

305 AEC PRICE ANALYSIS

Dr. Mahmoud Arafa

<http://scholar.cu.edu.eg/mahmoudarafa>

Main Topics

1. The budget line
2. The consumer choice
3. Trade
4. Using the market supply and demand
5. Measuring supply and demand
6. Production possibilities
7. Consumer surplus
8. The firm
9. Cost curve of the firm
10. Competitive industry
11. The long run supply curve
12. competition of property rights.

The Budget line

Two cases:

1- when income constant

2- when income change

The Budget line

To understand how households **make decisions**, economists look at **what consumers can afford**. To do this, we must chart the consumer's budget constraint. In a budget constraint, the quantity of one good is measured on the horizontal axis and the quantity of the other good is measured on the vertical axis. The budget constraint shows the various combinations of the two goods that the consumer can afford.

The Budget line

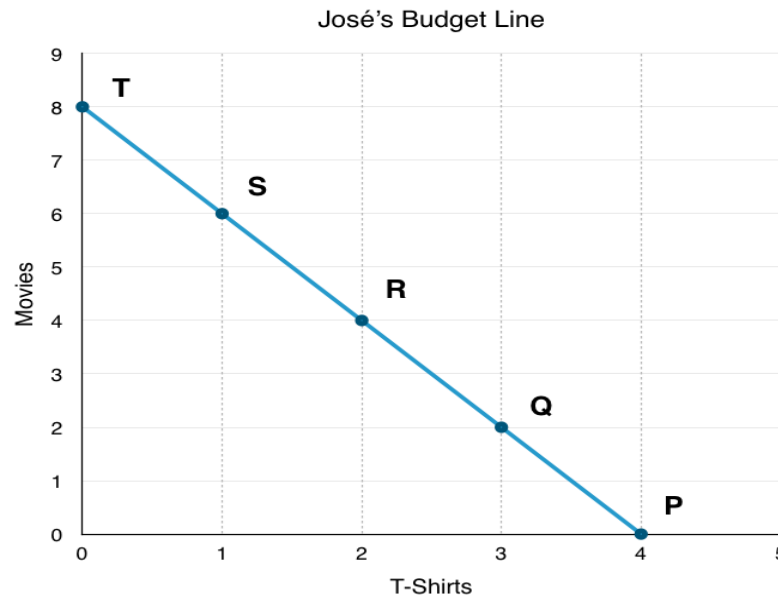
- Consider a consumer likes to collect T-shirts and movies. the number of T-shirts a consumer will buy is on the horizontal axis, while the number of movies he will buy is on the vertical axis. If he had unlimited income or if goods were free, then he could consume without limit. But he faces a **budget constraint**. He has a total of \$56 to spend. T-shirts cost \$14 and movies cost \$7.

The Budget line

Plotting the budget constraint is a fairly simple process. Each point on the budget line has to exhaust all \$56 of a consumer's budget. The easiest way to find these points is to plot the intercepts and connect the dots. Each intercept represents a case where a consumer spends all of his budget on either T-shirts or movies.

