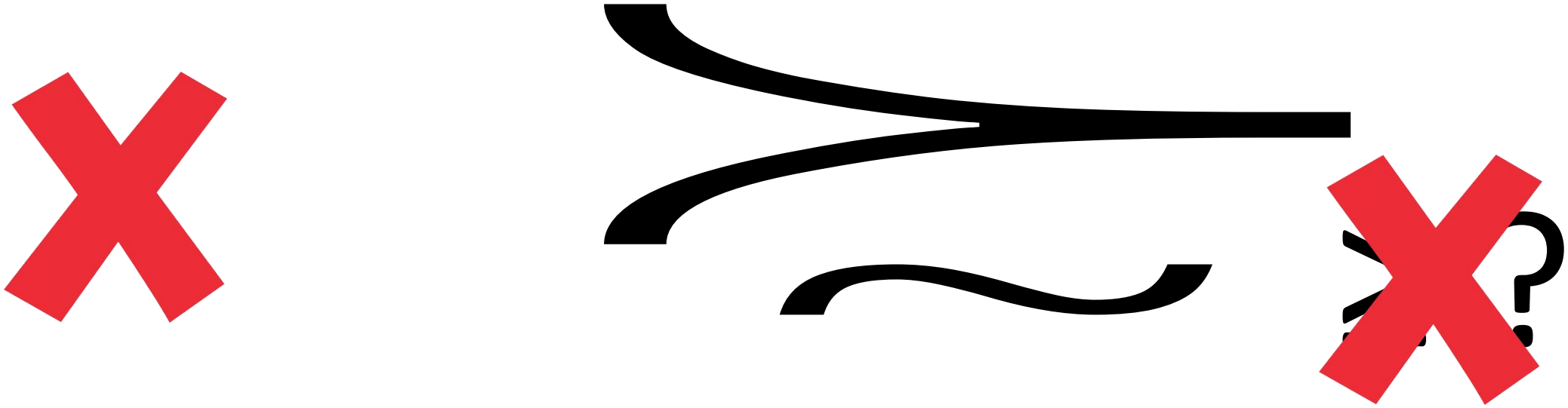
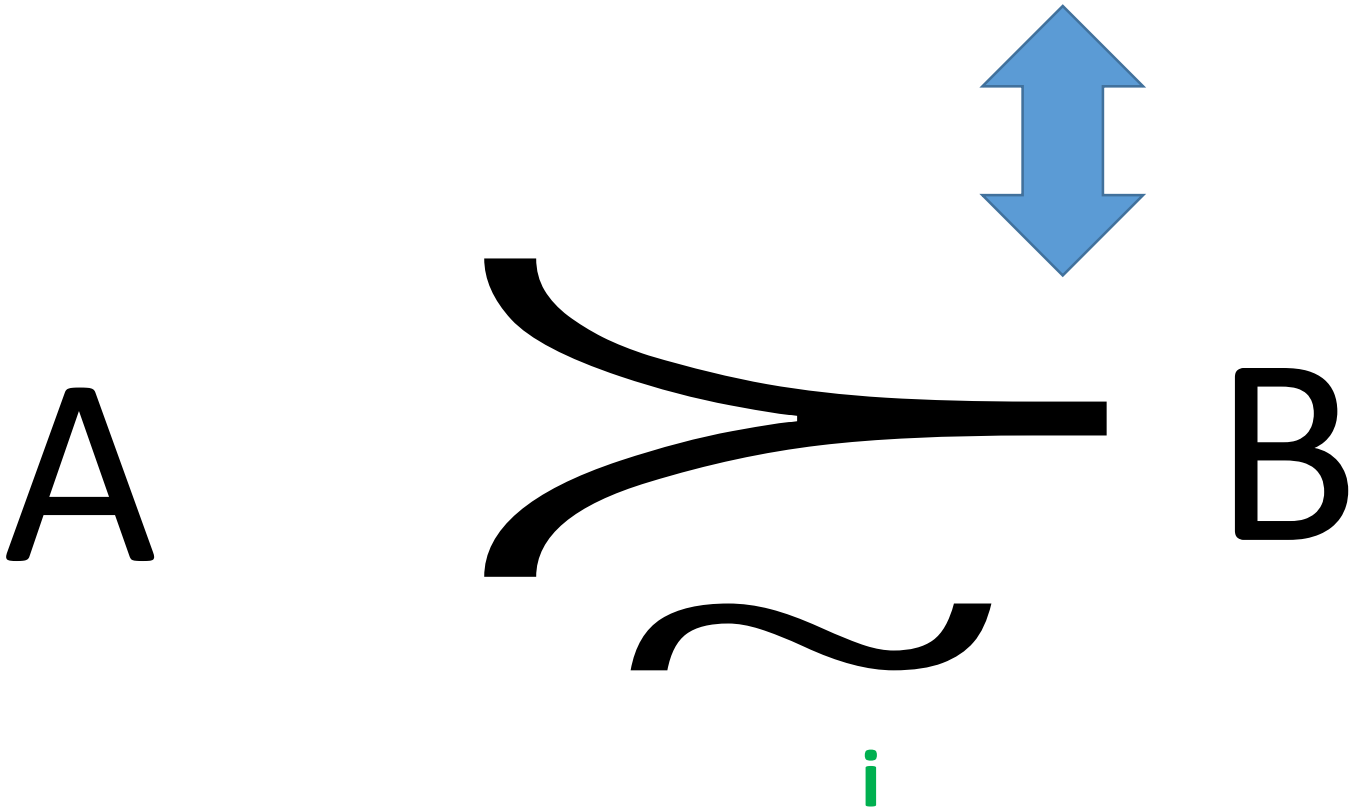
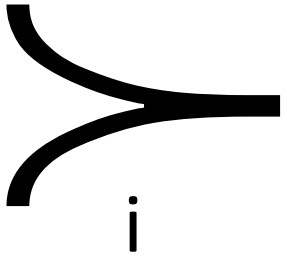
Chapter 2 - At least as liked as



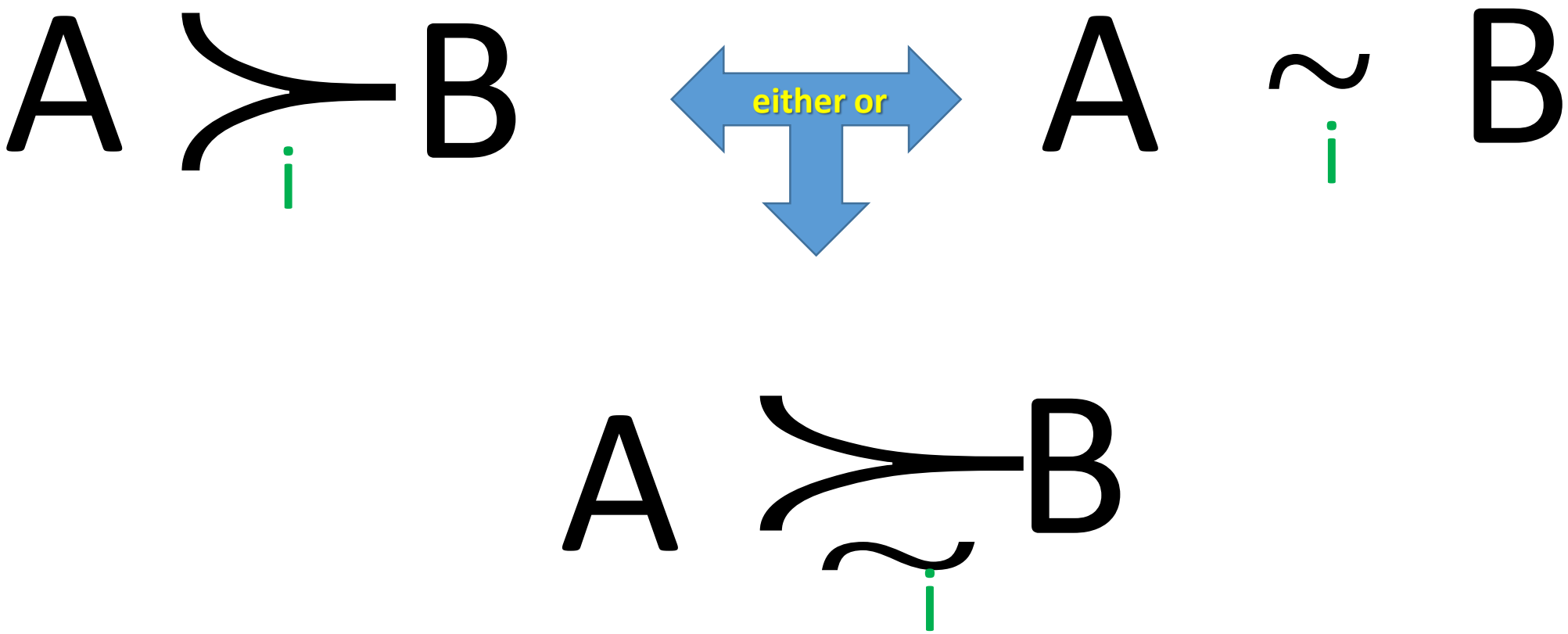
A «is at least as liked as» B by «i»



Strictly preferred to; indifferent to



A «is at least as liked as» B by «i»



Assumption 1

RATIONALITY

A.1 Completeness of the preference ordering «at least as liked as»

either $A \succsim B$ or $B \succsim A$ or both occur simultaneously. In the latter case, given the above definitions on the ordering "preferred or indifferent to", check that the individual must be indifferent between bundles A and B. This also means that if $A \succ B$ then it cannot be that $B \succ A$ (an hypothesis called of preference asymmetry).

A counter-example

Suppose you are a doctor, working in a country subject to a pandemic disease, who has been informed that 1,000 people will certainly die if left untreated. By using a vaccine you may get the following results:

- if you adopt vaccine A, it will save 600 of the 1000 people;
- if you adopt vaccine B, it will not save anyone with probability 1/4 and will save all with probability 3/4.

$A \succ B$ $B \succ A$

A or B?

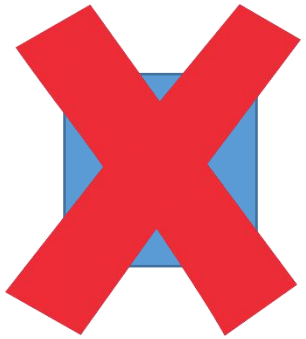
A counter-example

Suppose instead of having to choose between the following two alternatives (always in the hypothesis of certainty of death without cure):
- adopt the C vaccine which will result in the death of 400 of the 1000 people;
- adopt vaccine D which will involve death with probability 3/4 of nobody and of all with probability 1/4.

C or D?

Framing and the default option

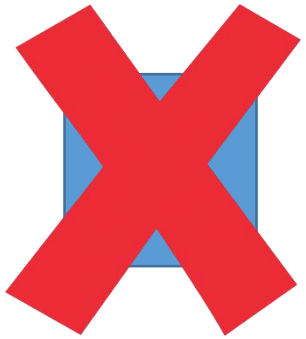
CONSENT CHOICE



I want to participate to organ donation (5)

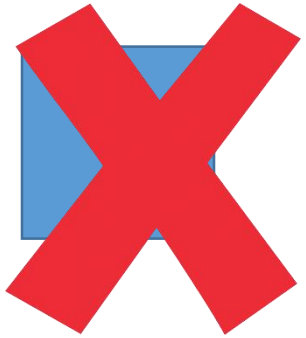
Framing and the default option

EXIT CHOICE



I do not want to participate to organ donation (3)

Framing: if you want to participate (5)



I want to participate to organ donation (5)

I do not want to participate to organ donation (5)

Framing: if you do not want to participate (3)

I want to participate to organ donation (0)

I do not want to participate to organ donation (3)

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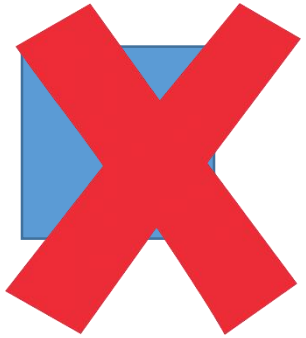
Framing: final result



I want to participate to organ donation (5)

I do not want to participate to organ donation (8)

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Binge watching

PS

Waiter: "*we have amatriciana and carbonara, dottore*";
Customer : "*amatriciana, [illegible] you*";
Waiter (back from the kitchen): "*I forgot, we also have minestrone*";
Customer : "*ah, then give me the carbonara thank you*".

A.2 Transitivity of preferences

your preferences "preferred or indifferent to" are such that, if you do not prefer a basket Y to a basket X (which we sometimes write as $X \succsim Y$, or that X is at least equally appreciated as Y) and you do not prefer a basket Z to basket Y ($Y \succsim Z$) then you do not prefer Z to X ($X \succsim Z$).

