Topics for Today

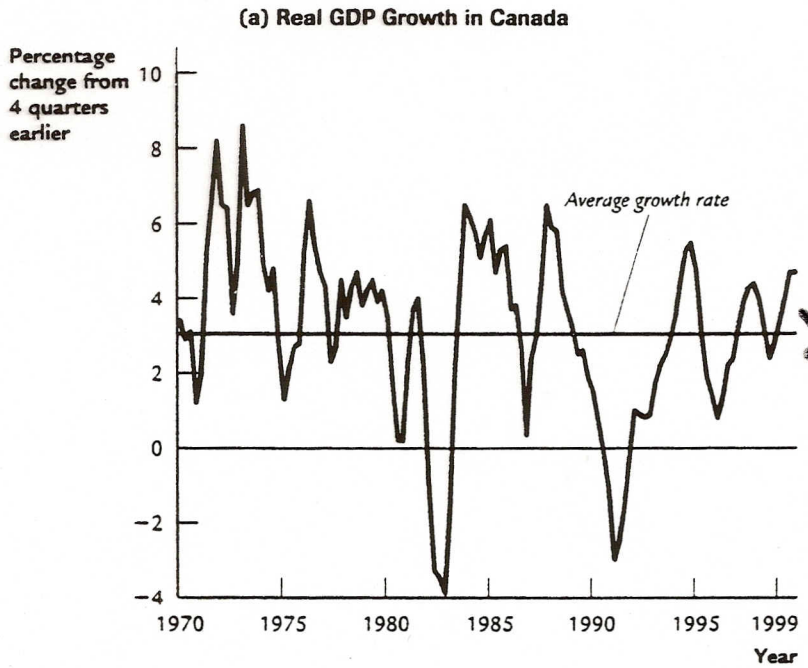
1.) Defining Business Cycles

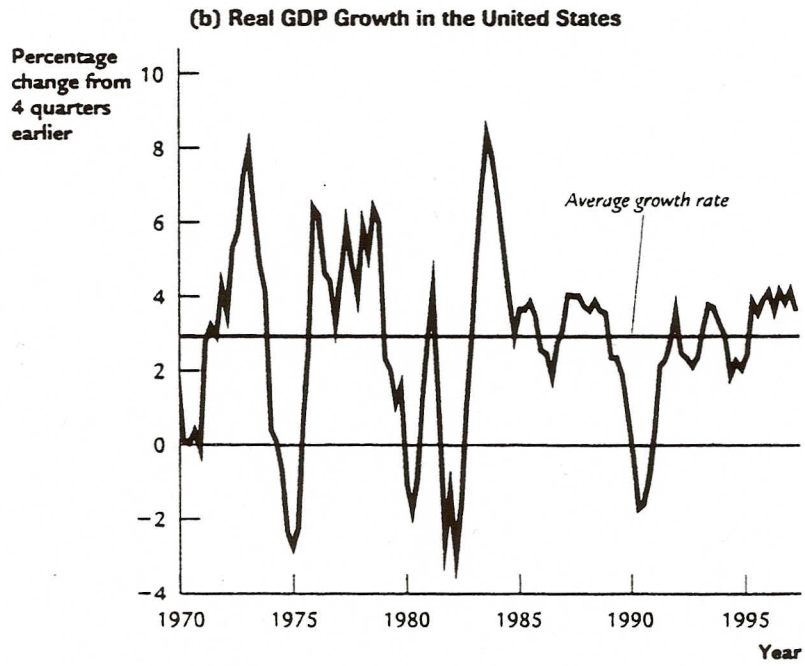
2.) Characteristics of Business Cycles

3.) A Preliminary Analysis of Business Cycles
- Aggregate Demand / Aggregate Supply
- Keynesians vs. Classicals

"In the long-run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is passed the ocean is flat again."

— John Maynard Keynes (1923)





Real GDP Growth in Canada and the United States In Canada the growth rate in real GDP averages around 3.1 percent per year, as indicated by the green line in Panel (a). But there is a wide variation around this average. Recessions are periods during which real GDP falls—that is, during which real GDP growth is negative. U.S. GDP is shown in Panel (b). Clearly business cycles in the two economies are closely connected. But the state of the U.S. economy is not the only important thing for Canada.

Source: Statistics Canada, D14872, and U.S. Department of Commerce.

Figure 9.8
Cyclical behaviour of the unemployment rate
The unemployment rate is countercyclical and very sensitive to the business cycle. It rises rapidly in contractions but falls more slowly in expansions.

Source: monthly unemployment rate, seasonally adjusted: *Canadian Economic Observer, Statistical Summary* or CANSIM D980745.

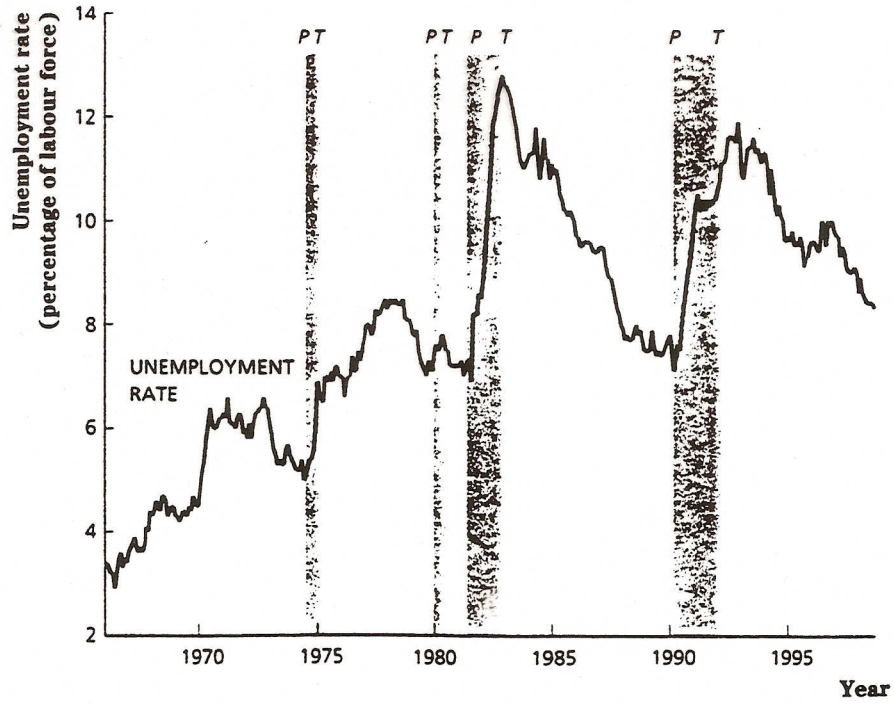
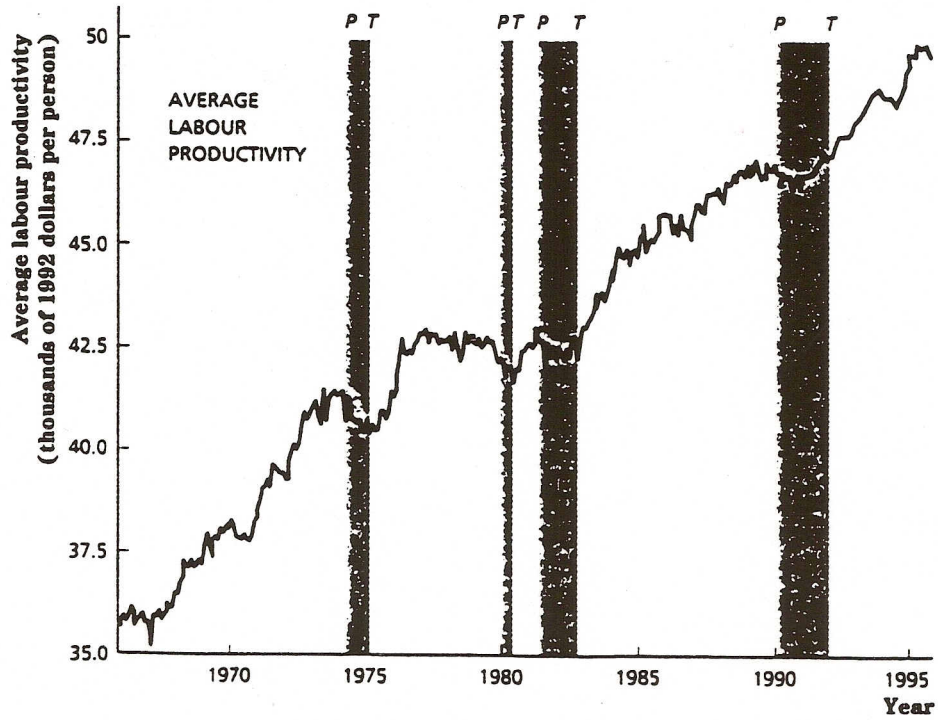