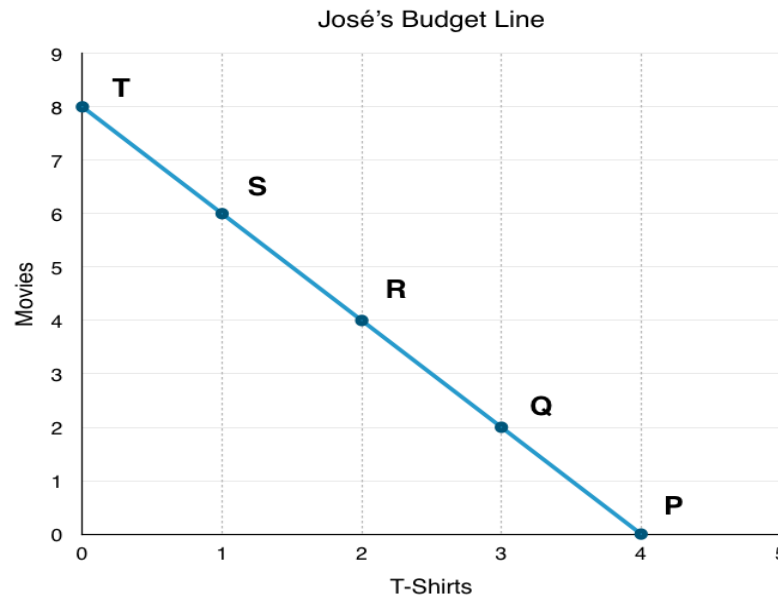
The Budget line

If consumer spends all his money on movies, which cost \$7, he can buy $\$56/\7 , or 8 of them. This means the y-intercept is the point (0,8). Here, he buys 0 T-shirts and 8 movies.



The Budget line

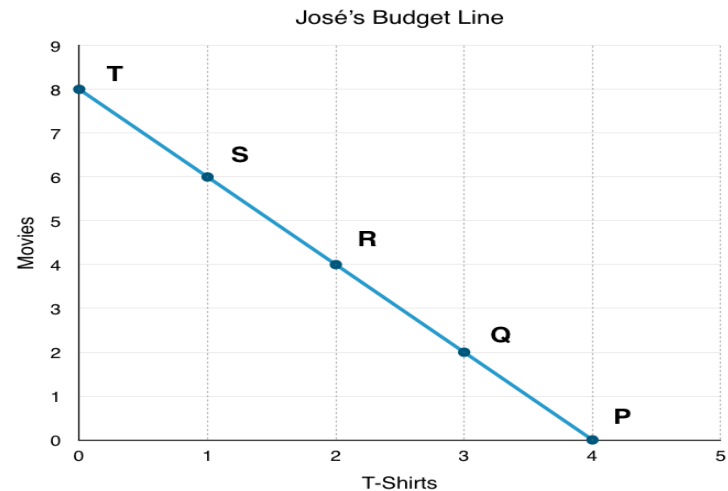
If he spends all his money on T-shirts, which cost \$14, he can buy only 4 of them ($\$56/\14). This means the x-intercept is the point (4,0). Here, he buys 4 T-shirts and 0 movies.



The Budget line

By connecting these two extremes, you can find every combination that consumer can afford along his **budget line**. For example, at point R, consumer buys 2 T-shirts and 4 movies. This costs him:

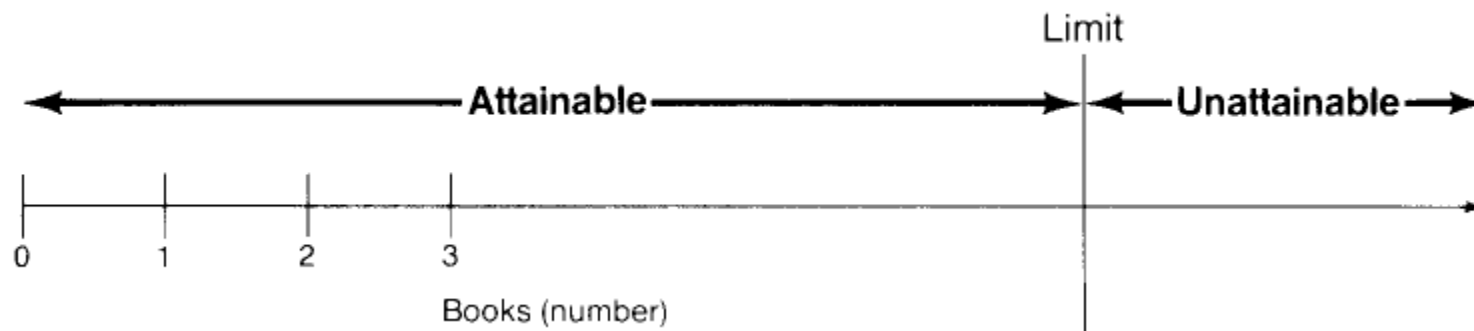
- T-Shirts @ $\$14 \times 2 = \28
- Movies @ $\$7 \times 4 = \28
- Total = $\$24 + \$28 = \$56$



- This point indeed exhausts consumer's budget.

