

# Budget Constraints: Change in Price

by Sophia Tutorial



## WHAT'S COVERED

This tutorial will discuss how a change in price affects a budget constraint.

Our discussion breaks down as follows:

1. Budget Constraint
  - a. Budget Constraint Graph
2. Effect of Price Change on Budget Constraint
3. Income Effect vs. Substitution Effect
  - a. Income Effect
  - b. Substitution Effect

## 1. Budget Constraint

Let's begin today's lesson with our first key term, which is **budget constraint**. This is the graphical depiction of consumer income relative to the price of goods available.

Where the budget constraint touches the highest indifference curve available, the consumer is said to be optimizing their consumption.

Indifference curves help us maximize our utility, or satisfaction, and we will be exploring graphs that combine both budget constraints and indifference curves.

### 1a. Budget Constraint Graph

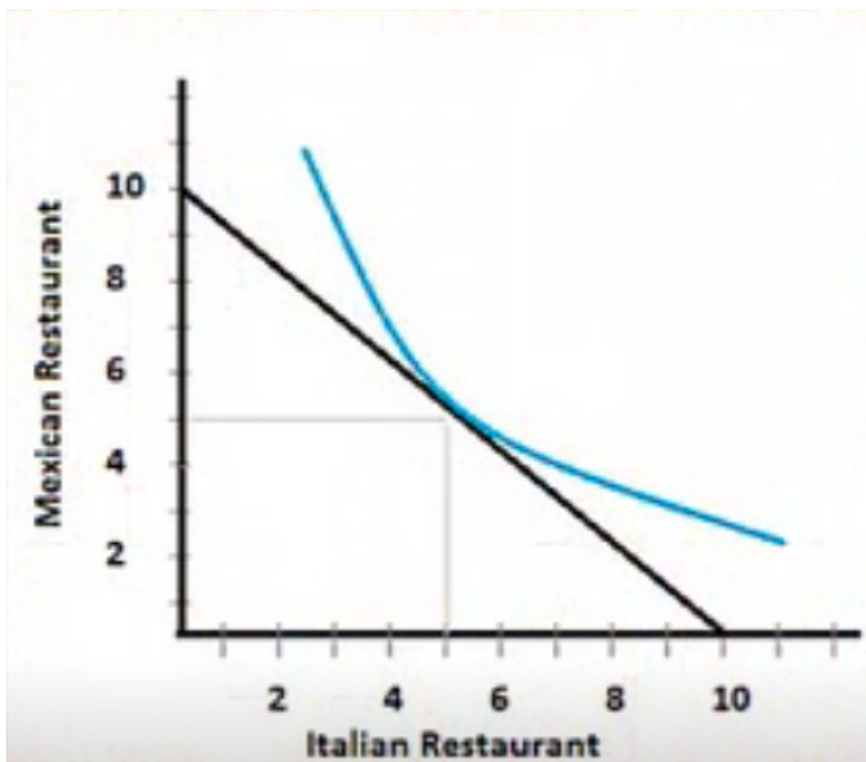
Here is an example to illustrate a budget constraint graph.

Suppose Kate has \$100 a month to go out to lunch at her two favorite places:

**The local Mexican restaurant = \$10**

**The local Italian restaurant = \$10**

Now, a budget constraint will list all possible combinations Kate can afford if she spends all \$100 on going out to lunch. Here is what it looks like in graph form:



The black line represents Kate's budget constraint.

Notice the extremes for each option where the budget constraint hits each axis, which indicate that Kate--if she is spending all \$100--can afford *either*:

- 10 Mexican meals ( $10 \times \$10 = \$100$ )
- 10 Italian meals ( $10 \times \$10 = \$100$ )

The indifference curve is represented by the blue curve on the graph, which shows which combination Kate chooses--because remember, most people probably wouldn't prefer all of one or all of the other.

The area within the budget constraint shows any combination that is affordable. However, Kate is maximizing her utility if she goes on her highest indifference curve.

According to Kate's indifference curve, she will choose five of each.



#### TERM TO KNOW

##### Budget Constraint

The graphical depiction of consumer income relative to the price of goods available. Where the budget constraint touches the highest indifference curve available, the consumer is defined to be optimizing consumption.

## 2. Effect of Price Change on Budget Constraint

Now, what would happen if prices change? Simply defined, **prices** are the cost of goods or services to the consumer.

