HFG Trust White Paper Series

Calculating Total Investment Return

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We have been writing about the formula used to determine the total investment return since 2008. There are three components to this formula, which can be used to explain historical investment results as well as to estimate the 7 to 10-year future returns. However, this measurement does not accurately estimate future returns for short periods of time, such as 1 or 3 years. It is necessary for any investor to consider each component for all types of investments. Whether the investor is considering bonds, stocks, real estate, farm land, or a purchase of gold, the formula can be used to project the long-term Total Return per Year.

The three components follow the acronym IGP and the formula is as follows:

Income + Growth of Income + Price Change = Total Return per Year

The Components Explained

Income

One vital component to understand is that when we make an investment, we purchase a future stream of income payments. Income includes the earnings, or cash flow, earned on the investment each year. For real estate, the net rental income is called the Capitalization Rate (Cap Rate), for bonds it is called the Interest Yield, and for stocks it is called the Dividend Yield. Thirty-year government bonds are currently earning approximately 2.9%, while 10-year bonds are earning about 2.2%, and 5-year bonds are earning 1.5%. When investing in stocks, companies generate profits. A portion of those profits are distributed to shareholders in the form of dividends, while the remaining amount may be kept by the company to aid in financial growth. Currently, the average Dividend Yield investors receive for investing in the broad stock market (S&P 500 index) is approximately 2.0% of the stock's price.

Growth of Income or Earnings

Growth of earnings is seen when corporations grow their dividends over time or real estate investors increase their net profits by increasing lease rates. Dividends generally go up over time due to rising profitability, which is generally a result of increased revenues. When we measure or estimate future growth for stocks, we generally look at overall economic growth which is broadly represented by the US Gross Domestic Product, or GDP. Each company also has their own specific growth projections; but for the economy as a whole, we use the GDP. When considering a real estate investment, growth represents the increase in rents charged to a tenant. Typically, cost-of-living adjustments, such as 2.0% per year, are written into long-term lease contracts. Even without long-term leases, rental rates generally go up over time. With bonds, there is generally no growth of income because bonds pay a set interest rate for the duration of the bond.

Price Change

The last component of the formula is price change, which can be calculated one of two ways: by comparing the beginning price to the ending price (or the expected ending price) or by comparing a specific valuation metric from beginning to end.

Change in Price Calculation

The first, and more simple, way to look at price change is to analyze the beginning and ending prices. If you purchase an investment for $10,000 and expect to sell it for $12,000, you will achieve a price change of $2,000, or a 20% increase. If you sold the investment one year later, the price change component of the formula equals a 20% annualized increase. If the sale took place after holding it four years, then the formula would equate to a 4.7% annualized increase.

Let us look at a stock example to see how the formula works when taking all three components into consideration.

Stock Scenario #1

Let's assume an investor purchased Microsoft stock for $40.00 per share and held those shares for five years. We will also assume the company initially paid a dividend of $1.20 per share each year, which would be a dividend yield of 3%. If they continue to pay the same dividend yield of 3%, the income variable would be 3%. If the company grew profits at an average rate of 4% per year, the growth rate would be 4%. Lastly, if the stock price improved to $48, resulting in a price change of $8 (or 20%) over 5 years, it would be 3.7%, compounded annually. The total return would be almost 10.7% per year.

Income	+ Growth of Income	+ Price Change	= Total Return per Year
3%	+ 4%	+ 3.7%	= 10.7%

Change in Value Calculation

However, a different way of analyzing price change is to consider the change in value rather than the change in price. One valuation metric we use is called the price to earnings ratio, or P/E Ratio. There are other valuation metrics, however, for the purpose of this letter we will consider the P/E ratio.

A simple way to understand what the P/E ratio measures is as follows: the price we, as investors, have to pay (price) for every dollar of annual corporate profit (earnings). Another way to look at it is the approximate amount of time in years we have to wait before the earnings repay us for the investment, assuming no growth in earnings. For example, if you paid $150,000 for a company or a rental property that earned $10,000 of net profit each year, the P/E ratio would be 15:1. You would have to hold the investment for roughly 15 years before you "earned back" your original investment. However, if you made an investment of $400,000 that earned $10,000 each year, you would have to wait 40 years, and the P/E ratio would be 40:1. The larger the P/E ratio, the longer you have to wait to earn your investment and the lower your investment returns.