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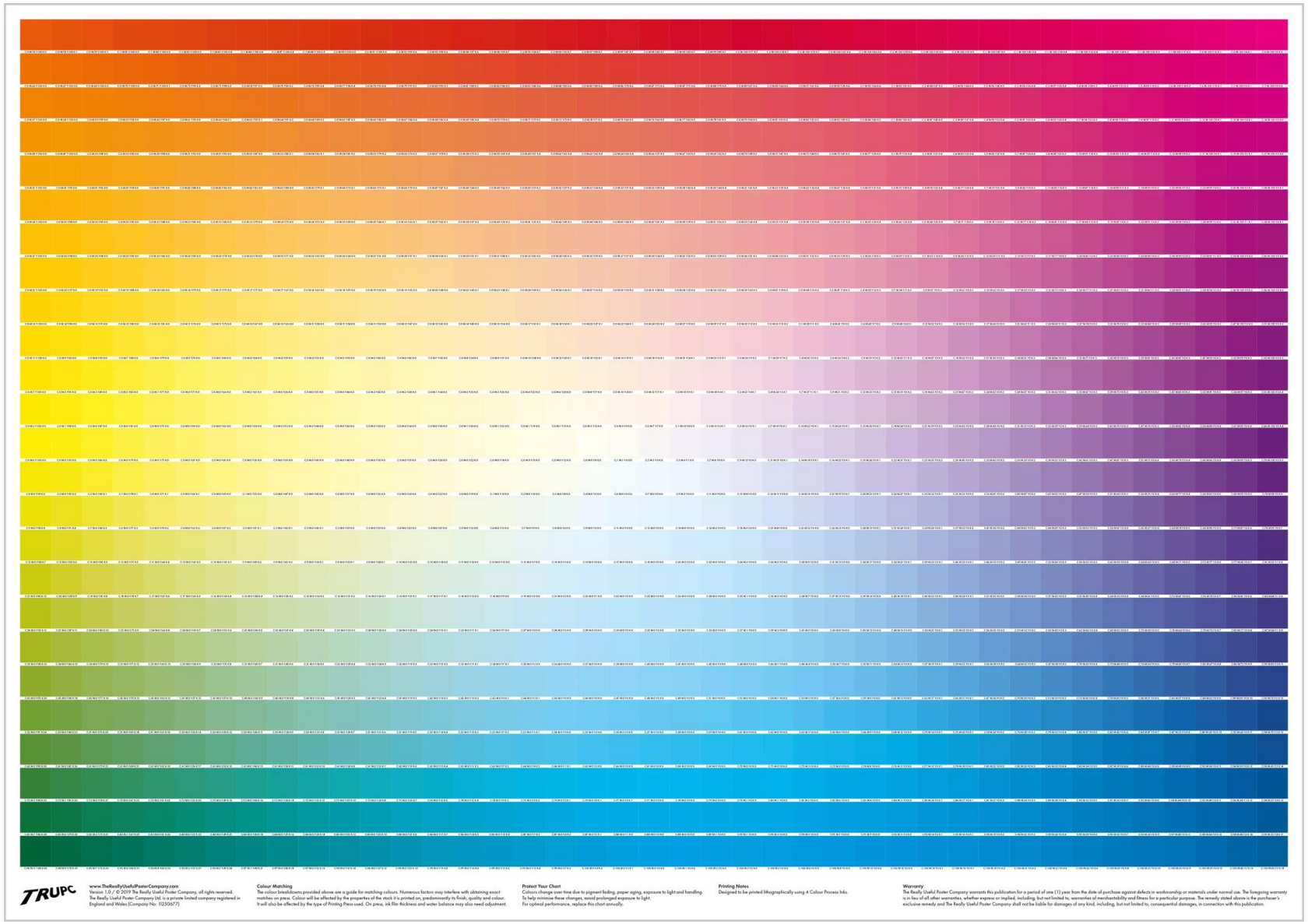
Transitivity of preferences?



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Transitivity of preferences?

Ulysses and the sirens

the best thing would be to listen to the sirens tied to the mast of the ship thus obtaining not only to listen to them, but also not to yield to their singing and survive (basket X) rather than not listening to the sirens that guarantee that "nothing unknown or dark to us remains" (basket Y), and that the latter alternative is itself better than listening to the sirens without being tied up and therefore die (basket Z)

$$X \succsim Y \succsim Z$$

But when he actually got to the sirens, Ulysses modifies its order of preference and feels that he would ultimately prefer to die listening to the sirens free of bonds (Z) rather than listen to the sirens bound by the ties to the mat (X): $Z \succ X$. In this case we would have a dramatic non-transitivity:

$$X \succ Y \succ Z \succ X$$

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Non rationality

Regrets
Addictions (chemical)
Addictions (behavioral: gratifications and…)
Obsessions (relief and…)
Compulsions (relief and…)

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A.3 The consumer's goal (and her rationality)

«i» prefers A to B, (fact)

«i» will try to obtain A rather than B (goal)

«i» knows how to obtain A rather than B (rationality)

(given the economic, technological, institutional, social **constraints**)

Preferences

Continuous (another assumption)

Then the utility function

exists!

Individual Utility Function

Given an individual *i*, this function U_i (X,Y) will be such that, for any basket A - consisting of a combination of X_a unit of good X and Y_a unit of good Y - and any basket B - consisting of a combination of X_b unit of good X and Y_b unit of good Y - where $A \succ_i B$ (i.e. A is strictly preferred to B by the individual "i"), U_i (X_a, Y_a)> U_i (X_b, Y_b). Similarly, for any basket A - consisting of a combination X_a of good X and Y_a of good Y - and any basket B - consisting of a combination X_b of good X and Y_b of good Y, where A ~ B (A is indifferent to B), the utility function will be such that U_i (X_a, Y_a) = U_i (X_b, Y_b).

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Our consumer, John

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

From cardinal to ordinal Utility

if "before" the utility defined the preferences (if $U(A) > U(B)$ - where U was considered measurable - then $A \succ B$) "now" the preferences define the utility (if $A \succ B$ then there exists a mathematical function U such that $U(A) > U(B)$).

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Who is he?

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	-100
B	7	1	-100
C	5	2	-100
D	4	3	-100
E	3	5	-100
F	2	8	-100
G	10	1	-20
H	8	2	-20
I	7	3	-20
L	9	1	?
M	7	5	?

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	100.000
B	7	1	100.000
C	5	2	100.000
D	4	3	100.000
E	3	5	100.000
F	2	8	100.000
G	10	1	1.000.000
H	8	2	1.000.000
I	7	3	1.000.000
L	9	1	?
M	7	5	?

Always John!

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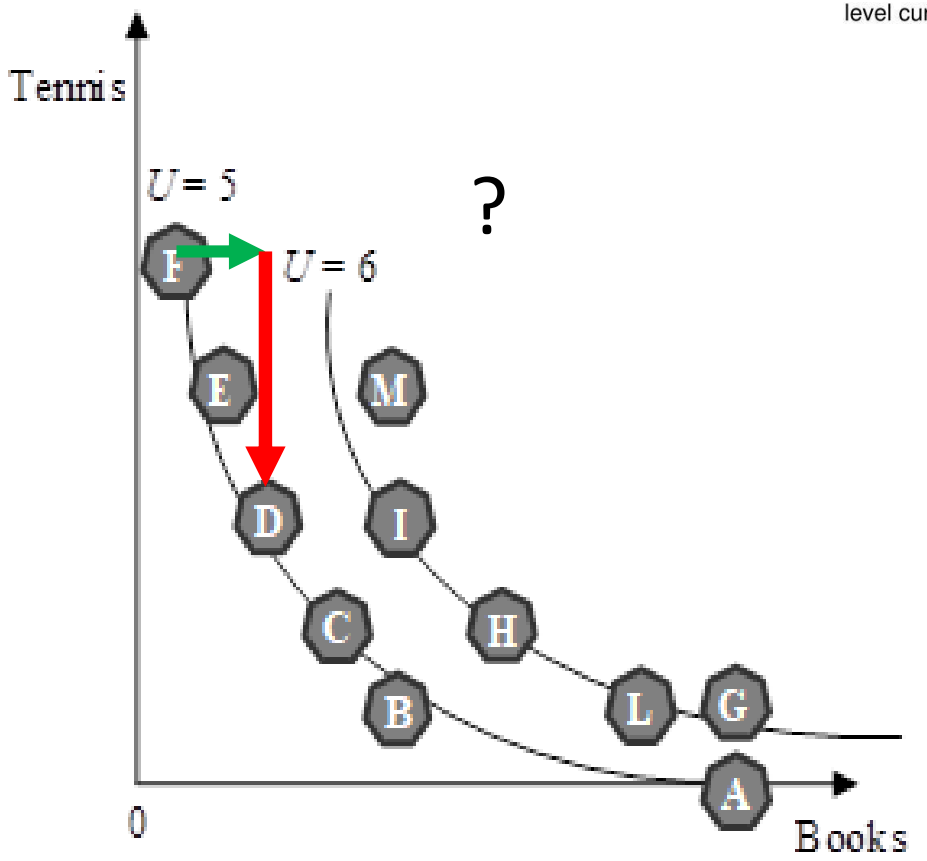
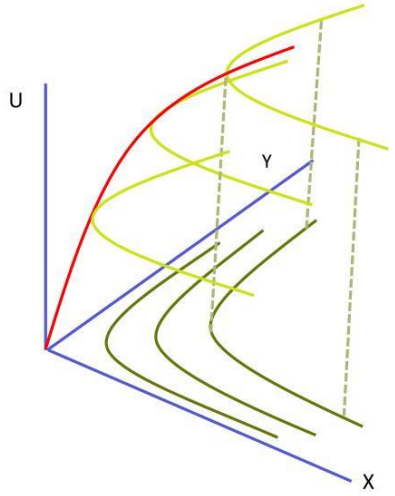
The indifference curve!

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?



Digression on indifference curves.

Indifference curves are often thought of as level curves projected onto the base plane



U=U(x, y)

is strictly concave as drawn

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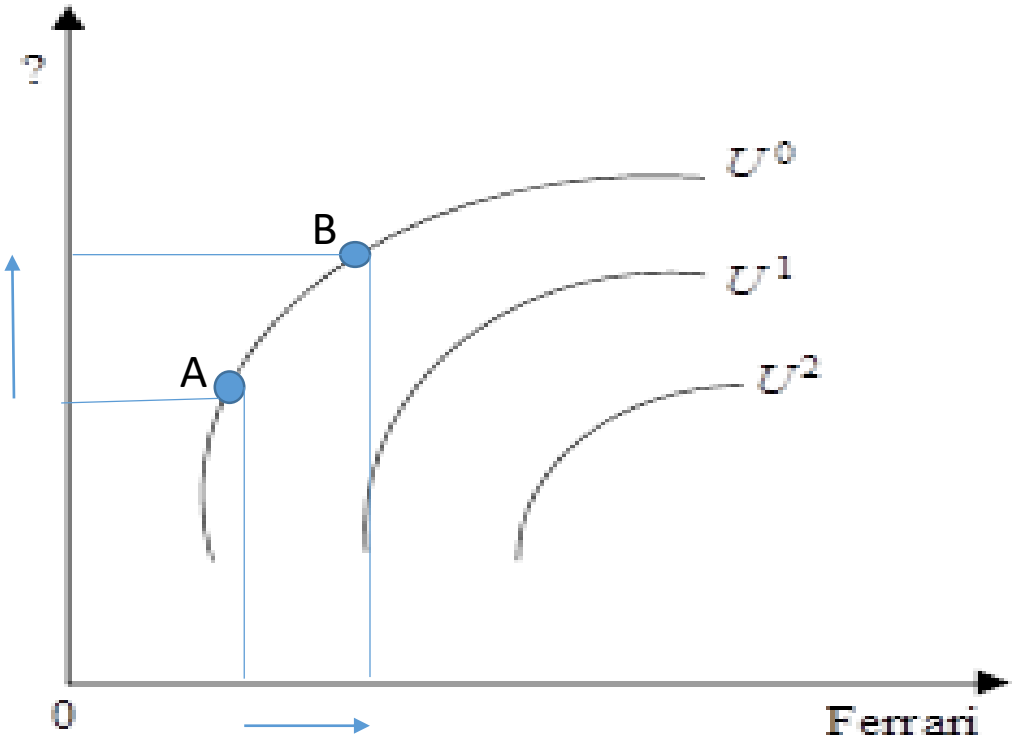
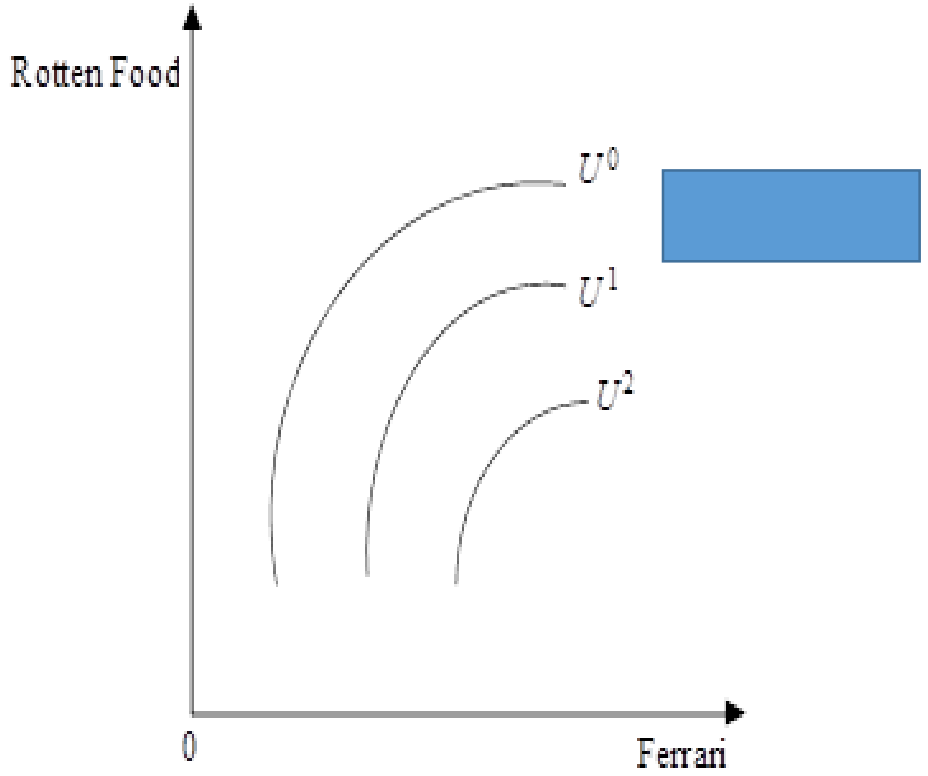
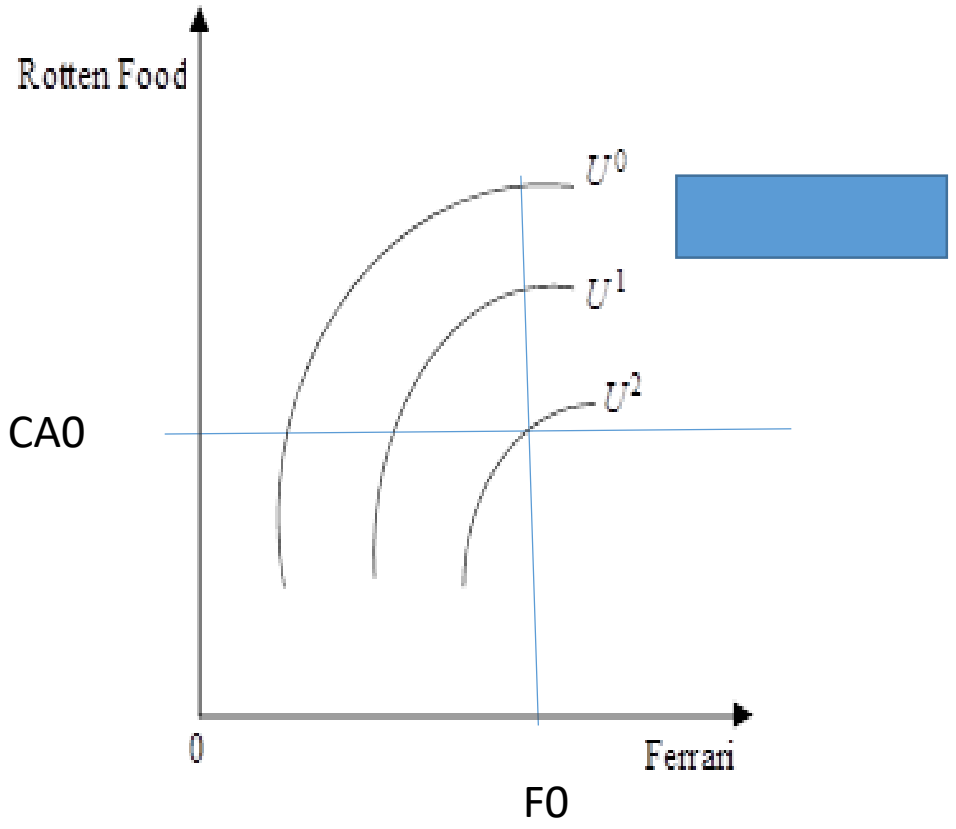
Why increasing? What is «?» ?



