ECON2103 Microeconomics

Chapter 3 Consumer Behavior

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Outline

1. Consumer Preferences
2. Budget Constraints
3. Consumer Choice
4. Revealed Preference
5. Marginal Utility and Consumer Choice
6. Summary and Exercises

Consumer Behavior

theory of consumer behavior - Description of how consumers allocate incomes among different goods and services to maximize their well-being.

Consumer behavior is best understood in three distinct steps:

1. Consumer preferences
2. Budget constraints
3. Consumer choices

Market Baskets

market basket (or bundle) - List with specific quantities of one or more goods.

TABLE 3.1 **ALTERNATIVE MARKET BASKETS**

MARKET BASKET	UNITS OF FOOD	UNITS OF CLOTHING
A	20	30
B	10	50
D	40	20
E	30	40
G	10	20
H	10	40

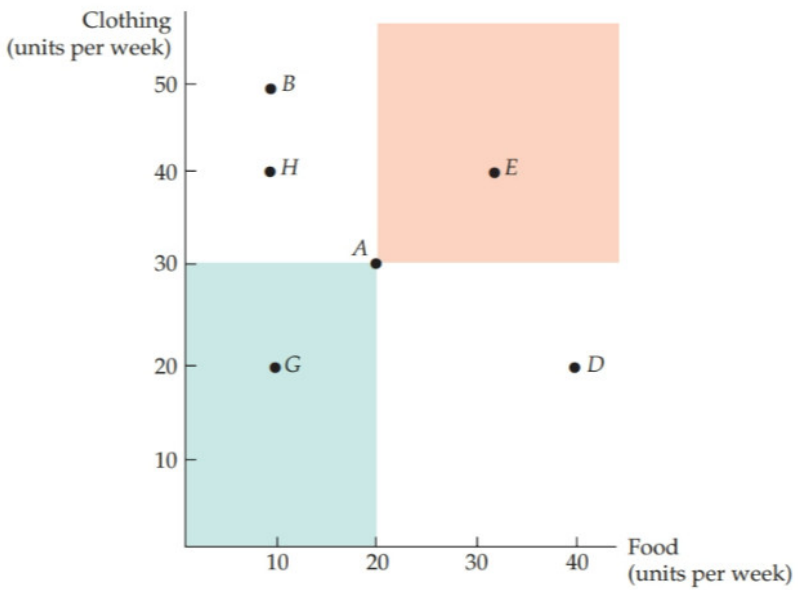
Note: We will avoid the use of the letters C and F to represent market baskets, whenever market baskets might be confused with the number of units of food and clothing.

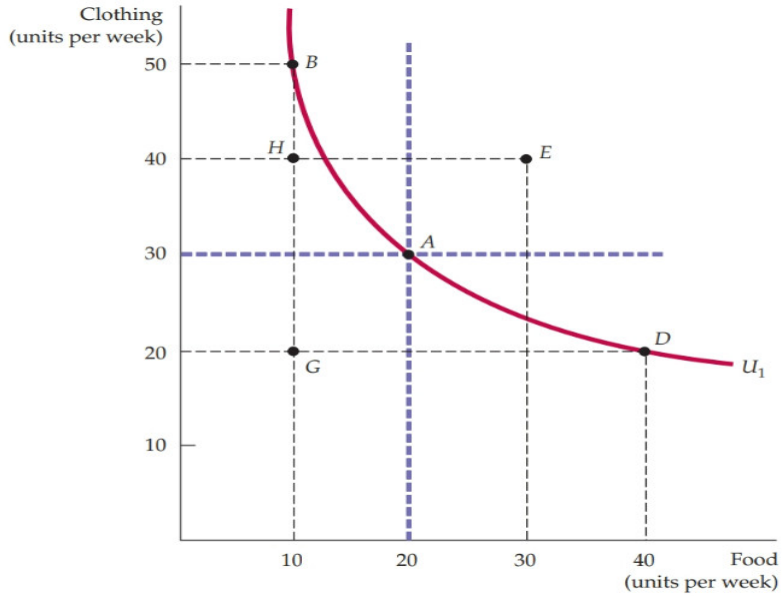
Basic Assumptions

1. **Completeness:** Preferences are assumed to be *complete*. In other words, consumers can compare and rank all possible baskets.
   - Preferences ignore costs. A consumer might prefer steak to hamburger but buy hamburger because it is cheaper.
2. **Transitivity:** Preferences are transitive. If a consumer prefers basket A to basket B and basket B to basket C, then the consumer also prefers A to C.
3. **More is better than less:** Consumers always prefer more of any good to less. They are never satisfied or satiated.

Indifference Curve

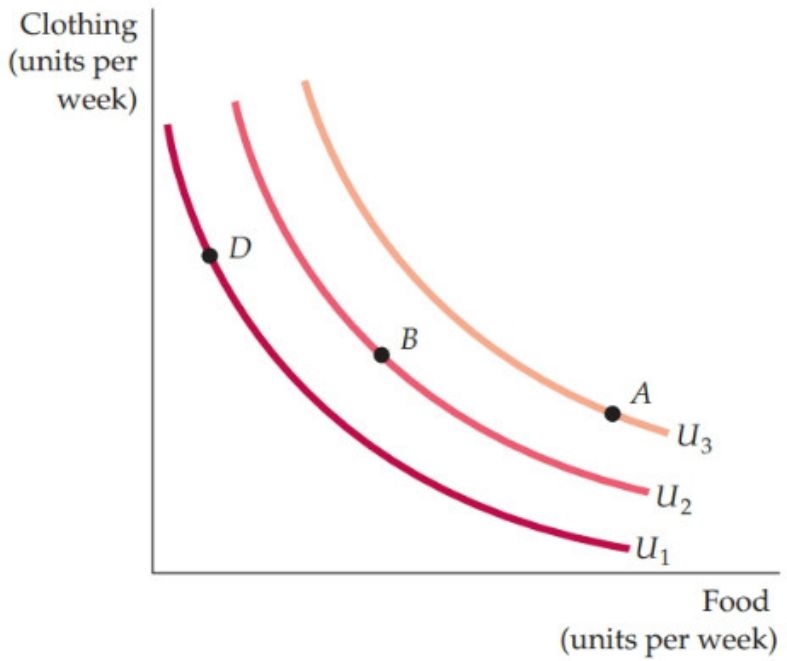
indifference curve - Curve representing all combinations of market baskets that provide a consumer with the same level of satisfaction.





