Chapter 2
Labor Supply

September 24, 2009

I. Introduction

1. Labor facts
   - Working men: decline in labor force participation from 90% in 1947 to 75% in 2000 in the US. *How about Taiwan?*
   - Working women: rise in labor force participation from 32% in 1947 to 60% in 2000 in the US. *How about Taiwan?*
   - Work hours fell from 40 to 35 per week during the same time period. *How about Taiwan?*

2. Measuring the Labor Force
   - Current population survey (CPS); 行政院主計處人力資源調查.
   - Labor Force = Employed + Unemployed
     \[ LF = E + U \]
     Size of LF does not tell us about “intensity” of work
   - Labor Force Participation Rate
     \[ LFPR = LF/P \]
     \( P \) = civilian adult population 16 years or older not in institutions
   - Employment Population Ratio (percent of population that is employed)
     \[ EPR = E/P \]
   - Unemployment Rate
     \[ UR = U/LF \]

3. Measurement Issues
   - Labor Force measurement relies on subjectivity and likely understates the effects of a recession.
   - Hidden unemployed: persons who have left the labor force, giving up in their search for work.
   - \( EPR \) is a better measure of fluctuations in economic activity than the \( UR \).
4. Facts of Labor Supply

- More women than men work part-time.
- More men who are high school drop outs work than women who are high school drop outs.
- White men have higher participation rates and hours of work than black men.
- How about Taiwan? 請參考教科書之 Table 2-1, 2-2, 2-3 和 Figure 2-1, 找出對應的台灣資料，並比較其異同處。

II. The Framework of Labor Supply Analysis

Neoclassical model of labor-leisure choice

1. The worker’s preferences

- Utility Function – measure of satisfaction that individuals receive from consumption of goods and leisure (can be viewed as one kind of good).
  
  \[ U = f(C, L), \]

  \( C \): consumption goods, defined as the total dollar value of all the goods in a given period.
  \( L \): leisure

- Indifference Curves
  - Downward sloping (indicates the trade off between consumption and leisure)
  - Higher curves = higher utility
  - Convex to the origin (indicating that opportunity costs increase)
  - Indifference curves do not intersect
  - Differences in Preferences across Workers (steep and flat indifference curves)
2. The budget constraint

\[ C = wh + V , \]
\[ T = h + L . \]

- $w$: hourly wage rate; $V$: non-labor income; $T$: total available time in a given period
- Budget constraint sets boundaries on the worker’s opportunity set of all the consumption baskets that the worker can afford.

3. The hours of work decision

- Individual will choose consumption and leisure to maximize utility
- Optimal consumption is given by the point where the budget line is tangent to the indifference curve
- At this point the Marginal Rate of Substitution between consumption and leisure equals the wage rate
- Any other bundle of consumption and leisure given the budget constraint would mean the individual has less utility
- Optimal Consumption and Leisure
4. Two Effects: Income Effect and Substitution Effect

**Income effect**
Increase in non-labor income allows worker to “jump” to higher indifference curve holding wage rate constant.

Note: Leisure can be treated as a normal good or as an inferior good.

**Substitution effect**
As wages change holding real income constant, changes in consumption-leisure bundle.

The Effect of a Change in Nonlabor Income on Hours of Work

(a) Leisure is a normal good  
(b) Leisure is an inferior good

The Effect of a Change in the Wage Rate on Hours of Work

Ambiguous Relationship

- As $w \uparrow$, S.E. > I.E., then $h \uparrow$
• As $w \uparrow$, S.E. $< I.E.$, then $h \downarrow$

III. To Work or Not to Work?

Are the “terms of trade” sufficiently attractive to bribe a worker to enter the labor market?

• Reservation wage: the minimum increase in income that would make the person indifferent between working and not working
  - If the market wage is less than the reservation wage, then the person will not work
  - The reservation wage increases as non-labor income increases
IV. Labor Supply Curve

- Relationship between hours worked and the wage rate
- At wages slightly above the reservation wage, the labor supply curve is positively sloped (the substitution effect dominates)
- If the income effect begins to dominate, hours of work decline as wage rates increase (a negatively sloped labor supply curve)
- Labor supply elasticity
  - % change in hours worked/% change in wage rate
  - Labor supply tends to be inelastic
  - As time period increases, labor supply becomes more elastic
- Labor Supply of Women
  - Over time, women’s participation rates have increased
  - Substantial cross-country differences in women’s labor force participation rates

V. Policy Applications

1. Welfare Programs and Work Incentives - Cash grants reduce work incentives
   - Welfare programs create work disincentives
     - Welfare reduces supply of labor by granting non-labor income, which raises reservation wage

2. The Earned-Income Tax Credit (EITC)
   - EITC is to increase labor force participation of non-workers of targeted groups
   - EITC produces an income effect, so hours worked should change

VI. Difference-in-difference Estimator