
Classical vs Keynesian Theory

To sum up: What is an Equilibrium?

SHORT RUN EQUILIBRIUM: $AD = SRAS$ and $IS = LM$

- **The Labor Market need not be in equilibrium**
- We need not be at the potential level of GDP Y^*
- If $Y < Y^*$ we are in a **recession**, if $Y > Y^*$ in a **boom**

LONG RUN EQUILIBRIUM: $AD = SRAS = Y^*$ and $IS = LM = Y^*$ and $N_d = N_s = N^*$

- **By definition, the labor market will clear**
- By definition, we will move to Y^*

Classical Theory

Real Business Cycle (RBC)

- What really drives the business cycle?
- **Kydland and Prescott developed the RBC theory that argues that real shocks to the economy are the primary cause of business cycle.**
- Real shocks are shocks that affect the production function, the size of the labor force, the spending and savings decisions,...Nominal shocks are shocks to money supply or demand
- In particular the RBC theory refer to **productivity shocks**
- The RBC theory is consistent with our IS-LM and AD-AS models. A negative productivity shock (A decreases) has two effects:
 - 1) reduces MPN and hence the demand for labor and N^*
 - 2) Decreases Y^* directly
- Both effects make Y^* to decrease (LRAS) and hence LM has to adjust!

Real Business Cycle (RBC)

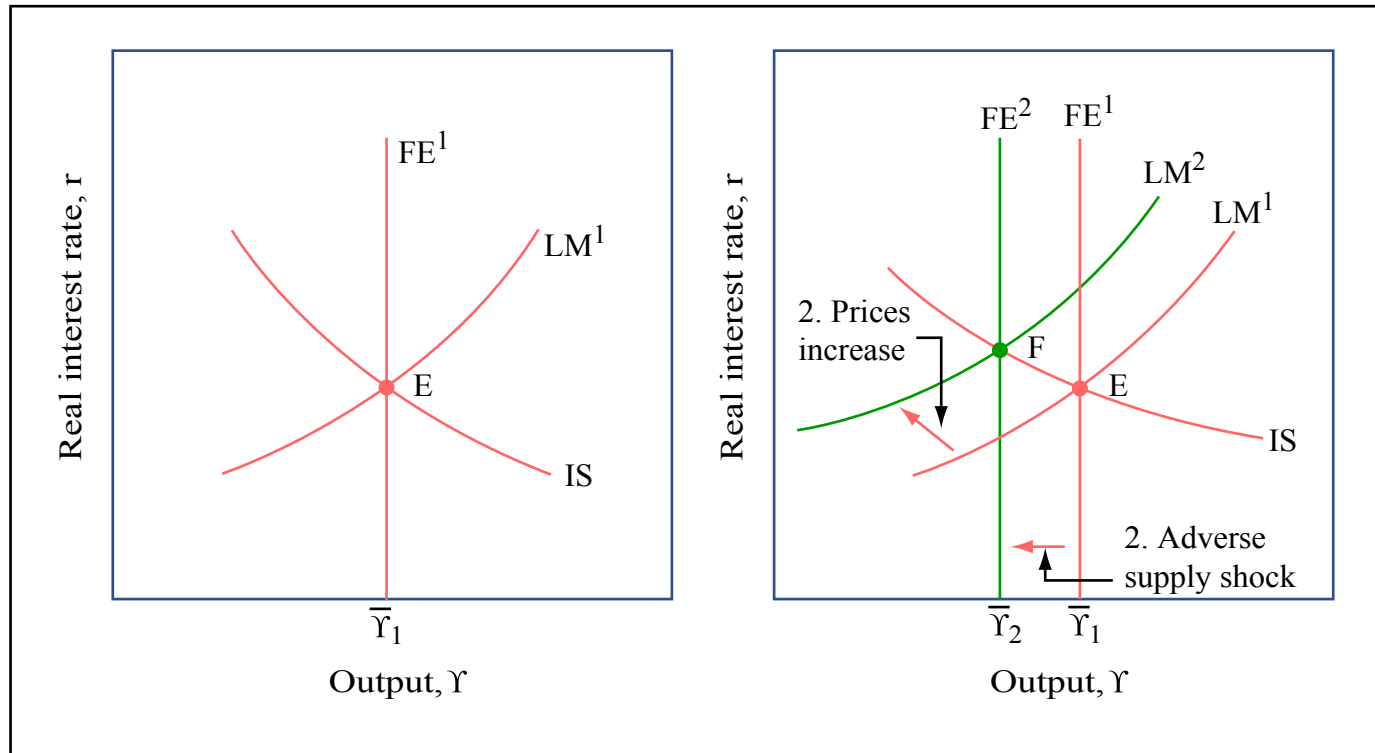


Figure by MIT OpenCourseWare.

Real Business Cycle: Facts

- Consistent with the following stylized facts:
 - 1) Continuous productivity shocks generate recurrent fluctuations
 - 2) Employment will move procyclically
 - 3) Real Wages will be higher in booms
 - 4) Average labor productivity is procyclical
- Fact 4 is crucial: with no productivity shocks, the expansion of employment during booms will tend to reduce average labor productivity because of diminishing marginal returns!
- **Fact against RBC: inflation tends to slow down during or immediately after recessions** (is this evidence controversial?)
- For RBC theory a negative shock is associated with inflation!

Real Business Cycle: Calibration

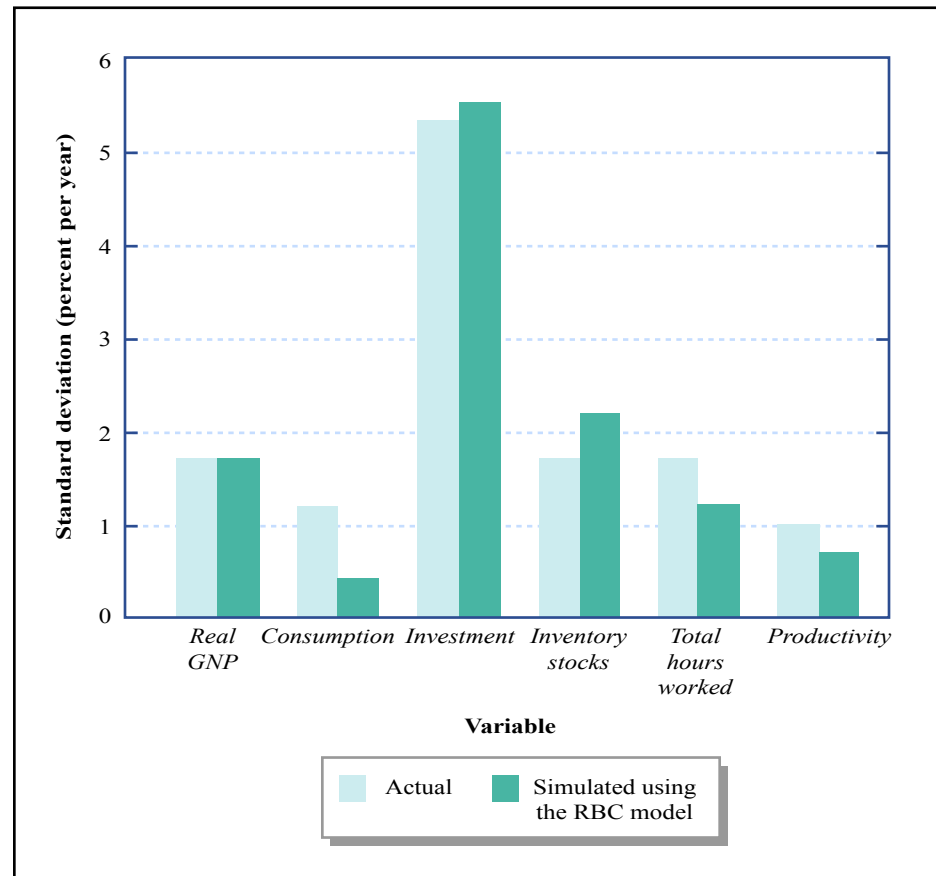


Figure by MIT OpenCourseWare.

Classical Economists

- Classical Economists believe that adjust instantaneously
- This implies that money is neutral, that is, monetary shocks do not affect real variables
- **Evidence: money is very procyclical!**
- Sometimes it can be reverse causation... (Money demand depends both on current and on expected future output!)
- However, more recently there is consensus that money is non-neutral! A classic study is **“A Monetary History of United States, 1867-1960”** by **Milton Friedman and Anna Schwartz**. Their findings:
 - 1) Money is procyclical
 - 2) The interrelation between monetary and economic changes has been stable
 - 3) Monetary changes have often had independent origin, they have not been simply a reflection of changes in economic activity (gold discoveries, changes in monetary institutions,...)

The Misperceptions Theory (Friedman, Lucas)

- A theory to explain an upward sloping aggregate supply, with classical principles
- Extra assumption: producers have imperfect information about the general price level.
- Hence, they sometimes can misinterpret changes in the general price level as changes in the relative prices of the goods that they produce.
- Even though prices are not slow to adjust, the aggregate supply curve can be upward sloping in the short run and money can be non-neutral!
- **The aggregate quantity of output supplied rises above the potential level when aggregate price level is higher than expected.**

The Misperceptions Theory: Intuition

- Consider a bakery owned and operated by a single baker
- Then the price of bread is the baker's nominal wage and the price of bread relative to the general price level is his real wage!
- Imagine the baker sees that the price of bread goes up. There can be two situations:
 - 1) The price of all goods went up
 - 2) The price of bread went up relative to the price of other goods
- If the price of bread goes up by 5% and the baker expects all prices to go up by 5%, then he believes that his real wage does not change!
- If the price of bread goes up by 5% and the baker expects all prices to go up by 3%, then he thinks that his real wage went up and increases the production of bread!

