

Principles of Economics

Discussion Session 7: Consumer Choice

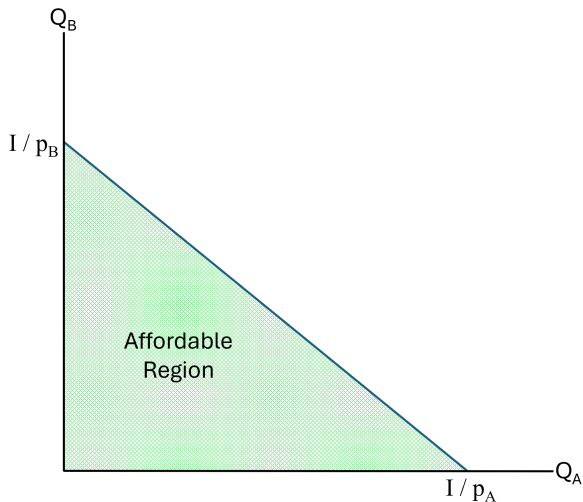
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The Budget Constraint

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



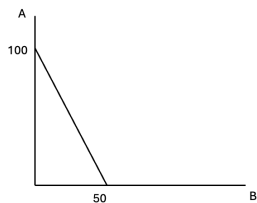
Exercise 1: Budget Constraint

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

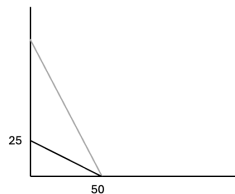
- ① Draw the budget constraint and label the intercepts.
- ② How will the budget constraint be affected if
 - P_A increases to \$4?
 - Income increases to \$120? (and P_A goes back to \$1)

Exercise 1: Budget Constraint

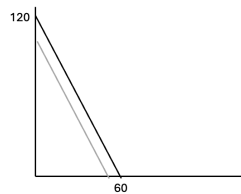
Solution:



(1)



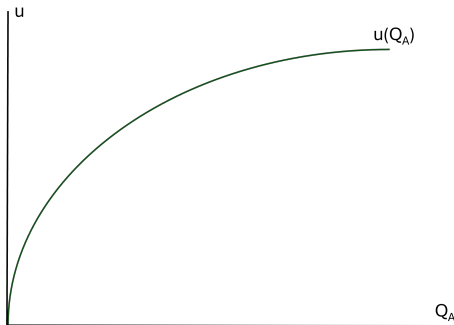
(2a)



(2b)

Utility Function

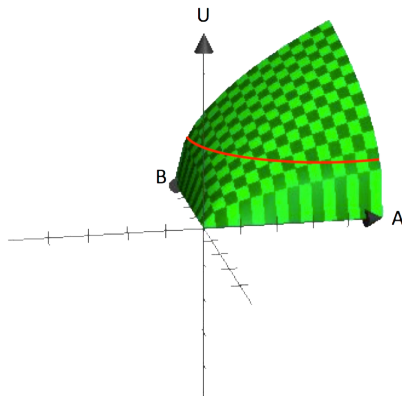
- Describes the satisfaction or “utility” that one receives from consuming a good
- Concave \implies diminishing marginal utility



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

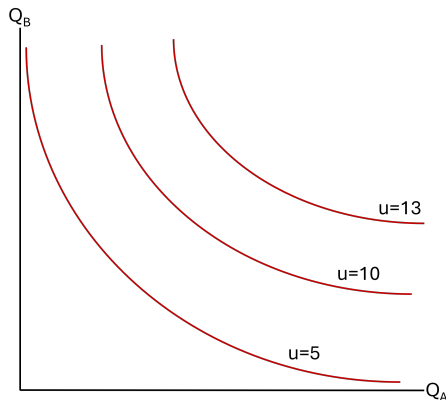
Utility in 3 Dimensions

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



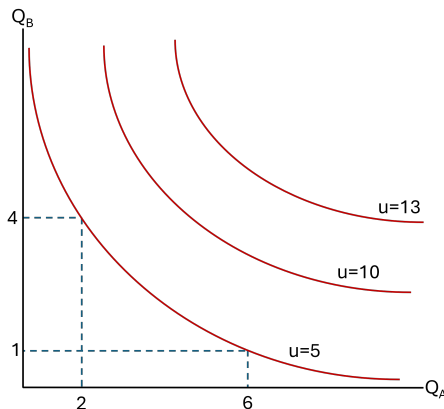
Indifference Curves

- 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



Marginal Rate of Substitution

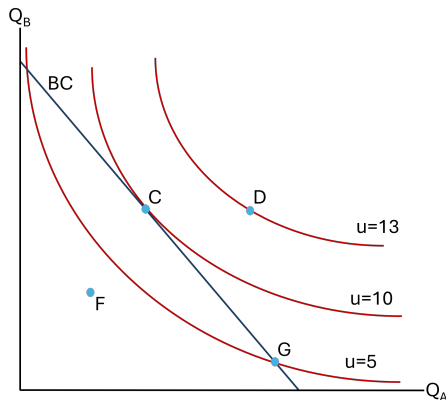
- MRS: How much B I'm willing to give up for one unit of A .
- Just the negative slope of the indifference curve between two points:
$$MRS = -(B_1 - B_2)/(A_1 - A_2)$$



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

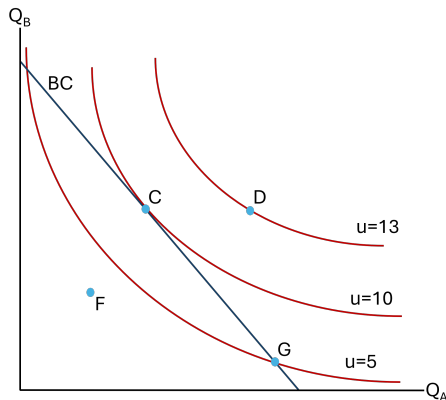
Optimal Consumption Point

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



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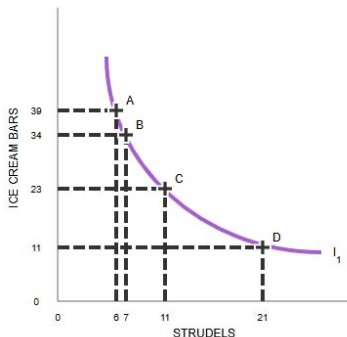
- At point C , the (negative) slope of the BC is equal to the MRS (slope of the IC)

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?

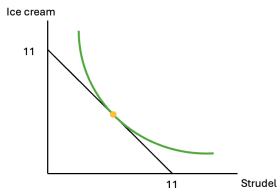
How must your indifference curves be shaped in each of those scenarios?



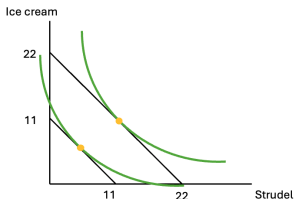
Exercise 2: Indifference Curve & Optimal Choice

Solution:

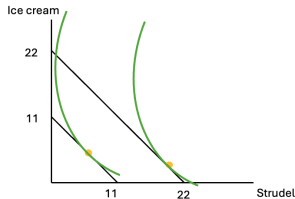
- 1 $MRS = \frac{34-23}{11-7} = \frac{11}{4}$
- 2 The optimal choice is the tangent point of the indifference curve to the budget line



- 3 Changes in optimal choice:



(a) Normal Good



(b) Inferior Good

- 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

$$Q^D(P^D) = Q^S(P^S)$$

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

$$20 - (P^S - 2) = P^S - 2$$

$$\implies P^S = 12,$$

$$P^D = 10,$$

$$Q^{\text{optimal}} = 10.$$