OUTLINE — November 20, 2019

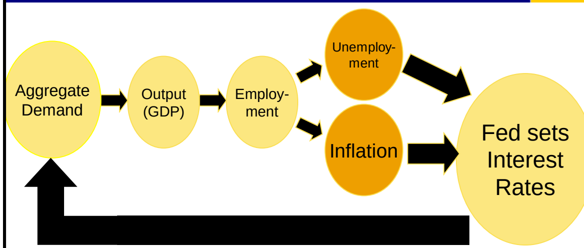
- A few comments about the essay
- The Fed & Monetary Policy, cont.
  - Yield Curve
  - Zero Lower Bound
- Phillips Curve
  - Why a Tradeoff?
  - Shifts of Phillips Curve

PS4 due Tuesday November 26, 8 pm

Midterm 3 is Thurs Dec. 5, 7-8:30 pm

Comprehensive Essay due via bCourses
Wed December 11, 8 am

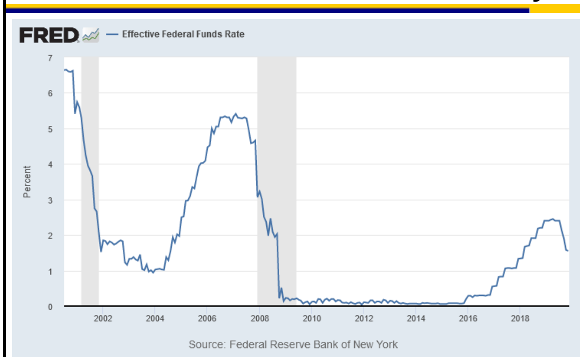
Stepping Back



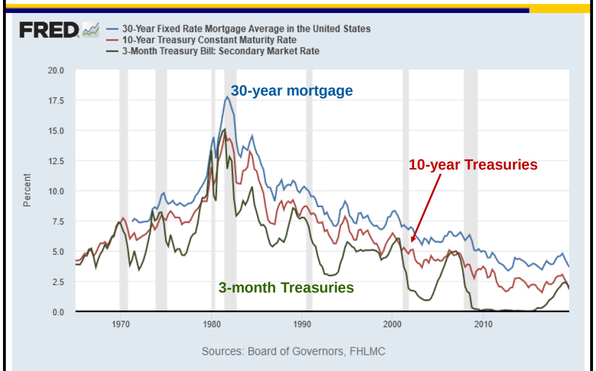
Summarizing Monday

- Banks hold required reserves because that's the law
  - Used to transfer $ between banks when we write checks
- Reserves are held in Federal Reserve Banks
- Excess reserves (ER) are what banks use to make loans
- The Fed pays interest on ER to banks: IOER
- A bank can't simultaneously hold ER and earn the IOER and lend *those very same* ER to a borrower; for each $ of ER, it's a choice: hold or lend
- If Fed raises IOER, banks will raise i they charge on loans (and vice versa, $\downarrow IOER \rightarrow \downarrow i$)

Federal Funds rate, 2000-today



Interest Rates, 1965-2019



Long-term & Short-term Rates, 1

- Borrowing for investment spending is mostly *long-term* borrowing
  - 10-year, 20-year, 30-year loans
- Fed policy affects *short*-term interest rates
  - Fed can directly change
    - Rate paid on excess reserves (IOER)
  - Fed has influence (but not control) over
    - Overnight rate (federal funds rate, FFR)
    - Treasury-bill rate (30-day, 90-day, 1-year)

Long-term & Short-term rates, 2

- What is connection between short-term (ST) and long-term (LT) interest rates?
  - LT rate = average of current & future expected ST rates + "term premium" + "risk premium"

Long-term & Short-term rates, 3

- What determines "future expected ST rates"?
  - Our expectations about the future
- What is one thing affecting our expectations?
  - "Forward guidance"
    - "Forward guidance" is a Fed policy starting 2004 to clearly state "this is what we're going to do in the future to interest rates"
    - Sometimes expressed as a conditional: "If X happens, then we will do <this> to interest rates"
    - Eliminates interest rate uncertainty (aside from uncertainty about when X will happen)

