

ECN 106 Macroeconomics 1

Lecture 6

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Roadmap for this lecture

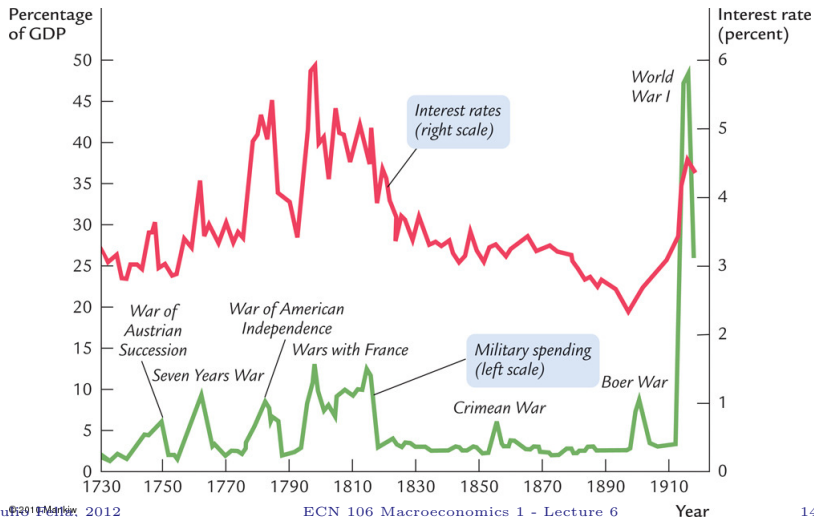
- ▶ Policy implications of the long-run model
- ▶ Macroeconomic stylized facts
- ▶ Short run vs long-run vs very long run
- ▶ Short run: sticky prices and business cycle
- ▶ Aggregate supply and demand in the short run
- ▶ Labour market equilibrium in the short run
- ▶ Mankiw: 9-1, 9-2, 9-4

Policy implications of the long run model

Effect of fiscal policy

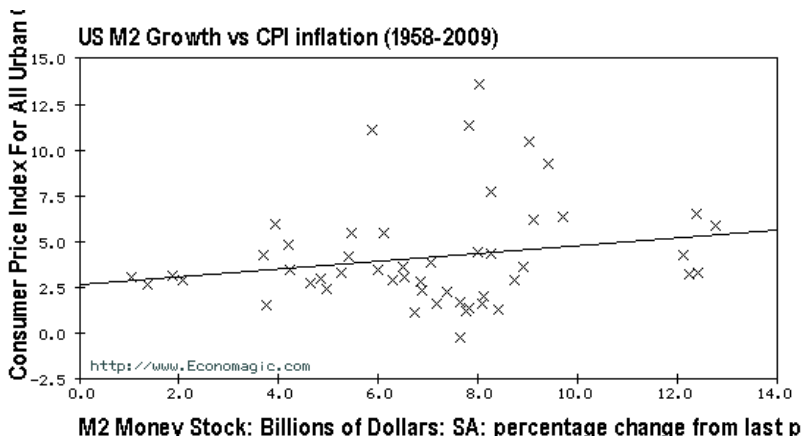
In the long run, fiscal policy does not affect output.

Expansionary fiscal policy just increases the real interest rate and crowds out private investment.



Monetary policy in the long run

In the long run, monetary policy does not affect real variables. Expansionary monetary policy just increases (nominal) wages and prices.



Fiscal policy implications of the long run model

- ▶ In the long run, government expenditure should be fully financed through taxes.
 - Whatever goods and services it is socially-desirable for the government to supply, their cost should be financed through taxes *in the long run*.
 - Optimal to minimize crowding out associated with financing of a given level of government expenditure.
- ▶ **In the long run (on average over the cycle) the government budget should be balanced (or be mildly in surplus).**

Monetary policy implications of the long run model

- ▶ Since money is neutral (does not affect real variables), it should just target nominal variables.
- ▶ In the long run, monetary policy should just target the rate of inflation.
- ▶ What rate of inflation? Costs vs benefits.
- ▶ Main costs of anticipated inflation:
 - Shoe-leather costs
 - Menu costs
 - Tax-bracket creep
- ▶ Monetary policy should target a relatively low rate of inflation.
 - But not too low...
 - We will see why when we talk about liquidity traps.

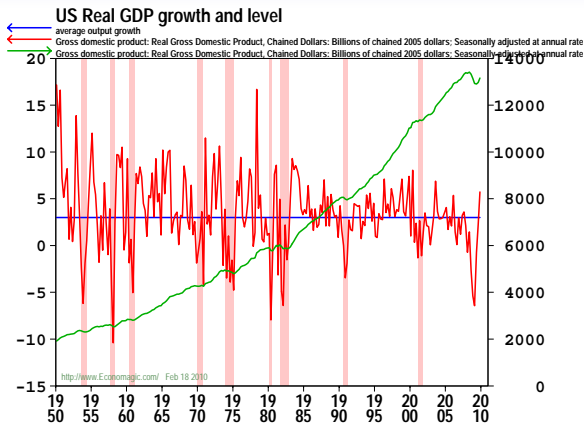
Short run vs long run vs very long run

What macroeconomics is about

How aggregate variables are determined and impact of policies.

- ▶ Why some countries grow faster than others? (economic growth)
- ▶ What determines economic fluctuations? (business cycle)
- ▶ What determines unemployment?
- ▶ What causes changes in the average price level? (inflation)
- ▶ What is the role of macroeconomic policies? (monetary and fiscal policies)

Real GDP: 1950-2010



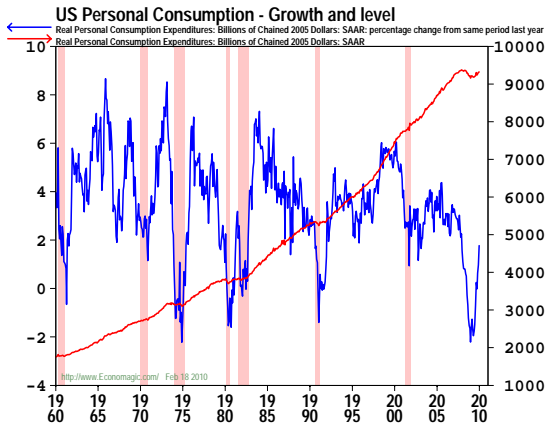
Green line: GDP level

Red line: GDP % growth rate

Blue line: average GDP % growth rate

Shaded regions: recessions

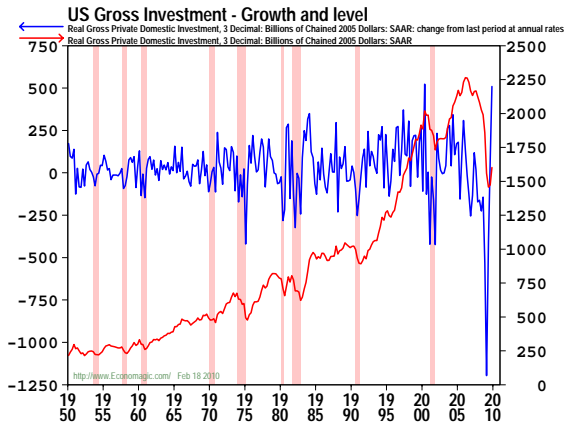
Real Private Consumption: 1950-2010



Red line: Consumption level

Blue line: Consumption % growth rate

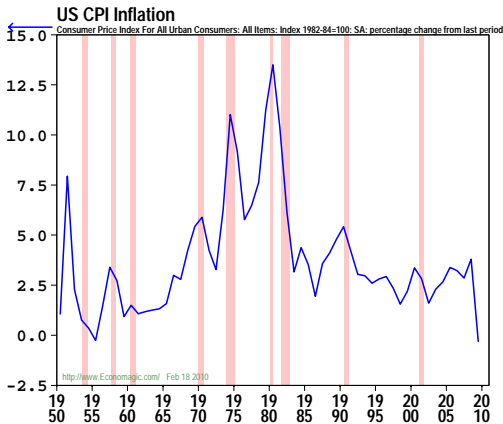
Real Gross Investment: 1950-2010



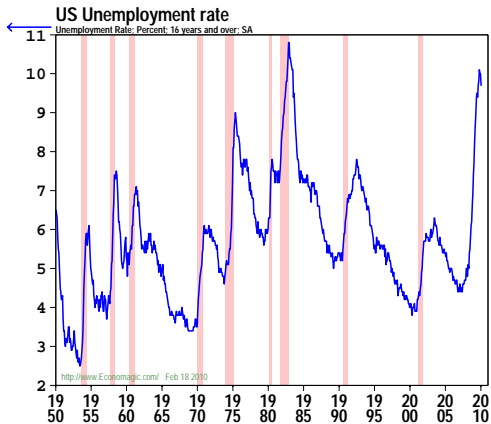
Red line: Investment level

Blue line: Investment % growth rate (Note left scale!)

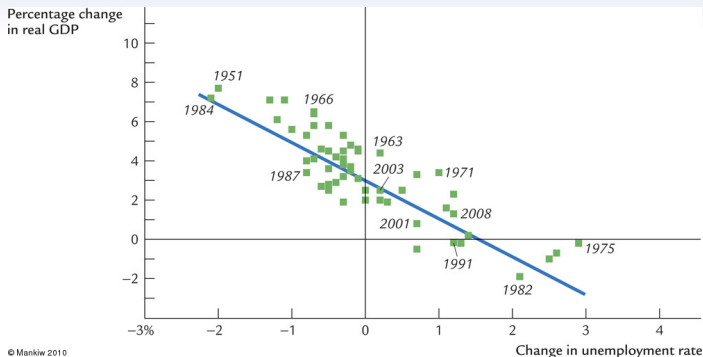
Inflation Rate: 1950-2010



Unemployment Rate: 1950-2010



Unemployment and GDP changes: Okun's law



- Empirical relationship

$$\% \text{change in GDP} = 3\% - 2 \times \text{change in the unemployment rate}$$

- inconsistent with growth model (long output growth unrelated to unemployment).

What are we to make of all this?

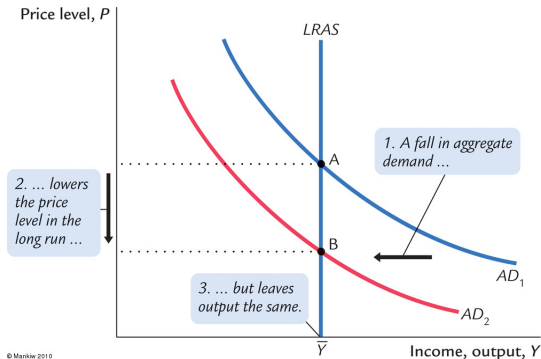
- ▶ Over the “very long” run (decades, generations) GDP and its components grow at a positive, stable, rate. Inflation is untrended.
- ▶ Over the “short run” deviations, sometimes large, from trend (business cycle).
- ▶ Investment is highly volatile.

What kind of model(s) do we need to explain all this

One model cannot account for all these fact. We need roughly three.

- ▶ **Very long run** (explaining the trend): growth driven by productivity, capital accumulation and population growth (**growth models** → Macroeconomics 2).
- ▶ **Long run**: three years or longer fluctuations around trend in consumption, government expenditure and investment and in the price level, but not output (**classical model**).
- ▶ **Short run**: fluctuations in output and unemployment, recessions and booms. We do not have a model which can explain them... **YET!**

Why cannot the long run model account for output fluctuations



- ▶ Flexible wages and prices: output determined on the labour market alone → vertical aggregate supply.
- ▶ AD (i.e. IS or LM) shocks do not affect output. Just its composition (IS) or nominal variables (LM).

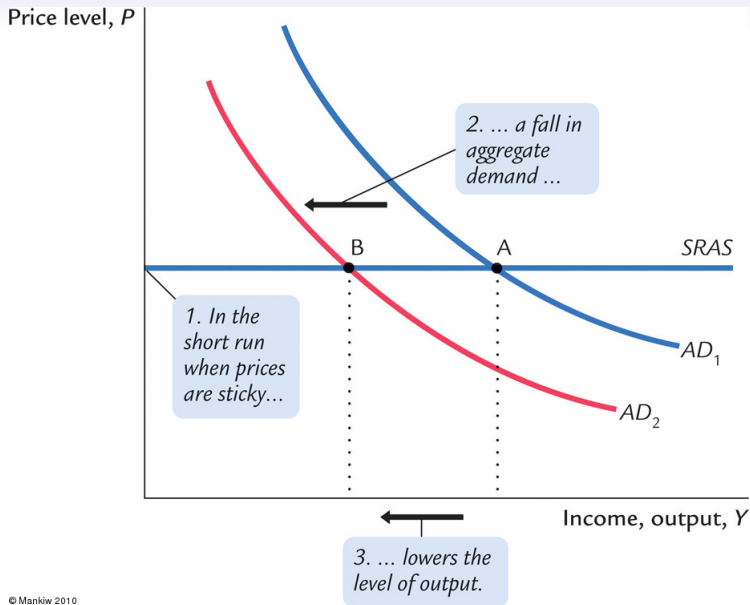
The short run model: sticky prices

Sticky prices in the short run.



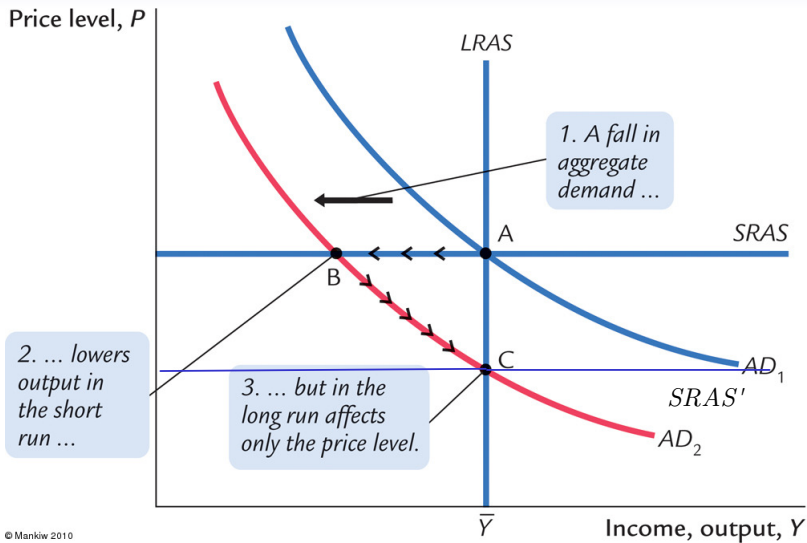
- ▶ Suppose firms are willing to supply any amount of output at exogenous price \bar{P} in the short run \rightarrow short run aggregate supply (SRAS) horizontal at \bar{P} .
- ▶ Demand shocks affects output.
- ▶ SRAS does not need to be horizontal, it just cannot be vertical.

Demand shocks in the short run



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From the short run to the long run



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Evidence on sticky prices

- ▶ Direct: survey evidence. Main reasons:
 - coordination failure (fear of losing market share by raising prices before competitor)
 - fairness, preference for other adjustment margins;
- ▶ Indirect: monetary policy matters.
 - If the whole world pays so much attention to how monetary policy is run, it **cannot** be neutral (at least in the short run);
 - Exogenous changes in the money supply (e.g. 18th century France).

Labour market equilibrium in the short run

The labour market in the short run

$$\frac{W}{P} = \frac{MPL(N)}{1 + \bar{\mu}} \quad (\text{PS})$$

$$\frac{W}{P} = g\left(1 - \frac{N}{\bar{L}}, \bar{z}\right) \quad (\text{WS})$$

- ▶ With flexible wages and prices, the price and wage setting curves determine the real wage and employment.
- ▶ Suppose instead the firm is willing to supply any amount of output at the (exogenously) fixed price \bar{P} .

Is it optimal for workers to supply the labour demanded?

- ▶ The wage setting locus is still

$$\frac{W}{\bar{P}} = g\left(1 - \frac{N}{\bar{L}}, \bar{z}\right) \quad (\text{WS})$$

only with \bar{P} fixed.

- ▶ If output and employment increase, workers are perfectly happy supplying the extra labour as long the nominal wage W rises along the WS curve in line with workers' wage demands.

Is it profitable for firms to produce at \bar{P} (I)?

- ▶ With $P = \bar{P}$ the firm is off its optimal price setting (PS) locus above.
- ▶ The PS locus is now $P = \bar{P}$.
- ▶ With $P = \bar{P}$ fixed, marginal revenue equals the price.
- ▶ Remember that the firm marginal cost is $W/MPL(N)$.
- ▶ As long as

$$\bar{P} > \frac{W}{MPL(N)}$$

expanding production increases profits.

- ▶ Suppose \bar{P} is initially set at its long-run optimum

$$\bar{P} = (1 + \mu) \frac{W^*}{MPL(N^*)} \geq \frac{W^*}{MPL(N^*)}$$

with W^*, N^* being long-run equilibrium values.

Is it profitable for firms to produce at \bar{P} (II)?

- ▶ As long as $\mu > 0$ it is indeed

$$\bar{P} > \frac{W^*}{MPL(N^*)} \quad (17)$$

- ▶ The RHS increases with W and N .
- ▶ Suppose employment falls (recession) to $N < N^*$:
 - the fall in N increase $MPL(N)$ and reduces MC;
 - from WS the nominal wage falls, further reducing MC;
 - equation (17) above is satisfied.
- ▶ Suppose employment increases (boom) to $N > N^*$:
 - both W and N increase raising MC;
 - but as long as the equation (17) is satisfied expanding production is optimal.

Short-run aggregate supply with exogenously sticky prices

- ▶ The short-run aggregate supply (SRAS) is the combination of output and prices for which the labour market is in equilibrium.
- ▶ Firms find it optimal to supply any amount of output at \bar{P} and workers are on their wage setting curve.
- ▶ The labour market is in equilibrium for $P = \bar{P}$ for (nearly) any level of employment (i.e. provided not too much above long-run equilibrium N^*).
- ▶ The short run aggregate supply is horizontal at $P = \bar{P}$ as we had assumed above.