Summary of IS-LM and AS-AD

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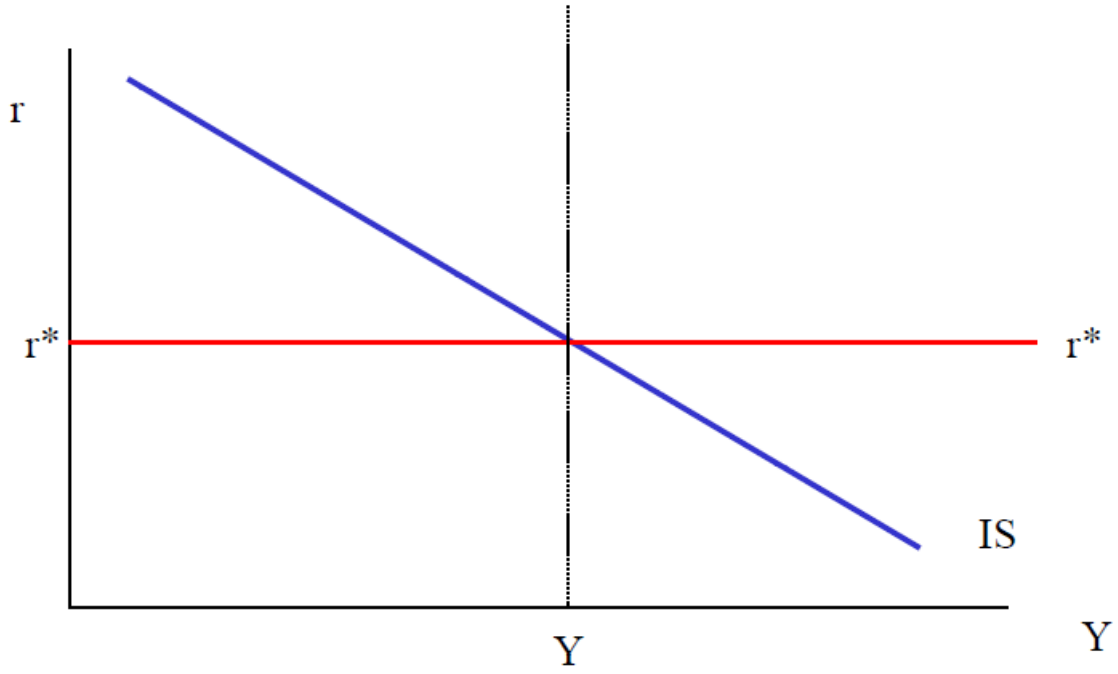
The Goods Market

- This is in equilibrium when the demand for goods equals the supply of goods.

$$Y = C + I + G + NX$$

- Higher real interest rates mean there is less demand for spending.
  - Consumers choose to save instead of spend.
  - Businesses discouraged from borrowing for investment.
- So higher real interest rates mean the goods market equilibrium (demand = supply) occurs at a lower level of supply, i.e. lower GDP>

