CFA Montréal

INVESTMENT PRINCIPLES

INFORMATION SHEET FOR INVESTORS

WHAT DRIVES MARKET RETURNS

8

IMPORTANT NOTICE

The term "financial advisor" is used here in a general and generic way to refer to any duly authorized person who works in the field of financial services, including the following:

- Investment brokers
- Mutual fund brokers
- Scholarship plan dealers
- Exempt market dealers
- Portfolio managers
- Investment fund managers
- Life insurance agents
- Financial planners (F.Pl.)

CFA Montréal

WHAT DRIVES MARKET RETURNS

We've been making the argument that most experts cannot forecast market returns. However, there are some guidelines and principles that may help understand what range of returns investors can reasonably expect. Furthermore, we seek to illustrate that historical performance is unreliable as a source of information on future performance. This is a complex topic, and we will address it in the simplest way possible.

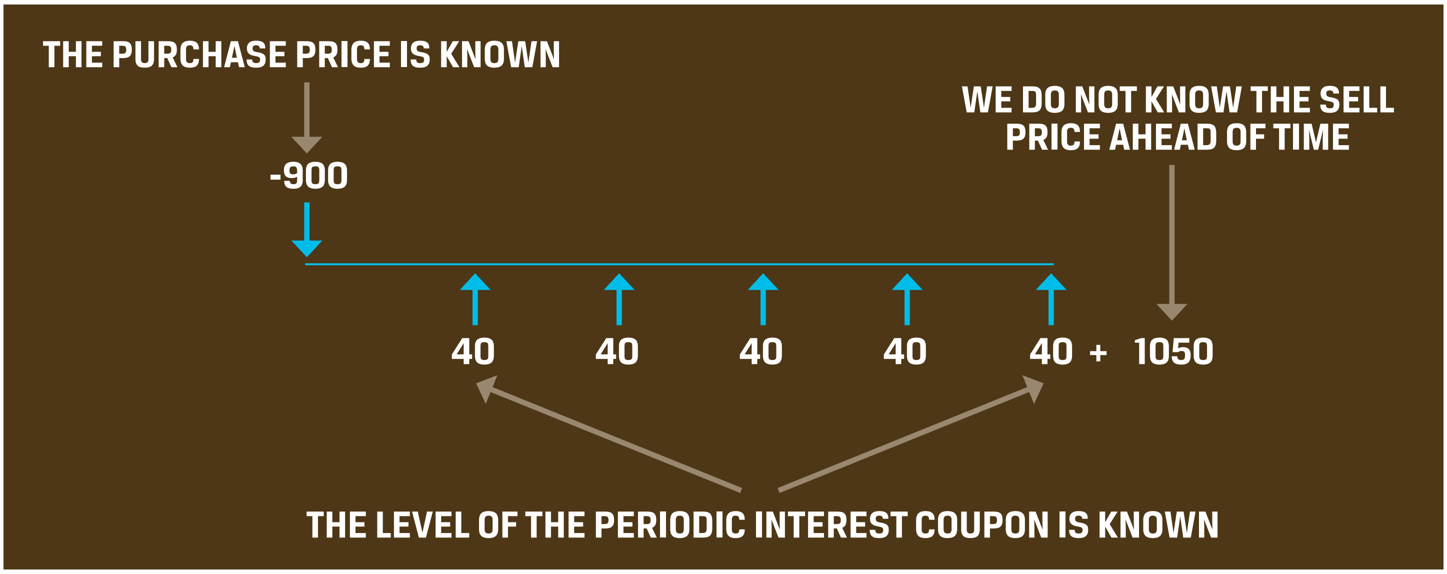
THE MATHEMATICS OF ASSET RETURNS

The following is a useful approximation of the average yearly return on any asset:

[Current Yield + Annualized return attributed to price change]

Let's consider a 20-year bond that pays a $40 annual interest coupon. The bond is purchased for $900 and sold for $1,050 five years later when its remaining maturity is 15 years. The coupon yield at time of purchase is 4.44% (40/900), and the compounded return attributed to the change in price is 3.15% ($[1050/900]^{(1/5)}-1$) for a total return of about 7.59%.

In a sense, we could say that a 4.44% performance is attributed to the interest coupons and the balance, 3.15%, to the increase in price.[1] The figure below illustrates the cash flow dynamic of this investment.



