

ECON 101: Principles of Economics I

Lecture Note 10

University of Michigan at Ann Arbor

Last Edit Date: 01/6/2023

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Lecture 10: The Rational Consumer and Consumer Choice

Monday, October 24, 2022 12:23 PM

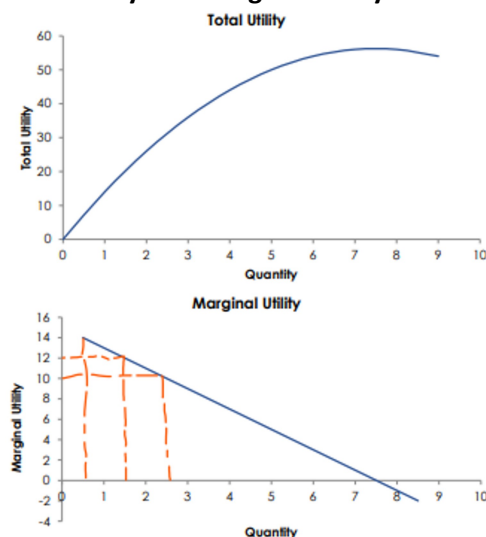
Utility and Consumption

Utility - measure of the satisfaction the consumer derives from consumption of goods and services (The more utility I get, the better off I am)

Consumption bundle - the collection (quantity) of all the goods and services consumed by that individual (Ex: bundle A has 2 bananas and 3 apples; bundle B has 10 bananas and 1 apple)

Utility function - a relationship between the consumption bundle and the total amount of utility generated by that bundle (every person has their own preferences and thus their own utility function)

Total utility and marginal utility



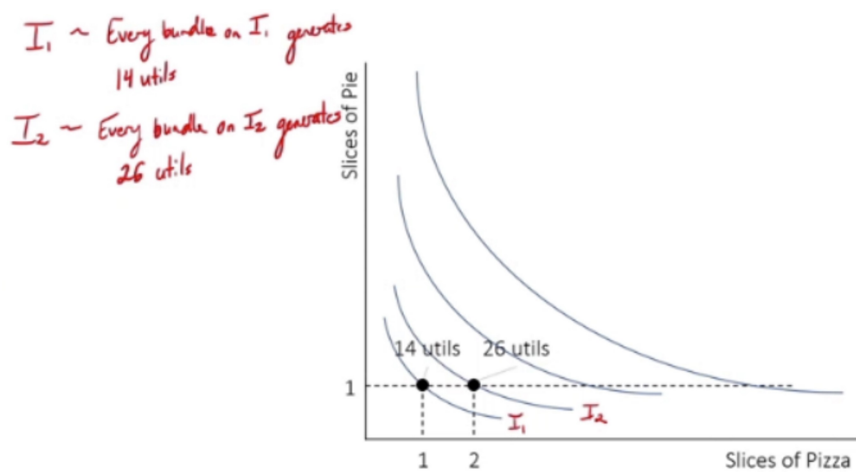
Quantity (Slices of Pizza)	Total Utility (utils)	Diminishing Marginal Utility (utils per slice)
0	0	
1	14	14
2	26	12
3	36	10
4	44	8
5	50	6
6	54	4
7	56	2
8	56	0
9	54	-2

As a person consumes a thing, every time the person consume one more, the marginal utility decreases a little bit.

Difference between MB and utility
Similar

Utility Function (enjoy more than 1 good)

Utility suggests that we can remove 1 stuff, and add another stuff



Properties of indifference curves

All indifference curve maps share four properties:

- Indifference curves never cross
- The farther out an indifference curve is, the higher the total utility it indicates
- They are downward sloping
- They are convex (bowed-in toward the origin) as a result of diminishing marginal utility

* No one wants to move along their indifference curve

The slope of an indifference curve

Marginal rate of substitution, MRS: the preferential trade-off between the two goods

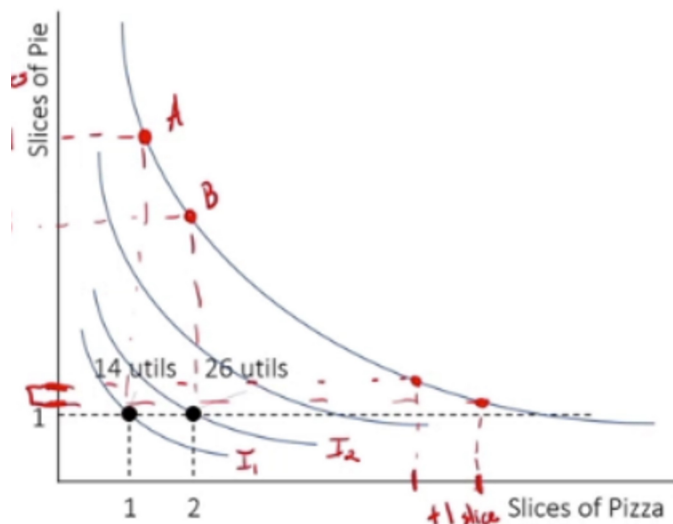
- Moving along the indifference curve:

