Theory of Consumer Behaviour

Reference

Intermediate

Microeconomics

by

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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.

PREFERENCES

- How consumers choose the "best" bundle or the "most preferred bundle"(MPB)?

- Suppose that given any two consumption bundles $X=\{x_1,……….,\ x_n\}$ and $X'=\{x_1',……….,\ x_n'\}$ the consumer can rank them according to their desirability.

- The idea of preferences is based on consumer's behaviour…how a consumer behaves in choice situations involving 2 bundles?

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 bundle x is preferred strictly to bundle y.
- $\sim$ denotes indifference; $x \sim y$ means x and y are equally preferred.

Fundamental Axioms of Consumer Theory

1.Completeness

2. Reflexivity

3. Transitivity

Known as the Three Fundamental Axioms of consumer theory.

These allow consumers to arrange bundles in order of preference.

Assumptions about Preferences

1. **Completeness** - any two bundles can be compared.

either XIX'

or XPX'

or $X'PX$

2. **Reflexivity** - A bundle is at least as good as itself.

XIX

Implies that the indifference set is non empty.

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.*

  $x \succsim y$ and $y \succsim z \Rightarrow x \succsim z$.

$XRX', X'RX'' \longrightarrow XRX''$

PP ➡ P, PI ➡ P, IP ➡ P, II ➡ I

This axiom helps to put any bundle in any one of the 3 sets:

(i)A better set B(X)is $\ni \forall$ elements $Y \in B(X)$ we have YPX.
(ii)A worse set W(X)is $\ni \forall$ elements $Z \in W(X)$ we have XPZ.

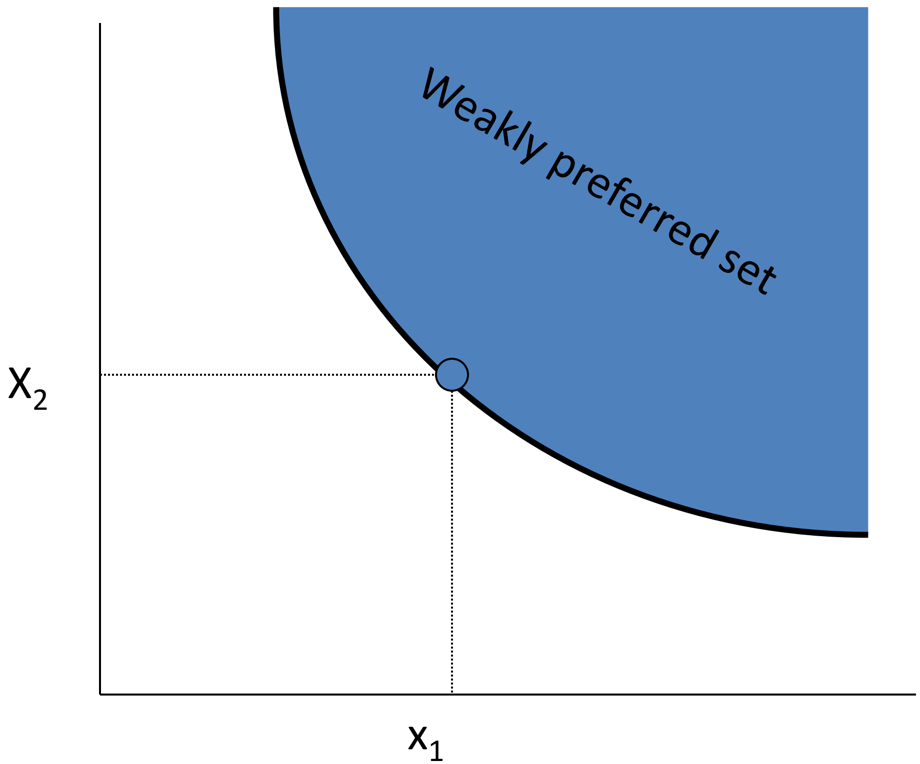
Implication: Indifference sets are disjoint.

Indifference curves (Ics) cannot intersect each other in two good world.

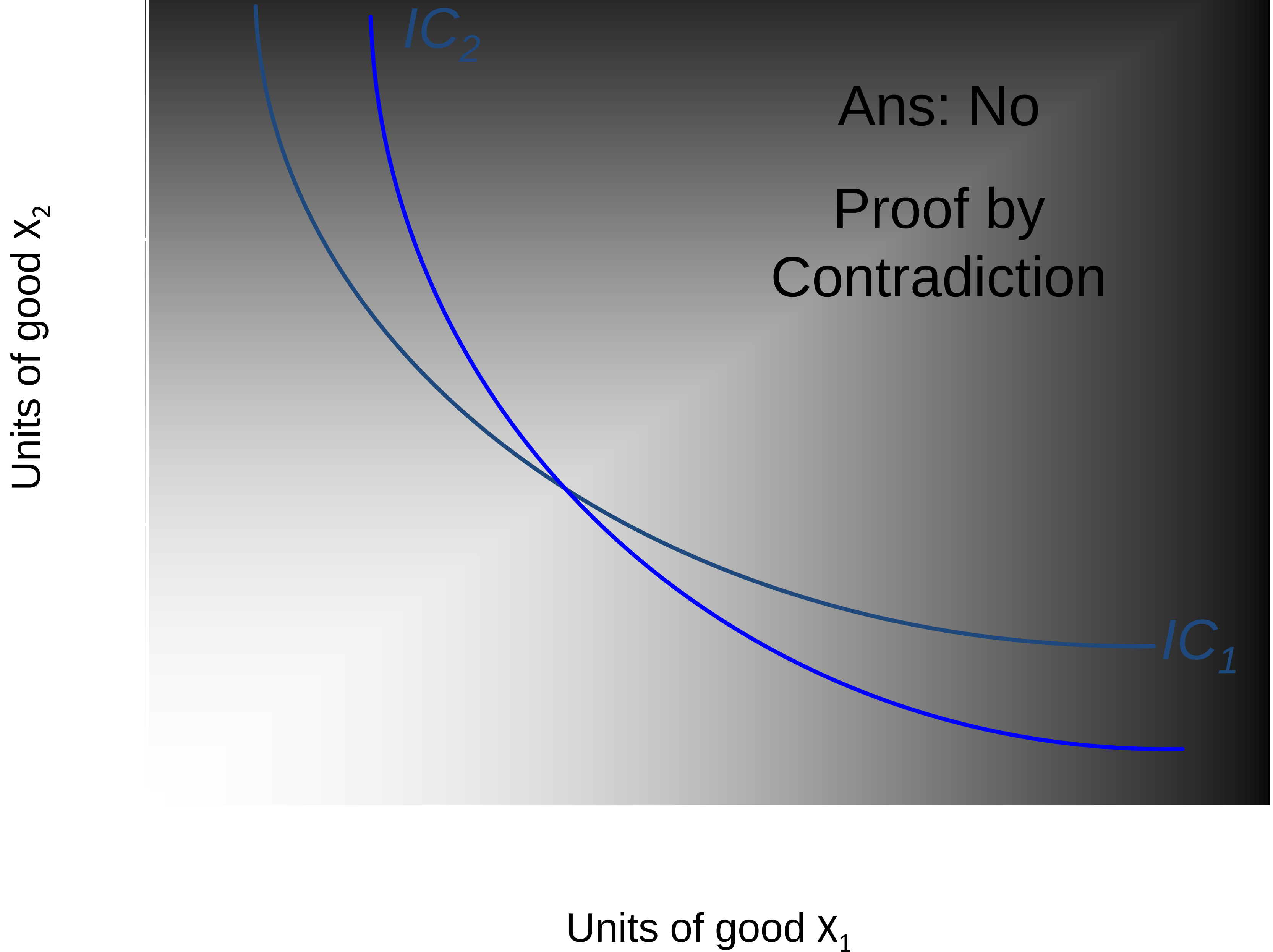
An IC is the locus of all bundles among which the consumer is indifferent to.

All the consumption bundles that are weakly preferred to (x_1, x_2) is called the weakly preferred set.

