Aggregate Demand

Road Map

- Business Cycle Facts
- Aggregate Demand
- Practice

What is a Business Cycle?...

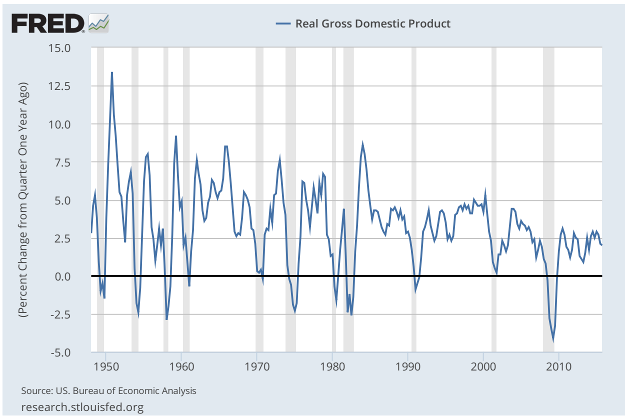
- Short-term economic fluctuations which ...

  "consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions and revivals which merge into the expansion phases of the next cycle."

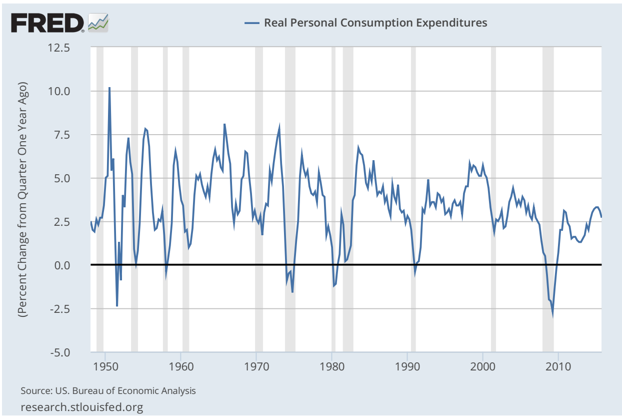
- The "official" cycle dates
  http://www.nber.org/cycles/recessions_faq.html

- Business cycles are recurrent, but not periodic.

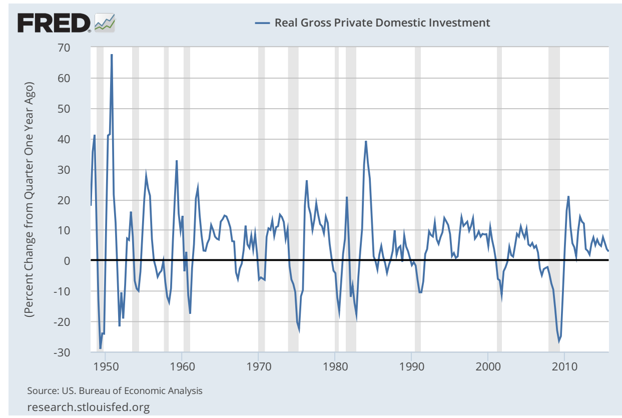
Real GDP Growth



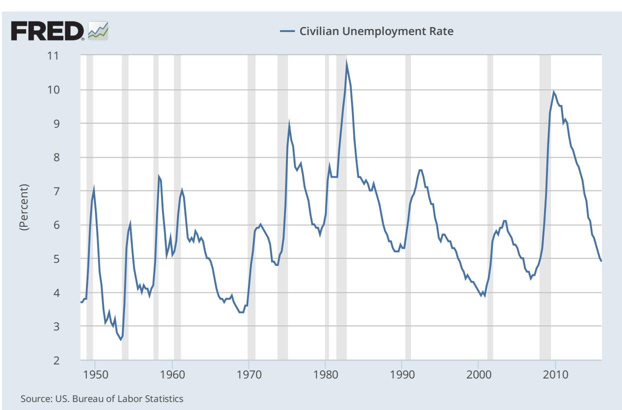
Real Consumption Growth



Real Investment Growth



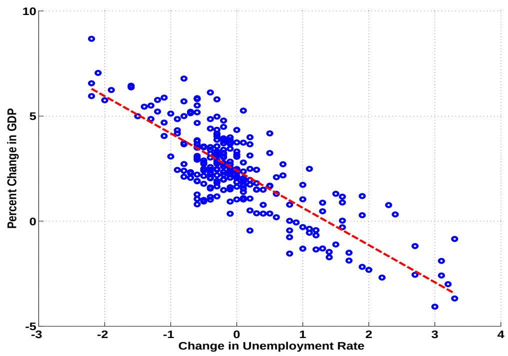
Unemployment Rate



Okun's Law

- Empirical relationship between unemployment and GDP.
- % Change in Real GDP $= 3\% - 2 \times$Change in Unemployment
- Widely used in industry/government for description/prediction purposes.

Okun's Law



Summary of Business Cycle Facts. . .

1. GDP grows on average, but fluctuates around its long-run trend in the short run.
2. Consumption, investment, all fluctuate with GDP.
3. Consumption is less volatile, investment is more volatile than GDP.
4. Okun's law: the negative relationship between GDP and unemployment.

