

# Keynesian Business Cycles & Policy

Chapter 11 (continued)

1. Keynesian Business Cycles
2. Role for Monetary and Fiscal Policies
3. Government Budget Deficits and Debt

# 1 Keynesian Business Cycles

## 1.1 Demand Shocks

- Stock market crash
  - Consumer wealth lower so consumption lower
  - Tobin's  $Q$  lower, so investment lower
  - IS-LM-FE graph, IS curve shifts down, and equilibrium output is below full employment - recession
  - SRAS, LRAS, AD graph, AD shifts down and output is below LRAS

- Since output is lower, labor demand is lower
- Efficiency wage is lower if workers are more concerned about layoffs in recession
- Over time the price level will fall, shifting LM right and SRAS down until reach FE again
- Employment and real wage both rise back to FE levels

- Government cuts taxes (lump-sum taxes on households) and about half of the population is liquidity-constrained
  - Consumption increases
  - IS-LM-FE graph, IS curve shifts up, and equilibrium output is above full employment.- expansion or boom
  - SRAS, LRAS, AD graph, AD shifts up and output is above LRAS
  - Since output is higher, labor demand is higher
  - The efficiency wage is higher if workers are less concerned about layoffs in booms
  - Over time the price level will rise, shifting LM left and SRAS upon until reach FE again

- Employment and the real wage both fall back to FE levels

- Money supply increases
  - LM curve shifts right and equilibrium output is above FE
  - AD curve shifts right and equilibrium output is above FE
  - Higher output implies higher labor demand raising employment
  - Efficiency wage rises if workers are less concerned about layoffs during booms
  - Over time the price level rises, shifting SRAS up and LM down to restore output to FE

## 1.2 Business Cycle Facts and Demand Shocks

- Aggregates like consumption, investment, employment are pro-cyclical
- Employment and real wages are pro-cyclical
- Money-growth can lead the business cycle
- Inflation is pro-cyclical
- Labor-productivity is counter-cyclical - contrary to data - consider capacity utilization and labor hoarding to make this consistent with the data

## 1.3 Supply Shocks

- Increase in the price of imported oil -  $A$  in production function falls
- Fall in  $A$  reduces FE output
- Prices rise because desired price is far from current price, shifting SRAS up and LM down
- Equilibrium output falls - how far?
- Long-run effect depends on whether the shock was permanent or not.

- Analysis with supply shocks looks more like RBC models - prices are not as sticky here

## 2 Role for Monetary and Fiscal Policy

- Recession caused by fall in demand
  - Involuntary unemployment
  - Expansionary policy can reduce the unemployment, returning output to its long-run equilibrium faster
  - Costs

- \* prices will not fall
  - \* if fiscal policy, interest rate rises, crowding out investment with implications for future output
  - \* if fiscal policy, new debt has future consequences
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- Expansion caused by a rise in demand
  - Recession caused by a negative technology (supply) shock
  - Expansion caused by a positive supply shock
  - Can expansionary policy raise growth?

### 3 Government Budget Deficits and Debt

- Real debt ( $B_t$ ) grows as the government government pays interest on old debt and finances a primary deficit ( $G - T > 0$ )

$$B_t - B_{t-1} = rB_{t-1} + G_t - T_t$$

- How can the government make debt stop growing?

$$T_t - G_t = rB_{t-1}$$

- Do we have to repay the debt?

- What is the present-value of paying interest in the amount  $rB_{t-1}$  forever?

$$\begin{aligned}
 & rB_{t-1} \left[ \frac{1}{1+r} + \left(\frac{1}{1+r}\right)^2 + \left(\frac{1}{1+r}\right)^3 + \dots \right] \\
 = & rB_{t-1} \left( \frac{1}{1+r} \left( 1 + \frac{1}{1+r} + \left(\frac{1}{1+r}\right)^2 + \left(\frac{1}{1+r}\right)^3 + \dots \right) \right) \\
 = & rB_{t-1} \left( \frac{1}{1+r} \left( \frac{1+r}{r} \right) \right) = B_{t-1}
 \end{aligned}$$

- Repaying the debt today and paying interest forever have the same present value
- However, repaying the debt today puts the full tax burden on the current generation, whereas paying interest forever spreads the tax burden over all current and future generations.

- Why can't the debt grow forever? Consider the debt/GDP ratio

$$\frac{B_t}{Y_t} = (1 + r) \frac{B_{t-1}}{Y_t} + \frac{G_t - T_t}{Y_t} = (1 + r) \frac{B_{t-1} Y_{t-1}}{Y_{t-1} Y_t} + \frac{G_t - T_t}{Y_t}$$

- Let  $\frac{Y_t}{Y_{t-1}} = 1 + g$ , where  $g$  has the interpretation of the growth rate of real output.

- Note that  $\frac{1+r}{1+g} \approx 1 + r - g$

$$\frac{B_t}{Y_t} = (1 + r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

- If the change in debt is positive,

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

then debt as a fraction of GDP will grow forever

- – Societies don't generally use lump-sum taxes.
- What would happen if all of labor income had to be taxed to pay the debt?
- When lenders become concerned that the government has no plans to stop the growth of the debt/GDP, they refuse to continue lending, and the government is forced to adjust