



THIRD EDITION

ECONOMICS

and

MICROECONOMICS

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Chapter 10

The Rational Consumer

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WHAT YOU WILL LEARN IN THIS CHAPTER

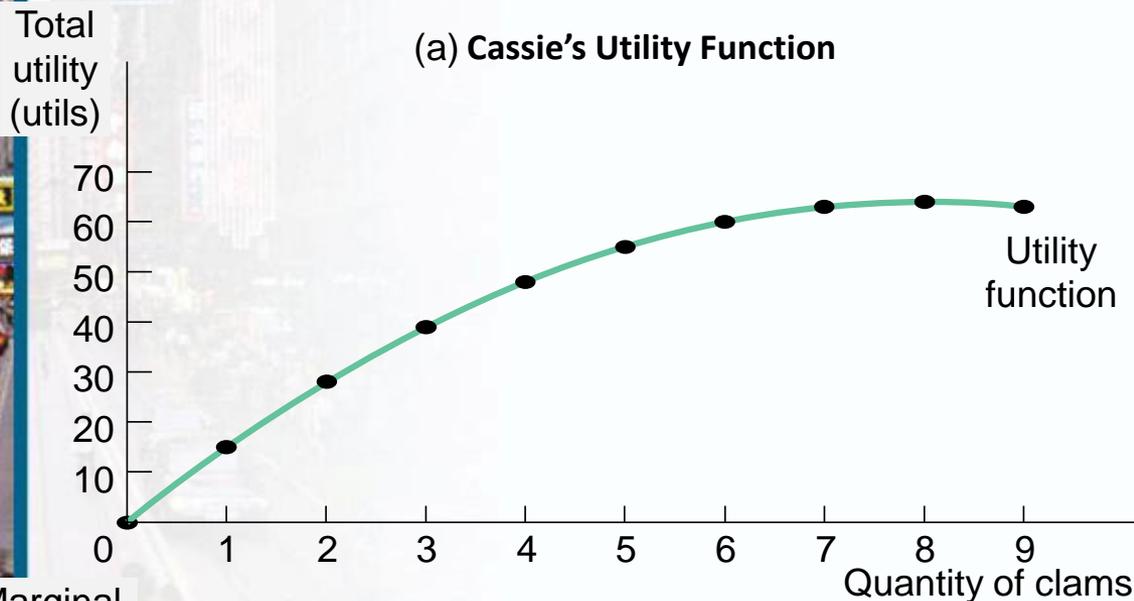
- How consumers choose to spend their income on goods and services
- Why consumers make choices by maximizing **utility**, a measure of satisfaction from consumption
- Why the **principle of diminishing marginal utility** applies to the consumption of most goods and services
- How to use marginal analysis to find the **optimal consumption bundle**
- What **income** and **substitution effects** are