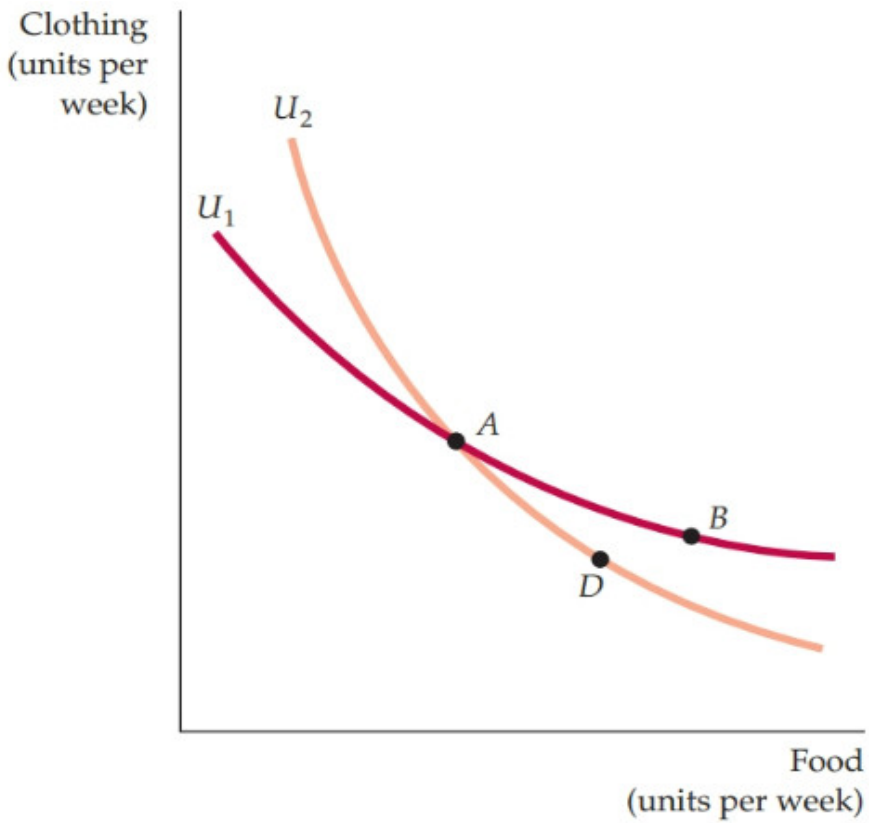
Indifference Map

indifference map - Graph containing a set of indifference curves showing the market baskets among which a consumer is indifferent.



What is the preference ranking of the market baskets A, B, and D?

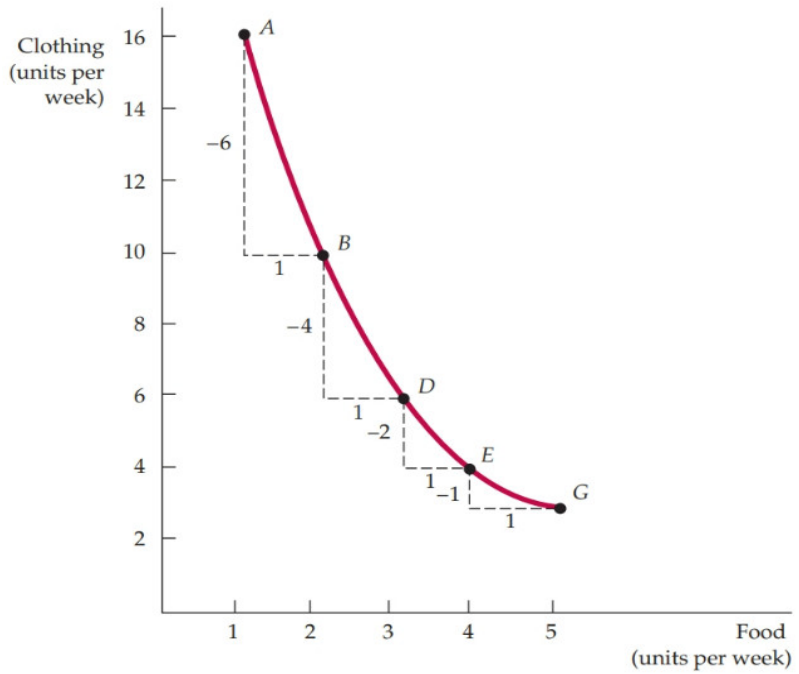
Indifference Curves CANNOT Intersect



Why cannot indifference curves intersect?

Marginal Rate of Substitution

marginal rate of substitution (MRS) - Maximum amount of a good that a consumer is willing to give up in order to obtain one additional unit of another good.



Convexity

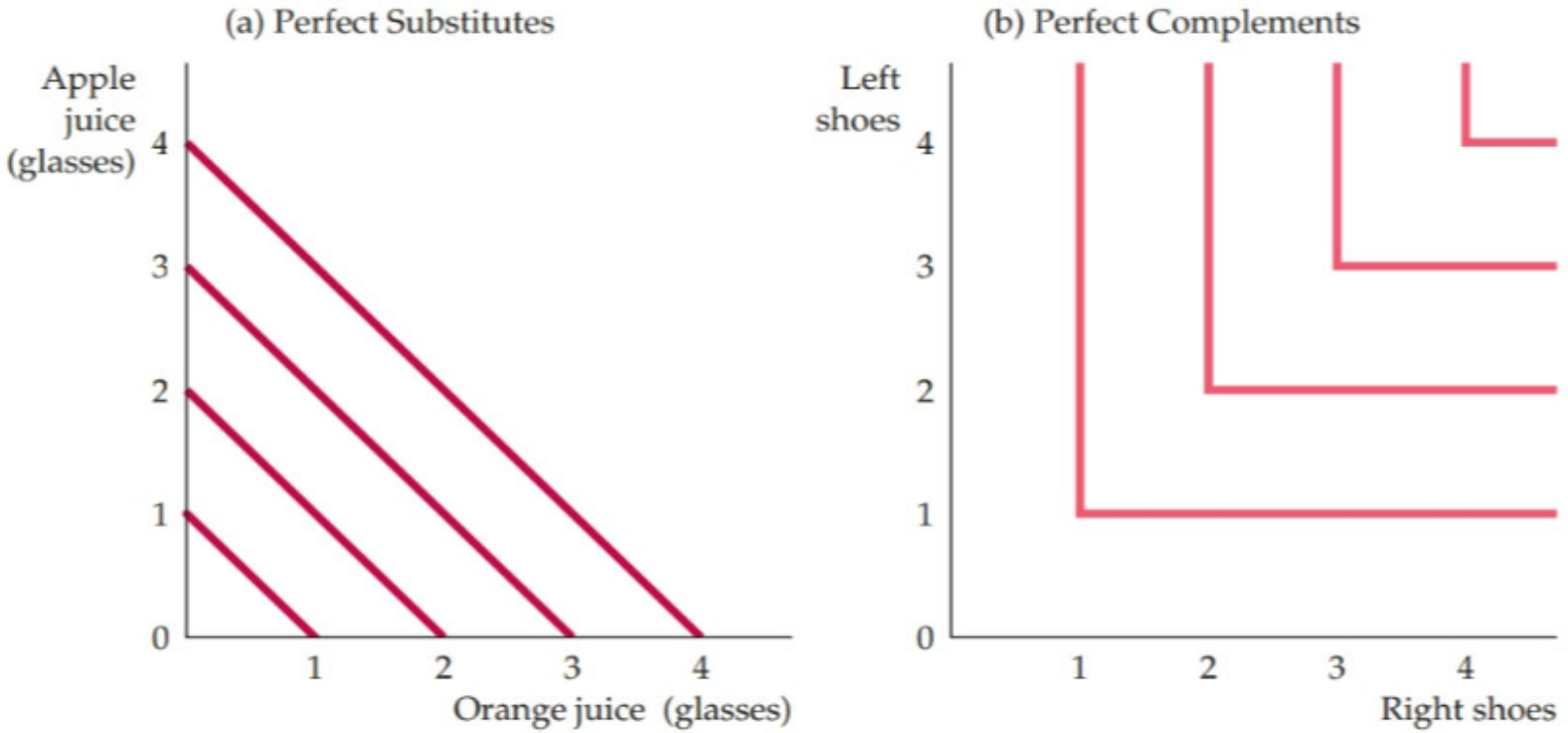
convex - The slope of the indifference curve *increases* (i.e., becomes less negative).

