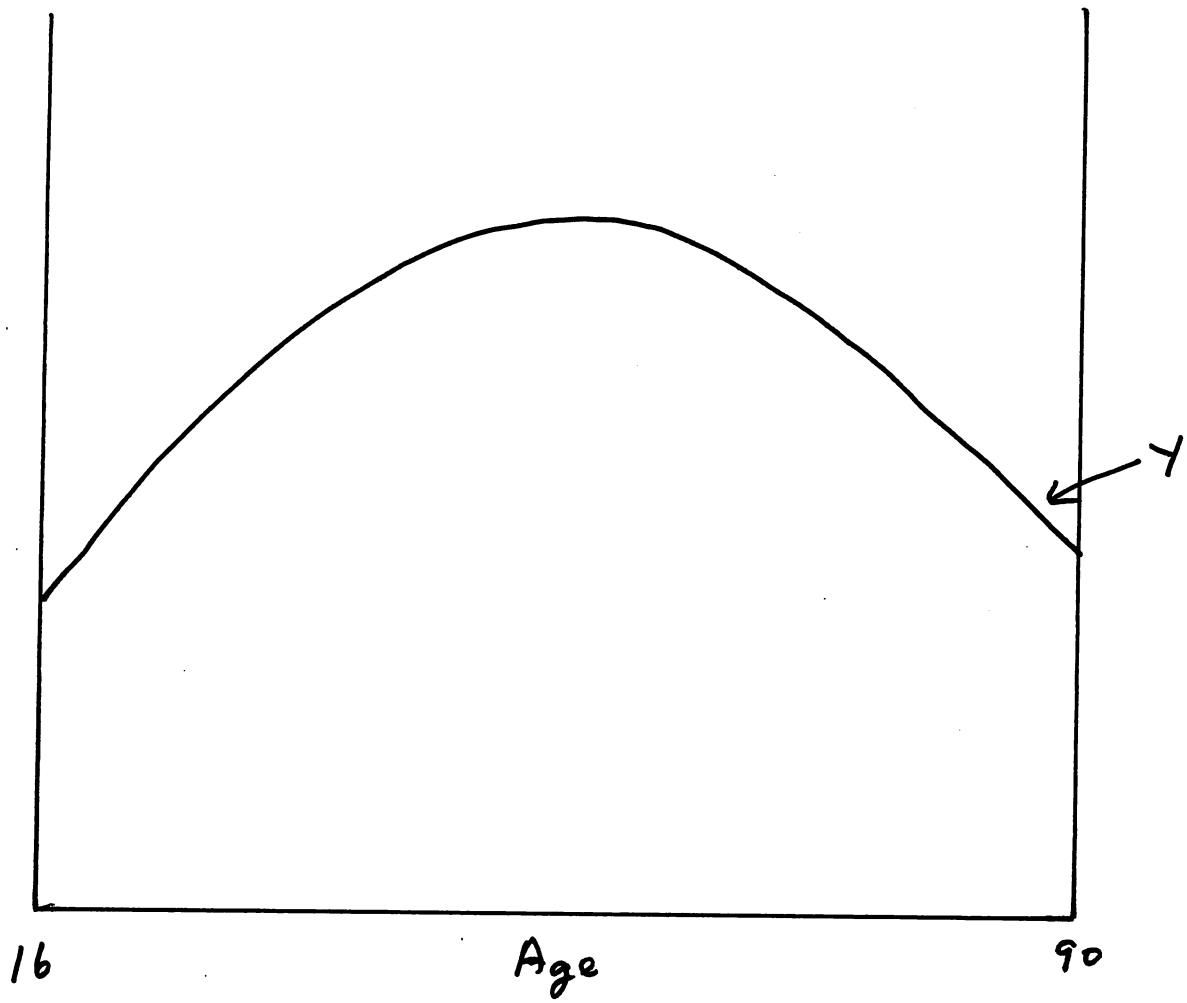
Lectures 14 and 15

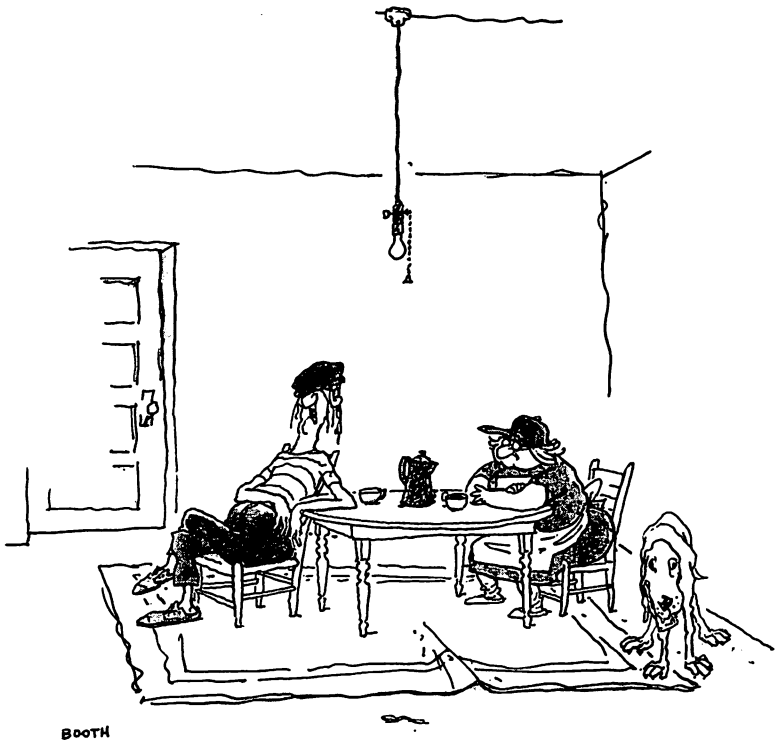
More on Household and Firm Behavior
Chapter 15

