

OUTLINE — December 2, 2019

- The Fed & Monetary Policy
 - Taylor rule
 - Inflation hawks & doves
- 2007-2009 Great Recession
 - Subprime Mortgages, Credit Default Swaps, and AIG
- Challenges Facing the Fed
- What's Next?

Bring electronic device to lecture for evals on Wed Dec. 4

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

Comprehensive Essay due via bCourses, Wed Dec. 11, 8 am

Straightforward: fighting inflation

- **Inflation up?**
 - Fed undertakes *contractionary* monetary policy
 - Raises interest rates
- Net effect?
 - unemployment
 - inflation

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

Straightforward: fighting unemployment

- **Unemployment up?**
 - Fed undertakes *expansionary* monetary policy
 - Lowers interest rates
- Net effect?
 - unemployment
 - inflation

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

Not straightforward: both fights at once

- **↑ inflationary expectations due to increase in inflationary expectations**
- Fed fights back:
 - ↑ interest rates
- Net effects?
 - Unemployment
 - Inflation
 - Fed typically does not "slay" inflation; just fights it

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

The Fed's Dual Mandate

- Fed reacts to inflation and unemployment
- Inflation hawk
- Inflation dove

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

"Taylor Rule"

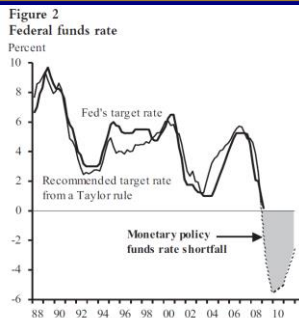
- Taylor Rule
 - An equation for FFR target that seems to fit the data reasonably well (except when we hit ZLB) is the "Taylor Rule" equation
 - Estimated separately for different central banks
 - The equation says: The central bank sets its interest rate target in reaction to inflation and unemployment (or growth rate of GDP)

FFR Target

$$\begin{aligned}
 &= \text{neutral FFR} \\
 &+ A * (\text{actual} - \text{Fed's goal for inflation rate}) \\
 &+ B * (\text{actual} - \text{Fed's goal for } \% \Delta \text{GDP}) \\
 &= \text{neutral FFR} \\
 &+ A * (\text{actual} - \text{Fed's goal for inflation rate}) \\
 &- \beta * (\text{actual} - \text{Fed's goal for unemployment rate})
 \end{aligned}$$

Taylor Rule Subprime & More Challenges What's Next?

Taylor Rule & Actual FFR, pre-2008



Taylor Rule Subprime & More Challenges What's Next?

Inflation Hawks And Doves

- Taylor Rule
 - Fed reacts to inflation and unemployment
- FFR Target*
- $$\begin{aligned}
 &= \text{neutral FFR} \\
 &+ A * (\text{actual} - \text{Fed's goal for inflation rate}) \\
 &- \beta * (\text{actual} - \text{Fed's goal for unemployment rate})
 \end{aligned}$$

Taylor Rule Subprime & More Challenges What's Next?

Using the Taylor Rule

Question: Suppose the Taylor Rule is estimated as

$$\text{FFR target} = 4 + 1.5(\text{actual inflation} - \text{inflation goal}) - 1(\text{actual unemployment} - \text{unempl't goal})$$

And suppose further

inflation goal = 2 percent (use 2, not 0.02)
 unemployment goal = 4 percent (use 4, not 0.04)
 actual inflation = 1 percent
 actual unemployment = 6 percent

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

How it's **supposed** to work

Fed goal: inflation rate 2%, unemployment rate ~4%

- Fed targets federal funds rate and sets IOER
- Substitution between assets changes other interest rates
- Exchange rates change
- Investment & net export spending respond
- Through multiplier, GDP changes
- Employment & unemployment change
- Impacting wages
- And changing inflation
- What could possibly go wrong?

Shifts of Phillips Curve Interest Rate Policy Taylor Rule Challenges

2007-09 downturn

- Most post-WWII downturns triggered by Fed raising interest rates . . . *But not 2007-2009!*
- 2007-09 characterized by a global financial crisis (GFC)
 - What is the crisis?
 - At its most essential: unwillingness to lend
 - What caused the crisis?
 - Asymmetric information, greed, dumb decisions, and more . . .
- What happened to AD in 2007-2009?
 - Consumption decline was key feature
 - And investment spending plummeted too
 - Commonality: effects of the financial crisis
 - Brought on by changes in mortgage lending

Taylor Rule Subprime & More Challenges What's Next?