An indifference curve is convex if the MRS diminishes along the curve, which is the fourth assumption regarding consumer preferences: **Diminishing marginal rate of substitution.**

Perfect Substitutes and Perfect Complements

- **perfect substitutes** - Two goods for which the marginal rate of substitution of one for the other is a constant.
- **perfect complements** - Two goods for which the MRS is zero or infinite; the indifference curves are shaped as right angles.
- **bad** - Good for which less is perferred rather than more, e.g., air pollution.

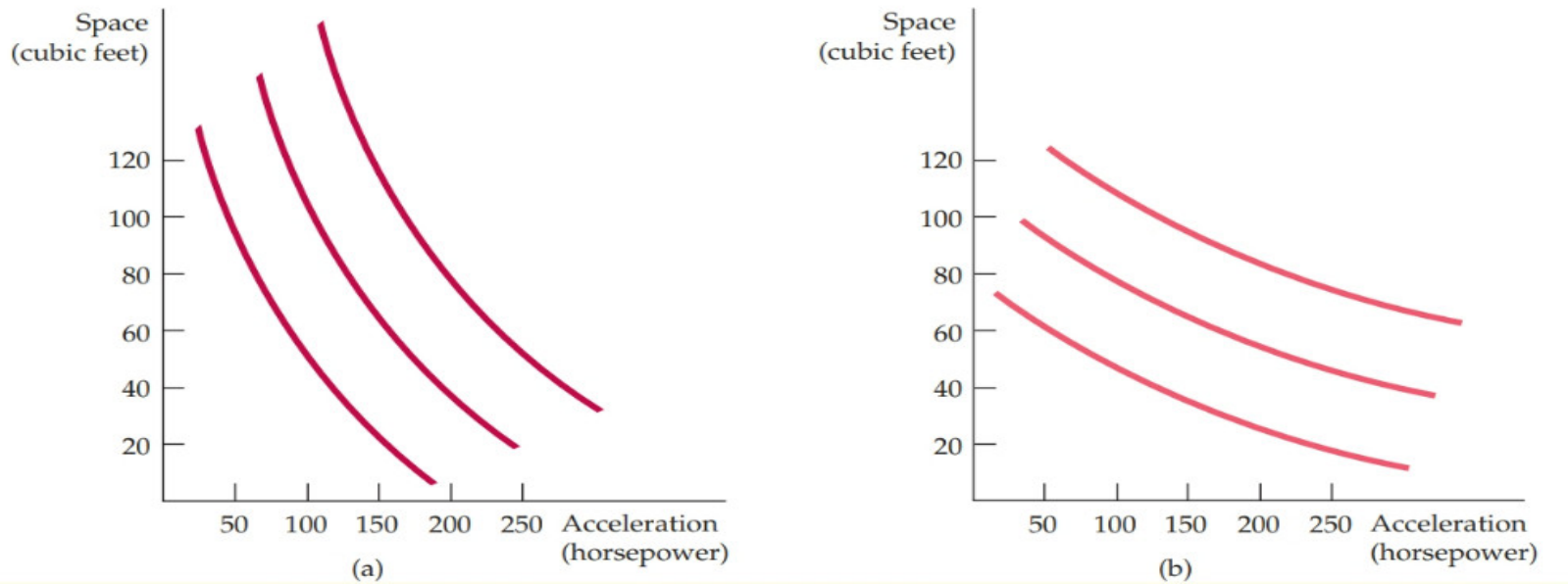
Perfect Substitutes and Perfect Complements



The slope of the indifference curves need not be -1 in the case of perfect substitutes.

Example: Designing New Automobiles

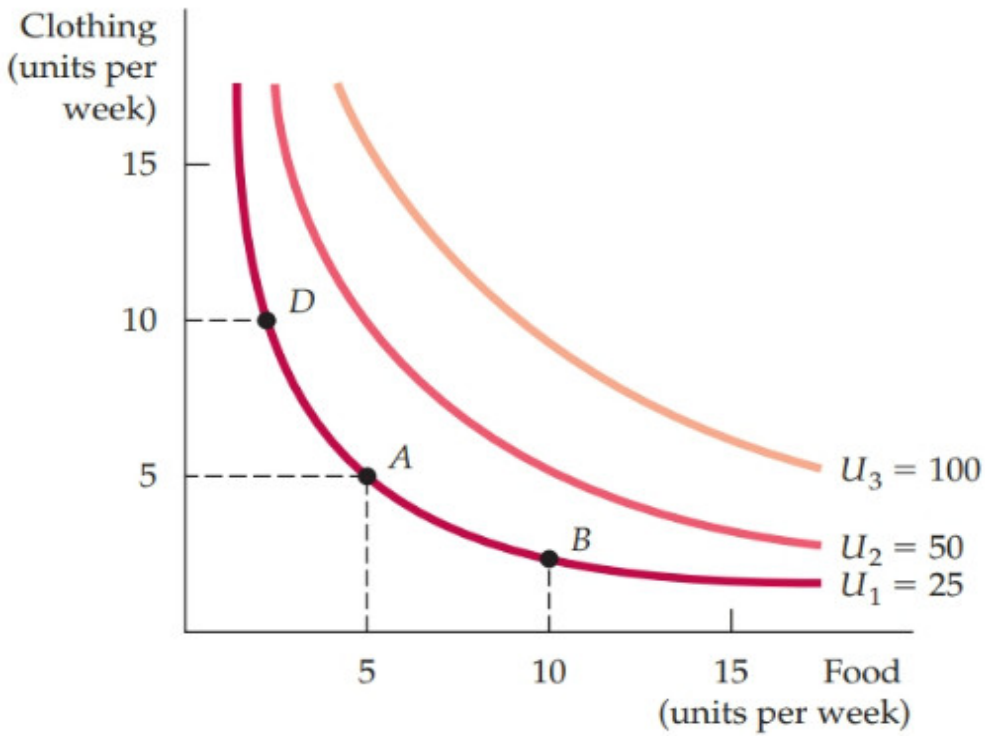
Preferences for automobile attributes can be described by indifference curves.



- For (a), owners are willing to give up considerable interior space for additional acceleration.
- For (b), owners prefer interior space to acceleration.

Utility and Utility Functions

- **utility** - Numerical score representing the satisfaction that a consumer gets from a given market basket.
- **utility function** - Formula that assigns a level of utility to individual market baskets.



Ordinal Versus Cardinal Utility

- **ordinal utility function** - Utility function that generates a ranking of market baskets in order of most to least preferred.
- **cardinal utility function** - Utility function describing by how much one market basket is preferred to another.
- Because our objective is to understand consumer behavior, all that matters is knowing how consumers rank different baskets. Therefore, we will work only with *ordinal utility functions*.

