Principles of Economics

Discussion Session 7: Consumer Choice

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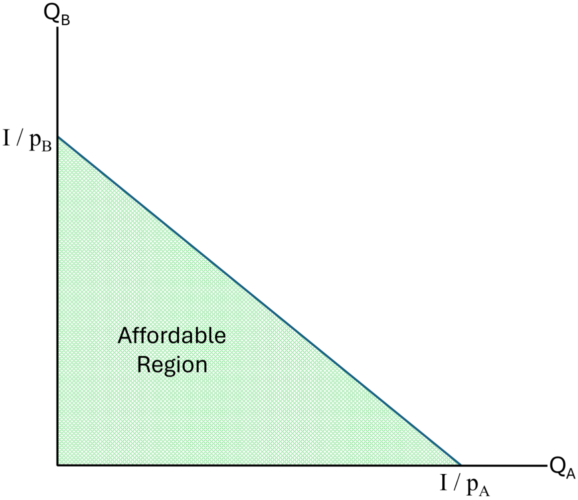
The Budget Constraint

Describes all combinations of Q_A and Q_B that are within your budget.



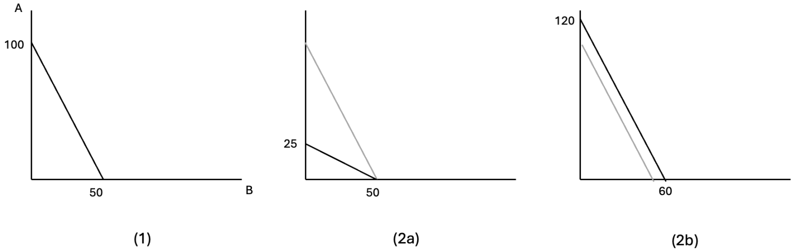
Exercise 1: Budget Constraint

Q1: Consider two goods, A and B, with $P_A = \$1$ and $P_B = \$2$. Suppose income is \$100.

1. Draw the budget constraint and label the intercepts.
2. How will the budget constraint be affected if
   - P_A increases to \$4?
   - Income increases to \$120? (and P_A goes back to \$1)

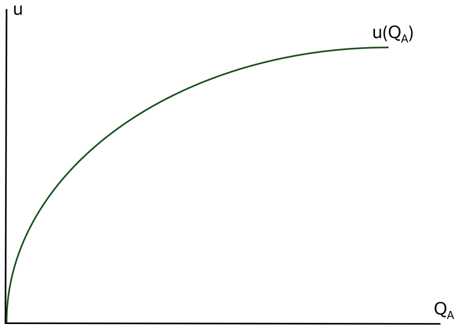
Exercise 1: Budget Constraint

Solution:



Utility Function

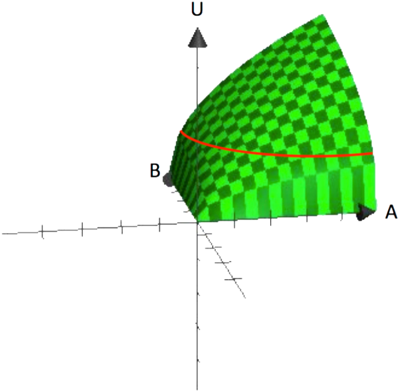
- Describes the satisfaction or "utility" that one receives from consuming a good
- Concave $\implies$ diminishing marginal utility



- But what if we want to compare the utility from both goods A and B?

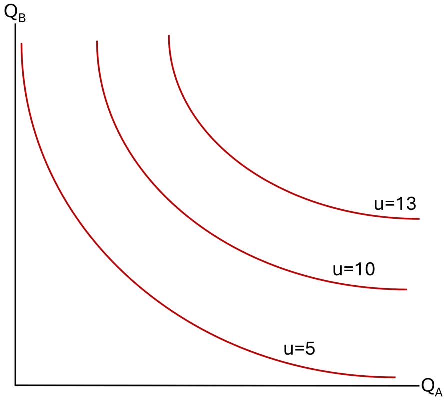
Utility in 3 Dimensions

- Add another axis!
  $\Longrightarrow$ Utility depends on Q_A and Q_B
- Can translate this to 2D by depicting curves where utility is constant
  - Like a topographical map



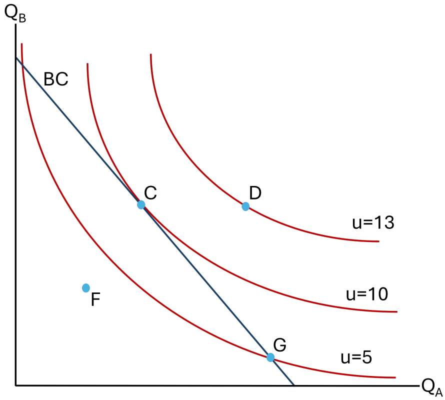
Indifference Curves

- Every combination of A and B along the same curve gives the same utility
- The consumer is “indifferent” between all points on the same curve



Optimal Consumption Point

- Consumer maximizes utility subject to budget constraint.
- "Climb as high up the hill as possible" while staying behind the BC.