We use this approximation to illustrate that the main source of return uncertainty when we buy financial assets is not the current yield, since we know the current level of interest coupon/dividend as well as the current price, but rather its future sell price. In the case of fixed income instruments, there is less uncertainty as to the possible range of the sell price, but in the case of equity, the uncertainty is much greater. This document seeks to explain the sources of this uncertainty and its materiality in the case of fixed income and equity.

THE CASE FOR BONDS

Bonds are usually transacted on the basis of a yield to maturity (YTM). The YTM of a bond is simply the return an investor will realize if this bond is purchased at its current market price, kept until maturity, and if all coupons and the principal are paid on time. Hence, the most important difference with the previous example is that the principal paid by a bond at maturity (usually $1,000 per bond) is known. If the YTM of a bond is 3%, it means the investor will realize a return of 3.0% if the bond is kept to maturity and all coupon and principal payments are timely. Returns are only uncertain if the bond is sold prior to maturity (since we do not know the sell price) or if a default occurs.

However, what determines the YTM that investors require on a bond? There are three main components:

- A compensation for inflation;
- A compensation for risk (default);
- A compensation in excess of inflation, often called the real return.

For example, as of the end of 2015, a 10-year US Treasury bond had a YTM of about 2.25%. Assuming investors expected an average inflation rate of 2%, it likely means that the compensation for risk was close to nil (Treasury bonds are considered riskless), while the real return was about 0.25% as of that date. However, if a corporate bond of similar maturity was selling on the basis of a YTM of 3.0% at the same time, we could conclude that the return compensation (risk premium) for the credit risk of that bond is 0.75% (3.00% - 2.25%).

[1] An accurate calculation would show that the return is in fact 7.32%, but it helps to segment performance as we did to illustrate the two sources of performance.

Let's now consider a simple example to illustrate under what circumstances the realized return of an investor could be different from the yield to maturity. Let's assume an investor acquires a bond that has a maturity of 1 year. It is expected to pay a single coupon of $30 and a payment of principal of $1,000 a year from now. Let's assume the yield to maturity for that bond is 3.0%. Hence, the bond will sell for $1,000 since:

Price =
($1,000 + $30) / (1 + 3%) = $1,000

Let's now assume that right after the bond has been acquired by an investor, an economic report shows that inflation is running at a much higher rate than investors expected. The yield to maturity on the bond immediately climbs from 3.0% to 4.0%, since investors now require greater compensation for the expected inflation. The market price of the same bond will decline since:

Price =
($1,000 + $30) / (1 + 4%) = $990.39

Let's analyze what just happened.

- If the investor bought the bond before the inflation report (when then YTM was 3.0%), a 3% return will be realized if the bond is kept until maturity.
- If the investor bought the bond after the inflation report (when the YTM is 4.0%), a 4% return will be realized if the bond is kept until maturity.
- If the investor bought the bond before the inflation report and sells it prior to maturity when the YTM is now 4.0%, the return will be lower than the original YTM of 3.0%. Return uncertainty occurs when the bond is sold prior to maturity.

However, most investors own bonds through a bond fund or a bond ETF. Furthermore, investors usually invest in bond funds or ETFs that target a specific maturity range (short-term, intermediate and long-term). Hence, as the maturity of existing bonds is reduced by the passage of time, new bonds of longer maturity are acquired by the managers of this bond fund or ETF to remain within this specific range of maturity.

One particularity of such a product is that if an investor purchases a bond fund that targets an average maturity of about "x" years, the return realized by the investor over "x" years will be approximately equal to the average yield to maturity of the bonds observed when the fund is acquired. In other words, if you had acquired at the end of 2015 the Ishares Intermediate Government/Credit Bond ETF that had an average maturity of about 4 years and an average yield to maturity of about 1.75%, and if you kept the ETF for about 4 years (until the end of 2019), your realized return (before fees) will likely be within a fairly narrow range of around 1.75%. Even if interest rates were to rise or decline, any increase or decrease in yield will be compensated by a price loss or price gain attributed to the change in yield. It is mathematical, not a forecast.

Hence, we can conclude the following about bonds (before fees):

- A bond purchased at a YTM of x% and kept to maturity will deliver a return equal to this YTM if no default occurs;
- If the bond is sold prior to maturity, the realized return will be greater than the initial YTM if the current YTM is less or will be lower if it is more;
- If a bond fund or a bond ETF is kept for a period approximately equal to the average maturity of the bonds within the product, the realized return will be similar to the initial YTM of the bond portfolio.

