

Chapter 10: The Rational Consumer

While firms choose to produce the quantity that will maximize their profits, consumers choose to consume the quantity that will maximize their well-being or happiness.

→ Consumers try to maximize their *utility*.



Economists assume that all consumers are “rational”, or that consumers know what they want and use all available opportunities to make themselves better off.

Utility can include any type of satisfaction.

- Material pleasures



- Meeting basic needs



- Enjoyment of luxuries



- Spiritual/cultural/family activities

Consumers attempt to maximize their utility by choosing a unique *consumption bundle*, or a collection of G&S consumed.

Producers maximize profits subject to market prices and input prices (costs).

Consumers maximize utility subject to their income and market prices.



The Basic Utility Function

Consumers use marginal analysis to decide how much to consume of a good.

When consumers buy more goods or services, they increase their total satisfaction or total utility (TU)



The marginal utility is the additional utility derived from one more unit of a G or S,

$$MU = \frac{\Delta TU}{\Delta Q}$$



Example: Eating Donuts

Quantity	Total Utility	Marginal Utility
0	0	
1	10	10_u
2	19	9_u
3	26	7_u
4	30	4_u
5	31	2_u
6	28	-3_u



mmmm.....

For most G&S there will be *diminishing marginal utility from consuming more and more within a given time period.*

Principle of diminishing marginal utility.

Budgets

Consumption is limited by income, so consumers have to make trade-offs.

Consumption of a certain good has an opportunity cost in terms of other goods that could have been purchased.



Consumers are subject to a *budget constraint*:
the cost of your consumption bundle cannot exceed your income (assuming no credit cards).

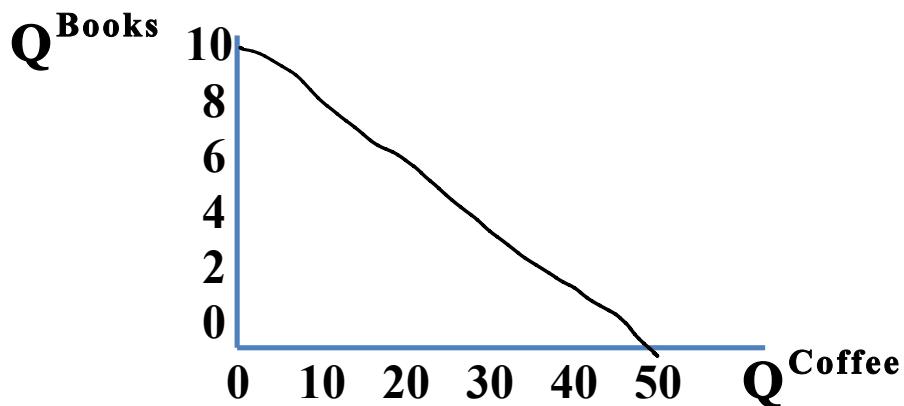
Example: Suppose you only consume coffee and books, then your budget constraint equation is:

$$\text{Expenditure on Coffee} + \text{Expenditure on Books} = \text{Income}$$
$$(P^C \cdot Q^C) + (P^B \cdot Q^B) = I$$

If your income is \$200 per week, $P^C = \$4$, and $P^B = \$20$, then your possible consumption bundles are:

Q^{Coffee}	Q^{Books}	Bundle
0	10	A
10	8	B
20	6	C
30	4	D
40	2	E
50	0	F

The *budget line* shows all possible consumption bundles when all of a consumer's income is spent.



The slope of the budget line measures the opportunity cost of the good on the horizontal axis.

Example: To get 10 more cups of coffee you'd have to give up 2 books

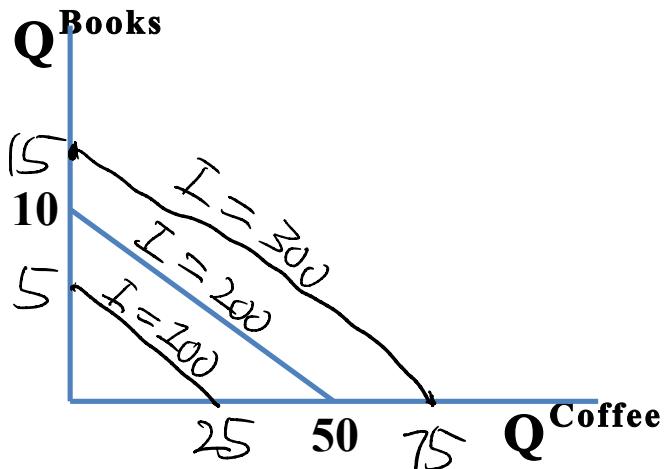
$$\text{Opportunity cost per cup of coffee} = 0.2 \text{ book/coffee}$$

The inverse of the slope of the budget line measures the opportunity cost of the good on the vertical axis.

