

Chapter Three

Preferences

Rationality in Economics

- Behavioral Postulate:
A decisionmaker always chooses its most preferred alternative from its set of available alternatives.
- So to model choice we must model decisionmakers' preferences.

Preference Relations

- Comparing two different consumption bundles, x and y :
 - strict preference: x is more preferred than is y .
 - weak preference: x is as at least as preferred as is y .
 - indifference: x is exactly as preferred as is y .

Preference Relations

- Strict preference, weak preference and indifference are all preference relations.
- Particularly, they are ordinal relations; *i.e.* they state only the order in which bundles are preferred.

Preference Relations

- \succ denotes strict preference;
 $x \succ y$ means that bundle x is preferred strictly to bundle y .

Preference Relations

- \succ denotes strict preference so
 $x \succ y$ means that bundle x is preferred strictly to bundle y .
 \sim denotes indifference; $x \sim y$ means x and y are equally preferred.
- \succeq denotes weak preference;
 $x \succeq y$ means x is preferred at least as much as is y .

Preference Relations

- $x \succeq y$ and $y \succeq x$ imply $x \sim y$.
- $x \succeq y$ and $(\text{not } y \succeq x)$ imply $x \succ y$.

Assumptions about Preference Relations

- Completeness: For any two bundles x and y it is always possible to make the statement that either
 $x \succeq y$
or
 $y \succeq x$.
- i.e. any two bundles can be compared.

Assumptions about Preference Relations

- Reflexivity: Any bundle x is always at least as preferred as itself; *i.e.*

$$x \succeq x.$$

- 此假設是爲了 \succeq 此符號的完備性，如果本身無法比較，無異曲線上此點爲空心點

Assumptions about Preference Relations

- Transitivity: If x is at least as preferred as y , and y is at least as preferred as z , then x is at least as preferred as z ; *i.e.*

$$x \succeq y \text{ and } y \succeq z \Rightarrow x \succeq z.$$

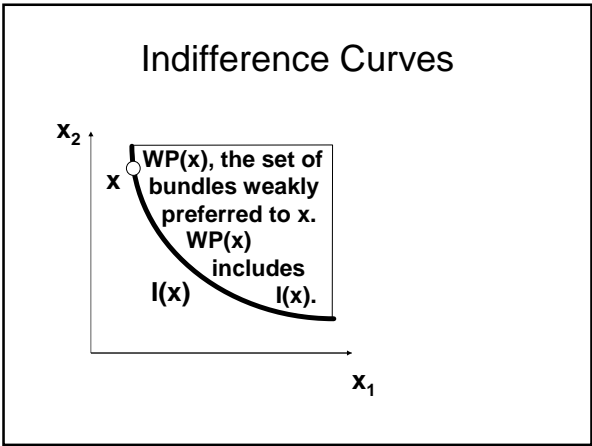
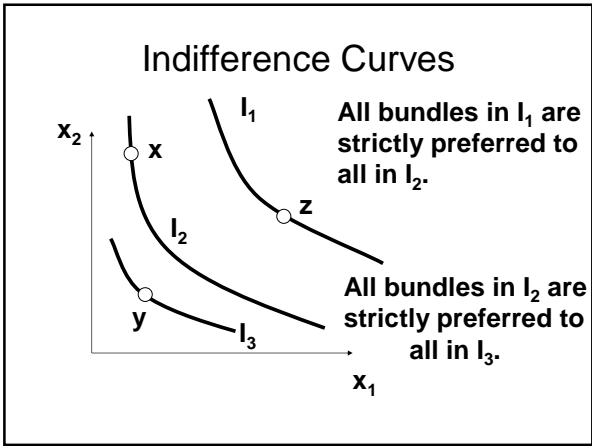
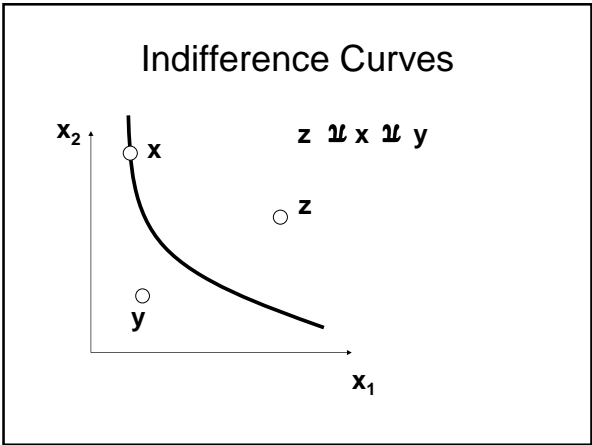
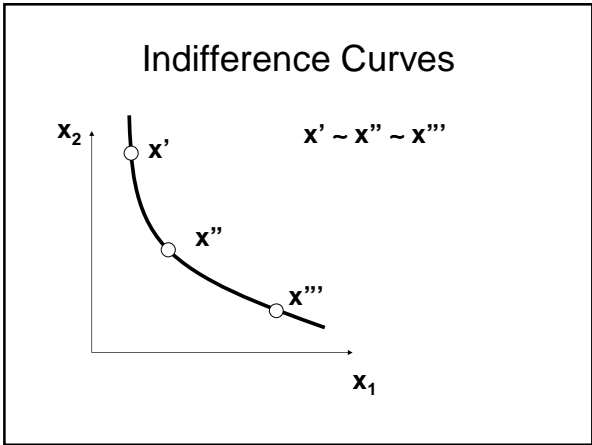
- No transitivity, no best choice.

