Economics 302 (Sec. 001)  
Intermediate Macroeconomic Theory and Policy (Spring 2011)  
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Instructor: Prof. Menzie Chinn  
UW Madison
16-1 Consumption

The Very Foresighted Consumer

A very foresighted consumer who decides how much to consume based on the value of his total wealth, which comprises:

1. The value of his nonhuman wealth, or the sum of financial wealth and housing wealth.

2. The value of his human wealth and nonhuman wealth together gives an estimate of his total wealth.

\[ C_t = C(\text{Total wealth}_t) \]

Human wealth is the Present Discounted Value of after tax labor income; for $40K Ch.00$, income growth = 0.03, t=0.25, r = 0.0

\[ V(Y_{Lt} - T_t^e) = (\$40,000)(0.75)(72.2) = \$2,166,000 \]
16-1 Consumption

Toward a More Realistic Description

• We want to smooth consumption
• But sometimes we can’t because of borrowing constraints
• And we might be risk averse

\[ C_t = C(\text{Total wealth}_t, Y_{LT} - T_t) \]

\[
Y_{Lt} = \text{real labor income in year } t.
\]
\[
T_t = \text{real taxes in year } t.
\]
\[
Y_{LT} - T_t = \text{human wealth, or the expected present value of after-tax labor income}
\]
Consumption Smoothing

\[ U(C) \]

\[ U(\bar{C} + \varepsilon) \]

\[ U(\bar{C}) \]

\[ 0.5[U(\bar{C} + \varepsilon) + U(\bar{C} - \varepsilon)] \]

\[ U(\bar{C} - \varepsilon) \]

\[ \bar{C} - \varepsilon \quad \bar{C} \quad \bar{C} + \varepsilon \]
FIGURE 10.7 Illustration of Steady Consumption Compared with Income Growth and Decline
Consumption

Source: BEA, 2011Q4 2nd release; Fed Flow of Funds.
16-1 Consumption

Putting Things Together: Current Income, Expectations, and Consumption

• This dependence of consumption on expectations has two main implications for the relation between consumption and income:

1. Consumption is likely to respond less than one for one to fluctuations in current income.

2. Consumption may move even if current income does not change.

• Consumption may move even if current income does not due to changes in consumer confidence.
16-2 Investment

The Present Value of Expected Profits

• $V(\Pi^e_t)$: The present value, in year $t$, of expected profit in year $t+1$ equals:

$$\frac{1}{1 + r_t} \Pi^e_{t+1}$$

In year $t+2$,

$$\frac{1}{(1 + r_t)(1 + r^e_{t+1})} (1 - \delta) \Pi^e_{t+2}$$

In year $t$,

$$V(\Pi^e_t) = \frac{1}{1 + r_t} \Pi^e_{t+1} \frac{1}{(1 + r_t)(1 + r^e_{t+1})} (1 - \delta) \Pi^e_{t+2} + \cdots$$

Reasonable values for $\delta$ are between 4 and 15% for machines, and between 2 and 4% for buildings and factories.
16-2 Investment

The Present Value of Expected Profits

Figure 16 - 1

Computing the Present Value of Expected Profits

\[
\frac{1}{1 + r_t} \Pi_{t+1}^e
\]

\[
\frac{1}{(1 + r_t)(1 + r_{t+1}^e)} (1 - \delta)\Pi_{t+2}^e
\]

\[
(1 - \delta)\Pi_{t+2}^e
\]
16-2 Investment

The Investment Decision

\[ I_t = I \left[ V \left( \Pi_t^e \right) \right] \]

\[ (\quad + \quad) \]

A Convenient Special Case

• Suppose firms expect both future profits and future interest rates to remain at the same level as today, so that

\[ \Pi_{t+1}^e = \Pi_{t+2}^e = \ldots = \Pi_t^e \quad \text{and} \quad r_{t+1}^e = r_{t+2}^e = \ldots = r_t^e \]

Economists call such expectations – expectations that the future will be like the present – **static expectations**. Under these two assumptions, we get

\[ V(\Pi_t^e) = \frac{\Pi_t}{r_t + \delta} \]
16-2 Investment

A Convenient Special Case

• Putting \( V(\Pi^e_t) = \frac{\Pi_t}{r_t + \delta} \) and \( I_t = I[V(\Pi^e_t)] \) together give us an equation for investment:

\[
I_t = I\left( \frac{\Pi_t}{r_t + \delta} \right)
\]

Rental Cost = \( (r_t + \delta) \)

- Firms may be reluctant to borrow if current profit is low. But if current profit is high, the firm may not need to borrow to finance its investments.

- Even if the firm wants to invest, it might have difficulty borrowing. Potential lenders may not be convinced the project is as good as the firms says.

\[
I_t = I[V(\Pi^e_t), \Pi_t] \\
( + , + )
\]
16-2 Investment

Current versus Expected Profit

Figure 16 - 2

Changes in Investment and Changes in Profit in the United States since 1960

Investment and profit move very much together.
16-2 Investment

Profit and Sales

Figure 16 - 3

Changes in Profit per Unit of Capital versus Changes in the Ratio of Output to Capital in the United States since 1960

Profit per unit of capital and the ratio of output to capital move largely together.

$$\Pi_t = \Pi \left( \frac{Y_t}{K_t} \right)$$

Change in output (scale at left)

Change in profit (scale at right)
16-3 The Volatility of Consumption and Investment

• Let’s look at the similarities between our treatment of consumption and of investment behavior:

  – Whether consumers perceive current movements in income to be transitory or permanent affects their consumption decisions.

  – In the same way, whether firms perceive current movements in sales to be transitory or permanent affects their investment decisions.
16-3 The Volatility of Consumption and Investment

• But there are also important differences between consumption decisions and investment decisions:

  – When faced with an increase in income that consumers perceive as permanent, they respond with *at most* an equal increase in consumption.

  – When firms are faced with an increase in sales they believe to be permanent, their present value of expected profits increases, leading to an increase in investment.
16-3 The Volatility of Consumption and Investment

*Figure 16 - 4*

*Rates of Change of Consumption and Investment since 1960*

Relative movements in investment are much larger than relative movements in consumption.
16-3 The Volatility of Consumption and Investment

The figure yields three conclusions:

- Consumption and investment usually move together.

- Investment is much more volatile than consumption.

- Because, however, the level of investment is much smaller than the level of consumption, changes in investment from one year to the next end up being of the same overall magnitude as changes in consumption.