chapter:

10

>> The Rational Consumer

Krugman/Wells Economics

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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

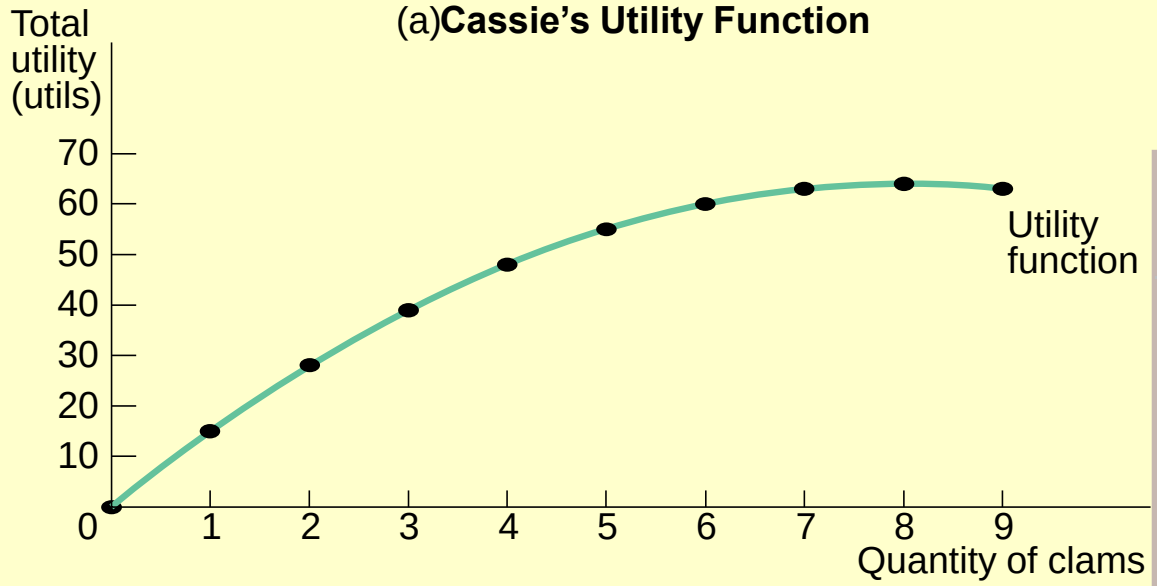
Opportunity Cost and Decisions

- The utility of a consumer is a measure of the satisfaction the consumer derives from consumption of goods and services.

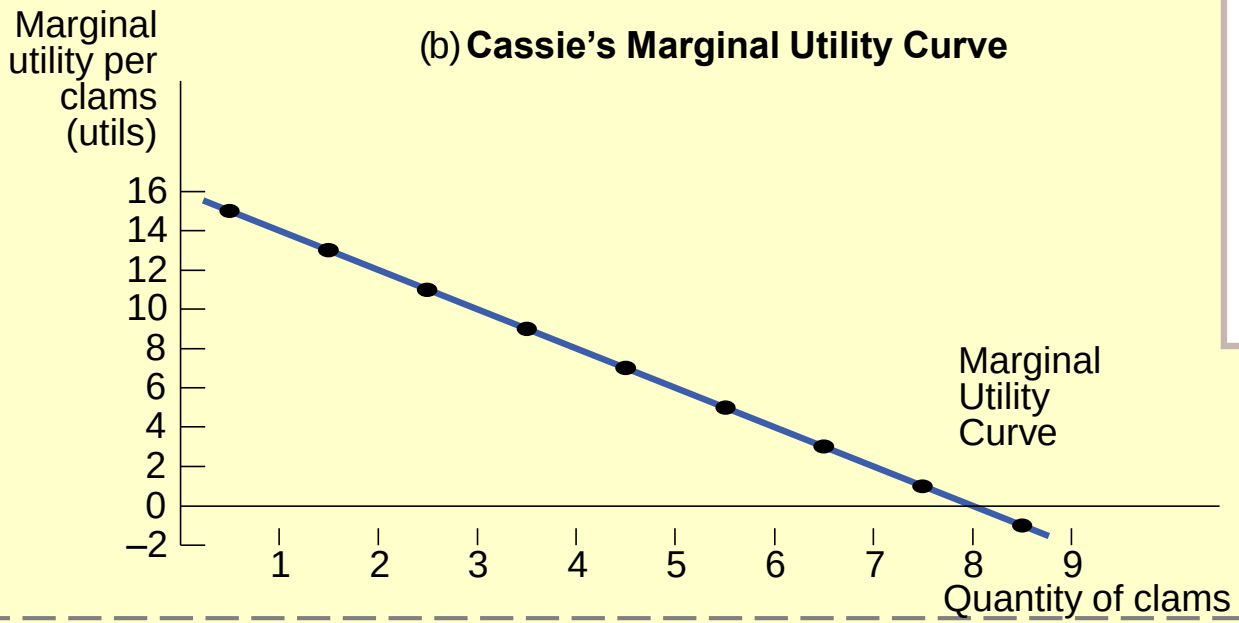
- An individual's consumption bundle is the collection of all the goods and services consumed by that individual.