$$MU_X \times \Delta Q_X = -MU_Y \times \Delta Q_Y$$

$$MRS = -\frac{MU_X}{MU_Y} = \frac{\Delta Q_Y}{\Delta Q_X}$$

- Diminishing marginal rate of substitution

As we add more of good X, it requires less good Y to be given up in order to maintain utility. This explains the convexity of our indifference curves.



Key Takeaways

Utility and Indifference Curves

- ❖ **Consumption bundle** – a grouping of goods and services consumed by that individual.
- ❖ **Utility** – a measure of the satisfaction the consumer derives from consumption of goods and services.
 - **Utility function** – a relationship between the consumption bundle and the total amount of utility generated by that bundle.
- ❖ **Indifference curves** – a graphical demonstration of all consumption bundles that result in the same level of utility.

Key Takeaways

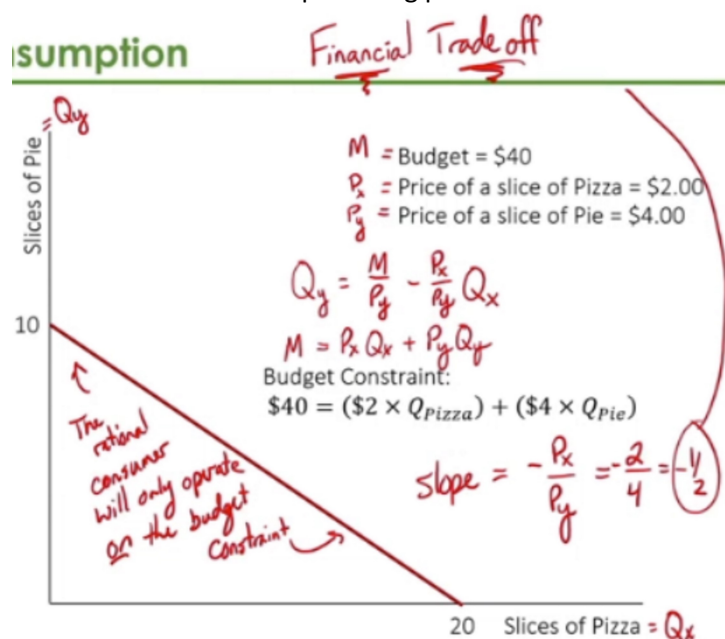
Utility and Indifference Curves

- ❖ **Consumption bundle** – a grouping of goods and services consumed by that individual.
- ❖ **Utility** – a measure of the satisfaction the consumer derives from consumption of goods and services.
 - **Utility function** – a relationship between the consumption bundle and the total amount of utility generated by that bundle.
- ❖ **Indifference curves** – a graphical demonstration of all consumption bundles that result in the same level of utility.
 - Indifference curves *never cross, are downward sloping and convex*. The farther out an indifference curve is, the *higher the total utility* it indicates
 - **Marginal rate of substitution, MRS**: the rate at which a consumer can give up some of one good in exchange for another good, while maintaining the same utility level.
 - ❖ Moving along the indifference curve: $MRS = -\frac{MU_X}{MU_Y} = \frac{\Delta Q_Y}{\Delta Q_X}$
 - ❖ MRS is diminishing, given that marginal utility is decreasing.

Budgets and Optimal Consumption

Budget constraint requires that the cost of a consumer's consumption bundle be no more than the consumer's total income.

Consumption possibilities is the set of all consumption bundles that can be consumed given the consumer's income and prevailing prices.



