# 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*

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# 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)

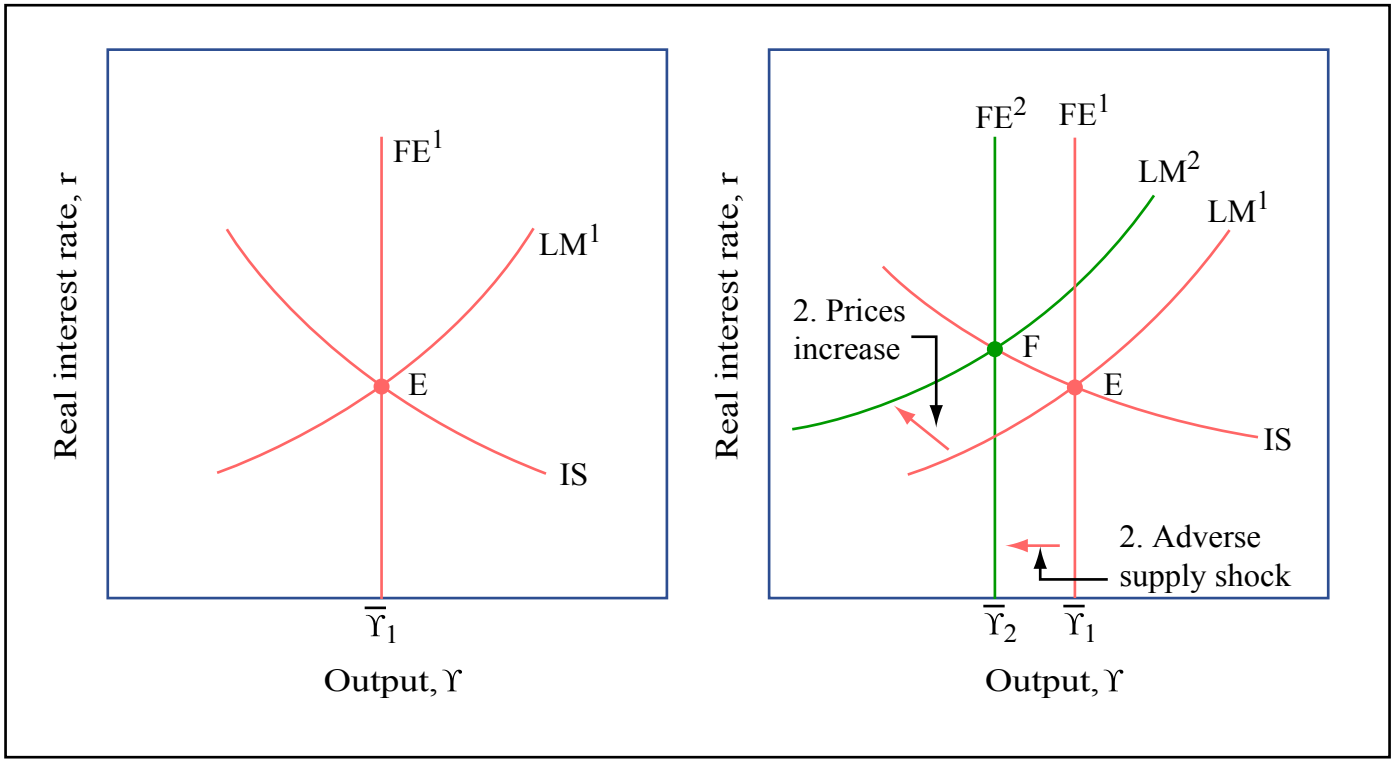



Figure by MIT OpenCourseWare.

# 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

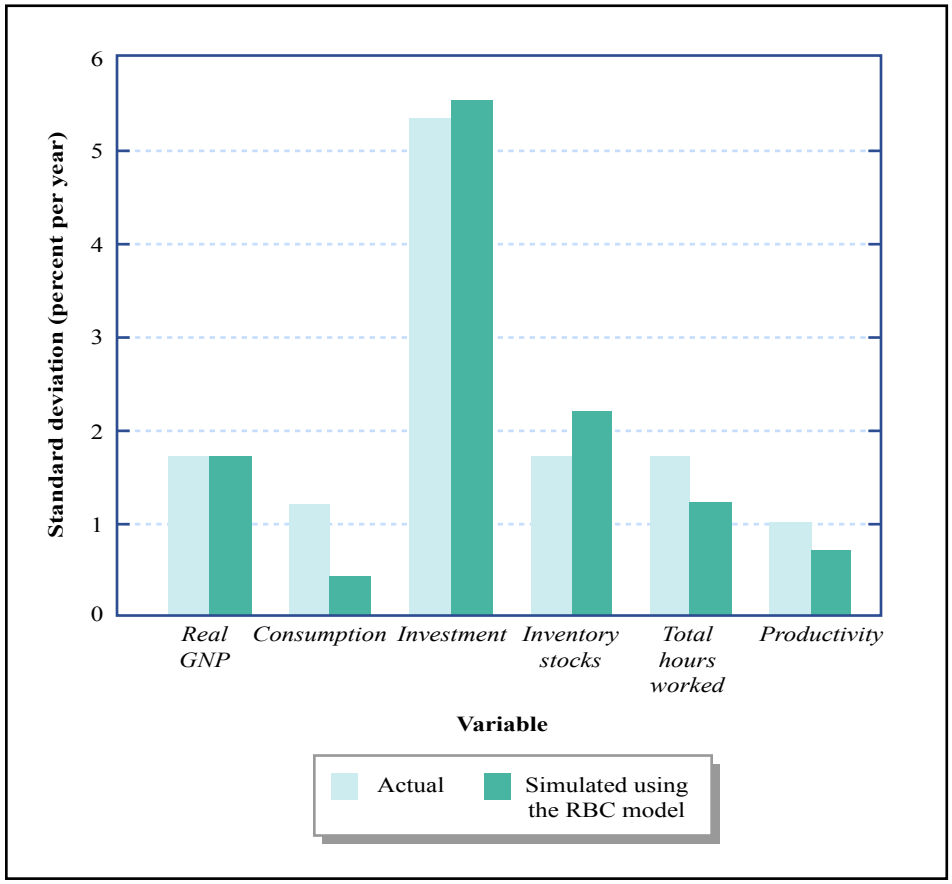



Figure by MIT OpenCourseWare.

