OUTLINE — November 29, 2017

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

Essay due via bCourses Tues Dec. 5, 8:00 am

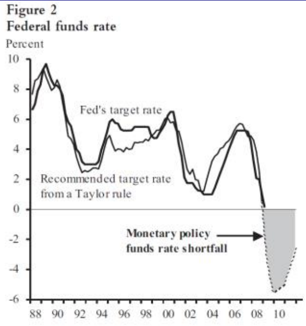
Olney reviews here, M&W of RRR week, but at 10 a.m. (yay!)

Inflation Hawks And Doves

- Taylor Rule
  - Looking at the data, one equation that seems to (usually) fit the data reasonably well is the "Taylor Rule" equation
  - It says: The Fed reacts to inflation and unemployment (or growth rate of GDP)

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

Taylor Rule & Actual FFR, pre-2008



Source: http://www.frbsf.org/economic-research/publications/economic-letter/2009/may/fed-monetary-policy-crisis/

Inflation Hawks And Doves

- Taylor Rule
  - Fed reacts to inflation and unemployment

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

- Inflation hawk
- Inflation dove

Hawks & Doves

2007-09 downturn

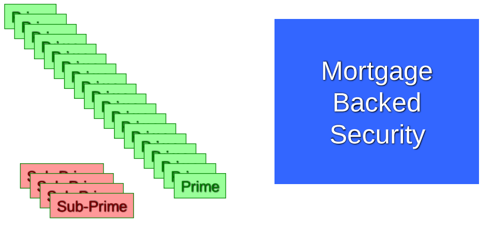
- Most post-WWII downturns triggered by Fed <u>raising</u> interest rates . . . *But not 2007-2009!*
- 2007-09 characterized by a financial crisis
  - What is the crisis?
    - At its most essential: unwillingness to lend
  - What caused the crisis?
    - Asymmetric information, greed, dumb decisions, 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

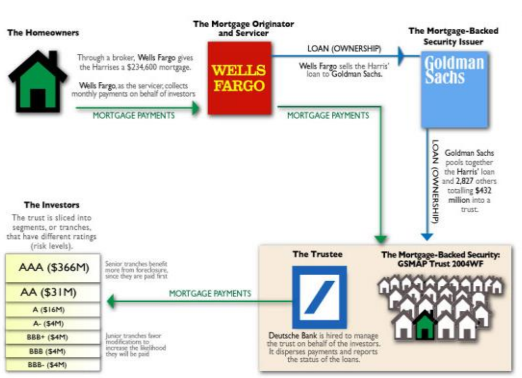
Subprime Mortgages

- Already discussed on November 1
  - 1989 development of FICO score allows risk-based pricing
  - Types of mortgages: Prime, subprime, alt-a
  - New products after 2000: 2/28, 3/27, teaser rate, no-doc
  - Mortgage Backed Securities (MBS)
  - Crisis begins with subprime, spreads to all mortgages
  - 2/28 at teaser rate: Borrow $400K, payment $1,333
    - But reset will raise monthly to $2987
    - If house price has risen 25%, refinance at lower rate: Win, refi
    - If house price didn't rise fast enough, can't refinance: Lose, default
  - Easy credit increased housing prices . . . In short run!

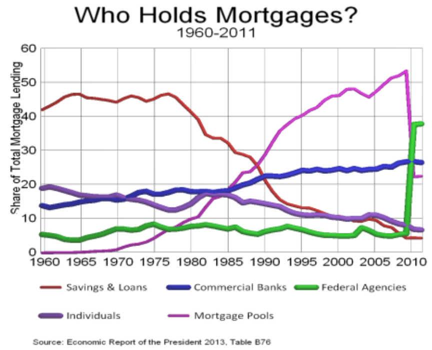
Problem: Mortgage Backed Securities

- Bundle together mortgages; sell shares





The rise of MBS ("mortgage pools")



Who Bought MBS?

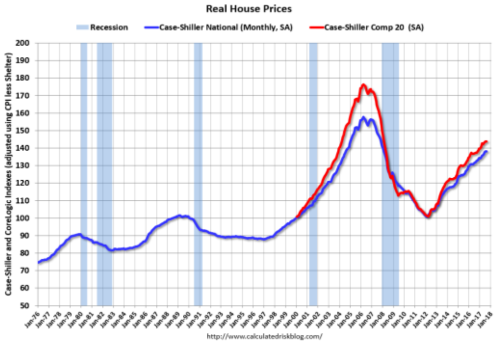
- Everyone . . . In every country
  - Banks
  - Central Banks
  - Hedge Funds
  - Any Financial institution you can name
  - Insurance Companies
  - Pension funds

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"
- Insurance company: AIG
  - American International Group
  - Issued trillions of dollars in credit default swaps

Housing prices soar with easy credit

Housing Prices Peaked 2006-07



Source: http://www.calculatedriskblog.com (accessed 10/31/2017)