Budget Constraints

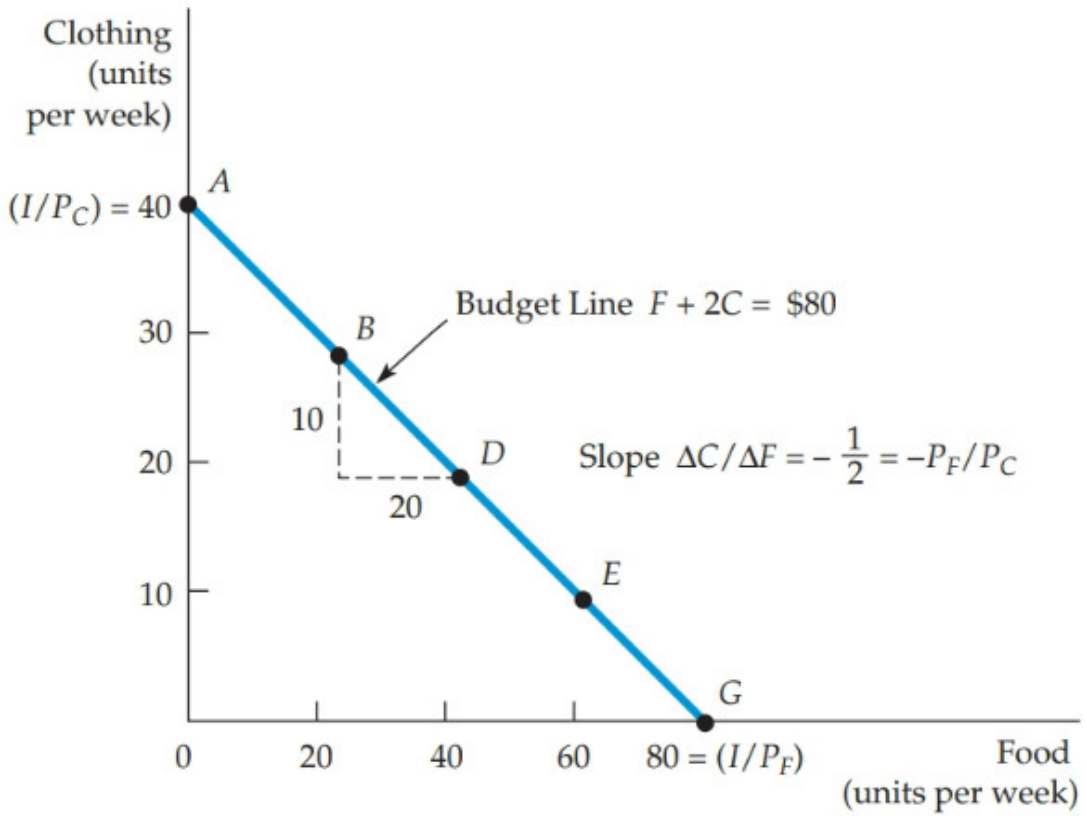
- **budget constraints** - Constraints that consumers face as a result of limited incomes.
- **budget line** - All combinations of goods for which the total amount of money spent is equal to income, for example,

$$P_F F + P_C C = I$$

TABLE 3.2 MARKET BASKETS AND THE BUDGET LINE

MARKET BASKET	FOOD (*F*)	CLOTHING (*C*)	TOTAL SPENDING
A	0	40	$80
B	20	30	$80
D	40	20	$80
E	60	10	$80
G	80	0	$80

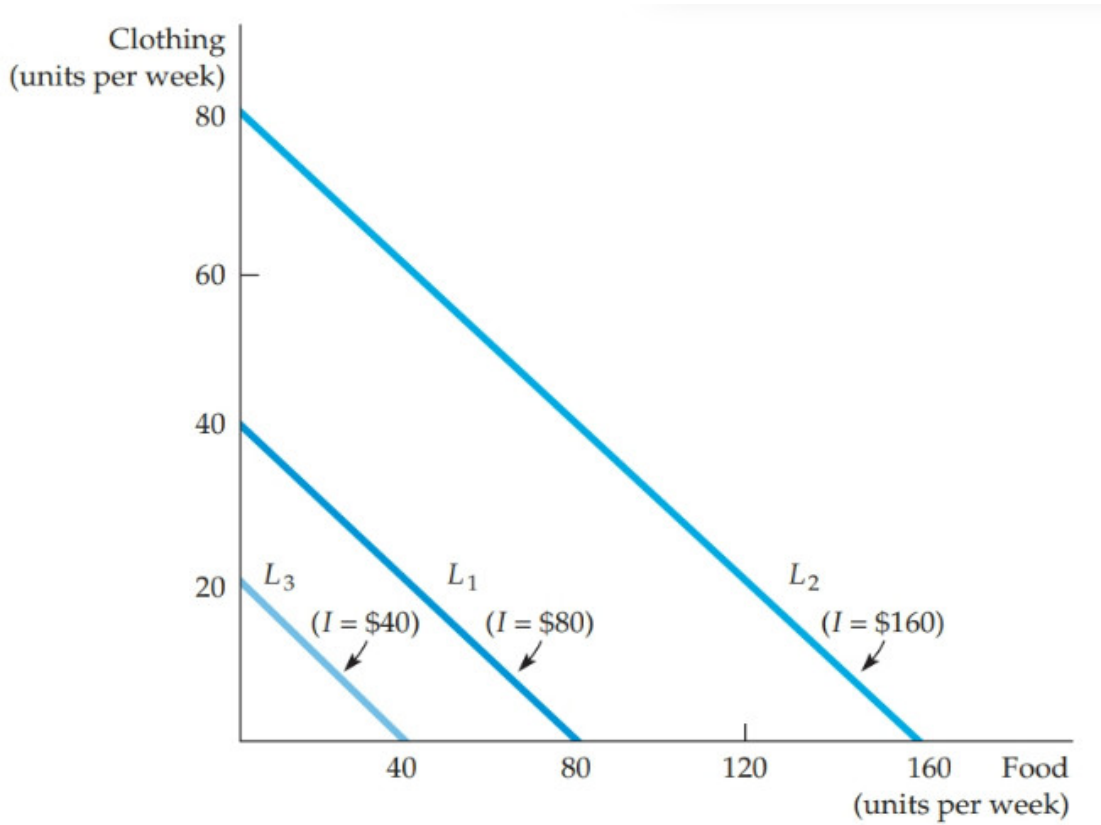
Budget Line



The budget line is $F + 2C = \$80$.

