

Labor Supply and Labor Market Equilibrium

Chapter 3

1. Labor supply

2. Labor market equilibrium

3. Unemployment

4. Adverse supply shock

1 Labor Supply by the Household

We will start with a simple one-period model in which the consumer does not save for the future. We will drop this assumption to allow saving soon. To build the model we will make assumptions about 1) consumer preferences, 2) consumer's budget constraint, and 3) consumer behavior. We will use these assumptions to develop a theory of labor supply.

- Consumer preferences - consumption and leisure both yield utility

$$U = u(c, l)$$

- Indifference curves - combinations of c and l for which the agent receives the same level of utility

- slope downward from left to right — to be willing to give up one good must receive more of the other
- higher indifference curves represent higher levels of utility - holding one good constant and increasing the other raises utility
- bowed toward the origin due to the law of diminishing marginal utility

- Budget constraint

$$c = a + \varpi N = a + \varpi (h - l)$$

where a includes resources available to the household including non-wage income and wealth.

– Graph c as a function of l

* slope is $-\varpi$

* intercept is $a + \varpi h$

* upper bound on l of h

- Behavior is utility maximization subject to the budget constraint
 - Find tangency of budget line to highest indifference curve

- How do household's desired work hours respond to an increase in the current wage (ϖ)
 - budget line becomes steeper from its kink at h
 - * Substitution effect - holding utility constant, an increase in the real wage will cause the household to substitute out of leisure and into consumption, implying that he works more
 - * Income effect - an increase in the real wage relaxes the budget constraint, allowing the agent to have both more consumption and leisure
 - * Generally believe the substitution effect dominates for an increase in the current real wage, all else constant.

- How do household's desired work hours respond to an increase in the agent's non-labor income? (a)
 - intercept increases, shifting budget constraint rightward
 - * leisure and consumption increase
 - * labor supply falls.

- How do household's desired work hours respond to an increase in the agent's expected future wage?
 - * not really in the model - when we expand it to allow the agent to borrow against his future income, we will analyze this as an increase in a
 - * what does this imply about the effect of a permanent increase in the agent's real wage?

- Household labor supply

- Work hours the household would like to provide at each given real wage.
- Labor supply is an upward sloping function of the real wage.
- Labor supply shifts inward when non-labor income increases and when expected future wages increase.

- Aggregate labor supply
 - Add up all household supplies
 - Additional shifts
 - * increase in working-age population
 - * increase in participation rate

2 Labor Market Equilibrium

- Equilibrium occurs where $ND = NS$.
- Denote equilibrium values with overbar's \bar{N} and $\bar{\omega}$.
- Why is this an equilibrium?
- What is the value of employment? of unemployment?

3 Unemployment

- Full employment output = potential output = $\bar{Y} = AK^\alpha \bar{N}^{1-\alpha}$, where \bar{N} is equilibrium (market-clearing) output
 - \bar{N} is determined in the current period, but K is determined by decisions made last period
 - anything that changes \bar{N} will change \bar{Y}
- Natural rate of unemployment = \bar{u} = rate of unemployment that prevails when output is equal to potential - consists of frictional and structural unemployment

- Cyclical unemployment = $(u - \bar{u})$ = unemployment which differs from the natural rate

- Okun's Law

$$\frac{\bar{Y} - Y}{\bar{Y}} = 2(u - \bar{u})$$

4 Supply shock = change in A

What is the effect on \bar{Y} of a fall in A?

- Direct effect
- Indirect effect through effect on \bar{N}
- Effect of future \bar{Y} ? (consider persistence of the shock)
- Give an example of an adverse supply shock