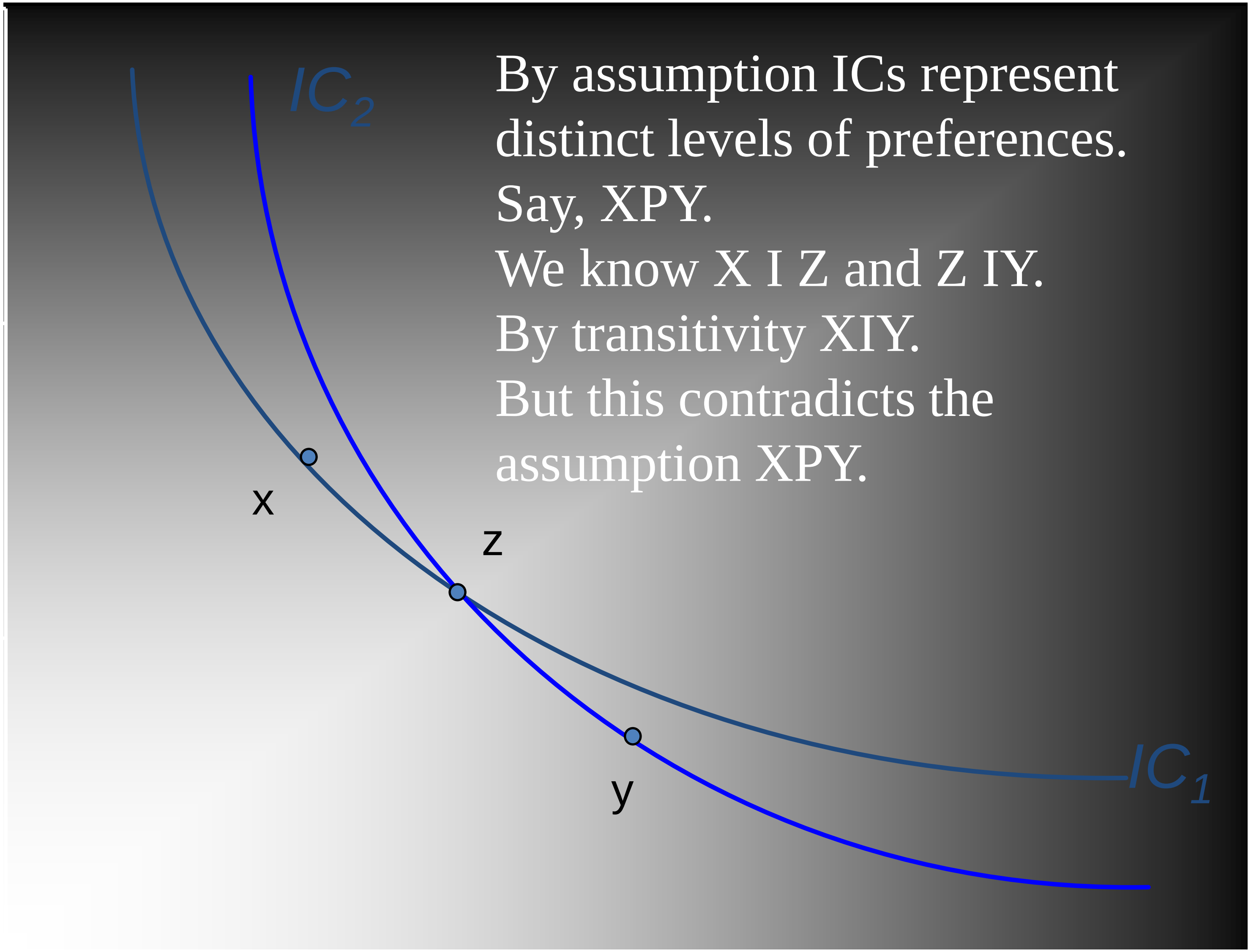
The bundles on the boundary of this set for which the consumer is indifferent to (x_1, x_2) is called the IC.



Can indifference curves ever cross?



By assumption ICs represent distinct levels of preferences.
Say, XPY.
We know X I Z and Z IY.
By transitivity XIY.
But this contradicts the assumption XPY.



Well-Behaved Preferences

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

4. Assumptions of well-behaved preference

- Monotonicity/Non-satiation/Dominance.

  “More is preferred to less”.

Implication of Monotonic Preference

i. Indifference curves are negatively sloped.

But monotonicity may not always hold.

Consider 2 commodity bundles: $X' = \{x_1^{'}, x_2^{'}\}$ and $X'' = \{x_1^{''}, x_2^{''}\}$

Let $x_1^{'} = x_1^{''}$

Then by monotonic preference

X”PX if $x_2^{''} > x_2^{'}$

X’PX” if $x_2^{''} < x_2^{'}$

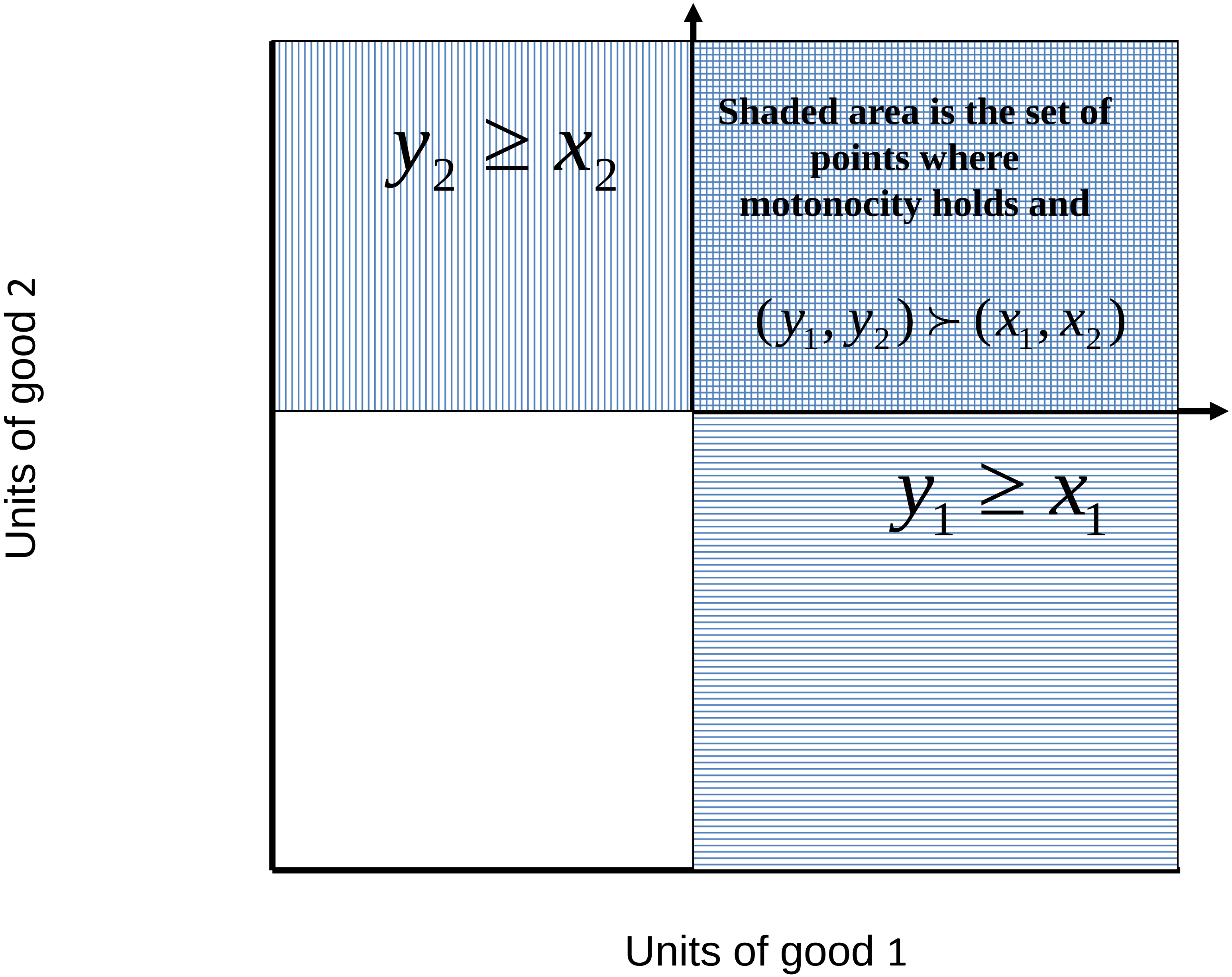
X’IX” if $x_2^{''} = x_2^{'}$

By the same logic $X^h P X' \forall x_j^h > x_j^{'}, x_j^h \in X^h$ and $X^{'} P X^h \forall x_j^h < x_j^{'}, x_j^h \in X^h$