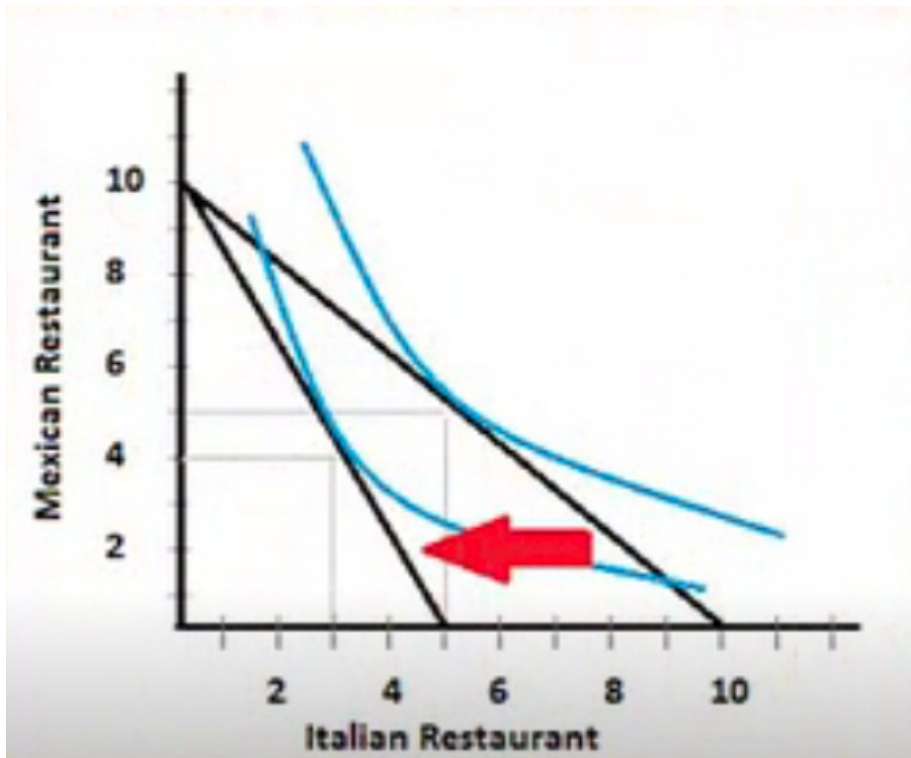
Suppose the Italian restaurant decides to end their lunch special, and now it is going to cost Kate \$20 to go to

lunch there.

This will certainly impact her budget constraint, and ultimately, her final choice as well.

Notice that Kate's budget itself did not change; she still has a budget of \$100. It is only the price of Italian meals that increased.

Here is the graph with the original budget constraint, able to afford 10 and 10 of each type of meal. Now, however, there is a new budget constraint, indicated by the red arrow.



Notice that nothing changed with the Mexican restaurant meals--they are still only \$10.

At the extremes, the new budget constraint shows that Kate can now afford *either*:

- 10 Mexican meals ( $10 \times \$10 = \$100$ )
- 5 Italian meals ( $5 \times \$20 = \$100$ )

Kate cannot afford as many Italian meals now. In fact, she can only afford half as many as before.

We call this a pivot of the budget constraint. It did not shift completely in parallel, because nothing changed with the price of the Mexican restaurant meals and nothing changed with the budget.

A change in income would have shifted the entire budget constraint in parallel, but that did not happen. The only change in price affected the Italian restaurant's meals.

Now, how is this going to impact Kate's ultimate choice?

We use the original indifference curve to see where Kate was on her old budget constraint line, but notice that now this curve is outside of her new budget constraint--she cannot afford anything on this curve.

Therefore, she needs a new indifference curve.

Remember, before the price change, Kate was enjoying five of each type of meal. This was the combination that maximized her utility.

However, now that her budget constraint has pivoted, the indifference curve that will maximize her utility places her at an optimal choice of three Italian meals and four Mexican meals.

	Italian Meals Demanded	Mexican Meals Demanded
Before Price Change	5	5
After Price Change	3	4



#### TERM TO KNOW

### Prices

The cost of goods or services

## 3. Income Effect vs. Substitution Effect

Now let's discuss two effects that both impacted Kate's decision.

The **income effect** states that consumers' purchasing power changes as income changes, affecting demand for a good or service.

The **substitution effect** states that when income decreases or price rises, cheaper goods and services are consumed instead of the more expensive alternative.

### 3a. Income Effect

The income effect can be slightly more difficult to understand. Notice that as the price of Italian meals increased, Kate not only bought fewer Italian meals, but she bought fewer Mexican meals as well. This, then, is the income effect. As the price of Italian meals went up, this had an impact on Kate's purchasing power, or on her *income*, so she was buying fewer of both meals.

Even though only one got more expensive, if she still wanted some Italian meals, it has impacted her overall purchasing power.

So, when she decreased her Mexican meal consumption from five down to four, it had nothing to do with Mexican meals changing in price. It was simply because her overall purchasing power went down--and that is the income effect.



#### TERM TO KNOW

### Income Effect

Consumers' purchasing power changes as income changes, affecting demand for a good or service

### 3b. Substitution Effect

The substitution effect is easier to understand. Now that Italian meals have become more expensive, Kate is dining at the Mexican restaurant more than the Italian restaurant.

Even though her consumption at the Mexican restaurant went down from five to four, she is still dining there more than at the Italian restaurant, where she is only going three times.

Despite the fact that she is able to afford both a little bit less, she is substituting more times now at the Mexican restaurant than the more expensive alternative, which is the Italian restaurant. This is what we call the substitution effect.



#### TERM TO KNOW

##### Substitution Effect

When income decreases or price rises, cheaper goods and services are consumed instead of the more expensive alternative



#### SUMMARY

Today we reviewed the definition of a **budget constraint** and its visual representation in a **budget constraint graph**. We learned that the **effect of a price change on a budget constraint** is that the budget constraint does not shift, but rather pivots when there is a change in the price of one good. We learned about the difference between the **income effect vs. substitution effect**. Remember, substitution is when we substitute out what is more expensive and begin buying what is less expensive, whereas the income effect shows the impact on our overall purchasing power.

Source: Adapted from Sophia instructor Kate Eskra.



#### TERMS TO KNOW

##### Budget Constraint

The graphical depiction of consumer income relative to the price of goods available. Where the budget constraint touches the highest indifference curve available, the consumer is defined to be optimizing consumption.

##### Income Effect

Consumers' purchasing power changes as income changes, affecting demand for a good or service.

##### Prices

The cost of goods or services.

##### Substitution Effect

When income decreases or price rises, cheaper goods and services are consumed instead of the more expensive alternative.