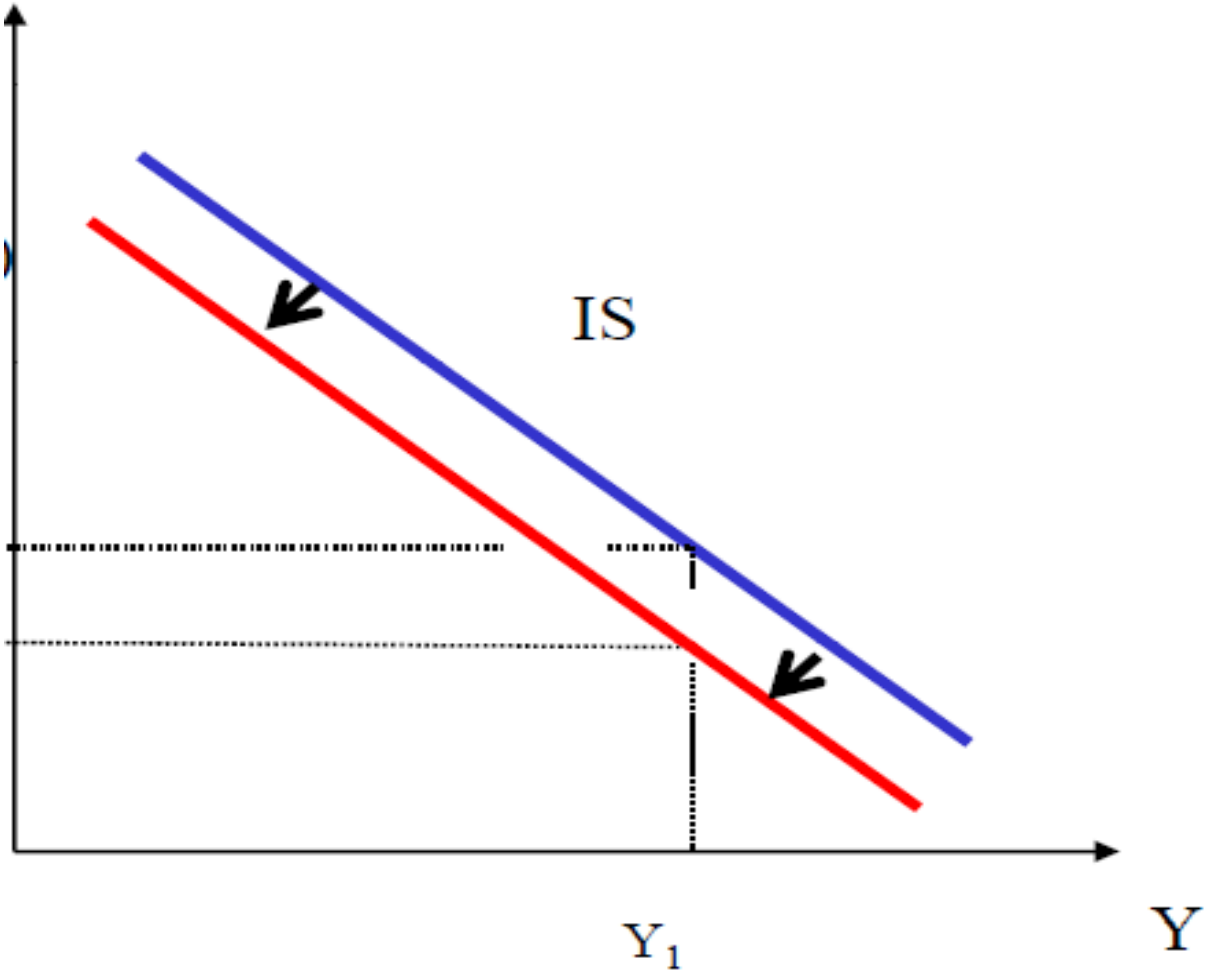
The IS Curve



Shifts in the IS Curve

- Anything that leads to higher demand for spending that is NOT real interest rates will shift the IS curve to the right. This includes
  - Improvements in consumer\business sentiment.
  - Higher government spending.
  - Lower taxes.
  - Good news about the future of the economy.
- The opposite type of developments (e.g. lower consumer sentiment) will shift the IS curve to the left.

A Fall in Consumer Confidence



The Money Market: Demand

- You have to keep all of your assets in one of two forms
  - Money, which bears no interest but can be used for transactions.
  - Bonds, which pay an interest rate of r.
- Three factors determine the demand for money
  - **GDP**: More GDP means you need more money for transactions.
  - **Prices**: Doubling prices means you need double the money for transactions
  - **Interest Rates**: Higher interest rates means less demand for money and more demand for bonds.

An Equation for Money Demand

An equation to describe this would look like this:

$$M^d = PL(Y, r)$$

Where

$$\frac{\partial L(Y, r)}{\partial Y} > 0$$

$$\frac{\partial L(Y, r)}{\partial r} < 0$$

Money Supply

- This is set by the central bank.
- In reality, the central bank only controls the monetary base (currency and reserves at the central bank).
- The money supply includes bank deposits and depends in a complex way on the behaviour of the banking system.
- So this is a major simplification of the IS-LM model.

Money Market Equilibrium

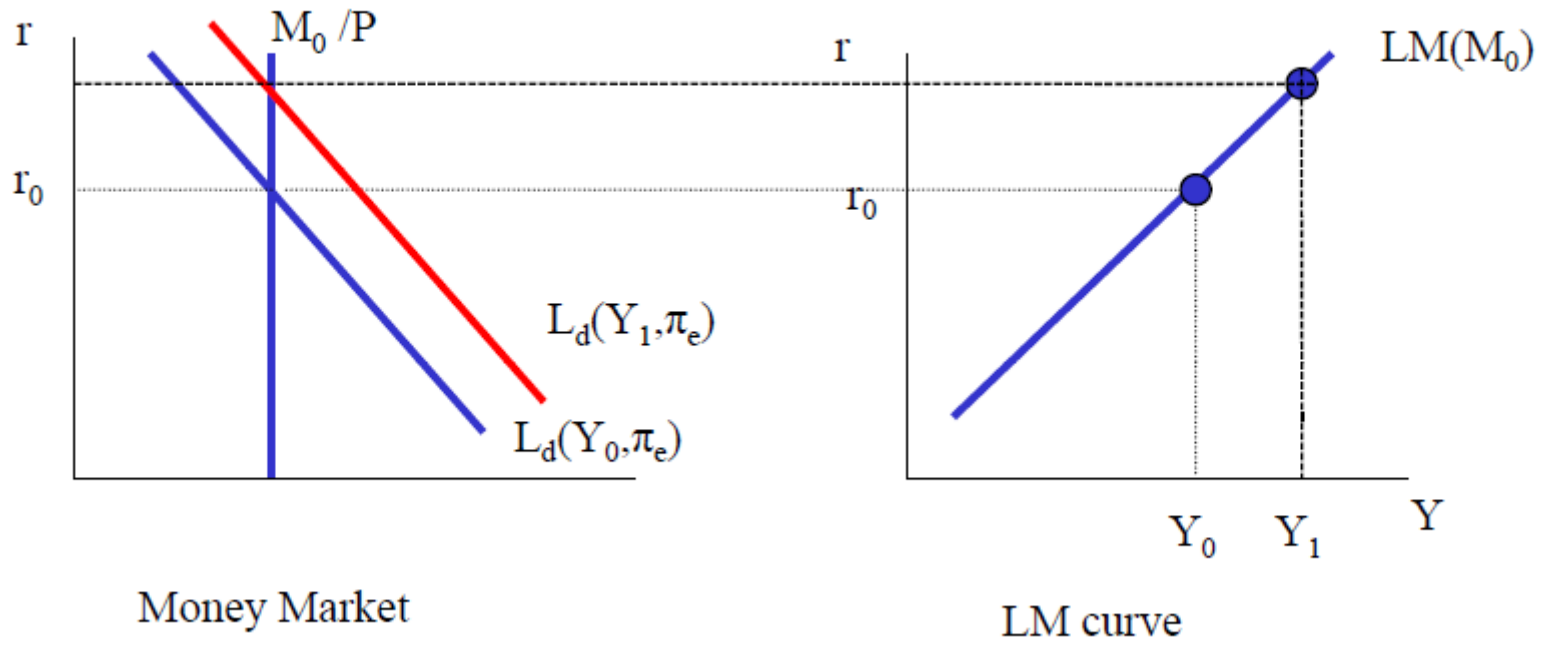
- This occurs when the amount of money demanded equals the amount supplied by the central bank.

$$M^s = PL\,(Y, r)$$

- Assume, the market is in equilibrium, what happens when GDP goes up, thus raising demand for money.
- If the price level and money supply are fixed, then equilibrium can only be restored via higher interest rates.
- This is why the LM curve slopes up.

The LM Curve

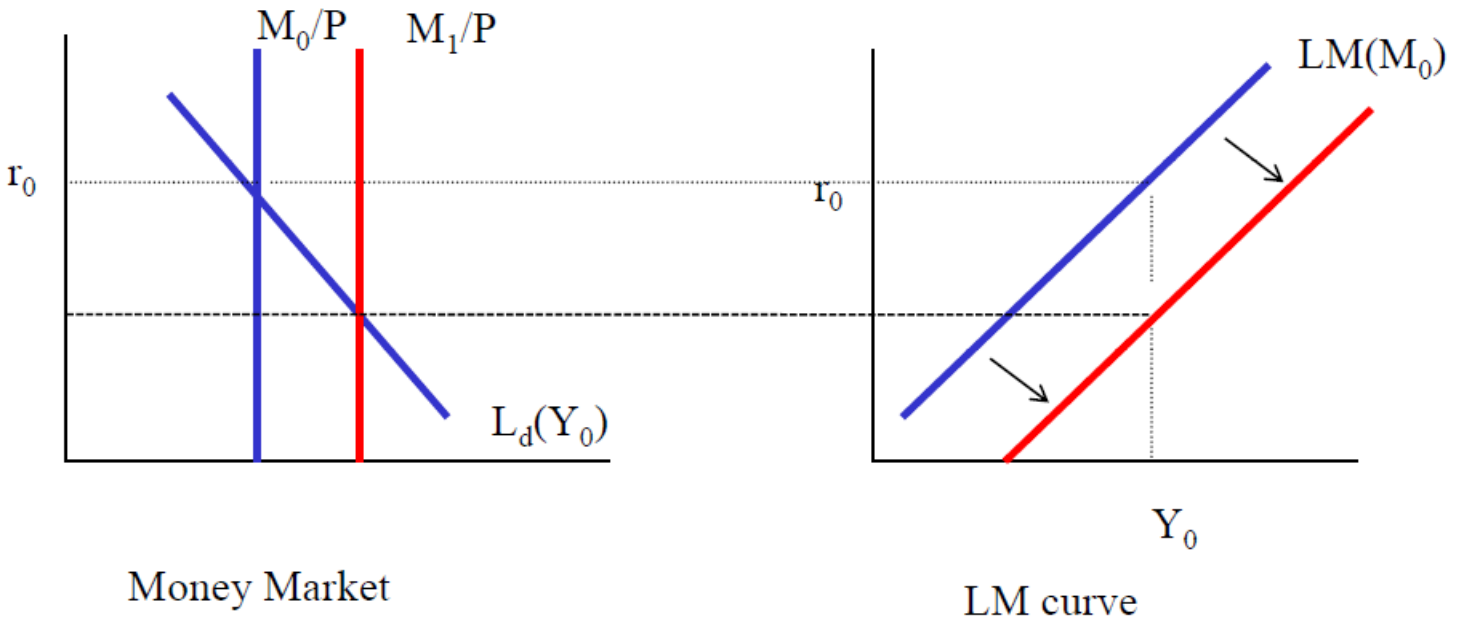
(Ignore the Pi term in the graph. Imagine it says r instead!)



Shifts in the Money Supply

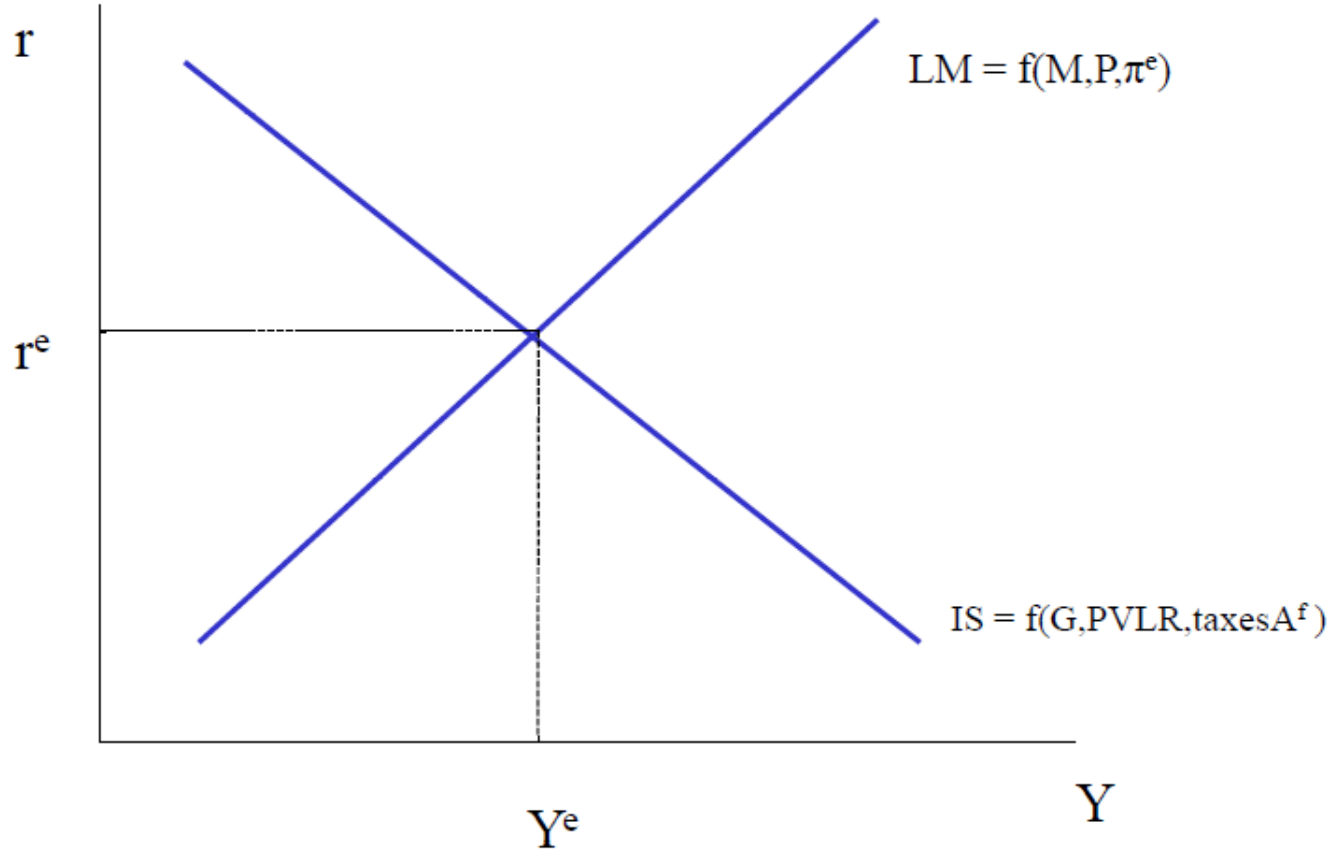
- Remembering $M^s = PL(Y, r)$
- If the market starts out in equilibrium, then a higher supply of money requires a higher demand for money.
- For every fixed level of interest rates, we need a higher level of GDP to generate this extra demand.
- The LM curve shifts out.

An Increase in the Money Supply



Equilibrium in the IS-LM Model

(Again, ignore the labelling).

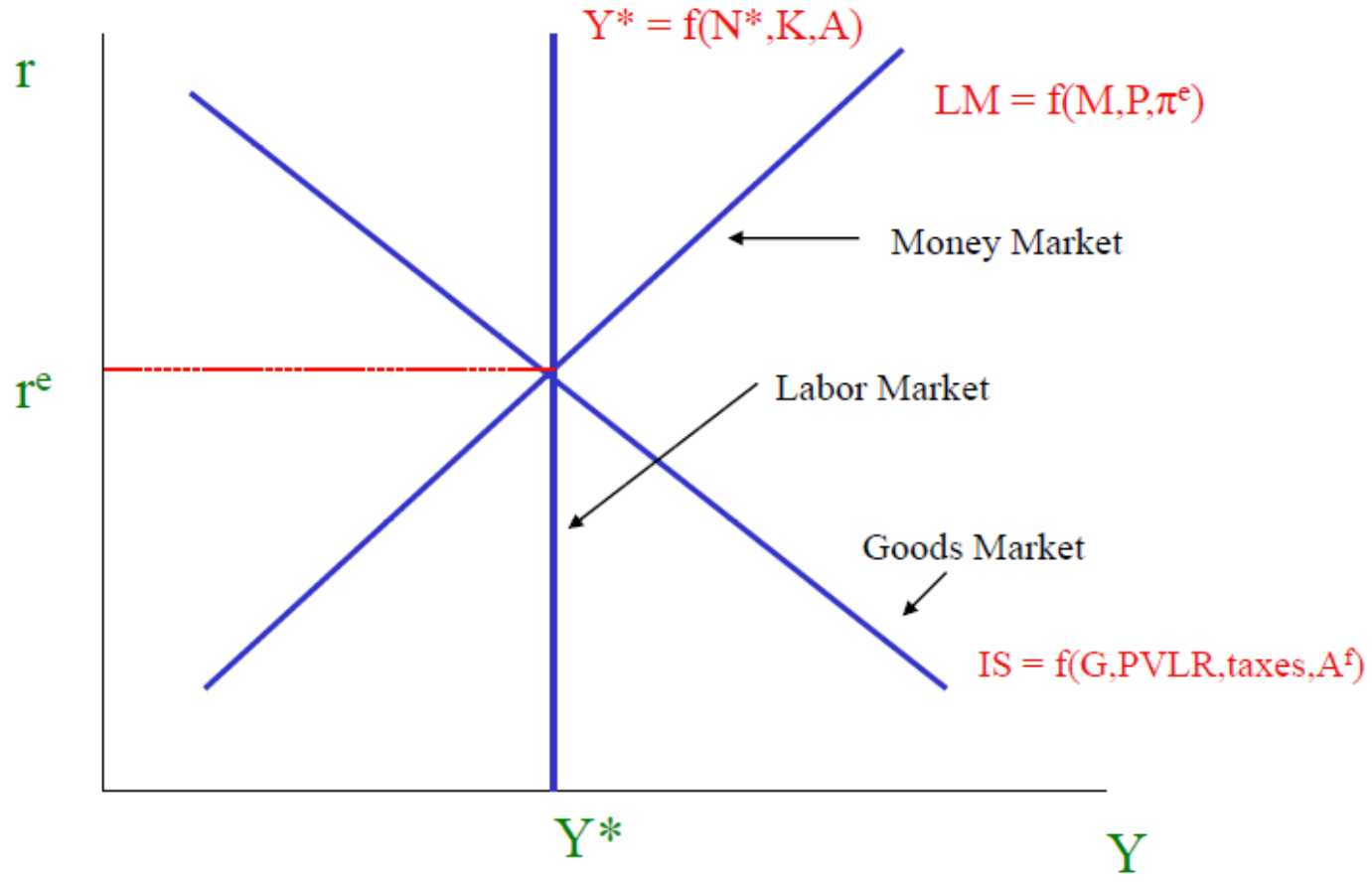


Aggregate Supply

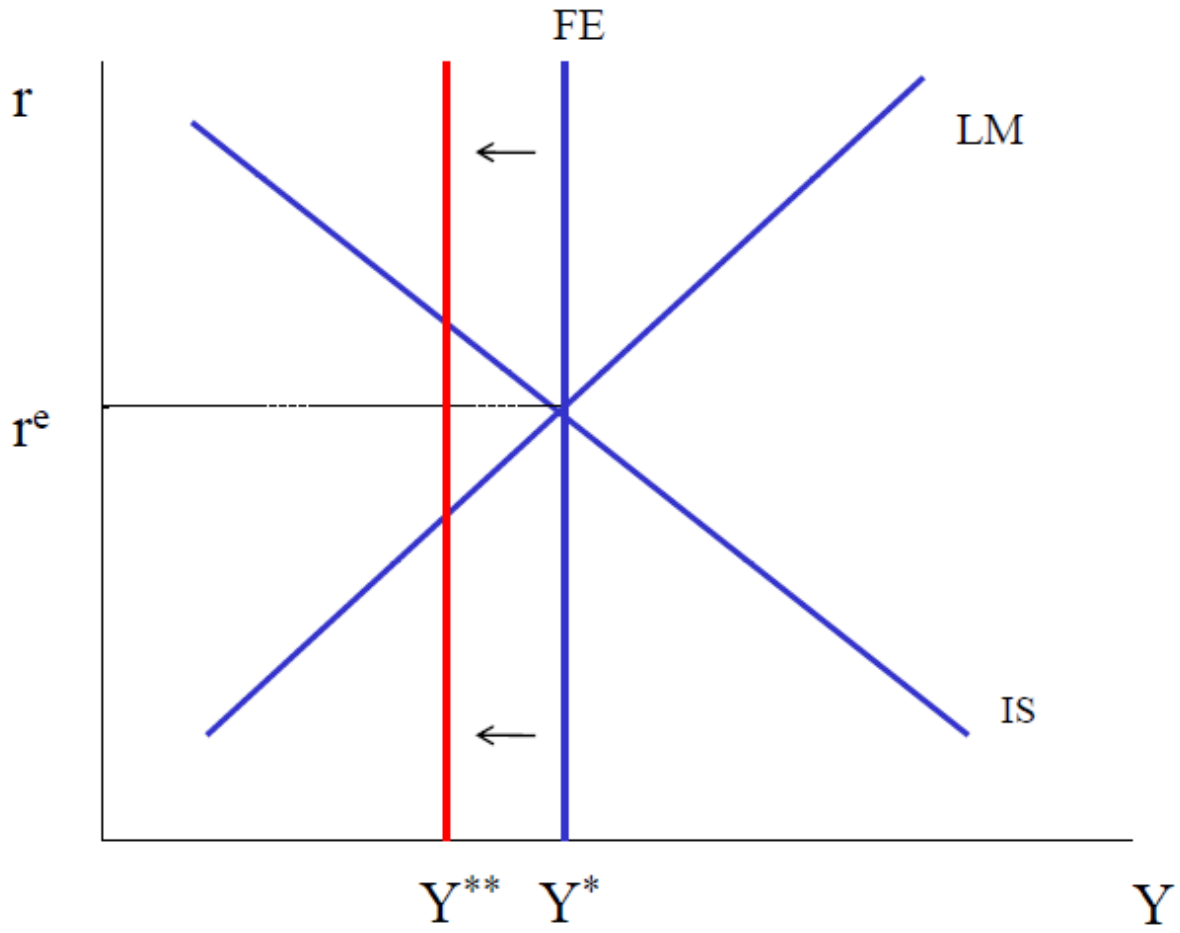
- We have derived a model of the aggregate demand for goods and services.
- But we need to also think about the supply side of the economy.
- Supply capacity is a function of capital and labour inputs and the efficiency of the economy.
- Labour market equilibrium delivers employment of N*
- So the equilibrium level of output should be

$$Y^* = f(N^*, K, A)$$

An Equilibrium With Demand = Supply



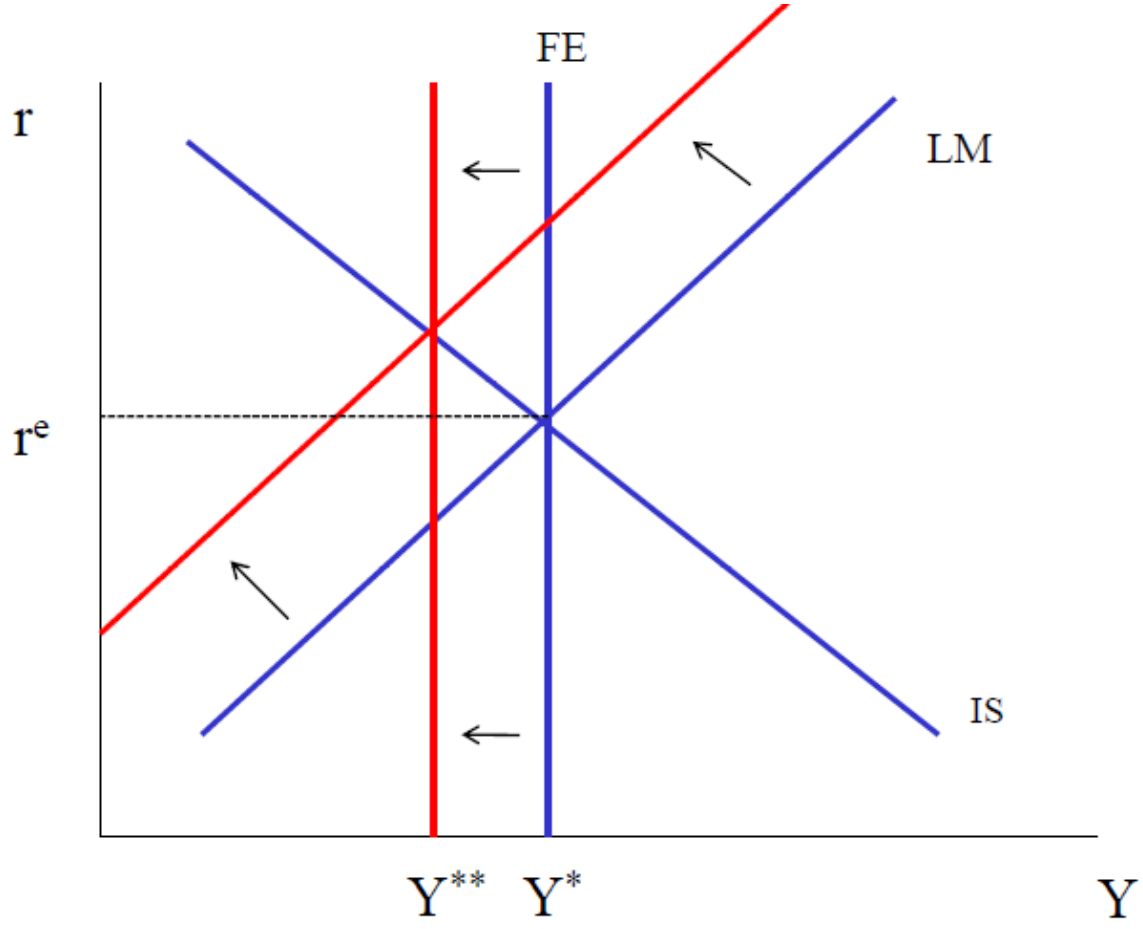
What if Supply Capacity Falls?



The Role of Price System

- In microeconomics, prices adjust to equate supply and demand.
- If this was to happen in this model, then prices would rise to reduce aggregate demand until it equals supply?
- How does this happen?
  - Higher prices raise the demand for money.
  - For each level of the interest rate, GDP must now be lower to maintain money market equilibrium.
  - In other words, the LM curve shifts in.

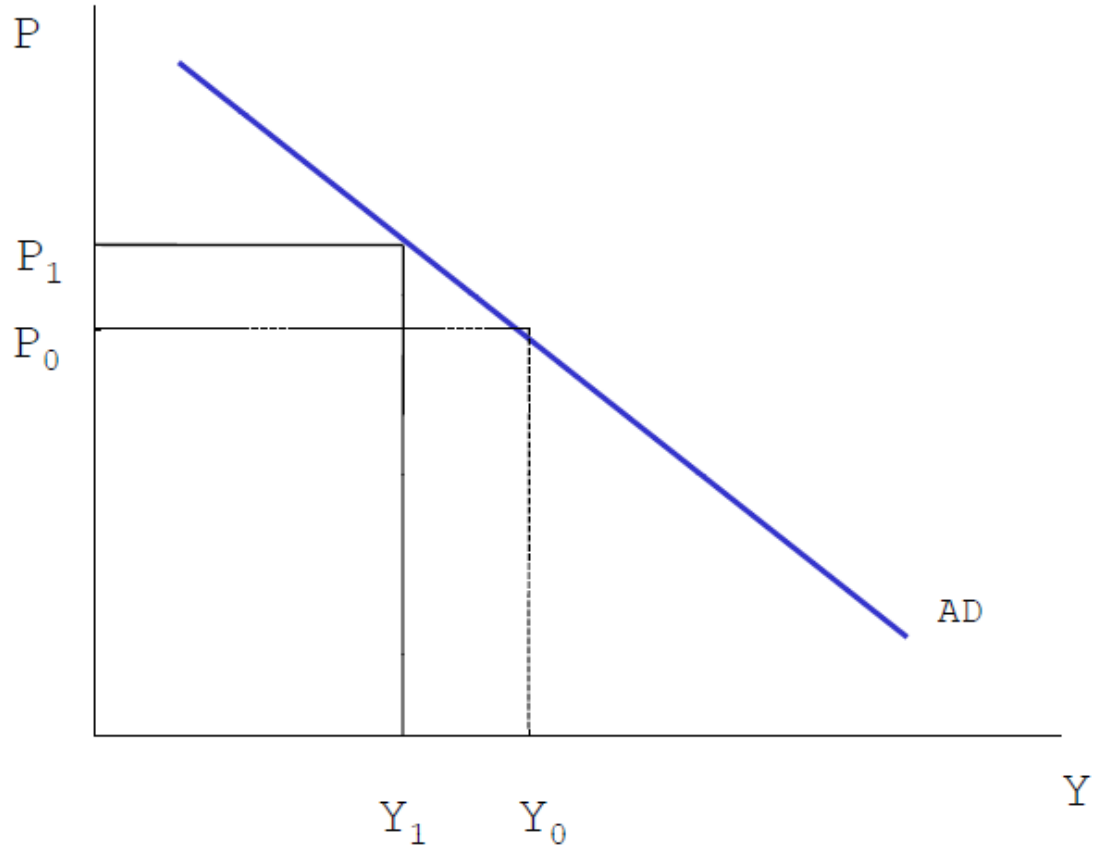
Prices Moving to Equate Supply and Demand



The AS-AS Model

- This is just the IS-LM model but with a more explicit focus on the role played by prices.
- We have just shown that a higher price level means an inward shift in the LM curve.
- Money and prices have symmetric effects in the model. A doubling of prices has the same impact as a halving of the money supply.
- The Aggregate Demand curve is just a set of price-GDP combinations consistent with IS-LM equilibrium for a fixed money supply.

The AD Curve



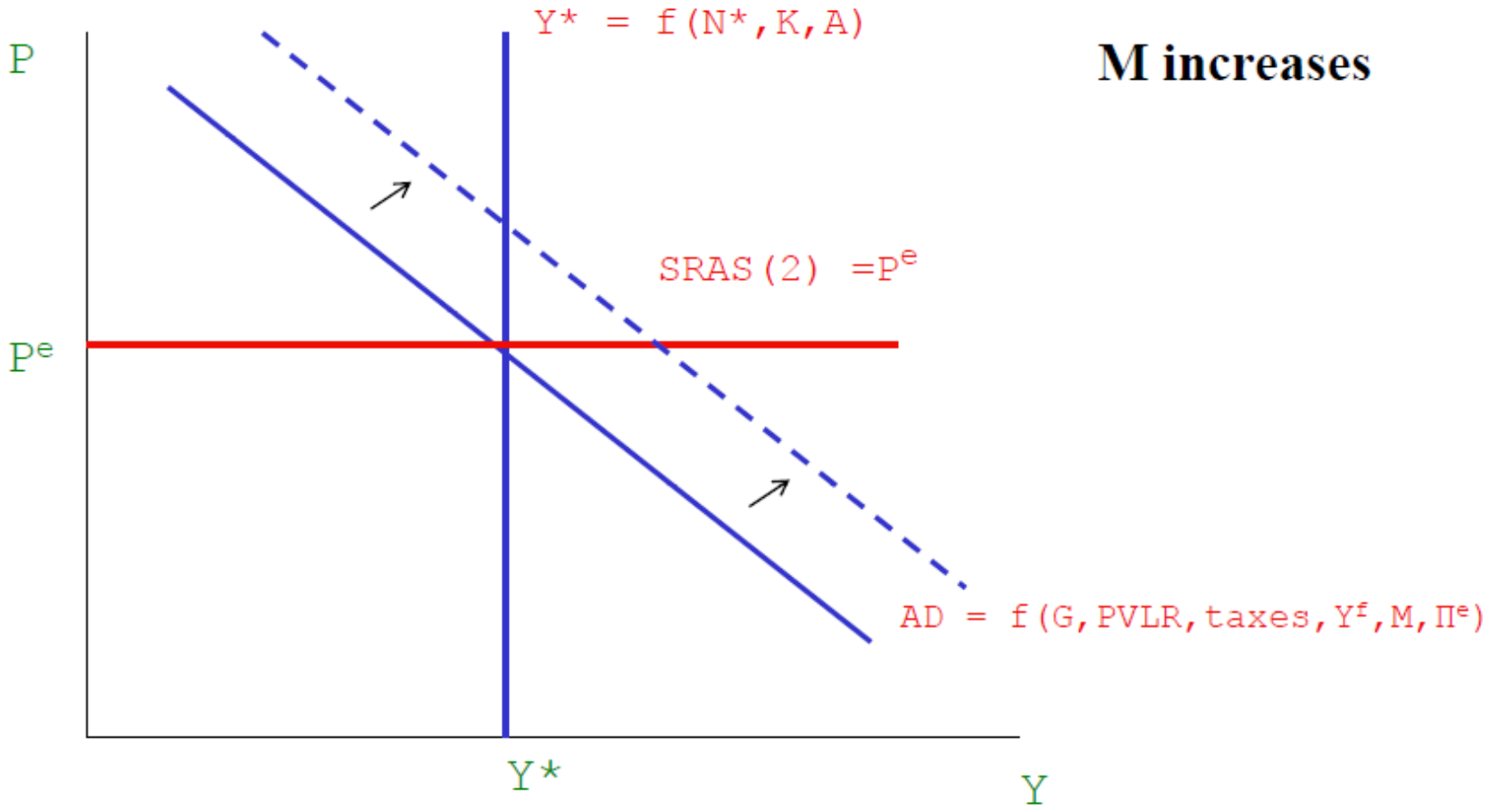
Shifts in the AD Curve

- Anything that gives an IS-LM equilibrium with higher output for a given price level will shift the AD curve to the left.
- This include
  - Increase in the money supply.
  - Increased government expenditure.
  - Increases in the part of consumption and investment that are unrelated to interest rates.

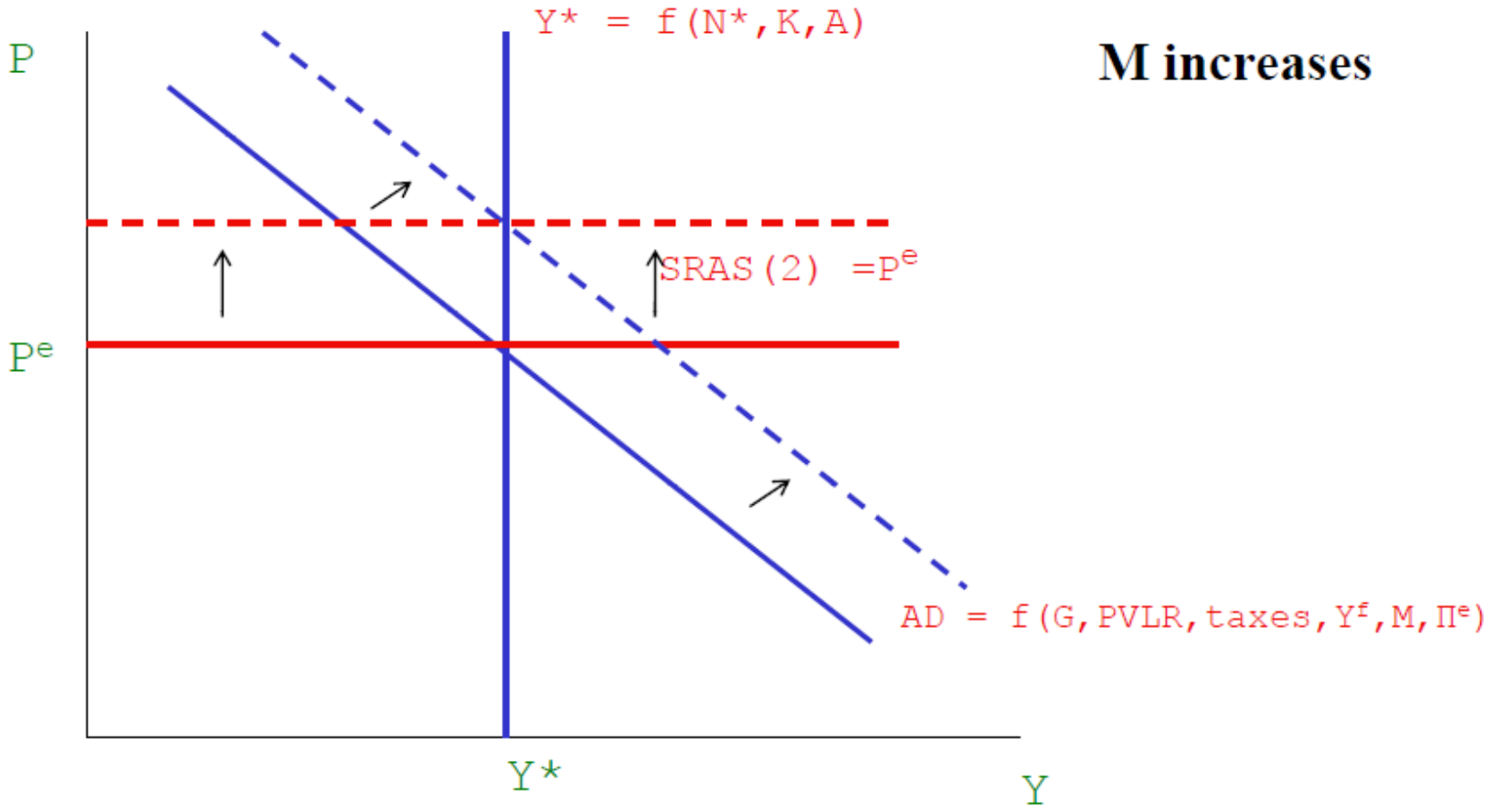
Short-Run and Long-Run

- Most economists assume that, over time, prices do adjust so that aggregate demand equals the long-run aggregate supply capacity of the economy.
- But it is clear that GDP often differs from its long-run supply capacity. High unemployment is a sign that the economy has lots of spare capacity.
- For this reason, Keynesian macroeconomists have suggested that prices are “sticky” and don’t always move to match aggregate demand with aggregate supply.

Short-Run AS with Fixed Prices: Right Shift in AD Means Higher Output



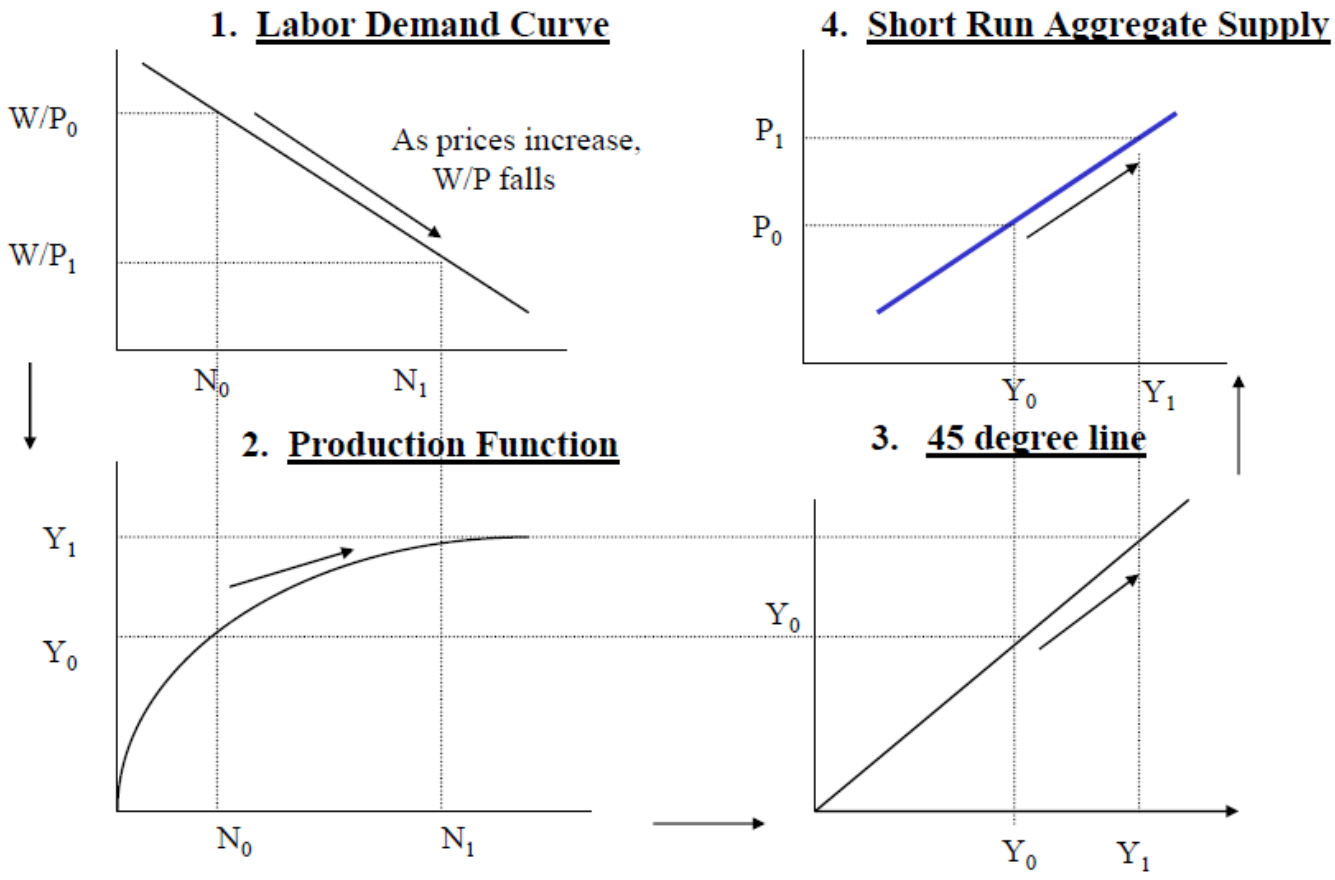
But Then Prices Gradually Increase: Fiscal\Monetary Policy Have No LR Effect on Y



An Alternative Theory of Aggregate Supply

- This approach assumes that prices are flexible but wages are fixed in the short-run.
- An increase in the real wage (W/P) has a negative effect on firm profitability and thus has a negative effect on output.
- Higher prices thus reduce the real wage, firms hire more labour and produce more.
- This gives an upward-sloping short-run AS curve.
- Over time, wages adjust to catch up with prices, so the economy moves back to its long-run supply capacity.

Sticky Wages and Aggregate Supply



Upward Sloping Short-Run AS Curve