Exam Thursday at 8:00 p.m. will cover Chapters 13 and 14

- Rooms switched from last time
  - 11:00 class now in Peterson 108, 12:30 class now in Peterson 110
- Students will have assigned seats
  - Find your seat assignment and room maps on course webpage
    [http://econweb.ucsd.edu/~jhamilton/Econ110B.html](http://econweb.ucsd.edu/~jhamilton/Econ110B.html)
  - If you have special needs (for example, if you want a left-handed desk) please email Professor Hamilton at jhamilton@ucsd.edu and we will change your seat
- Practice exams 2A and 2B available on course page
- Discussion sections will meet Tuesday Feb 21 (see course web page for details)

Should expect a question from Chapter 13 that asks you to show location of AS and AD 1, 2, and 3 periods following some shock.

AD:
\[ \bar{Y}_t = \bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi}) \]
slopes down
passes through \( \bar{Y}_t = \bar{a}, \pi_t = \bar{\pi} \)

AS:
\[ \pi_t = \pi_{t-1} + \bar{\sigma} + \sigma \bar{Y}_t \]
slopes up
passes through \( \bar{Y}_t = 0, \pi_t = \pi_{t-1} + \bar{\sigma} \)

Outline of Chapter 14 lectures

14.1. Financial frictions
14.2. Deflation
14.4. Unconventional monetary policy: large-scale asset purchases (U.S.: March 2009 to December 2014)
14.5. Unconventional monetary policy: negative interest rates (ECB: June 2014 to today)
14.6. Financial market regulation

14.4. Unconventional monetary policy: large-scale asset purchases (U.S.: March 2009 to Dec 2014)

- Fall of 2008: Fed made a variety of emergency loans, full financial collapse avoided.
- March 2009:
  - Unemployment was 8.7% and rising quickly
  - Year-over-year inflation was -0.7% and falling
  - Fed wanted to stimulate economy even though fed funds rate was already near zero and financial markets were stable

- In March 2009 the interest rate on 3-month Treasury securities was near zero.
- But the yield on 10-year Treasury bond was near 3%.
- Large-scale asset purchases (popularly called “quantitative easing” or QE).
  - Fed would start buying huge quantities of long-term Treasuries and mortgage-backed securities in hopes of bringing their yields down
Fed's assets (billions of dollars)

- Fed paid for these by creating new deposits.
- Deposits with Fed pay 0.25% annual rate, still better than T-bills.
- Banks willing to hold an arbitrary volume (currently $2.2 trillion) due to liquidity trap.

Fed's liabilities (billions of dollars)

- Currency held by public has not increased much despite the huge increase in deposits with the Fed.

- Note LSAP mechanism is very different from conventional monetary policy.
- Conventional policy: Fed is monopoly supplier of deposits with the Fed, change of a few billion dollars would change their yield (= fed funds rate).
- LSAP: Fed is only one buyer in market worth tens of trillions– not clear from economic theory it could have any effect.

10-year yield fell 0.5% within a few minutes of the Fed’s announcement in 2009 that it would begin LSAP.
• The Fed went back to this strategy in 3 separate phases
  • QE1: March 2009 – March 2010
  • QE3: began Nov 2012
    – new purchases cut to half by April 2014 (“taper”)
    – new purchases ended December 2014

But longer-term evidence suggests LSAP had limited effects

Fed stopped adding more to its holdings Dec 2014

Fed is currently taking back about $400 B in reserves using reverse repos

14.5. Unconventional monetary policy: negative interest rates (ECB: June 2014 to today)

• Interest rate on cash can’t go below zero
• But the central bank in fact has the power to cause some interest rates to become negative
• The European Central Bank, Bank of Sweden, Swiss National Bank, Bank of Denmark, and Bank of Japan are all pursuing negative interest rate policies today
Conventional system used by ECB

• ECB pays interest on deposits that banks have in accounts with ECB in excess of requirements
  – No incentive for bank to lend deposits to another bank for less than ECB deposit rate
• ECB will lend deposits to banks at a fixed interest rate
  – No incentive for bank to borrow deposits from another bank for more than ECB lending rate

In July 2012 ECB brought deposit rate down to zero
• In June 2014 brought to -0.1% (charged banks for holding deposits)
  – -0.2% in Sept 2014
  – -0.3% in Dec 2015
  – -0.4% since March 2016

