

6.5: Determinants of Interest Rates

$$k = k^* + IP + DRP + LRP + MRP + SCP \quad (6.5.1)$$

$$krf = k^* + IP \quad (6.5.2)$$

where

k^* = The real risk-free rate of interest

krf = The risk-free rate of interest

IP = The inflation premium

DRP = The default risk premium

LRP = The liquidity risk premium

MRP = The maturity risk premium

SCP = The special characteristics premium



Figure 6.5.1: Determinants of Interest Rates

Real Risk-Free Rate of Interest

The Real Risk-Free Rate of Interest should represent the amount of compensation that investors feel is necessary to forego consumption today and instead save/invest that capital. This is typically a small amount in the range of 1% to 3% per year. This is sometimes referred to as the “PURE RATE”. The pure rate (real risk-free rate) will fluctuate over time, but at any point in time should be approximately the same across all securities.

Inflation Premium

The Inflation Premium is a percentage above the real risk-free rate of interest that allows the investor/saver to compensate for any loss in purchasing power due to inflation. For example, if I were to earn a 5% rate of return on an investment and in the same time inflation was 10%, then I have really just lost 5% of my wealth. If I want to earn a real return of 3% when inflation is 10%, I need to get at least 13%. One other thing to keep in mind regarding the inflation premium is that it is based on the expected average annual rate of inflation over the length of the investment. For example, the 3-month Treasury Bill has an inflation premium based on the expected ANNUALIZED rate of inflation over the next 3-months, while the 30-year Treasury Bond has an inflation premium based on the expected AVERAGE ANNUAL inflation rate over the next 30-years. While 3 months is a relatively short time, in periods of rising prices, the expected ANNUALIZED can be quite high. Also, since we are looking at AVERAGE ANNUAL inflation not cumulative inflation, the inflation premium on longer term bonds can sometimes be relatively small. For securities with approximately the same time to maturity, the inflation premium should be the same across these securities.

Default Risk Premium

The Default Risk Premium compensates investors for the risk of a borrower defaulting on their loan. For Treasury securities this is usually estimated to be zero as the possibility of default by the US Treasury is nil. For Municipal Bonds and Corporate Bonds the default premium can be relatively small or large depending on the creditworthiness of the issuer. There is a strong relationship between default premiums and bond ratings. The weaker the bond rating, the higher the default risk premium.

Liquidity Risk Premium

The Liquidity Risk Premium compensates investors for the difficulty of turning their investments into cash on a timely basis for close to fair market value. The more liquid an asset is, the more valuable, other things being equal, it is to an investor. If investors are not able to quickly convert their investment to cash without selling the asset for a steep discount, they will demand compensation for tying up their capital. Treasury securities are very liquid. Corporate Bonds and Municipal Bonds are much less liquid and there is a lot of variance among the liquidity of various securities.

Maturity Risk Premium

The Maturity Risk Premium recognizes that longer-term securities are more risky than shorter-term securities. Remember from Chapter Four that long-term bonds fluctuate more in value when interest rates rise than short-term bonds. This makes them riskier. As investors are risk averse, they will demand a premium for investing in longer-term securities.

Special Characteristics Premium

The Special Characteristics Premium accounts for any special features that may be attractive or unattractive to investors. For example, the bond may be issued by an international firm and interest paid in a foreign currency. This introduces currency risk and may require a slightly higher rate in order to attract investors. There could be a call provision. As discussed in Chapter Four, a call provision limits the investors upside potential when interest rates go down, but doesn't help the investor if interest rates increase. This "Heads I Don't Win, Tails I lose" feature makes investors demand a higher premium to invest in callable bonds. Convertible Bonds typically carry a negative premium as it allows investors to participate in the gains from stock increases while providing the greater security of a bond. Any other special features can result in positive or negative special characteristic premiums depending on whether or not investors find the feature to be a bonus or a detriment.

Each security will have different interest rates based on the above factors. The real risk-free rate of interest should be similar across various securities, however the various other factors will fluctuate based on the issuer, time to maturity, and size of issue, etc.

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