Home Mortgages

- Mortgage = loan to buy house
- Technological development: FICO score, 1989
 - Allows risk-based pricing
- Home Loans, three levels of risk
 - Prime Alt-A Sub-prime
 - Sub-prime mortgage: borrower has bad credit (FICO<640) or low down payment (< 20 percent)
- Adjustable rate (rather than "fixed rate") mortgage
 - Interest rate & monthly payment change
- New products in early 2000s: 2/28, 3/27, teaser rate
 - And no-doc (no documents) "stated income" loans

Taylor Rule Subprime & More Challenges What's Next?

Housing prices soar with easy credit



Taylor Rule Subprime & More Challenges What's Next?

Subprime Lending

- Crazy loan offers in the subprime market
- “2/28 at teaser rate”
 - Borrow \$400,000 for 30 years, \$0 down, interest only for 2 years, at 4% teaser rate
 - Reset after 2 years to market rate of 8%
 - Monthly payment rises from \$1,333 to \$2,987
- What does a borrower do when payment rises?
 - If house price has risen 25%, refinance at lower rate: Win!!
 - If house price didn't rise fast enough, can't refinance: Must pay the new higher monthly amount.

Taylor Rule Subprime & More Challenges What's Next?

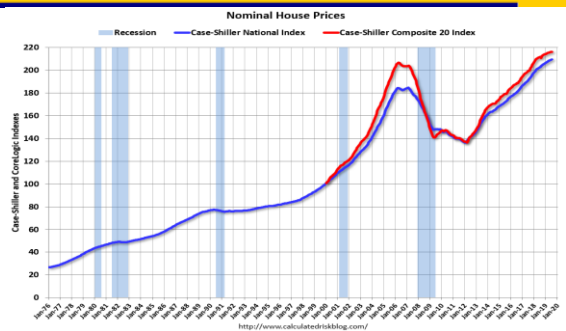
Housing “Bubble”

- Bubble: Rapid & temporary rise of prices
- Speculation?
 - Flip this house
- Buy for \$400,000
 - Appreciate 12% per year
 - In 2 years, worth \$502,000
 - Speculators sell
 - Others refinance
- Unsustainable rate of increase . . . Market forces



Taylor Rule Subprime & More Challenges What's Next?

Housing Prices Peaked 2006-07



Taylor Rule Subprime & More Challenges What's Next?

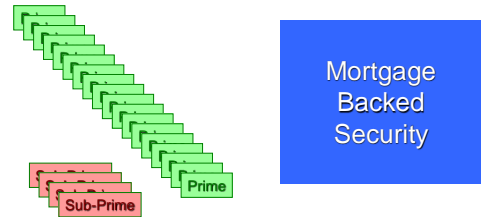
But Then Prices Stopped Rising

- Prices stopped rising, started falling
 - Supply up due to foreclosures
 - Supply up due to need to sell to avoid default
 - Demand down because less credit available
- Unable to refinance?
 - Into default. Possible foreclosure.
- Then Alt-A and Prime mortgages went bad too

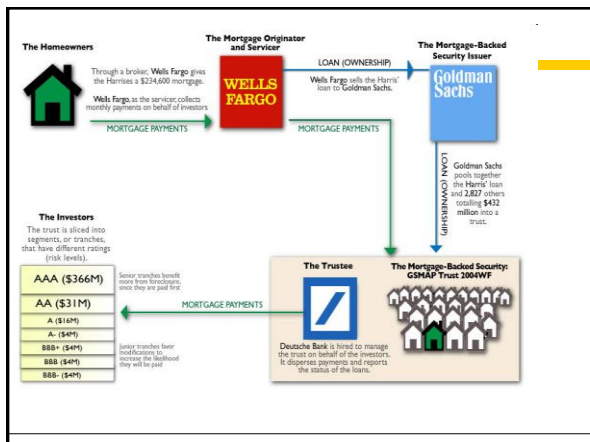
Taylor Rule Subprime & More Challenges What's Next?

Problem: Mortgage Backed Securities

- Bundle together mortgages; sell shares



Taylor Rule Subprime & More Challenges What's Next?



Taylor Rule Subprime & More Challenges What's Next?

Who Bought MBS?

