Consumer Theory

• Introduction
• Budget Set/line
• Study of Preferences
• Maximizing Utility
Introduction

• Where does the law of demand come from?
• Consumption choices depend on two factors:
  • 1. What choices you can afford (budget set)
  • 2. What choices you like (study of preferences)
Budget Set/Budget Line:

- The budget line shows all combinations of commodities that are available to the household given its money income and the prices of the goods that it purchases.
- In other words the budget set shows what combinations of goods a person can afford to purchase given the prices of the goods and the person's income. i.e. it shows all combinations of goods such that the total expenditure on all those goods is less than or equal to total income.
## Budget Set/Budget Line

<table>
<thead>
<tr>
<th>Combinations</th>
<th>Amount of X</th>
<th>Amount of Y</th>
<th>Expenditure on x</th>
<th>Expenditure on y</th>
<th>Total Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>50</td>
<td>0</td>
<td>$100</td>
<td>$0</td>
<td>$100</td>
</tr>
<tr>
<td>b</td>
<td>40</td>
<td>20</td>
<td>$80</td>
<td>$20</td>
<td>$100</td>
</tr>
<tr>
<td>c</td>
<td>30</td>
<td>40</td>
<td>$60</td>
<td>$40</td>
<td>$100</td>
</tr>
<tr>
<td>d</td>
<td>20</td>
<td>60</td>
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<td>e</td>
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<tr>
<td>f</td>
<td>0</td>
<td>100</td>
<td>$0</td>
<td>$100</td>
<td>$100</td>
</tr>
</tbody>
</table>

### Budget Line & Budget Set

The budget line is given by the equation:

\[ y = -2x + 100 \]

The graph illustrates the budget set and budget line with axes labeled as follows:

- **Amount of Good X (Tacos)**
- **Amount of Good Y (Dos Equis)**

The budget line is plotted with points at:

- (0, 100)
- (20, 60)
- (40, 20)
- (50, 0)

These points define the budget line and the budget set, where the total expenditure is always $100.
Budget Set/Budget Line

• Budget Equation

Income = Total expenditure

Income = Expenditure on X + Expenditure on Y

\[ I = X \cdot P_X + Y \cdot P_Y \]
Budget Set/Budget Line

• Slope of the budget line = Rise/Run
Axioms of Consumer Preference

• **Completeness**

• All bundles such as A and B can be ranked by the consumer. Either A is preferred to B \((APB)\) or B is preferred to A \((BPA)\) or the consumer is indifferent between A and B \((A\sim B)\)
Axioms of Consumer Preference

• Reflexivity:

• A consumer must be indifferent between bundle A and itself (AIA).
Axioms of Consumer Preference

• Transitivity:
  
  • If A is preferred to B and B is preferred to C the A must be preferred to C.
Axioms of Consumer Preference

• *Non-Satiation or More is Better:*

• If bundle A has more of at least one good (X or Y) than bundle B with at least the same or more amount of the other good than bundle B then A is preferred to B.
Indifference Curve

An indifference curve is an iso-utility line. It shows different combinations of the two goods that yield the same level of satisfaction (utility).
Properties of typical Indifference Curves and the logic behind them:

1. Indifference curves are negatively sloped.
2. As you progress to the NE, higher I.C.'s correspond to greater levels of total utility.
3. Indifference Curves are bowed toward the origin.
4. Indifference Curves do not cross.
5. Space is dense in indifference curves.
1. and 2. are based on the "More is Better" assumption.

**More is Better:**
It is assumed that the more of a good you get, the better off you are.

- Thus, to stay at the same level of TU as you move from a to b and get more pop, you must give up some pizza. Therefore, Indifference Curves slope downwards and higher I.C.s correspond to greater utility levels because on higher I.C.s you get more of at least one of the goods and no less of the other.
Logic behind 3

3 says Indifference curves are bowed toward the origin (converse to the origin). i.e. As value of $x \uparrow$ the slope becomes flatter in absolute value.

Reason: Principle of diminishing Marginal Utility. As You get more and more of a good the utility from each additional unit decreases.
Logic behind 4

- 4 says *Indifference Curves do not cross.*

One bundle cannot yield two different levels of happiness to the same person at the same point in time (If it does see the Psych. Department)
Logic Behind 5

5 says *Space is dense in indifference curves*

You have to be able to compare any two bundles to satisfy the axiom of completeness, hence you need indifference curves to cover all of the space.
MRS_{x,y} and Slope of an I.C.

- Definition: The marginal rate of substitution is the rate at which the person gives up the good on the vertical axis for one more unit of the good on the horizontal axis such that total utility remains unchanged.
Maximizing Utility:

To get that combination (bundle) of goods which yields the most satisfaction and is also within my budget.
Maximizing Utility

• To get that combination (bundle) of goods which yields the most satisfaction and is also within my budget.
Maximizing Utility

At Point A:

Slope of BC = Slope of IC ⇒ \[ MRS_{x,y} = \frac{P_x}{P_y} \]

Since by definition,

\[ MRS_{x,y} = \frac{MU_x}{MU_y} \]

Therefore at A:

\[ \frac{MU_x}{MU_y} = \frac{P_x}{P_y} \Rightarrow \frac{MU_x}{P_x} = \frac{MU_y}{P_y} \]

In other words utility maximization at A implies that the satisfaction from the last $ no matter which good (X or Y) it is spent on yields the same amount of satisfaction.
Corner Solutions: A consumer does not always maximize utility by consuming a positive amount of both goods. Sometimes a consumer finds that satisfaction can be maximized by consuming only one of the two goods.
Deriving Demand

- We allow the price of one good (say X) to change. Then we map out the different utility maximizing bundles of X and Y that the consumer chooses. This tells us how much of X the consumer will buy at each given price of X ceteris paribus. When we plot each of those prices against how much the consumer will buy of X we get the demand curve for X.

- Every point on the demand curve comes from a utility maximizing choice of X & Y given the person’s preferences (represented by the shape & slope of IC) and the prices of X and Y and income (represented by the shape, slope and position of the BC)
Shifts in Demand

Changes in Income (Normal Good)

Income $\rightarrow\Rightarrow$ Demand $\uparrow$

Diagram: Shifts in demand due to changes in income for a normal good.
Changes in Income (Inferior Good)

Income ↑⇒ Demand ↓