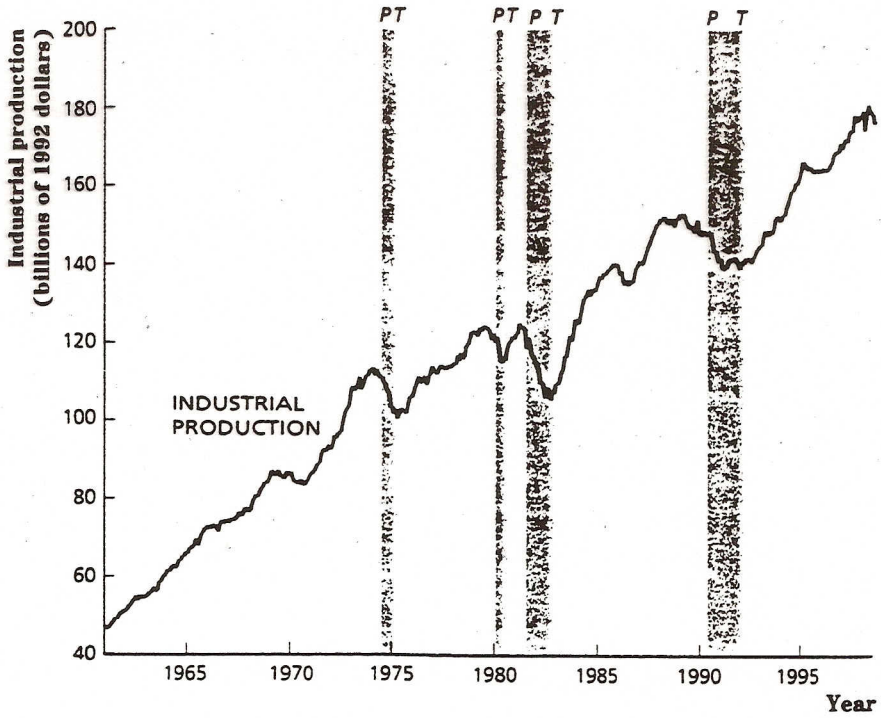
Figure 9.9
Cyclical behaviour of average labour productivity
Average labour productivity, measured as real output per person employed, is procyclical and leading.

Source: monthly GDP at factor cost and monthly employment, both seasonally adjusted: *Canadian Economic Observer, Statistical Summary* or CANSIM I56001 and D980595.



Cyclical behaviour of industrial production
Industrial production, an aggregate of production in all industries, is procyclical and coincident with the business cycle. The peaks and troughs of the business cycle are shown by the vertical lines *P* and *T*. The shaded areas represent recessions.

Source: monthly industrial production, seasonally adjusted: *Canadian Economic Observer, Statistical Summary* or CANSIM I56010.



Cyclical behaviour of consumption and investment
Both consumption and investment are procyclical. However, investment is more sensitive than consumption to the business cycle, reflecting the fact that durable goods are a larger part of investment spending than they are of consumption spending.

Source: consumption and business fixed investment, real, quarterly, and seasonally adjusted: *Canadian Economic Observer, Statistical Supplement* or CANSIM D15372 and D14851.