# Classical Economists

- Classical Economist 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-netural!
- **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:

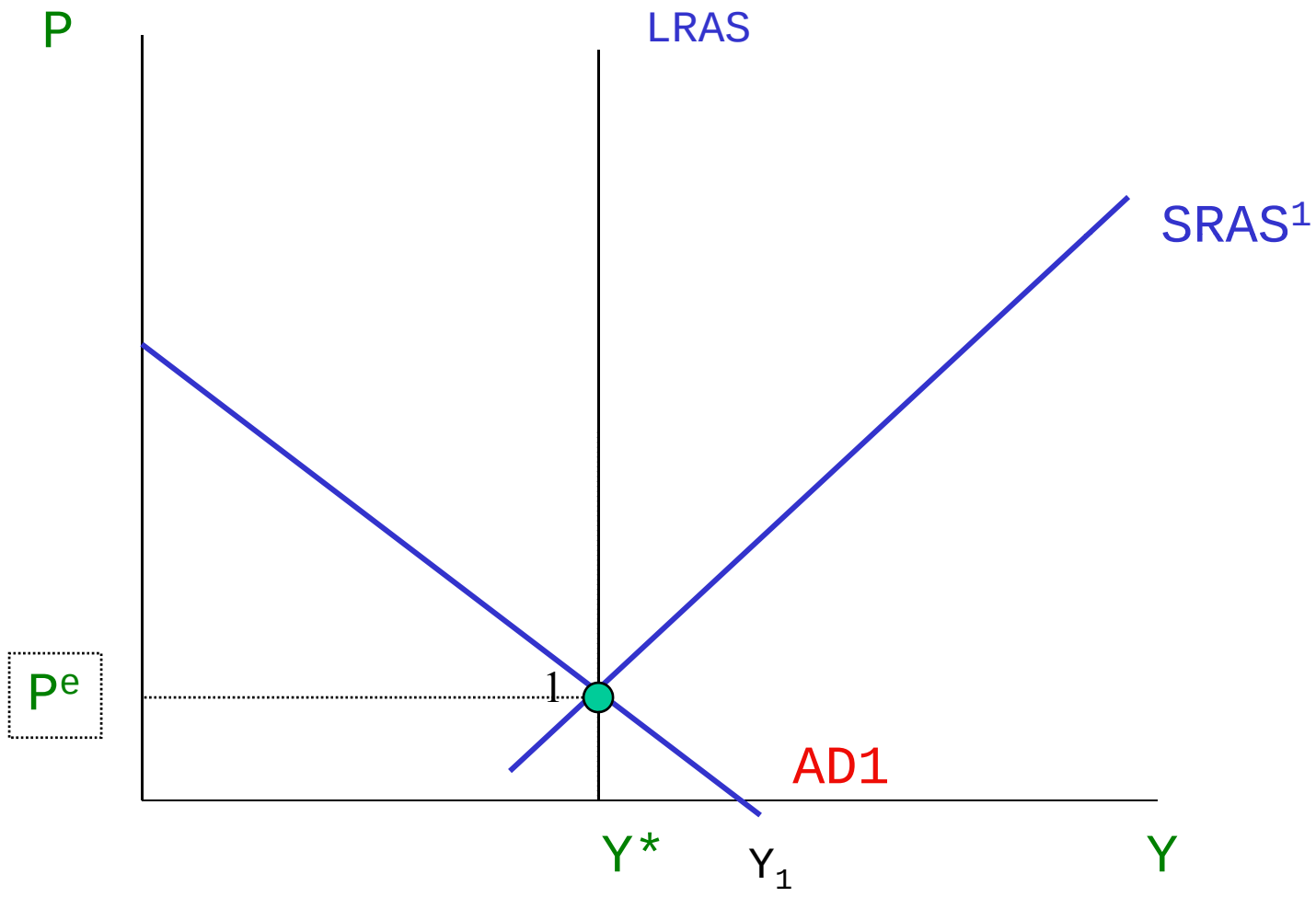
$$\mathbf{Y = Y^* + b^*(P - P^e)}$$

- 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!

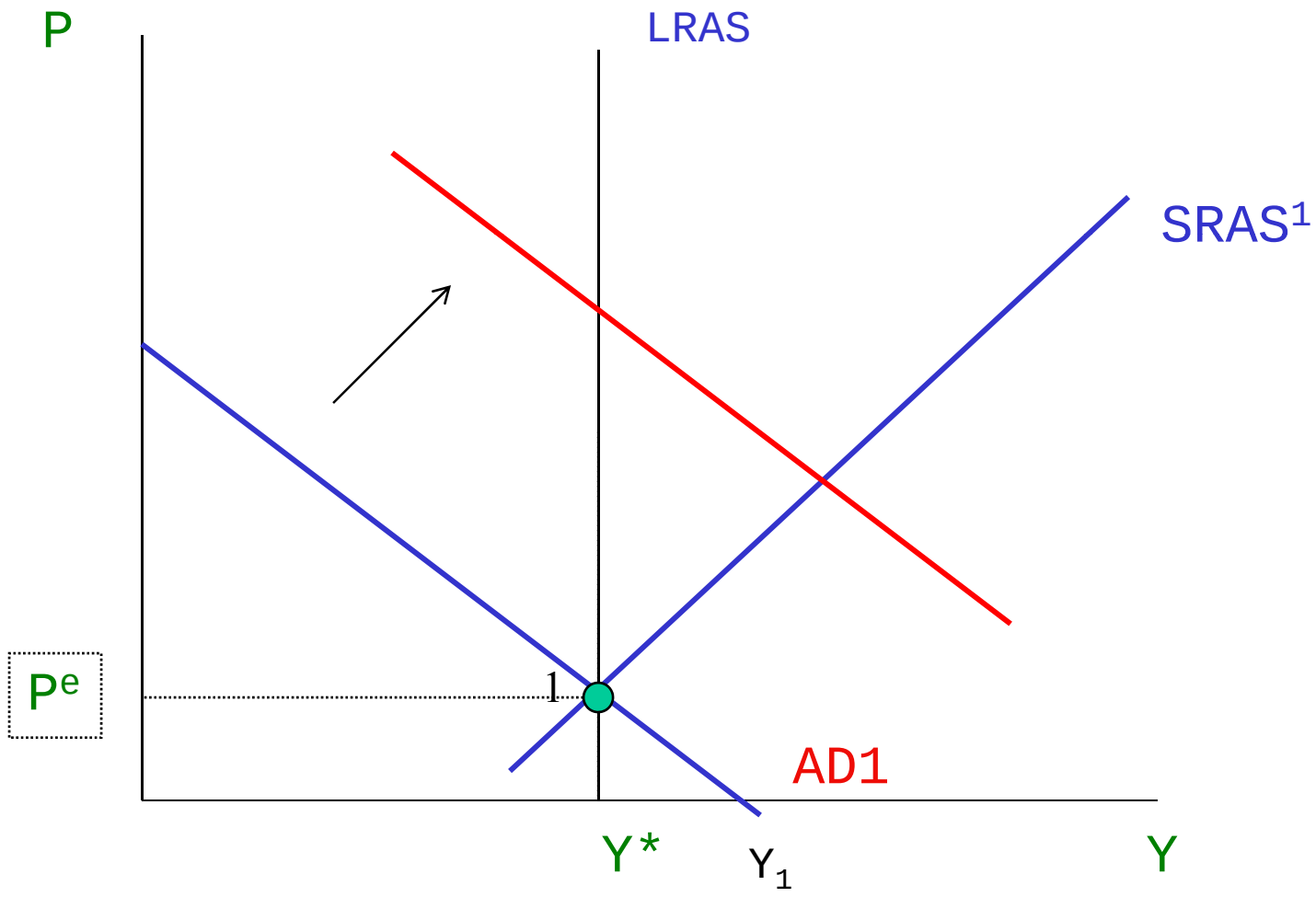
- According to the Misperception Theory, unanticipated changes in monetary policy have real effects in the short run.
- The reason: producers are fooled!
- Anticipated changes in monetary policy do not have real effects because the SRAS shifts accordingly.
- Are monetary policy good?
- Not clear because 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



