NOMINAL, REAL AND EFFECTIVE RATES OF INTEREST

**Nominal Interest Rate:**
The nominal interest rate is conceptually the simplest type of interest rate. It is quite simply the stated interest rate of a given bond or loan. It is also defined as a *stated* interest rate. This interest works according to the simple interest and does not take into account the compounding periods.

Nominal rates of interest on a loan are the rates the lender states the borrower will pay. Most financial institutions quote nominal rates on an annual basis. Because microenterprise loans frequently have terms of less than a year, nominal interest rates are often quoted on a monthly basis.

Nominal interest rates are used to calculate the amount of interest to be paid on a loan. The amount of interest to be paid for a loan depends on the nominal interest rate, the amount borrowed, and the time period.

For example, a loan of $1,000 to be repaid in one year at 9 percent annual interest would mean that the borrower pays back the $1,000 in principal at the end of one year, plus $90 in interest (1,000 x .09 x 1 year). Because this loan is paid back in one payment of principal and interest, the interest calculation is referred to as simple interest.

**Real Interest Rate:**
The real interest rate is slightly more complex than the nominal rate but still fairly simple. The nominal interest rate doesn’t tell the whole story because inflation reduces the lender's or investor’s purchasing power so that they cannot buy the same amount of goods or services at payoff or maturity with a given amount of money as they can now. The real interest rate is so named because it states the “real” rate that the lender or investor receives after inflation is factored in; that is, the interest rate that exceeds the inflation rate. For example, If a bond that compounds annually has a 6% nominal yield and the inflation rate is 4%, then the real rate of interest is only 2%. The real rate of interest could be said to be the actual mathematical rate at which investors and lenders are increasing their purchasing power with their bonds and loans. It is actually possible for real interest rates to be negative if the inflation rate exceeds the nominal.
rate of an investment. For example, a bond with a 3% nominal rate will have a real interest rate of -1% if the inflation rate is 4%.

A comparison of real and nominal interest rates can therefore be summed up in this equation:

\[ \text{Nominal interest rate} - \text{Inflation} = \text{Real interest rate} \]

Several economic stipulations can be derived from this formula that lenders, borrowers and investors can use to make more informed financial decisions.

- Real interest rates can not only be positive or negative, but can also be higher or lower than nominal rates. Nominal interest rates will exceed real rates when the inflation rate is a positive number (as it usually is). But real rates can also exceed nominal rates during deflation periods.
- A hypothesis maintains that the inflation rate moves in tandem with nominal interest rates over time, which means that real interest rates become stable over longer time periods. Investors with longer time horizons may, therefore, be able to more accurately assess their investment returns on an inflation-adjusted basis.

**Effective Interest Rate:**

One other type of interest rate that investors and borrowers should know is called the effective rate, which takes the power of compounding into account. For example, if a bond pays 6% on an annual basis and compounds semiannually, then an investor who invests $1,000 in this bond will receive $30 of interest after the first 6 months ($1,000 \times .03$), and $30.90 of interest after the next 6 months ($1,030 \times .03$). The investor received a total of $60.90 for the year, which means that while the nominal rate was 6%, the effective rate was 6.09%. Mathematically speaking, the difference between the nominal and effective rates increases with the number of compounding periods within a specific time period.

Effective rates of interest bring all of the direct financial costs of a loan together in one interest rate. Effective interest rates incorporate interest, fees and other loan requirements into the financial cost of the loan. Effective rates can be compared to determine whether the conditions of one loan make it more expensive or less expensive to the borrower than the conditions of another loan.
When interest is calculated on a declining balance, and there are no additional costs to a loan the
effective interest rate is the same as the nominal interest rate. Most financial institutions,
however, use an interest rate and fee structure that make the effective interest rate on their loans
higher than their nominal rate. Their reasoning may be a desire to have lower nominal interest
rates, a strategy to cover the costs of a specific service (such as loan monitoring) with a specific
fee, or a system for generating income upon loan disbursal.
Effective interest rates will differ from nominal rates whenever a different method of calculation
is used, or there are additional financial costs, such as:

a. The interest being calculated based on the original loan amount instead of the outstanding
   balance. This flat method of calculation is commonly used by informal lenders and some
   microenterprise credit programs.

b. The interest being deducted ("discounted") from the original loan amount before the loan is
disbursed.

c. A commission or other fee.
   Fees will alter the effective interest rate to varying degrees depending on how they are
calculated and paid.

d. A requirement that the borrower maintain a minimum amount, a compensating balance, in a
   savings account in order to receive a loan.

_The higher the effective interest rate, the more this loan is actually costing the borrower,
and the more it is earning the lender._

**Calculating Effective Interest Rates:**
The effective interest rate is the amount the borrower pays in interest, fees, and commissions,
divided by the amount the borrower receives.

*Effective Interest Rate = Amount paid in interest, fees and commissions
Principal amount received by borrower*
The chief advantage to knowing the difference between nominal, real and effective rates is that it allows consumers to make better decisions about their loans and investments. A loan with frequent compounding periods will be more expensive than one that compounds annually. A bond that only pays a 1% real interest rate may not be worth investors' time if they seek to grow their assets over time. These rates effectively reveal the true return that will be posted by a fixed-income investment and the true cost of borrowing for an individual or business.

Effective and nominal interest rates allow banks to use the number that looks most advantageous to the consumer. When banks are charging interest, they advertise the nominal rate, which is lower and does not reflect how much interest the consumer would owe on the balance after a full year of compounding. On the other hand, with deposit accounts where banks are paying interest, they generally advertise the effective rate because it is higher than the nominal rate.