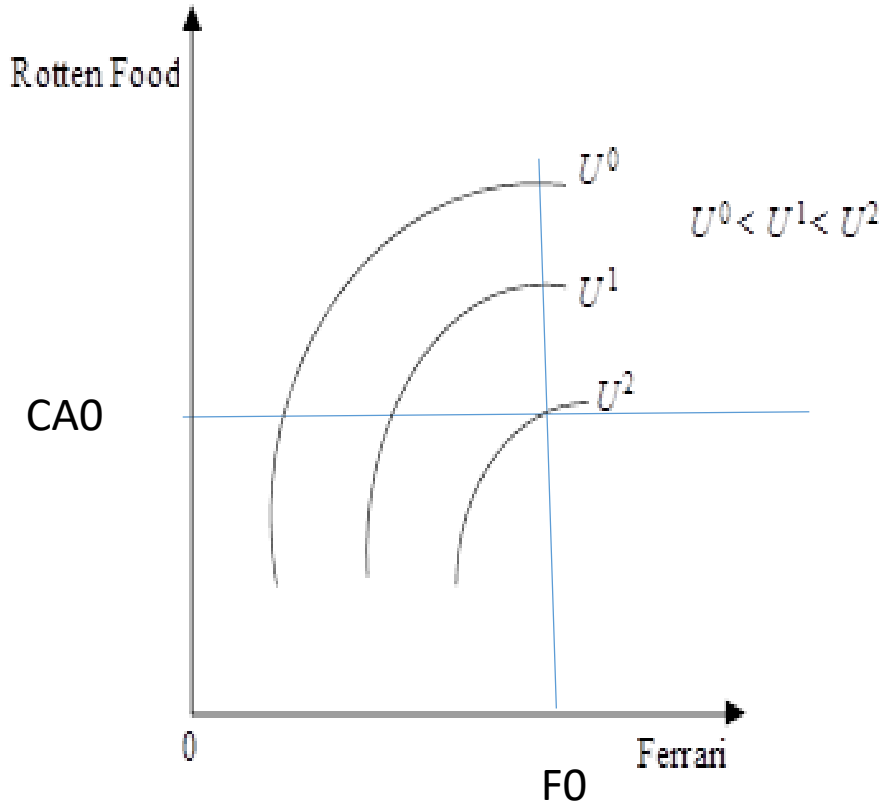
A «bad»



How bad?



How bad?



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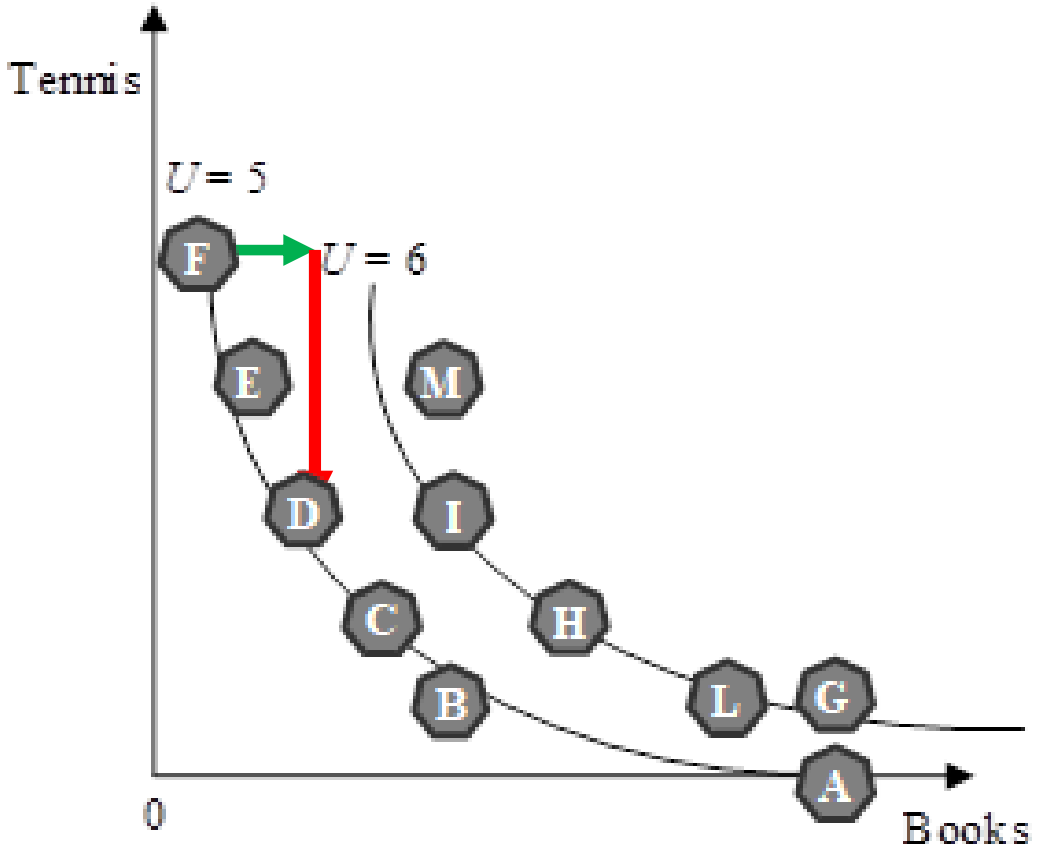
Bads exist

Karoshi

JOHN. Decreasing curves? NON SATIATION



Non satiation: implications

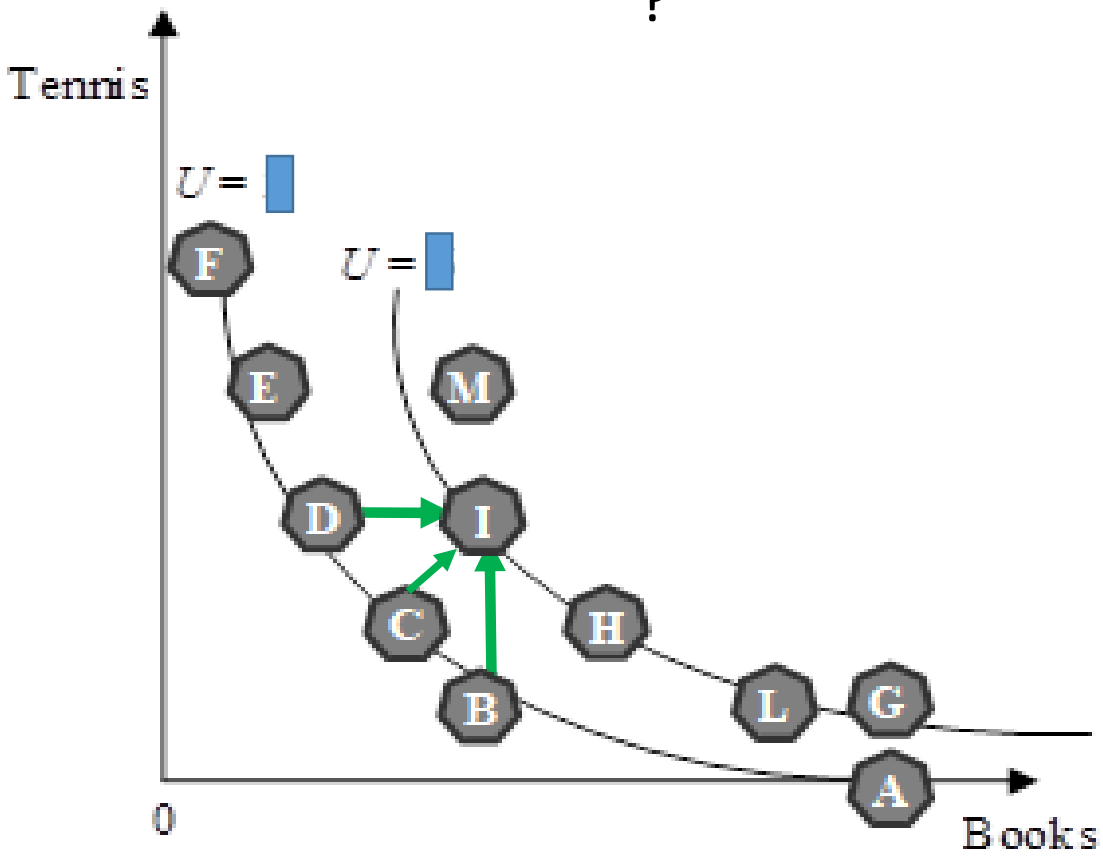
For each basket on a higher indifference curve you can always find a basket on a lower indifferent curve which has less of both the 2 goods!

Take basket I. Of which other basket does I have more of both goods?

So?

Ps: John and who else prefers I to C?

?



Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

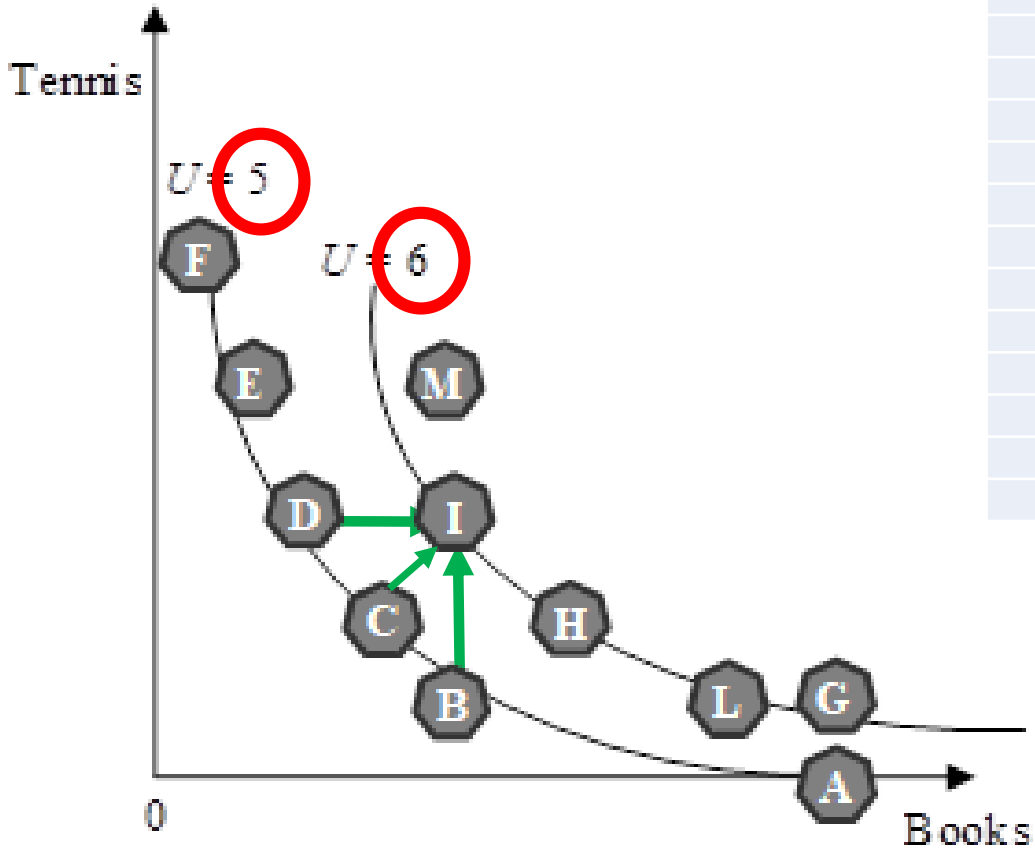
Non satiation and transitivity: implications

Careful:

I vs F?

If I $\succ$ D

And for John D is indifferent to F then…



Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

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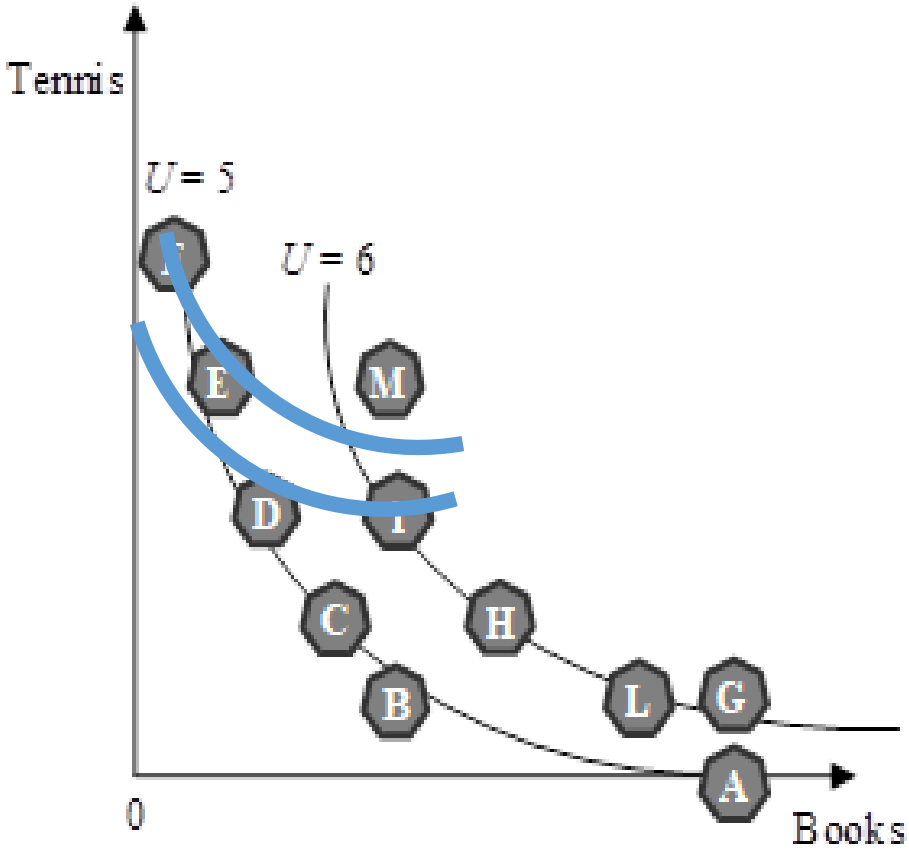
Another individual, Frank

Basket	Books (quantity B)	Tennis (hours L)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?



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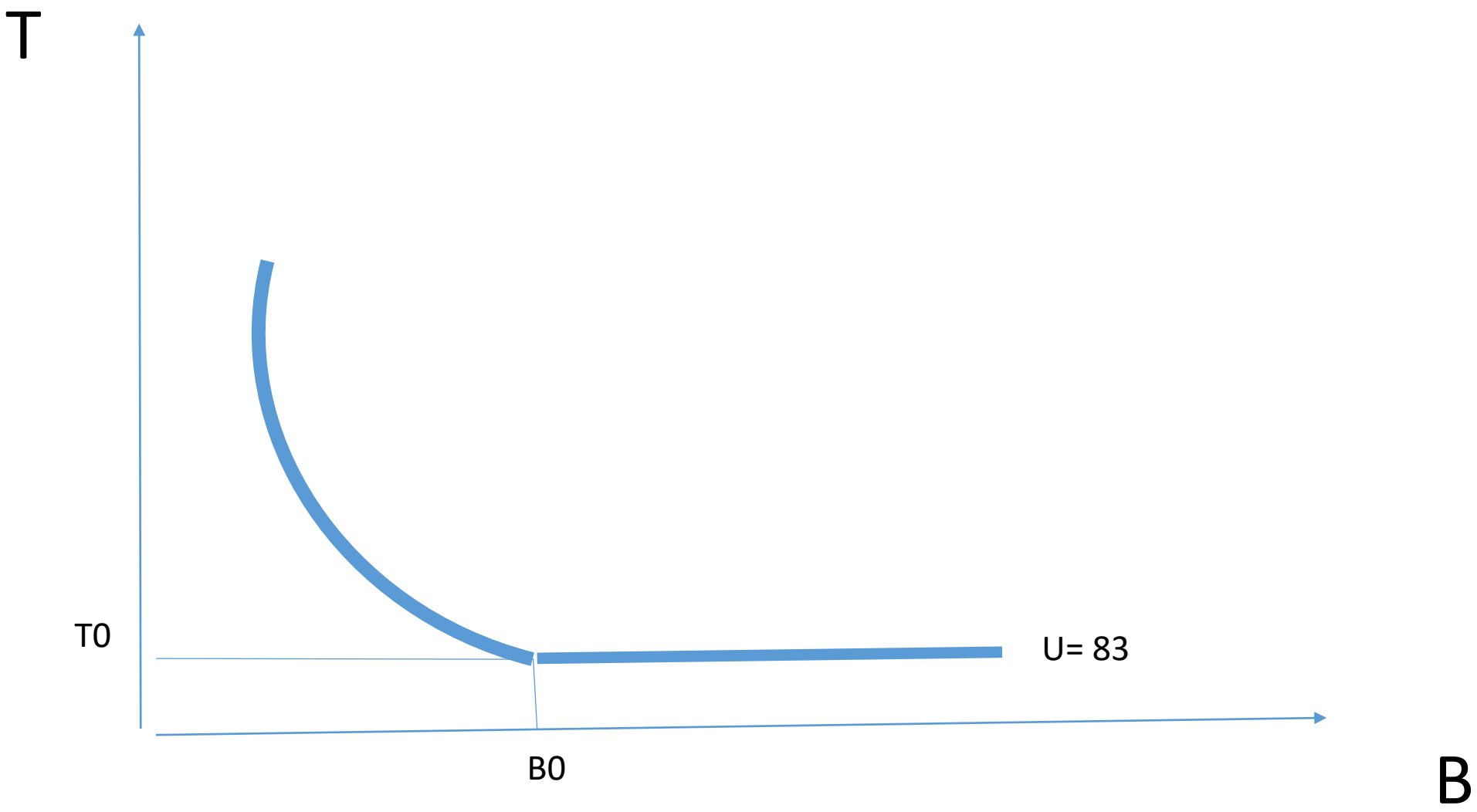
How are B and T?



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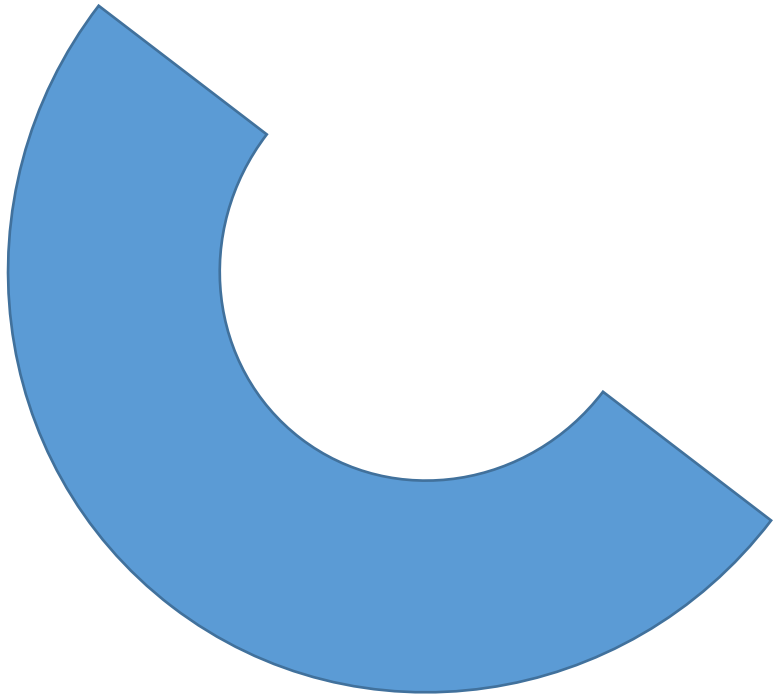
Thick curves? Satiation



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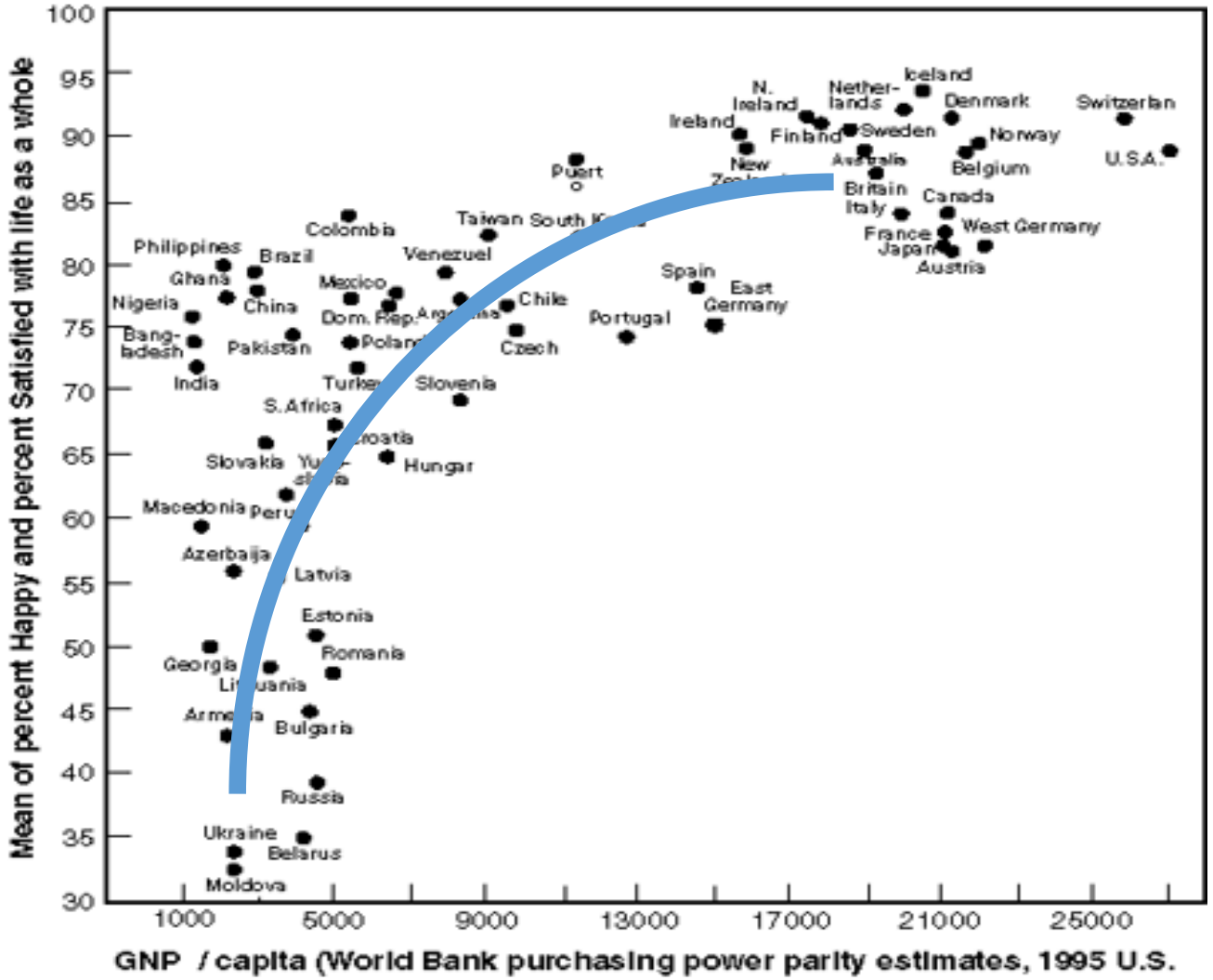
Does Money Buy Happiness?