But Then Prices Stopped Rising

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

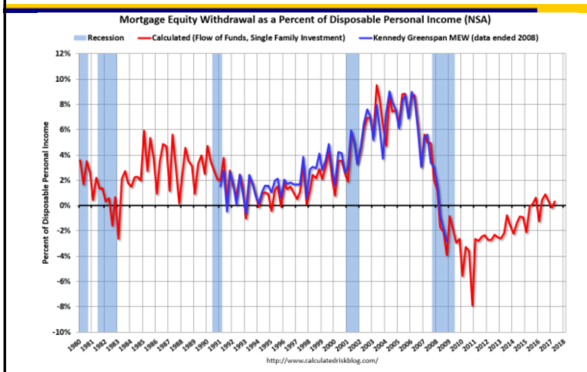
Credit Default Swap (CDS)

- Key problem: anyone could buy a credit default swap
- Insurance against someone else defaulting
  - You buy a CDS on Joe's home mortgage
    - If Joe defaults on his debt, you get $100
    - You pay $2 / year for this CDS (price reflects perceived default risk)
    - You are betting that Joe will default
    - Insurance company is betting that Joe won't default
- 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**

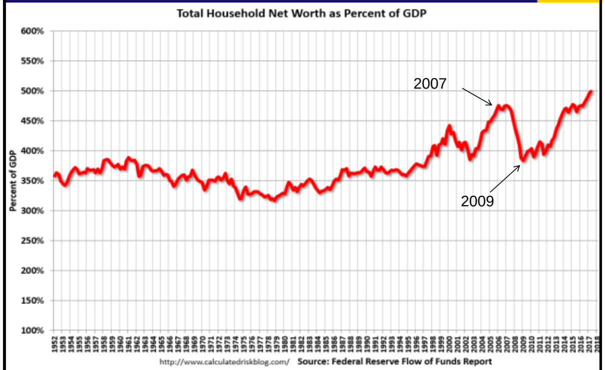
AIG (American International Group)

- 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

C is no longer funded by home equity



Household Wealth Fell

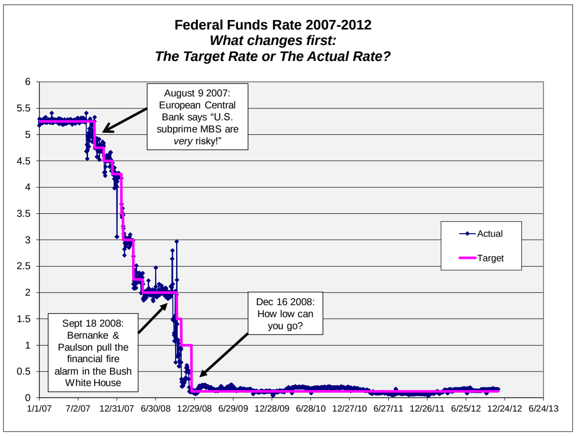


What has made monetary policy challenging?

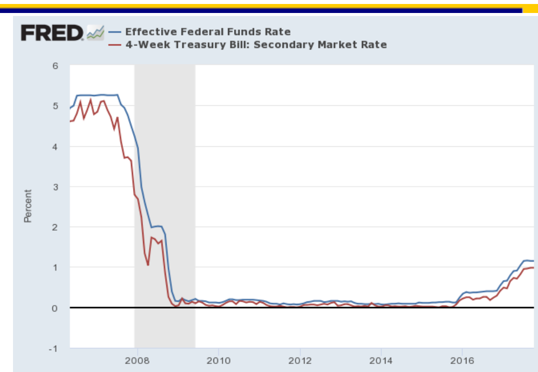
During the 2007-09 crisis, multiple challenges

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

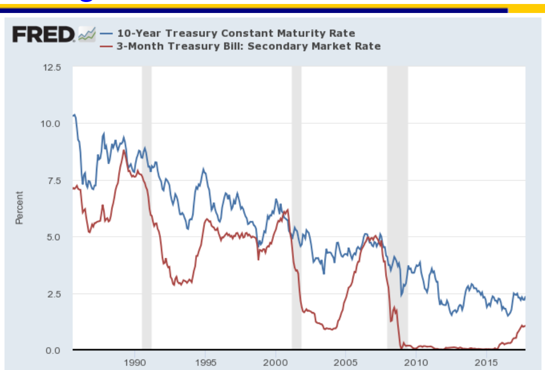
   And so Fed undertook Quantitative Easing to lower long-term rates
4. Lenders were not lending