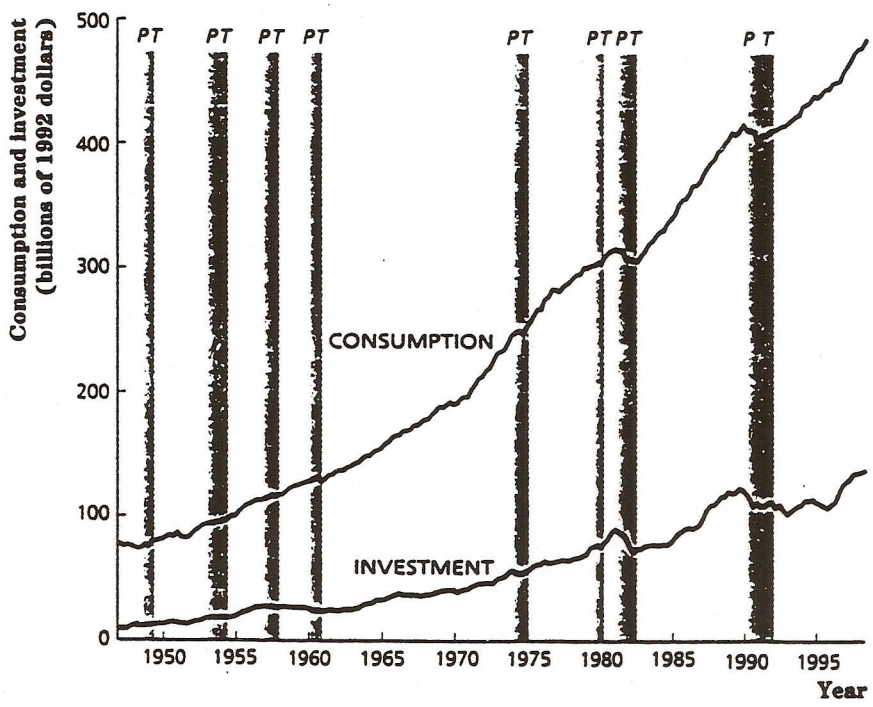


Table 9.1 Canadian Business Cycle Turning Points and Durations

Trough	Expansion (Months from Trough to Peak)	Peak	Contraction (Months from Peak to Next Trough)
		Nov. 1873	66
May 1879	38	July 1882	32
Mar. 1885	23	Feb. 1887	12
Feb. 1888	29	July 1890	9
Mar. 1891	23	Feb. 1893	13
Mar. 1894	17	Aug. 1895	12
Aug. 1896	44	Apr. 1900	10
Feb. 1901	22	Dec. 1902	18
June 1904	30	Dec. 1906	19
July 1908	20	Mar. 1910	16
July 1911	16	Nov. 1912	26
Jan. 1915	36 (WWI)	Jan. 1918	15
Apr. 1919	14	June 1920	15
Sep. 1921	21	June 1923	14
Aug. 1924	56	Apr. 1929	47 (Depression)
Mar. 1933	52	July 1937	15 (Depression)
Oct. 1938	80 (WWII)	June 1945	8
Feb. 1946	33	Oct. 1948	11
Sep. 1949	44 (Korean War)	May 1953	14
July 1954	31	Feb. 1957	12
Feb. 1958	26	Apr. 1960	10
Feb. 1961	160	June 1974	10
Apr. 1975	58	Feb. 1980	6
July 1980	12	July 1981	16
Nov. 1982	89	Apr. 1990	24
Apr. 1992	120 ?		

Avg. Contraction = 20 months

Avg. Expansion = 27 months

Avg. Contraction = 12 months

Avg. Expansion = 56 months

Sources: 1873–1897: Edward J. Chambers, "Late Nineteenth Century Business Cycles in Canada," *Canadian Journal of Economics and Political Science*, August 1964, pp. 391–412; 1900–1919: Keith A. J. Hay, "Early Twentieth Century Business Cycles in Canada," *Canadian Journal of Economics and Political Science*, August 1966, pp. 354–365; 1919–1954: Edward J. Chambers, "Canadian Business Cycles since 1919: A Progress Report," *Canadian Journal of Economics and Political Science*, May 1958, pp. 166–189; 1952–1982: Philip Cross and Francine Roy-Mayrand, "Statistics Canada's New System of Leading Indicators," *Canadian Economic Observer*, February 1989, pp. 3.1–3.37; 1982–1992: Philip Cross, "Alternative Measures of Business Cycles in Canada: 1947–1992," *Canadian Economic Observer*, February 1996, pp. 3.1–3.40. Contractions in 1967 and 1970 were too mild to count as recessions. Alternative postwar dates are given by Geoffrey H. Moore and Victor Zarnowitz, "The Development and Role of the National Bureau of Economic Research's Business Cycle Chronologies," Appendix A in Robert J. Gordon, ed., *The American Business Cycle: Continuity and Change*, Chicago: University of Chicago Press and National Bureau of Economic Research, 1986, Table A8.

2 Key Questions

1.) What causes business cycles?

2) How should government policy respond to business cycles?

Characteristics of Business Cycles

1.) Comovement. "Business cycles are all alike".

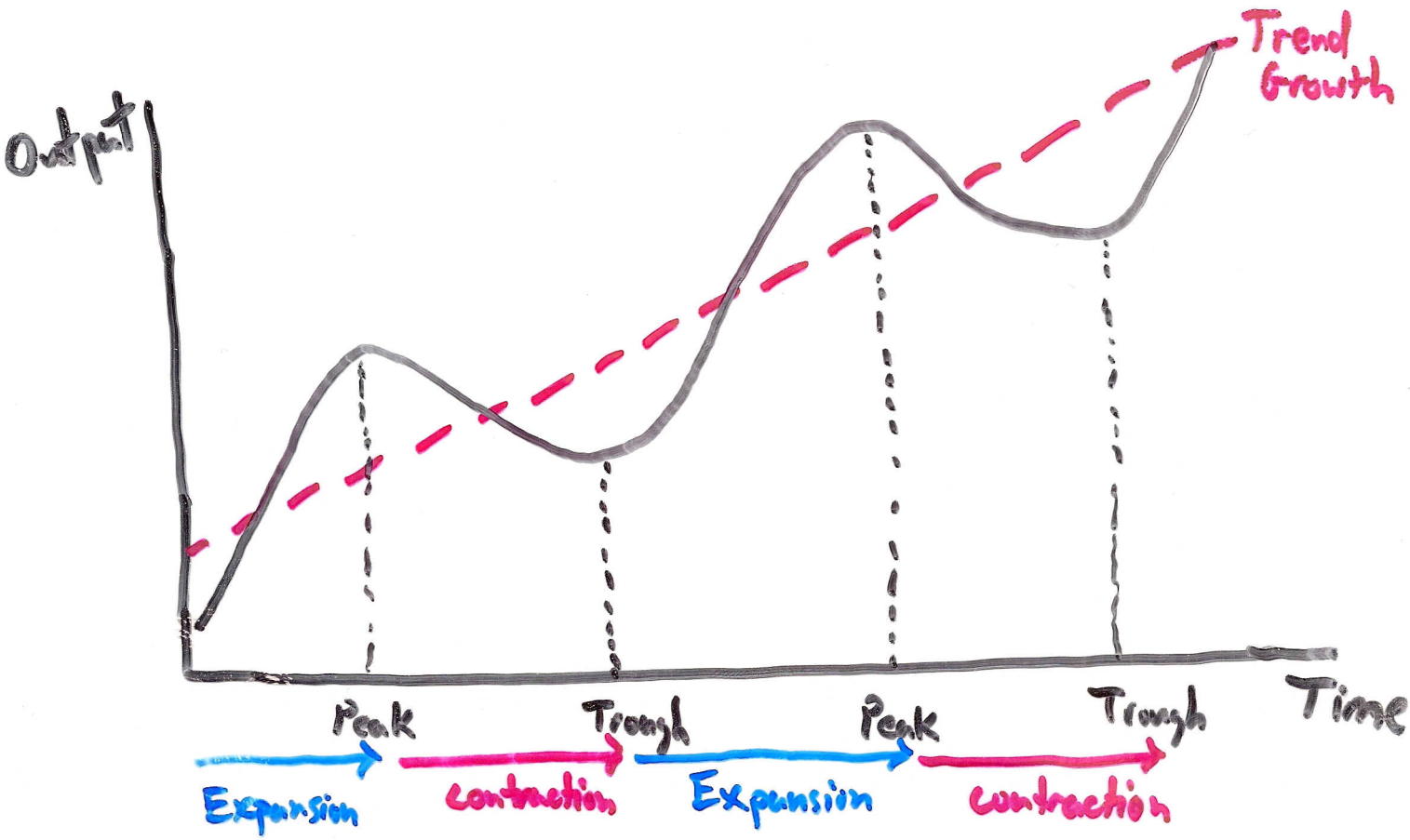
2.) Recurrent but not periodic

3.) Persistence

Measuring Business Cycles

Like technological progress and productivity, business cycles are usually measured as a *residual*.