Historically, the P/E ratio of the S&P 500 has averaged approximately 16:1 over the last 100+ years, using the Robert Shiller 10-Yr Cyclically Adjusted Price Earnings (CAPE) calculation. However, the price has risen as high as over 40:1 (in the late 90's) and dropped as low as about 5:1 (in 1932). The price of stocks, and future earnings, becomes inexpensive when investors have many alternative options for their investment dollars. When this happens, more people sell than buy and the demand for stocks falls, causing a decrease in prices. Prices of stocks get very expensive when investors believe there are limited alternative options for earnings. This is what happened in the late 90's, and what has happened over the last couple years, particularly in the extremely low interest rate environment. With interest rates at remarkably low levels for such a long period of time, it has continued to force more savers and investors into riskier investments to achieve earnings. As a result, this has increased the number of stock investors and pushed up stock prices.

The P/E ratio is also called a price multiple or multiple of earnings. When the multiple expands, the price change is a positive number and is added to the income and growth components of the formula. If the multiple contracts, it takes away from total return.

Let's see how a contraction of the P/E ratio affects the total return formula when we use change in valuation:

Stock Scenario #2

We will use the same return variables for income and growth of earnings as in the previous example. Looking at price change, if you were to purchase Microsoft stock at a P/E ratio of 40:1 and sell after it had fallen to a P/E of 20:1, this would result in an overall price change of -50%. If the investment were held for 5 years, it would result in a price change of approximately 12.9%, compounded per year, and an annualized total return of -5.9%.

Income	+ Growth of Income	+ Price Change	=Total Return per Year
3%	+ 4%	+ -12.9%	=-5.9%

As we can clearly see in hindsight, the investor paid too much for the stock. In spite of the company being a great name-brand, paying a good dividend and growing their earnings, it was still a poor investment. Why? Because the purchase price was too high and was subsequently sold at a much lower price.

The volatility we see from the stock market is a result of the price change and not a change of income or growth of earnings. Various economists have prognosticated about the total return formula to estimate future stock market returns over the next 7 to 10-year period. Without addressing any specific security, we will provide you with a summary of how they are determining their results.

Current Stock Outlook Explained

The average dividend yield of all stocks in the S&P 500 is approximately 2.2%, which is the income component. For growth of earnings, as stated previously, we use the projected growth of the US economy, as calculated by the Gross Domestic Product (GDP), along with an inflation estimate. The long-term average growth rate of the GDP is approximately 3.7%; and we would estimate inflation to be 2% per year, for a total of 5.7%. Now for price change. The stock market has incurred some volatility recently and the average P/E ratio, as calculated by the CAPE mentioned earlier, is approximately 25. If the P/E ratio were to decrease to the mean average of 16, this would be a decrease of 9. If we divide this decrease (9) by the average P/E ratio (25) we get 36% - this is the approximate premium we are currently paying for stocks today compared to the long-term average of 16. If over the next 10 year period, the stock market were to soften in price and revert to the mean valuation of 16, it would equate to an average annual price change reduction of -4.4%. Let's review this scenario.

Income	+ Growth of Income	+ Price Change	= Total Return per Year
2.2%	+ 5.7%	+ -4.4%	= 3.5%

From this summary, we can see how some economists, market analysts, and the team at HFG are projecting 7 to 10-year stock returns to be much lower than the long-term average of approximately 10%.

Bond Total Return Discussion

Bond investors earn income each year in the form of interest yield based on the "coupon" rate the bond pays. In addition to the coupon, bonds experience price change as interest rates fluctuate. However, there is no growth of earnings because bonds pay a fixed payment based on the terms of the bond. Investors of corporate bonds do not share in the potential Growth of Earnings of the underlying company.

When bonds are issued, they are generally purchased in $1,000 increments, and upon maturity, the investor is repaid their principal of $1,000 at some specific date in the future. A bond's price fluctuates in either direction as interest rates move up and down. The price decreases when interest rates go up, and increases when rates go down.

If an investor purchased a bond and interest rates declined, the price of the bond would increase. This is due to the premium that bond buyers have to pay for bonds with a higher rate compared to the current lower rate. Let me address this point: if all things were equal, no one would buy a $1,000 Treasury bond, paying $20 per year (2%), if they could pay the same price for another bond that pays $40 per year (4%). After interest rates decreased from 4% to 2%, the investor with the 4% bond could sell his for a higher price than the $1,000 he paid.

Duration is at term used to describe the formula that helps us determine the price risk of bonds we own and is based on the average payback period of the bonds, or bond funds, interest, and principal. If a bond has a maturity of 5 years from now, depending on the coupon rate, it will have a duration of approximately 4. The Duration tells us how much value change we could experience if interest rates were to change by 1%. So if interest rates were to increase by 1% in the next year, and we have bonds with an average Duration of 4, we could see a Price Change decline in value of 4% (1% x 4).

If you have long-term bonds with a duration of 15 (maturity dates of approximately 20 years from now), there would be significantly more volatility risk associated with a change in interest rates than there would be with a duration of 3. In previous years, when interest rates declined by 1% , long-term bond holders earned income from the coupon and price increase from the decrease in interest rates. Here is how a long-term bond holder generated total return:

Income	+ Growth of Income	+ Price Change	= Total Return per Year
5%	+ 0%	+ 15%	= 20%

As you can see from the table below, there is a difference, sometimes significant, between the coupon of 10-year treasuries and the total return, which considers the change in price due to the change in interest rates. Also notice that interest rates were at near all-time highs in the early 1980's and are at very low levels currently. From the math, these intermediate and long-term Treasury returns have been mostly positive as the interest rates decreased during this time period. Notice the years where there is negative total return, the interest rate increased from the prior year.

	10-Year Treasury				
	Return From				Total
	Coupon (Income)		Price Change		Return
1980	12.84%	+	-15.83%	=	-2.99%
1981	13.72%	+	-5.52%	=	8.20%
1982	10.54%	+	22.27%	=	32.81%
1983	11.83%	+	-8.63%	=	3.20%
1984	11.50%	+	2.23%	=	13.73%
1985	9.26%	+	16.45%	=	25.71%
1986	7.11%	+	17.17%	=	24.28%
1987	8.99%	+	-13.95%	=	-4.96%
1988	9.11%	+	-0.89%	=	8.22%
1989	7.84%	+	9.85%	=	17.69%

1990	8.08%	+	-1.84%	=	6.24%
1991	7.09%	+	7.91%	=	15.00%
1992	6.77%	+	2.59%	=	9.36%
1993	5.77%	+	8.44%	=	14.21%
1994	7.81%	+	-15.85%	=	-8.04%
1995	5.71%	+	17.77%	=	23.48%
1996	6.30%	+	-4.87%	=	1.43%
1997	5.81%	+	4.13%	=	9.94%
1998	4.65%	+	10.27%	=	14.92%
1999	6.44%	+	-14.69%	=	-8.25%
2000	5.11%	+	11.55%	=	16.66%
2001	5.05%	+	0.52%	=	5.57%
2002	3.82%	+	11.30%	=	15.12%
2003	4.25%	+	-3.87%	=	0.38%
2004	4.22%	+	0.27%	=	4.49%
2005	4.39%	+	-1.52%	=	2.87%
2006	4.70%	+	-2.74%	=	1.96%
2007	4.02%	+	6.19%	=	10.21%
2008	2.21%	+	17.89%	=	20.10%
2009	3.84%	+	-14.96%	=	-11.12%
2010	3.29%	+	5.17%	=	8.46%
2011	1.88%	+	14.16%	=	16.04%
2012	1.76%	+	1.21%	=	2.97%
2013	3.04%	+	-12.14%	=	-9.10%
2014	2.17%	+	8.58%	=	10.75%

Coupon and Total Return information per year was obtained from: http://www.stern.nyu.edu/~adamodar/pc/datasets/histretSP.xls

Over the last 30+ years, we have experienced an astonishing period where owning bonds has been a great source of earning income and price change. We call this a long-term Bond Bull Market.

Current Bond Return Discussion

Today, we are not able to earn as much income from bonds as in previous years. As you know, banks are not paying very much interest for savings accounts; and bonds across the maturity spectrum are at historical lows. What makes the current bond scenario even more disturbing is that, as interest rates start going up, we will experience a decrease in bond prices. This may cause total bond returns to be negative in some years in the near future, even using short-term bonds.

Here is an estimate of what could happen if a bondholder was earning 1.5% on a 5-year bond (duration of 4) after interest rates increased by 1% in one year.

Income	+ Growth of Income	+ Price Change	= Total Return per Year
1.5%	+ 0%	+ -4%	= -2.5%

Now, it may be possible that interest rates do not increase that fast and annual total returns from bonds are not that low. However, we believe that interest rates cannot stay this low forever and will have to go back up to a more adequate level in the next few years.

Investment Real Estate

Similar to how bonds change in value when interest rates change, real estate values change when an investor's demand for investment return increases or decreases. Given the same level of income, if investors need less return, then they will be willing to pay a high price; and if they require a high investment return, they will pay a smaller price. Let me expand on this point:

If you were to purchase an investment generating $5,000 of income and you wanted a net profit of 4%, then you would be willing to pay $125,000. ($5,000 / .04= $125,000). However, if you wanted an investment return of 7%, you would only be willing to purchase it for $71,428 ($5,000 / .07= $71,428).

Now we will address the change in real estate value to see how this impacts the total return formula.

