Economics 442
Macroeconomic Policy
(Spring 2015)
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Instructor: Prof. Menzie Chinn
UW Madison
15-2 The Stock Market and Movements in Stock Prices

Figure 15-6 Standard and Poor’s Stock Price Index, in Real Terms, since 1970

Source: Calculated using series SP500 and CPIUSCL, Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/
15-2 The Stock Market and Movements in Stock Prices

Figure 15-7 Returns from Holding One-Year Bonds or Stocks for One Year

<table>
<thead>
<tr>
<th></th>
<th>Year $t$</th>
<th>Year $t + 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year bonds</td>
<td>$1$</td>
<td>$1 (1 + i_{1t})$</td>
</tr>
<tr>
<td>Stocks</td>
<td>$1$</td>
<td>$1 \frac{D_{t+1}^e + Q_{t+1}^e}{Q_t}$</td>
</tr>
</tbody>
</table>
15-2 The Stock Market and Movements in Stock Prices

\[ Q_t = \frac{D_{t+1}^e}{(1 + i_{1t})} + \frac{Q_{t+1}^e}{(1 + i_{1t})} \]  \hspace{1cm} (15.9)

\[ Q_t = \frac{D_{t+1}^e}{(1 + i_{1t})} + \frac{D_{t+2}^e}{(1 + i_{1t})(1 + i_{t+1})} + \cdots + \frac{D_{t+n}^e}{(1 + i_{1t}) \cdots (1 + i_{t+n-1})} + \frac{Q_{t+n}^e}{(1 + i_{1t}) \cdots (1 + i_{t+n-1})} \]  \hspace{1cm} (15.10)
$Q_t = \frac{D_{t+1}^e}{(1 + i_{1t})} + \frac{D_{t+2}^e}{(1 + i_{1t})(1 + i_{1t+1}^e)} + \cdots + \frac{D_{t+n}^e}{(1 + i_{1t})\cdots(1 + i_{1t+n-1}^e)}$ (15.11)

$Q_t = \frac{D_{t+1}^e}{(1 + r_{1t})} + \frac{D_{t+2}^e}{(1 + r_{1t})(1 + r_{1t+1}^e)} + \cdots$ (15.12)
$Q_t = \frac{D_{t+1}^e}{(1 + i_{1t} + \theta)} + \frac{D_{t+2}^e}{(1 + i_{1t} + \theta)(1 + i_{1t+1}^e + \theta)} + \cdots + \frac{D_{t+n}^e}{(1 + i_{1t} + \theta) \cdots (1 + i_{1t+n-1}^e + \theta)}$
16-2 Investment

\[ V(\Pi_t^e) = \frac{1}{1 + r_t} \Pi_{t+1}^e + \frac{1}{(1 + r_t)(1 + r_{t+1}^e)} (1 - \delta) \Pi_{t+2}^e + \cdots \] (16.3)
Figure 16-2  Computing the Present Value of Expected Profits

Present value in Year $t$

\[
\frac{1}{1 + r_t} \Pi^e_{t+1}
\]

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

Expected profit in:

Year $t + 1$  

\[\Pi^e_{t+1}\]

Year $t + 2 \ldots$

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

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

\[ ( + ) \quad (16.4) \]

\[ V(\Pi_t^e) = \frac{\Pi_t}{r_t + \delta} \quad (16.5) \]
Figure 1  Tobin’s $q$ versus the Ratio of Investment to Capital. Annual Rates of Change, since 1960

Source: Flow of Funds Accounts Nonfarm Nonfinancial Corporate Business. Investment (line 12, Table F102). Capital measured by Nonfinancial assets (line 2, Table B102). Numerator of $q$: Market value of Equity (line 35) + [Financial Liabilities (line 21) − (Financial Assets (Total assets (line 1) − Nonfinancial assets (line 2)))] all Table B102. Denominator of $q$: Nonfinancial assets (line 2, Table B102).
16-2 Investment

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

(16.6)
Figure 16-3 Changes in Investment and Changes in Profit in the United States, since 1960

Source: Gross investment, Flow of funds variable FA105013005.A; Capital Stock Table 4.1, Bureau of Economic Analysis; Profit is constructed from After-tax profits and Net interest of nonfinancial corporations, Table B14, Economic Report of the President.
16-2 Investment

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

\[
( + , + )
\]

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

\[
( + )
\]
16-2 Investment

Figure 16-4 Changes in Profit per Unit of Capital versus Changes in the Ratio of Output to Capital in the United States, since 1960

Source: Capital stock: Table 4.1, Bureau of Economic Analysis; profit is constructed from After-Tax Profits and Net Interest of Nonfinancial Corporations, Table B14, Economic Report of the President. Output of the nonfinancial corporate sector is measured by gross value added using Table B14, Economic Report of the President.
16-3 The Volatility of Consumption and Investment

Figure 16-5 Rates of Change of Consumption and Investment, in the United States, since 1960

Source: Series PCEC96, GDPIC96 Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/
Appendix: Derivation of the Expected Present Value of Profits under Static Expectations

\[ V(\Pi^e_t) = \frac{1}{1 + r_t} \Pi_t \left( 1 + \frac{1 - \delta}{1 + r_t} + \cdots \right) \quad (16.A1) \]