The Global Economy

Aggregate Supply & Demand

NYU STERN

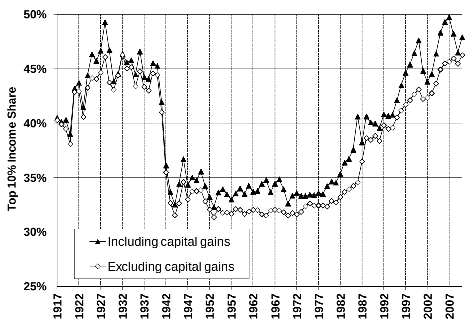
Roadmap

- In the news
- Where we've been…
- Aggregate supply
- Aggregate demand
- Aggregate supply AND demand
- Applications

In the news

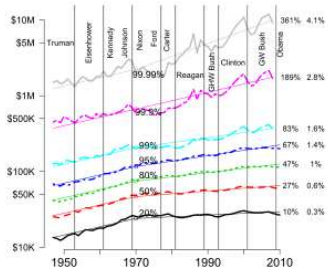
- Charles Kenny, "US inequality," *Business Week*, March 8 2012, via Rajesh Ranjan:
  - Recent analysis suggests about two-thirds of all countries have become more unequal over the past two decades.
- Why do you think this is? Should we do something about it?

In the news



Source: Saez and Piketty

In the news



Where we've been…

- Where we've been: business cycle data
  - Properties: some things are more cyclical than others
  - Indicators: some things lead, some lag
- Where we're headed: business cycle theory
  - Adapt supply/demand diagram to whole economy
  - Examine sources of fluctuations, possible policy responses
  - Today: using the AS/AD diagram
  - Next week: monetary policy and interest rates

Aggregate supply & demand

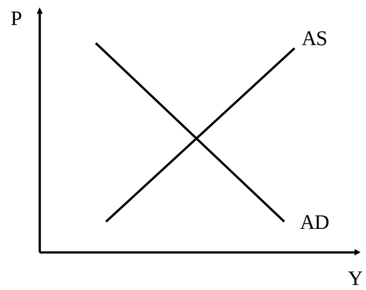
Two perspectives

- Supply is what matters
  - If you build it, people will buy it
  - All we had prior to 1930
- Demand is what matters
  - If there's demand, someone will build it
  - Response to Depression (John Maynard Keynes and others)
  - Paul Krugman?
- What we do
  - Supply AND demand

Aggregate supply and demand

- Adapt supply/demand diagram to whole economy
- Axes
  - P is price level
  - Y is real GDP
  - **Usually interpreted as inflation and GDP growth**
- Curves
  - Supply is about **production** of goods
  - Demand is about **purchases** of goods

Aggregate supply and demand



Aggregate supply

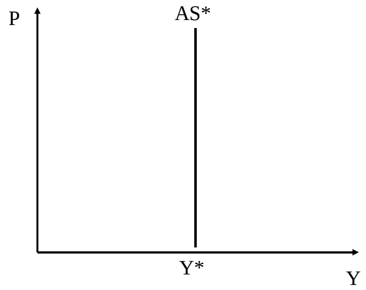
Aggregate supply I

- Supply is about production
- Classical version ["long run"]
- Production function

$$Y = A K^{\alpha} L^{1-\alpha}$$

- At any point in time
  - A is given [but may change over time]
  - K is given [but may change over time]
  - L reflects "equilibrium" in labor market
- Y must therefore be "given" [and AS vertical]

Aggregate supply I



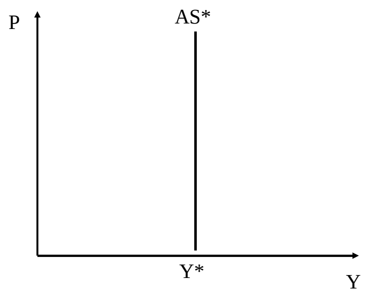
Aggregate supply I

- Reminder:

$$Y = A K^{\alpha} L^{1-\alpha}$$

- Over time, what happens when these change?
  - A?
  - K?
  - L?
- How do we represent this in the diagram?