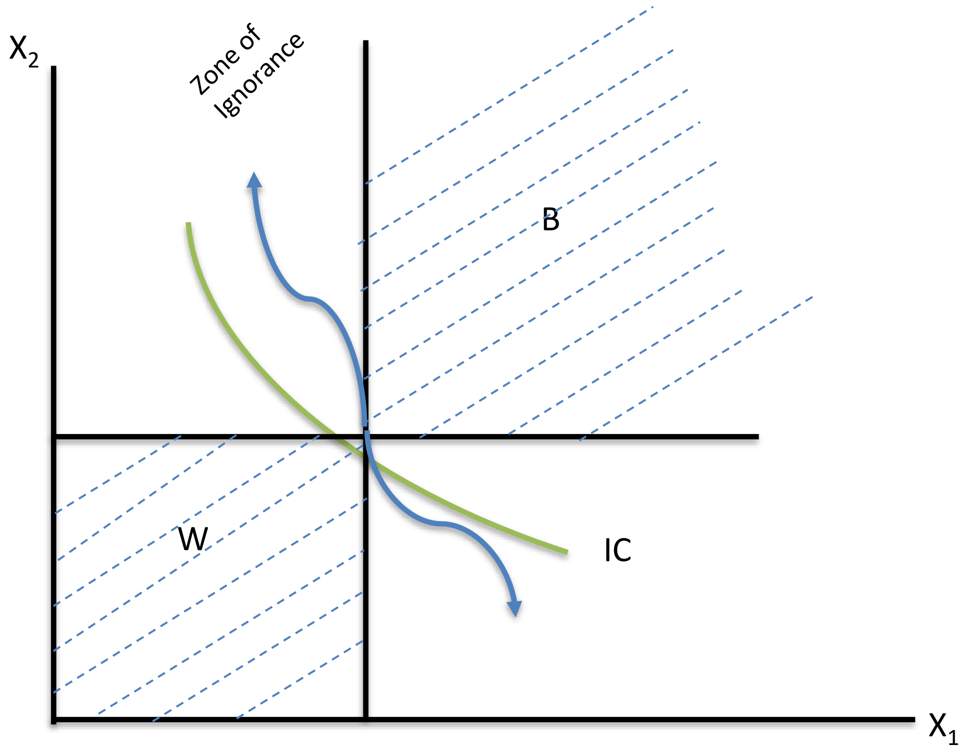
Therefore, pair of bundles X’ and Y’ can belong to the same indifference set I(X’) if the following conditions hold:

$$i) x_1^{'} > y_1^{'} \,\&\, x_2^{'} < y_2^{'}$$

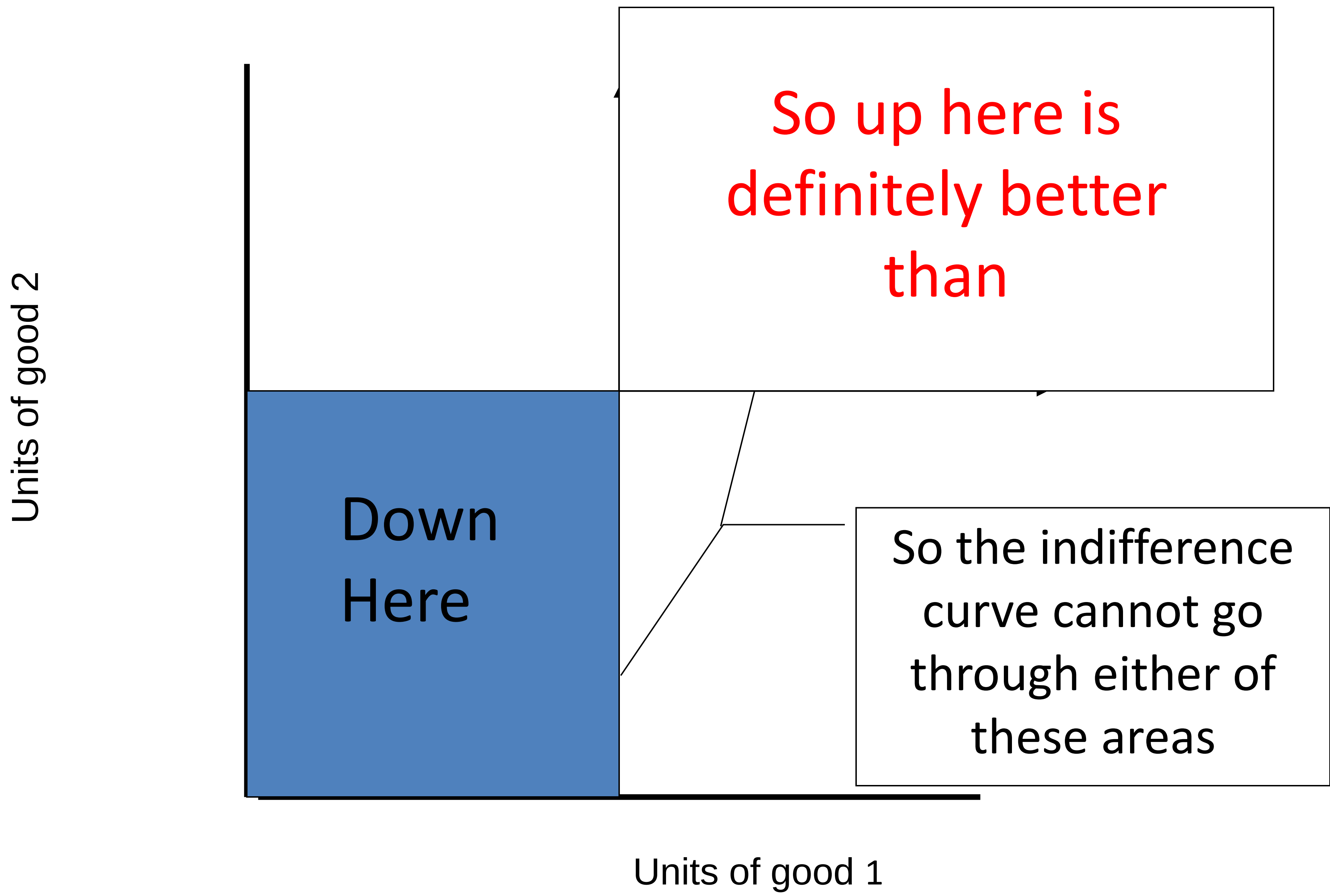
$$ii) x_1^{'} < y_1^{'} \,\&\, x_2^{'} > y_2^{'}$$

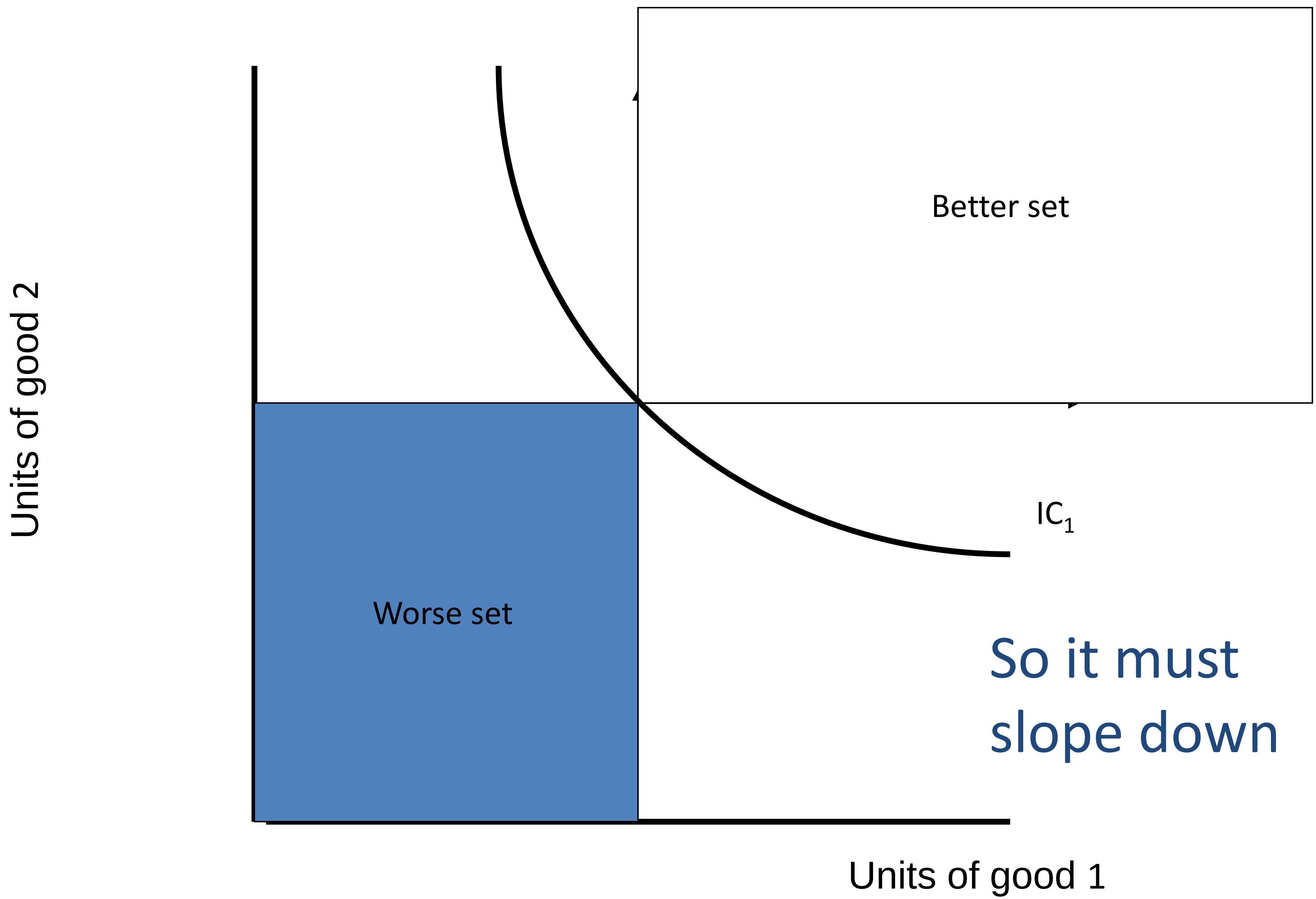


$y_2 \geq x_2$
Shaded area is the set of points where motonocity holds and
$(y_1, y_2) \succ (x_1, x_2)$
$y_1 \geq x_1$
Units of good 2
Units of good 1



X_2
Zone of Ignorance
B
W
IC
X_1


So up here is definitely better than
Down Here
So the indifference curve cannot go through either of these areas
Units of good 2
Units of good 1



So it must slope down

Implication of Monotonic Preference

ii. All bundles on a higher IC are preferred over all bundles on a lower IC .