Utility and Consumption

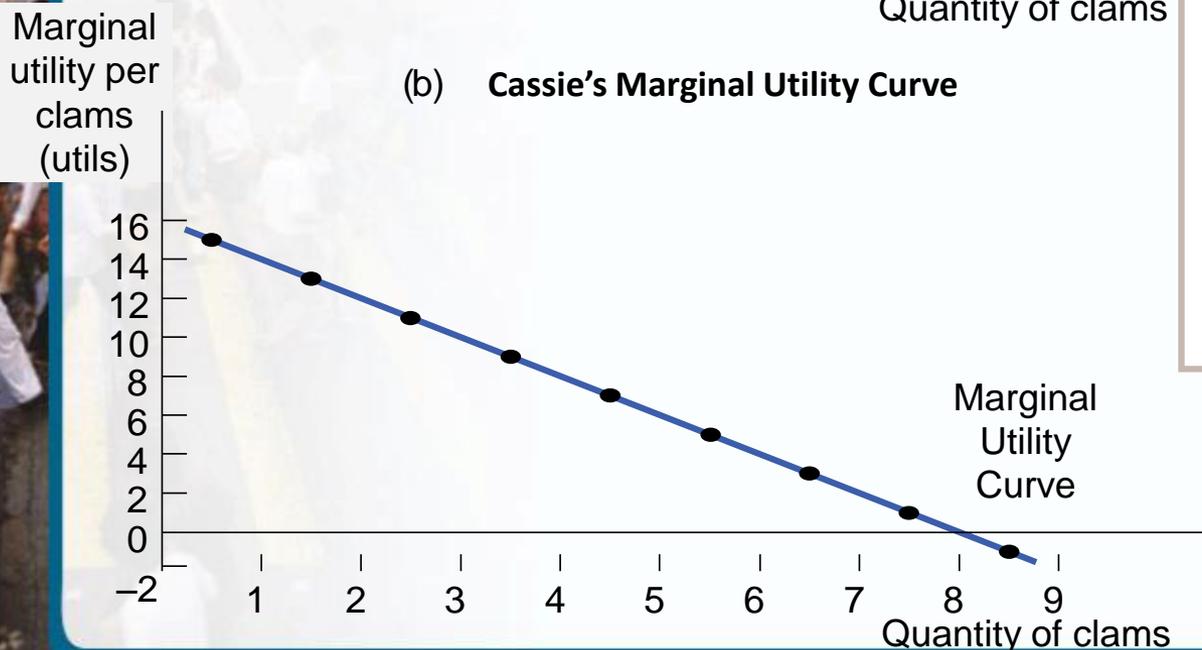
- The utility of a consumer is a measure of the satisfaction the consumer derives from the consumption of goods and services.
- An individual's consumption bundle is the collection of all the goods and services consumed by that individual.
- An individual's utility function gives the total utility generated by his or her consumption bundle. The unit of utility is a util.

Cassie's Total Utility and Marginal Utility

(a) Cassie's Utility Function



(b) Cassie's Marginal Utility Curve



Quantity of clams	Total utility (utils)	Marginal utility per clam (utils)
0	0	
1	15	15
2	28	13
3	39	11
4	48	9
5	55	7
6	60	5
7	63	3
8	64	1
9	63	-1

Cassie's Total Utility and Marginal Utility

- Cassie's total utility depends on her consumption of fried clams.
- It increases until it reaches its maximum utility level of 64 utils at 8 clams consumed and decreases after that.
- The marginal utility curve slopes downward due to diminishing marginal utility; each additional clam gives Cassie less utility than the previous clam.
- Note that the 9th clam is "too much."

The Principle of Diminishing Marginal Utility

- The **marginal utility** of a good or service is the change in total utility generated by consuming one additional unit of that good or service. The **marginal utility curve** shows how marginal utility depends on the quantity of a good or service consumed.
- The **principle of diminishing marginal utility** says that each successive unit of a good or service consumed adds less to total utility than the previous unit.

FOR INQUIRING MINDS

Is Marginal Utility Really Diminishing?

- Are all goods really subject to diminishing marginal utility? Of course not; there are a number of goods for which, at least over some range, marginal utility is surely increasing.
- Examples are:
 - Downhill skiing, which involves more fear than enjoyment at the start, but then becomes pleasurable after its mastered.
 - People who are not accustomed to drinking coffee find it bitter.
 - If you need two rolls of wallpaper to finish a room, the marginal utility of the second roll is larger than that of the first roll.

FOR INQUIRING MINDS

Is Marginal Utility Really Diminishing?

- So why does it make sense to assume diminishing marginal utility? Most goods don't suffer from the above qualifications.
- In the relevant range of consumption, marginal utility is still diminishing.

ECONOMICS IN ACTION

Oysters versus Chicken

- Is a particular food a special treat, something you consume on special occasions? Or is it an ordinary, take-it-or-leave-it dish?
 - The answer depends a lot on how much of that food people normally consume, which determines how much utility they get at the margin from having a bit more.
- Unlike today, chicken was once a luxury dish because chickens were expensive to raise.
 - Also, oysters were very cheap and abundant and were regarded as poverty food.