- 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."

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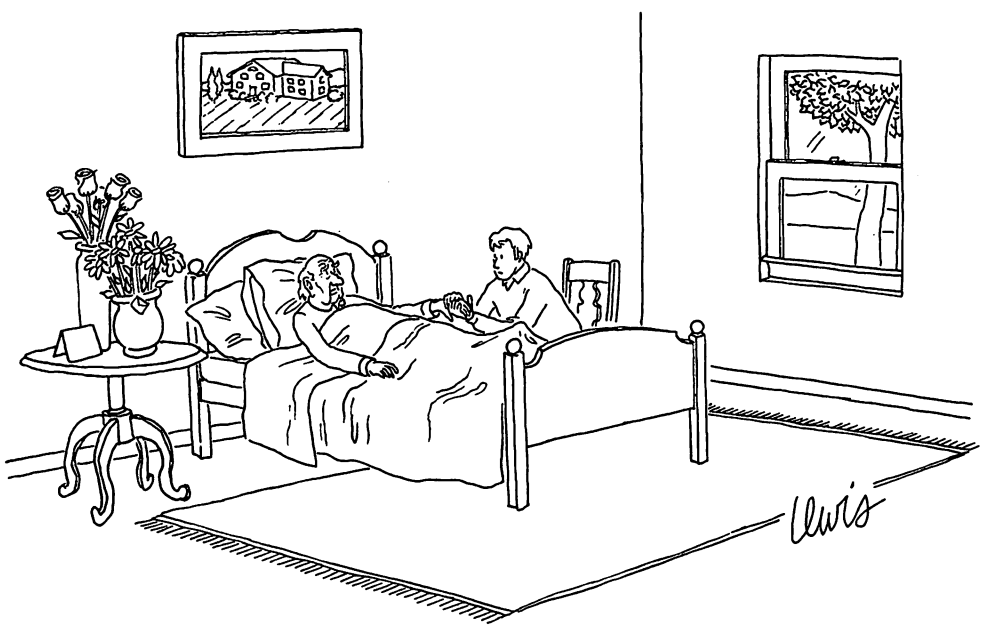

"I should have bought more crap."