The Ultimatum Game. Ready?

The organizer (Piga): proposes 100 million euro to be shared;

The proposer: Proposes to the counterpart how to divide it;

The counterpart: After hearing the offer of the proposer, he/she can accept or reject it (in this latter case the 100 million return to Piga).

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Overconsumption (of bads)

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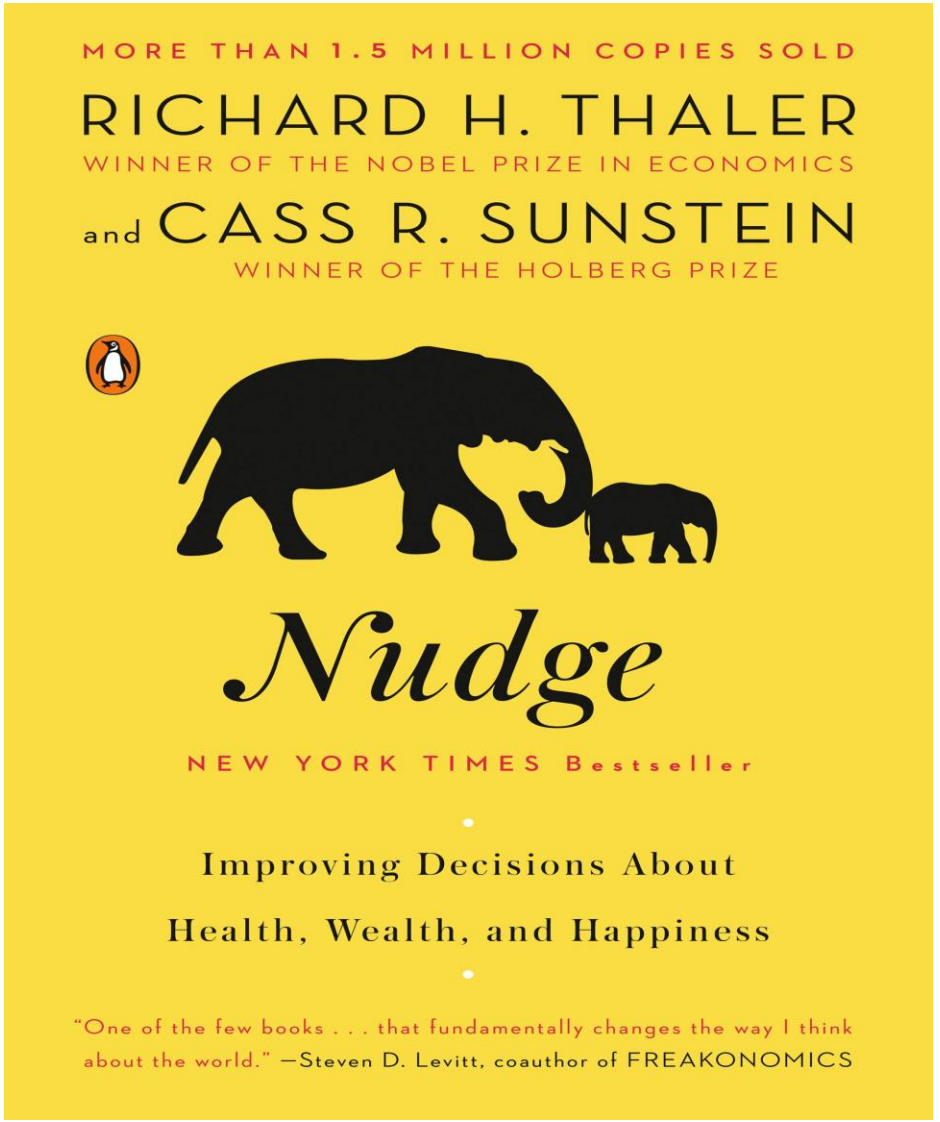
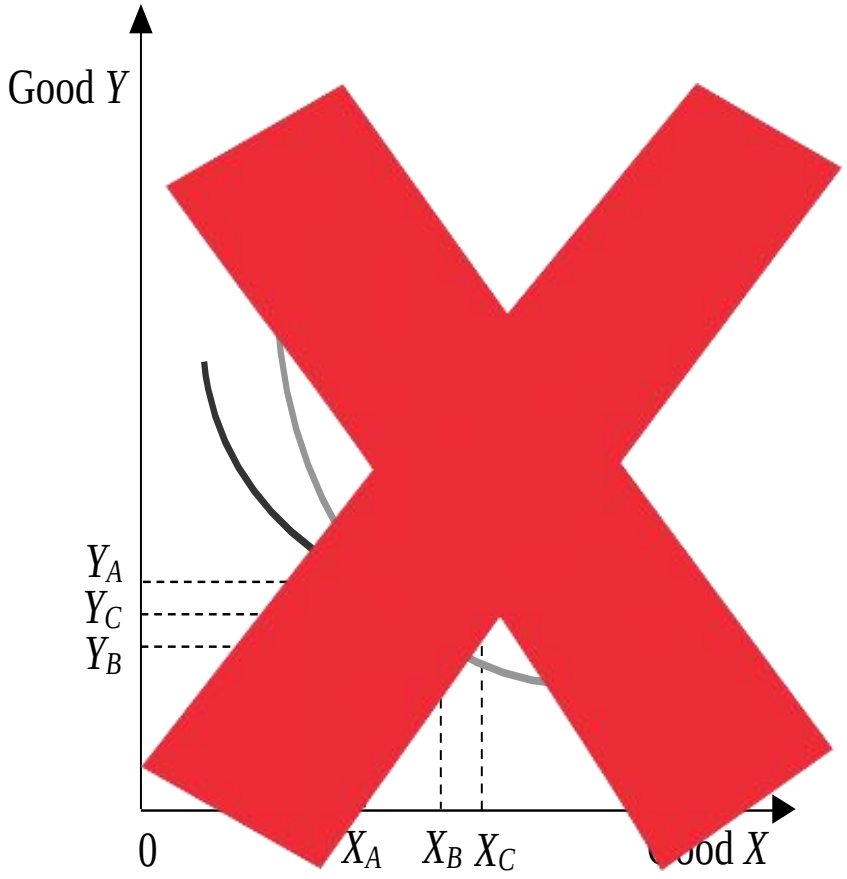
Paternalistic-Libertarian

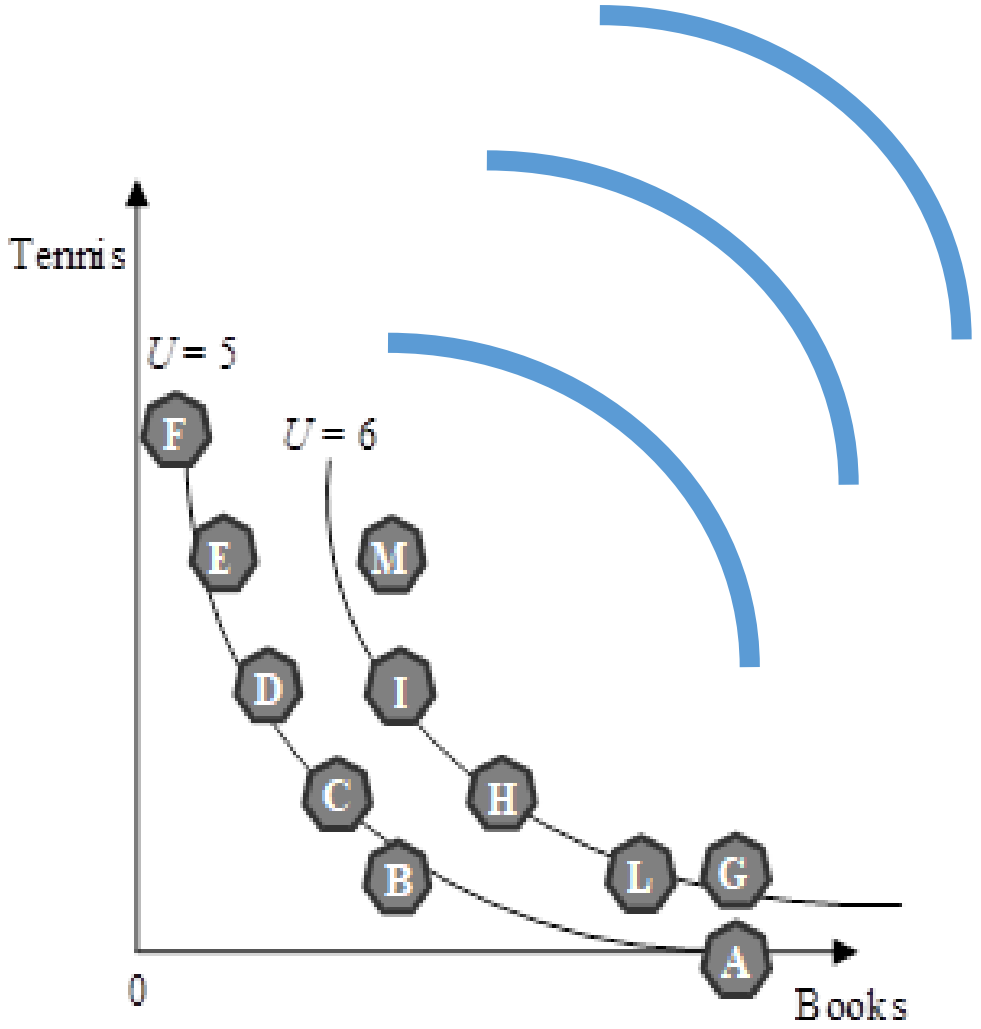


Can indifference curves intersect?



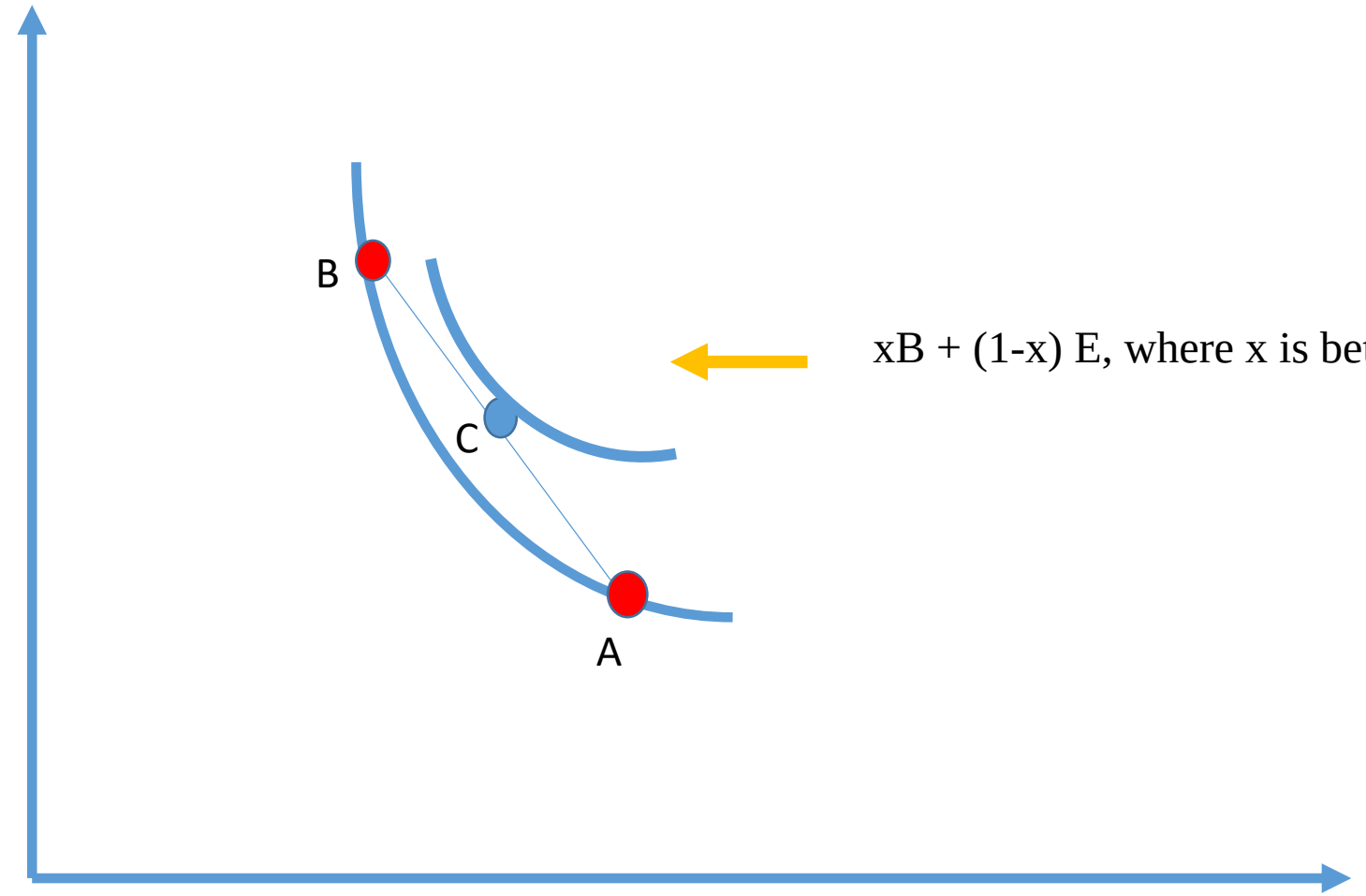
The Indifference Curve? Convex Toward the Origin

Basket	Books (quantity B)	Tennis (hours T)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?