$$\begin{pmatrix}\text{Observed}\\ \text{Output}\end{pmatrix} = \text{Trend} + \text{Cycle} + \text{Seasonal}$$



Structure of Business Cycle Theories

Business Cycles = Shocks + Propagation Mechanisms

Shocks:
- oil prices
- innovations
- weather
- govt. policy
- wars
- expectations?

Propagation Mechanisms:
- installation lags
- adjustment costs
- inventories
- Consumption-smoothing
- Fixed Costs (Hysteresis)
- Decision Lags

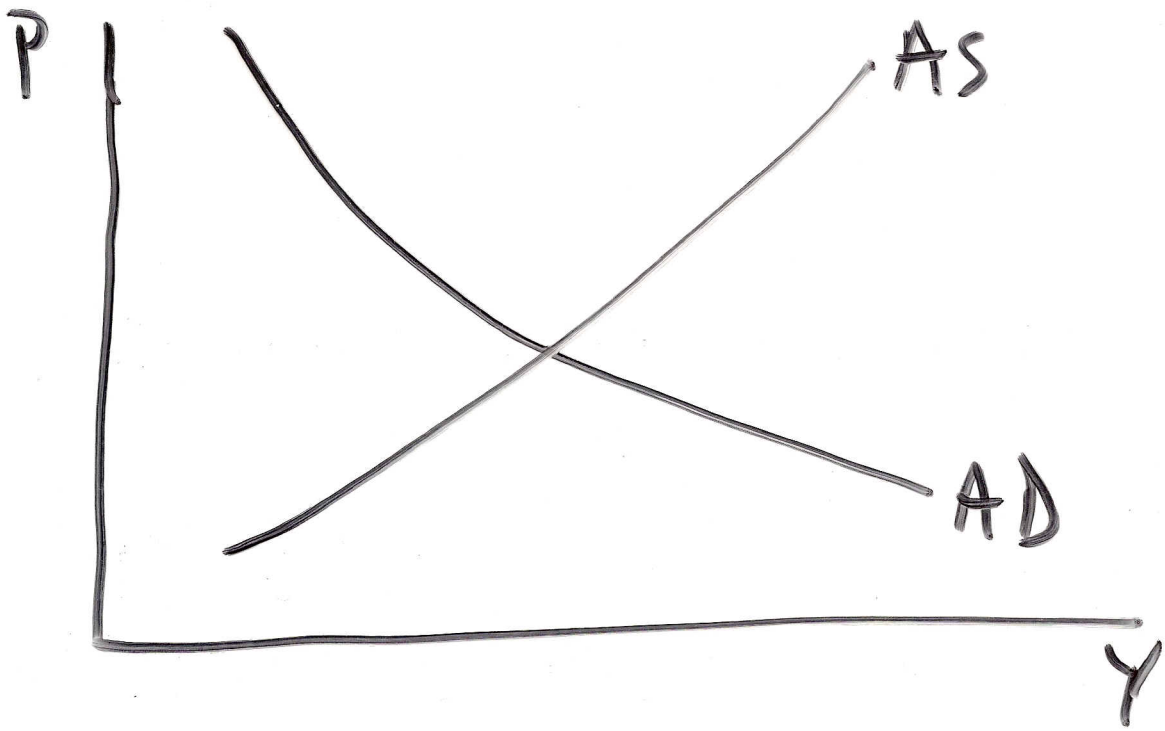
Reduced Form Model

$$Y_t = a_1 Y_{t-1} + a_2 Y_{t-2} + \varepsilon_t$$

$a_1 Y_{t-1} + a_2 Y_{t-2}$: propagation

ε_t: shock

The AD/AS Model



AD : Combinations of (P, Y) consistent with equilibrium in the goods and asset markets

AS : Combinations of (P, Y) consistent with equilibrium in the labor market.

Why Does AD slope down?

$Y \uparrow \Longrightarrow$ Demand for real balances $\left(\frac{M}{P}\right) \uparrow$

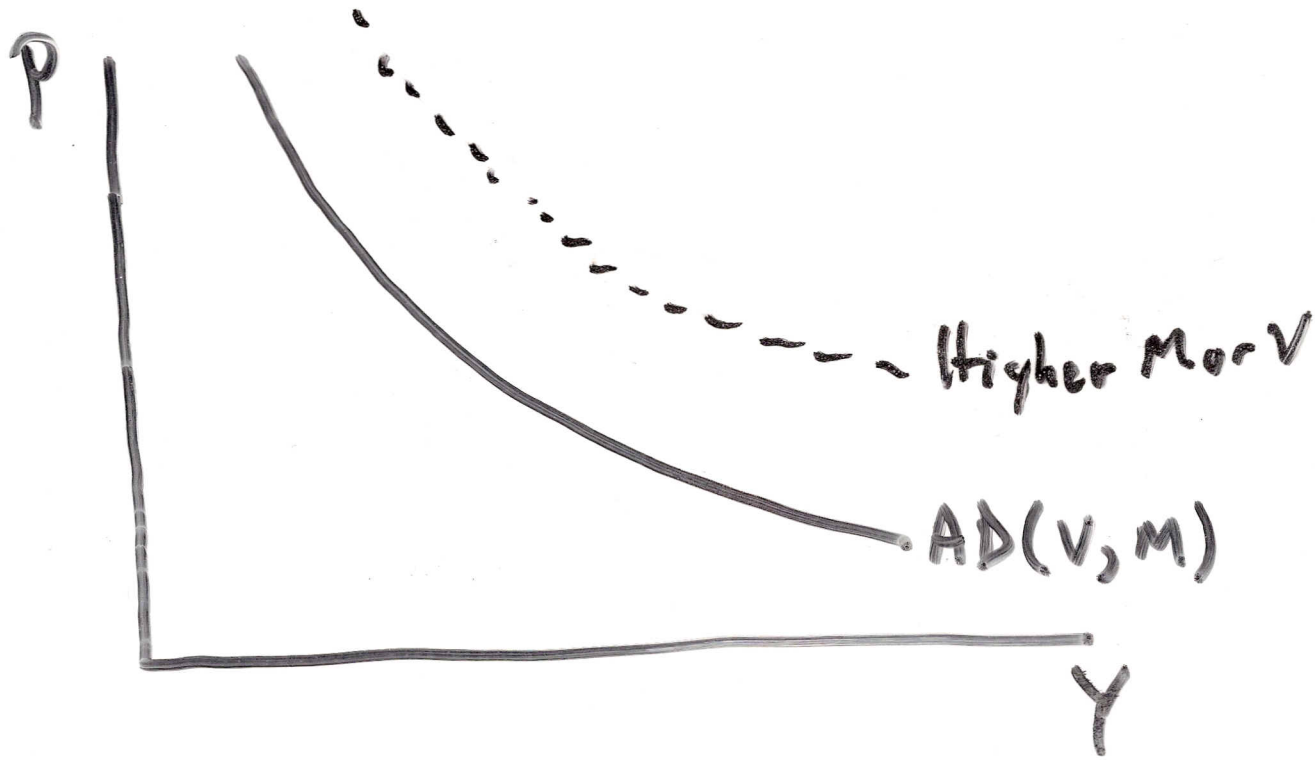
$\Longrightarrow$ For a given M, P must fall to maintain equilibrium in the money market