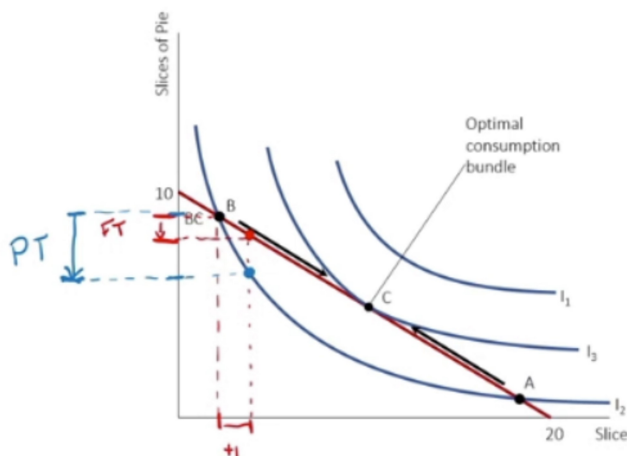
Tangency Condition

Tangency Condition

FT ~ Financial Tradeoff

Pizza and Pie

PT ~ Preferential Tradeoff



I₁ is the highest level of utility that I can achieve given my budget. Specifically, this occurs at consumption bundle C.

Math Speak: At bundle C the indifference curve and budget constraint are "tangent."

At a point of tangency, the slopes of the curves are equal.

Prices and the marginal rate of substitution

$$\text{Slope of indifference curve} = -\frac{MU_X}{MU_Y}$$

$$\text{Slope of budget line} = -\frac{P_X}{P_Y}$$

Optimal consumption bundle: The point at which the budget constraint is just tangent to the indifference curve. Thus their slopes are equal:

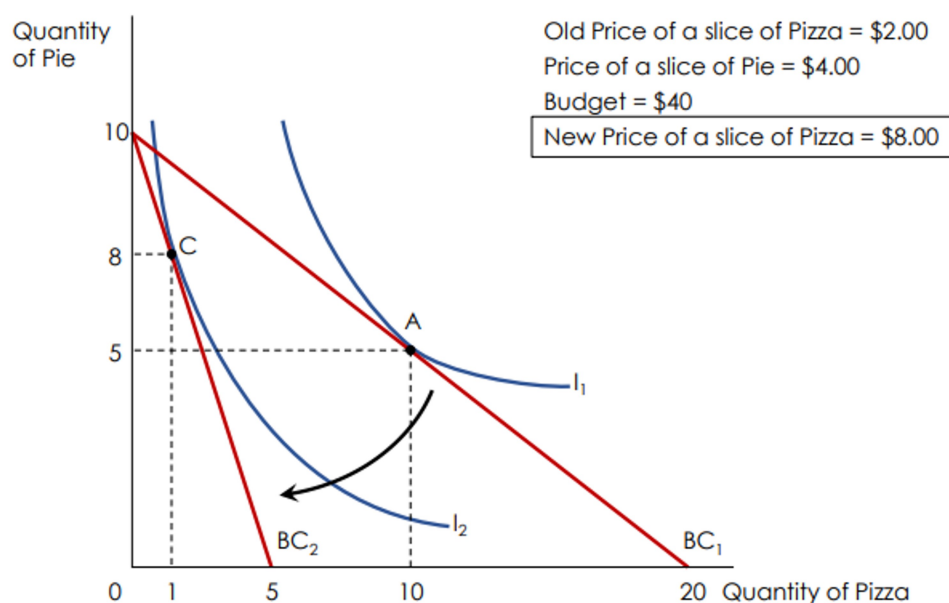
$-\frac{MU_X}{MU_Y} = -\frac{P_X}{P_Y}$ (So, the optimal consumption bundle occurs where the relative preferential price is equal to the relative financial price.)

OR

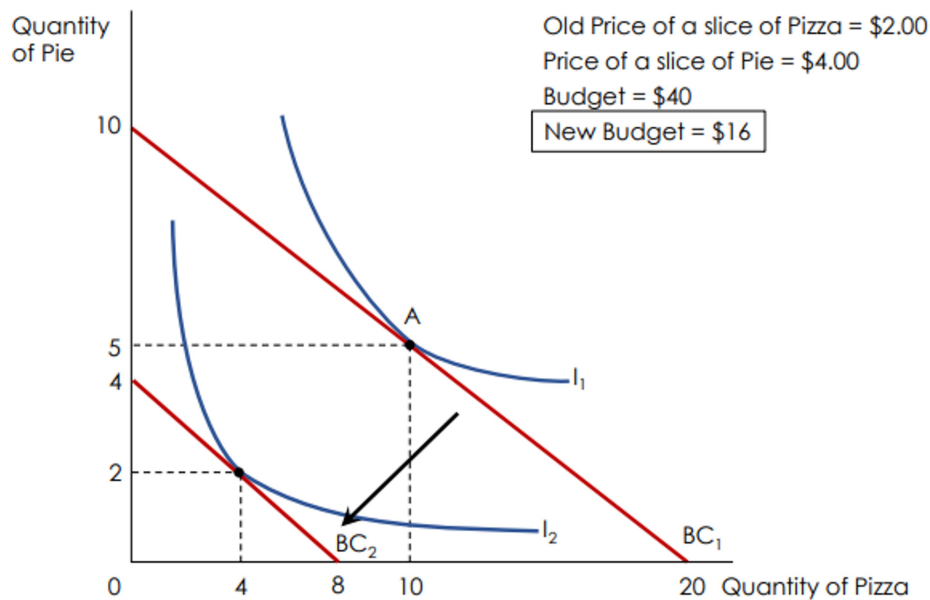
$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$ (Alternatively, the optimal consumption bundle occurs where the last dollar spent on each good generated the same marginal utility.)