Consider two indifference sets I_1 and I_2.

Let $X \in I_1$ And $Y \in I_2$

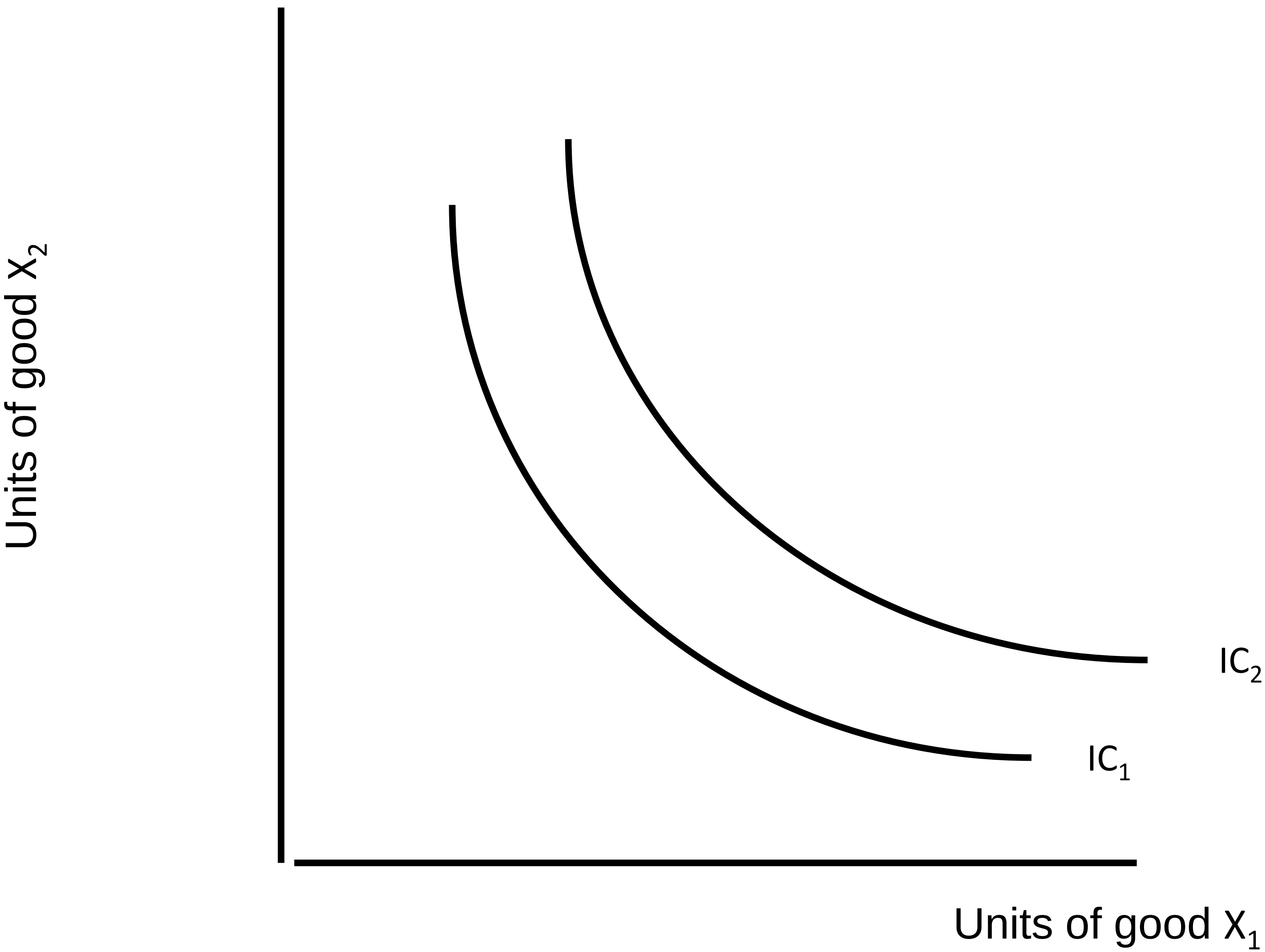
Since by transitivity I_1 and I_2 are non overlapping sets, so either XPY or YPX.

But XPY iff $x_j \geq y_j \forall j = 1,2,\ldots$

and strict inequality for at least one element.

Hence IC I_1 lies above I_2.

Hence better set to a bundle will be the upper set.

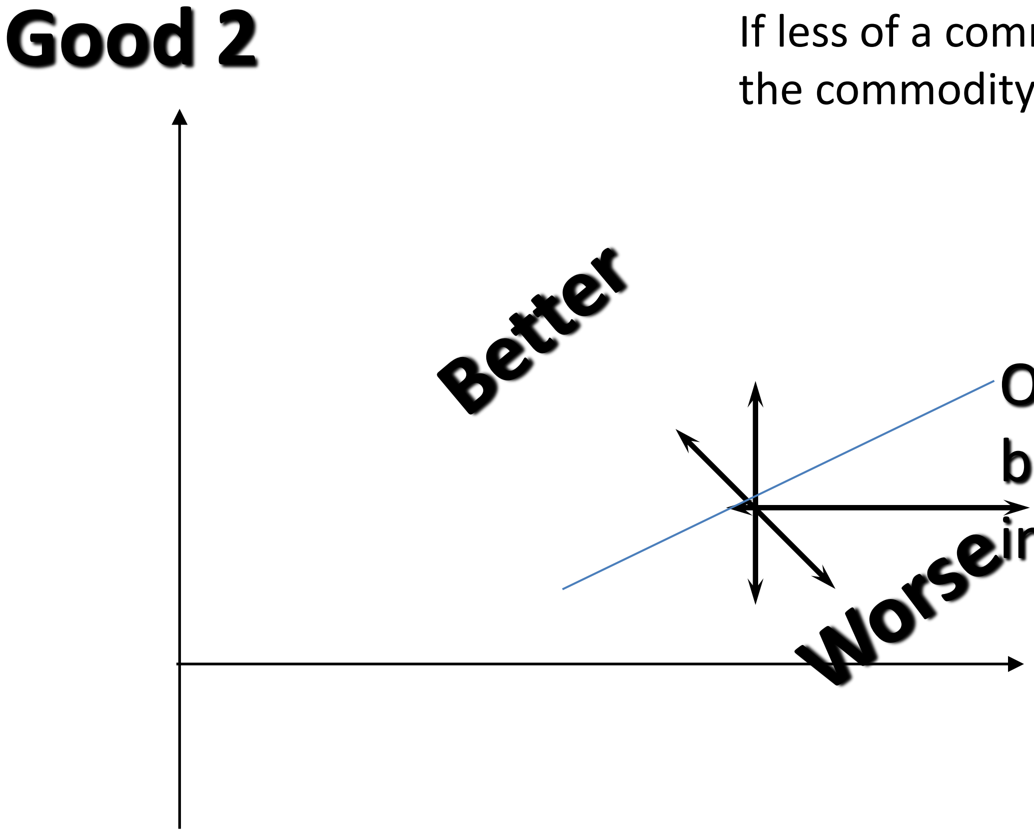


Units of good X2
IC2
IC1
Units of good X1

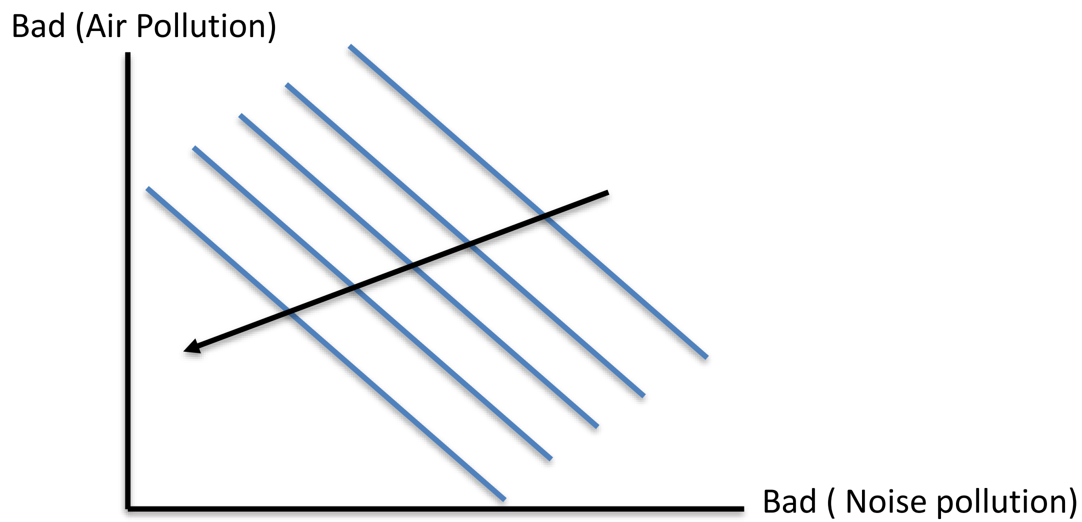
Does monotonicity always hold?