- Everyone . . . In every country
 - Banks
 - Central Banks
 - Hedge Funds
 - Any Financial institution you can name
 - Insurance Companies
 - Pension funds

Taylor Rule Subprime & More Challenges What's Next?

Banks & Insurance

- Banks insure themselves against losses
 - Bank buys insurance policy
 - Insurance company bears risk of default
 - If borrower defaults, bank is paid by insurance company
- Insurance is called “credit default swap”
- Largest insurance company: AIG
 - American International Group
 - Issued trillions of dollars in credit default swaps

Taylor Rule Subprime & More Challenges What's Next?

Credit Default Swap (CDS)

- Insurance against someone else defaulting
 - You buy a CDS on Joe's home mortgage
 - You pay \$2 / year for this CDS (price reflects perceived default risk)
 - If Joe defaults on his debt, you get \$100
 - You are betting that Joe will default
 - Insurance company is betting that Joe won't default
- Key problem: anyone could buy a credit default swap
- What if lots of borrowers default at once?
 - Insurer may be unable to pay
 - Debt-holders who bought CDS have big losses
 - Debt-holders may themselves go bankrupt
 - **Result: Big reduction in credit availability**

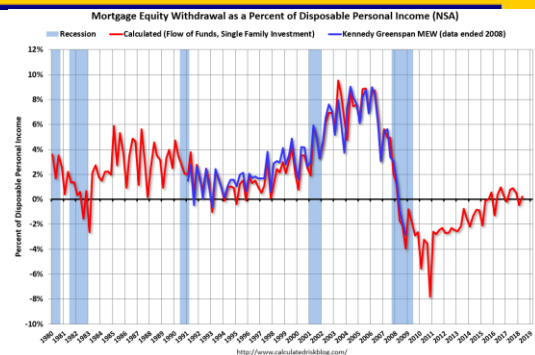
Taylor Rule Subprime & More Challenges What's Next?

AIG (American International Group)

- AIG suddenly had to cover hundreds of billions of dollars worth of CDS
 - . . . And it couldn't
- US federal government bailed out AIG
- So why not let AIG fail?
 - AIG insured all major financial institutions
 - Without insurance, no lending

Taylor Rule Subprime & More Challenges What's Next?

C is no longer funded by home equity



Taylor Rule Subprime & More Challenges What's Next?

Household Wealth Fell



What has made monetary policy challenging?

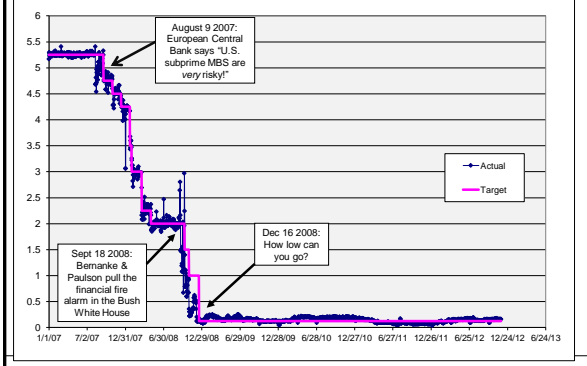
During the 2007-09 crisis, multiple challenges

1. At least initially, Fed's target & actual FFR differed
2. FFR & short-term government rate were at the Zero Lower Bound by December 2008
3. Long-term interest rates didn't fall as far as short-term rates

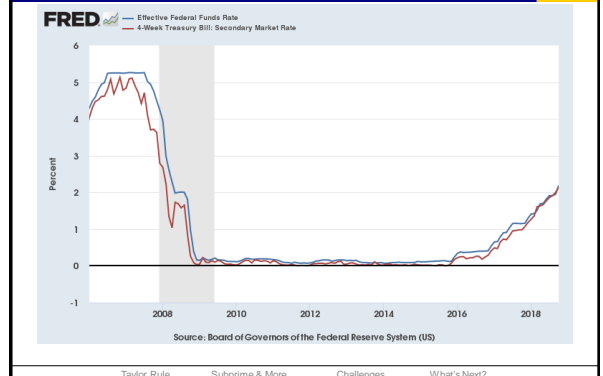
And so Fed undertook Quantitative Easing to lower long-term rates

4. Lenders were not lending

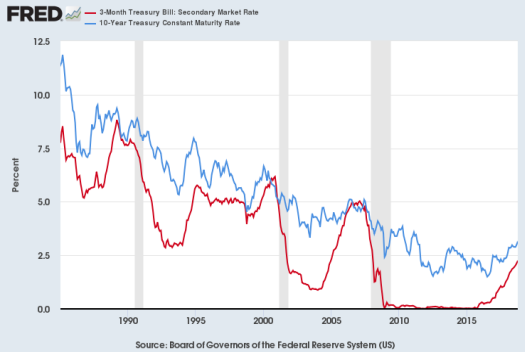
Federal Funds Rate 2007-2012
 What changes first:
 The Target Rate or The Actual Rate?