Example: To get 2 more books you'd have to give up 10 coffee

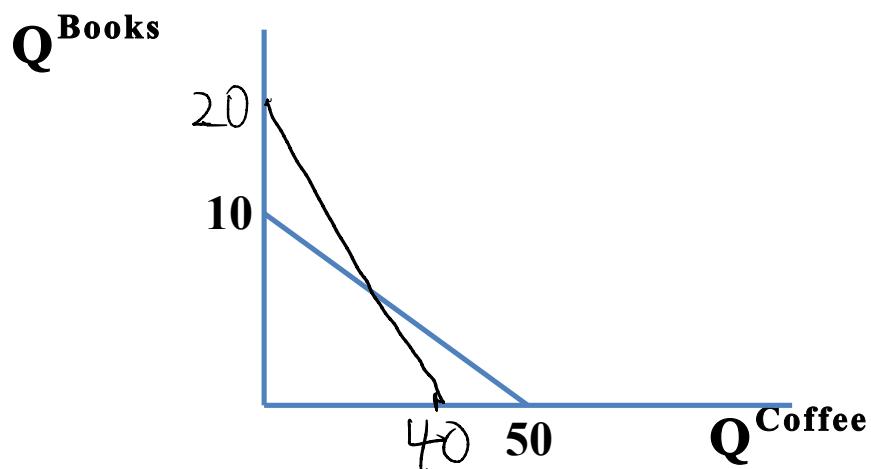
$$\text{Opportunity cost per book} = 5 \text{ coffee/book}$$

If your income increases to \$300 your budget line will shift out
Or if your income falls to \$100 it will shift in



When the prices change, the budget line will rotate

Example: $I = \$200$ and the price of books falls to \$10 and the price of coffee increases to \$5.