Indifference Curves of "Bad"

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



One good and one bad ➡ a positively sloped indifference curve.

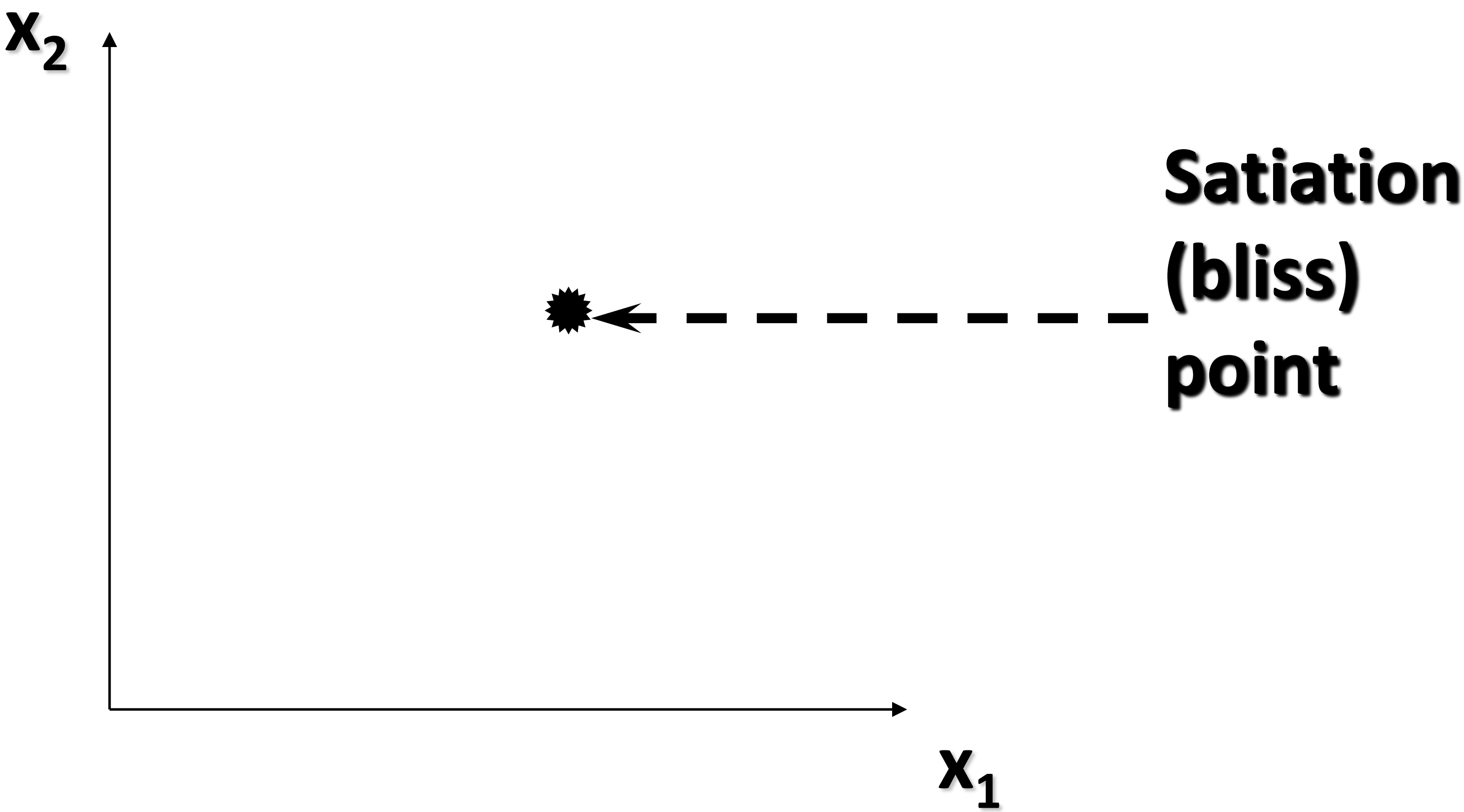


Bad (Air Pollution)
Bad (Noise pollution)

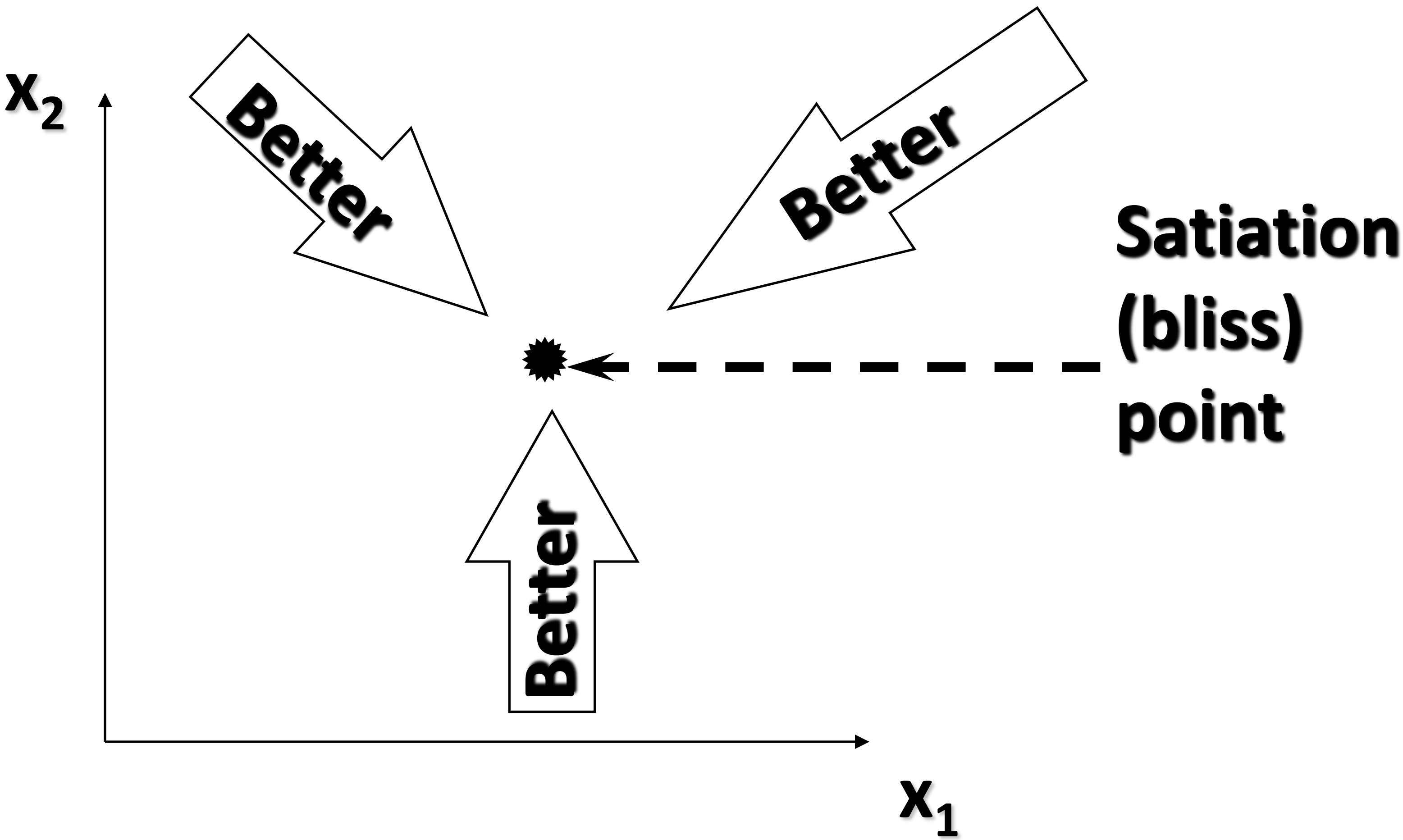
Preferences Exhibiting Satiation

- 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?