Aggregate supply I



Aggregate supply I

- Oil prices
- An increase is like a drop in TFP
- Why?
  - Think about total payments to capital, labor, and oil producers
  - If more goes to oil producers, there's less for capital and labor
  - Our measure of output is payments to capital and labor, so it's gone down
  - If oil producers are local the lost revenue would show up there, but if they're abroad, local output falls
  - That's just like a fall in productivity: AS shifts left

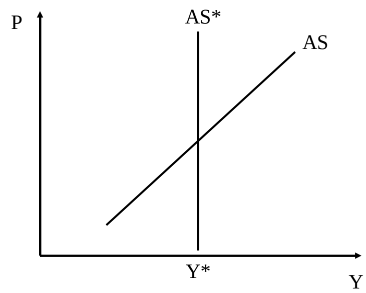
Aggregate supply II

- Keynesian version ["short run"]
- Production function

$$Y = A K^{\alpha} L^{1-\alpha}$$

- At any point in time
  - A, K given
  - Simple version: nominal wage "sticky"
  - Increase in P reduces real wage, firms hire more workers
  - More L implies more Y ⇨ AS curve slopes upward
- Wage eventually adjusts, bringing us back to AS*

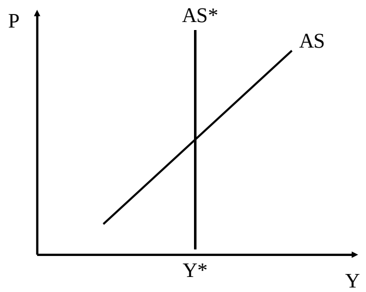
Aggregate supply II



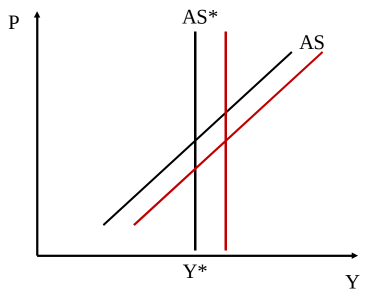
Aggregate supply: shifts

- What happens to aggregate supply if we
  - Change A or K?
  - Change price of oil?
- Note: both AS and AS* shift – and by same amount

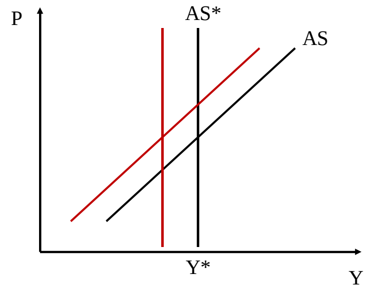
Aggregate supply II



Aggregate supply: shifts



Aggregate supply: shifts



Aggregate demand

Aggregate demand

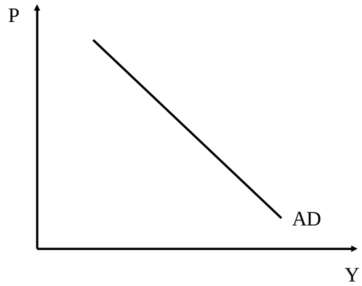
- Basic version
  - Quantity theory generates inverse relation between P and Y

$$M V = P Y$$

$$P = M V / Y$$

  - Given (M,V), high Y associated with low P
  - What happens if M rises?

Aggregate demand

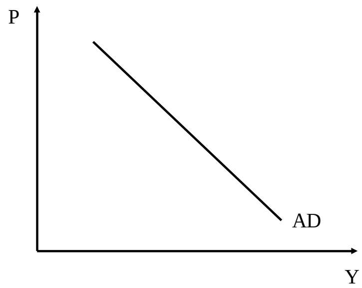


Aggregate demand

- Sophisticated version (more than we need)
  - Demand for money depends on nominal interest rate i

    $M/P = Y/V(i) \; [= Y\,L(i)]$
  - At higher interest rate, velocity higher, we hold less money
  - At given (M,V), high P associated with low Y (as before)
  - But: if we increase M, that would lead directly to higher M or P, or decrease i, which raises demand for interest-sensitive products (cars, houses, plant and equipment)
  - Yes, this is quick and dirty, but the shortcut is worth it

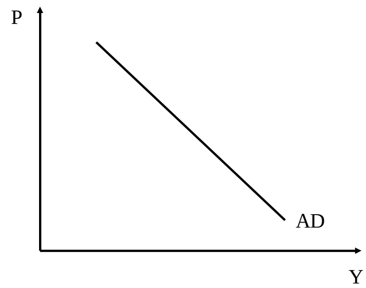
Aggregate demand



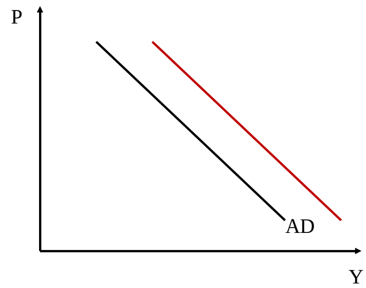
Aggregate demand: shifts

- What happens to aggregate demand if we
  - Increase M?
  - Increase G?
  - Increase something that changes consumption or investment demand (“optimism”?)