Hence, the current YTM is the best indicator of future returns on a bond fund (or a bond ETF), assuming the holding period is similar to that of the average maturity of the bonds in the fund. If bond funds have performed better in the past, it is simply because the YTMs were greater in the past. Higher YTMs indicate higher future nominal return, while lower YTMs indicate the opposite. Do not be fooled by the historical returns advertised on bond funds or bond ETFs.

THE CASE FOR EQUITY

Equity returns are more difficult to forecast because, in part, equity has no maturity and therefore no known price at a specific future point in time. Hence, we cannot calculate a YTM on equity. However, let's attempt to estimate the long-term return of equity (such as that of the S&P 500) using the same equation we used for bonds:

Yield rate + annualized return attributed to price change

Assuming the dividend yield of the S&P 500 is about 2%, what is the expected price appreciation of equity? To answer this question, let's first introduce the concept of the price-earnings ratio (or PE ratio). Equity prices are often expressed using the following relation:

Equity Price = Earnings x Price/Earnings

Where the Price/Earnings ratio is often simply called the PE ratio

The PE ratio is basically a multiple that reflects how much investors are willing to pay per dollar of corporate earnings to own a single stock or to own an equity index. There are different measurements for earnings and therefore different measurements for PEs, but a standard measurement is to use the earnings of the past 12 months (another common measurement is based on the expected earnings for the next 12 months). For example, the PE ratio of the S&P 500 using 12-month trailing earnings was 21.7 as at December 24, 2015, simply because the level of the S&P 500 was 2060 as of that date and the trailing earnings index of S&P 500 companies was about 94.4.

The reverse of the PE ratio is an implicit form of yield measurement called earnings yield or EP. Much like the YTM on bonds, it is influenced by many factors, such as inflation, real return, risk premium and earnings growth expectations. Investors will pay a lower or higher multiple for earnings (PEs) when:

	Lower PEs	Higher PEs
Interest Rates	High	Low
Market Risk	High	Low
Earnings Growth	Low	High

We can now also express the difference between current and future equity price as the following:

Current Price = Current earnings x Current PE

Future Price = Future earnings x Future PE

Therefore, there are two main reasons why we may be significantly wrong about the price appreciation of equity and hence, about equity returns:

- We may be significantly wrong about the growth and pattern of future earnings, as we were in 2008-2009 when earnings collapsed during the financial crisis;
- The future PE ratio can be lower than the current PE, such as happened in the early 2000s when the technology bubble burst and the risk premium required to own equity significantly increased. Higher interest rates can also lead to lower PEs.

Hence, even if investors are right about the expected growth of earnings, they can be significantly wrong about the changes in the PE ratio. For example, it is often assumed that long-term earnings growth tracks long-term expected inflation (such as 2%) plus expected real GDP growth (such as 3%). If we consider a dividend yield of 2%, long-term equity return could be expected to be 7.0% on average (2% + 3% + 2%), but only if the PE ratio remains constant.

However, the PE ratio is not constant. In the early 1980s, it was less than 10, while it was above 30 during the technology bubble. The PE ratio reflects market expectations and market sentiments. In the early 1980s, investors were concerned about high inflation and market risk and were unwilling to pay a high multiple for earnings. In the late 1990s, investors were unconcerned with market risk and, perhaps, overconfident.

Just as a higher YTM indicated higher future bond returns and a lower YTM lower future bond returns, higher future equity returns are usually associated with lower current PEs (and consequently with higher EPs) and lower future equity returns with higher current PEs (and consequently with lower EPs).

Was the level of 21.7 at the end of 2015 appropriate? It is certainly above the historical average of about 16/17, but expected inflation and real return have also never been so low. A PE of 21.7 is certainly not cheap, but is it expensive if inflation and real rates were to remain lower than historically?

SUMMARY AND CONCLUSIONS

The return on any asset is a combination of a yield rate and price appreciation. The uncertainty of return is driven by the uncertainty in the sell price. Bond uncertainty is less, not only because bond cash flows are more certain but also because bonds have a finite maturity and pay a known principal amount at maturity. In the case of equity, there is no finite maturity and the sell price is unknown and impacted more significantly by changes in expected inflation, real return, risk and growth expectations, all of which are difficult to forecast. Investing is complicated, and this is why it is important to diversify and have a long-term plan. The objective of this document was not to turn investors into forecasters but to illustrate that forecasting is difficult even for the experts.