Example for no transitivity

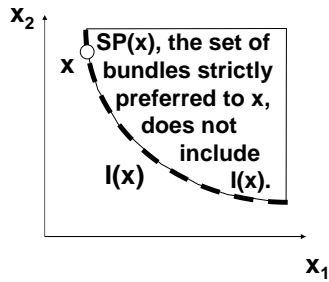
- If $x \succeq y$, $y \succeq z$ and $z \not\succeq x$, how would this agent behave in face of these three bundles x , y and z ?
- This choice has some problem.

Indifference Curves

- Take a reference bundle x' . The set of all bundles equally preferred to x' is the indifference curve containing x' ; the set of all bundles $y \sim x'$.
- Since an indifference "curve" is not always a curve a better name might be an indifference "set".



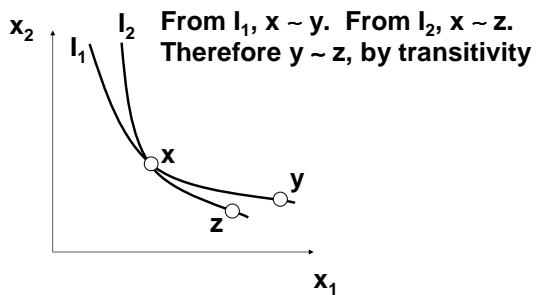
Indifference Curves



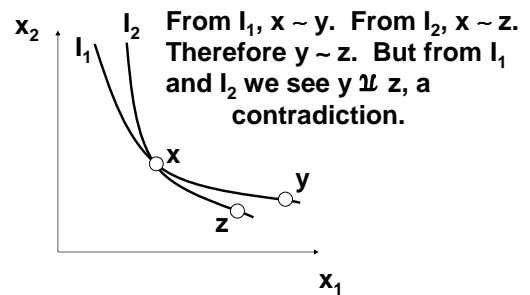
Indifference Curves

- So, Indifference curve is the boundary of the weakly preferred set.

Indifference Curves Cannot Intersect



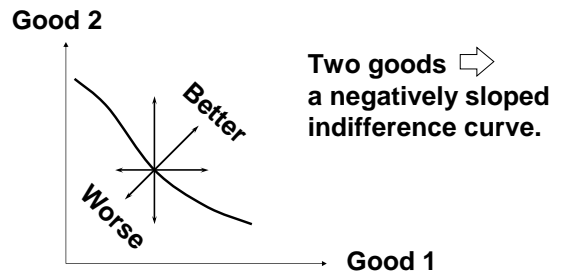
Indifference Curves Cannot Intersect



Slopes of Indifference Curves

- When more of a commodity is always preferred, the commodity is a good.
- If every commodity is a good then indifference curves are negatively sloped.

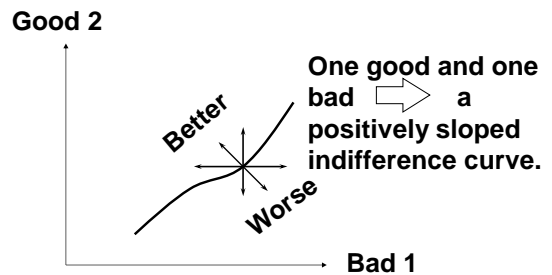
Slopes of Indifference Curves



Slopes of Indifference Curves

- If less of a commodity is always preferred then the commodity is a bad.