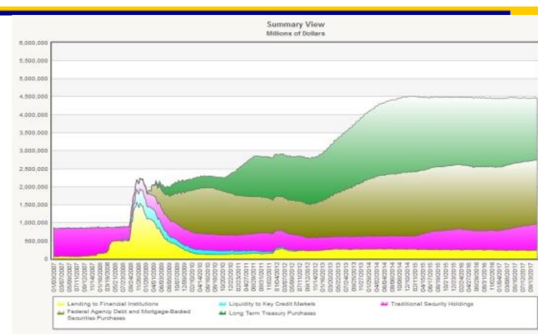
FFR & Short-Term Government Rate



Long-Term & Short-Term Rates

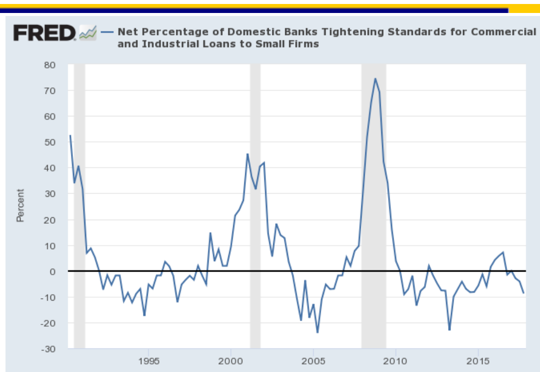


Fed Balance Sheet 2007-2017

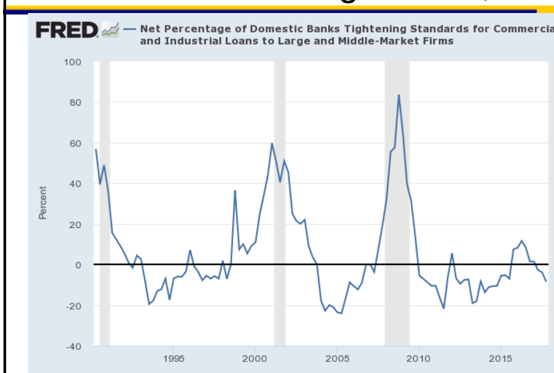


The Fed's Balance Sheet (saw this Nov. 17):
https://www.clevelandfed.org/our-research/indicators-and-data/credit-easing.aspx

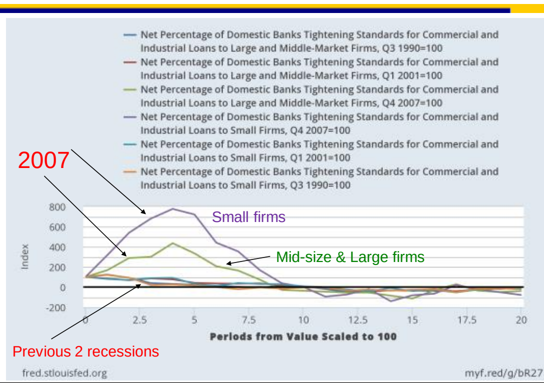
Banks Tightened Lending Standards



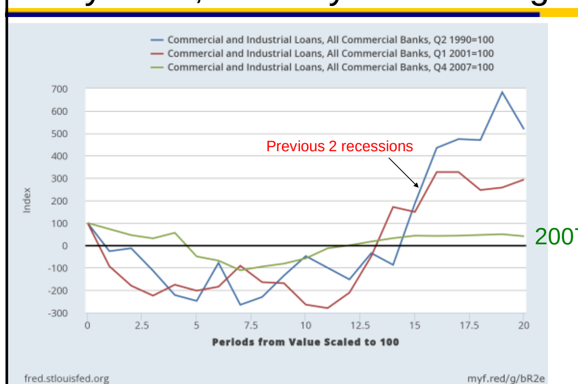
For Midsize & Large Firms, too



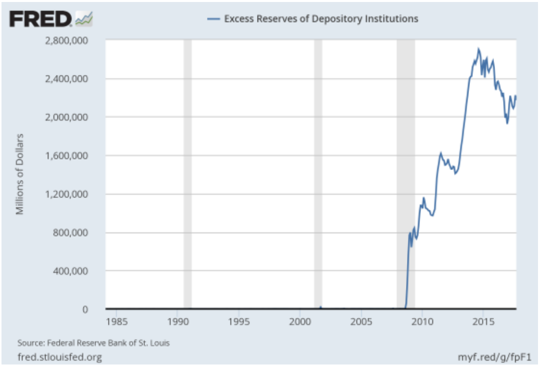
And this recession was unusual



By 2012, still very little lending



Banks no longer "lend all excess reserves"



What is Fed doing now?

- Today, Fed engaged in "normalization" (returning FFR to its neutral rate, ~4 percent)
- And also "unwinding its [balance sheet] position" (returning to a balance sheet with few long-term assets and mostly short-term Treasuries)

Challenges today

- Source: Janet Yellen speech, Oct. 2016
  https://www.federalreserve.gov/newsevents/speech/yellen20161014a.htm

1. Can shortfalls in AD trigger drop in potential GDP?
   Drop in labor supply? Drop in labor productivity growth due to slow growth in Investment?
2. 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?
3. What's role of finance in determining AD?
   What's unique to 2009-2017 due to 2007-09 financial crisis?
4. What determines inflation?
   So many questions I need another slide. . .

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 golly gee, but how are those expectations formed anyway?

5. 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?

So what's next?

- Indicators: economy looks recovered
  - Unemployment at 4.1 percent
  - Core Inflation (inflation less food & energy) at 1.8 percent
  - Fed raising FFR to neutral rate since Dec 2015, now 1.25%
- But now what's on the horizon?
  - Tax plan? Deficit ballooning? (or not?)
  - Trade wars? (or not?)
  - Health insurance cost/availability changing? (or not?)
  - Fed continue gradual normalization? (or not?)