A Simple Model of the AD Curve

Quantity Equation : $MV = PY$

If M and V are constant, then

$P\uparrow \Longrightarrow Y\downarrow$



$M\uparrow \Longrightarrow$ AD shifts right

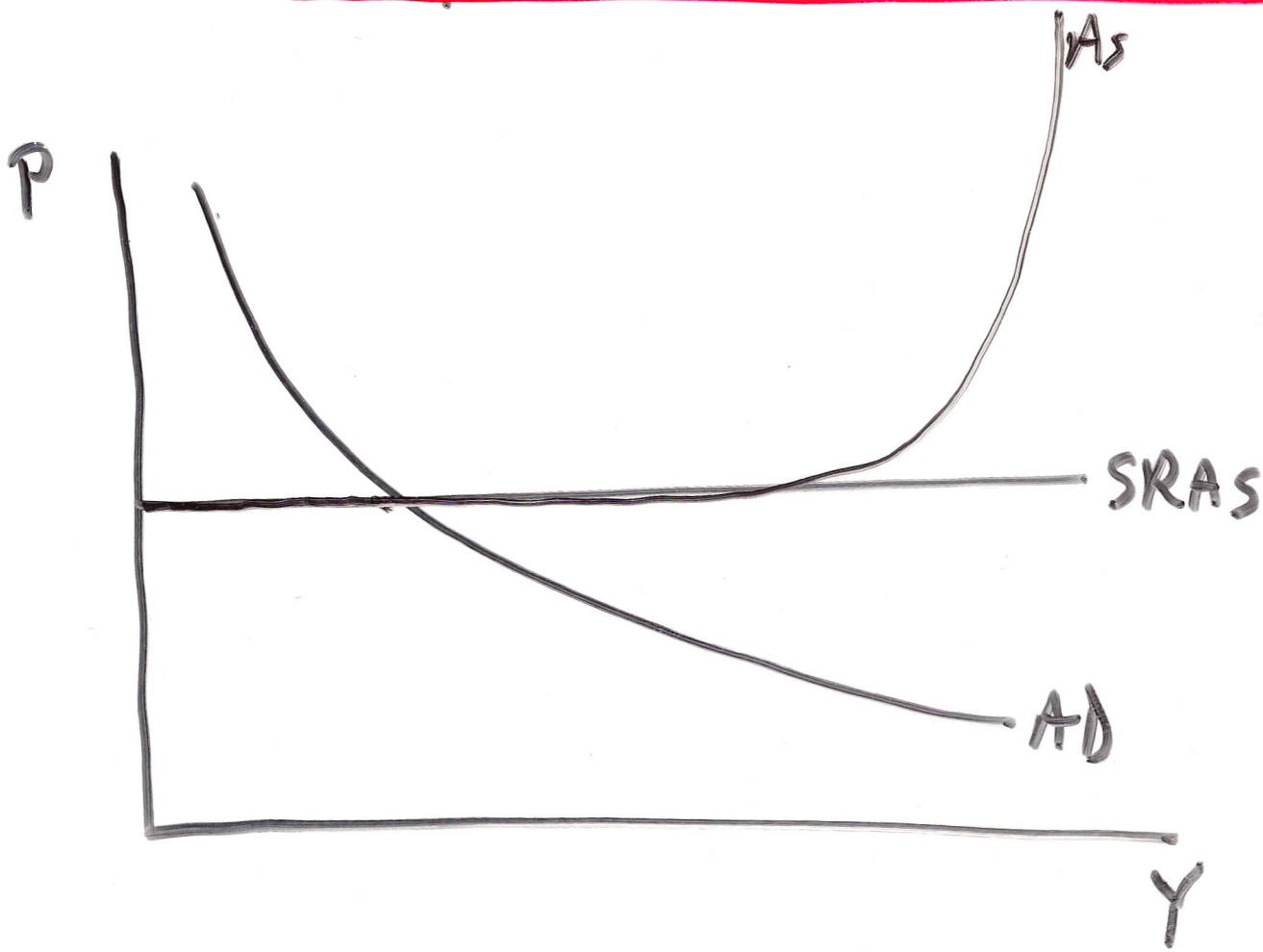
$V\uparrow \Longrightarrow$ AD shifts right

The Keynesian Model

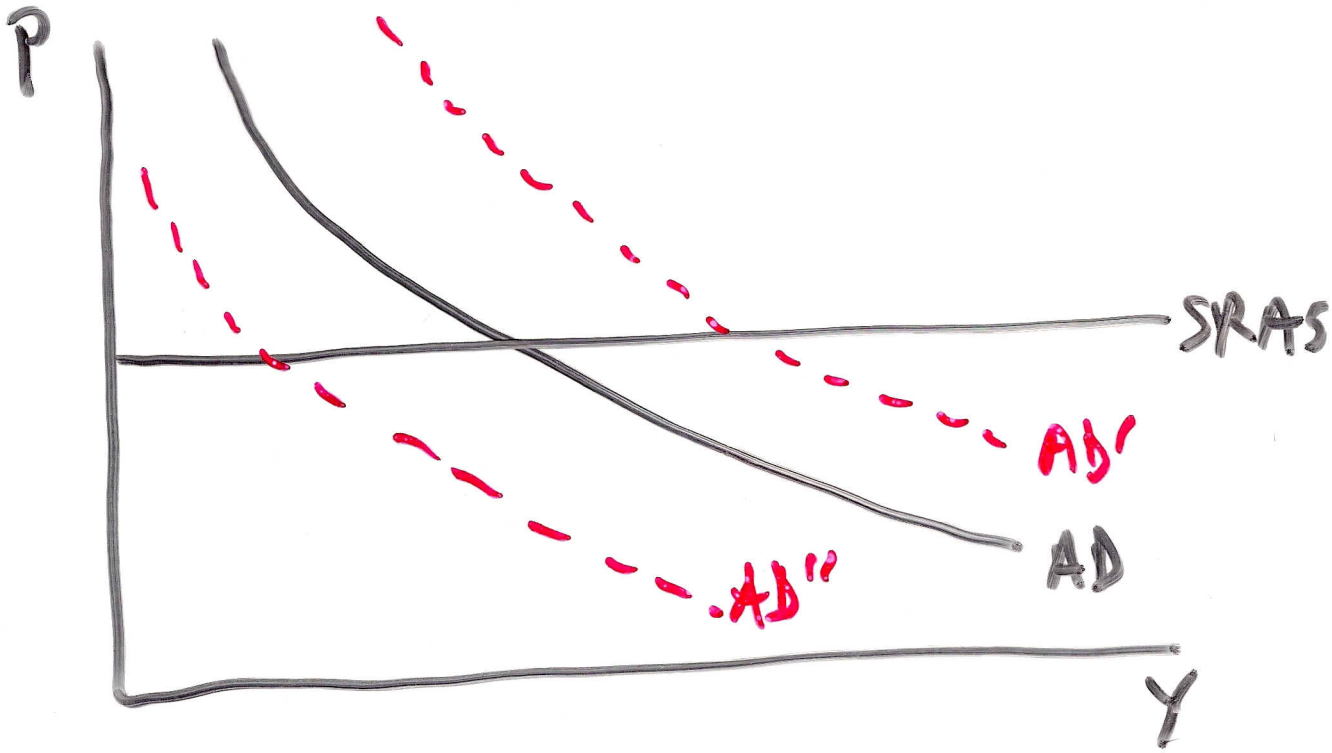
Keynes: What if prices <u>don't</u> adjust?

Then supply adjusts to the given level of demand.