ECONOMICS IN ACTION

Oysters versus Chicken

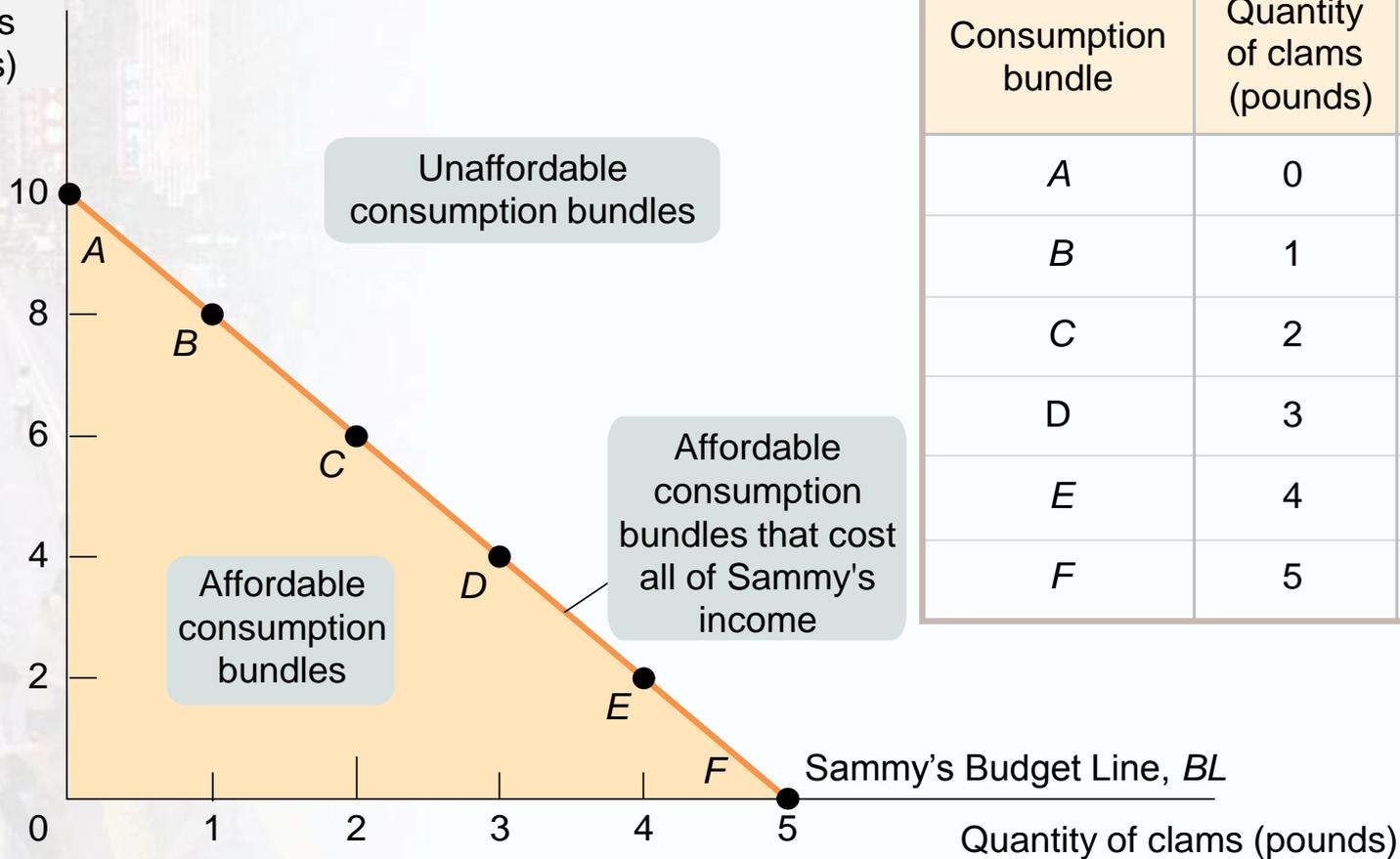
- However, the emergence of new, technologically advanced methods of raising and processing the birds made chicken abundant and cheap.
- At the same time, pollution destroyed many oyster beds and reduced supply, and human population growth increased demand.
 - So, oysters went from being common food to a luxury good while chicken took the reverse path.

Budgets and Optimal Consumption

- A **budget constraint** requires that the cost of a consumer's consumption bundle be no more than the consumer's total income.
- A consumer's **consumption possibilities** is the set of all consumption bundles that can be consumed given the consumer's income and prevailing prices.
- A consumer's **budget line** shows the consumption bundles available to a consumer who spends all of his or her income.