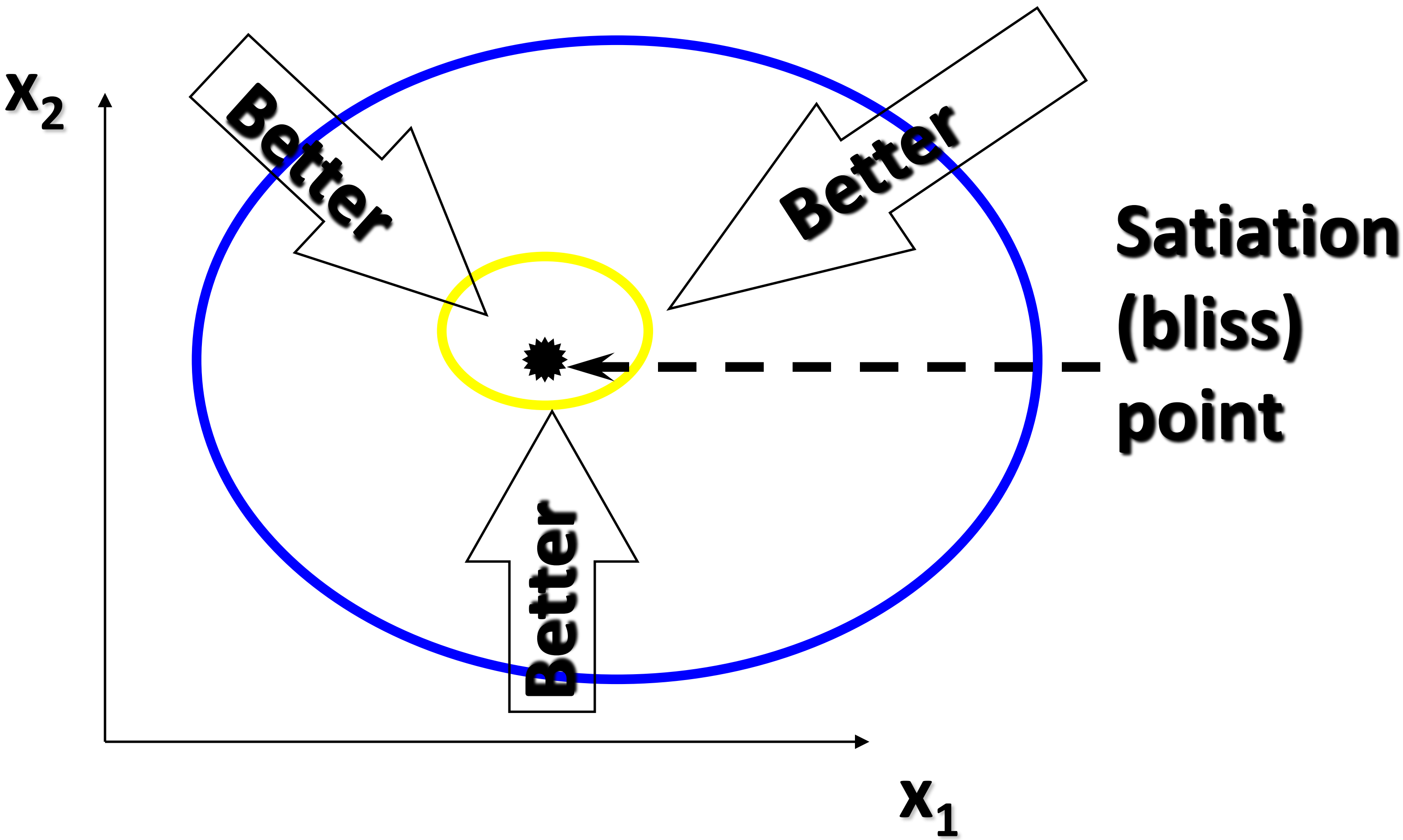
Indifference Curves Exhibiting Satiation



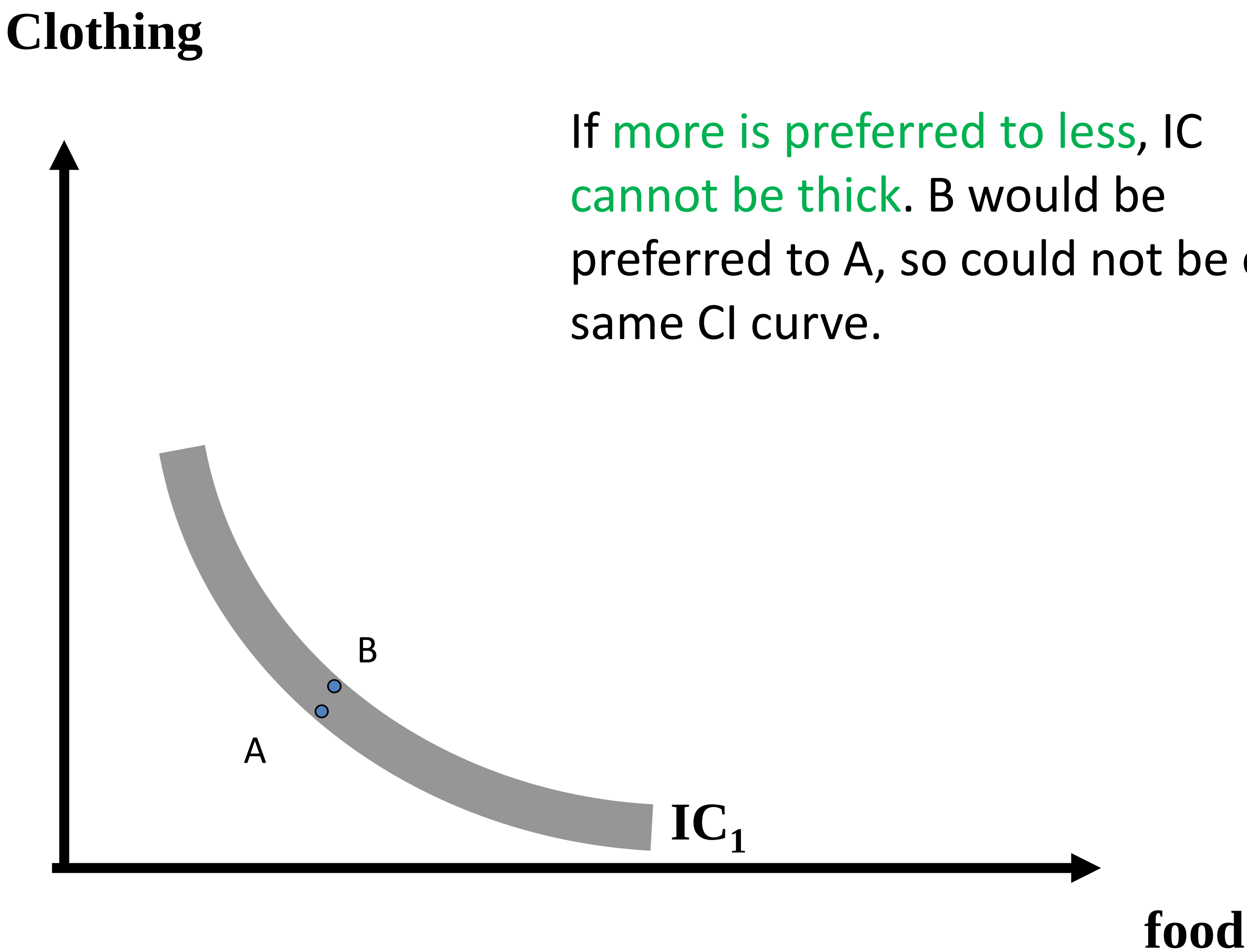
Indifference Curves Exhibiting Satiation



Indifference Curves Exhibiting Satiation



If more is preferred to less, IC cannot be thick. B would be preferred to A, so could not be on same CI curve.



5. Assumptions of well-behaved preference: Convexity

Consider any two commodity bundles

X and $X^{'} \ni XIX^{'}$

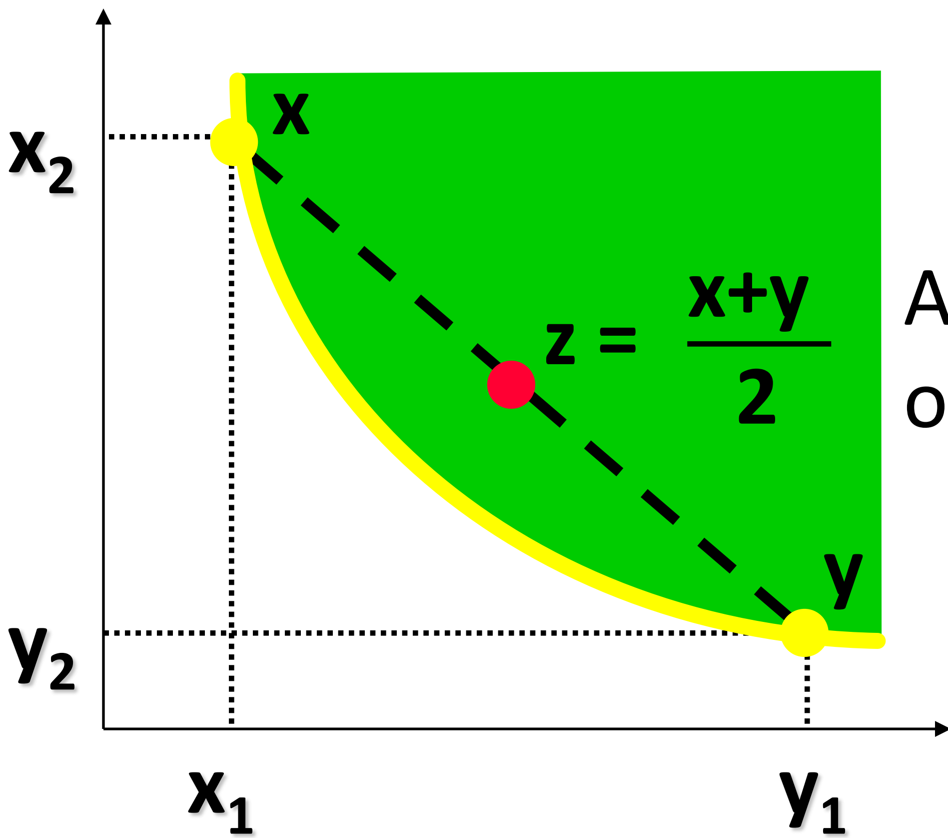
Let X” be another bundle such that

$$X^{"} = \lambda X + (1-\lambda)X^{'} \forall 0 \leq \lambda \leq 1$$

Then preference is said to be convex if

$$X^{"} PX \forall 0 < \lambda < 1$$

Well-Behaved Preferences -- Convexity.