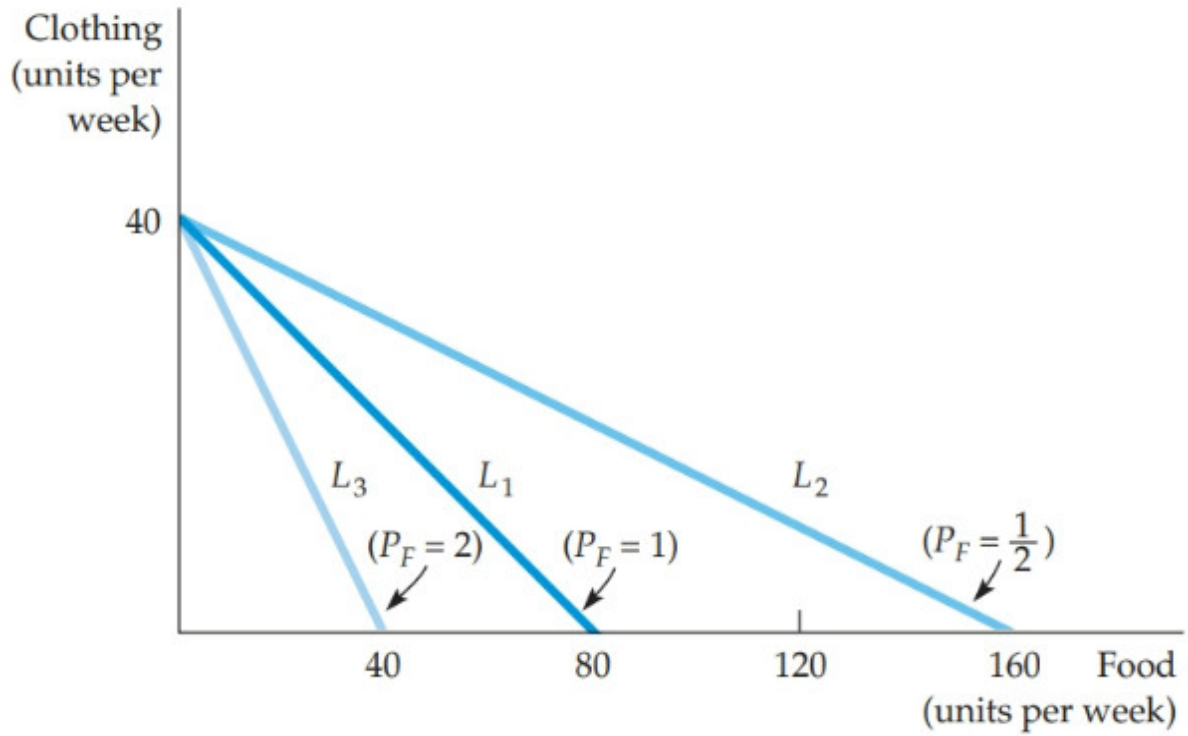
Effects of Changes in Income

Effects of a change in income on the budget line



Effects of Changes in Prices

Effects of a change in price on the budget line

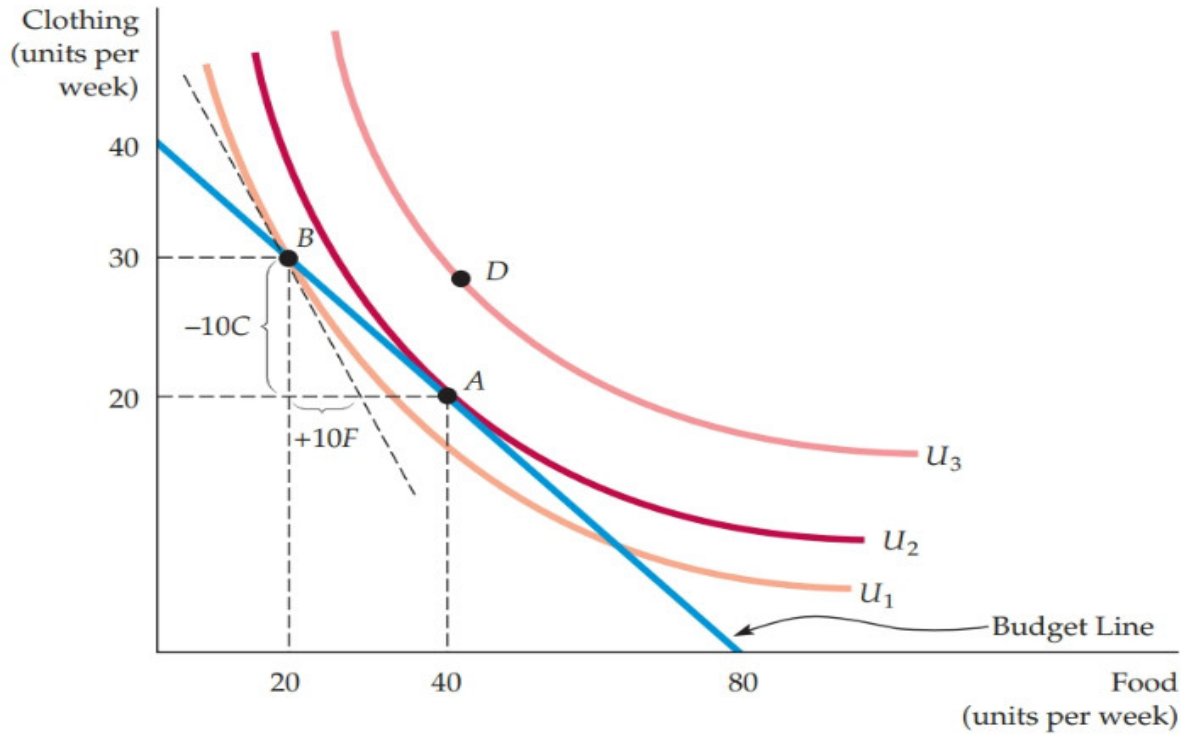


Consumer Choice

The maximizing market basket must satisfy two conditions:

1. It must be located on the budget line.
2. It must give the consumer the most preferred combination of goods and services.

Maximizing Consumer Satisfaction



A consumer maximizes satisfaction by choosing market basket A. At this point, the budget line and indifference curve U_2 are tangent.

Maximizing Consumer Satisfaction (Con't)

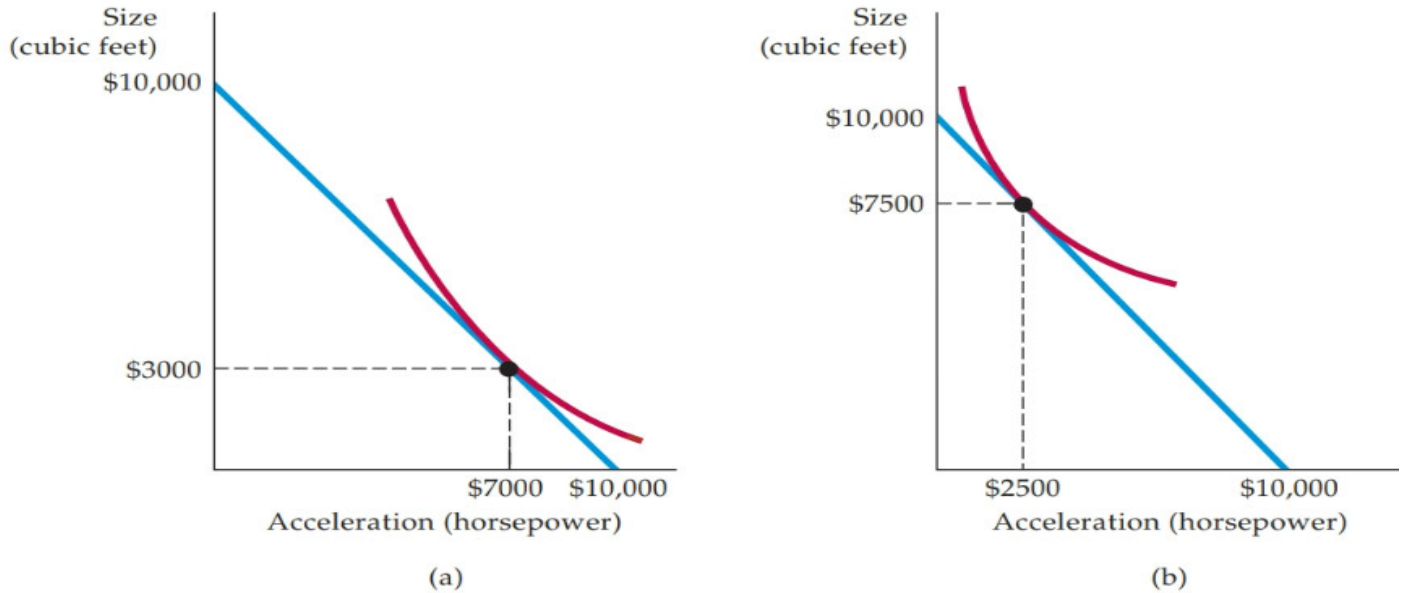
Satisfaction is maximized (given the budget constraint) at the point where

$$MRS = P_F/P_C$$

- **marginal benefit** - Benefit from the consumption of one additional unit of a good.
- **marginal cost** - Cost of one additional unit of a good.
- Satisfaction is maximized when the *marginal benefit is equal to the marginal cost*.