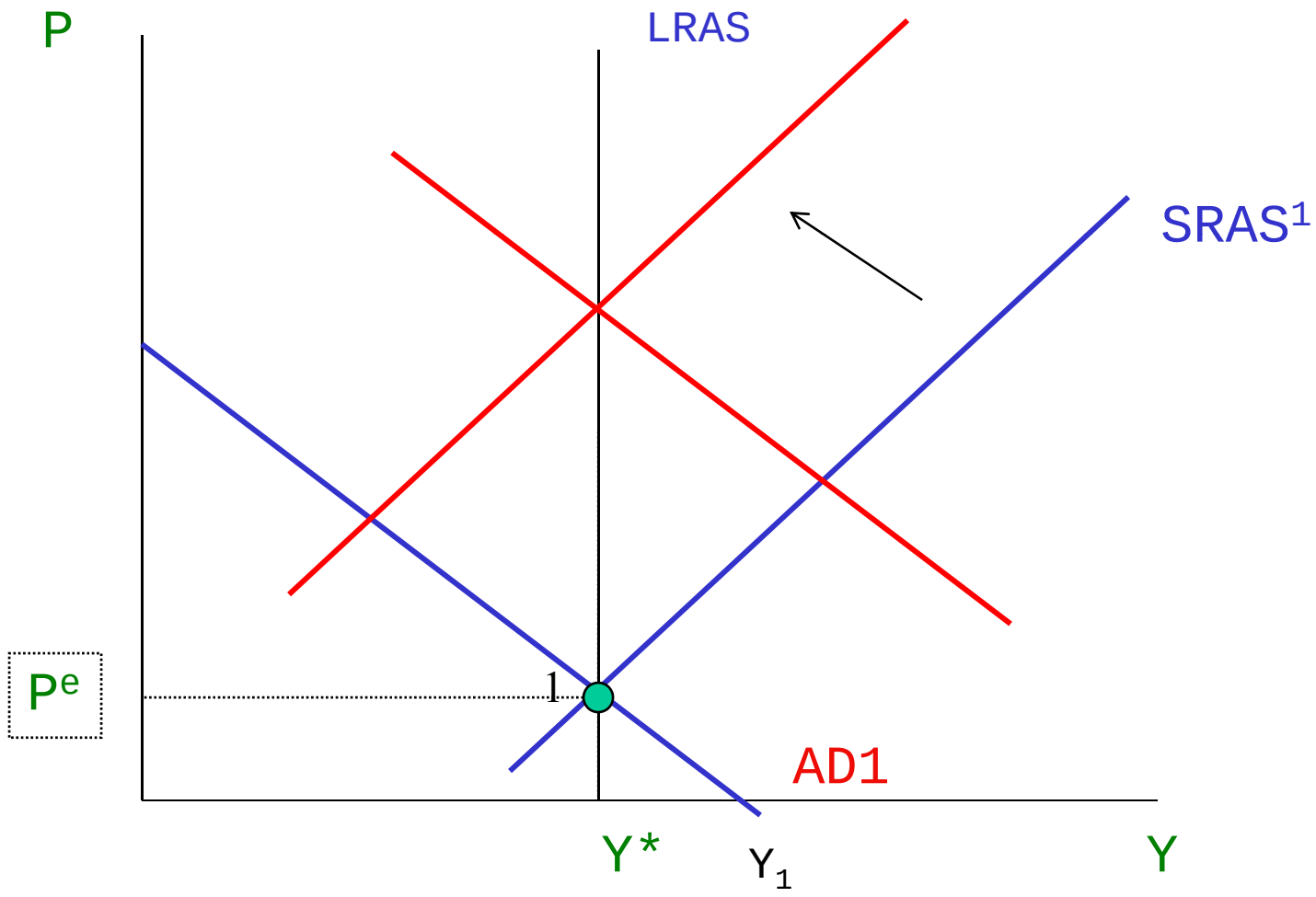
# Unanticipated Increase in M

Money is non-neutral in the short run!

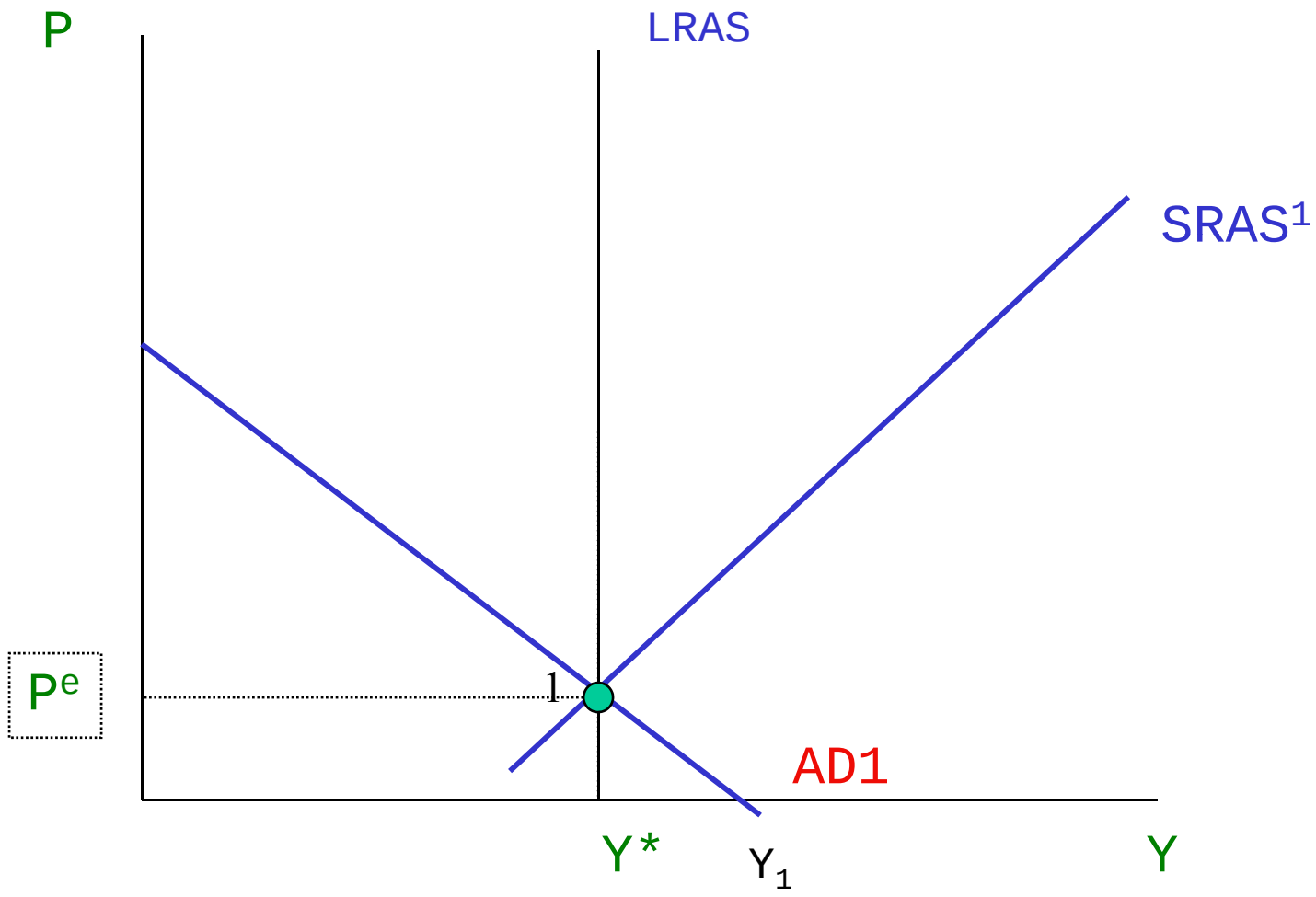


# Unanticipated Increase in M

In the long run is neutral!

