Consumption, Saving, and Investment, Part 2

Agenda
- Investment
- Goods Market Equilibrium

Investment

- From the desired capital stock to investment:
  - The capital stock changes from 2 sources.
    - Gross investment, which adds to the capital stock.
    - Depreciation, which reduces the capital stock.
  - Gross investment = net investment + depreciation.

Investment

- From the desired capital stock to investment:
  - Net investment = gross investment – depreciation:
    \[ K_{t+1} - K_t = I_t - dK_t \]
  - where net investment = the change in the capital stock.
Investment

- From the desired capital stock to investment:
  
  ➢ Rewrite
  
  \[ K_{t+1} - K_t = I_t - dK_t \]
  
  ➢ as
  
  \[ I_t = K_{t+1} - K_t + dK_t \]
Investment

• From the desired capital stock to investment:
  ➢ Lags and investment.
    • Some capital can be constructed easily, but other capital may take years to put in place.
    • So investment needed to reach the desired capital stock may be spread out over several years.

Investment

• Investment in inventories and housing:
  ➢ The marginal product of capital and user cost of capital also apply to housing and inventories as well as to equipment and structures.

Determinants of Desired Investment

• Desired investment will:
  ➢ Increase with an increase in the expected future marginal product of capital, $MPK'$, because the desired capital stock increases.
  ➢ Decline with an increase in the price of capital which also increases the user cost of capital and reduces the desired capital stock.

Determinants of Desired Investment

• Desired investment will:
  ➢ Decline with an increase in the real interest rate which also increases the user cost of capital and reduces the desired capital stock.
  ➢ Decline with an increase in the effective tax rate which also increases the tax-adjusted user cost of capital and reduces the desired capital stock.
Desired Investment & the Real Interest Rate

- Shifts of the investment curve:
  - The investment curve shifts right because of:
    - a rise in expected future marginal product of capital, or
    - a fall in the effective tax rate.

Goods Market Equilibrium

- The real interest rate adjusts to bring the goods market into equilibrium:
  \[ Y = C^d + I^d + G \]
  - This is goods market equilibrium condition.
  - This differs from the income-expenditure identity.
  \[ Y = C + I + G \]
Goods Market Equilibrium

• The goods market need not be in equilibrium.
  ➢ If undesired goods are produced, the goods market will NOT be in equilibrium.

Goods Market Equilibrium

• The income-expenditure identity is:
  \[ Y = C + I + G \]

• The goods market equilibrium condition is:
  \[ Y = C^d + I^d + G \]
  • or
  \[ I^d = Y - C^d - G \]

Goods Market Equilibrium

• Now
  \[ I^d = Y - C^d - G \]

• and (by definition):
  \[ S^d = Y - C^d - G \]

• So the goods market equilibrium is also:
  \[ S^d = I^d \]
Goods Market Equilibrium

• Establishing goods market equilibrium:
  ➢ Equilibrium where $S^d = I^d$.
  ➢ If $S^d > I^d$, then $r$ will decrease until $S^d = I^d$.
  ➢ If $S^d < I^d$, then $r$ will increase until $S^d = I^d$.

Goods Market Equilibrium

• Shifts of the saving curve, $S^d$:
  ➢ The saving curve shifts right because of:
    • A rise in current output,
    • A fall in expected future output,
    • A fall in wealth,
    • A fall in government purchases, or
    • A rise in taxes (unless Ricardian equivalence holds, in which case tax changes have no effect)

A decrease in desired savings

Goods Market Equilibrium

• Shifts of the investment curve, $I^d$:
  ➢ The investment curve shifts right because of:
    • A rise in expected future marginal product of capital,
    • A decrease in the price of capital, or
    • A decrease in the effective tax rate.
An increase in desired investment

Goods Market Equilibrium: Application

- Macroeconomic consequences of a boom and bust in stock prices.
  - Sharp changes in stock prices affect:
    - Consumption via a wealth effect, and
    - Business investment via the price of capital or Tobin’s q.

Real stock prices and the C/GDP ratio

Effect on consumption of 1987 stock crash
Goods Market Equilibrium

• The boom and bust in stock prices:
  ➢ Consumption and the 1987 stock crash.
    • The stock market crash of 1987 reduced wealth by about $1 trillion.
    • Consumption fell somewhat less than expected and not enough to cause a recession.
      – Probably because there had been a large run-up in stock prices between December 1986 and August 1987, so the crash mostly erased this run-up.

Effect on consumption of 1990s stock boom

 Goods Market Equilibrium

• The boom and bust in stock prices:
  ➢ Consumption and the 1990s stock boom.
    • Stock prices more than tripled in real terms.
    • Consumption was not strongly affected by the run-up in stock prices

Effect on consumption of 2000s stock crash
Goods Market Equilibrium

- The boom and bust in stock prices:
  - Consumption and the early 2000s stock crash.
    - In the early 2000s, the decline in the stock market reduced wealth by about $5 trillion.
    - But consumption actually increased as a share of GDP.

Effect on investment of 1990s stock boom

Effect on investment of 2000s stock crash

Goods Market Equilibrium

- The boom and bust in stock prices:
  - Investment and Tobin’s $q$.
    - Investment and Tobin’s $q$ were not closely correlated following the 1987 crash in stock prices.
    - But the relationship has been tighter in the 1990s and early 2000s, as the theory suggests.
Key Diagram #3: Goods Market Equilibrium

- Goods market equilibrium is given by:
  \[ Y = C^d + I^d + G \]
- or
  \[ I^d = Y - C^d - G \]

- If
  \[ I^d = Y - C^d - G \]
- and
  \[ S^d = Y - C^d - G \]
- then:
  \[ S^d = I^d \]
- which is also goods market equilibrium.
Key Diagram #3: Goods Market Equilibrium

• Factors that Shift the Curves:
  ➢ Changes in these factors will shift the $S^d$ curve:
    • Current income,
    • Expected future income,
    • Wealth,
    • Expected real interest rate,
    • Government purchases, and/or
    • Taxes.

Next Time

• Long-term Economic Growth, Part 1
  ➢ The Sources of Economic Growth
  ➢ Growth Dynamics: The Solow Model