FFR & Short-Term Government Rate



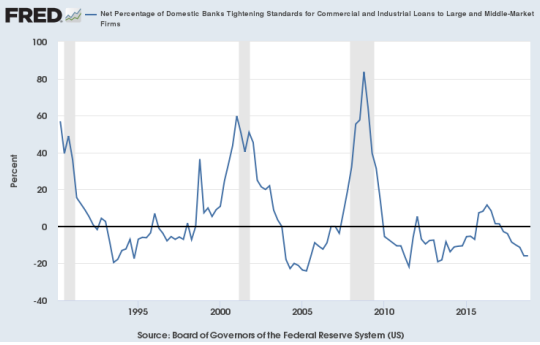
Short-Term & Long-Term Rates



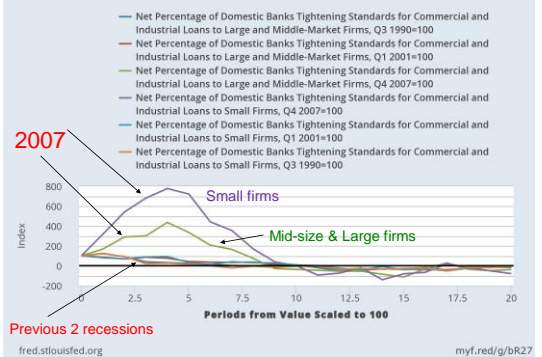
Banks Tightened Lending Standards



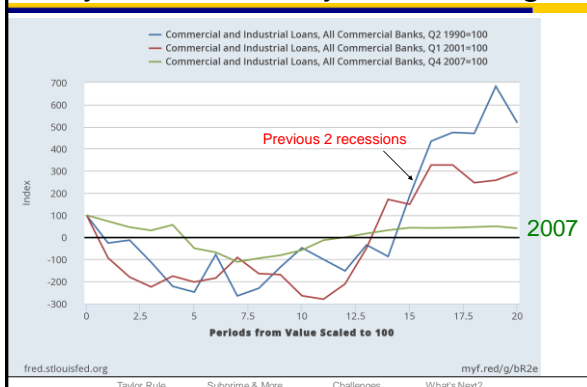
For Midsize & Large Firms, too



And this recession was unusual



By 2012, still very little lending



Challenges today

- Source: Former Fed Chair Janet Yellen speech, Oct. 2016

<https://www.federalreserve.gov/newsevents/speech/yellen20161014a.htm>

- Should we disaggregate "C" (or "I")?
Does a tax cut for high Y have same effect as one for low Y households? Are there systematic differences between firms?
- What's role of finance in determining AD?
Most macro models had no role for finance pre-2009. Many still don't.

Taylor Rule Subprime & More Challenges What's Next?

What determines inflation?

3. What determines inflation?

Do wages really respond to labor market conditions? Do firms really pass labor costs (or savings) on to customers? Which inflationary expectations (near term, far term) matter? And whose inflationary expectations matter (consumers, businesses, wealth-holders)? And how are those expectations formed anyway?

4. How are different economies connected?

What's effect of Fed policy on other countries? Is effect on advanced and emerging countries the same? Does QE have same effect as traditional FOMO? What's effect of monetary policy in other countries on US economy?

Taylor Rule Subprime & More Challenges What's Next?

So what's next?

- Indicators: economy looks strong
 - Unemployment at 3.6 percent
 - Core Inflation (CPI less food & energy) at 2.3 percent
 - At Oct 2019 meeting, Fed lowered IOER & FFR to 1.5% from Dec 2018 high of 2.5%
- But what's on the horizon?
 - Ongoing concern re labor force participation rate
 - Investment has been weak for over a year
 - Trade war and tariffs: direct & uncertainty effects
 - Agriculture feeling pain
 - Recent General Motors announcement re factory closures

Taylor Rule Subprime & More Challenges What's Next?