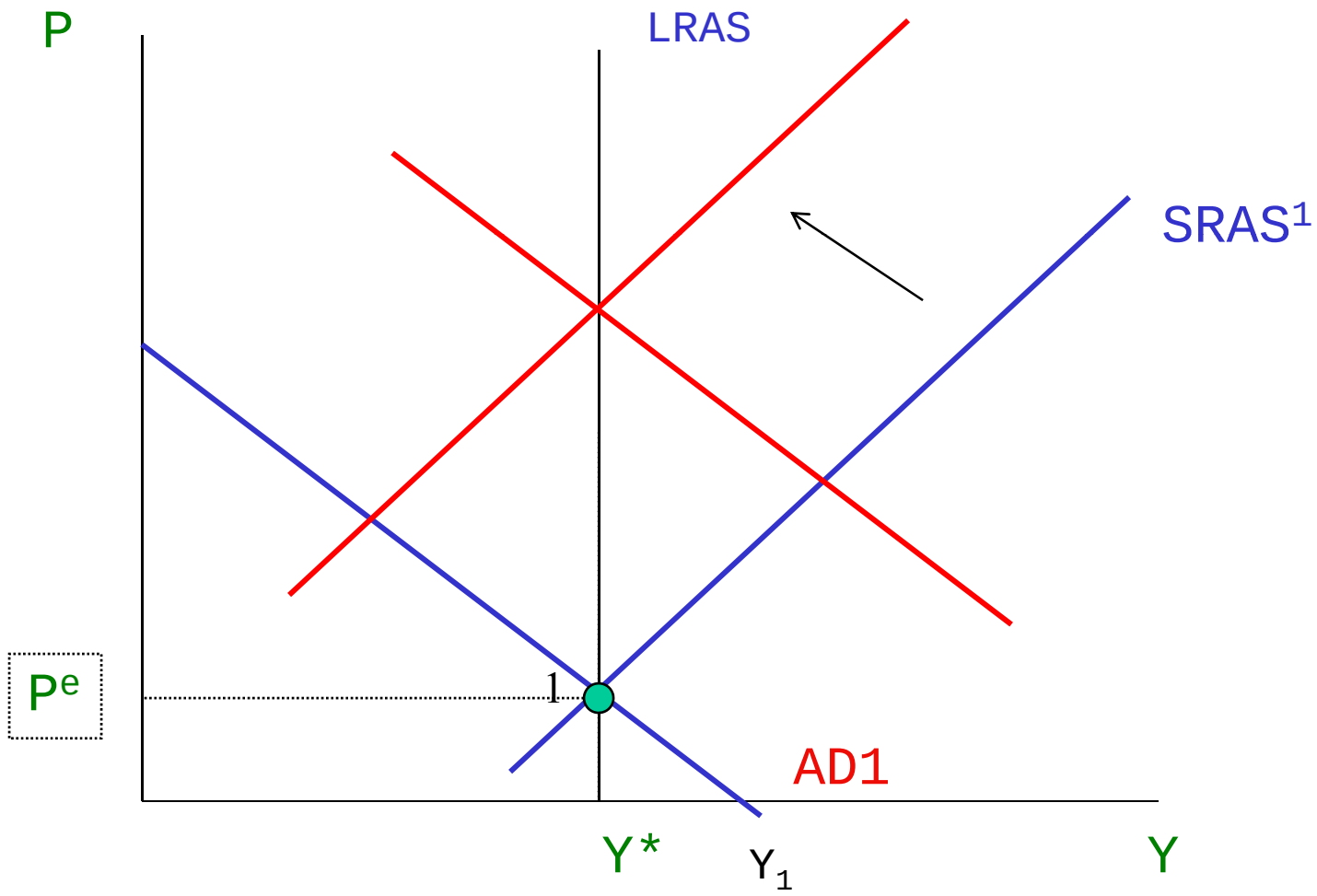


# Anticipated Increase in M



# 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!)

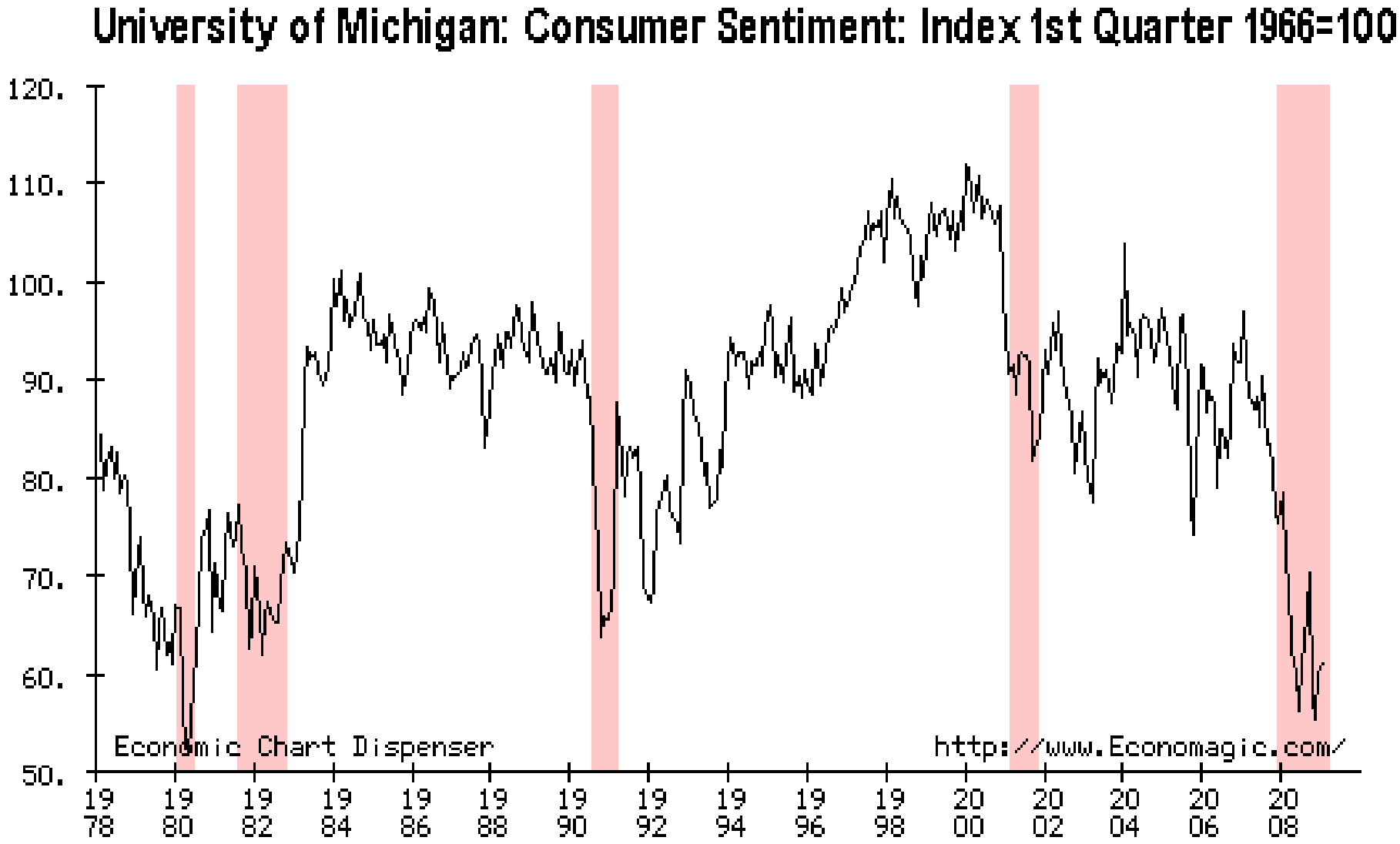
- Change in expectations about the future can have dramatic effects even if not founded!