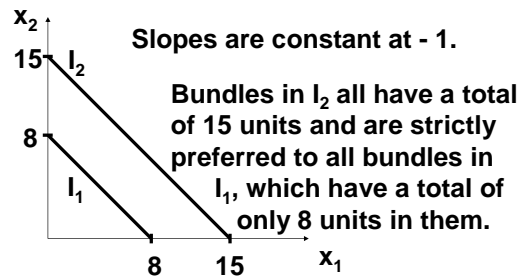
Slopes of Indifference Curves



Extreme Cases of Indifference Curves; Perfect Substitutes

- If a consumer always regards units of commodities 1 and 2 as equivalent, then the commodities are perfect substitutes and only the total amount of the two commodities in bundles determines their preference rank-order.

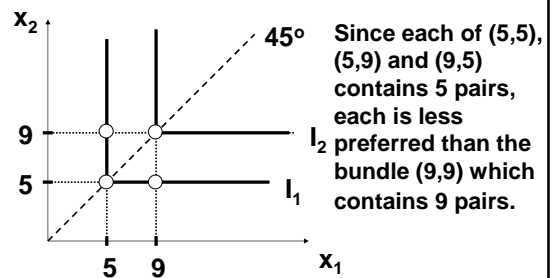
Extreme Cases of Indifference Curves; Perfect Substitutes



Extreme Cases of Indifference Curves; Perfect Complements

- If a consumer always consumes commodities 1 and 2 in fixed proportion (e.g. one-to-one), then the commodities are perfect complements and only the number of pairs of units of the two commodities determines the preference rank-order of bundles.

Extreme Cases of Indifference Curves; Perfect Complements



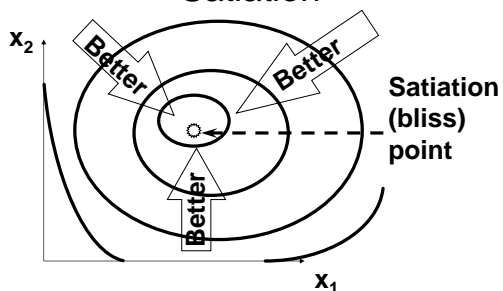
Neutral Good

- A good is a neutral good if the consumer doesn't care about it one way or the other.
- e.g. vegetarian, Buddha (萬物皆同)

Preferences Exhibiting Satiation

- A bundle strictly preferred to any other is a satiation point or a bliss point.
- What do indifference curves look like for preferences exhibiting satiation?

Indifference Curves Exhibiting Satiation



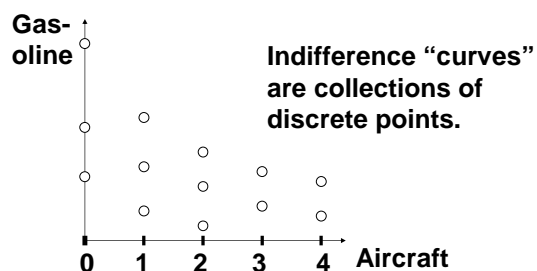
Indifference Curves for Discrete Commodities

- A commodity is infinitely divisible if it can be acquired in any quantity; e.g. water or cheese.
- A commodity is discrete if it comes in unit lumps of 1, 2, 3, ... and so on; e.g. aircraft, ships and refrigerators.

Indifference Curves for Discrete Commodities

- Suppose commodity 2 is an infinitely divisible good (gasoline) while commodity 1 is a discrete good (aircraft). What do indifference “curves” look like?

Indifference Curves With a Discrete Good



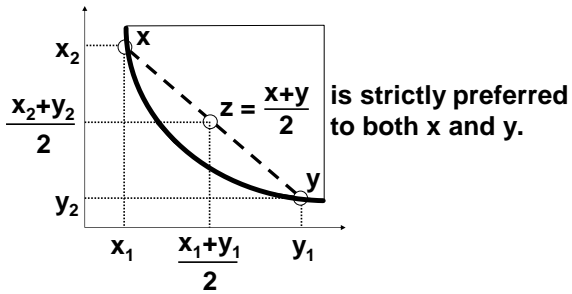
Well-Behaved Preferences

- A preference relation is “well-behaved” if it is
 - monotonic and convex.
- Monotonicity: More of any commodity is always preferred (*i.e.* no satiation and every commodity is a good). Thus, negative slop.