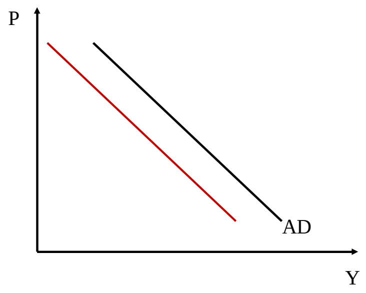
Aggregate demand: shifts



Aggregate demand: shifts



Aggregate demand: shifts

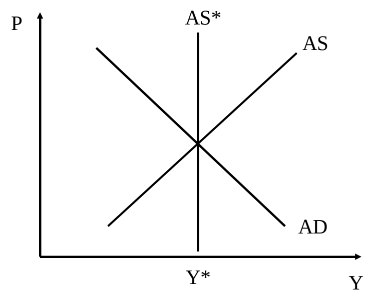


Aggregate supply & demand

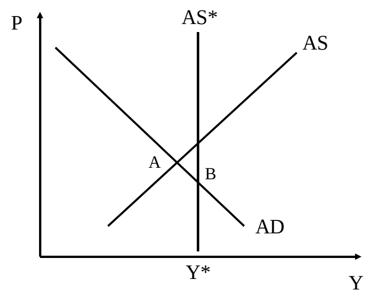
Equilibrium

- Equilibrium: where supply and demand cross
  - Which ones?
- Short-run equilibrium
  - Where AS and AD cross
- Long-run equilibrium
  - Where AS* and AD cross
- Question for later: how do you get from one to the other?

Equilibrium



Equilibrium ?



Equilibrium

- Start at A
  - At A, real wage is too high
    [How do we know that? Y is below Y*]
- How do we get to B?
  - Wage too high, so let's say it falls
  - That moves AS to the right until it crosses AS* at B
  - Wages "sticky," not stuck forever
  - At lower wage, firms hire more workers, output rises

Applications of the AS/AD model

Applications

- Increase money supply M
- Increase government purchases G
- Increase productivity A
- Increase price of oil

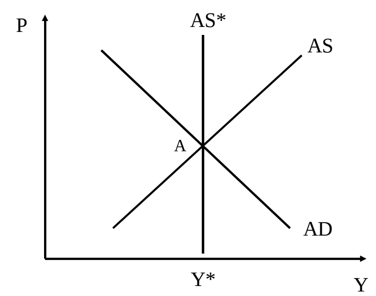
Applications

- Action plan
  - Start somewhere: curves (AS*, AS, AD)
  - Where are the short-run and long-run equilibria?
  - Suggest an application – which curve shifts?
  - What are the new short-run and long-run equilibria?
  - What happens to Y and P?

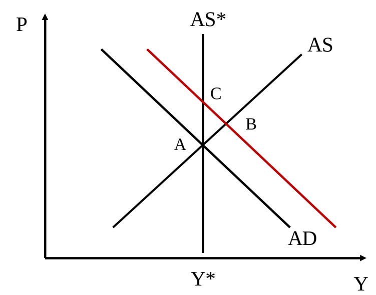
Application: more money

- Increase supply of money
- Which curve shifts? Which way?
- What happens to Y and P?

Application: more money



Application: more money



Application: more money

- Start at A: short run and long run equilibrium
- More money: AD shifts right
- New short-run equilibrium at B
  - Higher prices, higher output
- New long-run equilibrium at C
  - Higher prices, output unchanged (!)
- Why? Does this make sense to you?