The Misperceptions Theory: Intuition (continued)

- Everybody thinks the same!
- The amount of output produced will depend on the actual general price level compared to the expected general price level
- If actual prices are higher than expected producers are fooled into thinking that the relative price of their own goods increased
- A possible representation:

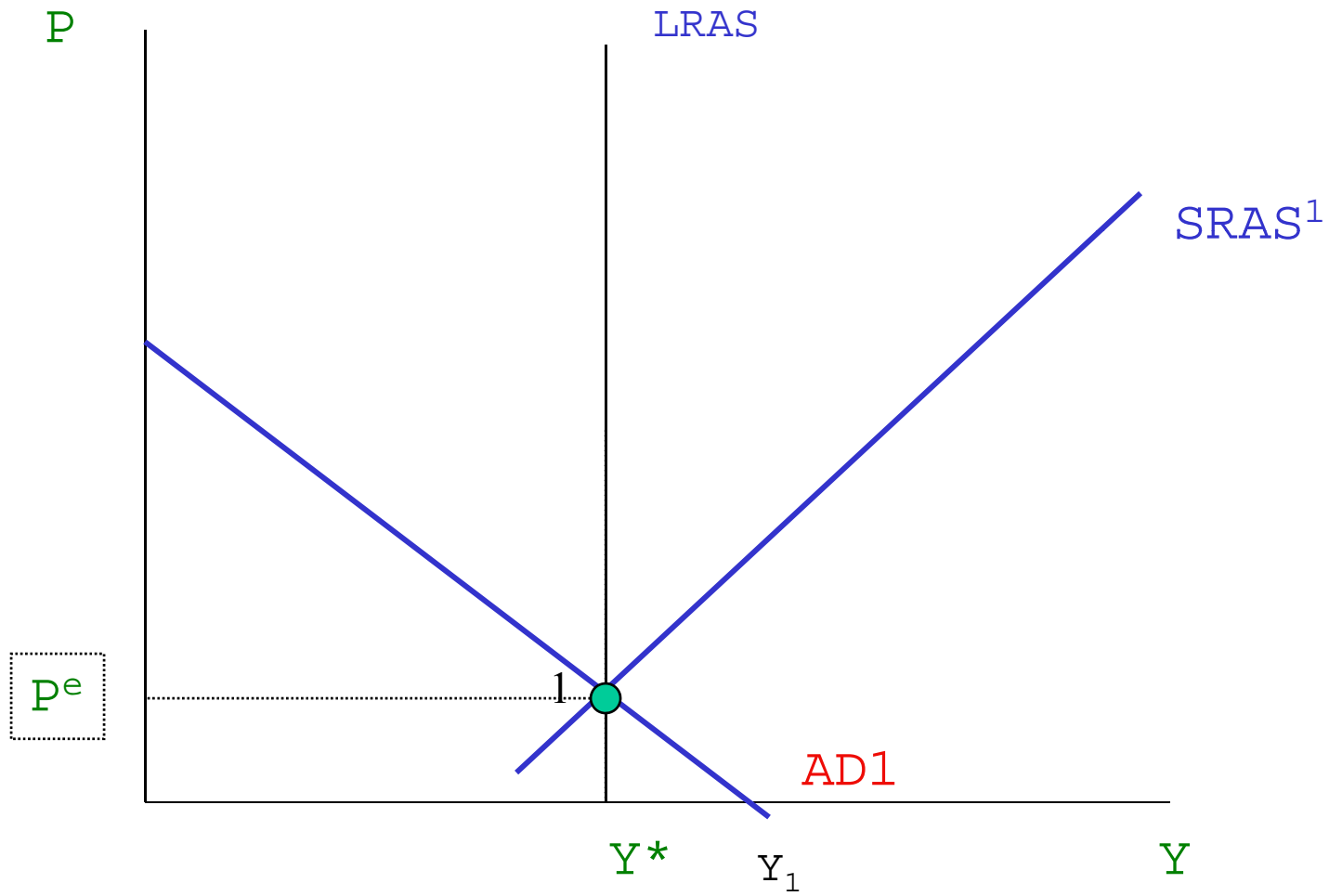
$$Y = Y^* + b*(P - P^e)$$

- Output exceeds its potential level when prices are higher than expected!
- In the long run people learn what happens to prices and change their expectations accordingly ($P = P^e$)!

Unanticipated Changes in M are non-netural!

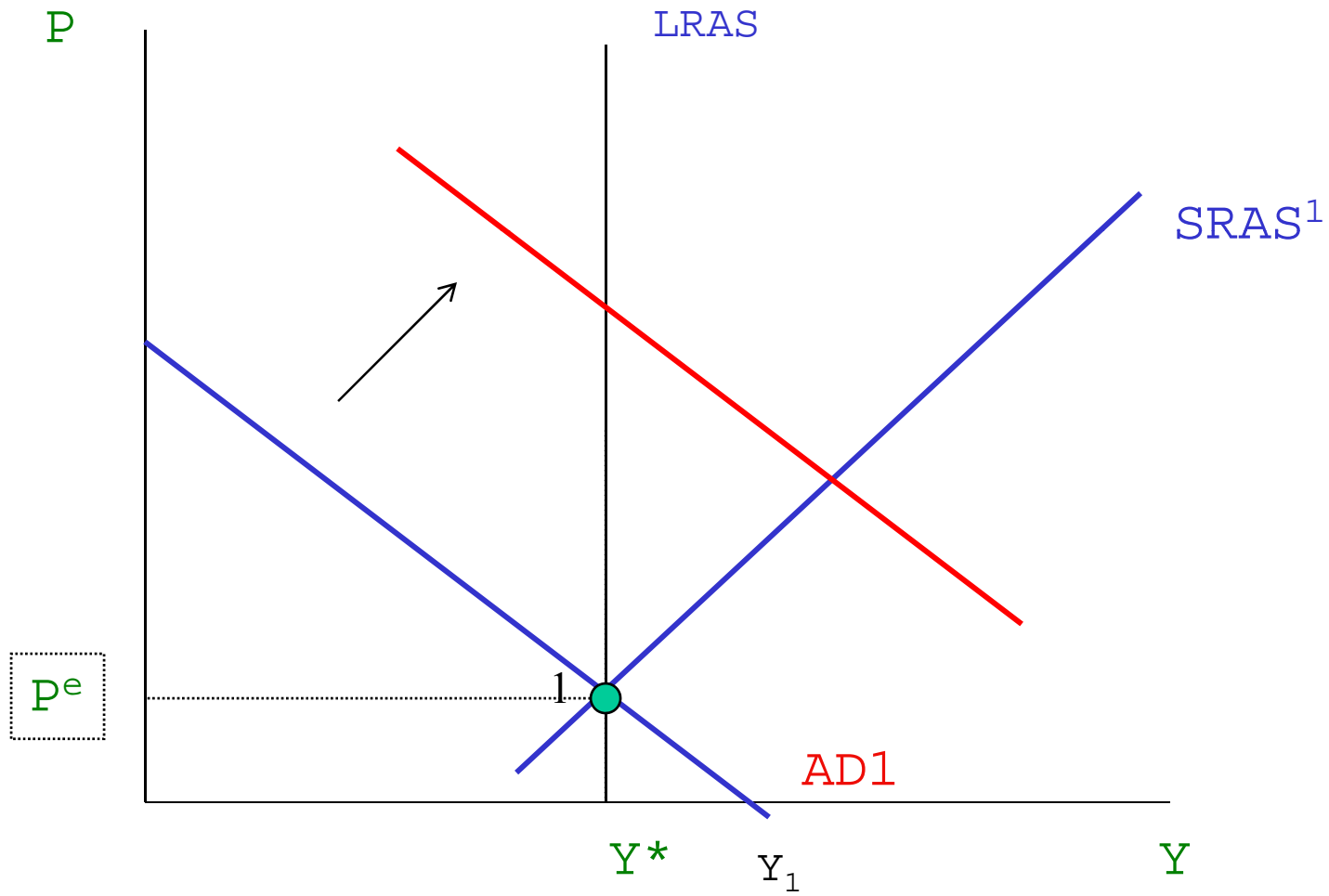
- According to the Misperception Theory, unanticipated changes in monetary policy have real effects in the short run.
- The reason: producers are fooled!
- Anticipated changes in monetary policy do not have real effects because the SRAS shifts accordingly.
- Are monetary policy good?
- Not clear because if agents have **rational expectations**, they will predict that the monetary authority will react to shocks and there will be no unexpected monetary policies!

Unanticipated Increase in M



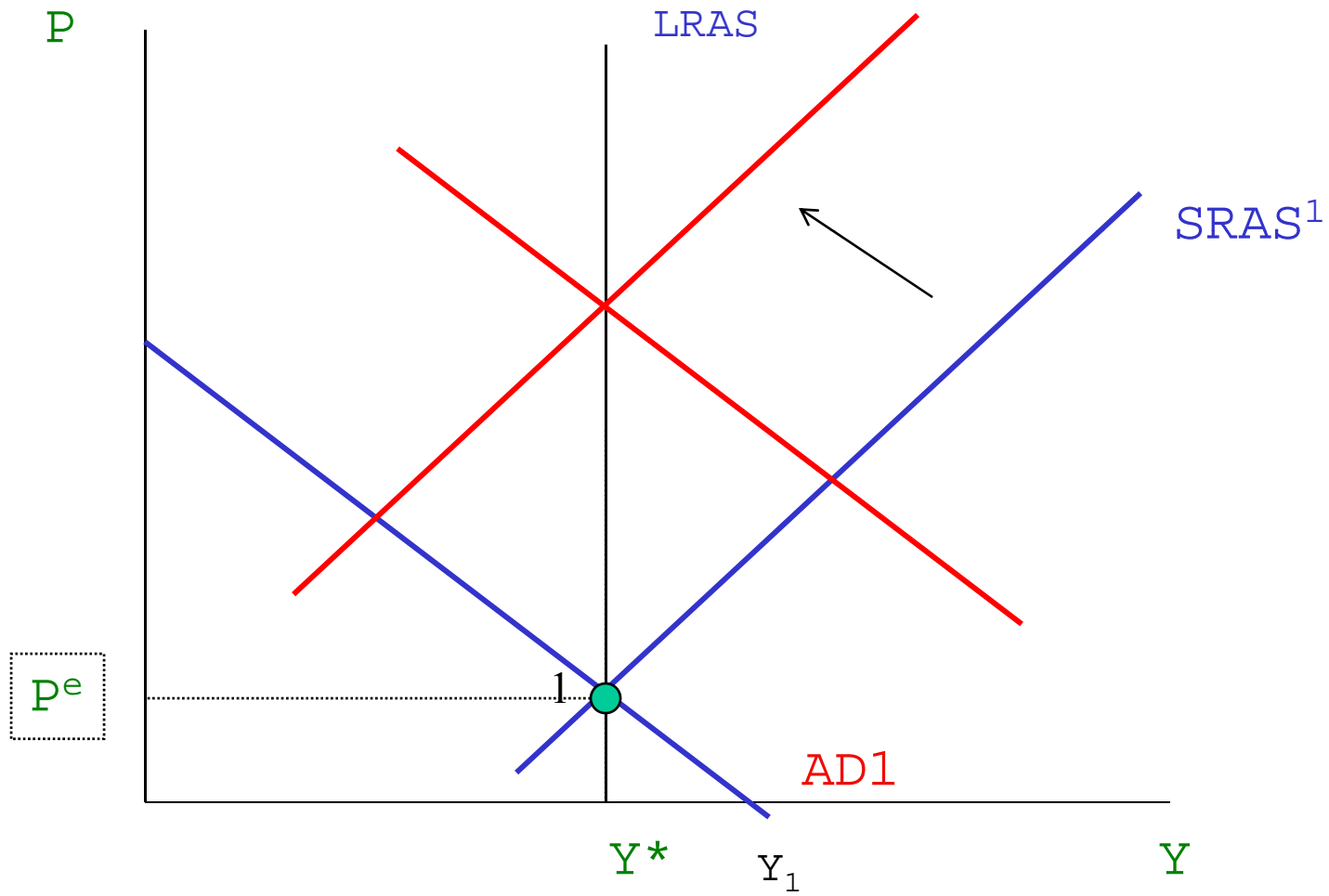
Unanticipated Increase in M

Money is non-neutral in the short run!

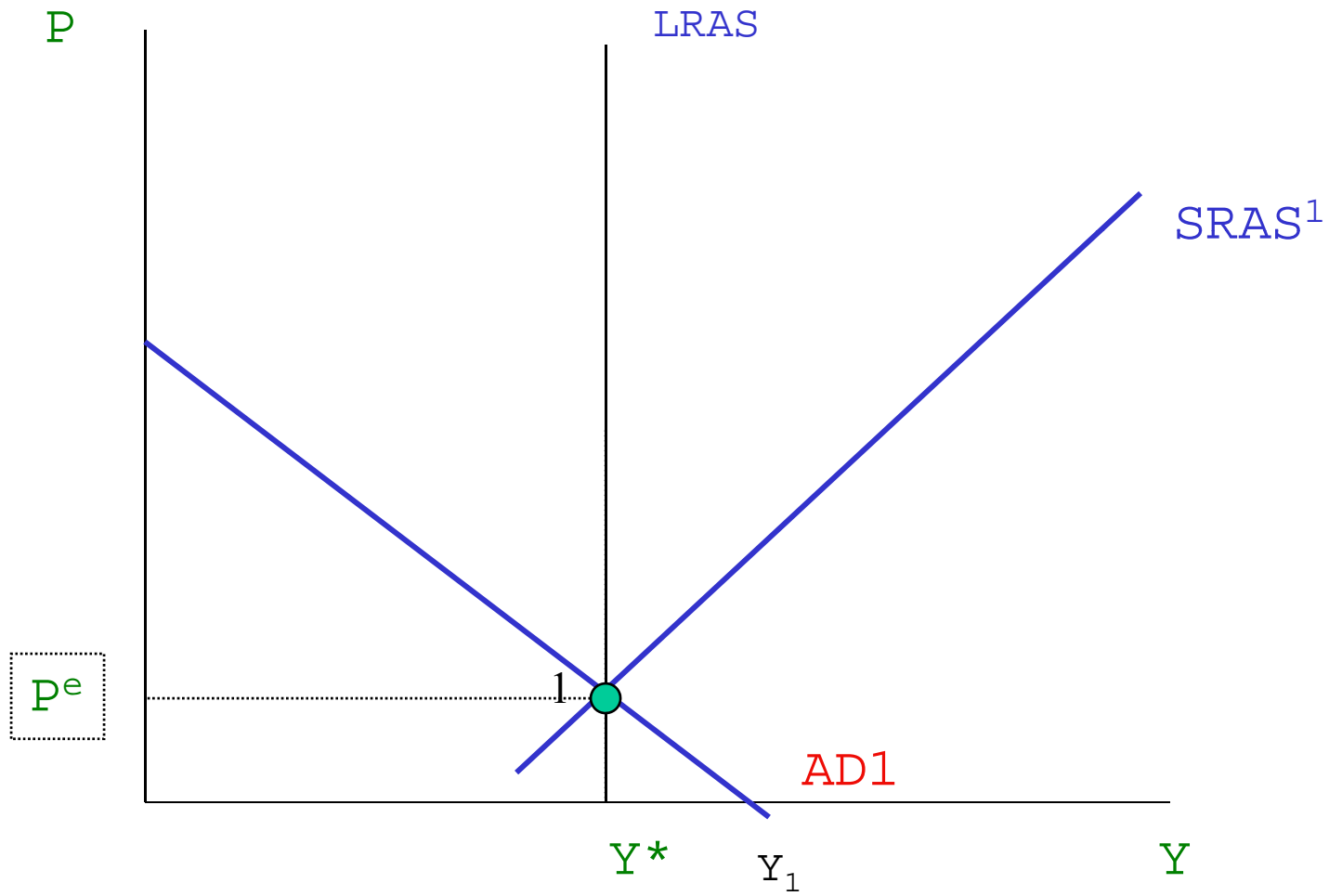


Unanticipated Increase in M

In the long run is neutral!

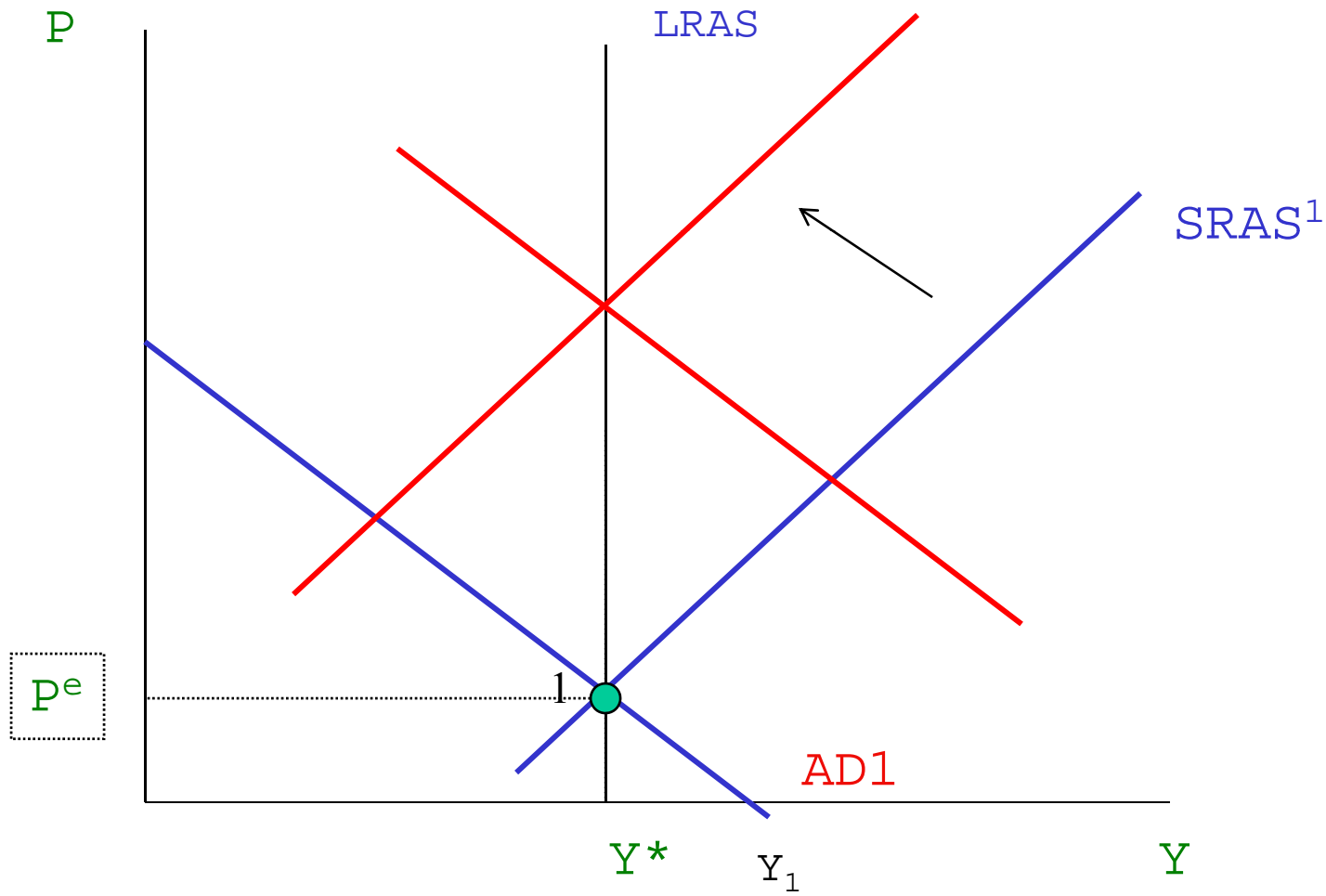


Anticipated Increase in M



Anticipated Increase in M

Money is neutral!



As M increases the AD shifts to the right but also expected prices increase!

Keynesian Theory

Road Map

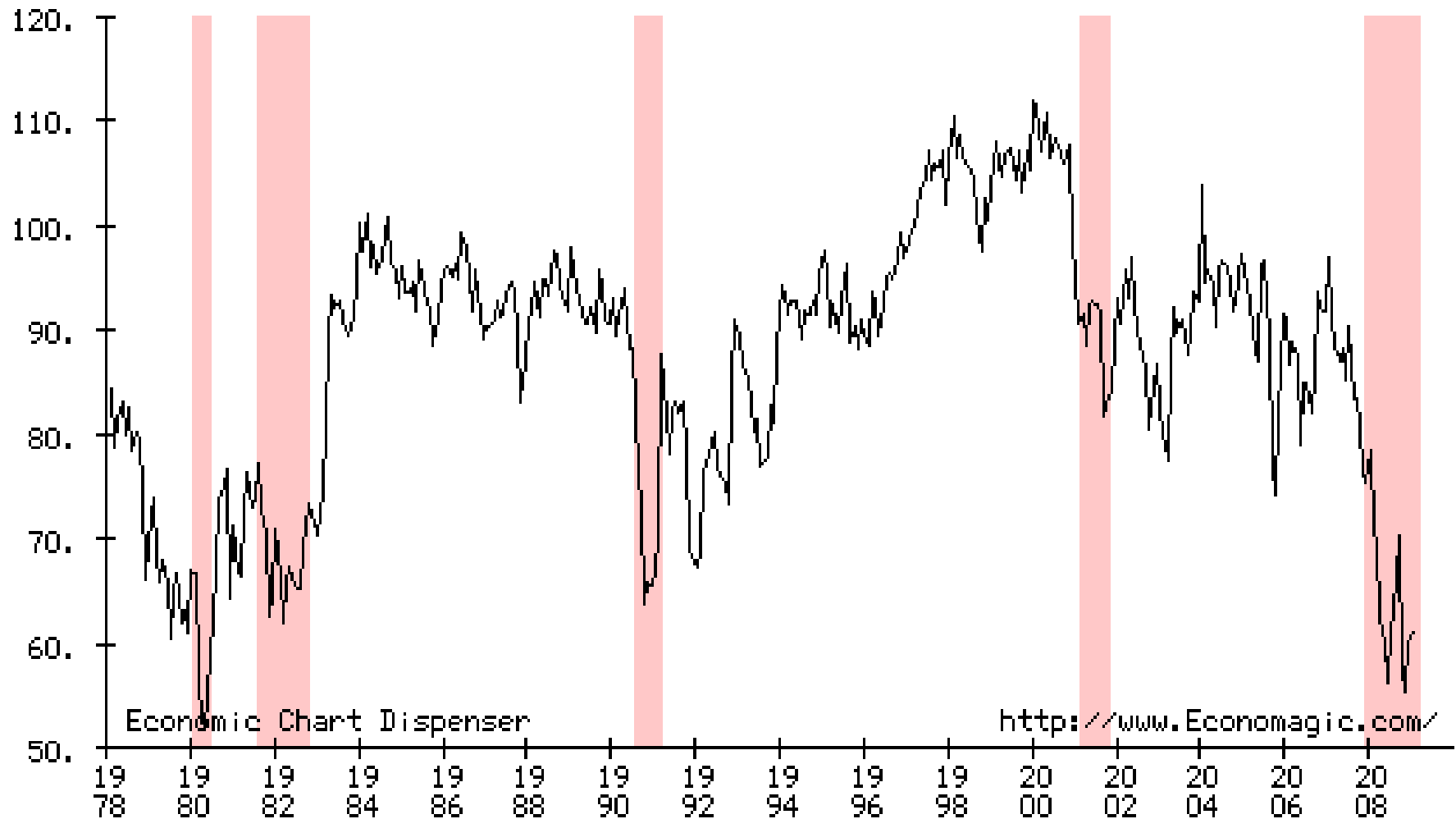
- Recessions may be driven by:
 - **demand shocks** (e.g. current recession) \longrightarrow P and Y co-move
 - **supply shocks** (e.g. oil shocks) \longrightarrow P and Y move in \neq directions
- How to get out from a recession? Self-Correcting Mechanism, Monetary Policy, or Fiscal Policy
- Brief History of the Fed policy: from output targeting to Taylor Rule
- Should the Fed react to asset price bubbles?

Example 1: Loss in Consumer Confidence

- Consider a loss in consumer confidence as in 1991 (and in the current recession!)
- Change in expectations about the future can have dramatic effects even if not founded!
- What does a loss of consumer confidence affect?
 - No effect on labor demand: **A hasn't really changed**
 - Consumption changes and the **AD and IS curves shift**
 - Some effect on labor supply (income effect): **PVLR decreased**
- **Assumptions for the following example:**
 1. **No income effect on labor supply (labor supply does not move)**
 2. **No change in A or A^f**
 3. **Consumers are standard PIH, no liquidity constrained, and non-ricardian**
 4. **Upward-sloping SRAS: sticky wages**