Yield Curve

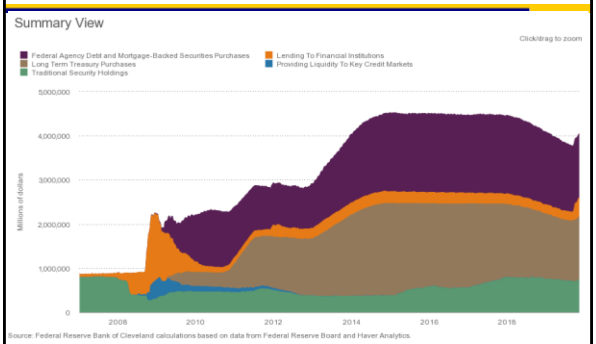
- Yield curve shows – *on any one day* – relationship between that day's ST rates and LT rates

- Animated Yield Curve: http://stockcharts.com/charts/YieldCurve.html

Zero Lower Bound (ZLB)

- Traditional belief: IOER and target for the nominal FFR can't go below 0
  - Fed's 2008-2015 target for Federal Funds Rate was "in the range of 0 – 0.25 percent"
  - Fed was at **zero lower bound**
- So Fed tried other strategies
  - "Quantitative Easing" (2009-2014)
  - Operation Twist (late 2011, 2012)
- All had same goal: increasing lending & spending

Assets owned by Federal Reserve

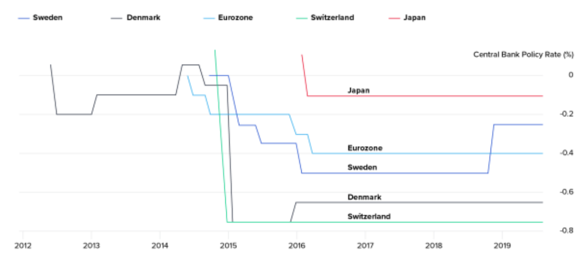


The Fed's Balance Sheet: https://www.clevelandfed.org/our-research/indicators-and-data/credit-easing.aspx

Zero Lower Bound (ZLB)

- Traditional belief: IOER and target for the nominal FFR can't go below 0
  - Fed's 2008-2015 target for Federal Funds Rate was "in the range of 0 – 0.25 percent"
  - Fed was at **zero lower bound**
- *Why do I say "Traditional belief"?* Because other countries have broken ZLB and Fed officials ponder whether Fed will eventually do so, too
  - Sweden, 2009
  - Denmark, 2012
  - Eurozone, 2014
  - Switzerland, 2015
  - Japan, 2016

Negative central bank interest rates



Source: Refinitiv

Phillips Curve

- Is a relationship between unemployment and price inflation (rate of change of CPI or other price index)
- Original, by A.W. Phillips, used UK data, 1861-1957
  - He found **stable** trade-off between unemployment & wage inflation (rate of change of nominal wages)

Original Phillips Curve

- A.W. Phillips used U.K. data for 1861-1957
- Found:
  - tradeoff between unemployment and wage inflation
- Story:
  - Bargaining power

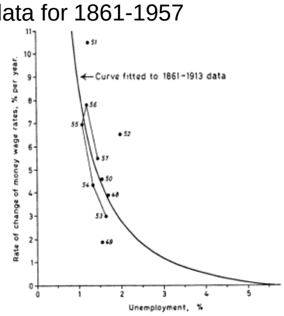


Fig. 10. 1948-1957

Phillips Curve

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- Original, by A.W. Phillips, used UK data, 1861-1957
  - He found **stable** trade-off between unemployment & wage inflation (rate of change of nominal wages)
- Story: Bargaining power
  - Change demand for labor → change wages
  - Lots of slack in labor market: low wage inflation
  - Little slack in labor market: high wage inflation

Phillips Curve (U.S. version)