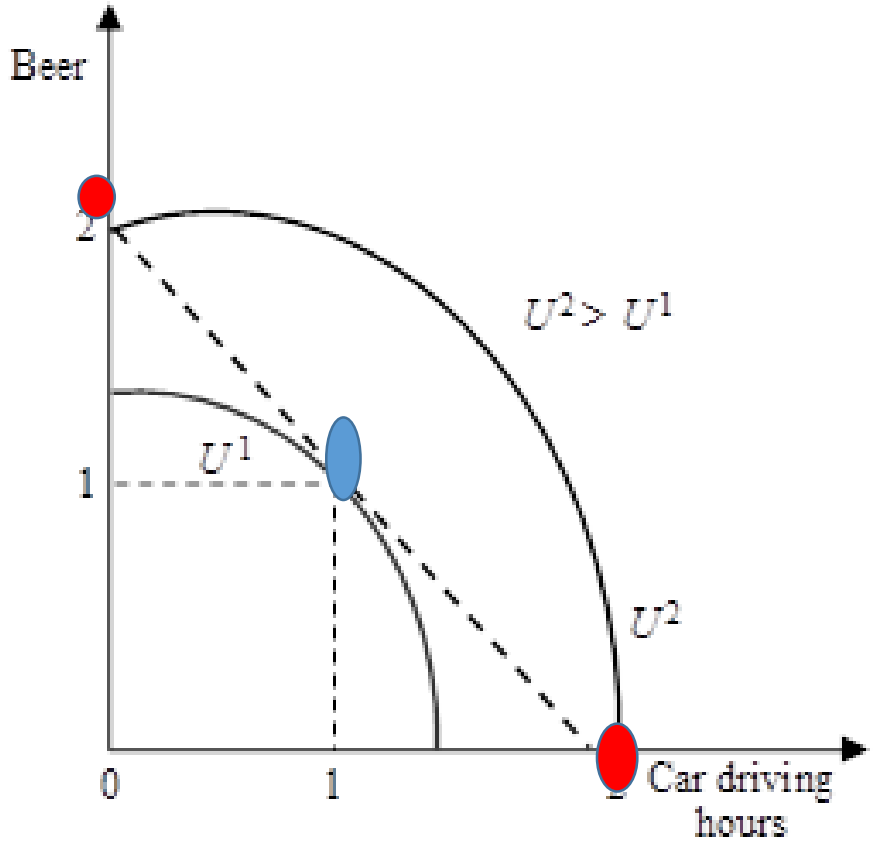
Convex curves

C $\succ$ B $\sim$ A

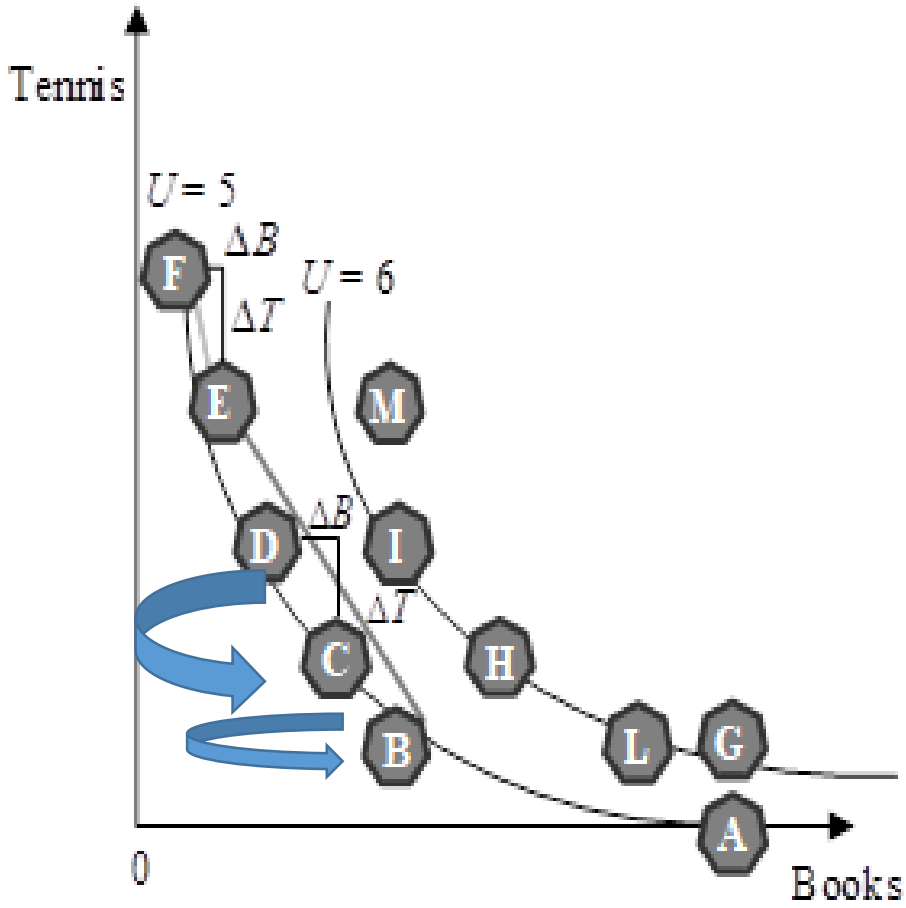


xB + (1-x) E, where x is between 0 and 1

Curves that are concave toward the origin exist!



Curves not just decreasing but convex toward the origin



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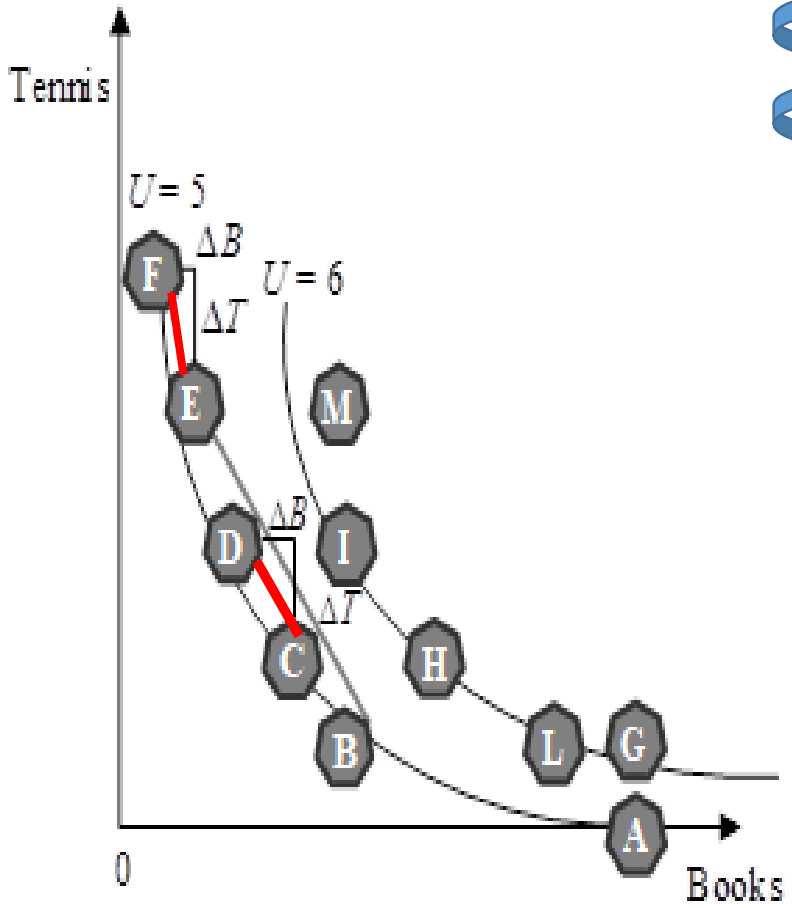
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

Subjective additional value of 1 unit of B

Moving from F to E, as we stay on the same indifference curve, **ΔB more books have the same value for us of ΔT tennis lessons**: which means that in that point (basket) **one more book is worth (ΔT/ΔB) tennis lessons for John**. (ΔT/ΔB), the value of one more unit of books in terms of tennis lessons for our consumer (hence a conception of **marginal subjective value**: how many tennis lessons John **is willing to give up** for one more unit of a book when he holds a certain amount of books), **decreases** with the increase in the consumption of books as you can see by going now from basket D to basket C. In fact (ΔT/ΔB) is nothing but the **slope of the hypotenuse** of the third side of the triangle (first FE and then DC) and this slope, due to **the convexity of the indifference curve**, is decreasing in absolute value.

If ΔB more books = ΔT tennis
[ΔB/ΔB] more book(s) = [ΔT/ΔB] Tennis
1 more book = ΔT/ΔB Tennis



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B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