The Budget Line

Quantity of potatoes (pounds)



Consumption bundle	Quantity of clams (pounds)	Quantity of potatoes (pounds)
A	0	10
B	1	8
C	2	6
D	3	4
E	4	2
F	5	0

The *budget line* represents all the possible combinations of quantities of potatoes and clams that Sammy can purchase if he spends all of his income. It is also the boundary between the set of affordable consumption bundles (the *consumption possibilities*) and unaffordable ones.

Sammy's Utility from Clam and Potato Consumption

TABLE 10-1 Sammy's Utility from Clam and Potato Consumption

<u>Utility from clam consumption</u>		<u>Utility from potato consumption</u>	
Quantity of clams (pounds)	Utility from clams (utils)	Quantity of potatoes (pounds)	Utility from potatoes (utils)
0	0	0	0
1	15	1	11.5
2	25	2	21.4
3	31	3	29.8
4	34	4	36.8
5	36	5	42.5
		6	47.0
		7	50.5
		8	53.2
		9	55.2
		10	56.7

Optimal Consumption Choice

- The **optimal consumption bundle** is the consumption bundle that maximizes a consumer's total utility given his or her budget constraint.



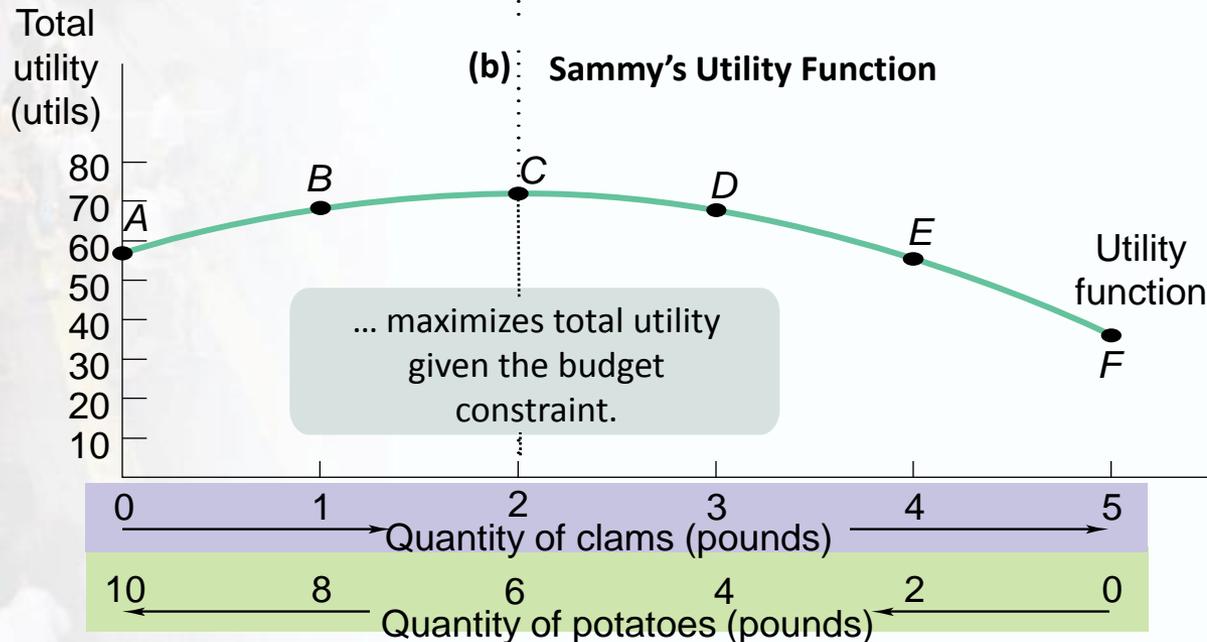
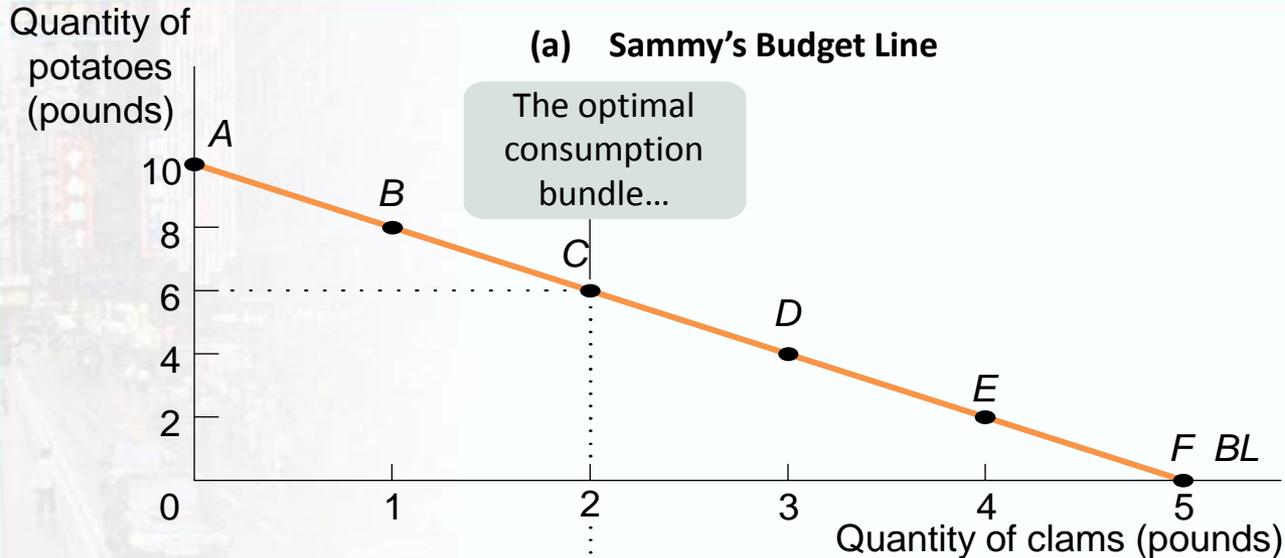
Sammy's Budget and Total Utility

