Labor Supply

1 Trends
Discuss Tables 6.1-6.4 (p175-179, v6)

2 Graphic Analysis of Labor/Leisure Choice
A. Preferences
   1) Goods
      a) Leisure
      b) Money
   2) Utility (interpersonal comparison?)
   3) Indifference curves: See Figure 1
      a) Negatively sloped
      b) Ordering of curves
      c) No intersections
      d) Usually convex
      e) Vary by individual
B. Budget constraint: See Figure 2
   1) Straight line
   2) Negative slope (=wage)
   3) Effect of property income
C. Optimal basket of goods
   1) Tangency
   2) Corner solutions: See Figure 3
D. Comparative statics
   1) Change in property income: See Figure 4
   2) Change in wage: See Figure 5
      a) Decompose into income and substitution effect: See Figure 6
E. Supply curves

3 Algebraic Analysis
A. Utility function
   \[ U(L, X) = \beta \log L + (1 - \beta) \log X. \]
B. Problem of consumer:
   \[ \max U(L, X) \quad \text{st} \quad V + (1 - L) w \geq pX \]
   or, equivalently,
   \[ \max U(L, X) \quad \text{st} \quad V + w \geq pX + wL. \]
C. Lagrangean:
\[ \mathcal{L} = U(L, X) + \lambda [V + (1 - L) w - pX] . \]

FOC’s:
\[
\begin{align*}
\frac{\partial \mathcal{L}}{\partial L} &= U_1 - \lambda w = 0; \\
\frac{\partial \mathcal{L}}{\partial X} &= U_2 - \lambda p = 0; \\
\frac{\partial \mathcal{L}}{\partial \lambda} &= V + (1 - L) w - pX = 0.
\end{align*}
\]

Solving for \( \lambda \), we get
\[
\frac{U_1}{w} = \frac{U_2}{p}
\]
or, equivalently,
\[
\frac{U_1}{U_2} = -\frac{w}{p}.
\]

The LHS is the slope of the indifference curve, and the RHS is the slope of the budget line; thus our tangency condition.

If \( U_1 > \lambda w \) at \( L = 1 \), then \( L = 1 \) (corner solution).

Example: Cobb-Douglas utility function is
\[ U(L, X) = \beta \log L + (1 - \beta) \log X. \]

Then
\[
\begin{align*}
\mathcal{L} &= \beta \log L + (1 - \beta) \log X + \lambda [V + (1 - L) w - pX]; \\
\frac{\partial \mathcal{L}}{\partial L} &= \frac{\beta}{L} - \lambda w = 0; \\
\frac{\partial \mathcal{L}}{\partial X} &= \frac{(1 - \beta)}{X} - \lambda p = 0; \\
\frac{\partial \mathcal{L}}{\partial \lambda} &= V + (1 - L) w - pX = 0.
\end{align*}
\]

\[
\begin{align*}
\frac{\beta}{wL} &= \frac{(1 - \beta)}{pX} \Rightarrow X = \frac{(1 - \beta) wL}{\beta p} \\
\Rightarrow V + (1 - L) w - p \frac{(1 - \beta) wL}{\beta p} &= 0 \\
\Rightarrow V + w - \frac{wL}{\beta} &= 0 \\
\Rightarrow L &= \frac{\beta V + w}{w} \\
\Rightarrow X &= (1 - \beta) \frac{V + w}{p}.
\end{align*}
\]

When is there a corner solution? This particular solution is particular to the Cobb-Douglas utility function.
4 Policy Analysis

A. Supply side economics - Effect of taxes
   1) Discussion of Laffer’s hypothesis
   2) Graphical analysis: See Figure 7
   3) Empirical analysis
B. Welfare
   1) With smooth taxes
   2) With kinks
C. Unemployment insurance
D. Oil shock
   1) Emphasize supply and demand

5 Selection Bias

A. Reservation wage - graphical analysis with indifference curves: See Figure 3
   1) Determinants of reservation wage
      a) Outside income
      b) Value of leisure
      c) Value of search
B. Determinants of wage offers
   1) Education
   2) Experience
   3) Sex
   4) Race
C. Graphical analysis of selection bias: See Figures 8 and 9

6 Dynamics - Verbal Discussion

A. Impact of experience
B. Job finding costs
C. Heterogeneity
D. Life cycle effects
E. Questions
   1) Why is there retirement?
   2) Why are there vacations?