From F to E:
ΔB=+1 ; ΔT = -3

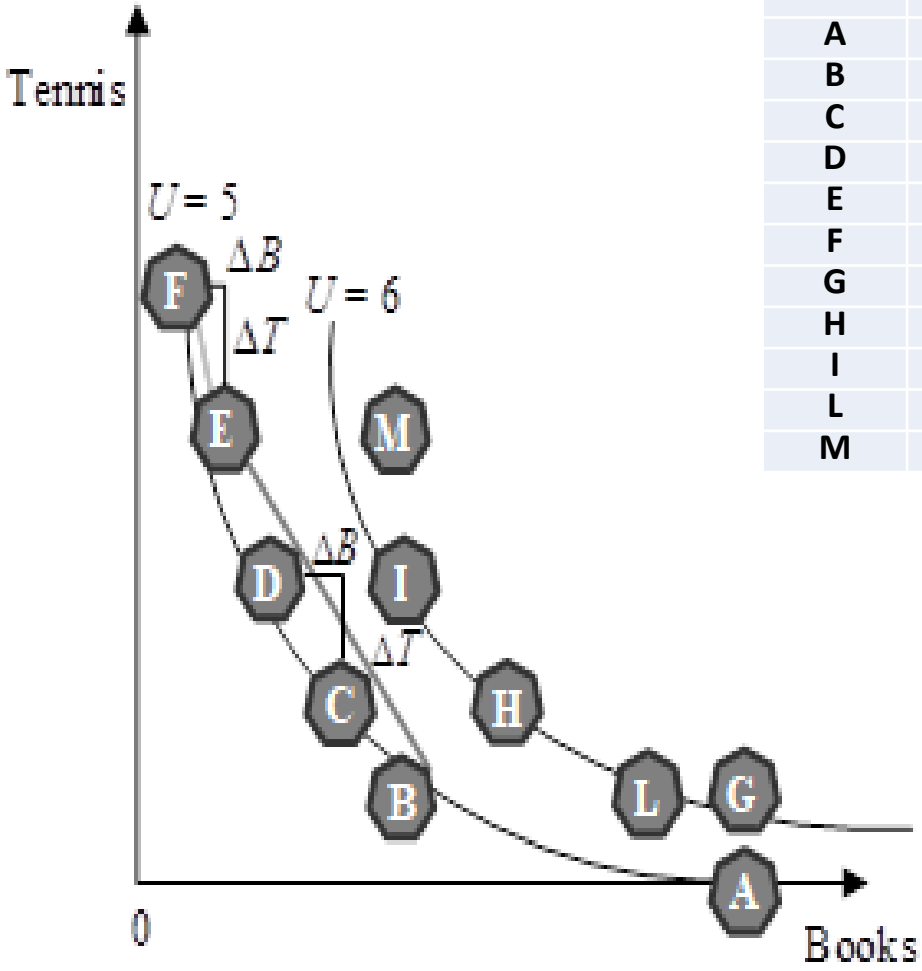
From D to C:
ΔB = +1 ; Δ T= -1

|ΔT/ΔB| ↘
when B↗

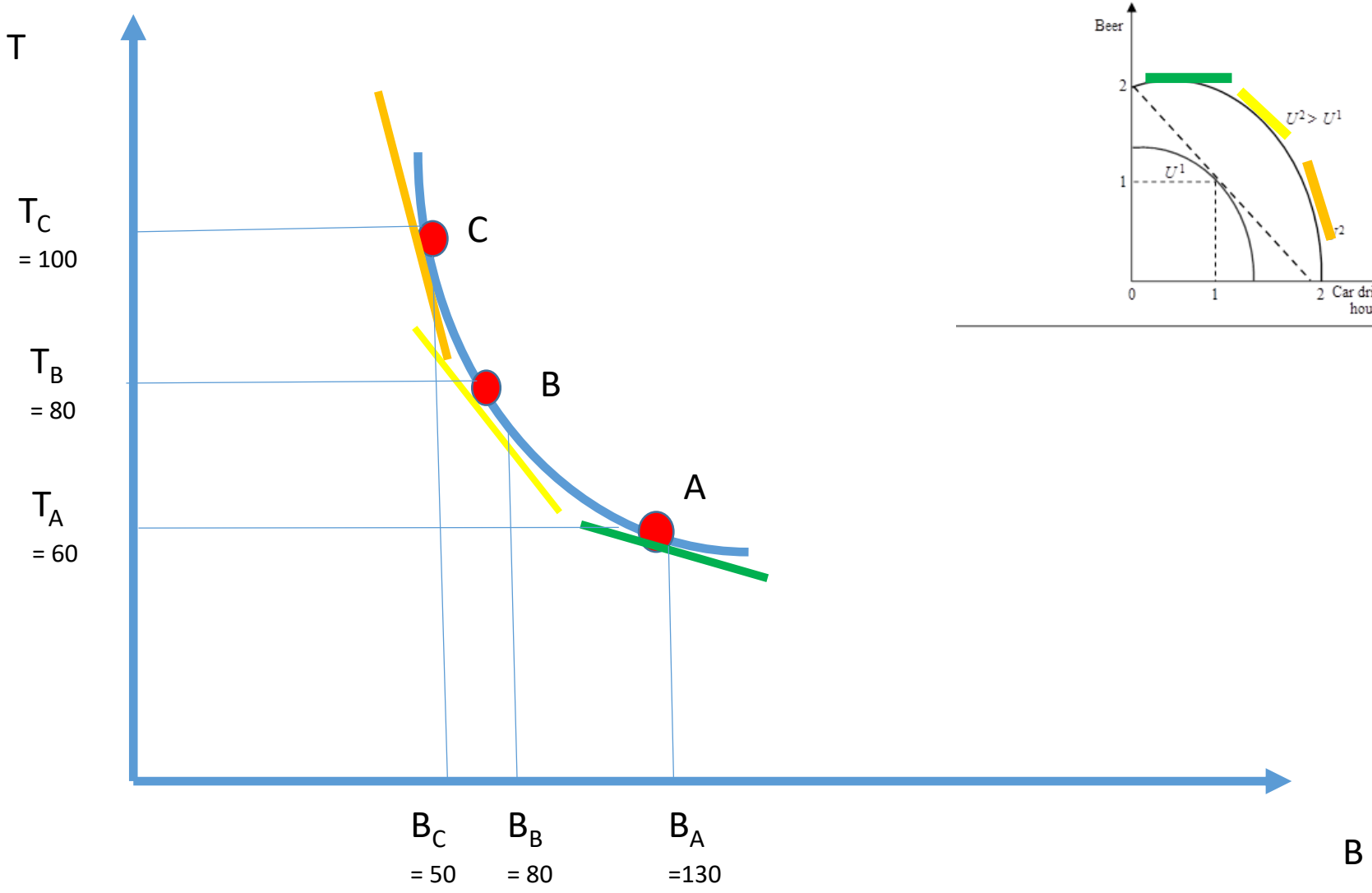
The marginal subjective value

If we let (ΔB) **converge towards zero**, the ratio ΔT/ ΔB becomes the **slope of the indifference curve** at the point considered. This slope of the indifference curve tells us how much we must decrease (since it is a negative number) the consumption of the good tennis lesson with an **infinitesimal increase** of the good books to remain indifferent to the previous situation. Hence, **the opposite of this slope** tells us, for a given amount of books and tennis lessons, **the value attributed by the specific consumer John to an infinitesimal additional unit of books in terms of tennis lessons**, and is called a **marginal rate of substitution MRS**.

Basket	Books (quantity B)	Tennis (hours T)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

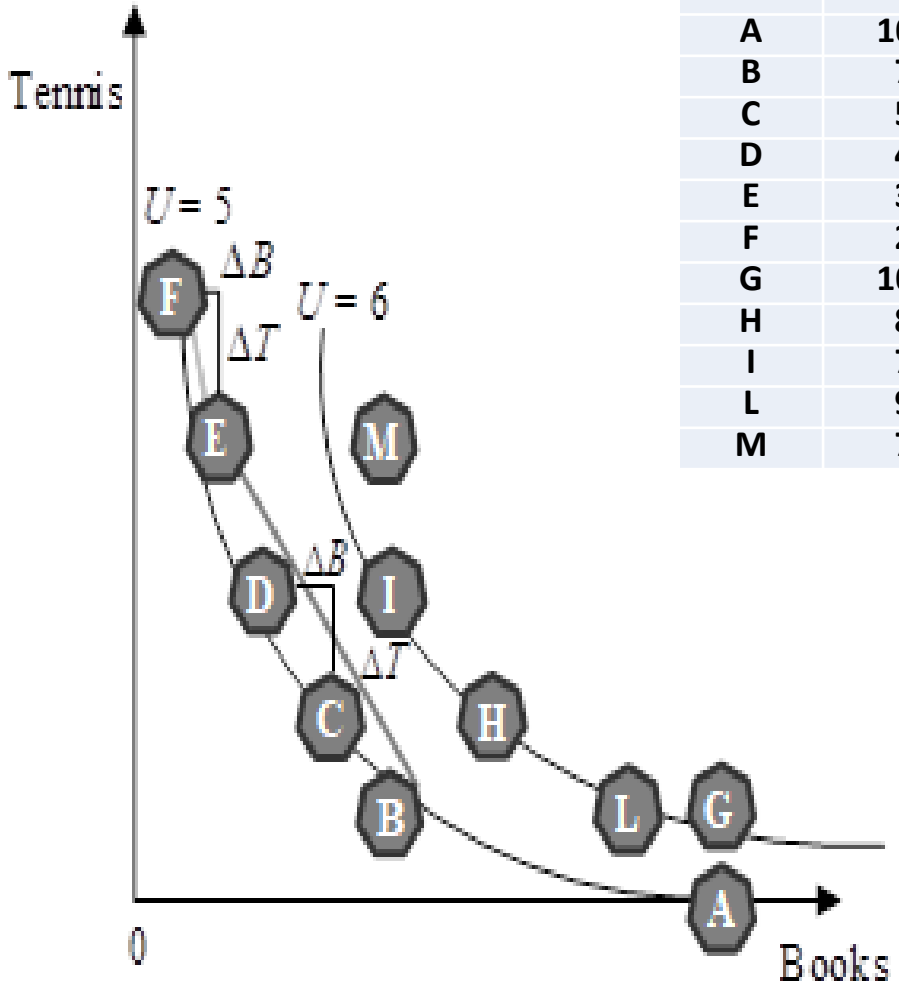


Convex curves: the slope declines as B grows



Slope of the indifference curve vs. MRS

The **slope** of the indifference curve dT/dB is **negative**, since the indifference curve is decreasing (downward-sloping), therefore the marginal substitution rate will be given by **(-dT/dB)**, coinciding with the opposite of the slope of the indifference curve. Please verify that the convexity towards the origin implies an indifference curve with a negative second derivative; this means that the **slope of the curve decreases as the variable increases on the x-axis**.



Basket	Books (quantity B)	Tennis (hours T)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
F	2	8	5
G	10	1	6
H	8	2	6
I	7	3	6
L	9	1	?
M	7	5	?

Marginal Rate of Substitution MRS and marginal use value

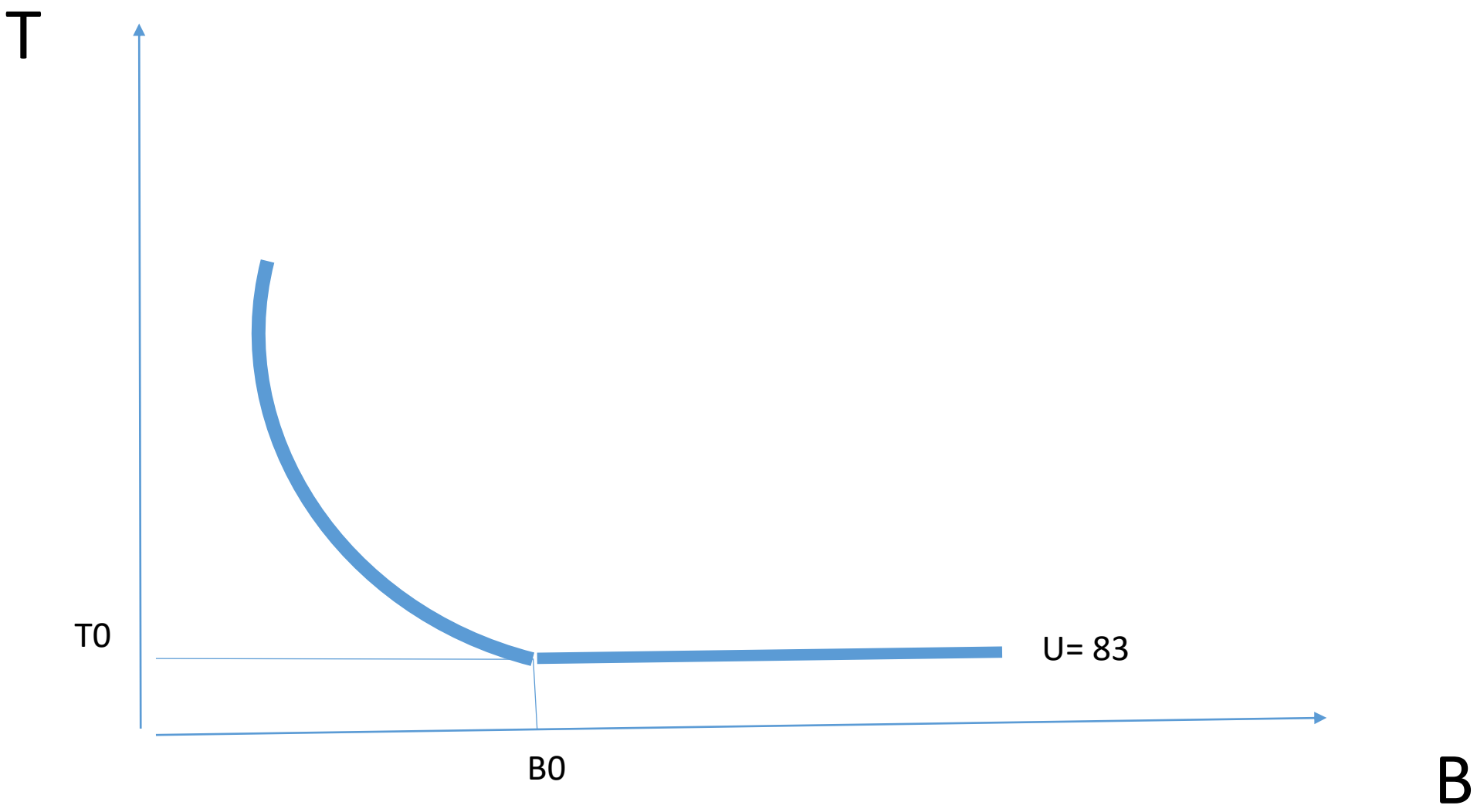
MRS of good B in terms of good T: the value of one more unit (a marginal increment) of the good B in terms of another good T, that is, how much we are **willing** to give up of another good T in order to come into possession **of one more unit** of that good B of which we already consume a certain amount.

PS: We are NOT talking about the exchange value, i.e. the price!

The convexity of preferences, which, as we have explained is an **assumption**, means that this **marginal value** is **decreasing** as the consumption of the good in question increases.

As the consumption of good A increases, we are **willing to give up** less and less of the other good B in order to consume **one additional unit** of good A.

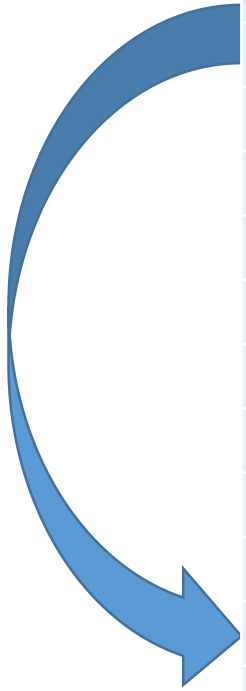
Again. MRS?



A walk in the forest toward our optimal basket

Where is the price/ marginal cost?

Where is the use value/marginal benefit?



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The exchange

At the roots of the reason for exchanging:

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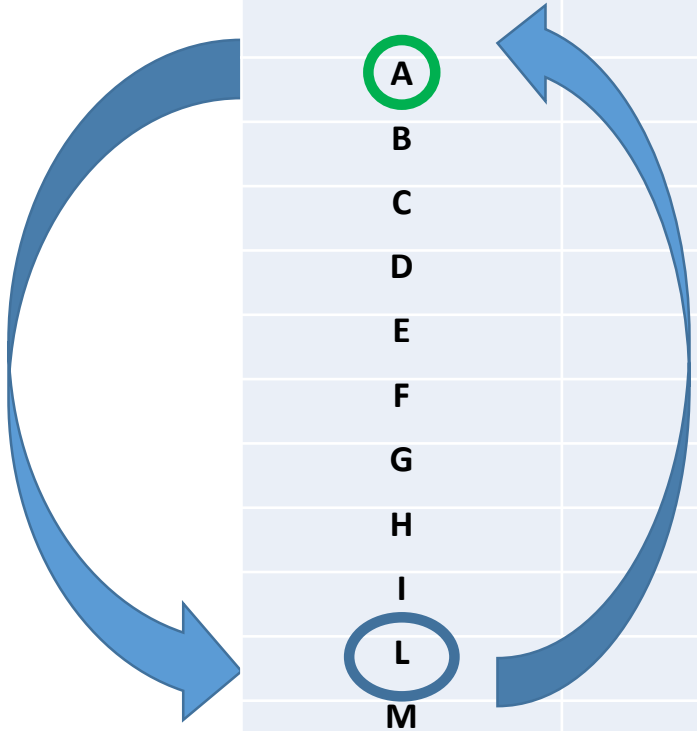
Do we have a counterpart?