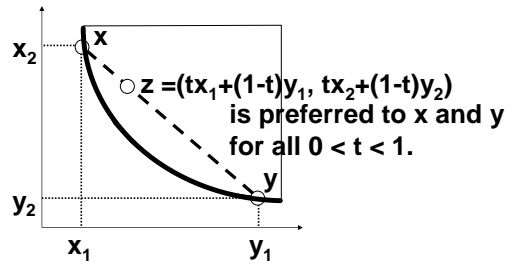
Well-Behaved Preferences

- Convexity: Mixtures of bundles are (at least weakly) preferred to the bundles themselves. E.g., the 50-50 mixture of the bundles x and y is
$$z = (0.5)x + (0.5)y.$$
 z is at least as preferred as x or y .
- Averages are preferred to extremes.

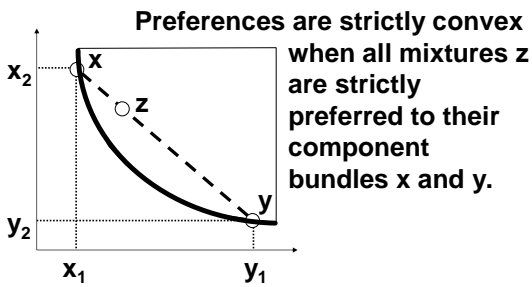
Well-Behaved Preferences -- Convexity.



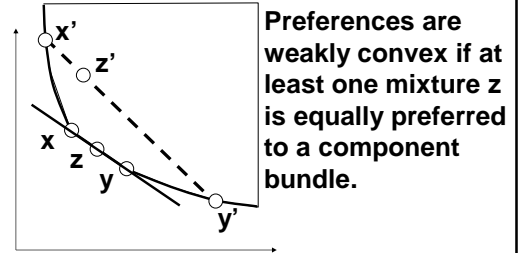
Well-Behaved Preferences -- Convexity.



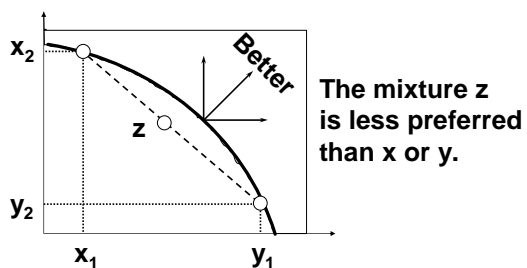
Well-Behaved Preferences -- Convexity.



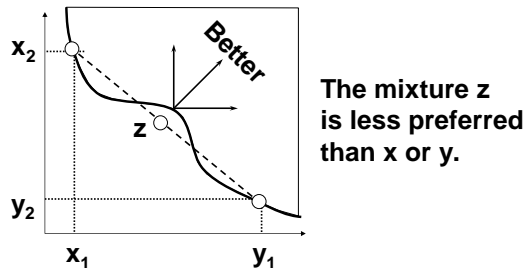
Well-Behaved Preferences -- Weak Convexity.



Non-Convex Preferences



More Non-Convex Preferences



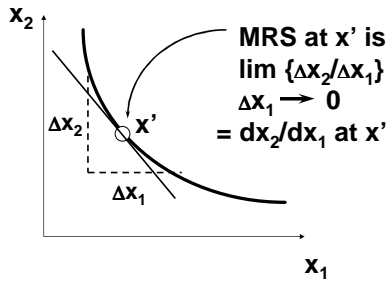
Why Convex?

- Goods are consumed together.
- Non-convex means the consumer prefer to specialize.
- In fact, in the long run, no one prefers only one of the goods.
- And a non-convex preference makes corner solution and then a great change for price.

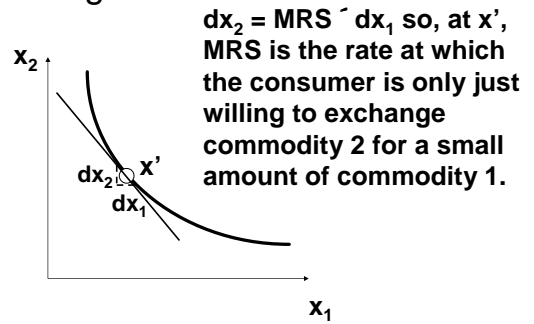
Slopes of Indifference Curves

- The slope of an indifference curve is its marginal rate-of-substitution (MRS).
- How can a MRS be calculated?