- 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



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



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.

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.

Continuous analysis

$$TU = U(x, y)$$ ⇢ Total Utility

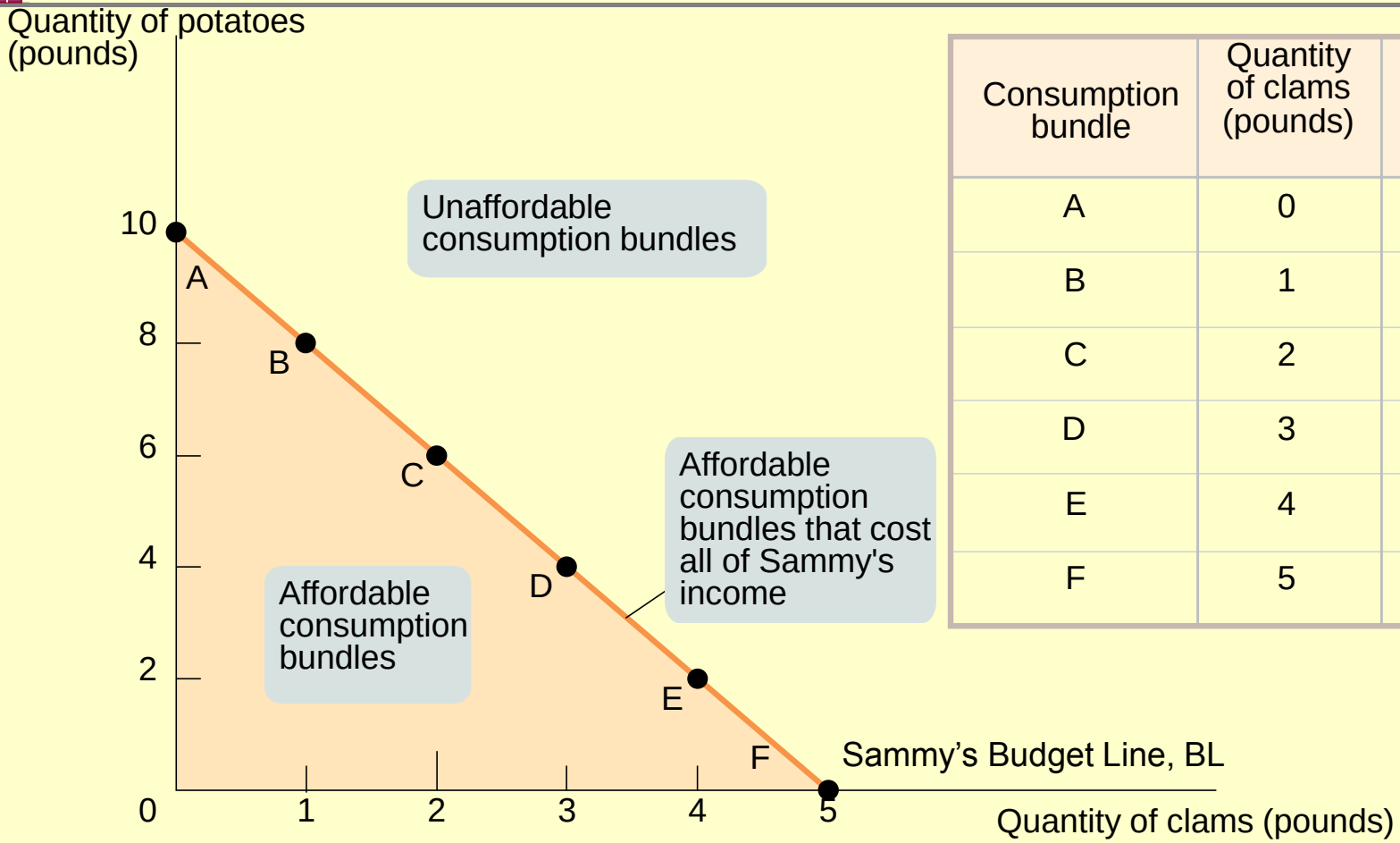
$$MU_X = \frac{\partial U(x, y)}{\partial x}$$ ⇢ Marginal Utility of good X