- Tradeoff between unemployment and *price* inflation

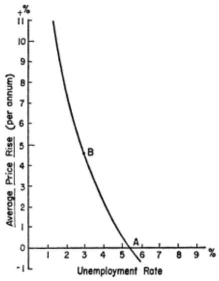


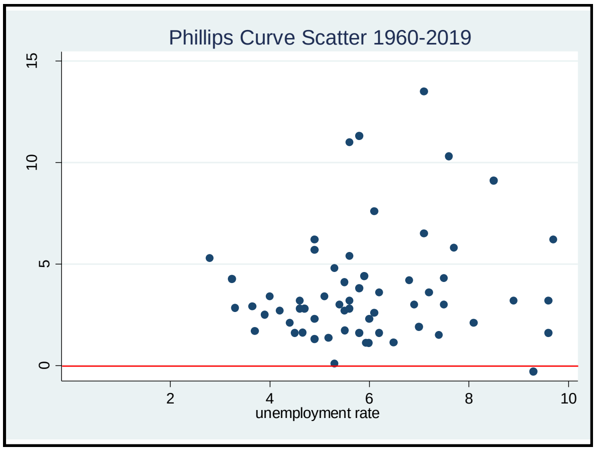
FIGURE 2
MODIFIED PHILLIPS CURVE FOR U.S.
This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

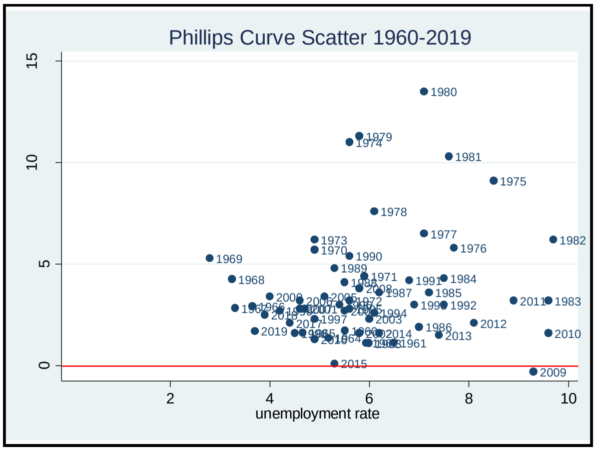
- "This shows the menu of choice…"

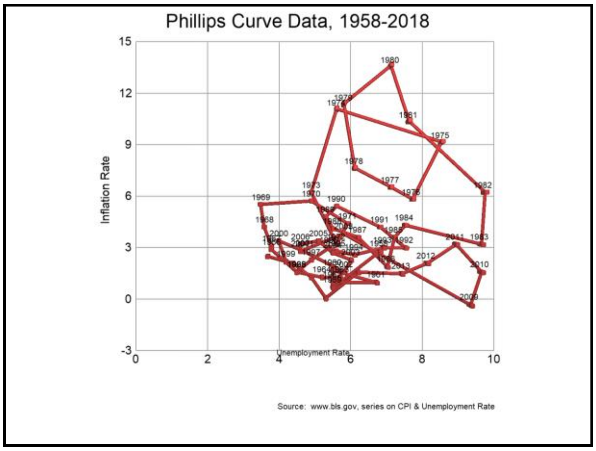
Phillips Curve

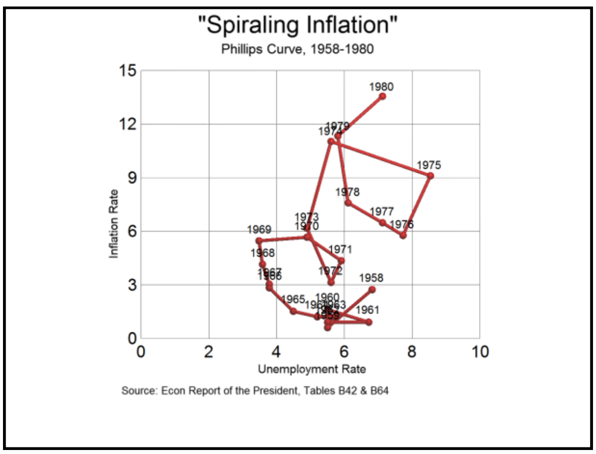
- Story: Bargaining power
  - Change AD → change output → change demand for labor → change wages → change costs of production → change prices