- 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**

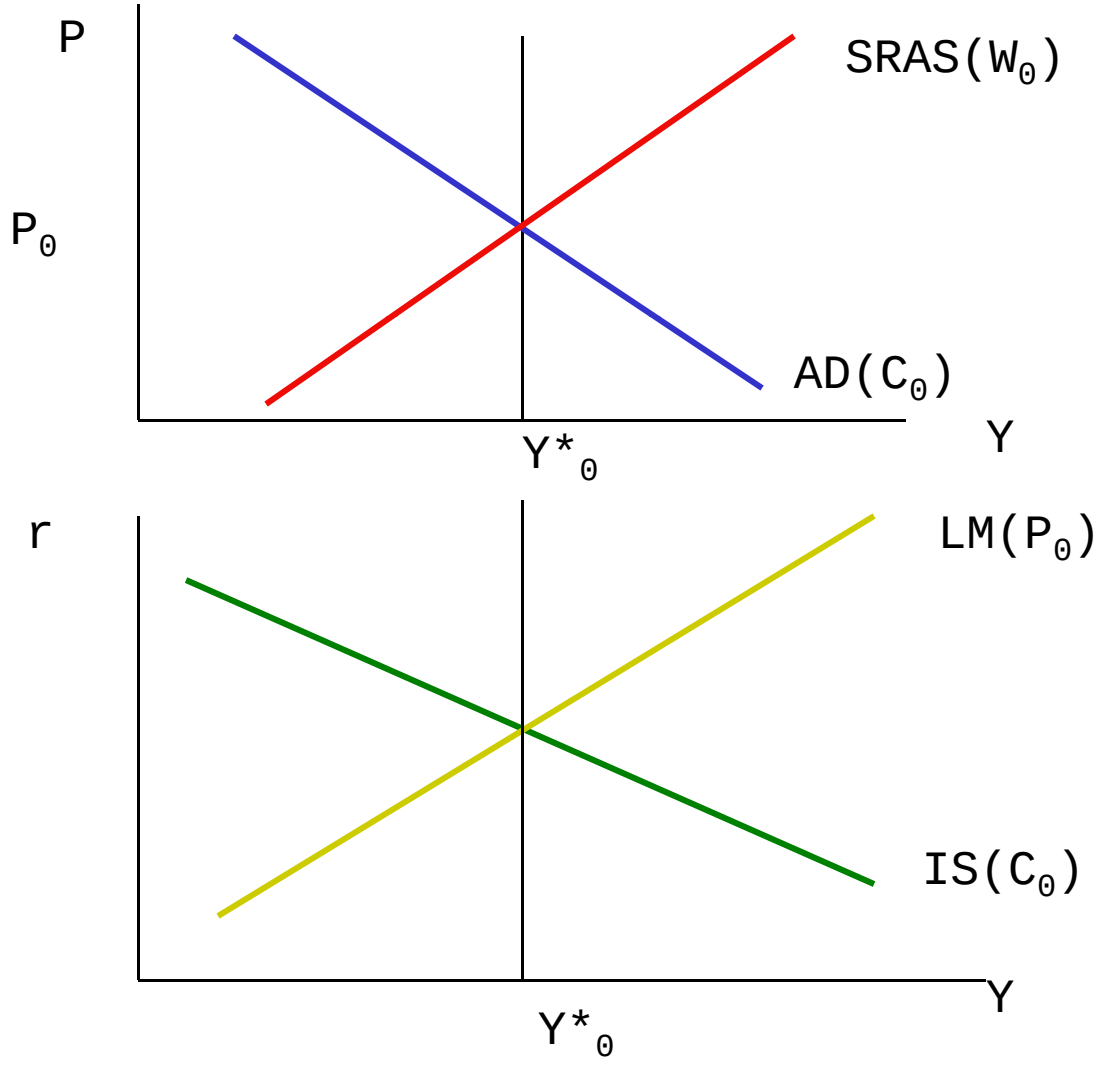
- Assumptions for the following example:
  1. **No income effect on labor supply (labor supply does not move)**
  2. **No change in A or $A^f$**
  3. **Consumers are standard PIH, no liquidity constrained, and non-ricardian**
  4. **Upward-sloping SRAS: sticky wages**

# Consumer Confidence: 1978M1 – 2009M1



# Example 1: Graphical Representation

Assume we start at Y*



# 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!)

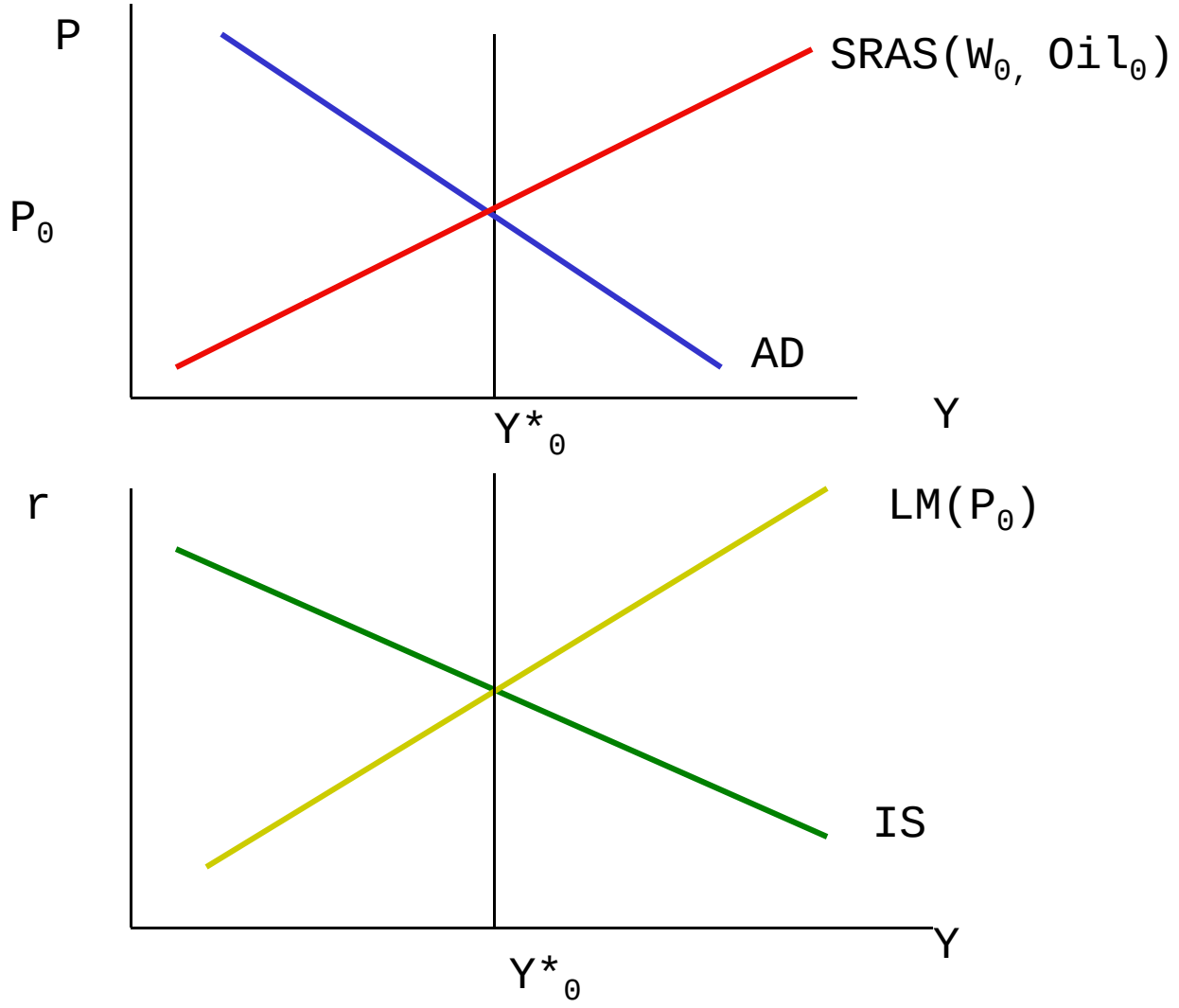
- What does a permanent increase in oil prices affect?

