brings inflation down via the Phillips curve

Disinflation with Adaptive Expectations

Real interest rate, R



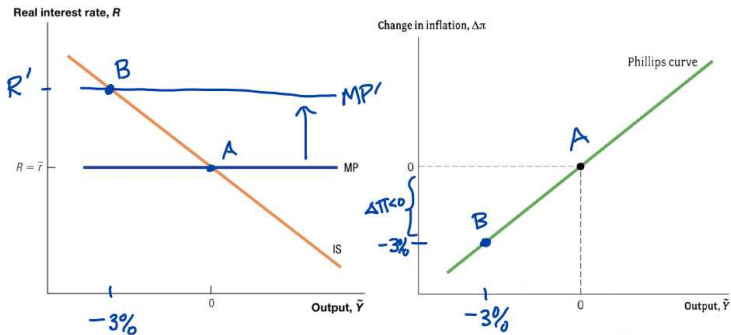
Change in inflation, $\Delta\pi$



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

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

Disinflation with Adaptive Expectations



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Disinflation with Rational Expectations and Credible Central Bank

- Key: everyone understands the previous exercise: they know the central bank can put the economy in a recession and bring down inflation

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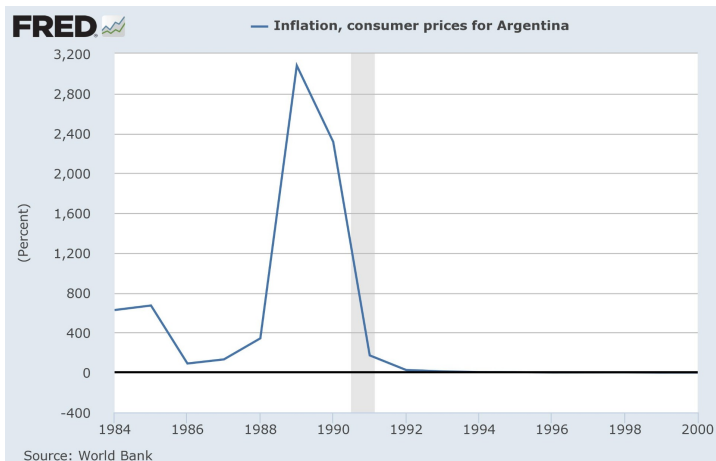
- **Suppose expectations managed by inflation target: $\pi^e = \bar{\pi}$**

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

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

- 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

- Extremely useful guide to monetary policy
- Used as guide throughout the world!

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: $\bar{r} = 2\%$, $\bar{\pi} = 2\%$, $\bar{m} = 1/2$

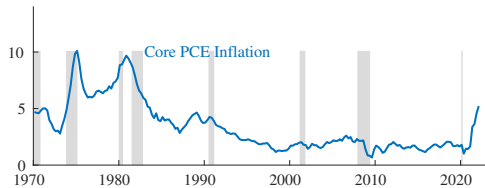
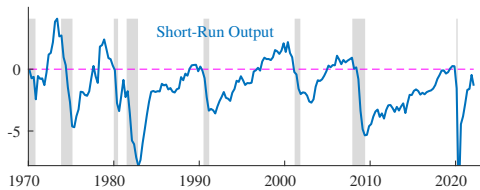
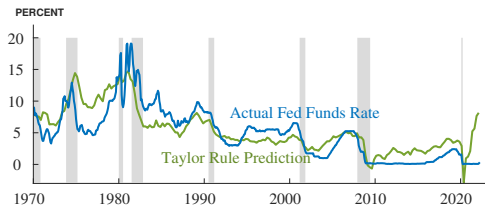
$$i_t = 1\% + 1.5\pi_t$$

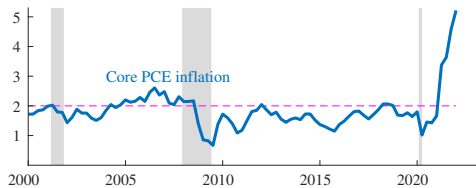
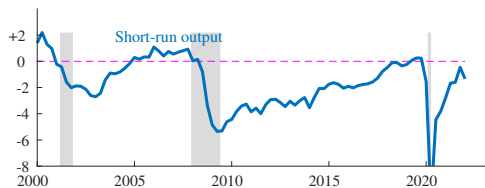
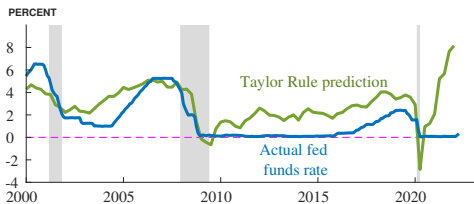
The Taylor Rule

- 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?
 - Maybe 1% instead of 2% (e.g. because of growth slowdown)
 - Lowers long-run FF rate to 3% instead of 4%