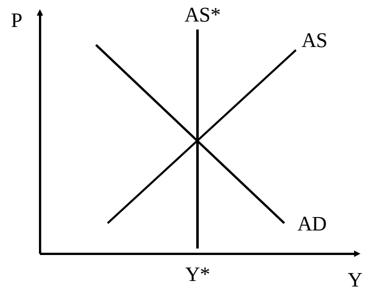
Application: more money

- How does this compare to our analysis of hyperinflations?
- Hyperinflation
  - More money generates higher prices
- AS/AD
  - Short run: higher prices AND higher output
  - Long run: only higher prices
- What about Milton Friedman
  - Is "inflation always and everywhere a monetary phenomenon"?

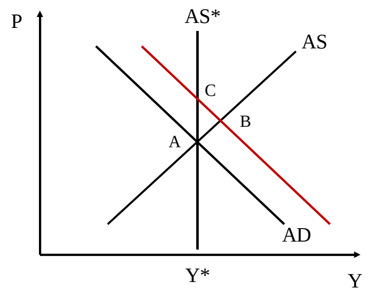
Application: fiscal stimulus

- Increase government purchases
- Which curve shifts? Which way?
- What happens to Y and P?

Application: fiscal stimulus



Application: fiscal stimulus



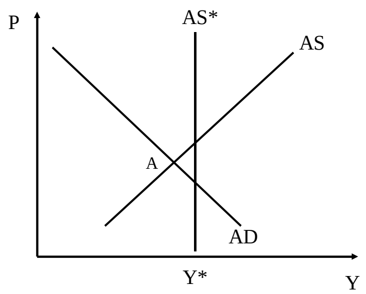
Application: fiscal stimulus

- Analysis same as previous one
  - AD shifts right
  - Short run impact: Y and P both rise
  - Long run impact: only P rises

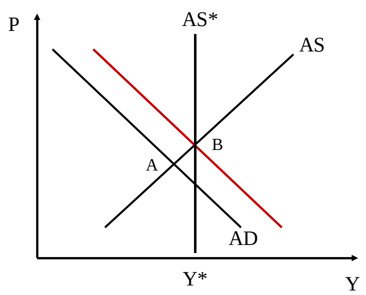
Application: fiscal stimulus

- Do we need more of it?
  - Krugman and others: we should have had more stimulus
  - What's the argument?

Application: fiscal stimulus



Application: fiscal stimulus



Application: fiscal stimulus

- How powerful is fiscal stimulus?
  - The "multiplier" m: if G goes up $1, Y goes up $m
  - Best guess: multiplier around one, maybe less
  - Estimates range from 0 to 2
  - Takes 1-2 years to implement
- What about tax cuts?
  - We estimate 70-75% of temporary tax cuts are saved
  - Hence: not an increase in demand
- Where does this leave Krugman?

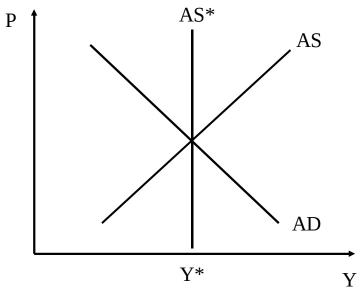
Application: fiscal stimulus

- David Cameron @ NYU, March 16, 2012
  - Q: Is Keysianism dead?
  - A: I don't think there's a huge difference between our approaches [stimulus in the US, austerity in the UK]. We both want to get growth. We both want to deal with our deficits.
  - As for Keynes: Of course government can stimulate economic activity. But when you're borrowing around 10% of your GDP, as we were in 2010, when the markets are beginning to ask, are you going to pay your debts? In that case, stimulus could raise interest rates and slow the economy. So I think you need to be practical.

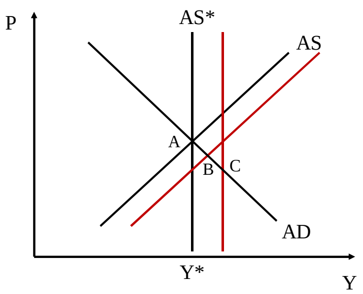
Application: productivity

- Increase productivity A
- Which curve shifts? Which way?
- What happens to Y and P?

Application: more productivity



Application: more productivity



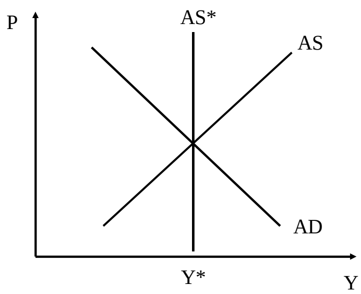
Application: more productivity

- Start at A: short-run and long-run equilibrium
- More productivity: AS and AS* shift right
- New short-run equilibrium at B
  - Lower prices, higher output
- New long-run equilibrium at C
  - Even lower prices, higher output
- Why? Does this make sense to you?