Average is preferred over extreme.

However, we need strict convexity of better sets.

Examples of non-convex preference:

1. Perfect substitutes

2. Perfect complements

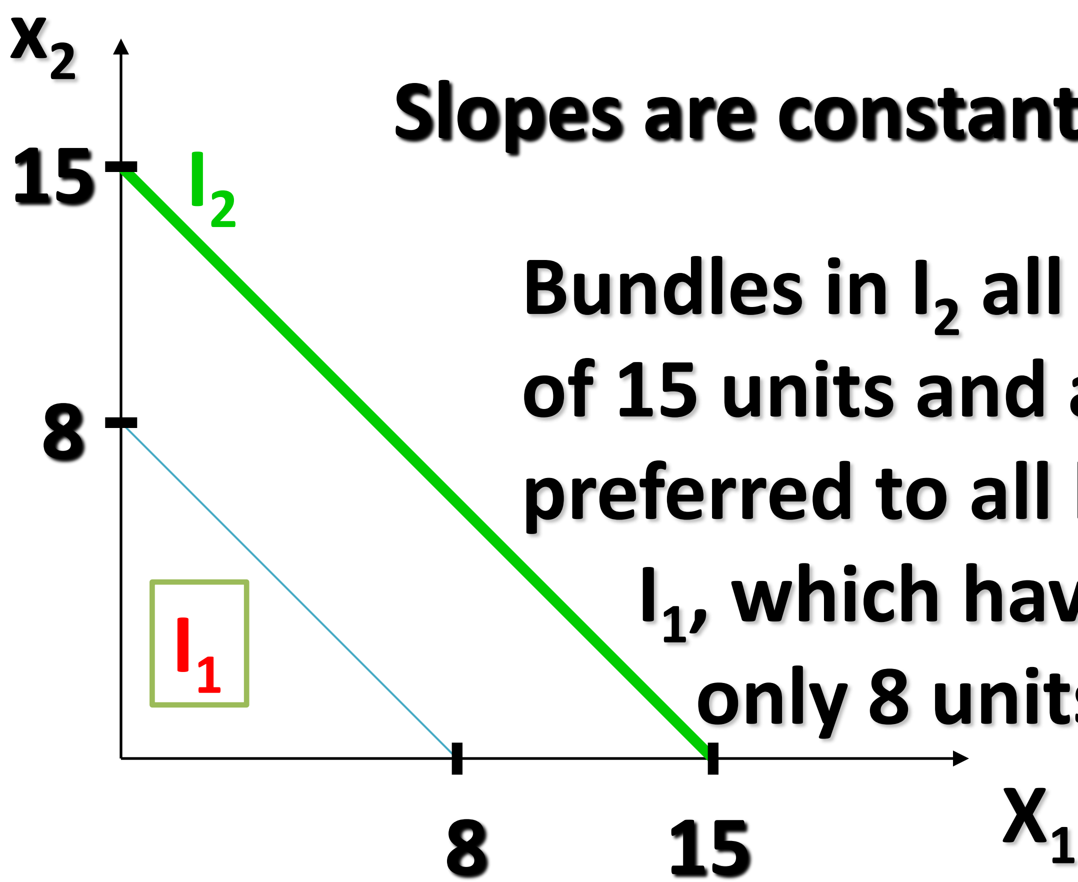
3. Bads

4. Neutrals

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



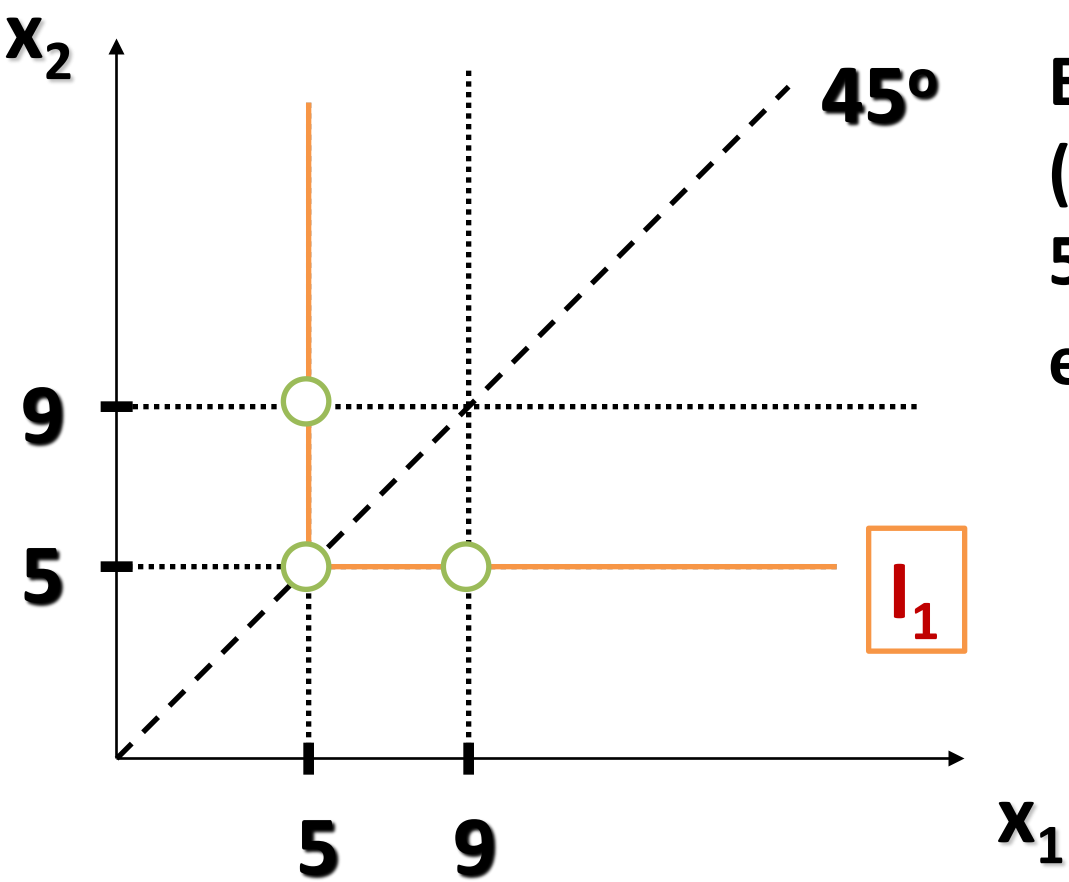
Slopes are constant at - 1.

Bundles in I_2 all have a total of 15 units and are strictly preferred to all bundles in I_1, which have a total of only 8 units in them.

