# LABOR SUPPLY

I. Consumer theory  
II. Labor supply by individuals  
III. What happens when wages change  
IV. Elasticity of labor supply

## I. CONSUMER THEORY

- Basis for theory of labor supply  
- SIMPLIFYING ASSUMPTIONS  
  - Two Good World  
  - Individuals express preferences for 1 good in terms of what they will give up of another  
  - Want more of everything

## CONSTRAINED MAXIMIZATION PROBLEM: What one wants

- Individual Preferences  
  - Expressed in terms of *Utility* derived from good or service (No $ yet)  
  - Negative slope (How much will you give up?)  
  - Subject to *diminishing returns*  
  - Different curves for different people
Indifference Curve

Good 1

\( U_0 \)

\( U_1 \)

Good 2

Individuals have Different Preferences:

\( U_a \)

\( U_b \)

Good 2

CONSTRAINED MAXIMIZATION: THE CONSTRAINT

- Budget Constraint
  - Expressed in terms of relative prices (price of good 1 and price of good 2)
  - Opportunity Cost: How much you would have to give up of good 1 to be able to afford more of good 2
  - Negative slope
    - Slope of line = relative price of 2 goods
**Budget Constraint**

Shifting vs. Rotating budget constraint:

**SHIFTING**
- Occurs when have move income to spend
- Slope of line does not change

**ROTATING**
- Occurs when relative prices change
  - E.g., When good one becomes more or less expensive relative to good two
  - Slope of line does change

**Shifting vs. Rotating**

- **SHIFTING**: More $ to spend
- **ROTATING**: Decrease in Price of Good 1
**EXAMPLE: $600 TO SPEND ON CLOTHES (both cost $60)**

- Original budget line
- Shoes | Blazers
  | 10 | 0
  | 7  | 3
  | 5  | 5
  | 3  | 7
  | 0  | 10

- Shift the budget line -
  - Now have $1200

| 10 | 0 | 1200
| 7  | 3 |
| 5  | 5 |
| 3  | 7 |
| 0  | 10 |

- Rotate budget line -
  - Shoes only cost $30
  - Relative price change, slope changes

**EXAMPLE CONT.: THE CHOICE**

- Want to be on highest utility curve (more of everything) but constrained by budget line
- **Optimal Point**: where marginal utility of exchanging 1 pr. of shoes for 1 blazer = cost of buying 1 blazer instead of 1 pr. of shoes

**Optimal Point**

![Diagram showing the relationship between shoes and blazers at the optimal point](image)
II. LABOR SUPPLY DECISION

- Applying Consumer Theory to Labor Supply
- Two Goods
  - Leisure
  - All other goods & services (purchased with $)
- Consumer/worker deciding how much to consume of each

INDIVIDUAL PREFERENCES

- Hours of work: $U = U(X, L)$
- Depends on Demand for Leisure
- How many goods will you give up to get more leisure?
- Hours of Work = (Discretion Time) - Leisure
- Diminishing Marginal Utility
- Family of Curves
- Different Shapes for different people

Indifference Curve

- Goods
- Leisure
- $U_0$
- $U_1$
Individuals have Different Preferences:

BUDGET CONSTRAINT FOR LABOR SUPPLY

- Depends on hourly wage and wealth
- Assume only 16 hours available for work
- Leisure = (Discretionary time - work)
- Opportunity Cost of Leisure = Wage rate
- Slope of budget constraint = Wage rate
- Cost of leisure increases as wage rate increases
Slope of Budget Line depends on wage rate

- Budget line @ $15/hr
- Budget line @ $10/hr

$240
$160
$160 goods

Leisure → Work

HOURS OF LABOR SUPPLIED

Maximum Utility Point

where market price of labor (i.e., the wage rate) = utility derived from converting one hour of leisure into 1 hour of income to buy goods

Hours of Labor Supplied

Goods

Hrs of Leisure Hrs of Work
Summary

Factors determining individual supply of labor
- Preferences for leisure versus goods & services
- How much money one can earn in the labor market
- How much wealth one has

III. EFFECT OF CHANGING WAGE RATE: 2 EFFECTS

1. SUBSTITUTION EFFECT
   - Results from changing wage rate
   - Change in wage rate = Change in price of leisure
   - Wage Increase --> Increase price of leisure --> Reduced demand for leisure --> Increased hours of work
   - Budget line rotates

EFFECT OF CHANGING WAGE RATE, CONT.