Output is demand determined



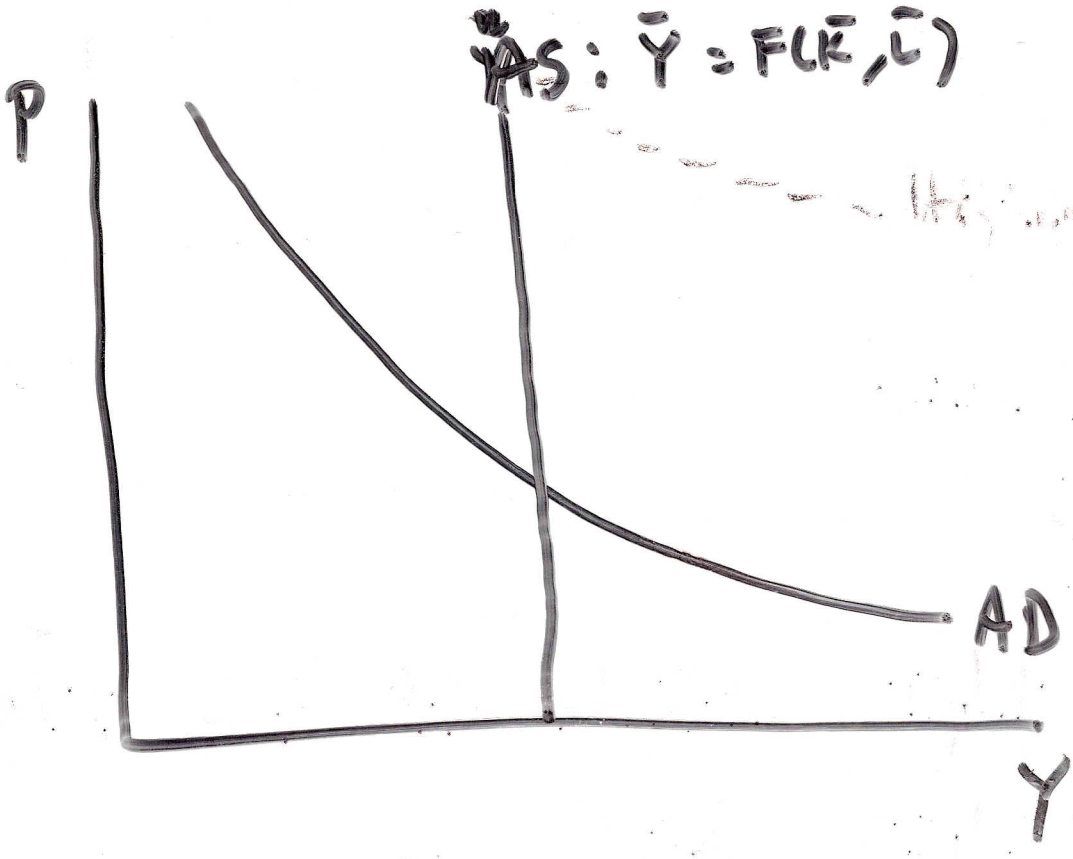
Business Cycles in the Keynesian Model



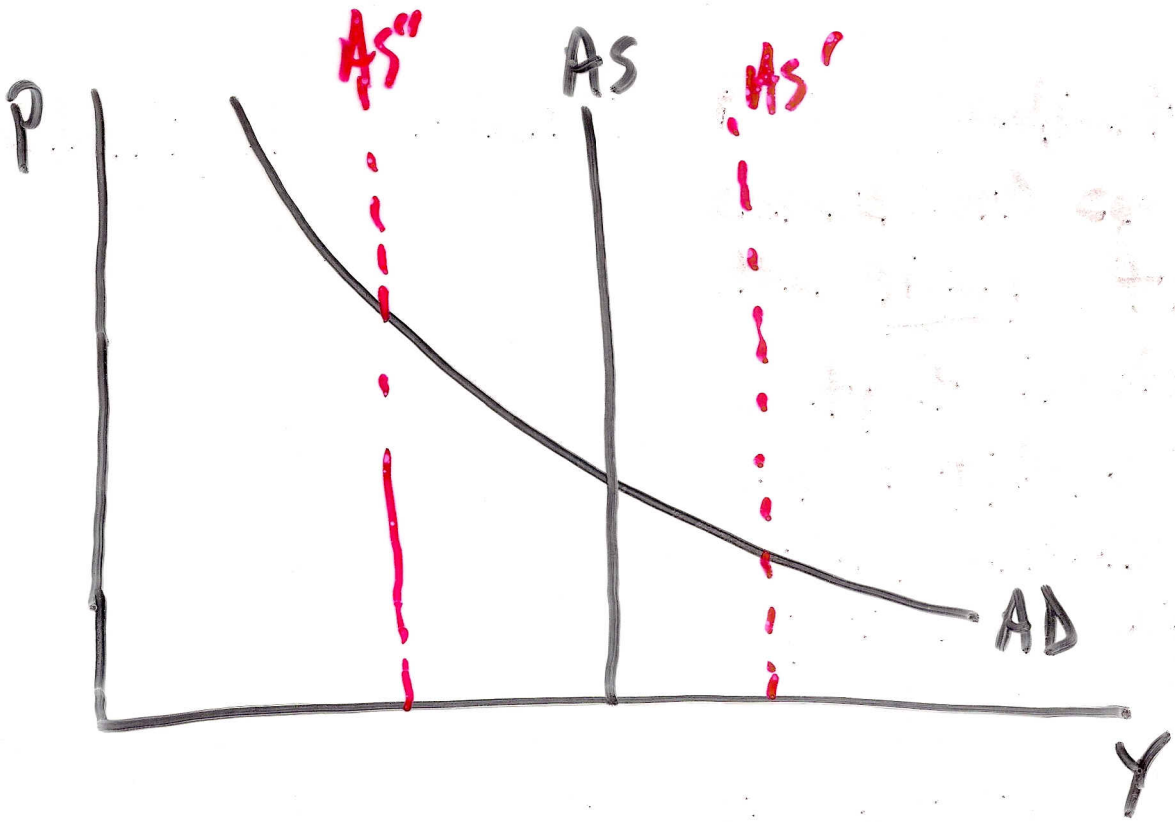
The Classical Model

Classical Model: Prices adjust to ensure AD equals the given AS.

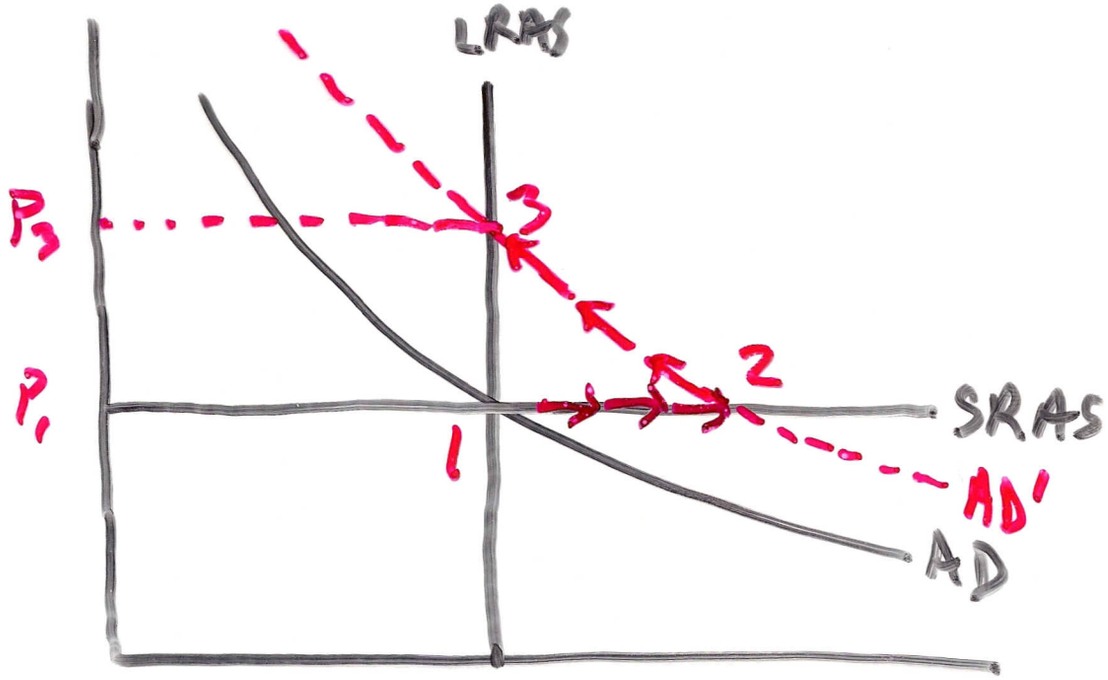
Output is determined by supply. Demand only affects the price level.



Business Cycles in the Classical Model



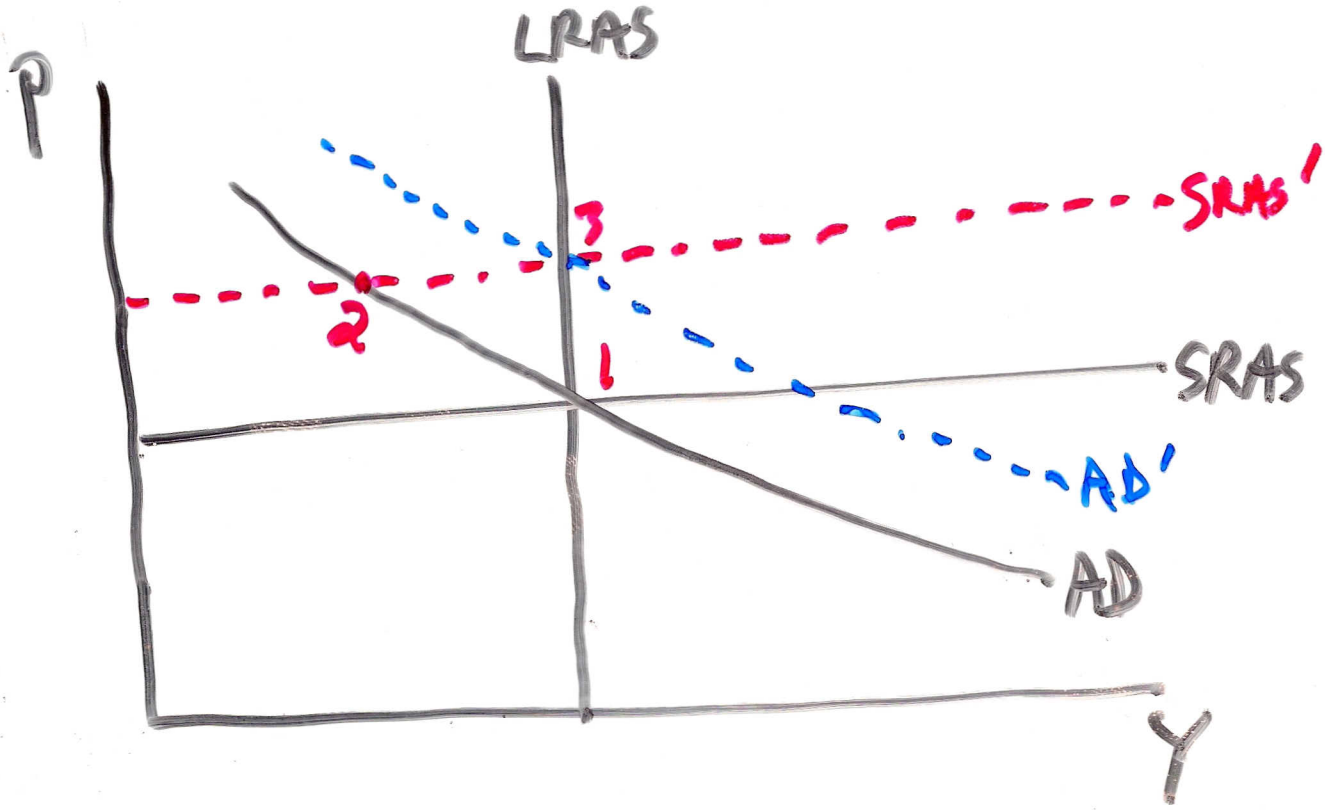
Dynamic Response to M↑



Initially, M↑ ⇒ Y↑

After awhile, P gradually rises and Y↓. In the Long-Run, prices rises proportionally to M↑, and output remains unchanged.