Let's say you purchase a commercial real estate property for $1,000,000, with no financing, and hold it for 5 years. For this example, we will consider a growth of earnings of 2%. The property generates a net profit of 6%, also called the Capitalization (Cap) Rate. That 6% return is $60,000 per year. When the property was purchased, there were other comparable properties that earned a similar level of income. If real estate investors at the end of the 5 years only require an investment return of 5%, the value of your property (as well as other properties) increases. Here is how that works:

The $60,000 of income on the $1,000,000 investment is 6%. If we take the $60,000 of income and divide it by 6%, or .06, we calculate the value of the property to be $1,000,000. If other real estate investors only need a 5% return on their investment, you would divide the income of $60,000 by the new required investment return rate of 5% to get the new value- $1,200,000. This is an increase in value of 20%, or 3.7% annualized for 5 years. In summary, a new investor could purchase your property for $1,200,000, earn the $60,000 of net income and receive their required return of 5%. Here is how the total investment return is calculated over the 5 years:

Income	+ Growth	+ Price Change	= Total Return per Year
6%	+ 2%	+ 3.7%	= 11.7%

However, if after your purchase, investors demand a higher rate of return, say 7%, you would divide the $60,000 of net profit by the new required return of .07 to get a market value of $857,142. This would result in a decrease in value of $142,858 or 14.2%, or an annualized return of -3.0%. And here is how your investment total return would be calculated, if it was sold after 5 years.

Income	+ Growth	+ Price Change	= Total Return per Year
6%	+ 2%	+ -3.0%	= 5.0%

As you can see, investment real estate fluctuates in value as investor's return requirements change. Return requirements generally follow the change of interest rates. Today, since interest rates are at historically low levels, investors of real estate have decreased their return requirements, which in return has helped push up the market value of investment real estate. When interest rates increase in the future, it should follow that investment real estate values will come back down.

How does this 3-pronged formula work with investments other than income-producing or growing investments, such as precious metals or commodities?

Commodities or Precious Metals

The physical assets of commodities and precious metals are assets that do not generate income and therefore do not have growing earnings. These assets are either consumed or held similar to a currency and later sold. Hence, the only component of total return for these assets is price change. Due to the absence of cash flow, we are not able to calculate the asset's present value based on the future income stream. Therefore, it is mathematically impossible to determine the intrinsic value of an investment using a cash flow method . The only component to consider is price change, and this is a highly speculative.

So what causes the price to change? Supply and demand and occasionally fear and greed. If, all of a sudden, everyone decides to own gold, the price will rise because the demand will be outgrowing the supply. However, if miners are able to find and extract large amounts of gold, or if an owner of great quantities of gold decides to sell, thereby pushing up the supply on the market faster than demand, price would fall.

Assume you purchased a gold coin in 2009 for $1,000, and sold it near the all-time high of $1,800 two years later. The 80% increase would have resulted in a compounded 34.2% annualized return. As gold does not generate Income or grow earnings, we see the how total return is only affected by the change of price.

Income	+ Growth	+ Price Change	= Total Return per Year
0%	+ 0%	+ 34.2%	= 34.2%

On the other hand, if you purchased gold at $1,800 in 2011 thinking it would go to $2,500 as analysts were predicting, but saw a fall in price and sold at a price of $1,150 four years later, this would have resulted in a loss of 36% in value, or -10.6% annualized return.

Income	+ Growth	+ Price Change	= Total Return per Year
0%	+ 0%	+ -10.6%	= -10.6%

As you can see, since this purchase does not generate income or participate in growing earnings, we are not able to calculate value based on future cash flow. We can only estimate what the supply and demand will be in the future to estimate total return. Due to this, buying this type of asset is also considered speculation rather than investing.

What About Farmland?

Similar to residential rental real estate, all three components need to be considered in order to determine total return.

Let's discuss farmland in North Pasco. Properties were selling for approximately $3,000 per acre 15 years ago, depending on the location and quality of the soil. If you had purchased farmland, you would have earned rental income and increased rents over the 15-year period. Additionally, you would have had the benefit of experiencing an increase in the value of the property, as prices today are approximately $6,000 per acre, partly due to the increase in rents. If you were to sell the property for $6,000, from the initial cost of $3,000, this would be a 100% return from price change alone. Over a 15-year period, the price change would result in an annualized compounded return of 4.7%.

If net rental income was 5% of the purchase price and income grew during the 15 years at a rate of 2%, then 7% would be added to the price change of 4.7% to achieve a total annualized return of 11.7%.

Income	+ Growth	+ Price Change	= Total Return per Year
5%	+ 2%	+ 4.7%	= 11.7%

Summary

As you can see from the different types of investments, all three components-income, growth of earnings, and price change-must be considered to determine an investor's total return. Whether you are considering an investment in stocks, bonds, or real estate, or a purchase of gold, this formula must be used to help you determine your total investment return.