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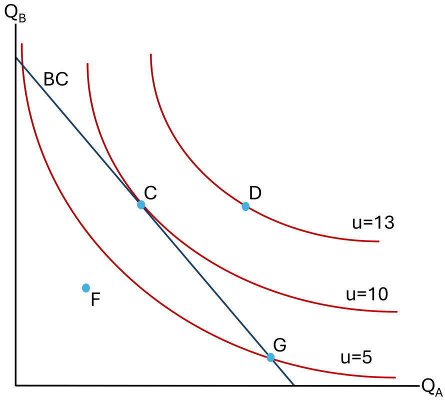
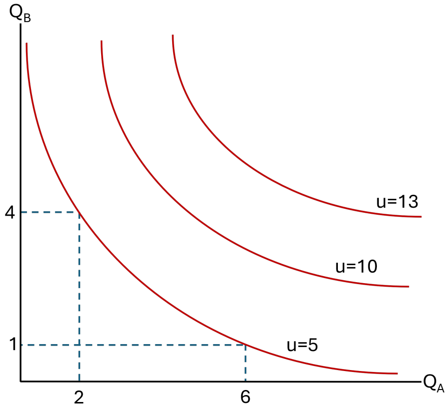


- At point C, the (negative) slope of the BC is equal to the MRS (slope of the IC)

Marginal Rate of Substitution

- MRS: How much B I'm willing to give up for one unit of A.
- Just the negative slope of the indifference curve between two points: $MRS = -(B_1 - B_2)/(A_1 - A_2)$



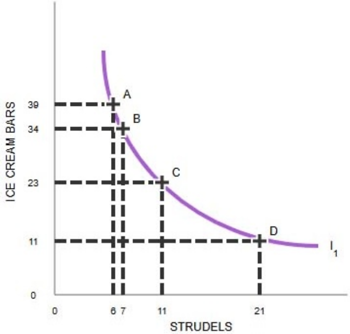
- In this case, $MRS = 3/4$. "I can give up 3/4 bananas for 1 apple and be indifferent".

Exercise 2: Indifference Curve & Optimal Choice

Q1: Consider the following indifference curve.

1. Calculate the marginal rate of substitution (MRS) from point B to C
2. Suppose the price of ice cream bars and strudels are both \$10. Your income is \$110. Draw and label your budget constraint and mark the optimal choice in relation to an indifference curve.
3. Suppose your income increases to \$220. How will your optimal choice change if
   - ice cream bar is a normal good?
   - ice cream bar is an inferior good?

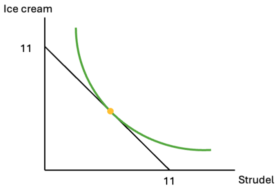
   How must your indifference curves be shaped in each of those scenarios?



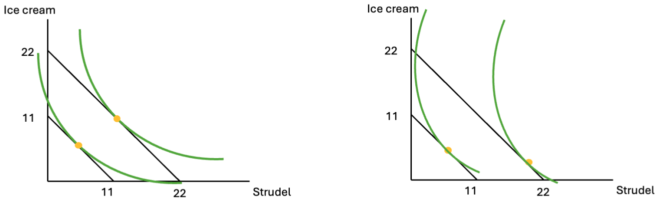
Exercise 2: Indifference Curve & Optimal Choice

Solution:

1. $MRS = \frac{34-23}{11-7} = \frac{11}{4}$
2. The optimal choice is the tangent point of the indifference curve to the budget line



3. Changes in optimal choice:



(a) Normal Good (b) Inferior Good

Externalities

- When a market transaction effects a third party.
- **Negative Externality:** The third party is negatively effected.
    - Quantity produced is too high.
    - Policy response is a tax.
- **Positive Externality:** The third party is positively effected.
    - Quantity produced is too low.
    - Policy response is a subsidy.

Exercise 3: Externalities

Q1: Consider the following market for beers:

- $Q^D = 20 - P$
- $Q^S = P - 2$

Suppose that drinking beers at a party makes the party more fun for everybody, including non-drinkers, to the tune of \$2 of fun per beer.

1. Find the market equilibrium quantity.
2. What kind of externality is this?
3. What is the appropriate policy response?
4. How big should the response be?
5. Assume the policy is implemented. Find the socially optimal quantity.

Exercise 3: Externalities

Solution:

1. $P = 11, \; Q = 9$
2. Positive
3. Beer should be subsidized
4. The size of the externality: $\sigma = \$2$
5. $P^D = P^S - 2$, so

$$\begin{aligned} Q^D(P^D) &= Q^S(P^S) \\ 20 - P^D &= P^S - 2 \\ 20 - (P^S - 2) &= P^S - 2 \\ \implies \quad P^S &= 12, \\ P^D &= 10, \\ Q^{\text{optimal}} &= 10. \end{aligned}$$