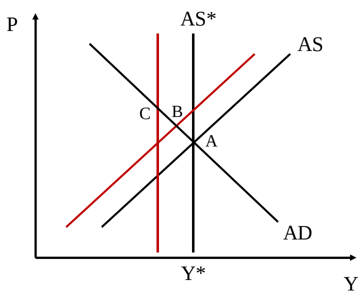
Application: higher oil prices

- Increase oil prices
- Which curve shifts? Which way?
- What happens to Y and P?

Application: higher oil prices



Aggregate supply: higher oil prices



Application: higher oil prices

- Start at A: short run and long run equilibrium
- Higher oil prices: AS and AS* shift left
- New short-run equilibrium at B
  - Higher prices, lower output
- New long-run equilibrium at C
  - Even higher prices, lower output
- Why? Does this make sense to you?

What have we learned?

- Aggregate supply and demand is the analyst standard
  - Supply refers to production, affected by productivity, oil prices, etc
  - Demand refers to purchases, affected by money supply, fiscal policy, etc
- Summary
  - In the long run, output is determined by the production function (the first half of the course)
  - In the short run, things like the money supply and government purchases also matter

The Global Economy

Policy in the AS/AD Model

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Roadmap

- Problem Set #3
- In the news
- AS/AD review
- Where do business cycles come from?
- Policy goals and responses
- What happened?

Problem Set #3

- Answers will be posted Tuesday

In the news

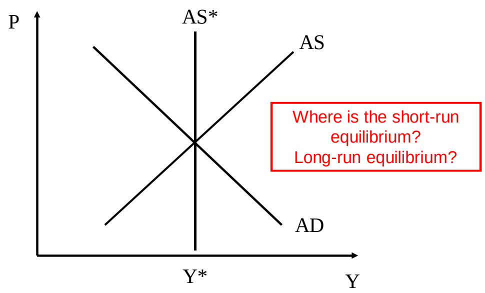
- "France in denial," *The Economist*, March 31, 2012
  - What is most striking about the French election is how little anybody is saying about the country's dire economic straits. Nobody has a serious agenda for reducing France's eye-watering taxes. Meanwhile, public debt is at 90% of GDP and rising, and public spending, at 56% of GDP, gobbles up a bigger chunk of output than in any other euro-zone country – more even than Sweden.
- What's going on here? Good or bad? What would you suggest?

AS/AD review

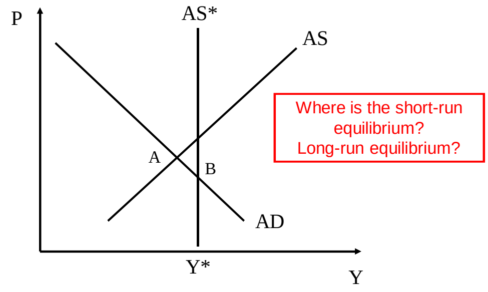
AS/AD review

- Aggregate supply and demand
  - Supply concerns the production of goods
  - Demands concerns purchases of goods
- How to use them
  - Short-run equilibrium: where AS and AD cross
  - Long-run equilibrium: where AS* and AD cross
- What shifts them
  - AD: money supply, government purchases, "optimism"
  - AS & AS*: productivity, capital stock, oil prices
  - Rule of thumb: AS and AS* shift left/right by the same amount

Equilibrium



Equilibrium ?

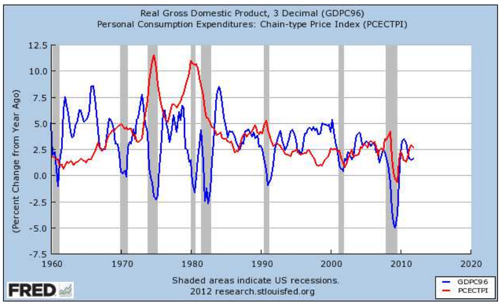


Where do business cycles come from?

Inflation and growth

- Why do they change?
- Shifts in AS and AD?
- Which one?
- How can we tell?