Example: Designing New Automobiles

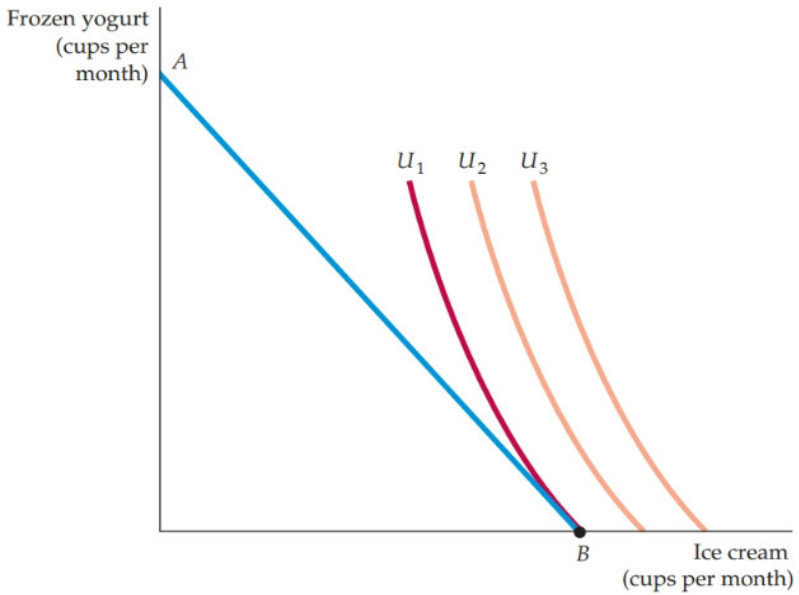
Different preferences of consumer groups for automobiles can affect their purchasing decisions.



- Given a budget constraint, the consumers in (a) will choose a car that emphasizes acceleration.
- The opposite is true for consumers in (b)

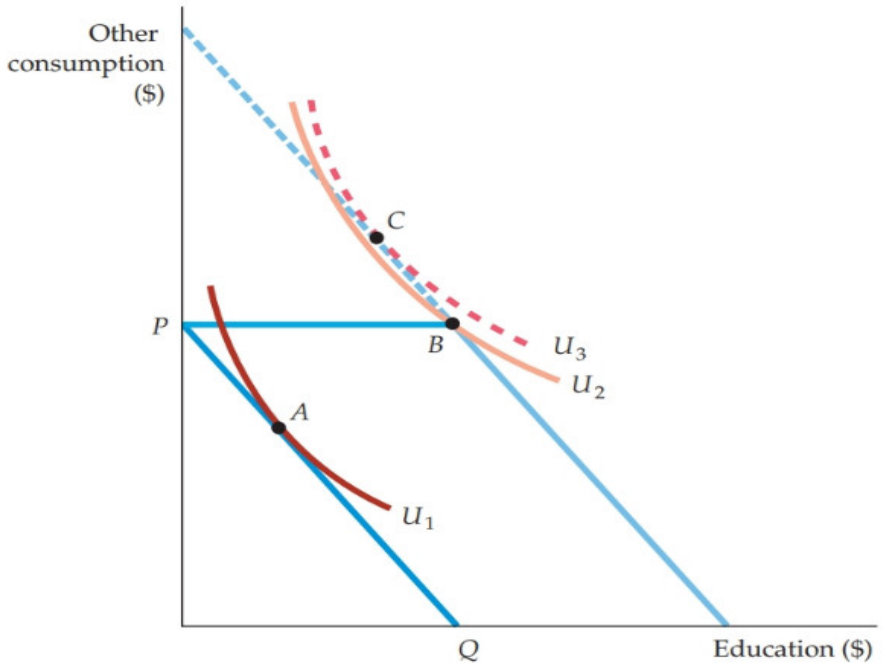
Corner Solutions

corner solution - Situation in which the marginal rate of substitution for one good in a chosen market basket is not equal to the slope of the budget line.



When a corner solution arises, the consumer maximizes satisfaction by consuming only one of the two goods.

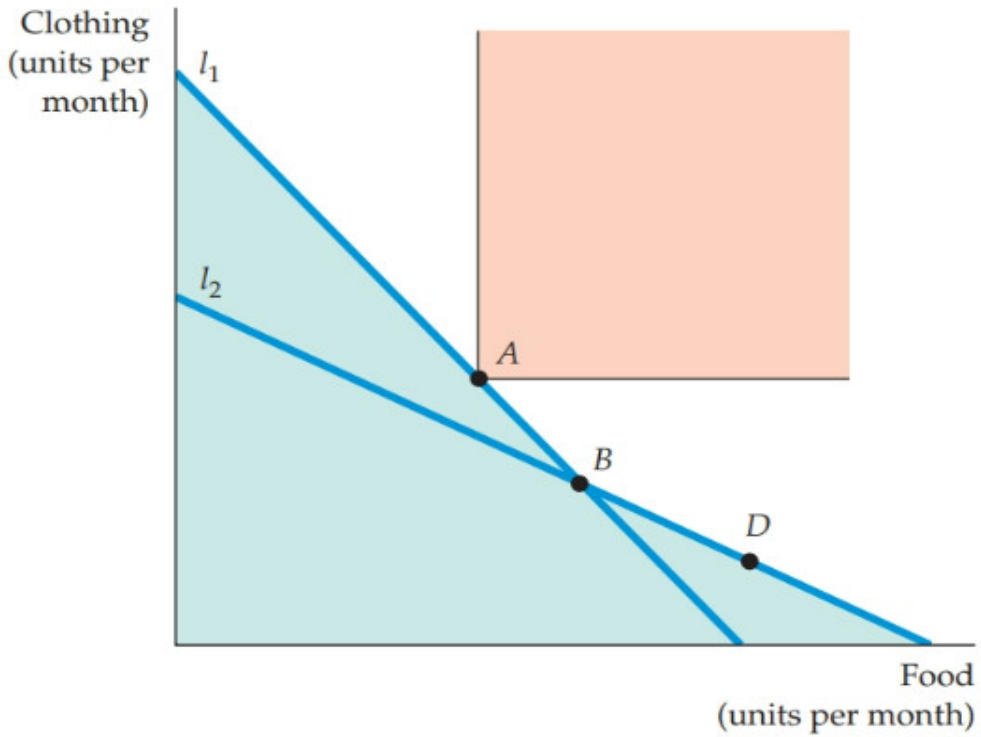
Example: College Trust Fund



- When given a college trust fund that must be spent on education, the student moves from A to B, a corner solution.
- If the trust fund could be spent on other consumption as well as education, the student would be better off at C.

