

Product Briefing - Inflation

Inflation represents rising prices, deflation falling prices and disinflation is where price increases slow down.

Within the inflation world a nominal frame of reference looks at investments in terms of cash paid without taking into account the loss of purchasing power. So if an item costs €1 today, with 2% inflation it will cost €1.02 by the end of the year.

Alternatively we could say that at the end of the year, €1 will only buy 0.98 of the item. How would this relate to bonds?

Key concepts:

- *Real yields*
- *Nominal yields*
- *Breakeven inflation*
- *Fisher equation*

Consider a one year bond that pays a principal of €100 plus one interest payment of €5 at its maturity. The real value of this final cash flow will depend on what happens to prices over the period. If an investor expected inflation to be 3% then it will cost €103 in one year to buy something that costs €100 presently. However, the bond will pay a cash flow of €105 and so you expect to have €2 of extra purchasing power - a 1.94% increase in purchasing power.

The **Fisher equation** is used extensively by the market to express the relationship between the yields on nominal bonds and expected inflation. The equation expresses the relationships as:

$$(1 + n) = (1 + r)(1 + f)(1 + p)$$

Where:

n = yield on a nominal bond

r = real yield on inflation linked bond

f = inflationary expectations

p = risk premium

However, the market has shortened the expression:

$$n = r + f + p$$

$$n = r + bei$$

Where:

bei = breakeven inflation

In essence, the formula states that the yield on a nominal bond is made up of three components:

1. A required real yield that investors demand over and above those inflationary expectations.
2. Inflationary expectations over a particular period of time ('break even inflation')
3. A factor that captures the combination of a risk premium and a liquidity discount. The risk premium is the compensation an investor earns for accepting undesirable inflation risk when holding nominal bonds. The liquidity discount represents the yield premium that investors demand to hold a less liquid inflation - linked bond.

However, the third component is generally considered to be difficult to disaggregate and so is generally ignored by the market.

The break even rate can be thought of as the average rate of inflation that will equate the returns on an inflation-linked bond and a comparator nominal bond issue of the same return.

To illustrate how it should be interpreted consider the following example. Suppose there is a nominal five year sovereign bond that is yielding 4.5% and an inflation-linked sovereign bond of the same maturity whose yield on a real basis is 1.5%. Using the principles of the Fisher equation this implies a breakeven inflation rate of 3.0%.

An investor could use the value of break even inflation to assess which bond should be purchased:

- If the investor expects inflation to average less than 3.0% over period they should hold the nominal bond
- If the investor expects inflation to average more than 3.0% over period they should hold the inflation-linked bond
- If the investor expects inflation to average 3.0% over period they will be indifferent between the two assets

Arguably the difficulty experienced by practitioners in trying to grasp the concept of inflation lies in defining the concept of a real yield. If one looked at the Fisher equation a simple but somewhat unsatisfactory definition of real yields is simply the difference between nominal yields and inflation expectations. We present two other definitions:

1. A real rate of interest reflects the amount earned or paid after taking into account the impact of inflation.
2. It is the market clearing rate of return in excess of expected future inflation that ensures supply meets demand for a particular investment opportunity.

Real yields should also:

- Reflect the growth in an economy's productivity
- Represent the rate at which investments are rewarded. Investments compete for capital on the basis of the real yield they offer given their associated risk.

What can be even more confusing is when real rates of interest become negative, an example of which occurred in the US Treasury market in 2008. This occurred when inflation expectations were higher than nominal interest rates. These negative real yields were attributable to:

1. Slower economic growth prospects which lowered rates of expected returns across investments.
2. The US Federal Reserve was expected to cut interest rates such that inflation would be greater than nominal rates.
3. A 'flight to quality' by investors which drove up the price of government securities reducing their nominal returns.

So in general terms **negative real yields could occur** if:

- An asset is not considered a productive use of capital
- The asset is attractive but faces excess demand relative to its supply. As a result its price rises and the nominal return falls

The existence of negative real yield can create an incentive to drive capital to other more potentially attractive investments.

Inflation - linked bonds

An inflation-linked bond is one whose value is linked to movements in a specific price index in order to maintain its purchasing power. An inflation index measures the way in which prices change. This is achieved by analysing and recording thousands of prices for a selection of goods and services on a monthly basis.

Inflation figures for a particular month are then typically issued 2-3 weeks later. Some of the goods and services will carry a higher weighting reflecting the fact that consumers will spend more money on some items than others. The basket and the constituent weightings are revised on an annual basis.

The most common inflation index used is the consumer price index (CPI) for the respective country of issue, although each country will typically calculate and quote a number of indices.

In the USA the 'Treasury Inflation Protected Securities' (TIPS; also sometimes referred to as Treasury Inflation Indexed Securities - TIIS) reference their return to the consumer price all urban non-seasonally adjusted inflation index. In Europe a common index is the Harmonised Index of Consumer Prices all items excluding tobacco (HCIP), while the UK mainly uses the Retail Price Index (RPI).