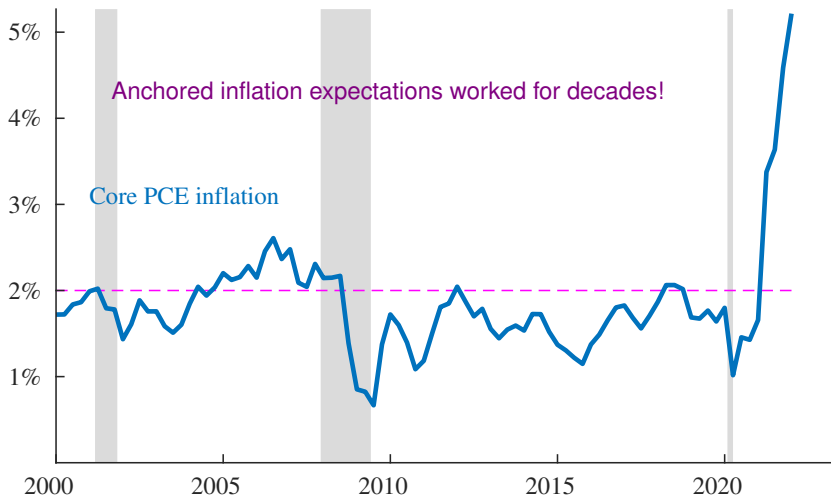


Inflation: Back to the 1970s?

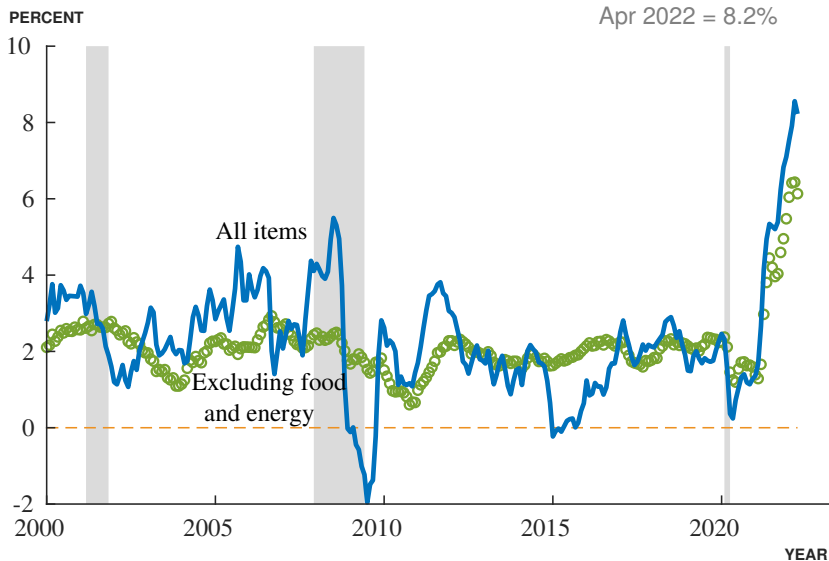
After low and stable for 25+ years

Recent Inflation

2022Q1 = 5.2%



Recent CPI Inflation



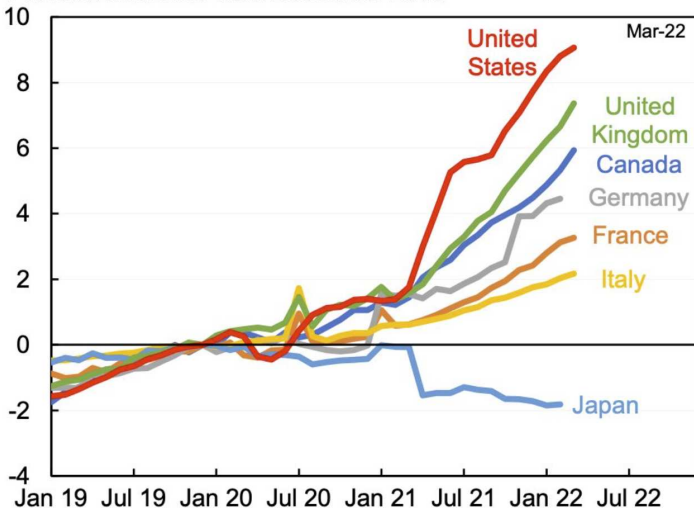
Why do we have 8% inflation currently?

- Many shocks combine
 - Supply chain shocks from Covid-19 [“good” supply shock coming?]
 - Energy price shocks from war in Ukraine
 - Government spending response to Covid-19 = 25% of GDP
 - Central banks kept interest rates low
- Long-run inflation expectations remain well-anchored?
- Nominal wages are rising, but not as fast as inflation
 - Wage-price spiral in the future?