Extreme Cases of Indifference Curves; Perfect Complements

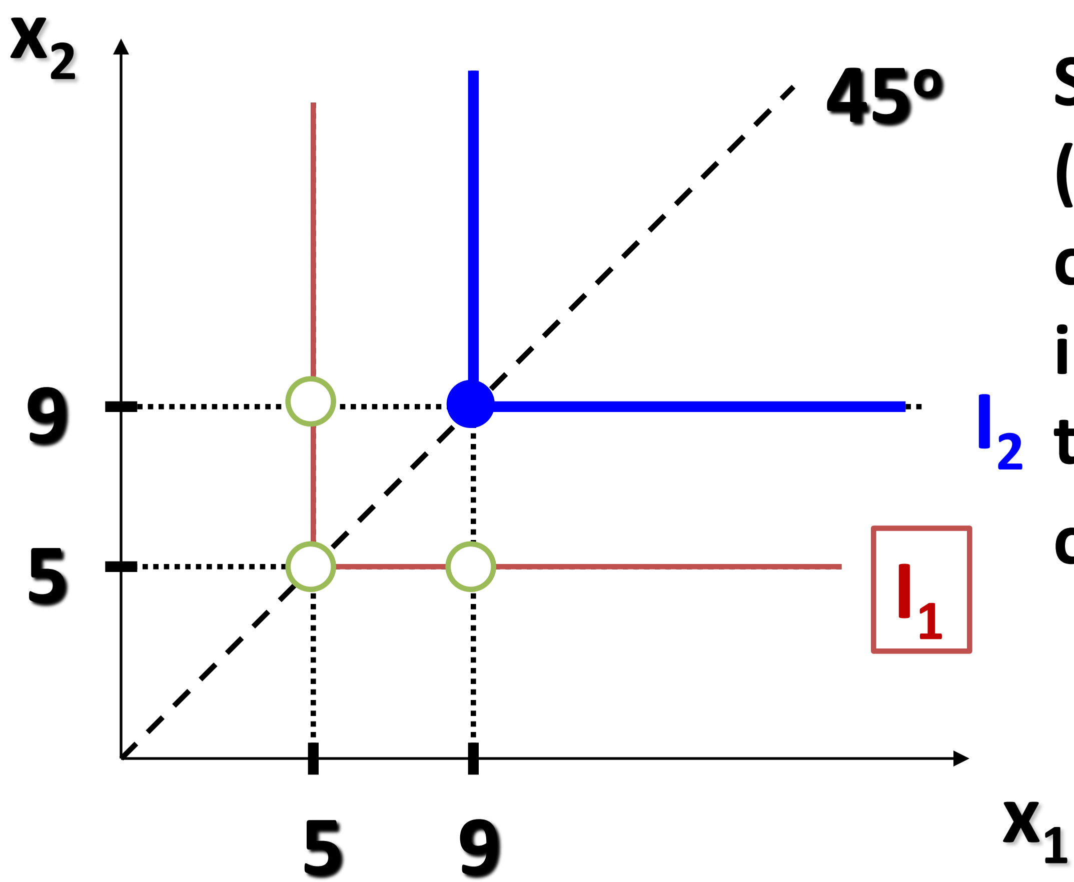
- If a consumer always consumes commodities 1 and 2 in fixed proportion (e.g. one-to-one), then the commodities are perfect complements and only the number of pairs of units of the two commodities determines the preference rank-order of bundles.

Extreme Cases of Indifference Curves; Perfect Complements



Each of (5,5), (5,9) and (9,5) contains 5 pairs so each is equally preferred.

Extreme Cases of Indifference Curves; Perfect Complements



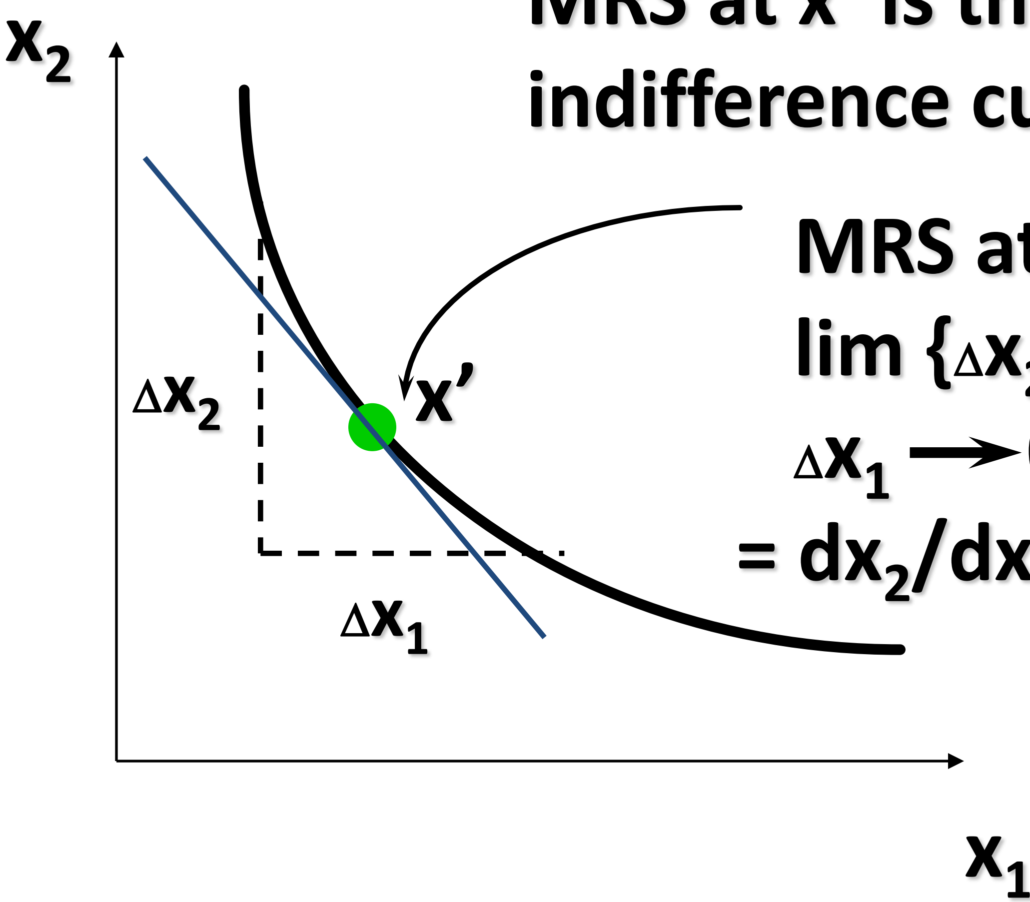
Since each of (5,5), (5,9) and (9,5) contains 5 pairs, each is less preferred than the bundle (9,9) which contains 9 pairs.

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

MRS at x’ is the slope of the indifference curve at x’

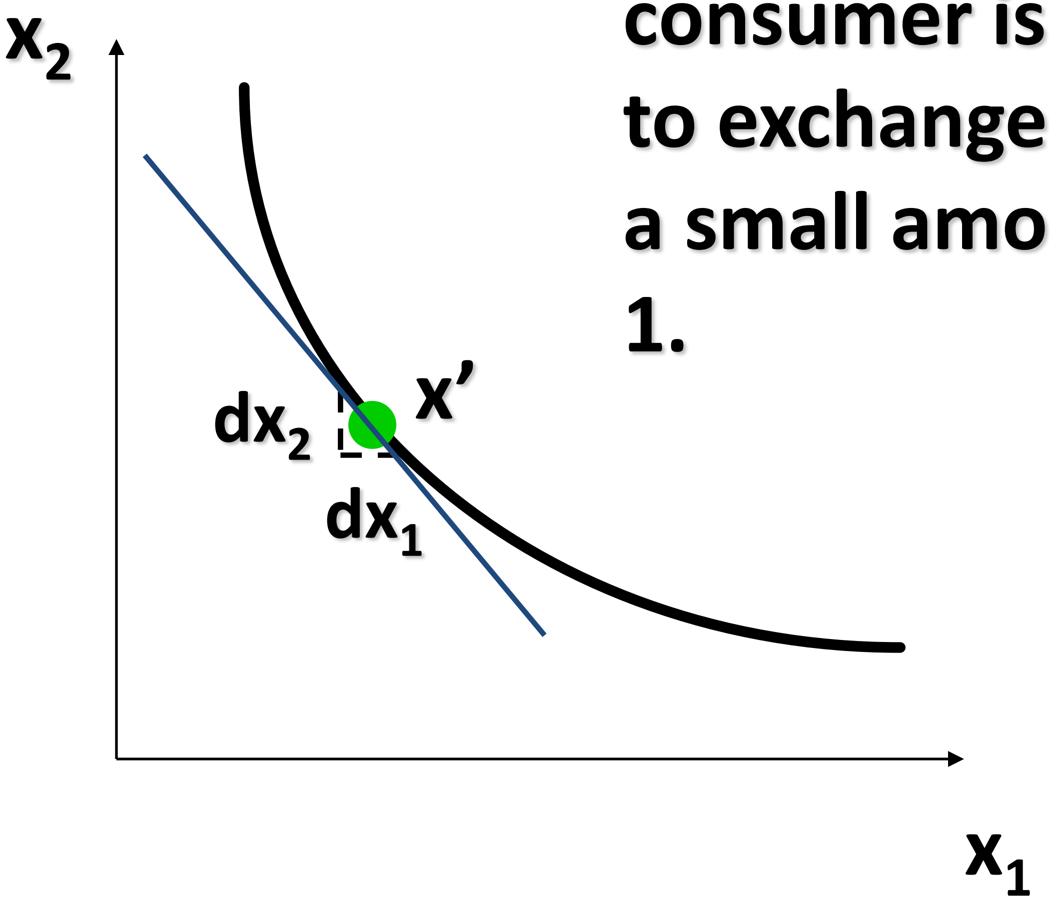


MRS at x’ is

$$\lim_{\Delta x_1 \to 0} \{\Delta x_2 / \Delta x_1\}$$

$$= dx_2/dx_1 \text{ at } x'$$

Marginal Rate of Substitution



MRS is the rate at which the consumer is only just willing to exchange commodity 2 for a small amount of commodity 1.

When monotonicity holds,
MRS involves reducing consumption of one good to get more of another. Hence MRS is negative number.

With strict convexity,
MRS is diminishing as good 1 consumption increases, i.e., the rate at which we want to substitute good 1 for good 2 falls as good 1 consumption increases.

Perfect substitutes: MRS = -1

Perfect complements: MRS = zero or infinity

Neutral = infinity