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**Lecture 07: Indifference Curves**

1. What makes people happy?
	1. There are many things: falling in love, gambling, watching movies, playing games, dancing, reading, eating good food.
	2. Consumer choice theory approaches this question and the possible answers using utility.
	3. To understand how people make decisions we begin with the most basic tenets of consumer choice theory: utility maximization—people seek to maximize utility—and budget constraints—people only have so many resources to achieve that utility.
2. Graphing Indifference
	1. We begin by considering two sources of utility—swimming and fishing, ice cream and brownies, or episodes of *Boston Legal* and episodes of *Law and Order*. Sometimes we simply refer to Good X and Good Y. For now, let’s consider movies and games.
	2. We can imagine thousands of combinations of games and movies—four games and two movies, one game and ten movies, five games and two movies, seven games and one movie, etc.
	3. It’s obvious that a person will prefer some combinations to others. What indifference curves describe are the combinations that the consumer is indifferent to—those combinations that generate the same utility.

Games

Movies

U1

U2

U3

* 1. Indifference curves have four basic properties that are worth noting.
		1. *MECE*. Indifference curves are *mutually exclusive* and *completely exhaustive*, meaning they cover **all** combinations of two goods (completely exhaustive) and they **never** overlap (mutually exclusive). All combinations of movies and games are represented on the whole map of indifference curves and only on one curve.
		2. *Non-satiation*. For any two goods, the more a person has the happier they are, *ceteris paribus*. Thus, as indifference curves move away from the origin (towards the northeast corner), the utility value of that curve increases. More games are always better than fewer games.
		3. *Downward Sloping*. Since more is better, to ensure indifference more of one good must result in less of the other. If I get 100 units of utility from four movies and three games, and then I get another box of movie, I’ll have to give up some games to maintain the 100 units of utility.
		4. *Convexity*. Because of diminishing marginal utility, indifference curves are convex—they bulged towards the origin. If each new movie is worth less and less to me then it will take fewer and fewer games to maintain indifference.
	2. We can think of indifference curves as a series of swaps. More movies and fewer games. Or more games and fewer movies. But indifference on a curve must always be maintained (by definition).
	3. Marginal rate of substitution (MRS)
		1. MRS is the mathematical interpretation of those swaps. If the goods are Y (on the y-axis) and X (on the x-axis), then

$$MRS=-\frac{∆Q\_{Y}}{∆Q\_{X}}$$

* + 1. This is the quotient describing the ratio of swaps needed to maintain indifference. The minus sign is added so MRS is a positive number.
		2. Because of diminishing marginal returns, MRS changes as it follows the convexity of the indifference curve.
1. Special Indifference Curves
	1. Perfect substitutes
		1. Indifference curves of perfect substitutes are straight lines. MRS is constant throughout.
	2. Perfect complements
		1. Indifference curves of perfect complements are lines at right angles. MRS is either zero or infinite.
	3. Bads, or the opposite of goods, are things people want less rather than more of. Trash is an example. If one good is actually a bad, the indifference curve slopes up. If both are bad, it slopes down but becomes concave. (Thus MRS will be made negative by the minus sign.)
		1. If we relax non-satiation and allow goods to *become* bads after a certain point, indifference curves become circles.