Inflation in Other Countries

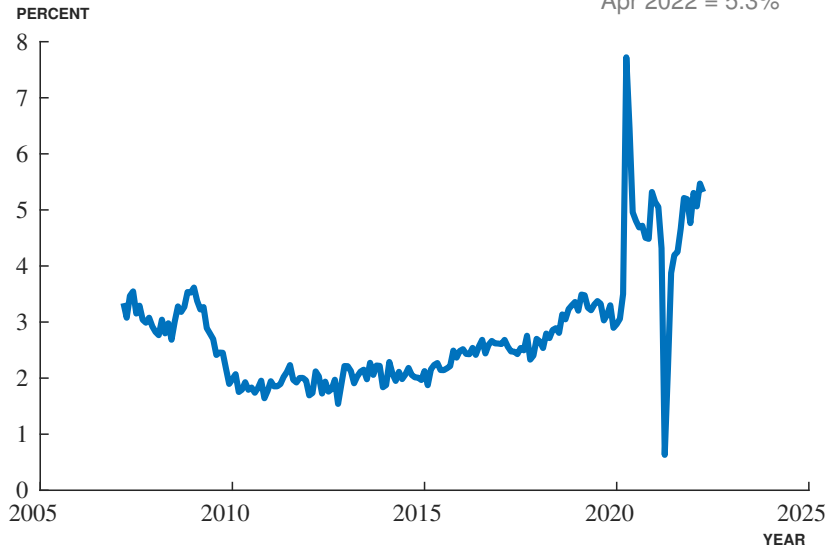
Core Consumer Price Inflation vs. Dec. 2019

Percent Difference from December 2019

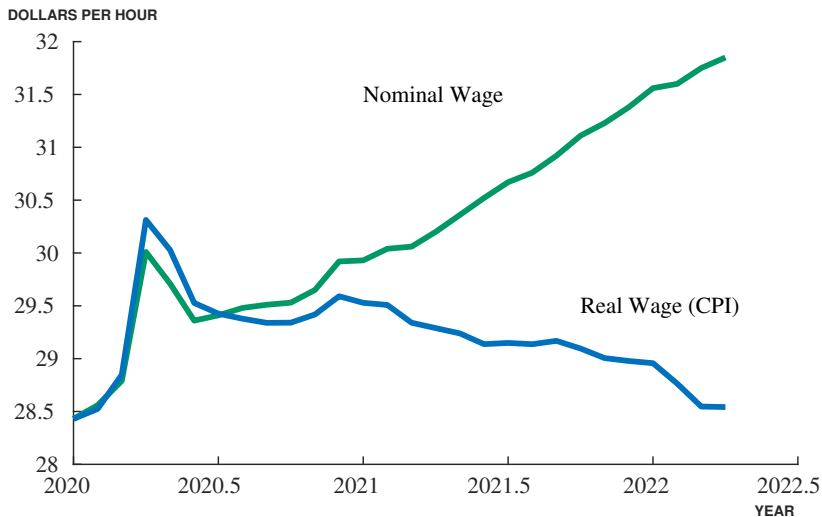


Growth Rate of Nominal Wages

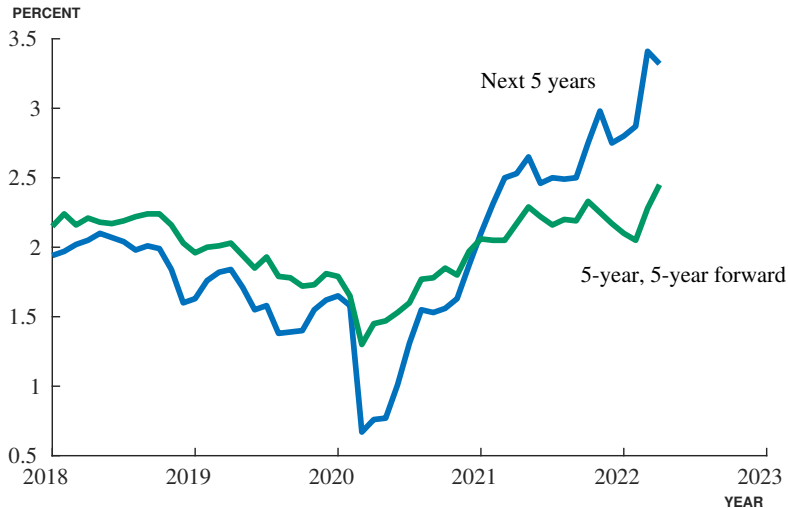
Apr 2022 = 5.3%



Real and Nominal Wages



Expected CPI Inflation in the U.S. (from TIPS)



Covid as a Shock to Potential Output (in part)

- Why didn't the 10% decline in GDP in 2020Q1/Q2 put huge downward pressure on inflation? Most was a decline in \bar{Y} !
- Think about COVID-19 in a Solow model
- How does this show up in our Short-Run Model?

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 - Also lower TFP: Shocks to supply chains and retail
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- 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, so the negative demand pressure in the Phillips curve is small

(In practice, of course COVID-19 affects \bar{a} as well...)

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?
- How should we think about the recent inflation experience?