The Budget line

Scarcity in one dimension: a thing is scarce when it is desirable but limited in quantity. This definition can be put in diagram by saying that, along the scale of amounts of desirable things, such as books in your library or food in the world there comes a stop. You and the world can not have unlimited amounts of food or books. The area marked unattainable is just that.



The Budget line

It is clear that each book is scarce, though it is not the last one there are substitute one for other. This called “fungible”.

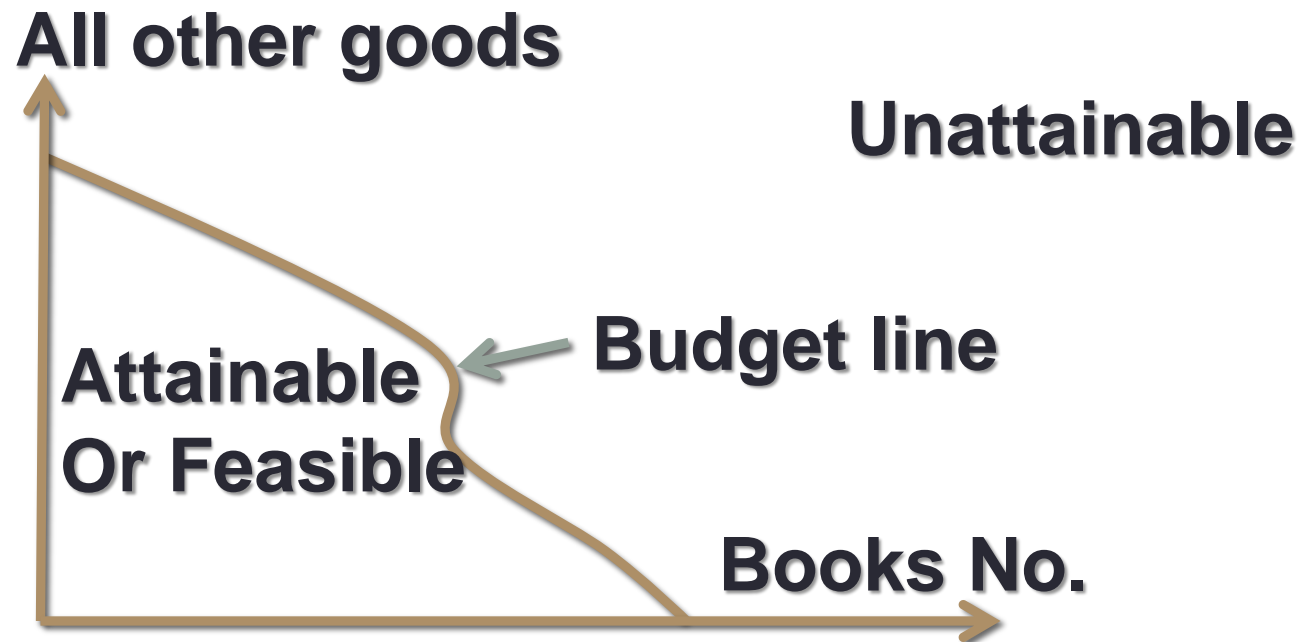
The Budget line

In economics, **Fungibility** is the property of a good or a commodity whose individual units are essentially interchangeable.

For example, since one kilogram of pure gold is equivalent to any other kilogram of pure gold, whether in the form of coins, ingots, or in other states, gold is fungible. Other fungible commodities include food, books, sweet crude oil, company shares, bonds, other precious metals, and currencies. Fungibility refers only to the equivalence of each unit of a commodity with other units of the same commodity and not to the exchange of one commodity for another, which is barter.