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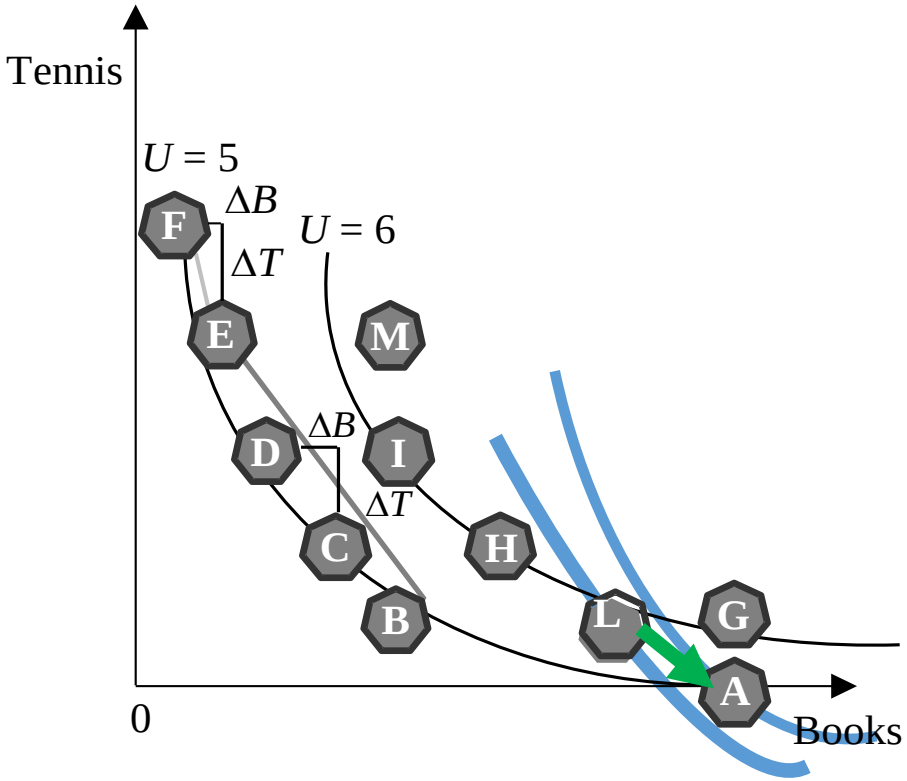
Another consumer



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When do we stop trading?

Basket	Books (quantity B)	Tennis (hours T)	Utility
A	10	0	5
B	7	1	5
C	5	2	5
D	4	3	5
E	3	5	5
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G	10	1	6
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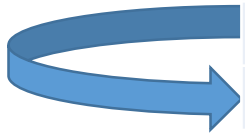
?



P_L/P_T?

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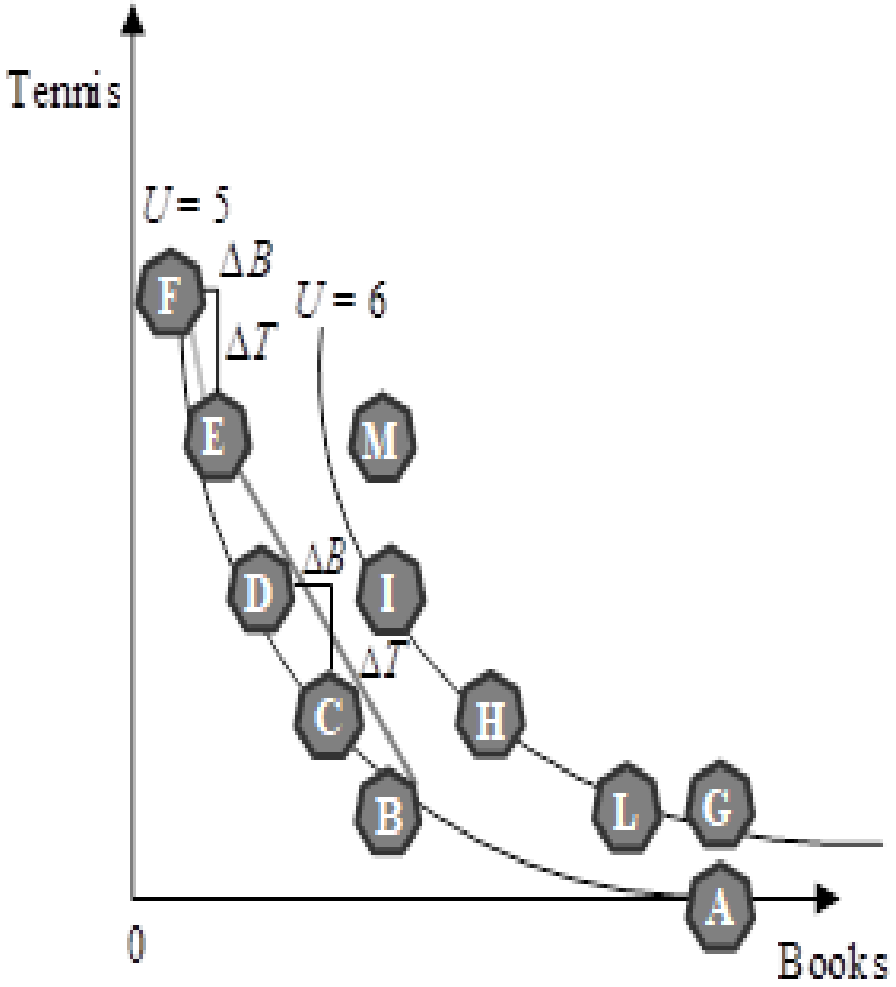
From L to M

M $\succ$ L ?

M $\succ$ I
I ~ G
G $\succ$ L
M $\succ$ L !

therefore
U(M) > 6
5 <U(L) <6



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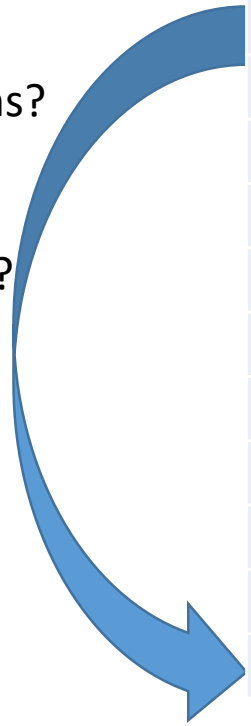
Toward the optimal basket

Passing from A to L, do I have the resources?

And from L to M?
And if at L we were asked 10 books for 4 tennis lessons?

What if there is no counterpart at those prices?



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The budget constraint

P_B = 50 euro
P_T = 100 euro (relative price?)
I, monetary income, equals 500 euro

Consumer is a a *price-taker*

Constraint?

$I \geq P_B \times B + P_T \times T$

$I = P_B \times B + P_T \times T$

$500 = 50 \times B + 100 \times T$

A: affordable?
L: affordable?
M: affordable?
(and if P_T were to go down to 30 €?)

$$I = (P_B \times B) + (P_T \times T)$$

$$I - (P_B \times B) = (P_T \times T)$$

$$T = \left(\frac{I}{P_T}\right) - \left(\frac{P_B}{P_T}\right) \times B$$

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and in our example:

$$T = \left(\frac{500}{100}\right) - \left(\frac{50}{100}\right) B = 5 - \left(\frac{1}{2}\right) B$$

The budget constraint

P_B = 50 euro
P_T = 100 euro (relative price?)
I, monetary income, equals 500 euro

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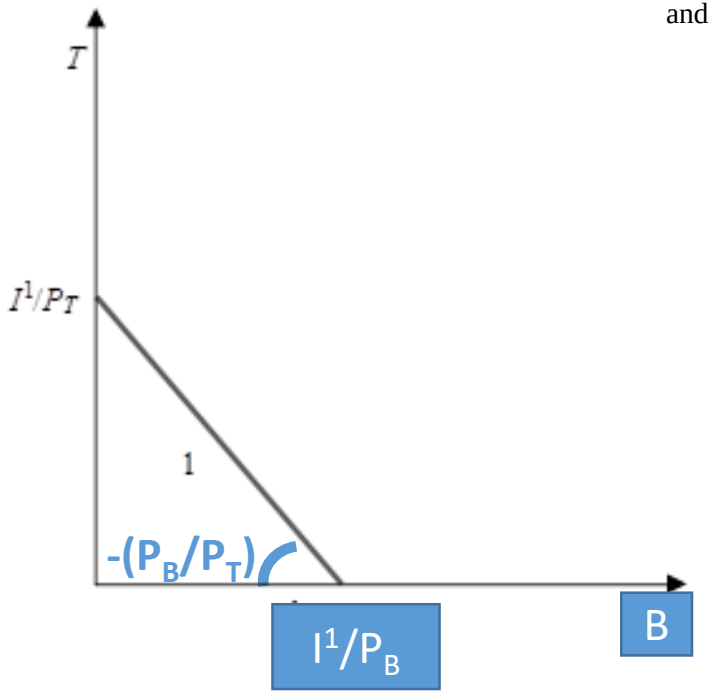


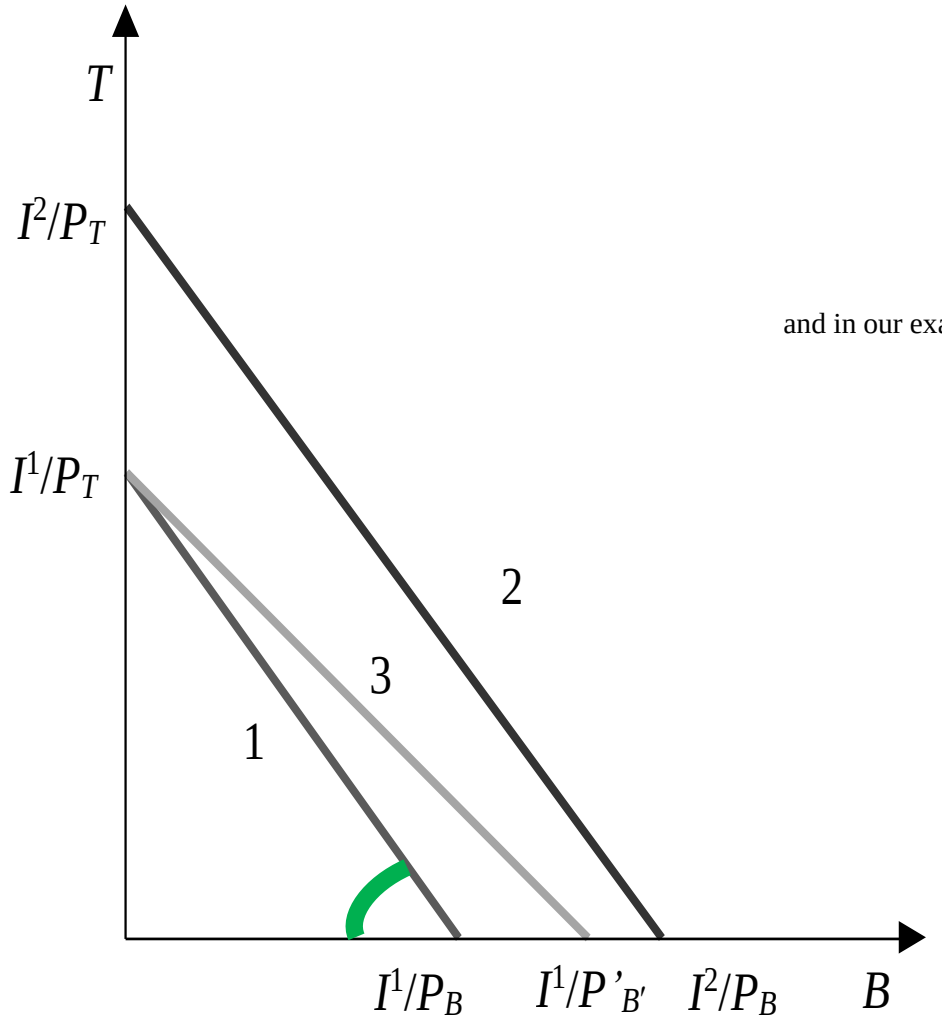
and in our example:

$$T = \left(\frac{500}{100}\right) - \left(\frac{50}{100}\right)B = 5 - \left(\frac{1}{2}\right)B$$

The budget constraint tells us for a given desired consumption of books ... the maximum amount of tennis lessons we can consume given our income and the absolute and relative cost of goods.

Decreasing!
Intercepts?
Area below? Area above?
Slope?

The budget constraint: shifts and tilting



$I = (P_B \times B) + (P_T \times T)$

$I - (P_B \times B) = (P_T \times T)$

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and in our example:

$$T = \left(\frac{500}{100}\right) - \left(\frac{50}{100}\right) B = 5 - \left(\frac{1}{2}\right) B$$

From «1» to «2» what changes?

Income. Or?

From «1» to «3» what changes?

Price. Of which good?

Books, right.

Are we richer?

What about hyperinflation?