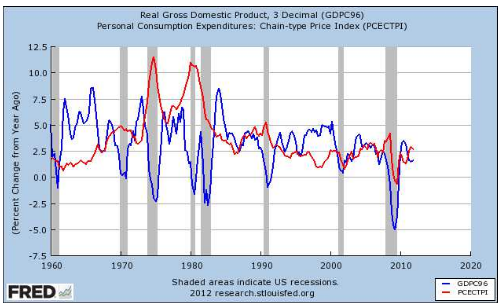
Inflation and growth



Inflation and growth

- Would you expect to see high growth associated with high or low inflation? Why?
- How would inflation and growth be related if
  - Most shifts were in AD?
  - Most shifts were in AS/AS*?
- Where do you see demand “shocks”?
- Where do you see supply “shocks”?

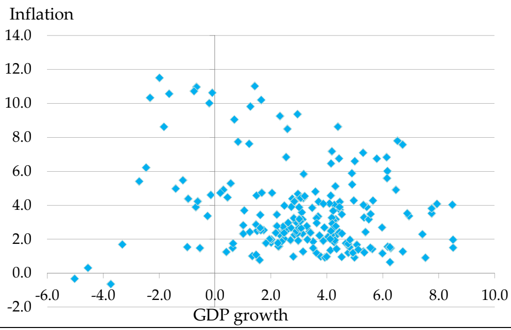
Inflation and growth



Inflation and growth

- Do we see mostly supply or demand shocks?

Inflation and growth



Policy goals and responses

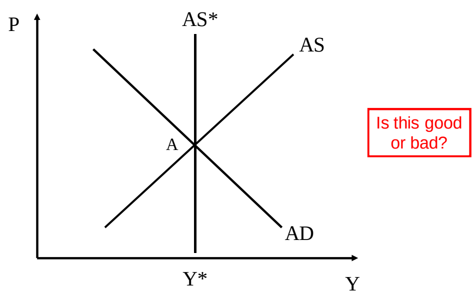
Policy goals and responses

- The idea
  - Monetary policy should respond differently to changes in output that result from supply and demand shifts
  - Accommodate one, offset the other
  - Intuitive only when you understand it – not before!

Policy goals and responses

- What are our policy goals?
  - Low inflation or stable prices [why?]
  - Output at or near Y* [invisible hand again]
- How would we reach them?
  - Typically monetary policy, which shifts AD
  - Could use fiscal policy, too, but it takes longer to implement

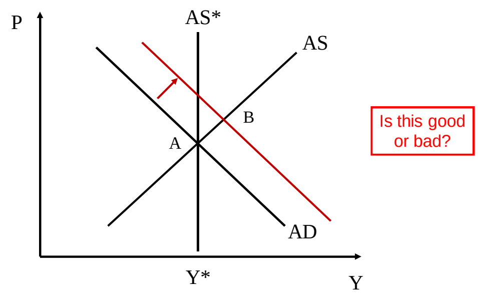
Policy goals and responses



Policy goals and responses

- What happens if demand shifts right?
  - What might do this?
  - Are things better or worse?

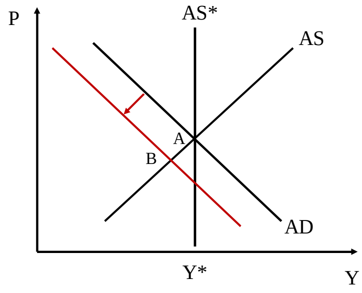
Policy goals and responses



Policy goals and responses

- What happens if demand shifts left?
  - What might do this?
  - Are things better or worse?

Policy goals and responses

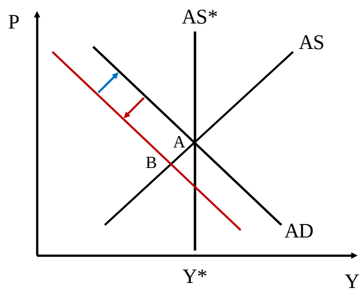


Is this good or bad?

Policy goals and responses

- How should we respond to a demand shift?
  - What should we do?
  - How would we do it?

Policy goals and responses



What should policy do?

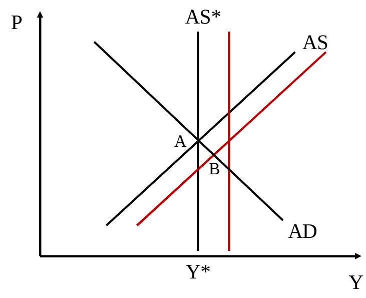
Policy goals and responses

- How should we respond to a demand shift?
  - Reverse it: use (say) monetary policy to shift demand back to A
- Does this make sense to you?