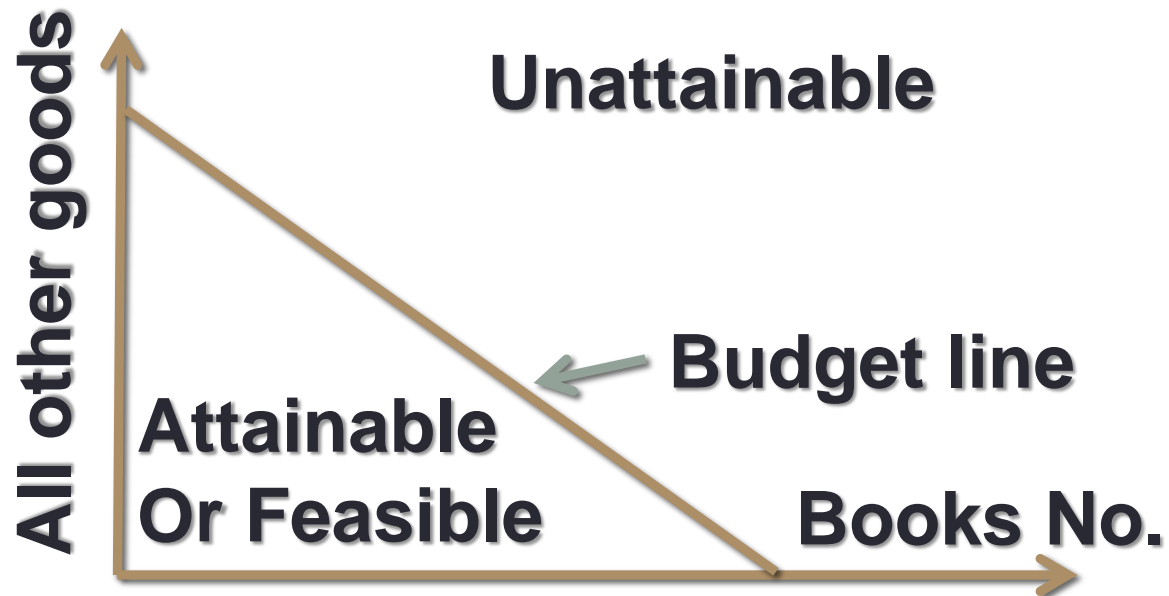
The Budget line

Scarcity in two dimension: mean stay inside one's budget line. Because of fungibility, the value of the last increment to a pile of things governs the value of the whole. All the things measured along a single axis are taken to be just like any other.



The Budget line

Opportunity cost is the slope of the budget line: opportunity cost is a result of scarcity. It is represented by the downward slope of the budget line. One must choose, and in choosing you move down the line.



The Budget line

Opportunity cost of a thing is the simply of its price along the budget line: that namely the amount of other things you have to give up to acquire a unit of the thing you are buying.

If you go to coffee shop serving tea at \$0.5 and coffee at \$1, what is the price of coffee could buy two glasses?

Clearly, it is two glasses of tea per glass of coffee. One dollar spent on a glass of coffee could buy two glasses of tea then

Tea per coffee = glasses of tea / glasses of coffee
= (dollars/ glasses of coffee) / (dollars/ glasses of tea)
=2/1 tea per coffee

The Budget line

Q: A Victorian novel takes 20 hours to read; the *Classic* comic book recounting the same story takes 15 minutes. Considering the time spent, what is the price of novels in terms of comics?

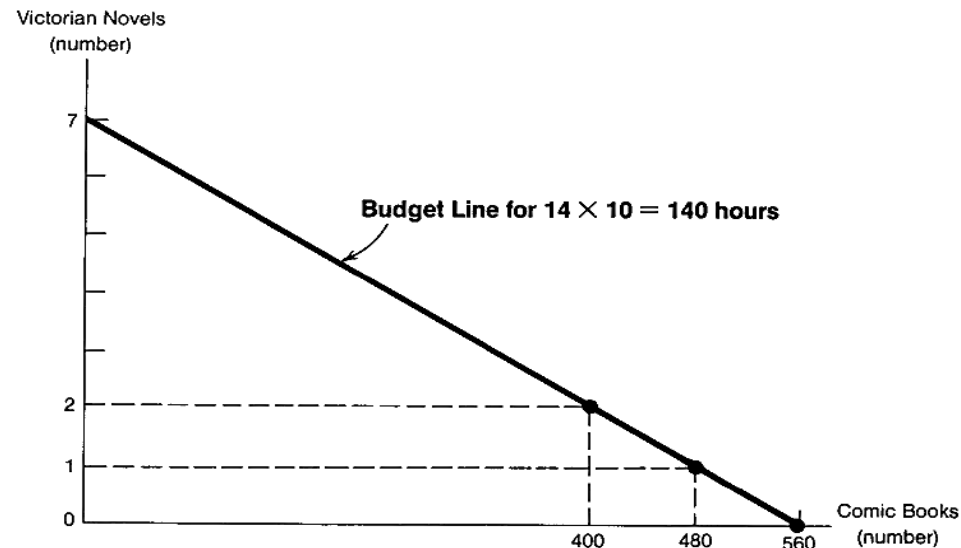
$$\frac{\text{Comics}}{\text{Novel}} = \frac{\text{hours/novel}}{\text{hours/comic}} = \frac{20}{1/4} = 80 \text{ comics per novel}$$

The Budget line

$$\begin{aligned} \text{Novel / comics} & \\ &= \text{hours comics} / \text{hours novel} \\ &= 1/4/80 \\ &= 0.0125 \end{aligned}$$

or 0.0125 novel per comic. With two weeks of leisure in which to read 10 hours a day, you could consume 7 Victorian novels or 560 comics; alternatively, you could trade off 80 of the 560 comics in order to read 1 novel and $560 - 80 = 480$ comics, or 2 novels and $560 - 80(2) = 400$ comics. In other words, you can consume in two weeks any straight-line combination between 7 novels and 560 comics.

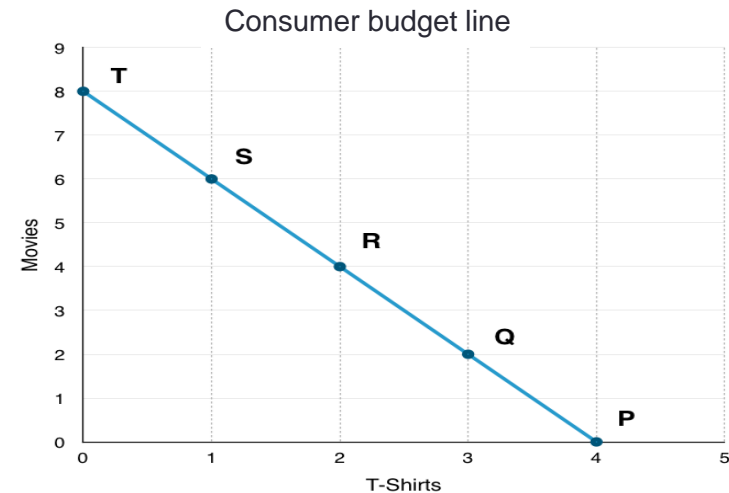
The Budget Line, drawn for a given number of hours available for reading, shows by its slope the rate at which the consumer forgoes reading Novels to read Comic Books.



The Budget Line of Literary Consumption

What Does Slope Mean?

- The meaning of the budget line's slope or **price ratio** is the same as the slope of a PPF.
- This means the slope of the curve is the relative price of the good on the x-axis in terms of the good on the y-axis ($-P_x/P_y$).
- The *price ratio of 2* means that consumer must give up 2 movies for every T-shirt. Likewise, the *inverse slope of 1/2* means that consumer must give up 1/2 T-shirt per one movie.