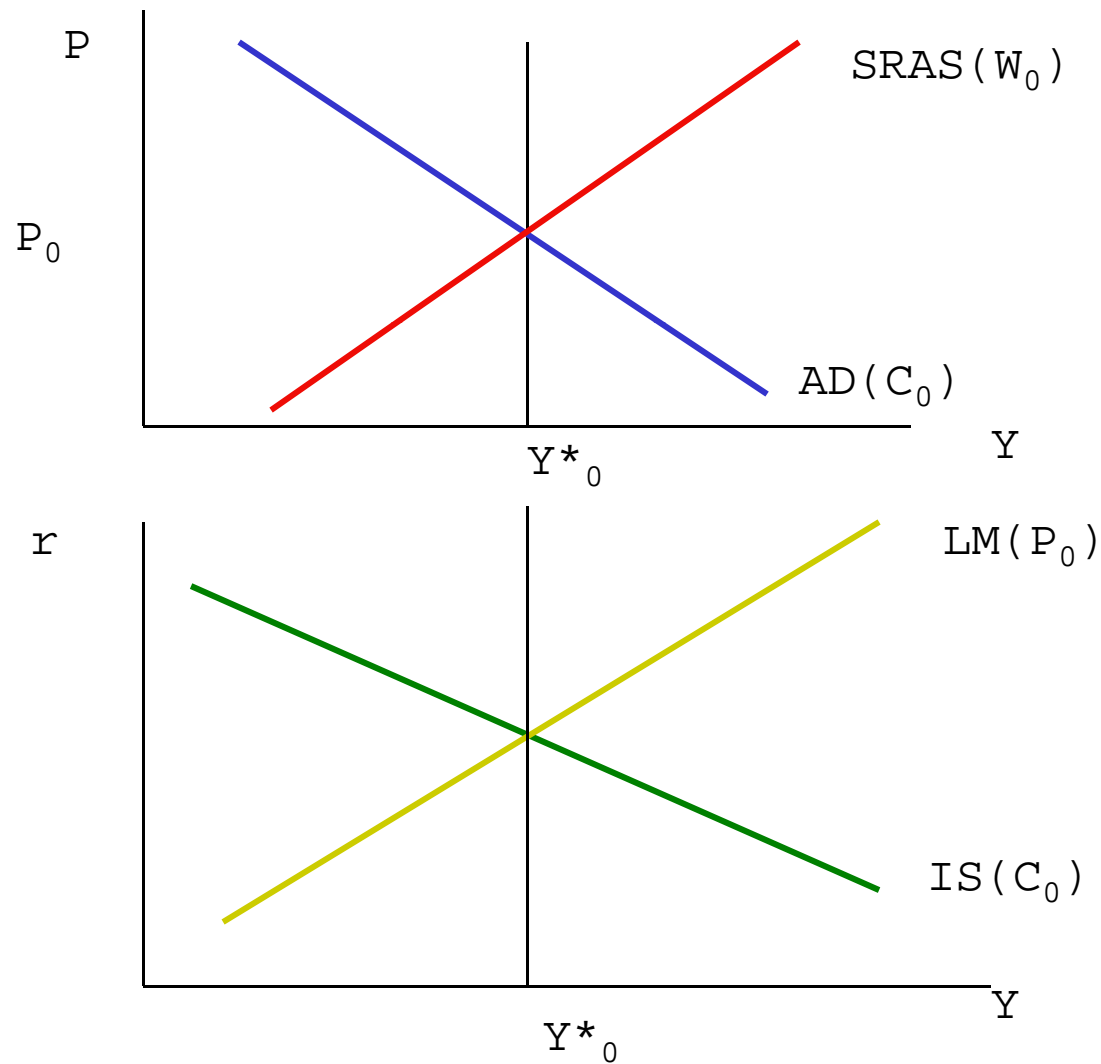
Consumer Confidence: 1978M1 – 2009M1

University of Michigan: Consumer Sentiment: Index 1st Quarter 1966=100



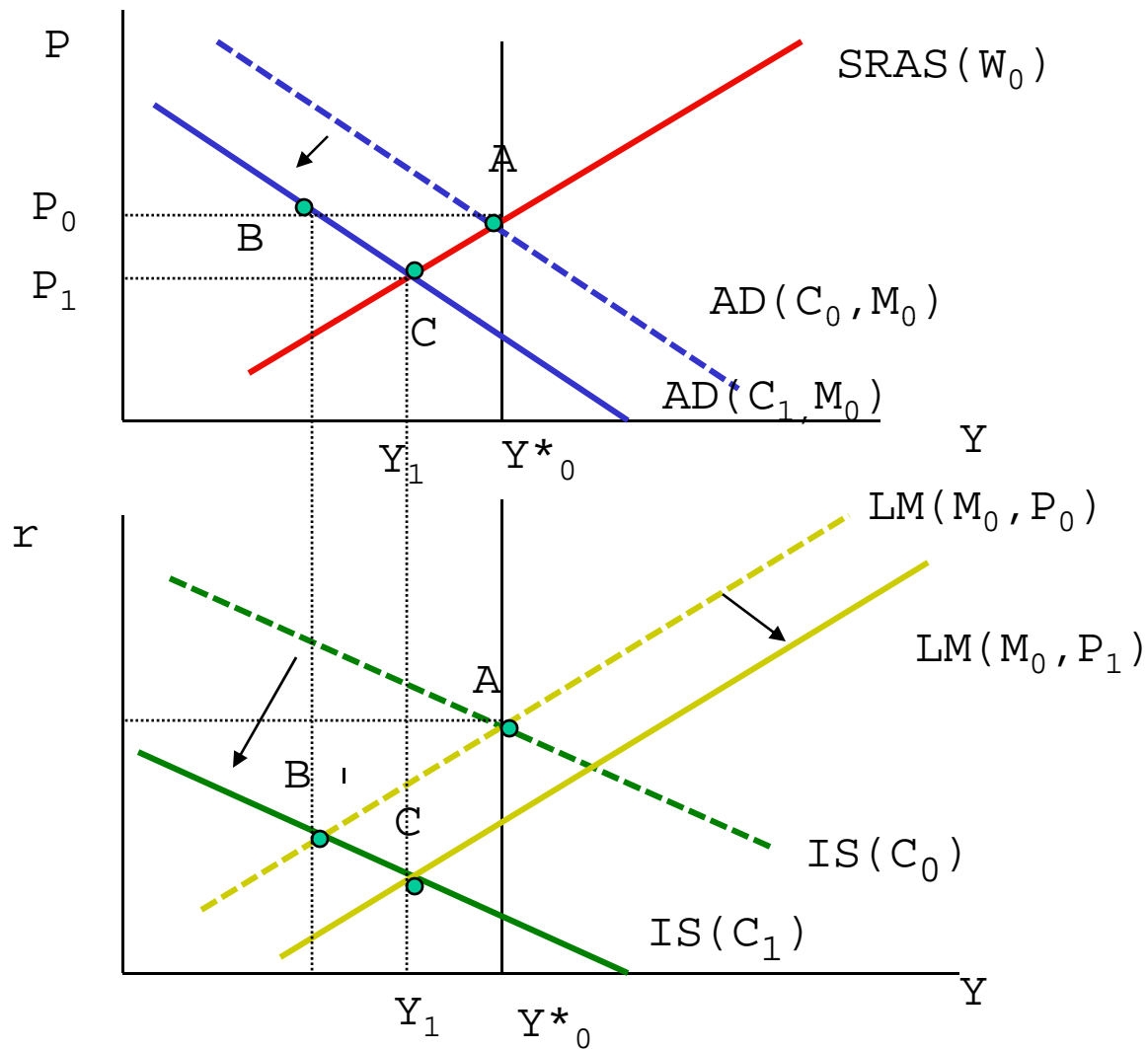
Example 1: Graphical Representation

Assume we start at Y^*



Example 1: Graphical Representation

Loss of Consumers' Confidence

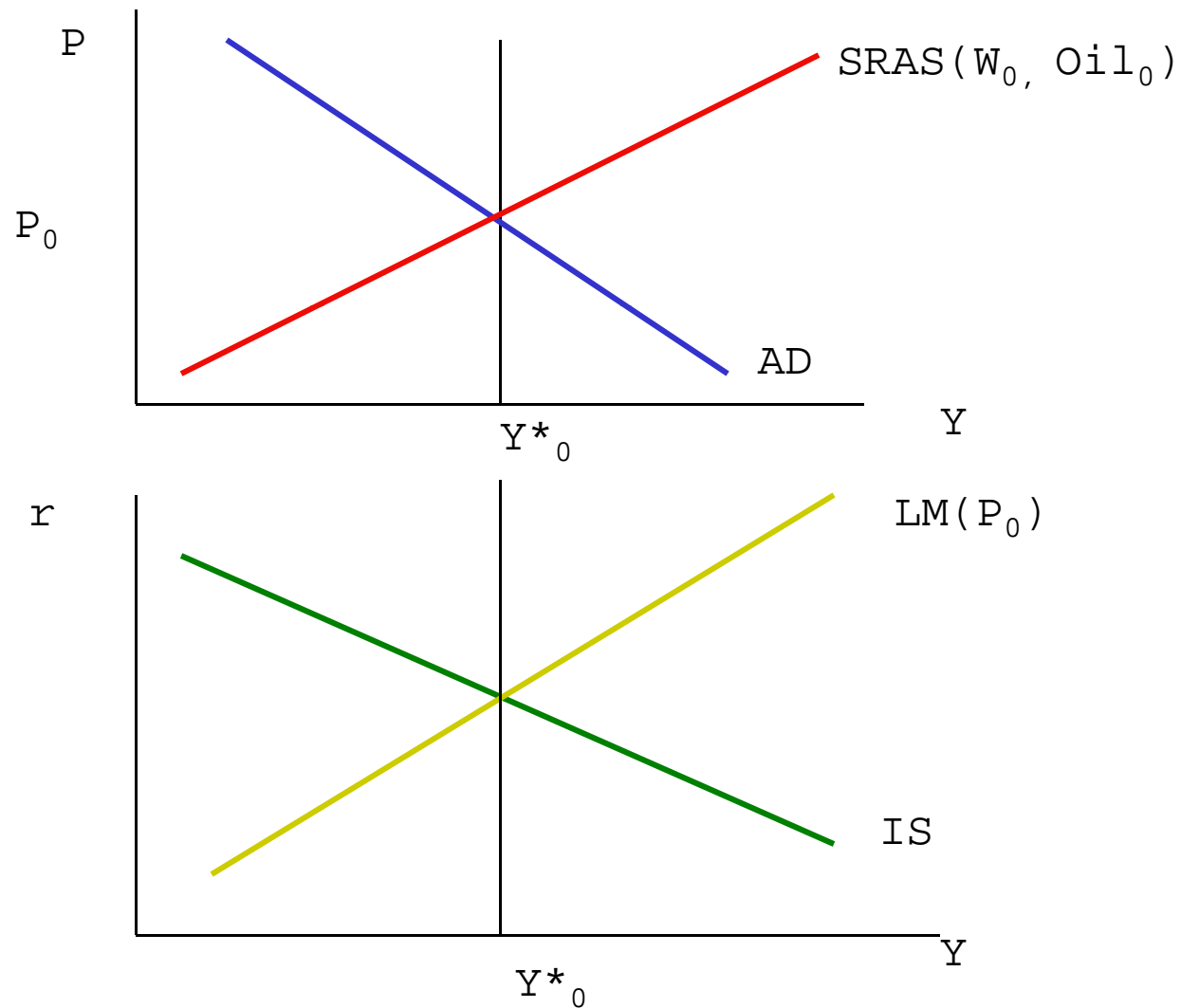


Example 2: Increase in Oil Prices

- Consider a negative supply shock: an increase in the oil price (as in 1974 and 1979)
- If oil prices increase, firms produce less with same N and K (it is like a decrease in A !)
- What does a permanent increase in oil prices affect?
 - Effect on supply: both **SRAS and LRAS (Y^*) shifts to the left**
 - Labor demand shifts to the left: **MPN decreases**
 - Labor supply shifts a bit to the right (income effect): **PVLR is lower**
 - I decreases (MPK lower) and C decreases (PVLR lower): **AD and IS shift left**
- Assumptions for the following example:
 1. **No income effect on labor supply (labor supply does not move)**
 2. **Consumers are standard PIH, no liquidity constrained, and non-ricardian**
 3. **Upward-sloping SRAS: sticky wages**

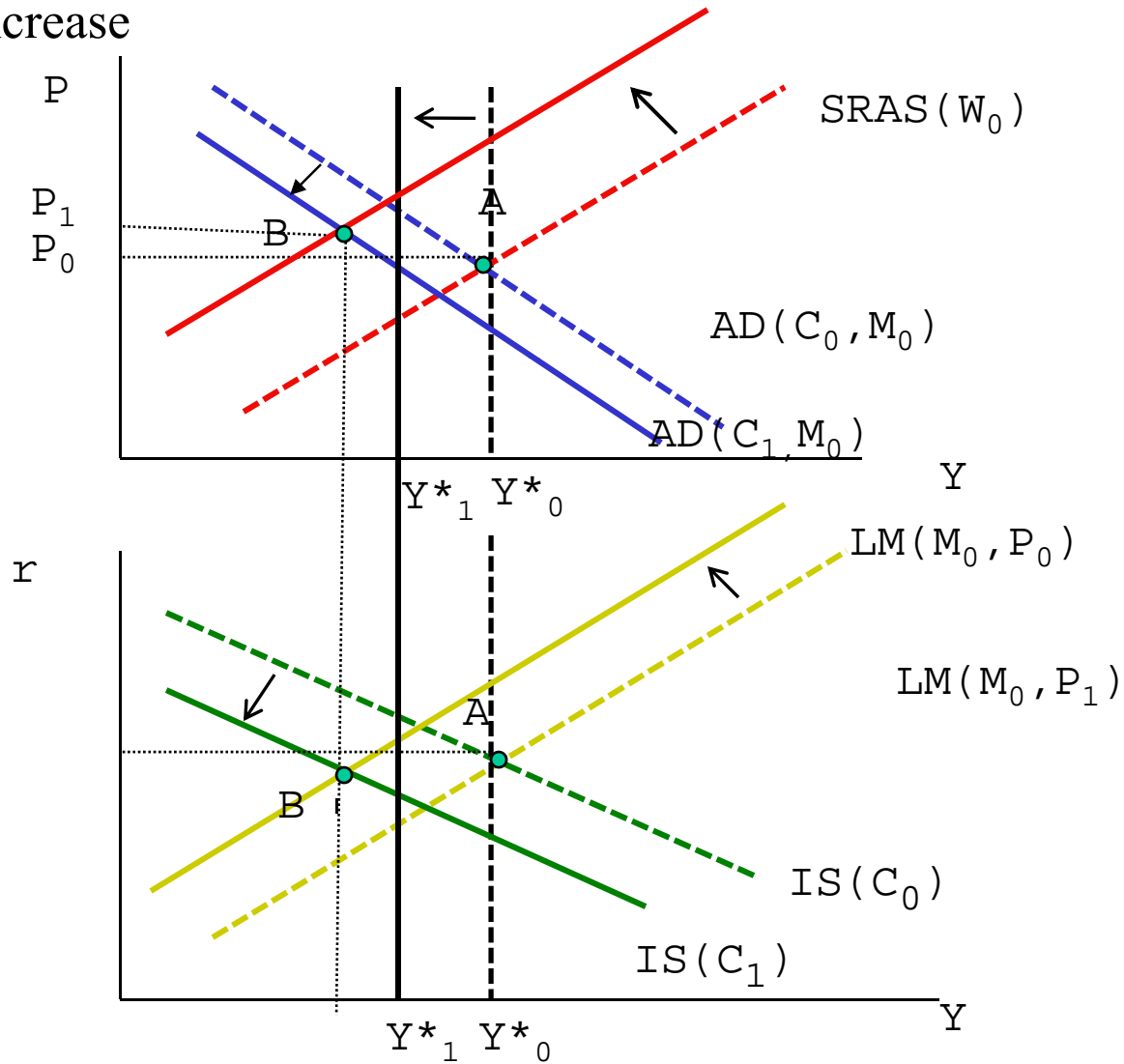
Example 2: Graphical Representation

Responsible (partially) for the 1975 and 1979-1980 recession (OPEC I and II)



Example 2: Graphical Representation

Oil price increase



Analyzing Demand and Supply Shocks

- **DEMAND SHOCK:** unemployment and prices move in opposite directions if there are no policies!
- Example: loss in consumer confidence (negative), increase in M (positive)
- **SUPPLY SHOCK:** unemployment and prices to move in the same direction if there are no policies!
- Example: oil shocks (negative) or increase in productivity (positive)
- A negative supply shock is BAD!!!

STAGFLATION: increase in inflation + increase in unemployment

Reviewing The Data

From First Class:

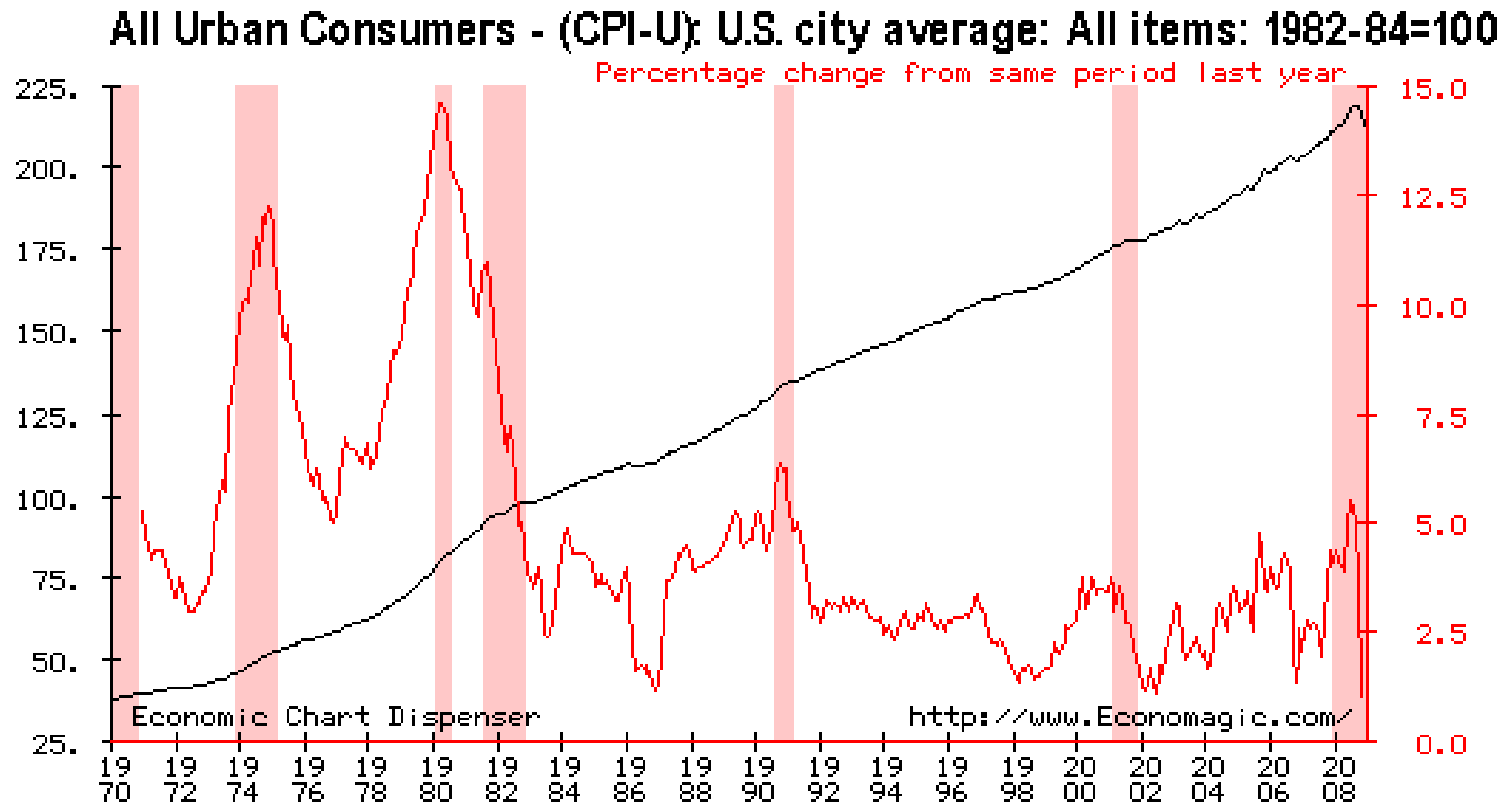
1. Some falls in GDP were associated with **no increase in prices**.
2. Some falls in GDP were associated with large **increase in prices**.

Do our theories reconcile these facts?

- **YES!** Demand shocks explain (1)
- **YES!** Supply shocks explain (2)

You should really understand the difference between **demand shocks** (things that primarily affect AD) and **supply shocks** (things that primarily affect AS) on the economy - their implications are much different!

Historical Inflation: 1970M1 - 2008M12



Black line - trend in CPI over time (left axis)

Red line - trend in CPI inflation rate (percentage change in CPI) over time (right axis)

Shaded areas represent "official" recession dates (as calculated by National Bureau of Economic Research)

Reinterpreting the Business Cycle Data 1970-2008

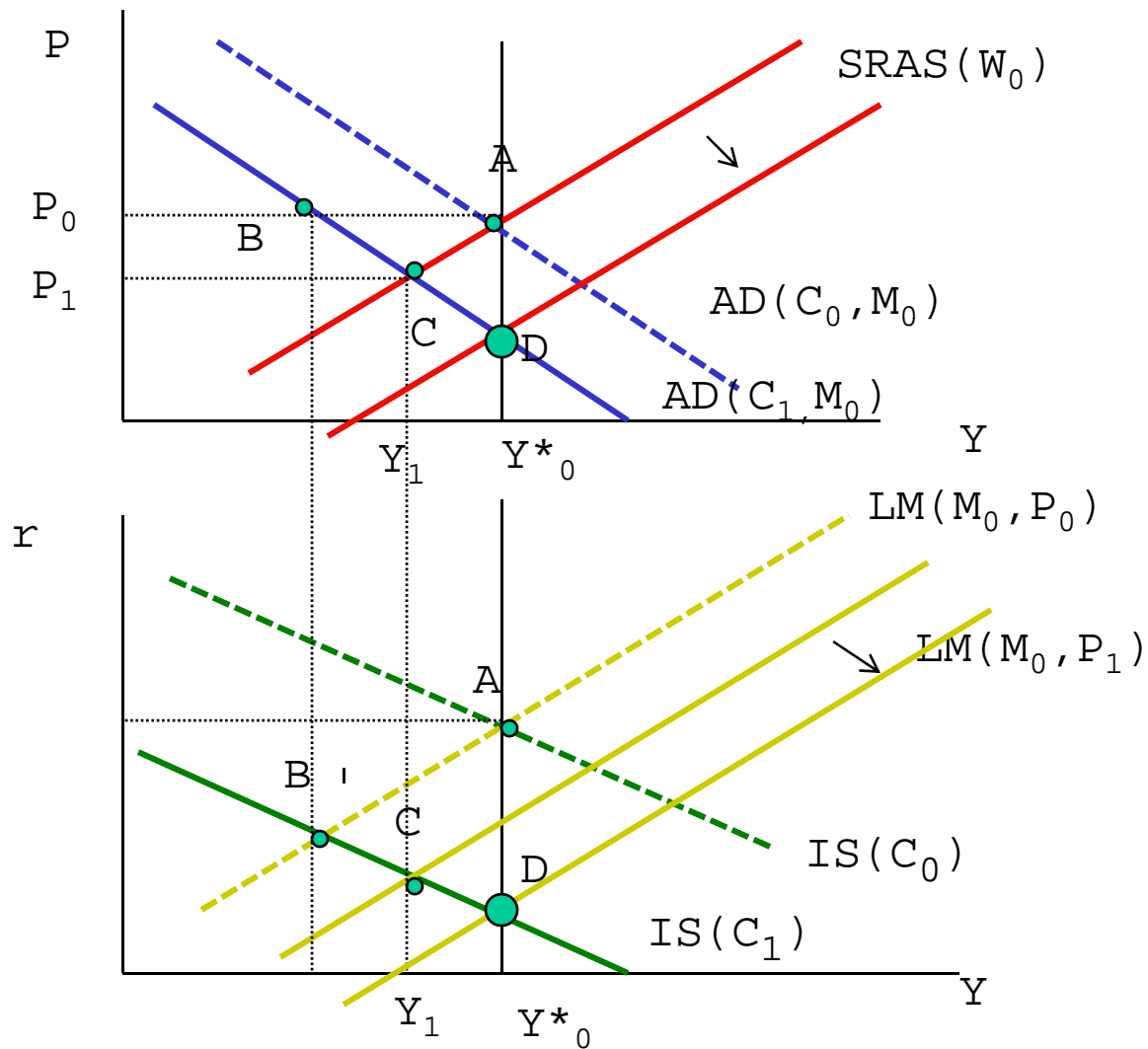
1970 recession:	Inflation increasing at start of recession! Supply shock: oil price + productivity + misguided Fed policy
1981 recession:	Dramatic decrease in inflation at start of recession Demand shock: Volker (Fed starts to worry about inflation!)
1990 recession:	Little increase in inflation/but low level of inflation Demand shock: fall in consumer confidence
Rapid growth in mid 1990s:	No inflation Positive Supply shock: IT revolution
2001 recession:	No inflation Demand shock: firms overconfidence: inventory adjustment
Current recession:	Inflation first up and then down. Supply: oil shock Demand: credit crunch, confidence loss, drop in wealth

Self-Correcting Mechanism

- What would happen in the **long-run** after a negative shock if there was no policy?
- A Self-Correcting Mechanism will bring the economy **back to the potential Y^***
- Mechanism: workers would like to work more, so firms at some point will decrease nominal wages, so that the labor market goes back to equilibrium!
- As nominal wages decrease, it is cheaper to produce and the **SRAS will shift to the right!**
- As wages decrease, prices decrease, the real value of money supply increase and the **LM shifts to the right!**
- As M/P increases, the equilibrium interest rate has to decrease, stimulating I and C !