Policy goals and responses

- Now do the same thing with supply shifts
- Same logic, but keep your eyes open for something new
- What happens if supply shifts right?
  - What might do this?
  - Are things better or worse?

Policy goals and responses

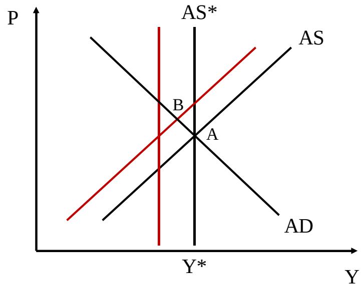


Is this good or bad?

Policy goals and responses

- What happens if supply shifts left?
  - What might do this?
  - Are things better or worse?

Policy goals and responses

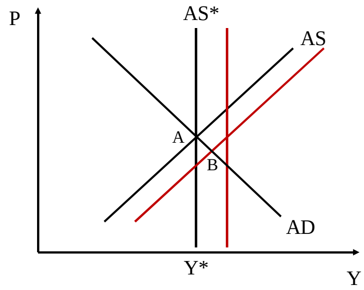


Is this good or bad?

Policy goals and responses

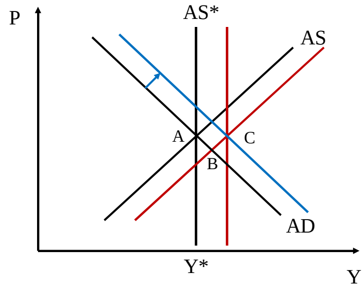
- How should we respond to a supply shift?
  - What should we do?
  - How should we do it?
- Reminder: policy goals are
  - Stable prices
  - Output at or near Y*

Policy goals and responses



What should policy do?

Policy goals and responses

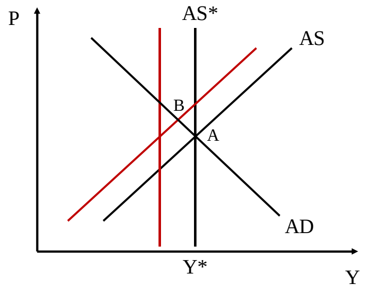


Why is C good?

Policy goals and responses

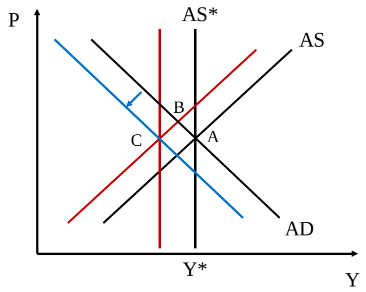
- How should we respond to a supply shift?
  - Reinforce or "accommodate" it: shift AD in same direction as AS
- Does this make sense?

Policy goals and responses



What should policy do?

Policy goals and responses



Why is C good?

Policy goals and responses

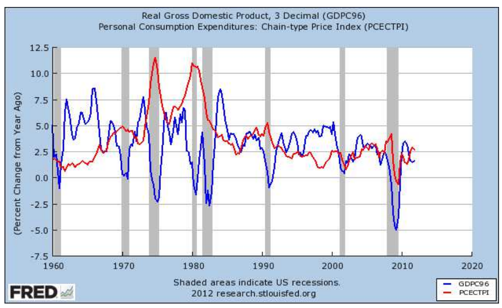
- How should we respond to a supply shift?
  - Reinforce or "accommodate" it: shift AD in same direction as AS
- Does it make sense to lower output further?

What happened?

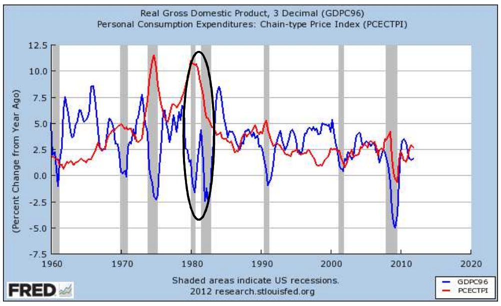
What happened?

- In the mid 1970s?
  - GDP growth low, inflation jumped up
- In the early 1980s
  - Double-dip recession, inflation fell sharply
- In the late 1990s?
  - GDP growth high, inflation remained low

What happened?