Functions just as always did—banks lend to a rate in between ECB deposit rate (-0.4%) and ECB lending rate (+0.25%)
• In December 2016 interbank lending rate was -0.32%
  – I pay the other bank 0.32% per year to let me lend to them
  – If I don’t get rid of the deposits ECB will charge me 0.40%

An individual bank could also avoid paying ECB 0.4% if it uses deposits to buy a government security
• But then the other bank has the problem (it now will owe ECB 0.4%)
• Banks bid price of government securities above par so they too have a negative yield
Goals

1. Help bring other interest rates down and encourage more borrowing and spending
2. Help bring exchange rate down (will study in Chapter 20)

Drawbacks

1. Banks reluctant to start charging customers to deposit in bank
   -- If they don't charge, erodes bank margins
   -- This may be contributing to financial strains on European banks
   -- This could add to financial frictions, not reduce

Drawbacks

2. If banks do charge for deposits, it creates an incentive for “lockbox shadow bank” to hoard cash
   -- You make a deposit with me
   -- I take funds and stuff them in a box
   -- I give back to you for small fee when you want it (less than a real bank charges)
   -- Defeats whole purpose of spurring investment

14.6. Financial market regulation

- Can better regulatory structure reduce the probability of the turmoil of 2008 recurring?
- Three basic problems
  1. Moral hazard
  2. Too big to fail
  3. Wrong incentives for managers of financial firms

Problem 1: Moral hazard

- Failure of major financial institutions imposes big costs on everybody
  -- Reduced lending, big economic downturn
- Government thus has incentive to bail out banks so they don’t fail.
- But if bank knows it is going to be bailed out, has incentive to take even bigger risks.
Balance sheet of private bank:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans 1,000</td>
<td>Deposits 1,000</td>
</tr>
<tr>
<td>Securities 1,000</td>
<td>Debt 800</td>
</tr>
<tr>
<td>Equity 200</td>
<td></td>
</tr>
</tbody>
</table>

If loans turn out to only be worth 600, taxpayers must put in 200 to keep solvent.

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Equity = 200 - 400 = -200

But if bank’s initial equity was 400 instead of 200, bank absorbs all the losses and taxpayers lose nothing.

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<td>Equity 400</td>
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</table>

Equity = 400 - 400 = 0

Solution: capital requirements

- One solution is thus to require banks to raise more equity
- If you own Bank of America stock, you are part owner of the bank
- When B of A pays dividend to shareholders based on its profits, that takes money out of the bank and gives to the owners
- B of A could be forced instead to retain those profits to build up equity

Bank’s balance sheet after it sells 400 worth of new stock

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<td>Deposits 800</td>
</tr>
<tr>
<td>Securities 1,000</td>
<td>Debt 800</td>
</tr>
<tr>
<td>Cash 400</td>
<td>Equity 400 + 400 = 800</td>
</tr>
</tbody>
</table>

- If equity is needed more quickly, B of A could be ordered to sell new stock
- This brings in new owners and new equity
- Dilutes the holdings of existing stockholders
• Basel III: agreement on bank regulation to be implemented around the world by 2019
• U.S. Federal Reserve implemented even tougher versions of these in 2013

• Basel III raises required minimum ratio of equity to risk-weighted assets from 4% to 6% (U.S. banks now have above 12%)
• Establishes minimum ratio of equity to assets plus off-balance-sheet exposures to 3% (U.S. banks now have above 6%)
• Disallows counting of hybrid assets, goodwill, deferred tax liabilities as “equity”
• But today there is some strong political opposition to Basel III

• Benefits of tougher capital requirements: bank is safer and will not need bailout if bad times come
• Costs of tougher capital requirements: keeps banks from making as many loans which could mean lower total aggregate demand

• Problem 2: Too big to fail

• If bank is too big and systemically important, its failure may start financial chaos
  – Example: failure of Lehman in Sept 2008 triggered financial panic
• Not even clear how to “shut down” Lehman—hundreds of billions of dollars of complicated, interconnected securities
Solutions

- “Living will”– clear plan of how government will liquidate the firm in case of insolvency
- Don’t let any one firm become that big or systemically critical
- Now required as result of Dodd-Frank Act
- But there is current political discussion of changing many of the Dodd-Frank requirements

Problem 3: Misaligned incentives for managers

- Some financial firms made huge profits during the house price bubble.
- Managers earned huge bonuses.
- When bubble collapsed, somebody else took the losses.

Solution: delay bonus pay to managers of financial firms

- Reward manager for good performance in 2005 with a bond that pays off in 2010.
- If firm falls below capital requirements between 2005 and 2010, manager does not receive the pay.