2. INCOME EFFECT
   - Wages increase wealth
   - Increase in wealth allows greater consumption of “normal goods”
   - Budget line shifts, no change in slope
   - BOTH EFFECTS OCCUR WITH WAGE CHANGE
     - 2 Effects operate in opposite directions
IV. ELASTICITY OF LABOR SUPPLY

- Definition:
  \% change qty. supplied/\% change wages

- Indicator of economic power
  - Wage increase: the more inelastic the supply of labor, the more powerful the workforce
  - Wage decrease: the more inelastic the supply of labor, the less powerful the workforce

Supply of Labor more elastic:

- In response to a wage increase:
  - Fewer barriers to entry (if raise wage): Skill, education, and/or training time required to do the job, unions, internal labor market, certifications, etc.
  - The lower one’s preference for leisure
  - The lower one’s wealth
- In response to wage decrease:
  - The more employment alternatives elsewhere in the market
  - The greater one’s wealth
  - The greater one’s preference for leisure

LABOR SUPPLY IN CONTEXT OF HOME LIFE

I. Theory of Household Production
II. Supply by Multiple Members of the Household
I. THEORY OF HOUSEHOLD PRODUCTION: Household as "little factory"

- **Basic Premise:** Individuals productive in two places, at home and in the market
- **Home Production Function:**
  - Goods can be purchased in the market or produced at home
  - Diminishing marginal productivity
  - Differing productivity across individuals

HOME PRODUCTION AS PART OF BUDGET CONSTRAINT

- **TWO BUDGET CONSTRAINTS**
  - **MONEY CONSTRAINT:** Rate at which can convert work hours to money (put with wealth) to buy goods & services
  - **HOME CONSTRAINT:** Rate at which can convert hours at home into goods & services

Home Production Constraint
CONSTRAINT DIFFERENCES

- Differences across individuals in market and home productivities
  - The more productive at home, the steeper the home production function
  - The more productive in the market, the steeper the money constraint

Home Production Constraint:

- Placement of curve
- Shape of curve shows trade-off b/n purchased & home-produced goods
- Greater mkt. productivity -> greater wage
  - Less home production

LABOR SUPPLY ALLOWING FOR HOME PRODUCTION

- What is best mix of home-produced and market produced goods and services?
- Maximize Utility = U(X,L), where X = Xh + Xm subj. to 2 budget constraints
- Placement of curve
  - Shape of curve shows trade-off b/n purchased & home-produced goods
- Greater mkt. productivity -> greater wage
  - Less home production
Constraint that shows both productivity at home and in market

Goods

Leisure

Market Productivity

Home Productivity

2 People with same preferences: one producing at home and one going into the market

Goods

Leisure

Person earning more
gets more goods by
Going into the Market

Person earning less
gets more goods by
Producing at home

3 People, equally productive at home w/ same wage rate, but different preferences for home vs. mkt. Produced goods

Goods

Leisure

Person prefers market produced goods

Person likes mix of market and home produced goods

Person likes home produce goods

Person prefers market produced goods

Person likes mix of market and home produced goods

Person likes home produce goods
EFFECT OF WAGE INCREASE

- Steeper slope of Mkt. budget constraint
- Have Substitution and Income Effect:
  - SUBSTITUTION EFFECT
    - Wage increase → increase in Mkt. productivity relative to home productivity → More hours at work
  - INCOME EFFECT
    - Depends on preferences whether more home production or more leisure

SUMMARY

- People differ in preferences for home & market produced goods
- People differ in home productivity
- When wages are raised, some people may work less

II. JOINT HOUSEHOLD LABOR SUPPLY DECISIONS

- Assumptions
  - Decision-making unit: HH rather than individual
  - 2 Potential earners
  - Point: Individuals make labor supply decisions based on household income and household preferences
HOUSEHOLD LABOR SUPPLY

Interdependent labor supply decisions

Factors in Decision:
1) HH Preferences (mkt. goods, home goods, leisure)
2) Relative productivity at home & in market
   Interdependent Productivities
   - Productivity of one spouse depends on other's supply to market
   - Recall diminishing marginal productivity of home production

HH LABOR SUPPLY, CONT.

Decision Rule: if 1 hr. of work in mkt. by either person increases utility more than hr. of home work, will go into mkt.

Cross-elasticity of substitution:
% Change H/ % Change Wj < > 0
If > 0, couple are complements
If < 0, couple is substitutes

Summary

Factors individuals take into account when making labor supply decision:
- Their earnings/wage rate
- Their productivity at home
- Their wealth
- Their preferences for market goods, home produced goods and leisure

These change with people's life circumstance.