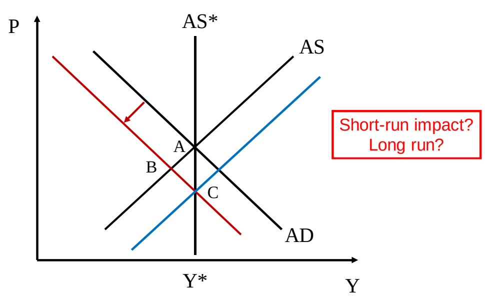
What happened in the early 1980s?



What happened in the early 1980s?

- In the early 1980s?
  - Double dip recession, inflation dropped sharply
- Order of events
  - Volcker appointed head of Fed, charged with killing inflation
  - Reduced money growth, interest rates rose sharply
  - After a year or two, inflation dropped
- How did this work? Shift in supply or demand?

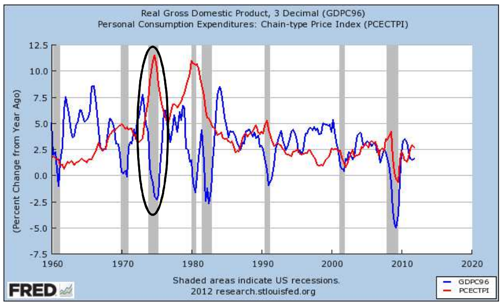
What happened in the early 1980s?



What happened in the early 1980s?

- Standard interpretation
  - Fed shifted AD back sharply
  - Short run impact: recession, lower inflation (A to B)
  - Long-run impact: much lower inflation (B to C)

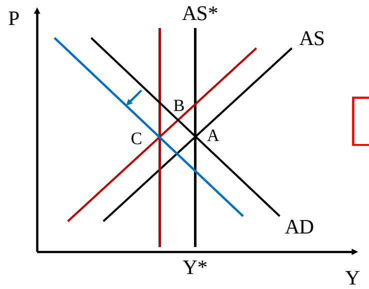
What happened in the mid-1970s?



What happened in the mid-1970s?

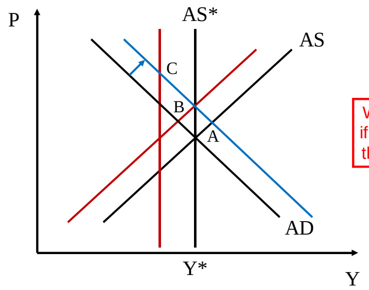
- In the mid 1970s?
  - GDP growth low, inflation jumped up
- Order of events
  - OPEC raised oil prices from $15 to $30
  - Output fell
  - Inflation soared – and stayed up
- How did this work? Shift in supply or demand?

What happened in mid-1970s?



What should Fed do?

What happened in mid-1970s?

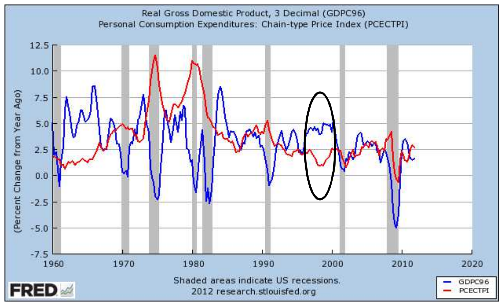


What happens if Fed shifts AD the other way?

What happened in the mid-1970s?

- Standard interpretation of 1970s inflation
  - OPEC was a shift left in AS/AS*
  - Fed should therefore accommodate, shift AD left
  - If so, we would have seen a drop in Y but stable prices
  - But the Fed shifted AD right, raising inflation sharply
  - Long-run output response the same in both cases

What happened in the late 1990s?



What happened in the late 1990s?

- In the late 1990s
  - The economy is booming
  - Is it "overheating"?
  - What should the Fed do?
- Recall:
  - If high demand, Fed should reverse it
  - If high supply, Fed should accommodate
  - Which was it? How can you tell?

What have we learned?

- Shifts to supply and demand move GDP growth and inflation around
- AS/AD model suggests we should
  - "Offset" demand shifts
  - "Accommodate" supply shifts
- How do you tell them apart?
  - Ask yourself whether inflation and GDP growth are moving in the same direction or not

For the ride home

- Should Fed dramatically expand money supply and/or use other methods to increase demand?
- Are you worried more right now about
  - Low growth?
  - Inflation?

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