Aggregate Demand and Supply

- The paradigm most policymakers use to think about economic fluctuations and policies to stabilize the economy.
- Shows how the price level and aggregate output are determined.
- Shows how the economy's behavior is different in the short run and long run.

Aggregate Demand

- The aggregate demand curve shows the relationship between the price level and the quantity of output demanded.
- This course: aggregate demand is based on the quantity theory of money (ignore chapters 11-12).

Money Demand is Aggregate Demand

- The demand for real money balances is

$$\frac{M}{P} = k \times Y$$

- This implies an inverse relationship between the aggregate price level and real gdp—just like a demand curve.
- An increase in the price level causes a fall in real money balances M/P, causing a decrease in the demand for goods & services, i.e. lower Y.

Aggregate Demand

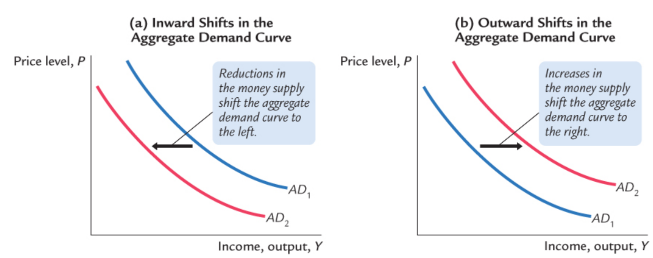
AD + Monetary Policy

- The demand for real money balances is

$$\frac{M}{P} = k \times Y$$

- How does a change in the money supply affect the aggregate demand curve?
  - Increase in M shifts the AD curve out. At any given price level, with more money, more goods and services are demanded.
  - Decrease in M shifts the AD curve in. At any give price level, with less money, less goods and services are demanded.

AD + Monetary Policy



Tools of Monetary Policy

- Open market operations
  - To increase the base, the Fed buys short-term government bonds, paying with reserves/dollars.
  - This reduces short-term nominal interest rates. The policy target is the FED's desired interest rate.
  - Traditional open market operations are constrained by the "zero lower bound" (nominal interest rates must be greater than zero).
- The discount rate
  - The interest rate the Fed charges on loans to banks
- Reserve requirements
  - Regulations that impose a minimum reserve-deposit ratio.

Open Market Operations

- The treasury issues debt: bills, bonds, etc
- Central bank manages the money supply via reserves (i.e. the monetary base, B)
- Balance sheets for
  - Treasury
  - Central bank
  - Private banks

Open Market Operations

Treasury

Assets		Liabilities	
		T-Bills	200

Central bank

Assets		Liabilities	
T-Bills	20	Reserves	20

Banks

Assets		Liabilities	
Reserves	20		
T-Bills	180		

Open Market Operations

Treasury

Assets		Liabilities	
		T-Bills	200

Central bank

Assets		Liabilities	
T-Bills	20	Reserves	20
	+40		+40

Banks

Assets		Liabilities	
Reserves	20		
T-Bills	180		
Reserves	+40		
T-Bills	-40		

Open Market Operations Summary

- Central bank buys bonds in return gives money/reserves (i.e. an increase in the monetary base).
- Increases in the monetary base leads to an increase in the money supply as banks lend out their reserves.
- Implications for nominal interest rates:
  - Fact: Bond prices move opposite of bond yields/interest rates. Ask your Foundations of Finance professor why.
  - As the FED buys bonds, it bids up the price, pushes down interest rates.
  - This is an example of a loosening of monetary policy.
  - How would it work if the FED sold bonds?

AD + Monetary Policy II

- The aggregate demand curve

$$\frac{M}{P} = k \times Y$$

- How is the money supply manipulated? Through the monetary base...
  - Money supply is $M = m \times B$ where m is the money multiplier and B is the monetary base.
  - Substitute into the money demand function...

AD + Monetary Policy II

- The aggregate demand curve with monetary policy tools substituted in is...

$$\frac{m \times B}{P} = k \times Y$$

- Via the manipulations of the monetary base, the FED can affect aggregate demand.
- Open market operations or quantitative easing increase/decrease the monetary base to shift the AD curve out/in.

Example

- Suppose the FED wants to increase Aggregate Demand.
- How does the FED do it...
  - Buy T-bills from banks in exchange for reserves. This increases the monetary base B. Note nominal interest rates decrease here.
  - This this expands the money supply as $M = m \times B$.
- This shifts the aggregate demand curve outward.

Shocks

- "Shocks" are exogenous, unanticipated events that effect economic outcomes.
- Common language policy makers and economists use, e.g. "the US faced an aggregate demand shock"...
- What shocks are possible to the aggregate demand curve?
  - Shocks to "liquidity preference." The k parameter. An example of this from Y2K.
  - Shocks to the money multiplier. The m parameter. Great depression. Fall of 2008. In class example.

Case Study: Great Depression

- From 1929 to 1933:
  - over 9,000 banks closed,
  - money supply fell by 28%
  - Why? Banks became very cautions and increased fraction of reserves held, this reduced the money multiplier.

	August 1929	March 1933	% Change
Money Supply (M)	26.5	19.0	-28.3 %
Monetary Base (B)	7.1	8.4	18.3 %
Money multiplier (m)	3.7	2.3	-37.8 %