The Dilemma of AS Shocks

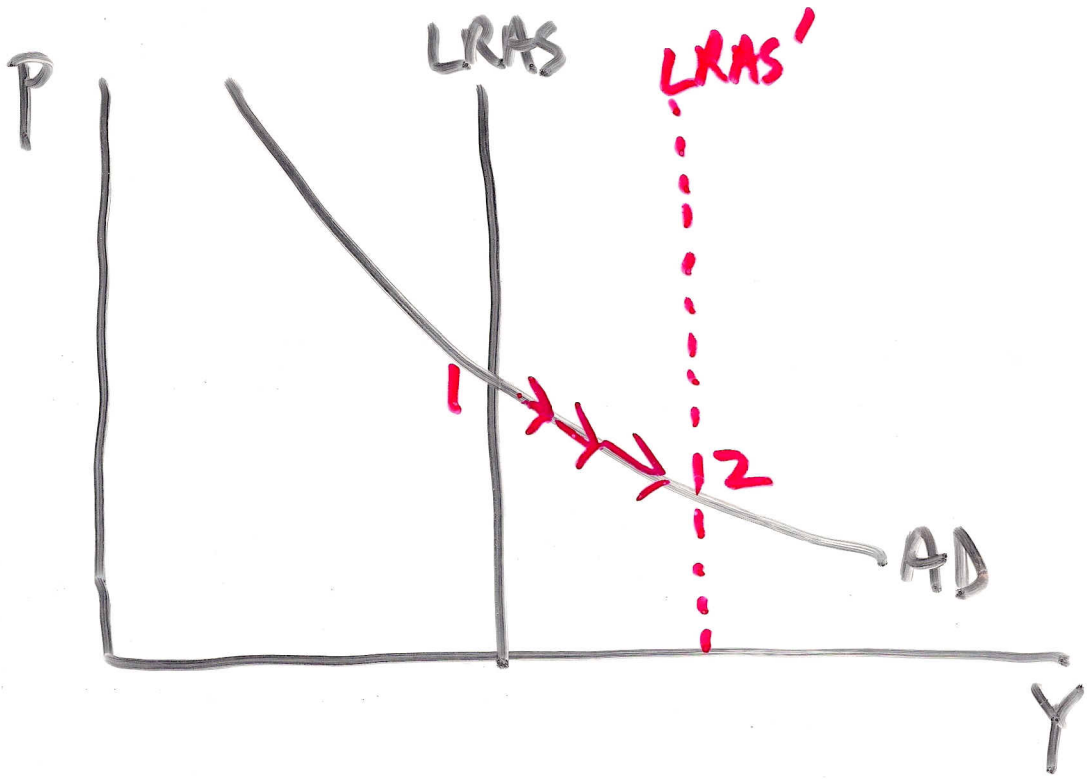


Dilemma: At point 2, do you stabilize output by increasing the M^s, which shifts out AD?

Or do you allow prices to gradually fall to their original level, but at the cost of a temporary recession?

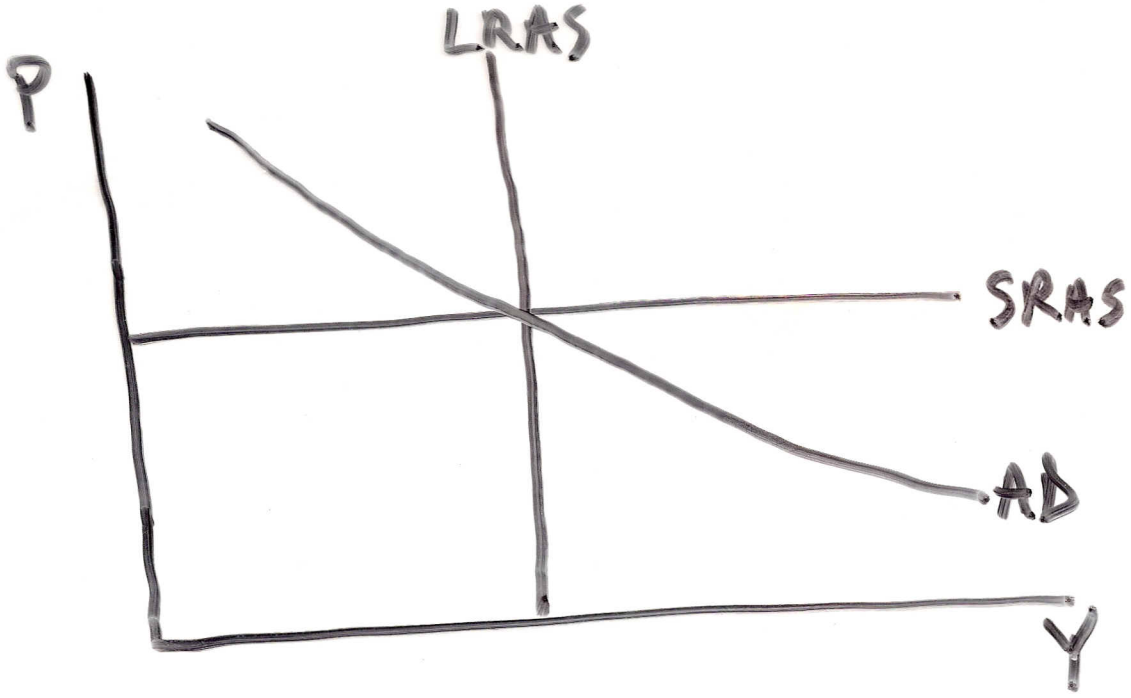
Output Stabilization vs. Inflation Stabiliza

The 1990s (?)



Positive Supply Shock lowers inflation and raises output. "Win/Win".

An Integrated View



Basic Keynesian Assumption

$Y > LRAS \Longrightarrow$ Prices + Wages Rise
SRAS curve shifts up

$Y < LRAS \Longrightarrow$ Prices & wages Fall
SRAS curve shifts down