

Nominal GDP Versus Real GDP

by Sophia Tutorial



WHAT'S COVERED

This tutorial will explore the difference between nominal GDP versus real GDP.

Our discussion breaks down as follows:

1. Comparing GDP in Different Years
2. Nominal GDP
3. Real GDP
4. Real vs. Nominal Interest Rates

1. Comparing GDP in Different Years

GDP stands for Gross Domestic Product, and it is the sum of all final goods and services that are produced or sold within a country's borders. It is how we measure economic activity.

So, when we compare GDP from one year to the next, we are essentially trying to see if we are more productive from one year to the next. In other words, is there more or less economic activity going on within a country's borders?

IN CONTEXT

Let's explore a real-world example of comparing GDP. Suppose you want to know how much the economy has grown between 1980 and 2012. Were we more productive in 2012? Likely yes, but how much more productive?

Research tells us that GDP in 1980 was about \$2.8 trillion, or \$2,800 billion. Now, often economists like to take this figure down to per person in the country, which is called per capita GDP. Therefore, per capita in 1980 equated to about \$12,500 per person, in terms of productivity.

Now, GDP in 2012 was over \$16 trillion or \$16,000 billion. Per capita, that was about \$50,000 per person, per year.

Looking at this figure, you may ask yourself, "Did the economy really grow six times its size between

1980 and 2012? Did people really have four times the amount of stuff in 2012 versus 1980, per capita?"

It seems so, based on the difference between the GDP, because again, remember that the point of measuring GDP is to see how productive the economy is from quarter to quarter, or year to year.

However, the answer is not so simple, as we will explain in the course of this tutorial.



TERM TO KNOW

GDP

Gross Domestic Product; the sum of all final goods and services sold within a nation's domestic borders; a measurement of economic activity

2. Nominal GDP

Referring to our example, as mentioned, GDP in 1980 was \$2,800 billion or \$2.8 trillion, and in 2012, it was \$16 trillion. It is critically important to understand--as well as the key idea of this tutorial--that those figures are expressed in each respective year's prices.

This is what we call **nominal GDP**. Now, **nominal** is a value of an economic variable, such as GDP, inflation, or prices in the current period. It does not reflect changes in purchasing power or the price level over time. Nominal GDP, then, is the value of GDP including the impact of inflation.

Therefore, when we are looking at those figures in our example, we need to understand that while we were certainly more productive in 2012, prices had also risen significantly since 1980. This means that those figures are taking into account the fact that prices have gone up so much, which is why they are so inflated.

🔗 **EXAMPLE** Suppose we estimate the price of a McDonald's hamburger back in 1980 to be about \$0.40, while the price of a McDonald's hamburger in 2012 was somewhere around \$1. In this example alone, then, prices have risen by at least 2.5 times.

Now, **price** is defined as the cost of a good or service. Keep in mind, though, that we are talking about nominal prices here. Nominal prices reflect the current or prevailing price for an item, whereas real prices, which we will discuss shortly, adjust for purchasing power variation over time, or inflation.



TERMS TO KNOW

Nominal GDP

The value of GDP including the impact of inflation

Nominal

The value of an economic variable such as GDP, inflation, or prices in the current period; does not reflect changes in purchasing power (price level) over time

Price

The cost of a good or service; nominal prices reflect the current or prevailing price for an item; real prices adjust for purchasing power variation over time (inflation)

3. Real GDP

Circling back to our example, then, let's assume, for this example, that almost everything has risen by at least 2.5 times in price level between 1980 and 2012.

Then, if we take 2012's \$50,000 per capita GDP and divide that by 2.5, this tells us that the average person in 2012 made the equivalent of \$20,000 in 1980 prices.

$$\text{\$50,000 per capita GDP} / 2.5 = \text{\$20,000}$$

Put another way, we could say that 1980's \$12,500 per capita GDP is the equivalent of \$31,250 in 2012 prices.

$$\text{1980's \$12,500 per capita GDP} \times 2.5 = \text{\$31,250}$$

So, as you can see, we were certainly more productive in 2012 versus 1980--however, not by the amount it appeared when comparing nominal GDPs, due to inflation.

When comparing figures like this, we want to see what the impact is of inflation versus the impact of actually producing more goods and services, which leads us to the concept of **real GDP**. Now, **real** is the value of an economic variable such as GDP, inflation, or prices in the current period, adjusted for the change in purchasing power, or price level, over time.

Real GDP adjusts for inflation by restating nominal GDP in reference to a base year dollar value. This is the only way we can compare apples to apples, to truly know if an economy has been more productive from one year to the next because it takes prices out of the equation.