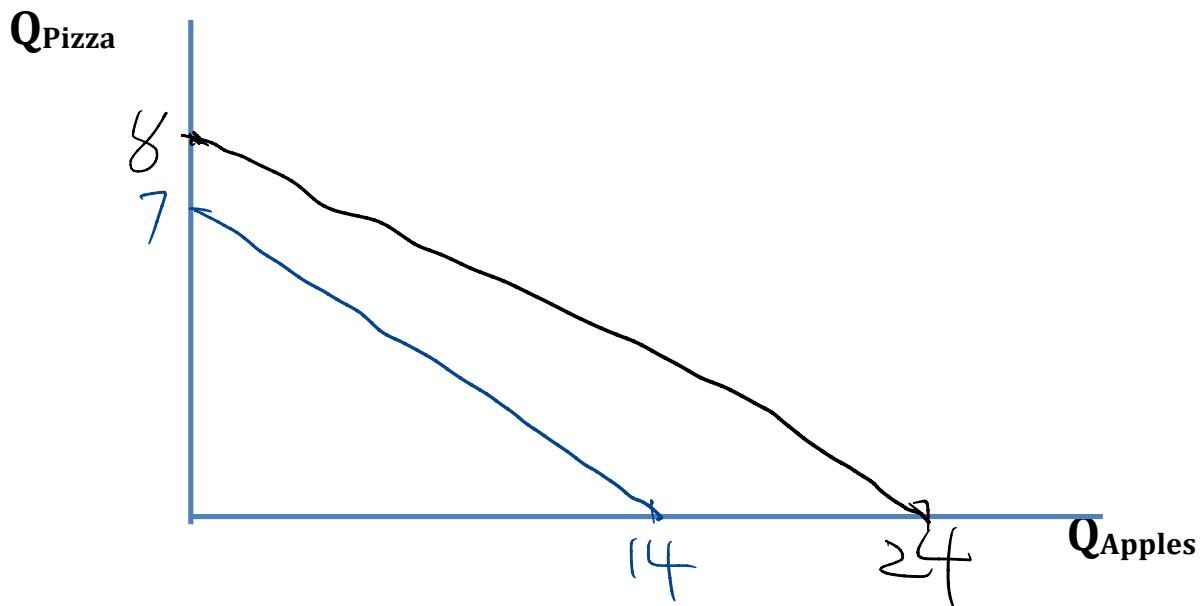


Exercise 1: Suppose you have \$24 per month to spend on pizza and apples. The price of pizza is \$3 per slice and apples cost \$1 each.

Fill in the table below with your different possible consumption bundles.

Bundle	Q(Pizza)	Q(Apples)
A	0	24
B	1	23
C	2	22
D	3	21
E	4	20
F	5	19
G	6	18
H	7	17
I	8	16

Plot your budget line.



Show your new budget line if your income decreases to \$21 and the price of apples increases to \$1.50 each.

Books and Coffee Example

Now assume $I = \$200$. Which bundle of books and coffee would you choose?

Consumers will choose an optimal consumption bundle that maximize their total utility given their income.

Suppose coffee and books provide the following levels of utility:

Bundle	Q^{Coffee}	Q^{Books}	TU^{Coffee}	TU^{Books}	TU
A	0	10	0	70	70
B	10	8	12	62	74
C	20	6	20	51	71
D	30	4	26	37	63
E	40	2	30	20	50
F	50	0	32	0	32

Which bundle will maximize total utility?

Other Budget Constraints:

- Time
- Energy
- Appetite
- Attention span
- Moral strength



Using Marginal Analysis to find the Optimal Consumption Bundle

Optimizing under a budget constraint means consumers try to maximize utility from each dollar they spend.



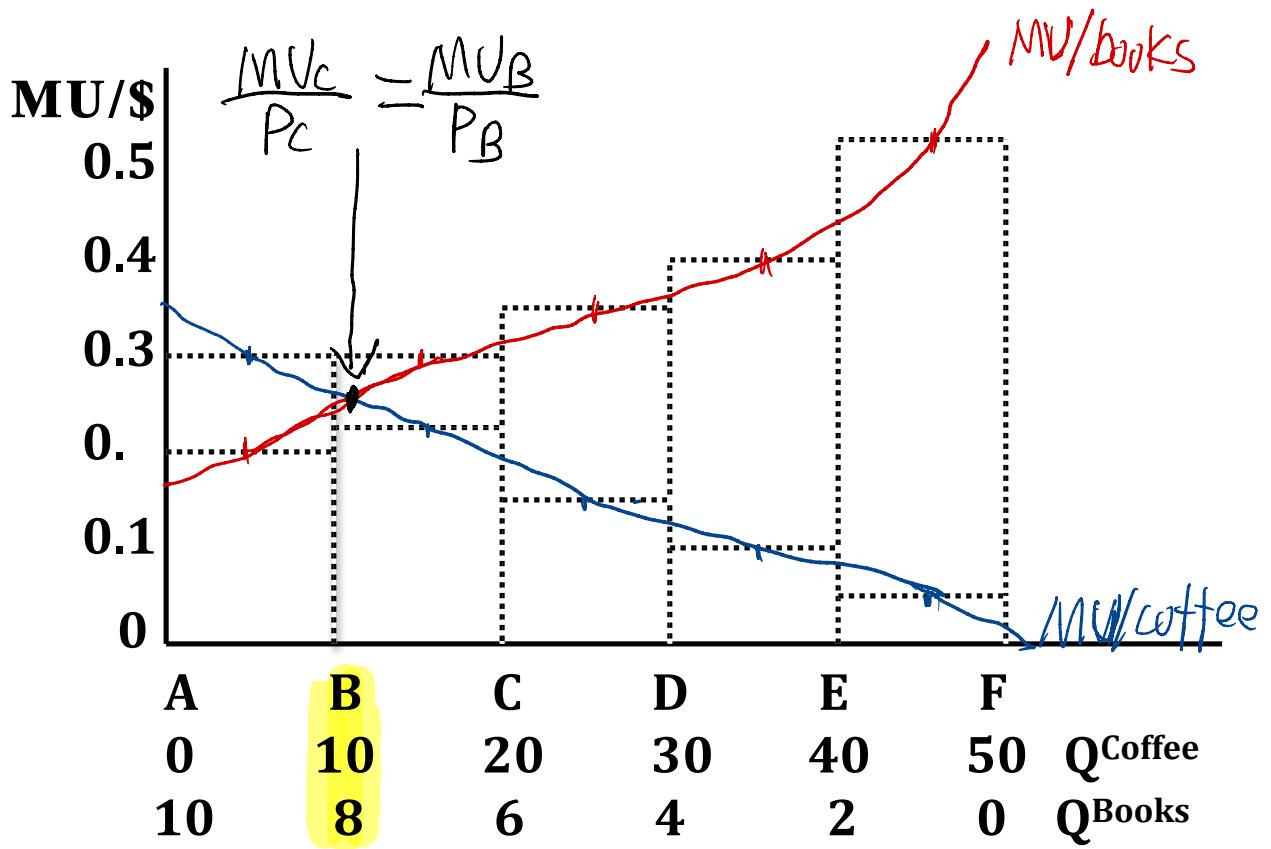
Consumers consider the marginal utility they will get per dollar spent on different items.

The marginal utility per dollar spent is the additional utility from spending one more dollar on a G or S.

$$\text{MU per dollar spent} = \frac{\text{MU per unit of good}}{\text{Price of good}}$$

Using $P^C = \$4$ and $P^B = \$20$...

Bundle	Q _{Books}	TU _{Books}	MU/\$ Books	Q _{Coffee}	TU _{Coffee}	MU/\$ Coffee
A	10	70		0	0	
			0.2u/\$			$\frac{1.2}{4} = 0.3u/\$$
B	8	62		10	12	
			0.22u/\$			0.2u/\$
C	6	51		20	20	
			0.35u/\$			0.15u/\$
D	4	37		30	26	
			0.425u/\$			0.7u/\$
E	2	20		40	30	
			0.5u/\$			0.05u/\$
F	0	0		50	32	



The MU/\$ curves will cross at the *optimal bundle* →

The optimal bundle is where
the MU per dollar spent
between two goods are equal.

$$\frac{MU_c}{P_c} = \frac{MU_b}{P_b}$$

Why is B Optimal?

Starting at bundle F you would gain more U/\$ from books than is given up from coffee.

Starting at bundle A you would gain more U/\$ from coffee than is given up from books.

Optimal consumption Rule:

A consumer maximizing utility subject to a budget constraint chooses the bundle where

$$\frac{MU^*}{P_x} = \frac{MU^y}{P_y}$$

Utility and the Demand Curve

A demand curve for a good shows the relationship between the price and quantity demanded of a good.

Law of Demand = as the price increases the quantity demanded will decrease.

The optimal bundle B where $\frac{MU_{coffee}}{P_{coffee}} = \frac{MU_{books}}{P_{books}}$

What if the price of coffee fell to \$2?

$$\frac{MU_c}{P_c} > \frac{MU_b}{P_b}$$

You would be better off buying a ratio of more coffee and fewer books.

What if the price of coffee increased to \$6?

$$\frac{MU_c}{P_c} < \frac{MU_b}{P_b}$$

You'd be better off buying a ratio of more books and less coffee.

Exercise 2: Suppose you have \$24 per month to spend on pizza and apples. The price of pizza is \$3 per slice and apples cost \$1 each.

Fill in the table:

Bundle	Q Pizza	TU _{Pizza}	MU/\$	Q Apples	TU _{Apples}	MU/\$	TU
A	0	0		24	132		132
			6.67u/\$			2u/\$	
B	1	20		21	126		146
			6u/\$			3u/\$	
C	2	38		18	117		155
			5.33u/\$			4u/\$	
(D)	3	54		15	105		159
			4.67u/\$			5u/\$	
E	4	68		12	90		158
			4u/\$			6u/\$	
F	5	80		9	72		152
			3.33u/\$			7u/\$	
G	6	90		6	51		141
			2.67u/\$			8u/\$	
H	7	98		3	27		125
			2u/\$			9u/\$	
I	8	104		0	0		104