  - 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)



# 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.

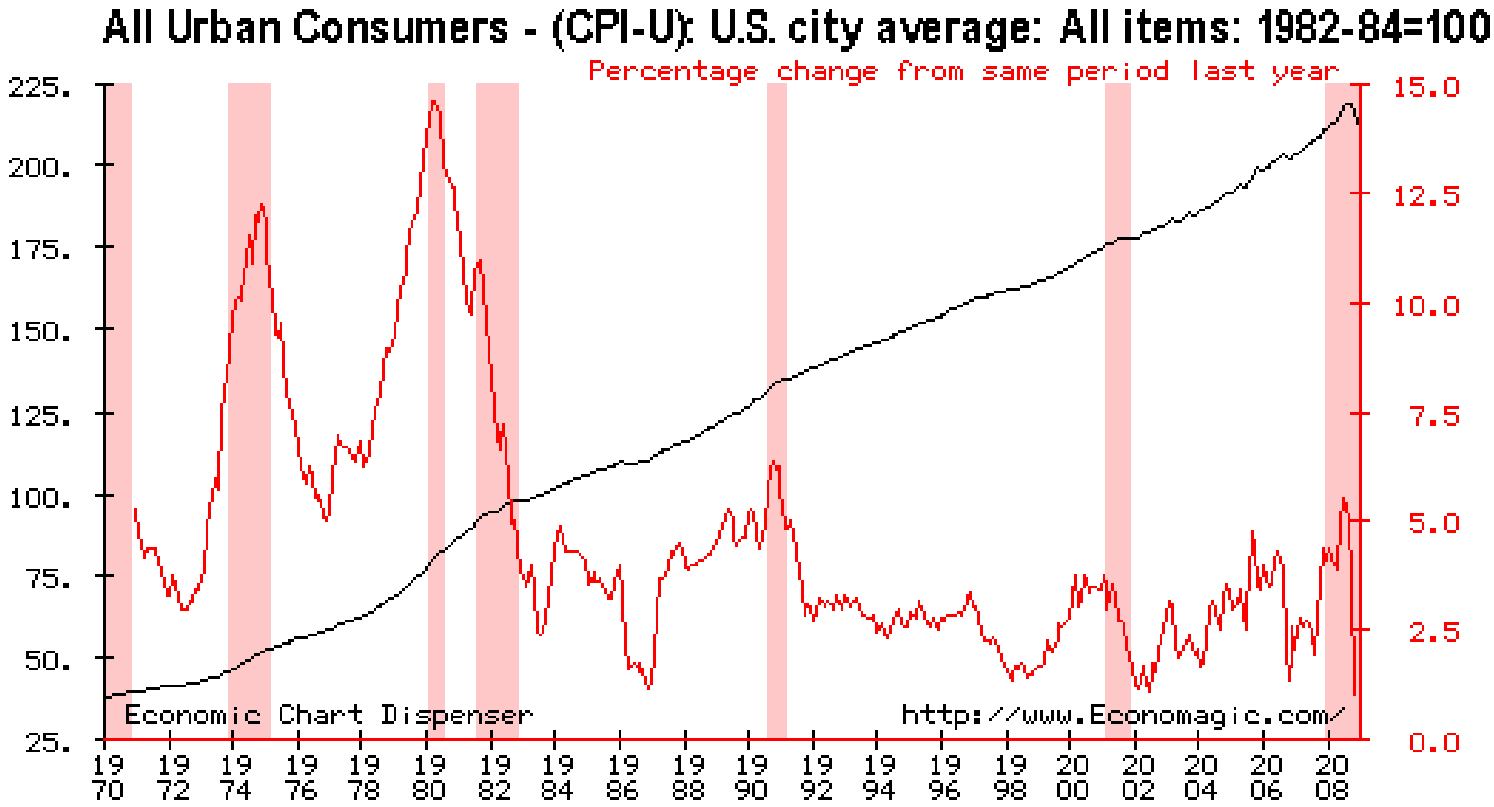
Do our theories reconcile these facts?