TABLE 10-2 Sammy's Budget and Total Utility

Consumption bundle	Quantity of clams (pounds)	Utility from clams (utils)	Quantity of potatoes (pounds)	Utility from potatoes (utils)	Total utility (utils)
<i>A</i>	0	0	10	56.7	56.7
<i>B</i>	1	15	8	53.2	68.2
<i>C</i>	2	25	6	47.0	72.0
<i>D</i>	3	31	4	36.8	67.8
<i>E</i>	4	34	2	21.4	55.4
<i>F</i>	5	36	0	0	36.0

Sammy's total utility is the sum of the utility he gets from clams and the utility he gets from potatoes.

Optimal Consumption Bundle



Sammy's total utility is maximized at bundle C, where he consumes 2 pounds of clams and 6 pounds of potatoes. This is Sammy's *optimal consumption bundle*.

FOR INQUIRING MINDS

Food for Thought on Budget Constraints

- Budget constraints aren't just about money. In fact, there are many other budget constraints affecting our lives.
- Examples include:
 - A limited amount of closet space for clothes.
 - A fixed number of hours in a day.
 - A dieter on the Weight Watchers plan is only allowed to eat a maximum number of points each day (each food is assigned a certain number of points).
- The dieter is just like a consumer choosing a consumption bundle: points are the equivalent of prices, and the overall point limit is the equivalent of total income.

ECONOMICS IN ACTION

The Consumption Possibilities of American Workers, 1895-2000

- Over the past century, the consumption possibilities of the average American worker have increased radically as the nation has become vastly richer.
- According to economist Brad DeLong,
 - In 1895, an average worker's annual income would have bought 7.7 one-speed bicycles; in 2000, it would have bought 278 bicycles.
 - In 1895, the worker's annual income would have bought 45 full sets of dinner plates; in 2000, it would have bought 556 sets.
 - In 1895, an average worker's annual income would have bought 0.83 of a Steinway piano; in 2000, it would have bought 1.8 pianos.
- By any standard, the average American's consumption possibilities have increased enormously.