$$MU_Y = \frac{\partial U(x, y)}{\partial y}$$ ⇢ Marginal Utility of good Y

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



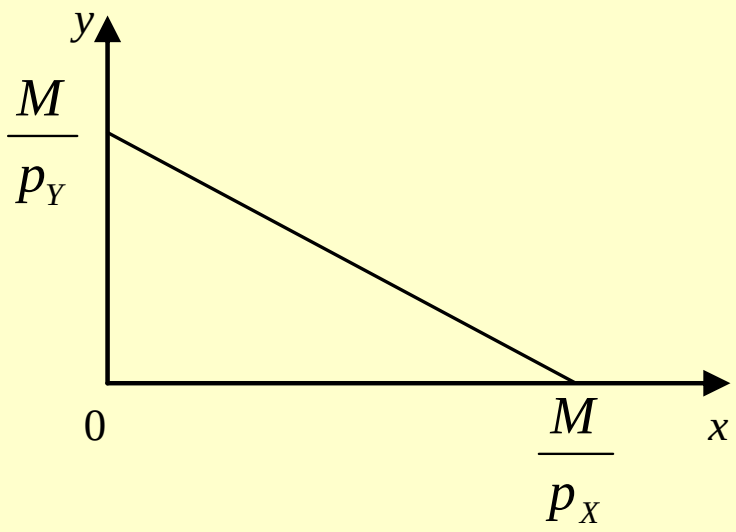
Consumption bundle	Quantity of clams (pounds)	Quantity of potatoes (pounds)
A	0	10
B	1	8
C	2	6
D	3	4
E	4	2
F	5	0

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.

Continuous analysis

$p_X \times x + p_Y \times y \leq M$ ⇢ Budget restriction

$p_X \times x + p_Y \times y = M$ ⇢ Budget line



Sammy's Utility from Clam and Potato Consumption

Utility from clam consumption		Utility from potato consumption	
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