When comparing the productivity of two years, we always use a certain year's prices as the base year.

➡ **EXAMPLE** For example, if we are comparing 1980 with 2012, then we need to use one year as the base for both. We could use the prices in 1980 for both years or the prices in 2012 for both years.

Again, going back to our example, let's refer to our nominal figures:

$$\text{1980 GDP} = \text{\$2800 billion}$$

$$\text{2012 GDP} = \text{\$16 trillion}$$

If we adjusted for inflation and used 1980 prices as the base year, then \$2800 billion would still reflect our nominal and real GDP in 1980. However, the real GDP in 2012 in 1980 prices would then become \$6.4 trillion.

$$\text{Real GDP 2012} = \text{\$16 trillion} / 2.5 = \text{\$6.4 trillion}$$

You can see that we were more productive in 2012 because \$6.4 trillion is greater than \$2.8 trillion. However, it is not by the amount that it initially appeared to be, because of the impact of inflation.



BIG IDEA

When comparing two different years, it is important to use real GDP. Using real GDP is the only way to really know how productive an economy was from one year to the next since it takes prices out of the equation.



TERMS TO KNOW

Real GDP

Adjusts for inflation by restating nominal GDP in reference to a base year dollar value

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The value of an economic variable such as GDP, inflation, or prices in the current period, adjusted for the change in purchasing power (price level) over time

4. Real vs. Nominal Interest Rates

Now, we also have to consider the impact on interest rates. Remember, interest rates are what we pay to borrow money, and if you, as a lender, lend someone money and charge them 5%, this is what we would consider the nominal interest rate.

However, if they pay you back over time, and there is 10% inflation over the years that they are paying you back, they are actually paying you back in money that is worthless.

So, do you really make any money? The answer is no.

Because they are paying you back in money that is worth less and less over time, you need to consider what the real interest rate would be.

The real interest rate involves taking the difference between the nominal interest rate and the rate of inflation. In this example from above, then, it would be a -5%, or 5% minus 10%.

Now, the method to find the rate of inflation from one year to the next is to take the price level in one year and divide it by the price level in the prior year.

🔗 **EXAMPLE** For example, suppose a bundle of goods that cost \$100 last year now costs \$103 this year. We can find the rate of inflation by dividing 103 by 100, which gives us 1.03. The ".03" tells us that the rate of inflation is 3%.

$$103 / 100 = 1.03$$

Taking it a step further, if the rate of inflation was 3% and the interest rate was 5%, then the real interest rate that banks and other lenders are earning is only 2%, which is the difference between the nominal interest rate and the rate of inflation.

It is imperative to focus on these real figures and understand how interest rates impact spending levels in the economy. They tell us how much our purchasing power will actually increase over time, instead of only looking at how much cash we have. Although it is great to have more money, if our cash cannot actually purchase more for us, then it does not do any good.

As a reminder, the **interest rate effect** is that as interest rates fall, consumption increases due to the decrease in the cost of borrowing. As a result, purchases and business investment (Consumption, or C, and Investment, or I, respectively) both increase.



TERM TO KNOW

Interest Rate Effect

As interest rates fall, consumption increases due to the decrease in the cost of borrowing; as a result, purchases and business investment (consumption, C, and investment, I, respectively) both increase



SUMMARY

Today we learned about the difference between **nominal GDP** and **real GDP**. We learned about the importance of using real GDP when **comparing GDP in different years** because it is the only way to compare "apples to apples" accurately. We also learned the importance of understanding the difference between **real vs. nominal interest rates** when looking at borrowing and lending money.

Source: Adapted from Sophia instructor Kate Eskra.



TERMS TO KNOW

GDP

Gross Domestic Product; the sum of all final goods and services sold within a nation's domestic borders; a measurement of economic activity.

Interest Rate Effect

As interest rates fall, consumption increases due to the decrease in the cost of borrowing; as a result, purchases and business investment (consumption, C, and investment, I, respectively) both increase.

Nominal

The value of an economic variable such as GDP, inflation, or prices in the current period; does not reflect changes in purchasing power (price level) over time.

Nominal GDP

The value of GDP including the impact of inflation.

Price

The cost of a good or service; nominal prices reflect the current or prevailing price for an item; real prices adjust for purchasing power variation over time (inflation).

Real

The value of an economic variable such as GDP, inflation, or prices in the current period, adjusted for the change in purchasing power (price level) over time.

Real GDP

Adjusts for inflation by restating nominal GDP in reference to a base year dollar value.