ECONOMICS IN ACTION

The Great Condiment Craze

- Lately, Americans have developed an intense liking for condiments.
 - And in a dizzying array of varieties: Who wants plain mustard when you can get roasted garlic, apricot, or even bourbon mustard? Do you want garlic mayonnaise or wasabi mayonnaise on your club sandwich? Salsa has overtaken ketchup.

ECONOMICS IN ACTION

The Great Condiment Craze

- So what happened? Tastes changed and budgets changed.
 - With budget-conscious consumers more likely to eat at home, but having already been exposed to gourmet cooking and ethnic cuisine, specialty condiments have become an affordable way of spicing up home cooking.
 - In 2010, the U.S. condiment market was valued at \$5.6 billion, and projected to grow to \$7 billion by 2015, driven by demand from mainly 18- to 34-year-old customers.

Spending the Marginal Dollar

The **marginal utility per dollar** spent on a good or service is the additional utility from spending one more dollar on that good or service.

Marginal utility per dollar spent on a good

= Marginal utility of one unit of the good / Price of one unit of the good

$$= MU_{good} / P_{good}$$

Pitfalls

The Right Marginal Comparison

- Marginal analysis solves “how much” decisions by setting the marginal benefit of some activity equal to its marginal cost.
- In consumption decisions, unlike production decisions, there’s a budget constraint which must be accounted for when doing marginal analysis.

Pitfalls

The Right Marginal Comparison

- The right answer for marginal decisions involving consumption is that the marginal utility per dollar spent on each good must be the same at the optimal consumption bundle.
- By factoring in prices, this comparison takes into account the fact that a consumer has a limited amount of money to spend.