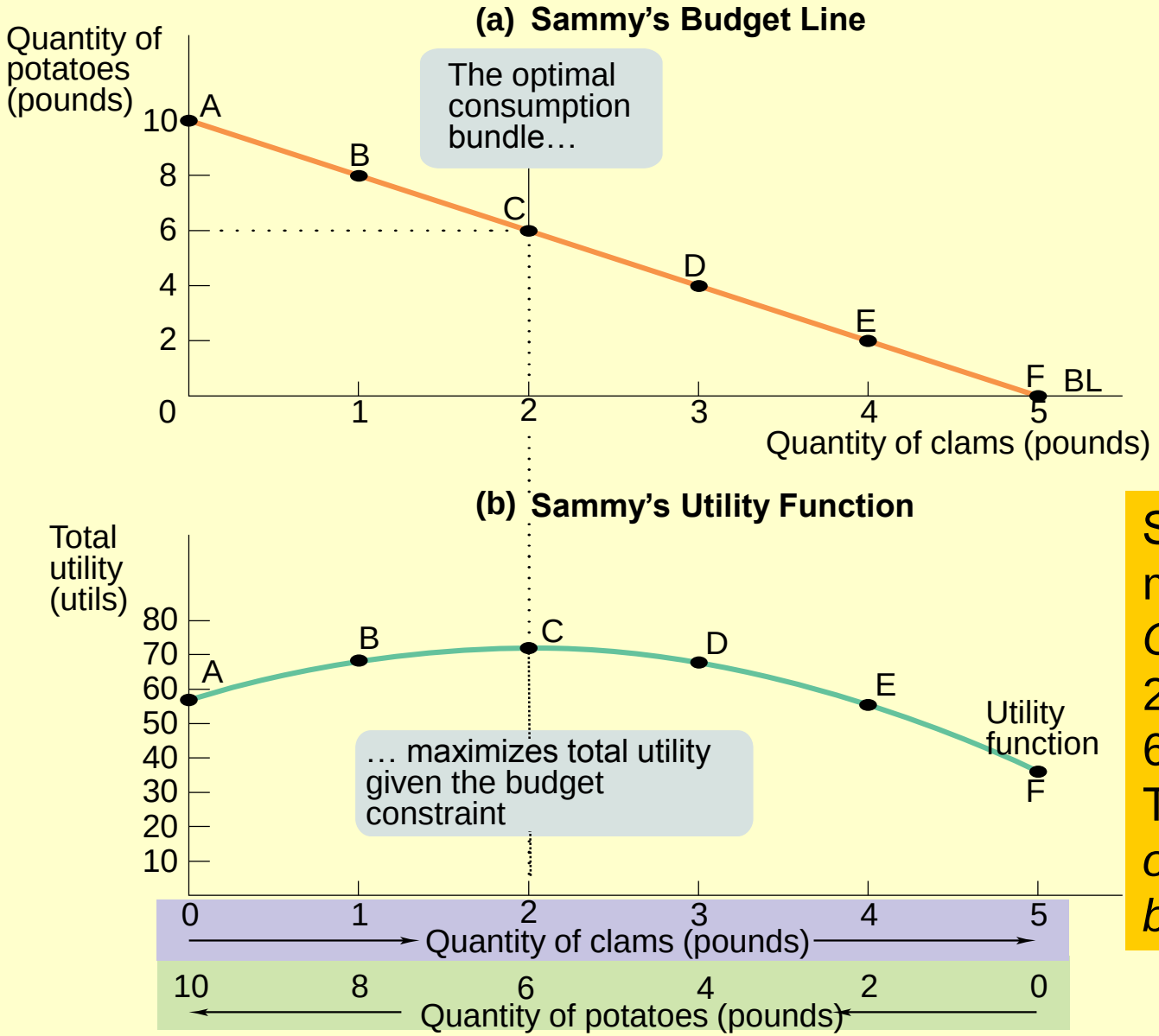
- The **optimal consumption bundle** is the consumption bundle that maximizes a consumer's total utility given his or her budget constraint.

Sammy's Budget and Total Utility

Consumption Bundle	Quantity of clams (pounds)	Utility from clams (utils)	Quantity of potatoes (pounds)	Utility from potatoes (utils)	Total utility (utils)
A	0	0	10	56.7	56.7
B	1	15	8	53.2	68.2
C	2	25	6	47.0	72.0
D	3	31	4	36.8	67.8
E	4	34	2	21.4	55.4
F	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*.

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}

Sammy's Marginal Utility per Dollar

(a) Clams (price of clams = $4 per pound)