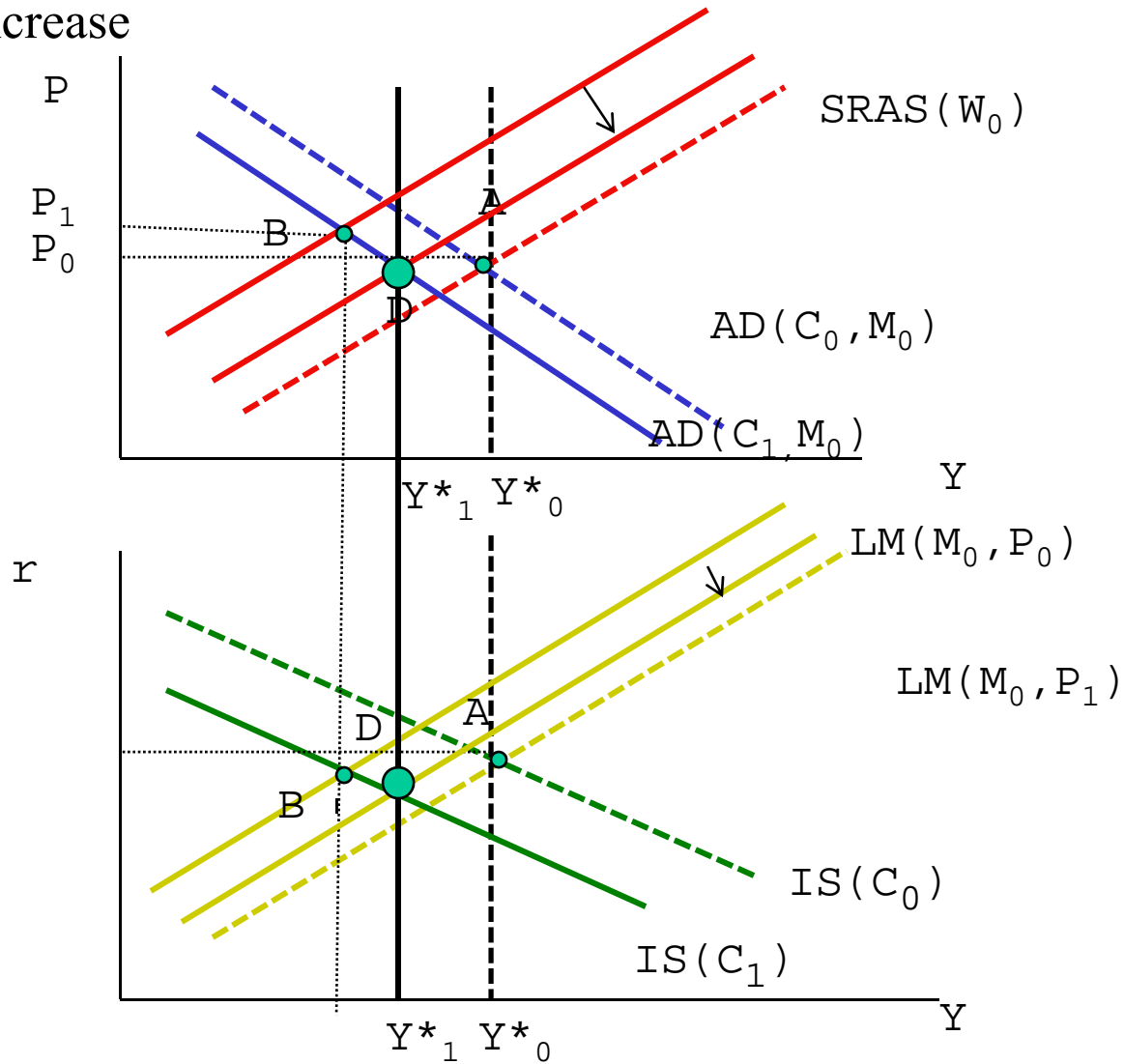
Example 1: Self-Correcting Mechanism

Loss of Consumers' Confidence



Example 2: Self-Correcting Mechanism

Oil price increase



Fed Policy versus Self-correcting Mechanism

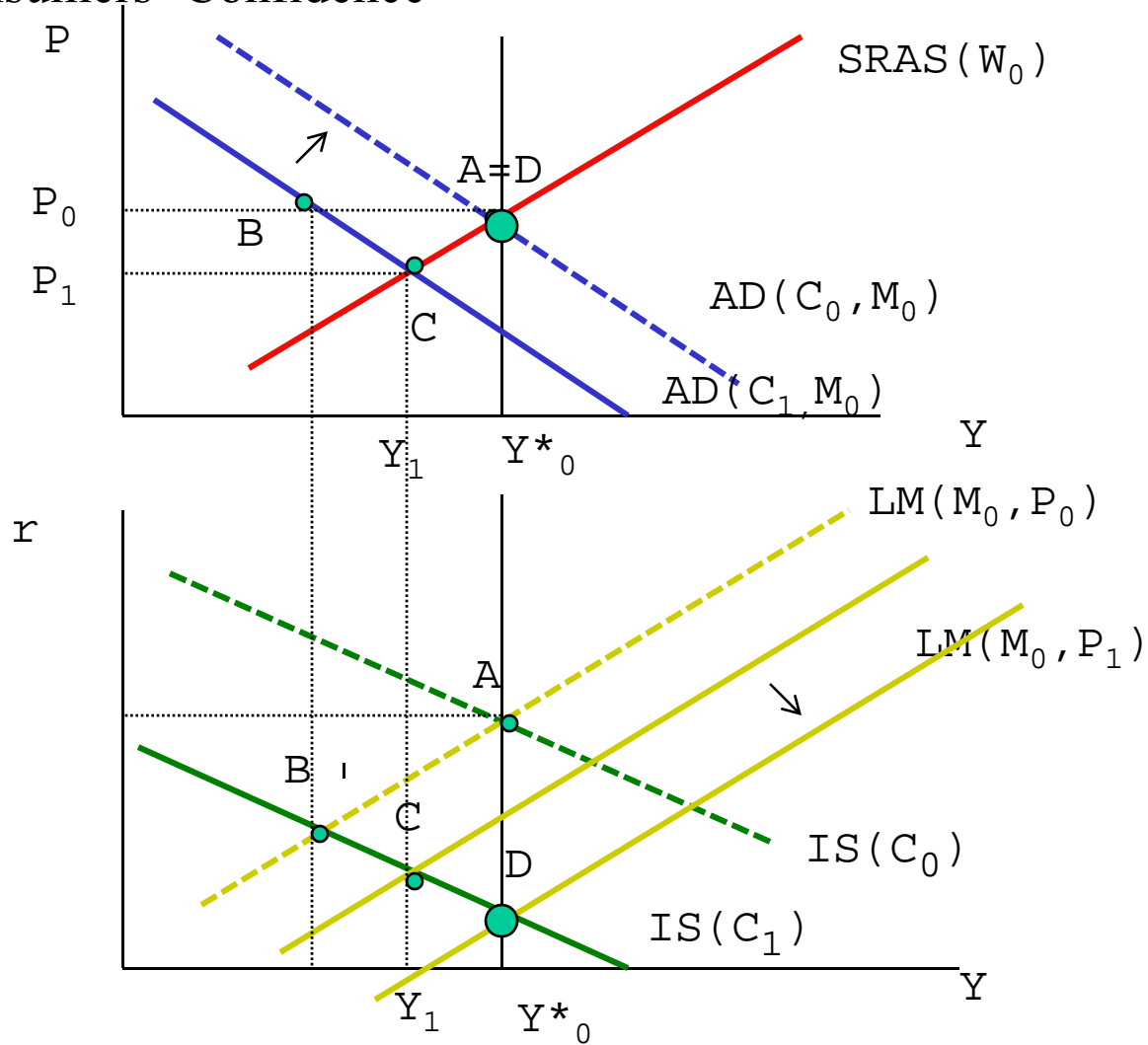
- The Fed may decide to conduct an expansionary monetary policy (increase M) to fight the recession
- Trade-off: Fed policy may speed up the recovery, but pushes prices up!

COMPARISON:

1. Real variables go back to the same long run equilibrium (both Fed or self-correcting mechanism)
2. BUT prices and nominal wages behave differently: risk of inflation!
3. Fed can increase the speed of adjustment ...

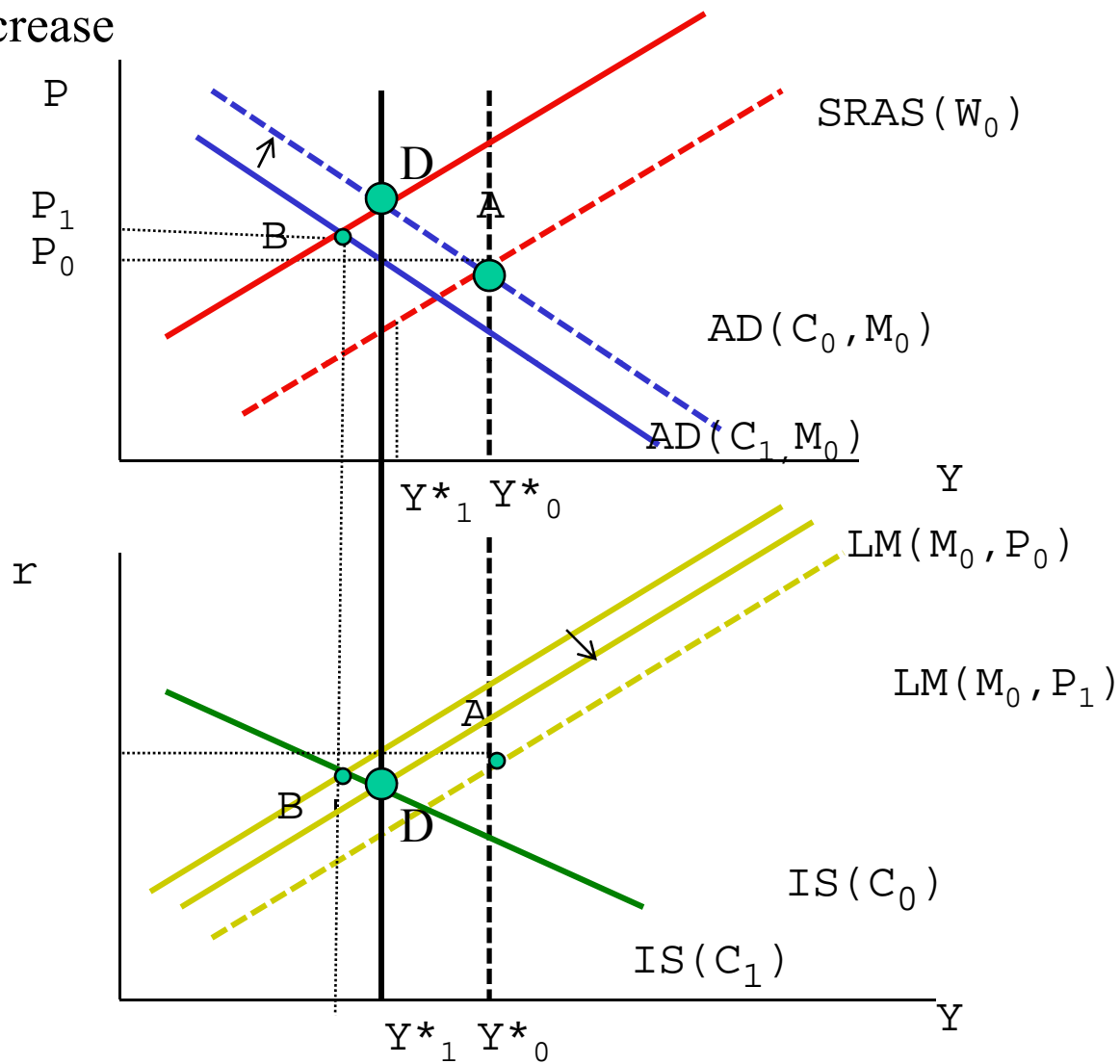
Example 1: Monetary Policy

Loss of Consumers' Confidence



Example 2: Monetary Policy

Oil price increase



The Fed in the '70s: push inflation

- After the negative supply shocks in the mid/late '70s, the Fed adopted a policy mainly based on **fighting the recession by increasing M**
- The Fed believed that the potential was still Y_0^*
- The Fed tried to bring Y back to the **wrong potential, Y_0^* instead of Y_1^* !**
- This pushed prices up and then, through the adjustment of the labor market, wages even higher!
- This pushed the SRAS in, pushing inflation up! Say back to Y_1^* .
- But the Fed wants to go to Y_0^* , so increases M again...
- Amplifying mechanism: if workers expect high inflation they will try to get higher nominal wages!

New Fed view: Inflation Targeting

- Late '70s: inflation was out of control also because of bad Fed policies!
- Friedman: the Fed has to control inflation! **Reset, expected inflation rates.**
- —→ **1982: Volker Recession**
- Cold Turkey money cut to reduce inflation and change **individuals' perception** of Fed policy (not try to stabilize output at the expense of inflation!)
- Cut inflation from double digits to 4%!
- However, this caused **a short deep recession.**

On unemployment and inflation...

- In the short run, the SRAS tells us that if output is high, or unemployment low, typically prices are high!
- If $Y < Y^*$, or $u > u^*$, output stabilization policies tend to generate inflation...
- If $Y = Y^*$, or $u = u^*$, but P high, inflation control policies generate a recession...
- Phillips curve = relationship between inflation and unemployment: one-to-one relationship with the AS!
- **Phillips** discovered a negative correlation between unemployment rate and inflation rate across time in the 1950s (**Phillips curve**)
- Old Keynesians in the 1960s: there is a stable, exploitable trade-off between the rate inflation and unemployment. **Maybe can permanently lower unemployment at the cost of permanently higher inflation!**

Friedman: evidence killed it!

- Milton Friedman in 1968: the long run Phillips Curve is vertical at u^* .
- This is because the LRAS is vertical at Y^* !
- Vindicating evidence: the Phillips Curve broke down after 1970, as the Fed was trying to push Y above Y^*
- Over time in the U.S., higher money growth just lead to more inflation and no higher real GDP
- Across countries, higher money growth just leads to more inflation and no higher real GDP.
- If anything, in the long run, real GDP appears to be hindered by high levels of inflation!

To sum up ...

- In the **SHORT RUN** there is a tradeoff between the unemployment rate and inflation rate *changes*:
 - Inflation tends to fall in years following $U > U^*$.
The cost of a **permanently** lower inflation rate is a **temporarily** higher unemployment rate.
 - Inflation tends to rise in years following $U < U^*$.
The cost of **temporarily** lowering the unemployment rate is a **permanently** higher inflation rate.
- In the **LONG RUN** the unemployment rate is fixed at u^* and any monetary policy will have only effects on the inflation rate

MIT OpenCourseWare
<http://ocw.mit.edu>

14.02 Principles of Macroeconomics
Fall 2009

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.