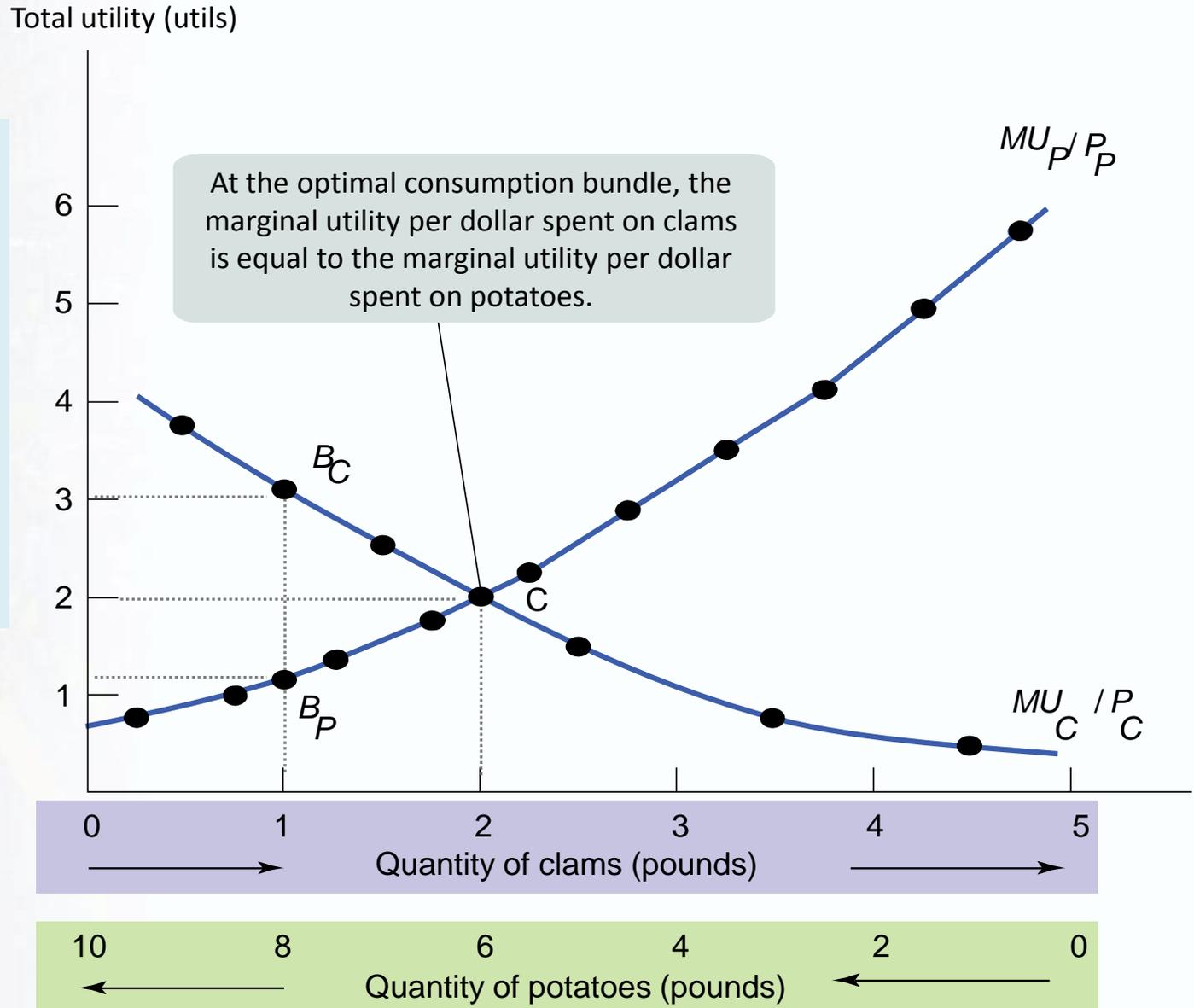
Sammy's Marginal Utility per Dollar

TABLE 10-3 Sammy's Marginal Utility per Dollar

(a) Clams (price of clams = \$4 per pound)				(b) Potatoes (price of potatoes = \$2 per pound)			
Quantity of clams (pounds)	Utility from clams (utils)	Marginal utility per pound of clams (utils)	Marginal utility per dollar (utils)	Quantity of potatoes (pounds)	Utility from potatoes (utils)	Marginal utility per pound of potatoes (utils)	Marginal utility per dollar (utils)
0	0	15	3.75	0	0	11.5	5.75
1	15	10	2.50	1	11.5	9.9	4.95
2	25	6	1.50	2	21.4	8.4	4.20
3	31	3	0.75	3	29.8	7.0	3.50
4	34	2	0.50	4	36.8	5.7	2.85
5	36			5	42.5	4.5	2.25
				6	47.0	3.5	1.75
				7	50.5	2.7	1.35
				8	53.2	2.0	1.00
				9	55.2	1.5	0.75
				10	56.7		

Marginal Utility per Dollar

If Sammy has, in fact, chosen his optimal consumption bundle, his marginal utility per dollar spent on clams and potatoes must be equal.



Optimal Consumption Rule

The **optimal consumption rule** says that when a consumer maximizes utility, the marginal utility per dollar spent must be the same for all goods and services in the consumption bundle.

$$MU_C/P_C = MU_P/P_P$$

FOR INQUIRING MINDS

But Are Consumers Really Rational?

- Many companies offer retirement plans for their employees, such as the 401(k), which save the worker thousands of dollars in taxes each year.
- However, some plans invest these savings in their own stock and when the company goes under, the employees lose their savings (for example: Enron and Bear Stearns).

FOR INQUIRING MINDS

But Are Consumers Really Rational?

- Employees should compare the marginal utility of a dollar spent on current consumption with the marginal utility of a dollar saved for retirement.
 - They should weigh the tax advantages of saving through the employer plan against the risks of letting the employer decide where savings are invested.
- But recent economic research suggests that most people aren't careful about these issues.

FOR INQUIRING MINDS

But Are Consumers Really Rational?

- As the National Bureau of Economic Research puts it, workers seem to follow the path of least resistance, instead of comparing their options and maximizing their utility.
- Behavioral economists question the whole concept of the rational consumer.
 - Their research focuses on situations in which people don't seem to be rational—that is, when they behave in ways that can't be easily explained by utility maximization.

ECONOMICS IN ACTION

Buying Your Way Out of Temptation

- It might seem odd to pay more to get less. But snack food companies have discovered that consumers are indeed willing to pay more for smaller portions, and exploiting this trend is a recipe for success.
- Small packages are popular because they help consumers eat less without having to count calories themselves.