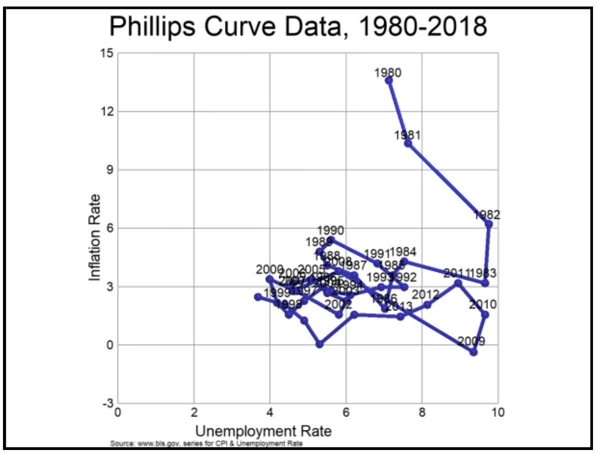
Phillips Curve

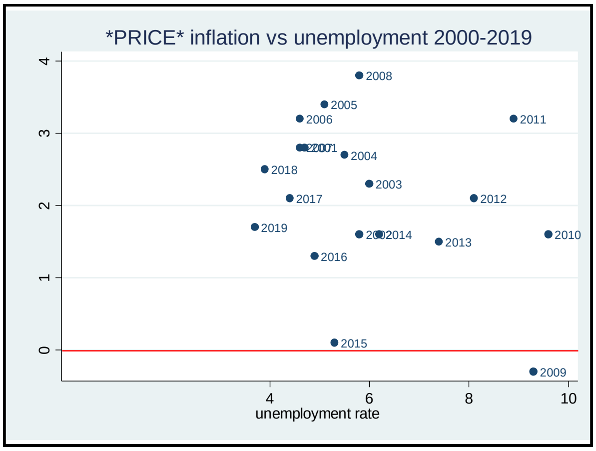



Phillips Curve Scatter 1960-2019
unemployment rate


Phillips Curve Data, 1958-2018
Inflation Rate
Unemployment Rate
Source: www.bls.gov, series on CPI & Unemployment Rate


"Spiraling Inflation"
Phillips Curve, 1958-1980
Inflation Rate
Unemployment Rate
Source: Econ Report of the President, Tables B42 & B64


Phillips Curve Data, 1980-2018
Inflation Rate
Unemployment Rate



Movements Along vs. Shifts

- If aggregate demand changes (which of course then changes GDP, employment, and unemployment), ***move along*** Phillips Curve
- If prices change for some reason other than "change in AD," ***shift of*** Phillips Curve

What makes Phillips Curve shift?

1. Change in inflationary expectations

What makes Phillips Curve shift?

2. cost shocks (“supply shocks”)

What makes Phillips Curve shift?

3. change in labor productivity growth

Interpreting Fed-speak

Question: Interpret the Fed statement from Sept 2009:

> “With substantial resource slack likely to continue to dampen cost pressures and with longer-term inflation expectations stable, the Committee expects that inflation will remain subdued for some time.”

Interpreting Fed-speak

Question: Interpret the Fed statement from Oct 2015:

> “Inflation is anticipated to remain near its recent low level in the near term but the Committee expects inflation to rise gradually toward 2 percent over the medium term as the labor market improves further and the transitory effects of declines in energy and import prices dissipate.”

Fall 2018 statement: Nov 8 2018

Information received since the Federal Open Market Committee met in September indicates that the labor market has continued to strengthen and that economic activity has been rising at a strong rate.

Job gains have been strong, on average, in recent months, and the unemployment rate has declined.

Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year.

On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent.

Indicators of longer-term inflation expectations are little changed, on balance.

Most recent statement (Oct 29-30 2019)

Information received since the Federal Open Market Committee met in September indicates that the labor market remains strong and that economic activity has been rising at a moderate rate.

Job gains have been solid, on average, in recent months, and the unemployment rate has remained low.

Although household spending has been rising at a strong pace, business fixed investment and exports remain weak.

On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent.

Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.

Side by side

Nov 2018	Oct 2019
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Job gains have been strong, on average, in recent months, and the unemployment rate has declined.	Job gains have been solid, on average, in recent months, and the unemployment rate has remained low.
Household spending has continued to grow strongly, while growth of business fixed investment has moderated from its rapid pace earlier in the year.	Although household spending has been rising at a strong pace, business fixed investment and exports remain weak.
On a 12-month basis, both overall inflation and inflation for items other than food and energy remain near 2 percent.	On a 12-month basis, overall inflation and inflation for items other than food and energy are running below 2 percent.
Indicators of longer-term inflation expectations are little changed, on balance.	Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed.