Consumer Choice

From utility to demand

Scarcity and constraints

- Economics is about making choices.
  - Everything has an opportunity cost (scarcity):
    - You can't always get what you want.
- For consumers, money (income, wealth) is scarce.
  -
    -
    -

Making buying decisions

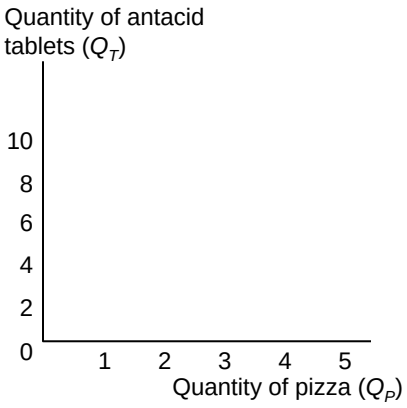
- How do consumers make decisions about buying goods?
  - Firms are interested in doing what gives them the most profit.
  - Consumers are interested in doing what gives them the most
    -
    -

Making buying decisions

- From all the possible *consumption bundles* of good, a consumer will choose the bundle that gives her the most utility.
  - A *consumption bundle* lists the quantities of all the goods a consumer could consume.
    - Example:
      -
      -
      -

Consumption bundles

- Graphically:



Bundle *A*: (2, 6)

Bundle *B*: (5, 0)

What you want … and can get

- From all the possible consumption bundles of good, a consumer will choose the bundle that gives her the most utility.
  - This means we need to study two things:
    - What consumption bundles are possible?
      - That is, what is the budget constraint?
    - What gives the consumer utility?
  - Then we put those two together.

Consumption Possibilities

You can't always get what you want.

Consumption possibilities

- Example:
  - Income (N) = \$10
  - Price of pizza (P_P) = \$2 per slice
  - Price of antacid tablet (P_T) = \$1 per tablet
- Which of the following consumption bundles – remember the format (Q_P, Q_T) – are affordable?
  - (2, 6)
  - (5, 0)
  - (1, 1)
  - (3, 5)

Consumption possibilities

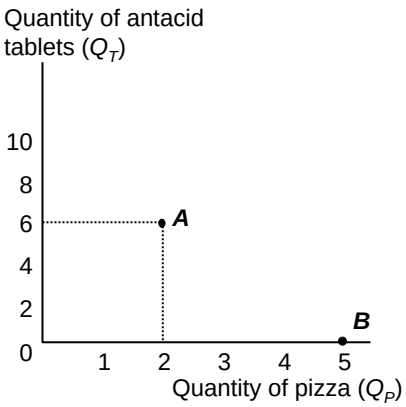
- With a given income, some consumption bundles are affordable, and others are not.
  - All affordable consumption bundles are in the set of *consumption possibilities*.
- But some of these don't make sense!
  -
  -

Consumption possibilities

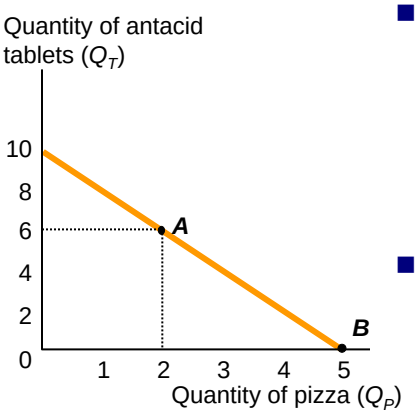
- Which consumption bundles are <u>just</u> affordable (example)?
  - $Q_P \cdot \$2 + Q_T \cdot \$1 = \$10$
  -
- Suppose $Q_P = 0$:
  -
  -
- Suppose $Q_T = 0$:
  -
  -

- Which consumption bundles are <u>just</u> affordable (general)?
  -
  - This is the *budget line*.
- Suppose $Q_P = 0$:
  -
  -
- Suppose $Q_T = 0$:
  -
  -

Budget line



Budget line slope



- The slope of any line is: "rise over run".
  - Take one step to the right
    -
  - How much do you have to give up?
    -
- The slope of this budget line is:
  -

Budget line slope

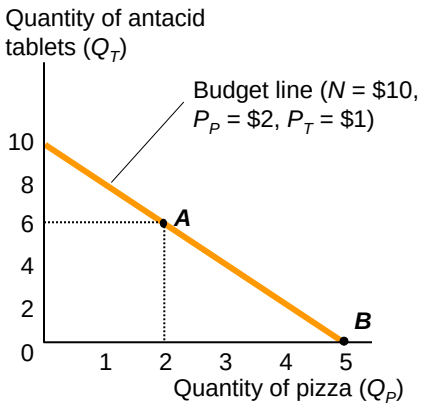
- The slope of the budget line is: “rise over run”.
  - If you buy one more unit of the good on the horizontal axis (one step to the right) …
  - … how many units of the good on the vertical axis do you have to give (negative step up) …
  - … while remaining on your budget line?
-
  - Sometimes, this is also called

Budget line slope

- In this case, the opportunity cost of the good on the horizontal axis (*P*) in terms of the good on the vertical axis (*T*) is:
  -
- More generally, the opportunity cost of the good on the horizontal axis (*P*) in terms of the good on the vertical axis (*T*) is:
  -
- To see this consider the budget line equation:
- $$Q_P \cdot P_P + Q_T \cdot P_T = N$$
- *Rearranging:*

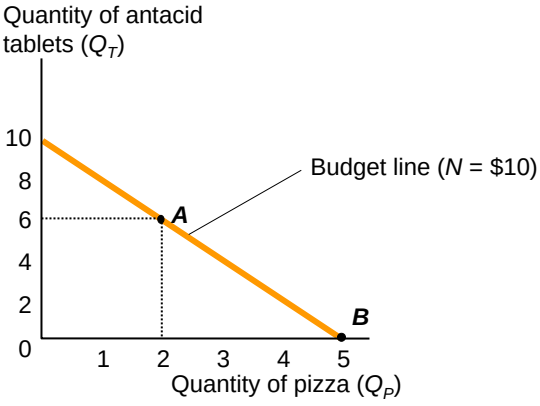
Budget line and price changes

- As the price of the good on the horizontal axis increases, its relative price (the slope of the budget constraint) increases.



Budget line and income changes

- As a consumer's income decreases, the budget line shifts inward.



As you like it

Utility and indifference curves

Utility

- The satisfaction or reward a good or bundle of goods gives you
- **Utility is relative**
  -
  -
- **Utility is ordinal** as opposed to cardinal
  -
  -
- **Utility is individual**
  -

Total Utility v.s. Marginal Utility

Total Utility:

- The total amount of satisfaction obtained from consumption

Marginal Utility:

- The additional satisfaction you gain by consuming one more unit of a good

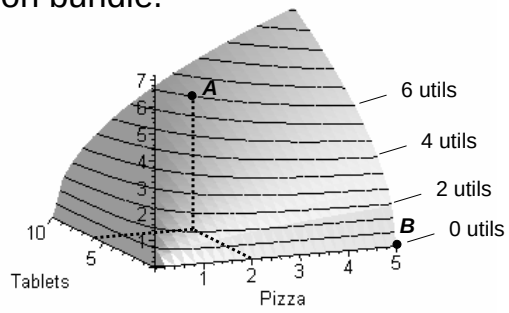
Law of Diminishing Marginal Utility

- The more of a good consumed (in any period) the less utility is generated by each additional (marginal) unit
  - e.g. the first v.s. fourth and fifth slices of pizza

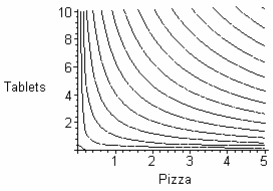
# Slices	Total Utility	Marginal Utility
0	0	
1	12	
2	22	
3	28	
4	32	
5	32	

Utility function

- A consumer's *utility function* tells you the level of satisfaction, or *total utility*, that the consumer gets from each consumption bundle.

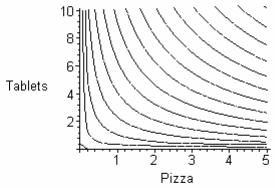


Utility and indifference curves



Indifference curves

- Which indifference curve a consumption bundle lies on shows graphically the level of total utility for that consumption bundle.



"Nice" indifference curves

- We'll assume that consumers' preferences are *monotone*.
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- This means indifference curves "further out" represent bundles that are more preferred.
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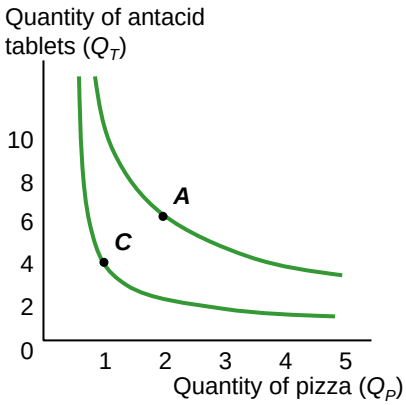
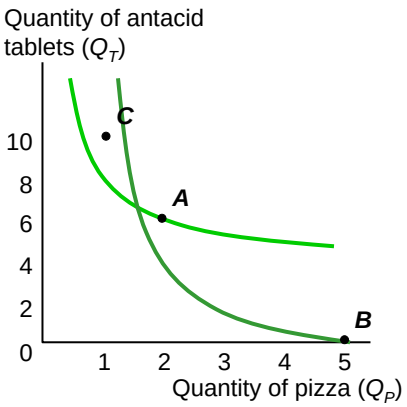


“Nice” indifference curves

- A rational consumer is one that has preferences that are *transitive*.
  - Transitivity means that if the consumer:
    - prefers consumption bundle A to consumption bundle B, and
    - prefers consumption bundle B to consumption bundle C, then
    -
- This rules out “crossing” indifference curves.



“Nice” indifference curves

- We’ll also assume that indifference curves have a convex shape.
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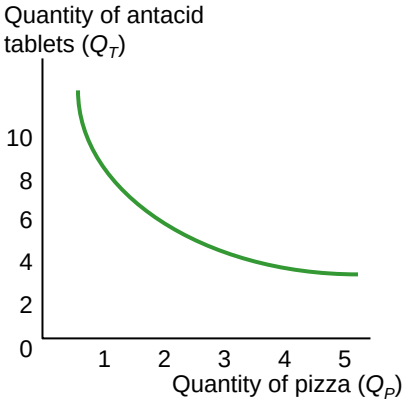
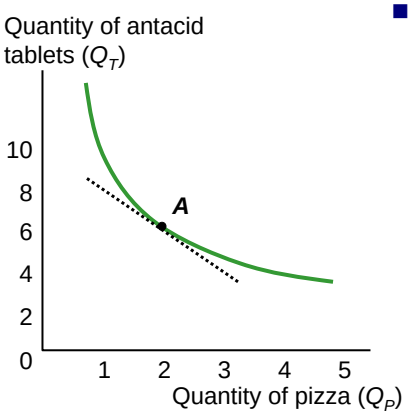


Marginal rate of substitution



- Suppose I give you one more unit of the good on the horizontal axis. How much of the good on the vertical axis would you <u>at most</u> be willing to give up?
  -
  - … the (absolute value of the) slope of the indifference curve at some consumption bundle is called the *MRS* at that consumption bundle.
    -

Marginal rate of substitution

- As you get one more slice of pizza, and give up antacid tablets in place of it, your total utility remains the same.
  - How much does your total utility change from one more slice of pizza?
    - From ΔQ_P more slices of pizza, your total utility changes by
  - How much does your total utility change from one more antacid table?
    - From ΔQ_T more antacid tablets, your total utility changes by

Marginal rate of substitution

- As you get one more slice of pizza, and give up antacid tablets in place of it, your total utility remains the same.
  - In other words, the change in total utility from more pizza and the change in total utility from fewer antacid tablets adds up to zero.
  -
  -
  -
-

Why are indifference curves convex?

- Why does the slope become flatter?
- Slope = MRS = MU_P/MU_T
- Recall: law of diminishing marginal utility

left to right: consume fewer tablets and more pizza

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-
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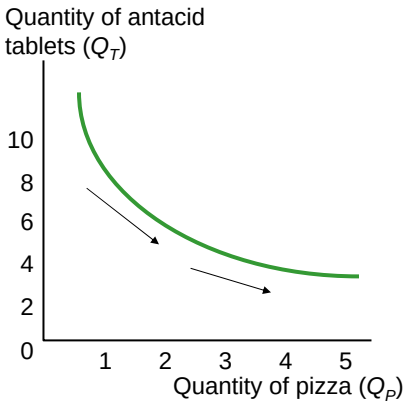
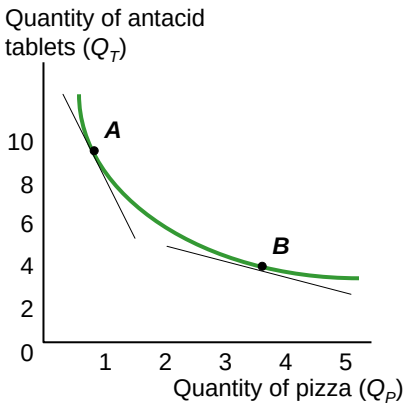


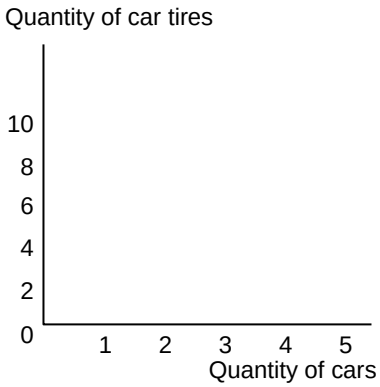
Why are indifference curves convex?

- At a point like A
  - You have lots of antacid
  -
  -
- At a point like B
  - You have lots of pizza and little antacid
  -
  -



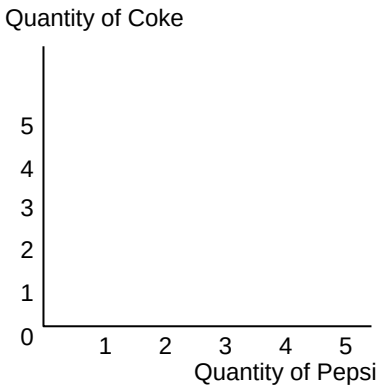
Special indifference curves

- Two goods that you always want to consume in the same ratio are called *perfect complements*.
  - One more unit of one good makes you no better off
  - Only get higher utility with more of both goods
  - Example:



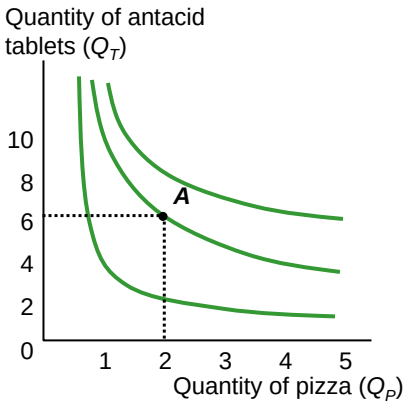
Special indifference curves

- Two goods for which the MRS is always the same are called *perfect substitutes*.
- Willing to trade off the two goods at a constant rate
  - Example:



Optimal consumption bundle

- We now have all the information we need to solve for the optimal bundle
- Example:
  - Suppose a consumer has the following indifference curves representing her preferences:
  - And suppose that:
    - N = \$10
    - P_P = \$2
    - P_T = \$1



Tangency condition

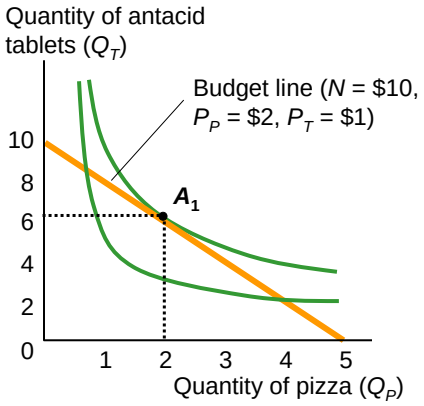
- Utility maximization occurs at a point of tangency between the budget constraint and indifference curve
- At the optimal consumption bundle,
  -
  -
  - The rate at which the market allows the consumer to exchange antacid for pizza equals the rate at which the consumer is willing to exchange antacid for pizza

Tangency condition

- We can rewrite the tangency condition as follows
  - $P_P / P_T = MU_P / MU_T$
  -
- The "law of the equal bang for the buck":
  -
- Why?
- Suppose instead that $MU_T / P_T > MU_P / P_P$
-

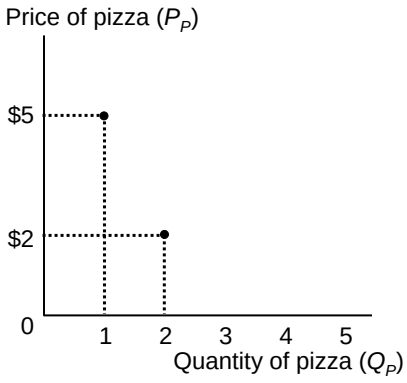
Changing prices

- As the price of the good on the horizontal axis increases, the optimal quantity of that good consumed changes.
  - (Of the other good too, but we don't care.)



Summary of consumer decisions

- As the price of a good changes, we keep track of how much of that good the individual consumer chooses to consume.
  - This is the *individual demand* curve.

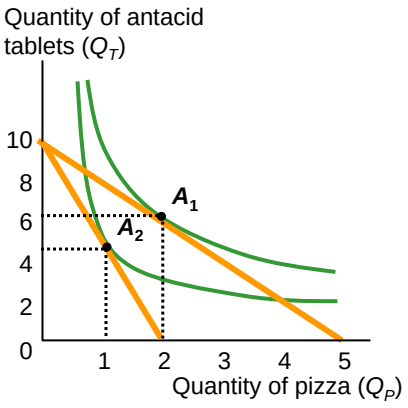


Understanding individual demand

Income and substitution effects

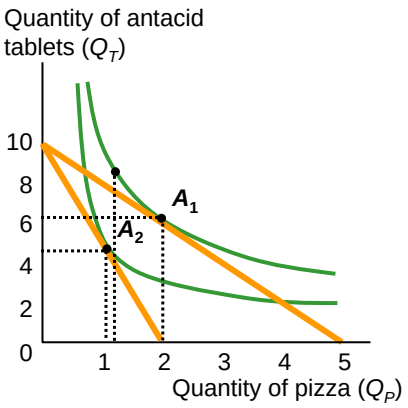
Income and substitution effects

- As the price of pizza increases, two things happen:
  - The relative price of pizza increases …
  - … and the consumer becomes "poorer"



Income and substitution effects

- As the price of pizza increases, two things happen:
  - The *substitution effect* …
    - (the consumer substitutes away from the relatively more expensive pizza)
  - … and the *income effect*
    - (the consumer consumes – more or less? – pizza as real income falls)



Normal and inferior goods

- As income changes, will a consumer consume more or less of a good?
- Goods for which consumption falls as income falls are *normal goods*.
- Goods for which consumption rises as income falls are *inferior goods*.

Do demand curves slope down?

- For a normal good, definitely yes:
  - As price rises …
    -
    -
- For an inferior good, maybe:
  - As price rises …
    -
    -
  - Now it depends on which effect is stronger.
    - If the substitution effect is stronger, everything is fine.
    - If the income effect is stronger, we have a problem
- The “law of demand”: demand curves slope down