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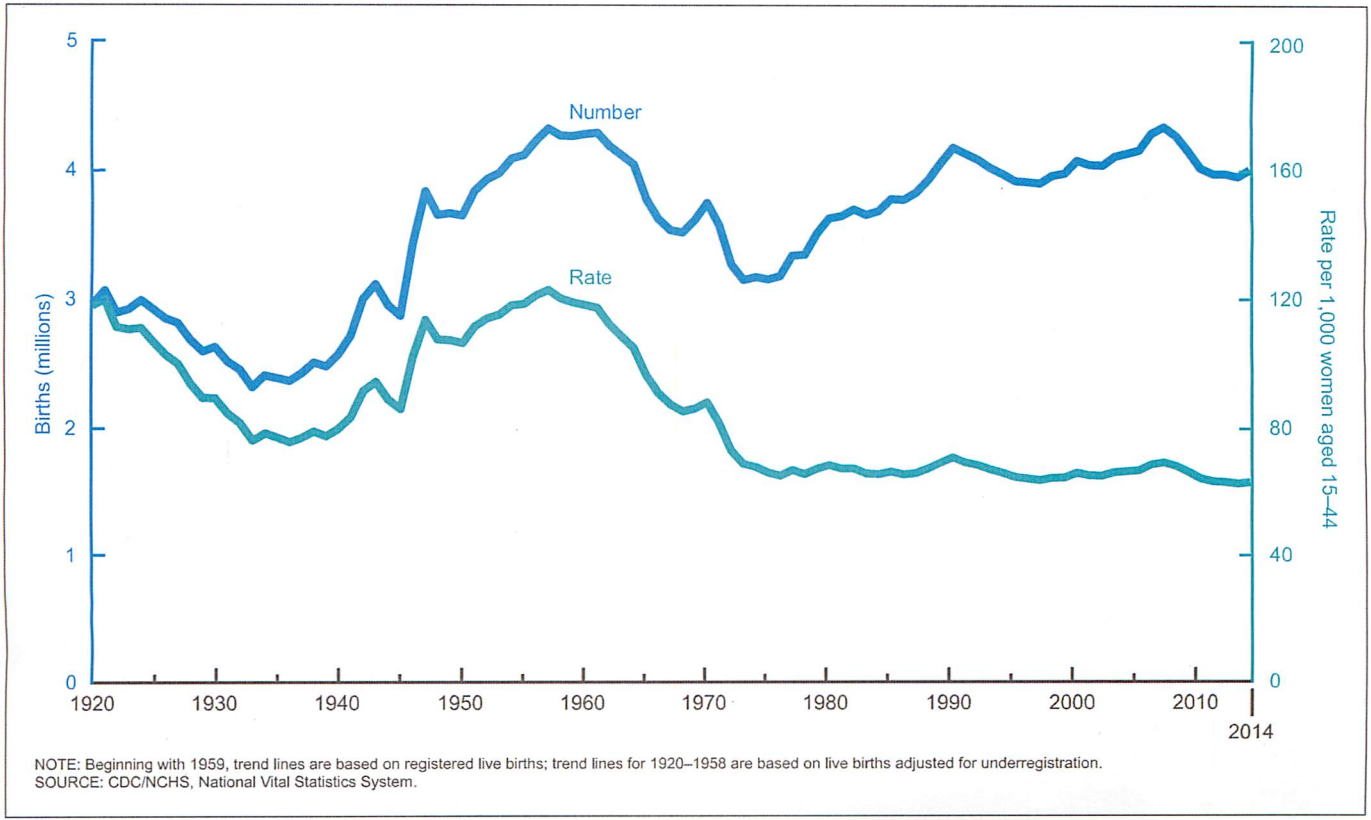


NOTE: Beginning with 1959, trend lines are based on registered live births; trend lines for 1920–1958 are based on live births adjusted for underregistration.
SOURCE: CDC/NCHS, National Vital Statistics System.