Marginal utility per dollar: the additional utility from spending one more dollar on that good or service

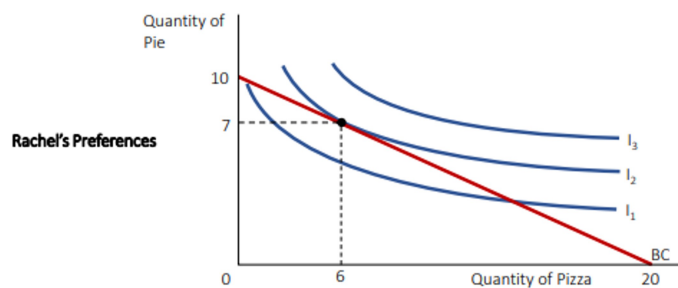
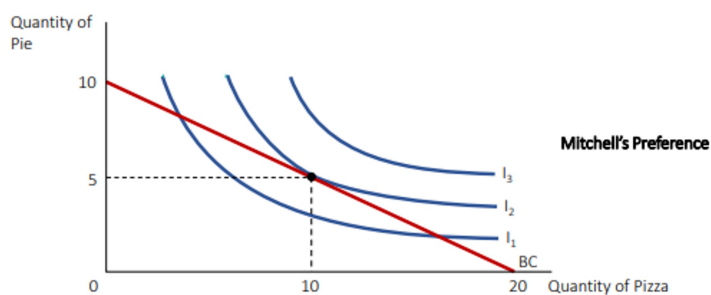
Responding to the price increase



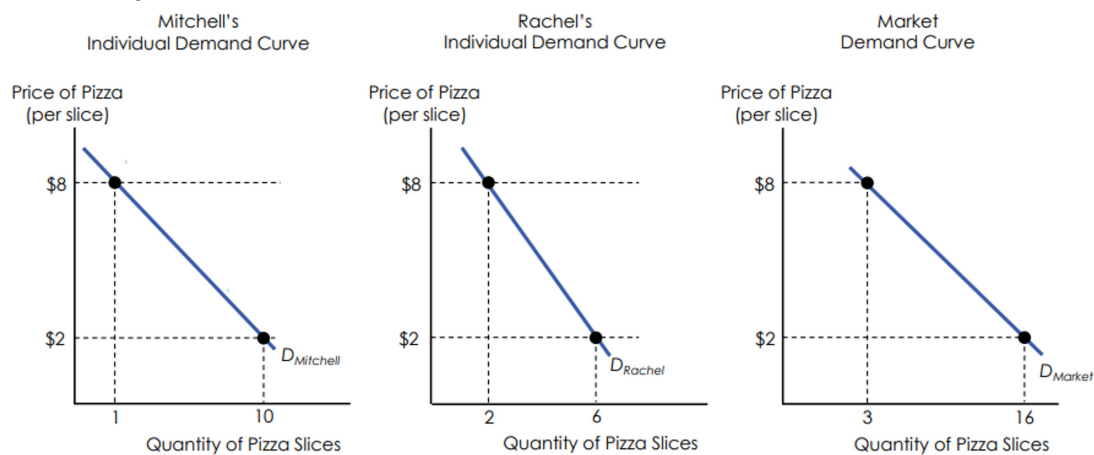
Income and consumption: Normal Goods



Differences in Preference



From utility to the demand curve



- ❖ An individual's demand for a good evolves out of their optimal consumption bundle.
 - As the price of the good changes, so does their optimal bundle, and thus we move along their demand curve.
 - As the other good's price changes, so does their optimal bundle, and thus we shift their demand curve.
 - As income changes, so does their optimal bundle, and thus we shift their demand curve.
 - As tastes, preferences, and expectations change, so does their optimal bundle, and thus we shift their demand curve.
- ❖ A market demand is the horizontal sum of all the individuals' demand curves.
 - Different consumers, even with the same budget constraint, may have different optimal consumption bundles due to differences in preferences.