ECONOMICS IN ACTION

Buying Your Way Out of Temptation

- The extra utility gained from not having to worry about whether they've eaten too much is worth the extra cost.
- Consumers are being rational: in addition to their snack, they're buying a little hand-to-mouth restraint.

From Utility to the Demand Curve

- The main reason for studying consumer behavior is to go behind the market demand curve.
- To understand how the downward slope of the market demand curve is explained by the utility-maximizing behavior of individual consumers.

Marginal Utility, the Substitution Effect, and the Law of Demand

- The substitution effect of a change in the price of a good is the change in the quantity consumed of that good as the consumer substitutes the good that has become relatively cheaper for the good that has become relatively more expensive.

The Income Effect

- The income effect of a change in the price of a good is the change in the quantity consumed of that good that results from a change in the consumer's purchasing power due to the change in the price of the good.
 - Normal Goods
 - Inferior Goods
 - Giffen Goods

FOR INQUIRING MINDS

Giffen Goods

- Back when Ireland was a desperately poor country—not the prosperous “Celtic Tiger” it has lately become—it was claimed that the Irish would eat more potatoes when the price of potatoes went up.
 - That is, some observers claimed that Ireland’s demand curve for potatoes sloped upward, not downward.
- Suppose that there is a good that absorbs a large share of consumer’s budgets and that this good is also inferior.
 - People demand less of it when their income rises.

FOR INQUIRING MINDS

Giffen Goods

- Suppose the price of the good, say potatoes, increases. This would, other things equal, cause people to substitute other goods for potatoes. But other things are not equal: given the higher price of potatoes, people are poorer.
 - This increases the demand for potatoes because potatoes are an inferior good.

ECONOMICS IN ACTION

Mortgage Rates and Consumer Demand

- Most people buy houses with mortgages—loans backed by the value of the house. The interest rates of such change over time.
 - For example, they fell quite a lot between 2000 and 2003.
- When mortgage rates fall, the cost of housing falls and the demand for housing goes up as even people who have mortgages at high rates are able to refinance them at lower rates.
- Economists have noticed that when this happens, the demand for other goods also rises, such as furniture, cars, more vacation time, etc. WHY?

ECONOMICS IN ACTION

Mortgage Rates and Consumer Demand

- When housing is cheaper, there is a substitution effect: *people have an incentive to substitute housing in place of other goods in their consumption bundle.*
- So, when house prices fall, people are in effect richer—there is a noticeable income effect.
 - People buy more of the other goods in addition to the houses that they buy.

VIDEO



TED TALK

- Barry Schwartz on the paradox of choice:
http://www.ted.com/talks/barry_schwartz_on_the_paradox_of_choice.html

Summary

1. Consumers maximize a measure of satisfaction called **utility**. Each consumer has a **utility function** that determines the level of total utility generated by his or her **consumption bundle**, the goods and services that are consumed.
2. A good's or service's **marginal utility** is the additional utility generated by consuming one more unit of the good or service. We usually assume that the **principle of diminishing marginal utility** holds: consumption of another unit of a good or service yields less additional utility than the previous unit.

Summary

3. A **budget constraint** limits a consumer's spending to no more than his or her income. It defines the consumer's **consumption possibilities**, the set of all affordable consumption bundles. A consumer who spends all of his or her income will choose a consumption bundle on the **budget line**. An individual chooses the consumption bundle that maximizes total utility, the **optimal consumption bundle**.
4. The **optimal consumption rule** says that at the optimal consumption bundle the **marginal utility per dollar** spent on each good and service—the marginal utility of a good divided by its price—is the same.

Summary

5. Changes in the price of a good affect the quantity consumed in two possible ways: the **substitution effect** and the **income effect**. For normal goods, the substitution and income effects reinforce each other. For inferior goods, however, they work in opposite directions.

KEY TERMS



- Utility
- Consumption bundle
- Utility function
- Util
- Marginal utility
- Marginal utility curve
- Principle of diminishing marginal utility
- Budget constraint
- Consumption possibilities
- Budget line
- Optimal consumption bundle
- Marginal utility per dollar
- Optimal consumption rule
- Substitution effect
- Income effect
- Giffen good