

# Nominal and Real Values

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### Dollars and Cents at Different Dates

To compare dollar amounts at different dates, we need to know the CPI on those dates. To convert the price of a good in past dollars (Year 2) to its price in current dollars (Year 1), use the following formula:

$$\text{Value in Year 1 dollars} = \left\{ \frac{\text{CPI in Year 1}}{\text{CPI in Year 2}} \right\} \times \text{Value in Year 2 dollars}$$

Notice that in the above formula, Year 2 does not necessarily have to be greater than Year 1. Thus, the formula works for any two years.<sup>(17)</sup>

### Nominal and Real Values in Macroeconomics

The difference between nominal and real variables is important in macroeconomics. In macroeconomics, we generally use the GDP deflator rather than the CPI as our measure of the price level because we are dealing with economy totals, of which consumer spending is just one part.

The calculation of the real wage is similar to the calculation of real GDP, only using a different set of variables.<sup>(17)</sup>

$$\text{Real wage} = (\text{Nominal wage}) \div (\text{CPI})$$

$$\text{Real GDP} = (\text{nominal GDP}) \div (\text{GDP deflator})$$

### Nominal GDP and Real GDP

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP price index}} \times 100$$

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### Nominal Wage Rate and Real Wage Rate

The **nominal wage rate** is the average hourly wage rate measured in *current* dollars and the **real wage rate** is the average hourly wage rate measured in dollars of a given reference base year.

$$\text{Real wage rate} = \frac{\text{Nominal wage rate}}{\text{CPI}} \times 100$$

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The real wage rate is the quantity of goods and services that an hour's work can buy.

Between 1981 and 2011, the nominal wage rate more than doubled, but the real wage rate stayed roughly constant because the increase in the nominal wage rate just kept up with inflation. <sup>(17)</sup>

## Nominal Interest Rate and Real Interest Rate

The **nominal interest rate** is the percentage return on a loan calculated by using dollars. The **real interest rate** is the percentage return on a loan calculated by using purchasing power; it's the nominal interest rate adjusted for the effects of inflation.

Real interest rate = Nominal interest rate – Inflation rate

The calculation of the real interest rate also “deflates” the nominal interest rate. However, because the numbers are already percentages, we must subtract the percentage change in prices (the inflation rate) rather than divide by the price level. When the inflation rate was high, during the 1970s and early 1980s, the gap between the real interest rate and the nominal interest rate was large. The real interest rate was negative in the mid-to-late 1970s and very high in the early 1980s, but has shown no real upward or downward trend since 1971. <sup>(17)</sup>

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