Lectures 14 and 15

More on Household and Firm Behavior

Chapter 15

- Households: life cycle model, expectations of the future, temporary versus permanent policy changes.

- Current consumption also depends on the interest rate and wealth.

- Firms at times hold excess labor and excess capital. The amounts held affect future employment and investment decisions.

- Expectations of future output affect current employment and investment decisions.

- “Productivity” is pro cyclical due to excess labor fluctuations.

- Employment is smoothed relative to production.
• Some inventory investment is unexpected.

• Production is smoothed relative to sales.

• Okun's law—three leakages: excess labor, moonlighters, labor force. Output falls 3 percent, unemployment rate rises 1 percentage point.

• Price effects on consumption through real wealth effects and real wage effects. \( P \) affects \( C \) negatively.)

• How the economy affects the government deficit. Deficit, \( D \), is \( G - tY + TR \).
Life Cycle Model
"If I won forty-seven million dollars in the lottery, I wouldn't change a thing. Not at first."

"I should have bought more crap."
Figure 2. Live births and general fertility rates: United States, 1920–2014

NOTE: Beginning with 1959, trend lines are based on registered live births; trend lines for 1920–1958 are based on live births adjusted for underregistration.
Firms

\[ Y = f(h, s') \quad h \geq h' \quad s \leq s' \]

Excess \( L = s - s' \)

Excess \( h = h - h' \)

\[ h = h_r + I - OEP \]

\[ I = g_i(c, w, y^e, h_r - h_r') \]

\[ S = g_s(r, w, y^e, s_r - s_r') \]

\[ \begin{array}{c}
\text{r} \\
\text{I} \\
\text{Y/s} \\
\text{time}
\end{array} \]

\[ \text{↑ expectations} \\
\text{MEI} \]
\[ V = V_{-1} + Y - X \]
\[ V^e = V_{-1} + Y - X^e \]

If \( X < X^e \) then \( V > V^e \)

IV = \( V - V_{-1} \) (some may be unexpected)

\[ \frac{V}{X} \]

\[ \frac{Y}{X} = f(X^e_{-1}, X^e_{-1+1}, X^e_{-1+2}, \ldots, V_{-1}) \]

\[ X, Y, S \]

\[ \frac{X, Y, S}{time} \]
Ohun's Law

$$UR = \frac{L-E}{L}$$

$$E = T - MOON$$

$$Y \downarrow \Rightarrow T \downarrow \text{ but less than } Y$$

$$S \downarrow \equiv MOON \downarrow \ [\text{so } E \downarrow < T \downarrow]$$

$$T \downarrow \equiv L \downarrow \ [\text{so } UR \uparrow \text{ less than otherwise}]$$

$$Y \downarrow \Rightarrow UR \uparrow$$

37o 1 point (Ohun's Law)
NOTATION

• $Y$ output or income
• $C$ consumption
• $I$ investment
• $G$ government purchases of goods and services—exogenous
• $TR$ government spending on transfer payments (a negative tax)—exogenous
• $t$ tax rate—exogenous
• $TAX$ taxes
• $T$ net taxes ($TAX - TR$)
• $Y_d$ disposable income ($Y - T$)
• $r$ interest rate
• $P$ price level
• $PM$ price of imports (cost variable)—exogenous
• $Z$ "Z" variables in Fed rule—exogenous
AS/AD MODEL

- $Y_d \equiv Y - T$  
  Definition

- $C = a + bY_d$  
  Behavioral (households) \( j \), \( r \) \( wealth \), \( \text{life cycle} \), \( \rho \)

- $I = d - e \cdot r$  
  Behavioral (firms), \( \gamma \), excess capital

- $Y = C + I + G$  
  Equilibrium condition, \( \nu = \nu + Y - X \)

- $TAX = tY$  
  Behavioral (government)

- $T \equiv TAX - TR$  
  Definition

- $P = \delta + \epsilon Y + \zeta PM$  
  Behavioral (AS curve, firms)

- $r = \alpha Y + \beta P + \gamma Z$  
  Behavioral (Fed rule)
**SOLUTION of AS/AD MODEL**

\[
Y = C + I + G \\
= a + b(Y - tY + TR) + d \\
- e \cdot (\alpha Y + \beta[\delta + eY + \zeta PM] + \gamma Z) + G
\]

Let \( q = 1 - b + bt + e\alpha + e\beta\epsilon \).

Reduced form equation is:

\[
= \frac{a}{q} + \frac{b}{q}TR + \frac{d}{q} - \frac{e\beta\delta}{q} - \frac{e\beta\zeta}{q}PM - \frac{e\gamma}{q}Z + \frac{1}{q}G
\]

If \( b = .75, t = 1/3, \alpha = .3, e = .3, \epsilon = .3, \beta = .3, \) then \( q = 0.617 \), so \( \frac{1}{q} = 1.62 \). This compares to \( \frac{1}{1-b+bt} = 2.0 \).

Why is the government spending multiplier smaller when the AS curve and/or the Fed rule are added to the model?
Adding the Deficit

- \( D = G - tY + TR \) \hspace{1em} \text{Definition} \hspace{1em} = G - T
- \( \Delta Y / \Delta G = 1/q \)
- \( \Delta Y / \Delta TR = b/q \)
- \( \Delta D / \Delta G = 1 - t(1/q) \)
  \hspace{1em} = 1 - (1/3)1.62 = 0.460
- \( \Delta D / \Delta TR = -t(b/q) + 1 \)
  \hspace{1em} = -(1/3)(0.75)(1.62) + 1 = 0.595
Other Price Effects

- $P \uparrow \rightarrow \text{RealWealth} \downarrow \rightarrow C \downarrow$
- $P \uparrow \rightarrow W/P \downarrow \rightarrow Y_d \downarrow \rightarrow C \downarrow$