Figure 2. Live births and general fertility rates: United States, 1920–2014

Firms

$$Y = f(k', J') \qquad k \geq k' \qquad J \geq J'$$

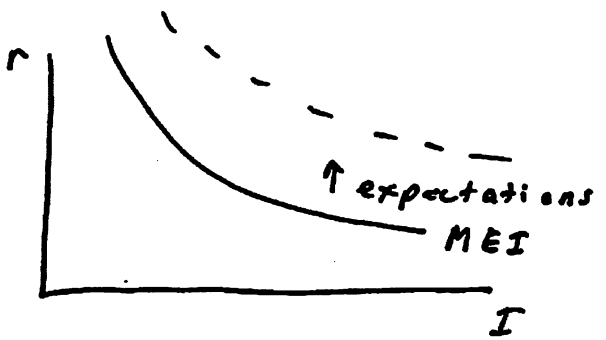
Excess $L = J - J'$

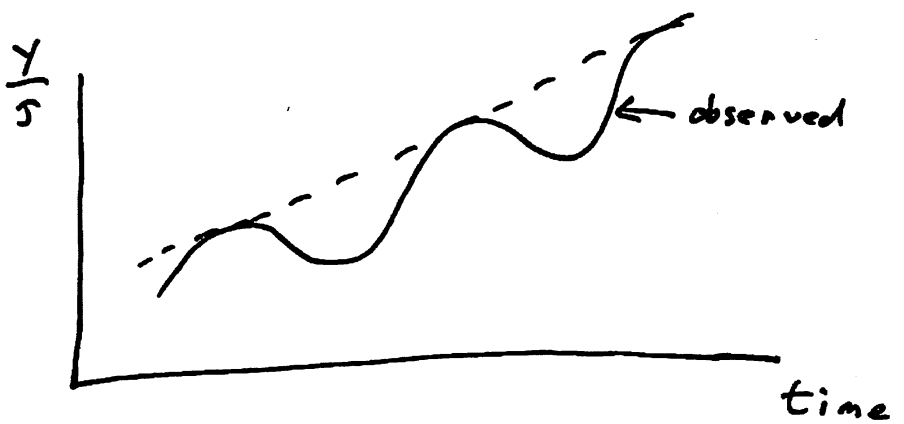
Excess $k = k - k'$

$$k = k_{-1} + I - DEP$$

$$I = g_1(r, W, Y^e, k_{-1} - k'_{-1})$$

$$J = g_2(r, W, Y^e, J_{-1} - J'_{-1})$$





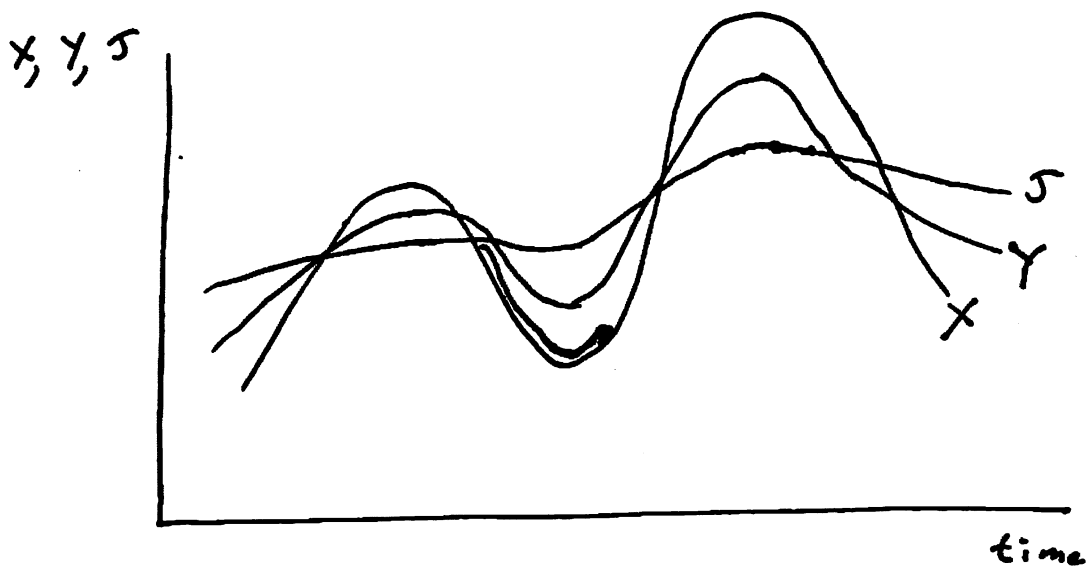
$$V = V_{-1} + Y - X$$

$$V^e = V_{-1} + Y - X^e$$

If $X \begin{matrix} < \\ > \end{matrix} X^e_{,}$ than $V \begin{matrix} > \\ < \end{matrix} V^e$

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

$$Y = f(X^e_{,}\ X^e_{+1,}\ X^e_{+2}\ ,\ \cdots,\ V_{-1}\ )$$



Ohun's Law

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

$E = J - MOON$

$Y\downarrow \Rightarrow J\downarrow$ but less than Y

$J\downarrow \Rightarrow MOON\downarrow$ [so $E\downarrow < J\downarrow$]

$J\downarrow \Rightarrow L\downarrow$ [so $UR\uparrow$ less than otherwise]

$Y\downarrow \Rightarrow UR\uparrow$

3% 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); r, wealth, life cycle, P
- $I = d - e \cdot r$ Behavioral (firms); Y^e, excess capital
- $Y = C + I + G$ Equilibrium condition; $V = V_{-1} + Y - X$
- $TAX = tY$ 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

$$
\begin{aligned}
Y &= C + I + G \\
&= a + b(Y - tY + TR) + d \\
&\quad -e \cdot (\alpha Y + \beta[\delta + \epsilon Y + \zeta PM] + \gamma Z) + G
\end{aligned}
$$

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

- $D = G - tY + TR$ Definition
  $= G - T$
- $\Delta Y/\Delta G = 1/q$
- $\Delta Y/\Delta TR = b/q$
- $\Delta D/\Delta G = 1 - t(1/q)$
  $= 1 - (1/3)1.62 = 0.460$
- $\Delta D/\Delta TR = -t(b/q) + 1$
  $= -(1/3)(0.75)(1.62) + 1 = 0.595$

Other Price Effects

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