The Budget line

- The budget line then can be written:

$$P_f * F + P_c * C = I$$

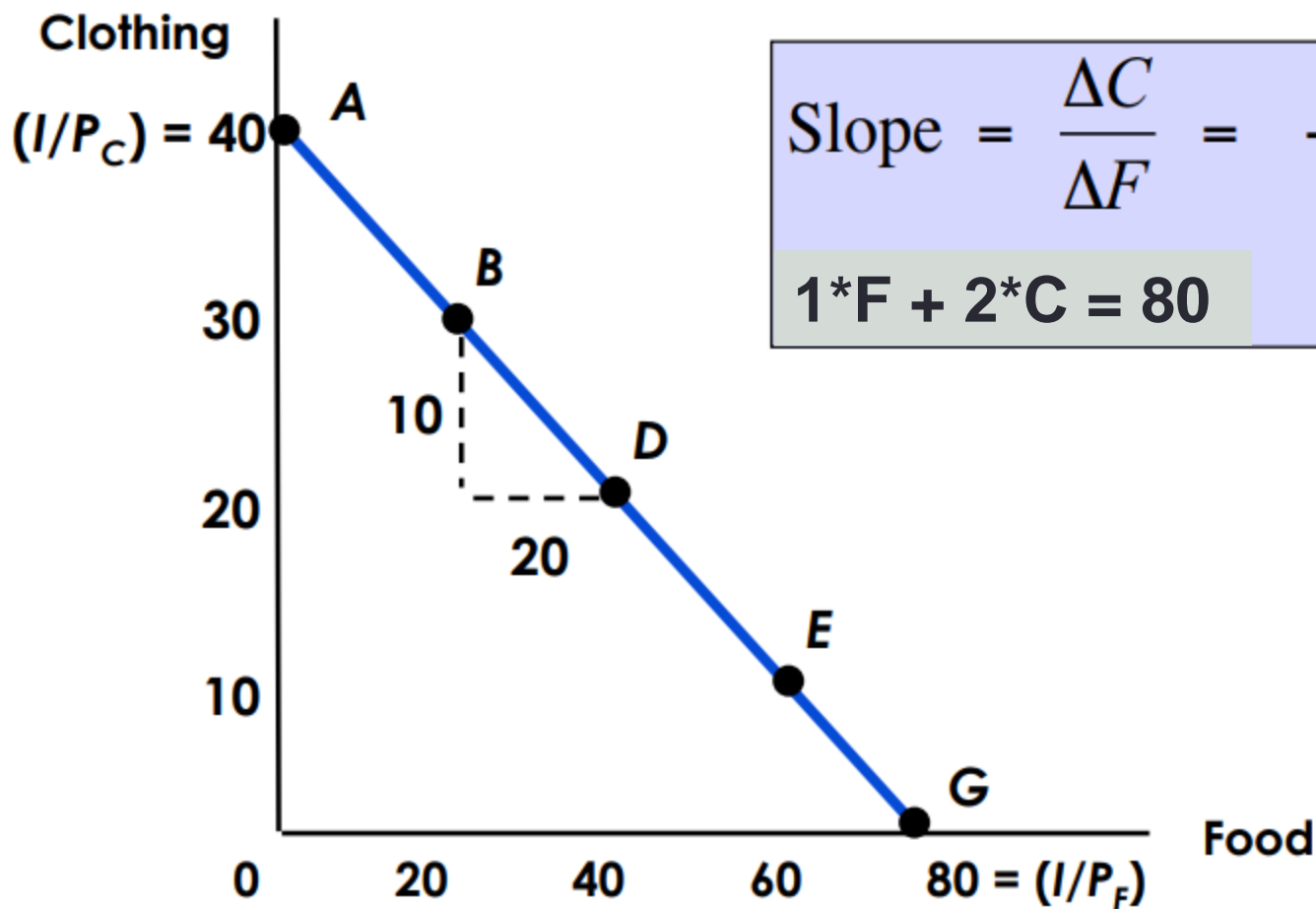
All income is allocated to food (F) and/or clothing (C)

Different choices of food and clothing can be calculated that use all income These choices can be graphed as the budget line

Example:

- Assume income of \$80/week, $P_f = \$1$ and $P_c = \$2$

| | Food $P_f = \$1$ | Clothing $P_c = \$2$ | Total $I = P_f * F + P_c * C$ |
|---|---------------------|-------------------------|----------------------------------|
| A | 0 | 40 | 80 |
| B | 20 | ? | 80 |
| C | 40 | ? | 80 |
| D | 60 | 10 | 80 |
| E | 80 | 0 | 80 |



$$\text{Slope} = \frac{\Delta C}{\Delta F} = -\frac{1}{2} = -\frac{P_F}{P_C}$$
$$1 * F + 2 * C = 80$$

- As consumption moves along a budget line from the intercept, the consumer spends less on one item and more on the other
- The slope of the line measures the relative cost of food and clothing
- The slope is the negative of the ratio of the prices of the two goods
- The slope indicates the rate at which the two goods can be substituted without changing the amount of money spent
- We can rearrange the budget line equation to make this more clear

- $1 \cdot F + 2 \cdot C = 80$
- $C = -0.5 \cdot F + 40$
- The vertical intercept, I/P_C , illustrates the maximum amount of C that can be purchased with income I
- The horizontal intercept, I/P_F , illustrates the maximum amount of F that can be purchased with income I

$$I = P_X X + P_Y Y$$

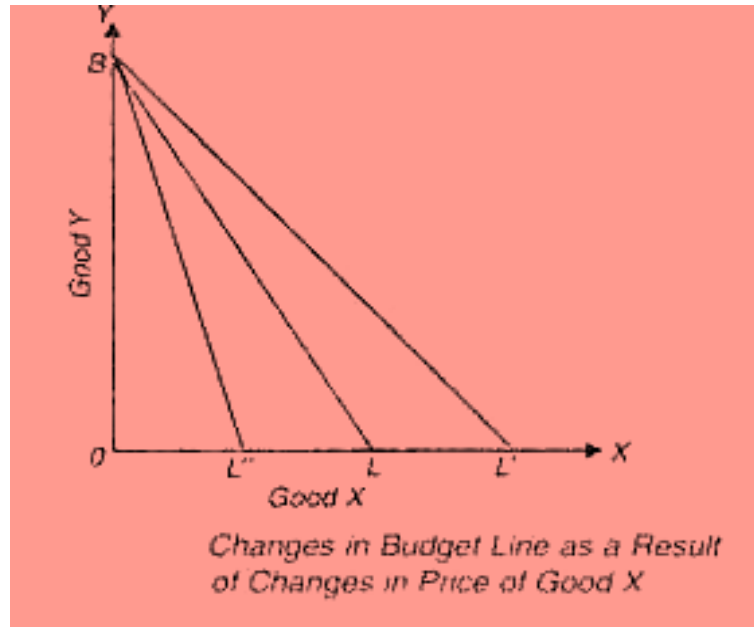
$$I - P_X X = P_Y Y$$

$$\frac{I}{P_Y} - \frac{P_X}{P_Y} X = Y$$

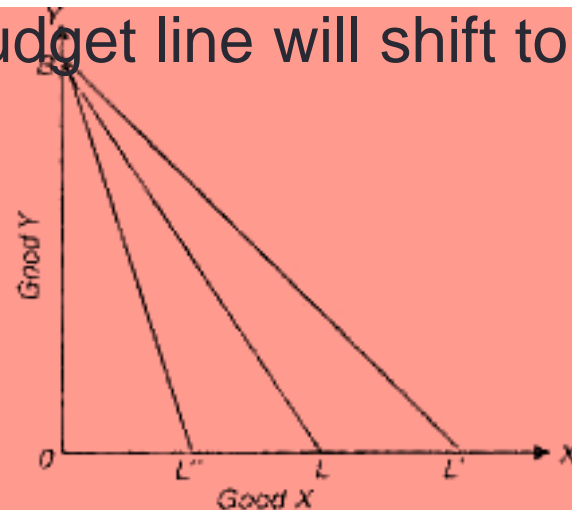
The Budget line: Changes in Price and Shift in Budget Line:

what happens to the budget line if the prices of goods change ?

Suppose the budget line in the beginning is BL, given certain prices of goods X and Y and a certain income. Suppose price of X falls, the price of Y and income remaining unchanged. Now, with a lower price of X the consumer will be able to purchase more quantity of X than before with his given income.