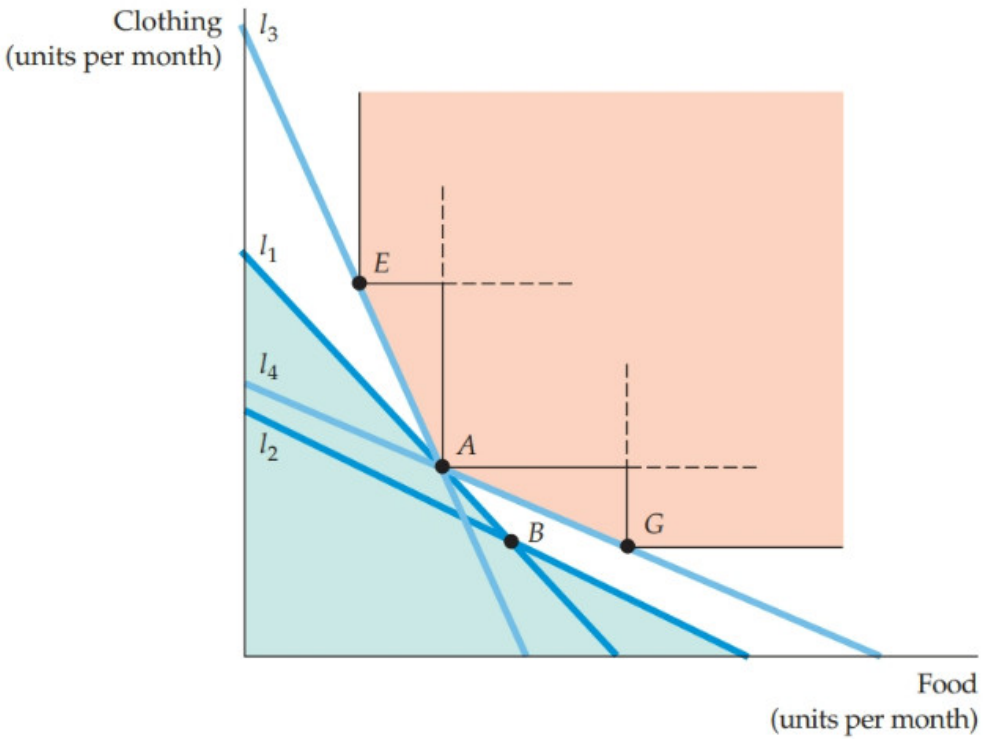
Revealed Preference: Two Budget Lines

The indifference curve passing through A must lie in the unshaded area.



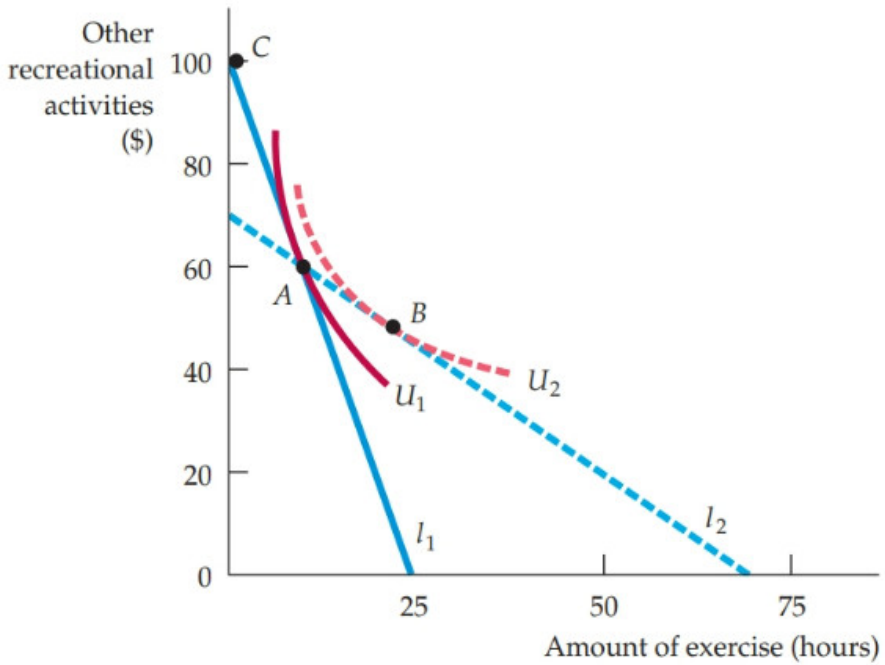
Revealed Preference: Four Budget Lines

The indifference curve passing through A must lie within the unshaded area.



Example: Recreation

Suppose that Roberta has \$100 of income available each week for recreational activities. When a health club charged a fee of \$4 per hour, Roberta used the facility 10 hours per week. Under the new arrangement, she is required to pay \$30 per week but can use the club for only \$1 per hour. Is this change beneficial for Roberta?



Marginal Utility

marginal utility (MU) - Additional satisfaction obtained from consuming one additional unit of a good.
diminishing marginal utility - Principle that as more of a good is consumed, the consumption of additional amounts will yield smaller additions to utility.

$$\begin{aligned} 0 &= MU_F(\Delta F) + MU_C(\Delta C) \\ -(\Delta C/\Delta F) &= MU_F/MU_C \\ MRS &= MU_F/MU_C \end{aligned}$$

Equal Marginal Principle

$$\begin{aligned} MRS &= P_F/P_C \\ MU_F/MU_C &= P_F/P_C \end{aligned}$$

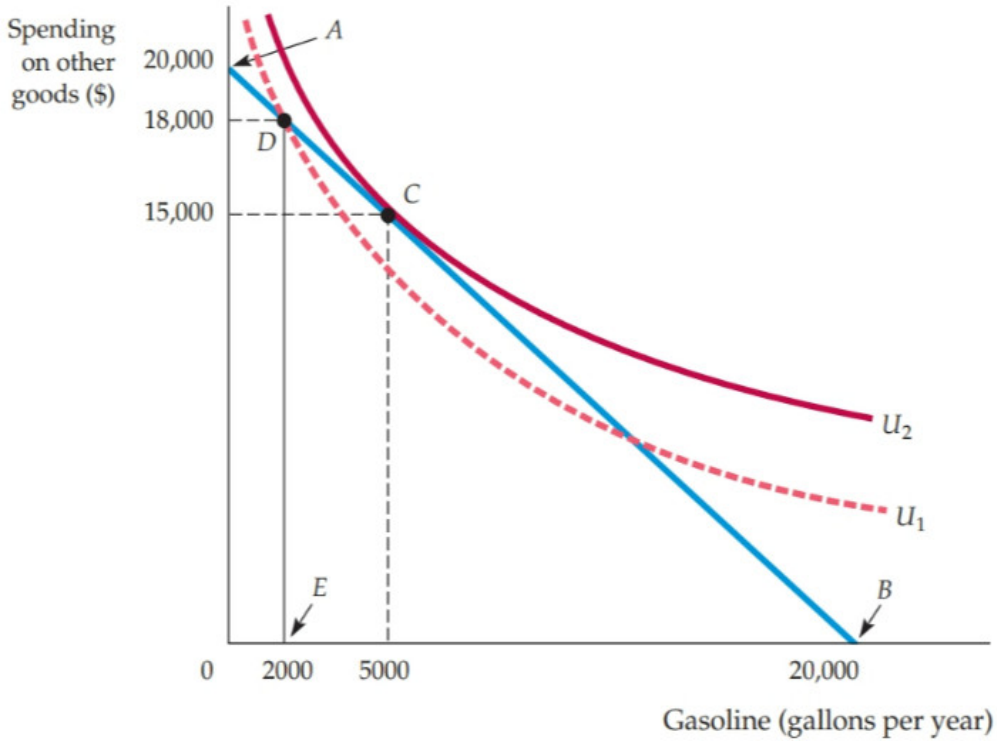
or

$$MU_F/P_F = MU_C/P_C$$

equal marginal principle - Principle that utility is maximized when the consumer has equalized the marginal utility per dollar of expenditure across all goods.