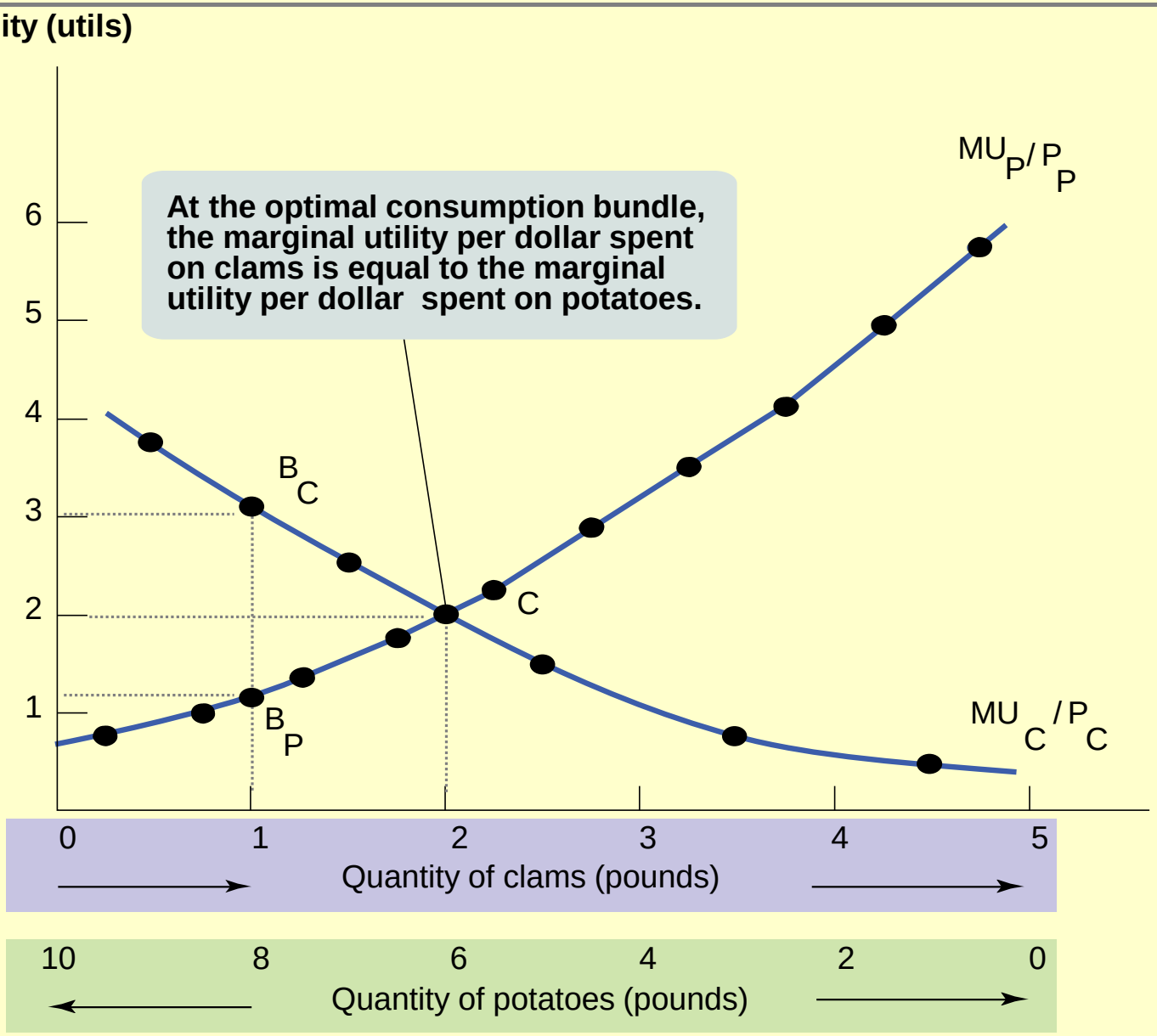
Quantity of clams (pounds)	Utility from clams (utils)	Marginal utility per pound of clams (utils)	Marginal utility per dollar (utils)
0	0		
		15	
1	15		3.75
		10	
2	25		2.50
		6	
3	31		1.50
		3	
4	34		0.75
		2	
5	36		0.50

(b) Potatoes (price of potatoes = $2 per pound)

Quantity of potatoes (pounds)	Utility from potatoes (utils)	Marginal utility per pound of potatoes (utils)	Marginal utility per dollar (utils)
0	0		
		11.5	
1	11.5		5.75
		9.9	
2	21.4		4.95
		8.4	
3	29.8		4.20
		7.0	
4	36.8		3.50
		5.7	
5	42.5		2.85
		4.5	
6	47.0		2.25
		3.5	
7	50.5		1.75
		2.7	
8	53.2		1.35
		2.0	
9	55.2		1.00
		1.5	
10	56.7		0.75

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.

$$MU_C/P_C = MU_P/P_P$$

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

Summary of the price effects

	Δp	Δinc (real)	SE	IE	final effect in ΔQ	observations
Normal Good	↗	↘	↘	↘	↘	
	↘	↗	↗	↗	↗	
Inferior Good	↗	↘	↘	↗	↘ if |SE| > IE ↗ if |SE| < IE Giffen Good	Income effect – we compare the magnitudes of the effects in absolute value, to find the final effect on the change in the quantity demanded of the good, ΔQ. In the case of Giffen goods, the law of demand isnot resopected, the quantity demanded changes in the same direction as price, because of the dominant income effect over the substitution effect, in absolute value.
	↘	↗	↗	↘	↗ if SE > |IE| ↘ if SE < |IE| Giffen Good	

The End of Chapter 10

Coming attraction:

Chapter 10 Appendix: Consumer Preferences and Consumer Choice