Marginal Rate of Substitution



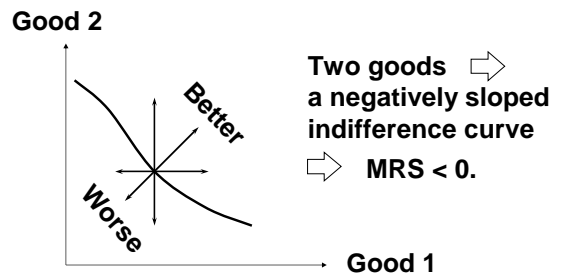
Marginal Rate of Substitution

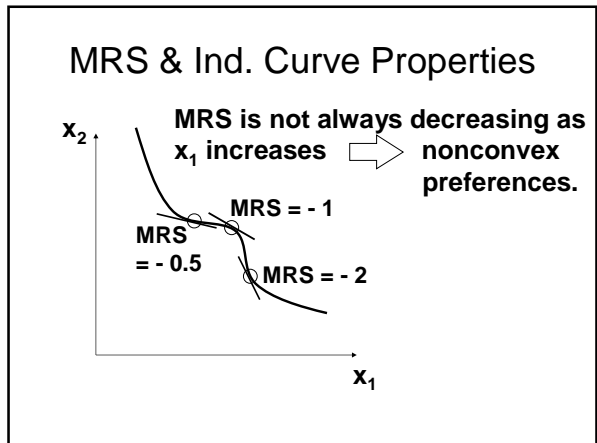
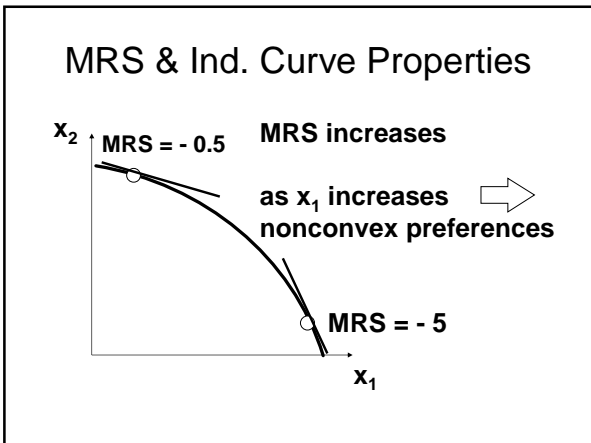
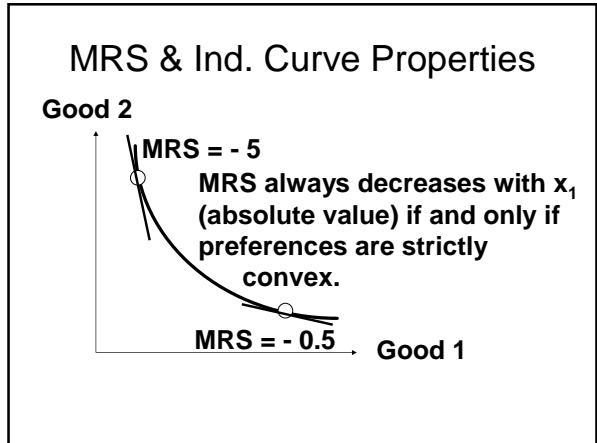
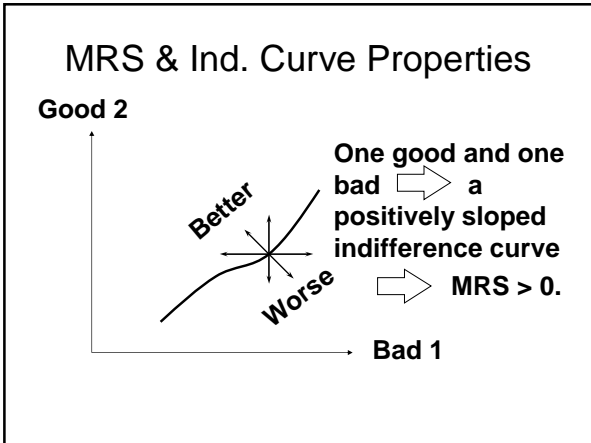


Marginal Rate of Substitution

- MRS measures the “marginal willingness to pay”
- How much you have to pay will depend on the price of the good
- How much you are willing to pay doesn't depend on the price.

MRS & Ind. Curve Properties





Marginal Rate of Substitution

- MRS is the main representative feature of indifference curve
- Perfect substitutes, then MRS is constant;
- Neutrals, then MRS is infinity;
- Perfect complements, then MRS is either zero or infinity.