- **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

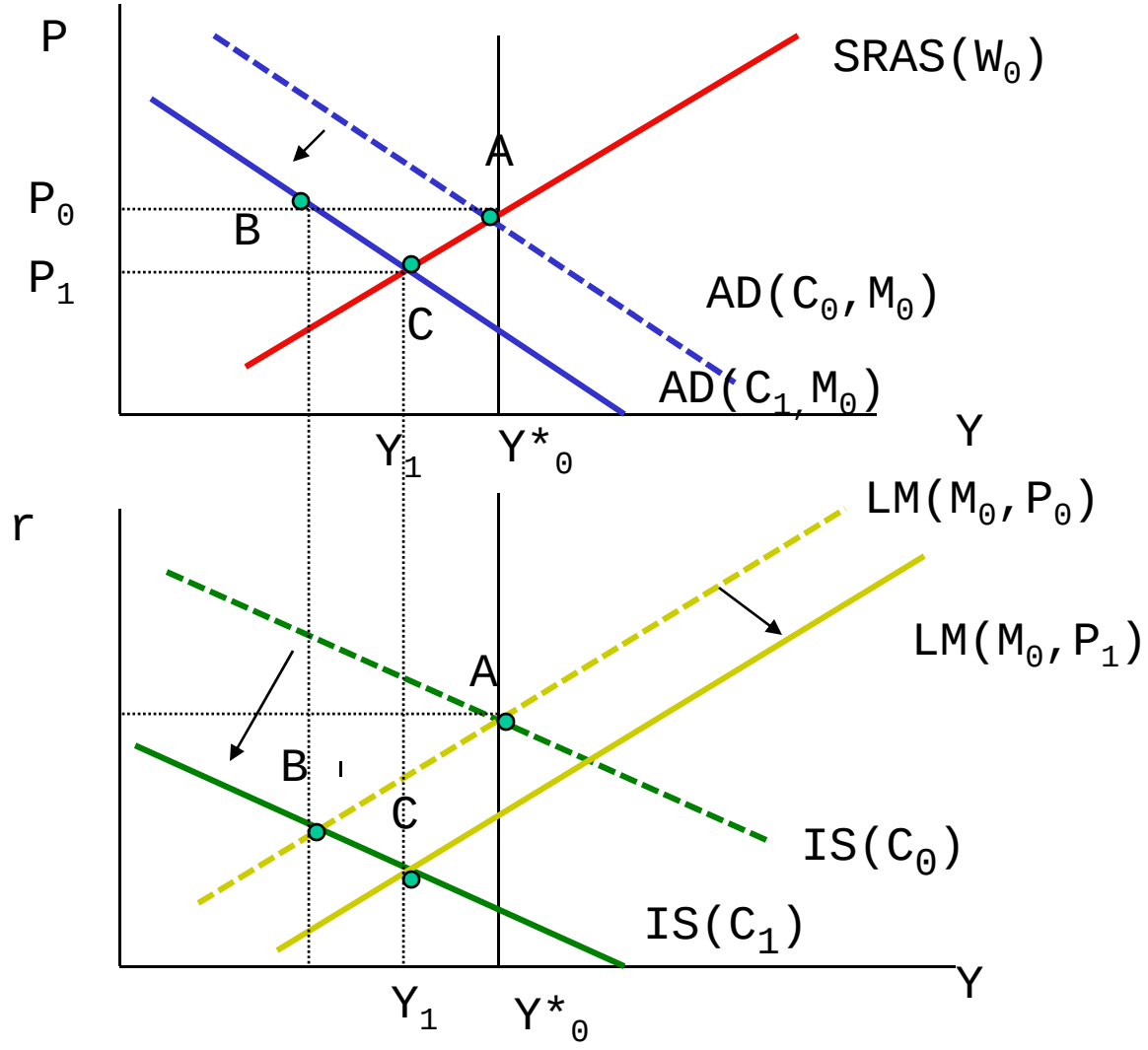
| | |
|---|---|
| 1970 recession: | Inflation increasing at start of recession!<br>Supply shock: oil price + productivity + misguided Fed policy |
| 1981 recession: | Dramatic decrease in inflation at start of recession<br>Demand shock: Volker (Fed starts to worry about inflation!) |
| 1990 recession: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

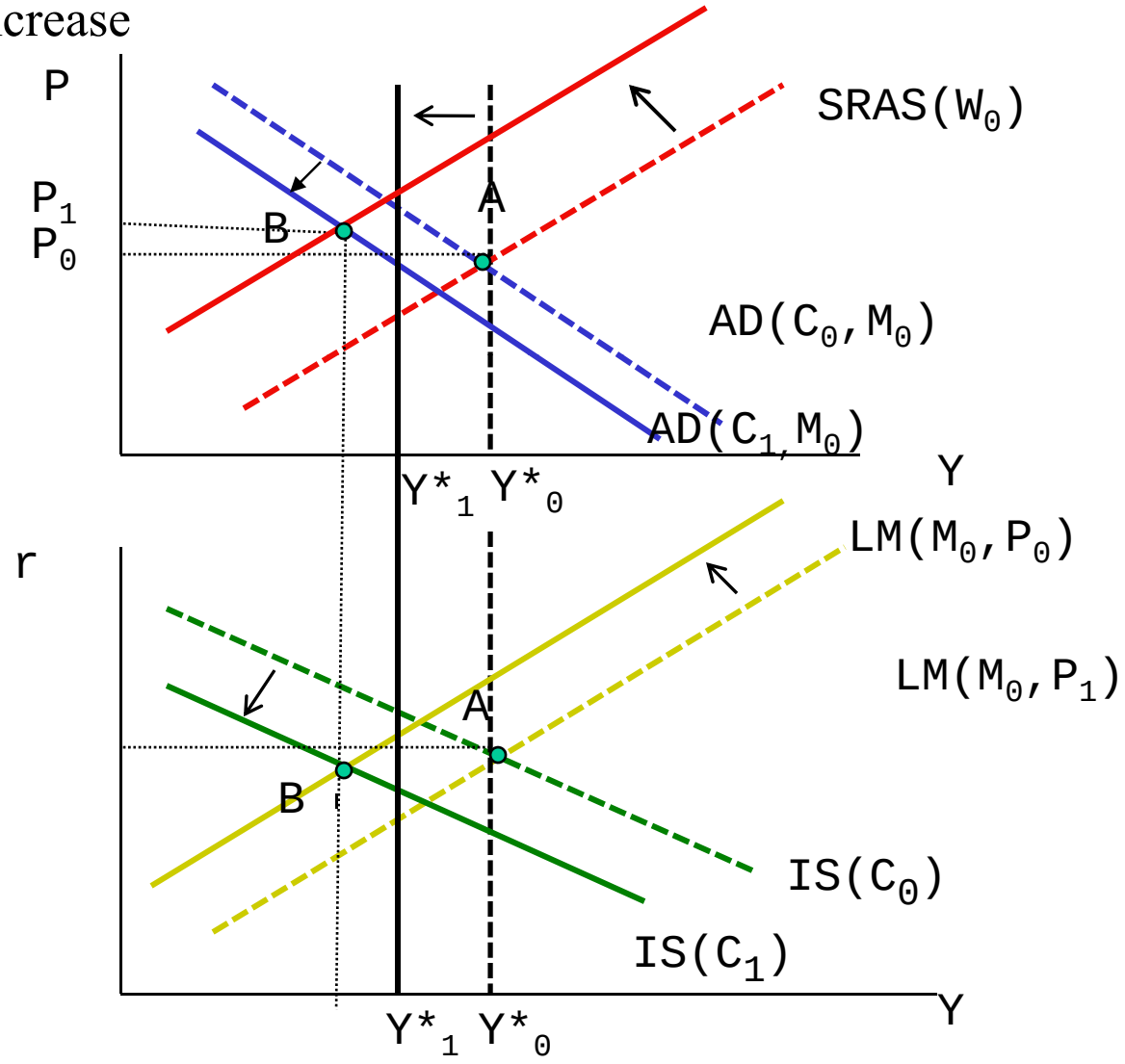
# Example 1: Self-Correcting Mechanism

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:

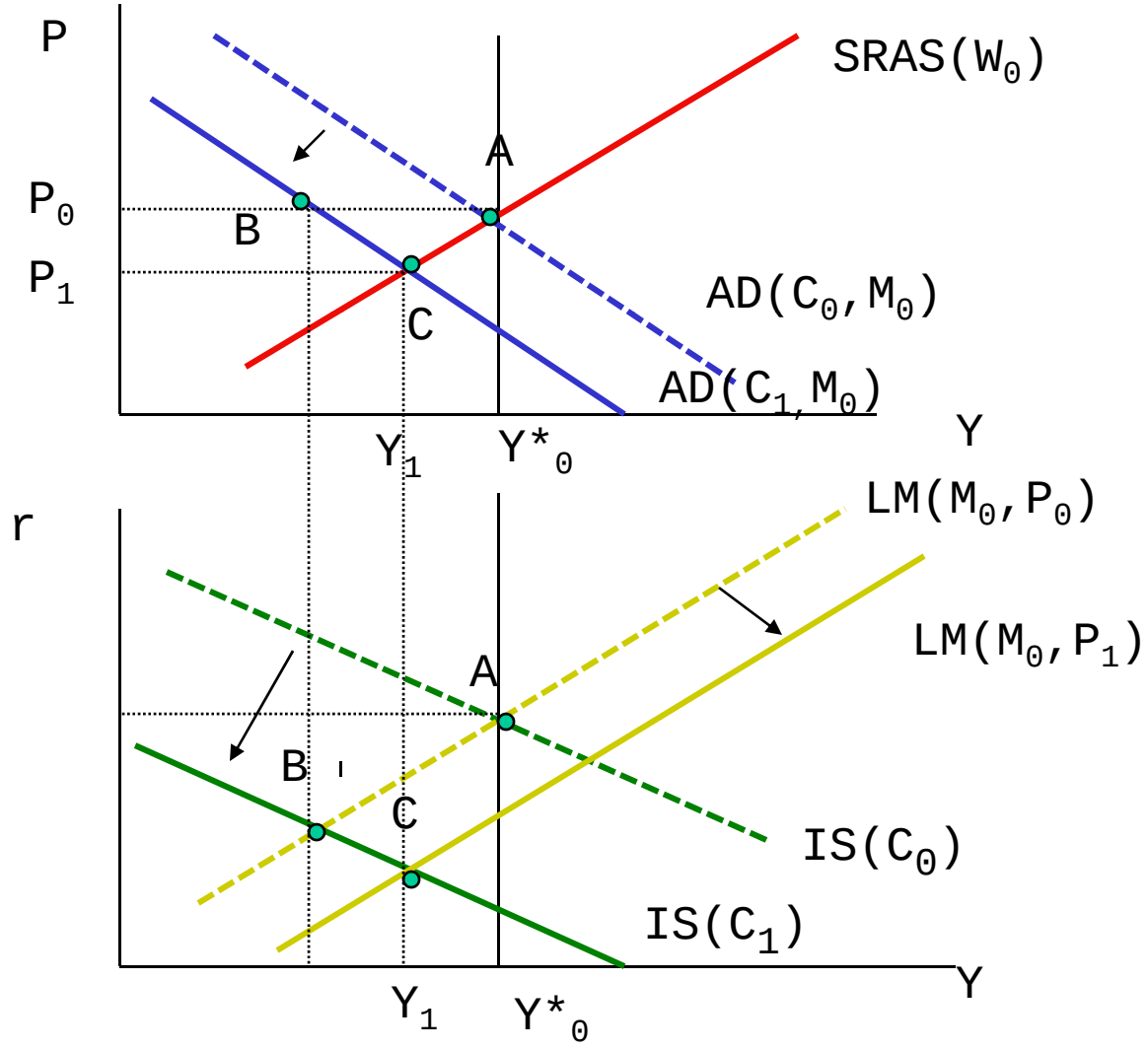
1. Real variables go back to the same long run equilibrium (both Fed or self-correcting mechanism)

2. BUT prices and nominal wages behave differently: risk of inflation!

3. Fed can increase the speed of adjustment …

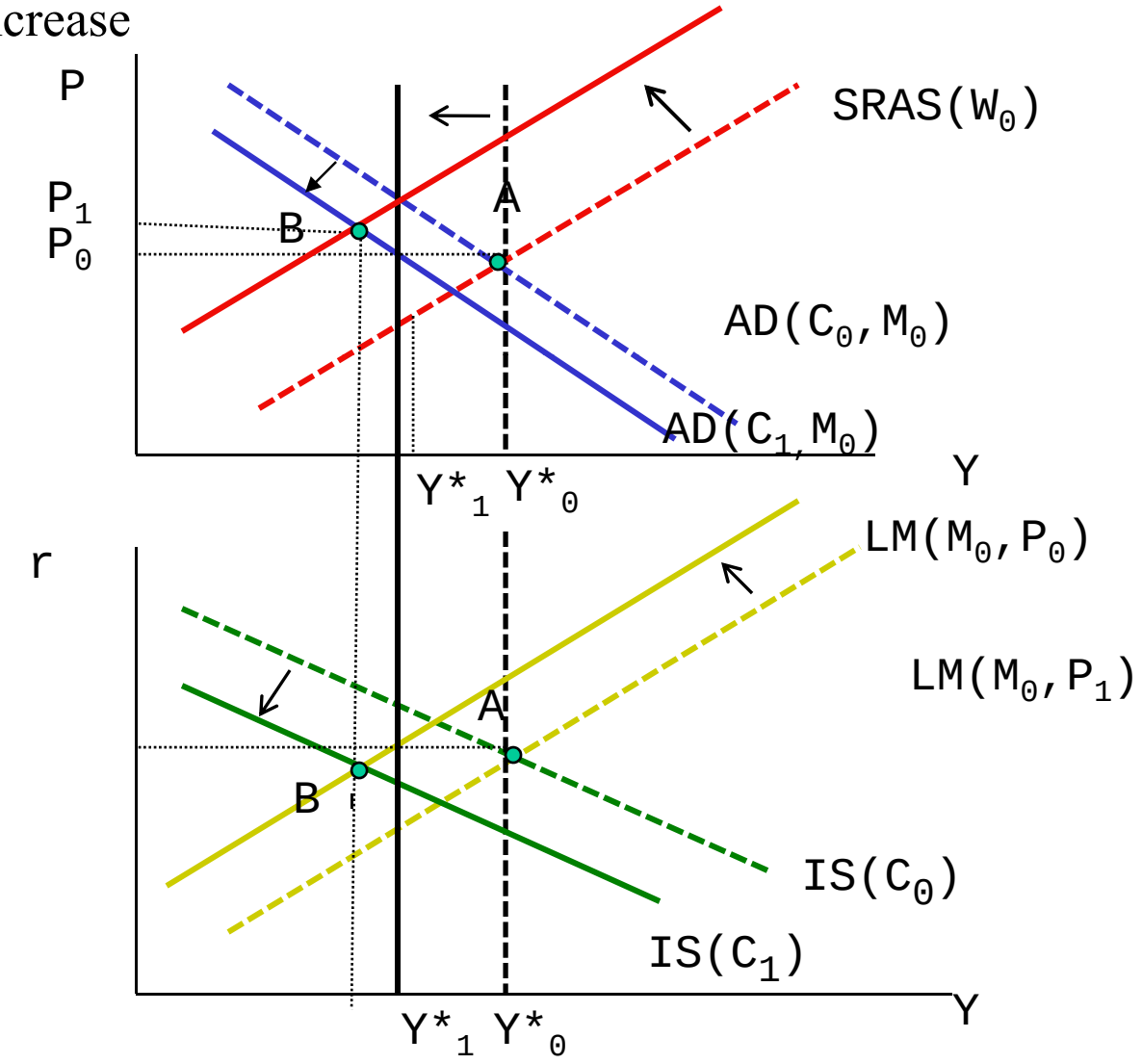
# Example 1: Monetary Policy

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.
- $\longrightarrow$ 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

# 14.02 Principles of Macroeconomics

Fall 2009