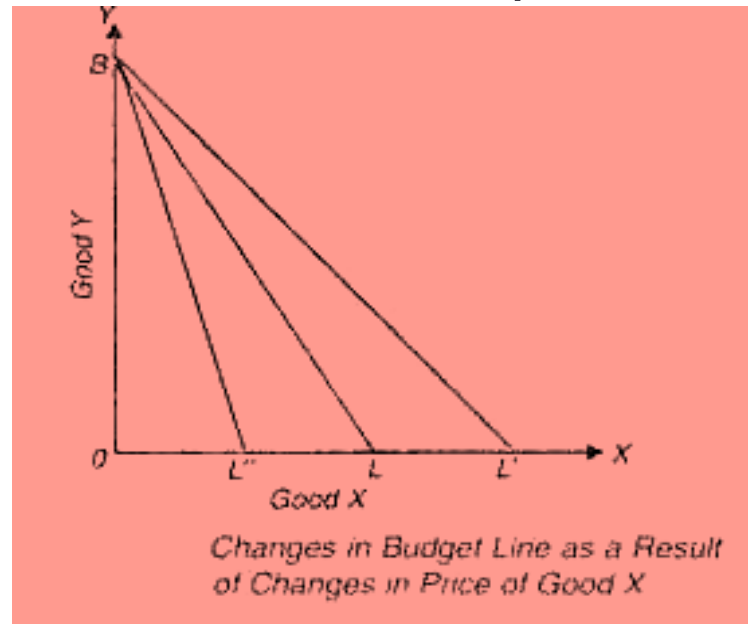


Let at the lower price of X, the given income purchases OL' of X which is greater than OL . Since price of Y remains the same, there can be no change in the quantity purchased of good Y with the same given income and as a result there will be no shift in the point B. Thus, with the fall in price of good X, the consumer's money income and the price of Y remaining constant, the budget line will shift to the right to the new position BL' .

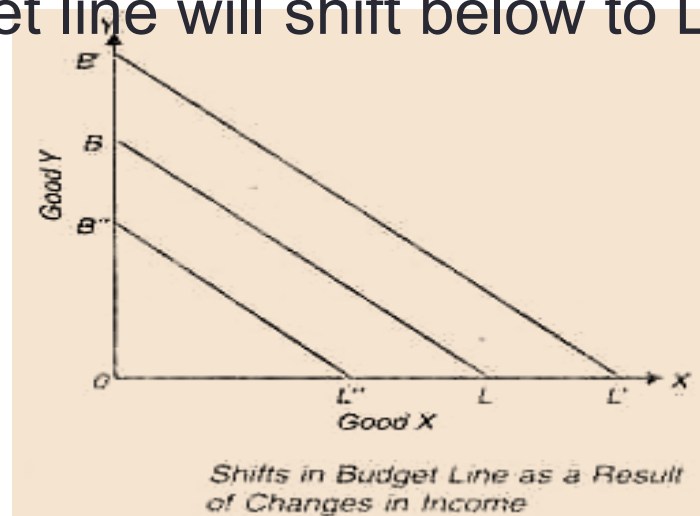


Changes in Budget Line as a Result of Changes in Price of Good X

- Now, what will happen to the budget line (initial budget line BL) if price of good X rises, the price of good Y and income remaining unaltered. With higher price of good X, the consumer can purchase smaller quantity of X, say OL” than before. Thus, with the rise in price of X the budget line will shift to the left to the new position BL”.



- the changes in the budget line when price of good Y falls or rises, with the price of X and income remaining the same. In this the initial budget line is BL. With fall in price of good Y, other things remaining unchanged, the consumer could buy more of Y with the given money income and therefore budget line will shift above to LB'. Similarly, with the rise in price of Y, other things being constant, the budget line will shift below to LB ".



Changes in Income and Shifts in Budget line

- As we know, income and prices can change
- As incomes and prices change, there are changes in budget lines
- We can show the effects of these changes on budget lines and consumer choices
- This will be illustrated in next lecture