

## From Preferences to Demand

- Price change
  - Two-panel diagram

- “movement along”

## Income change

- Two panel diagram

- “shift”

## Corner solutions

- Usually, find spot where  $MRS = P_x/P_y$ .
- What if MRS at  $(x,y)=(I/P_x,0)$  exceeds the slope of the budget constraint?

## Types of Income Effects

- Normal good – as income rises, amount of good purchased rises ( $\partial x/\partial I > 0$ )
- Inferior good – as income rises, consumption of good declines ( $\partial x/\partial I < 0$ )

## Income and Substitution Effects

- Decompose price change into
  - pure (parallel shift) effect of income, and
  - pure (rotational) effect of price change
  - Substitution effect always negative
  - Income effect depends

## Ordinary and Compensated Demand

- Ordinary holds income constant
- Compensated holds *utility* constant

## Inc & Subst Effects w/Math

- $X(P_x, P_y, I)$  is an ordinary demand function
- Goal: create a demand curve that holds utility constant
  - How? Alter  $I$  to stay on the original indifference curve
  - $X(P_x, P_y, \text{Income needed, given new } P_x \text{ and } P_y)$ . To keep individual at original utility level)
  - Want: fcn showing expenditure needed, given prices, to achieve given level of  $U$ 
    - “expenditure function”

## Expenditure Function Aside

- Minimum Expenditure needed to achieve  $U$
- Minimize  $P_x X + P_y Y$  such that  $U(X, Y) = U_0$
- $L = P_x X + P_y Y + \lambda[U_0 - U(X, Y)]$ 
  - Find focs
  - Solve them to get compensated demands
    - $X^*(P_x, P_y, U_0), Y^*(P_x, P_y, U_0)$
- Minimum expenditure is
  - $P_x X^*(P_x, P_y, U_0) + P_y Y^*(P_x, P_y, U_0)$
  - $\equiv e(P_x, P_y, U_0)$

- Get  $X^*$  by plugging  $e$  into  $X$ :
- $X^* = X(P_x, P_y, e(P_x, P_y, U))$ 
  - Total derivative of this function w.r.t.  $P_x$  holds utility constant
  - = substitution effect!
- $(dX^*/dP_x) = \partial X/\partial P_x + (\partial X/\partial e)(\partial e/\partial P_x)$ 
  - Aside:  $(\partial e/\partial P_x) = X^*(P_x, P_y, U)$
- Thus,
  - $\partial X/\partial P_x = (dX^*/dP_x) - (\partial X/\partial I)X^*$
  - (total effect of price change on demand) = utility-constant change + income effect

## Exp. Function Example

- $U = XY$
- $L = P_x X + P_y Y + \lambda[U_0 - XY]$

## Discussion Questions

- Who is best able to know what goods choice will make a particular person (say, Sally) as happy as possible?
  - What is the “economics textbook” answer?
  - What do you think?
  
- How can we think about gift-giving in an economic context?
  - What does it look like in an indifference curve diagram
  - Is gift-giving efficient? Explain.
  
  
  
  
  
  
  
  
  
  
- Are you comfortable with this analysis of gift giving? (Are you a heartless, unsentimental beast?) Explain.
  
  
  
  
  
  
  
  
  
  
- What existing or potential business opportunities does this analysis of the efficiency of gift giving suggest?
  
  
  
  
  
  
  
  
  
  
- What other comments you have about any of this?