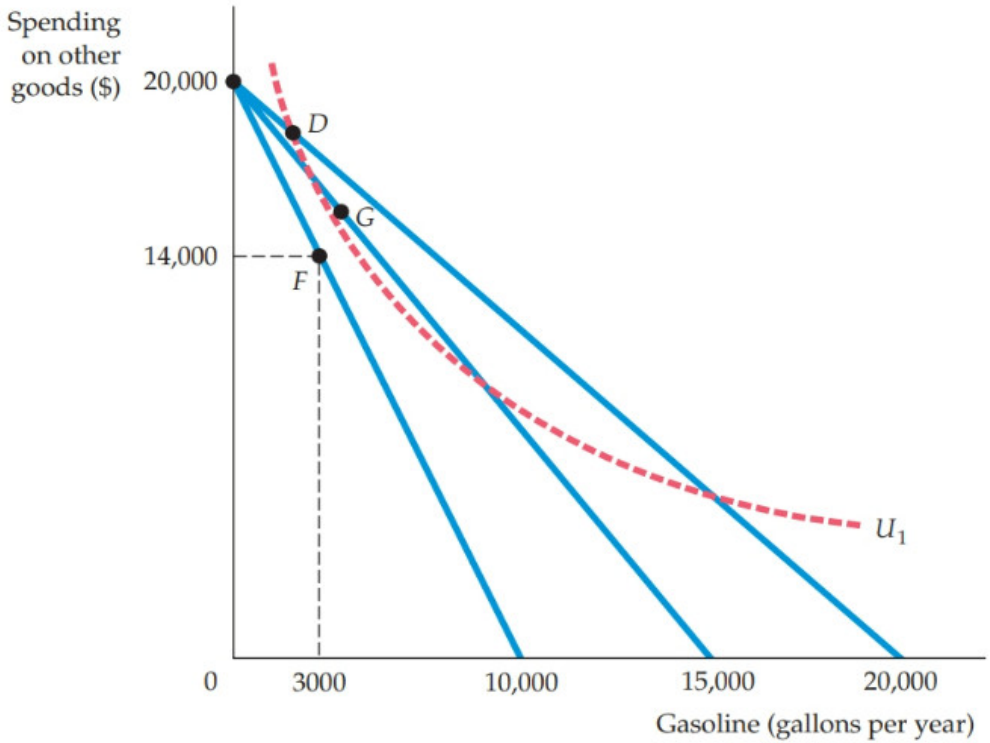
Rationing: Inefficiency of Gasoline Rationing

Suppose the controlled gasoline price is \$1 per gallon, and with rationing, a consumer can purchase up to a maximum of 2000 gallons of gasoline.



Rationing: Comparing Gasoline Rationing to the Free Market

Some consumers will be worse off, but others may be better off with rationing.

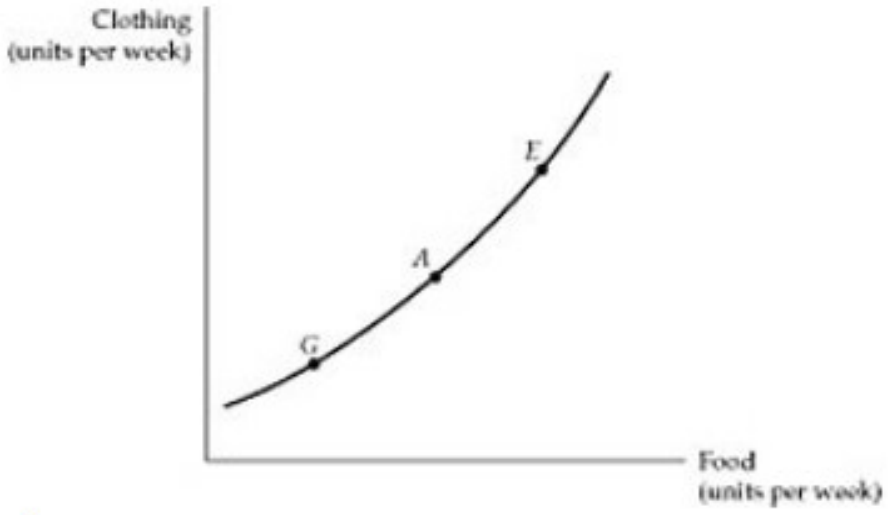


Summary

- Main concepts
  - indifference curve
  - utility
  - marginal rate of substitution (MRS)
  - marginal utility (MU)
- Consumer choice determination
  - consumer preferences
  - budget constraints
  - marginal benefit = marginal cost
  - equal marginal principle

Exercises

1. The shape of an indifference curve like the one in this figure:



   a. represents more realistically the preferences of a rational consumer.
   b. implies that consumer preferences are not complete.
   c. violates the assumption that more is preferred to less.
   d. has market baskets that represent different levels of utility.

Exercises (Con't)

2. Envision a graph with meat on the horizontal axis and vegetables on the vertical axis. A strict vegetarian would have indifference curves that are:
   a. vertical lines.
   b. horizontal lines.
   c. diagonal straight lines.
   d. right angles.
   e. upward sloping.

Exercises (Con't)

3. Suppose that the prices of good A and good B were to suddenly double. If good A is plotted along the horizontal axis,
   a. the budget line will become steeper.
   b. the budget line will become flatter.
   c. the slope of the budget line will not change.
   d. the slope of the budget line will change, but in an indeterminate way.

Exercises (Con't)

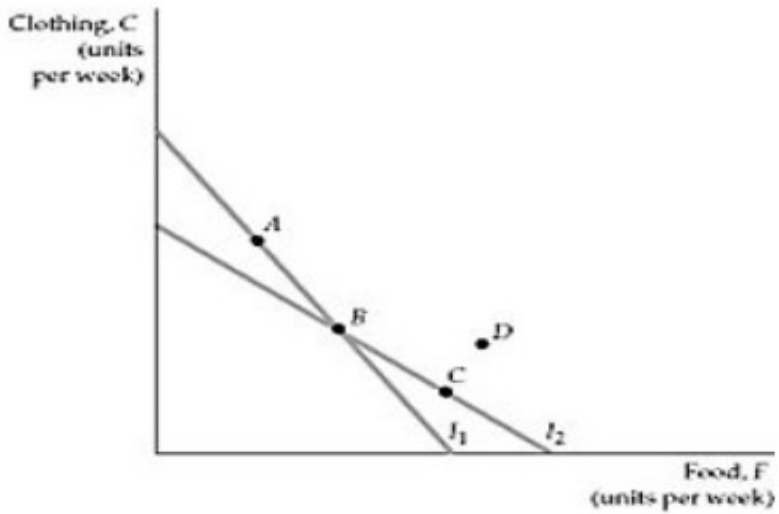
4. The price of lemonade is \$0.50; the price of popcorn is \$1.00. If Fred has maximized his utility by purchasing lemonade and popcorn, his marginal rate of substitution will be:
   a. 2 lemonades for each popcorn.
   b. 1 lemonade for each popcorn.
   c. 1/2 lemonade for each popcorn.
   d. indeterminate unless more information on Fred's marginal utilities is provided.

Exercises (Con't)

5. You may consume ice cream or frozen yogurt, and ice cream consumption is plotted along the horizontal axis of your indifference map. The prices are denoted P_Y for frozen yogurt and P_{IC} for ice cream. Under what condition will you only consume frozen yogurt?
   a. MRS is greater than P_{IC}/P_Y.
   b. MRS is less than P_{IC}/P_Y.
   c. MRS is less than P_Y/P_{IC}.
   d. MRS is infinite.

Exercises (Con't)

6. The consumer chooses A on budget line I_1 and B on budget line I_2. Which of the following statements is NOT true?



   a. A is preferred to B.
   b. B is preferred to C.
   c. C is preferred to D.
   d. A is preferred to C.

Exercises (Con't)

7. Monica consumes only goods A and B. Suppose that her marginal utility from consuming good A is equal to $1/Q_a$, and her marginal utility from consuming good B is $1/Q_b$. If the price of A is \$0.50, the price of B is \$4.00, and Monica's income is \$120.00, how much of good A will she purchase?
   a. 0
   b. 12
   c. 24
   d. 48
   e. 120