Investment Newsletter – June 2019

This quarter's newsletter is an introduction to the topic of asset allocation. I'll explain what it is, why it's important to investors, and illustrate the trade-offs between risks and returns. I'll also explain how to assess risk and how differences between different assets enable us to create a portfolio superior to its components.

Asset Allocation and Why it Matters

Simply put, asset allocation is how you divide up your investable assets among different asset classes. Asset classes are different categories of investments that perform differently from one another depending on the market environment. Some people define these categories very broadly. For example a very broad classification scheme divides all assets into three classes:
1. Equity
2. Fixed Income
3. Cash and money market funds

In such a broad classification we don't consider real estate as its own class but rather a specialized form of equity. We can also make finer distinctions to define classes as subsets of the above. For example we could break the equity class into the following asset classes:
1. U.S. stocks
2. U.S. real estate investment trusts
3. International stocks
4. International real estate investment trusts

Likewise we could further subdivide fixed income based on interest rate risk – long maturity and short maturity, and credit risk – investment grade and high-yield. Thus asset allocation means defining the categories of assets according to some logical classification scheme for risk factors and expected returns, and then choosing how to divide your assets among the classes so as to meet some investing objectives.

I prefer to use finer distinctions within the broad asset classes so as to isolate particular risk and return characteristics that I think are important in fine tuning a portfolio's risk and return characteristics. Therefore, as described in previous newsletters, Berkeley Investment Advisors manages four separate fixed income

strategies that are differentiated by interest rate and credit risk characteristics. In addition our equity portfolio is designed to diversify across the breakdown of categories listed above.

The choice of where to allocate money across asset classes will be the primary determinant of the risks and returns of your investment portfolio. Most importantly, you must be able to tolerate the risk of the allocation. If your portfolio can drop to the point where you would abandon your investment allocation after losses, you have chosen an allocation that is inferior to a pure money market fund. If you are not sure you can maintain your positions through a typical down period, choose a lower risk allocation.

Measuring the Risk that Matters

In this newsletter and in finance generally we focus a lot on risk and its management, but there are multiple ways to define investment risk. Most academics and many investors define risk as the volatility (also known as standard deviation) of returns. This is a statistical concept of dispersion which takes into account how much returns vary from their average on a daily[1] basis – both positively and negatively. Academics like this measure because it is easy to quantify and use in their models but in my view this is not an appropriate measure of risk for most individuals.

In my experience, people don't care so much about volatility as they do about the possibility of losing money. Sure, there is some relationship between volatility and downside losses, but volatility can also be high because of upward moves. Frequent price reversals, as we see with low liquidity securities, increase the standard deviation of returns but do not necessarily result in large losses over time.

In my work I focus on what most individuals care about – draw down risk. By that I mean the percentage by which an asset has fallen since its most recent high point. People think of this as how much money they have "lost" even if they have not sold the position. Therefore this is the risk variable that can potentially ruin their investment plan by scaring them into selling at a low point.

Asset Risks and Returns

Besides risk, the investment allocation determines expected returns. Expected returns, in this sense means the probability weighted return. Generally we can expect higher risk allocations to provide higher expected returns compared to lower risk allocations. Actual after-the-fact realized returns can, of course, be lower or higher – that's the underlying real risk. For example, over the long run we expect real estate to provide higher returns than a money market fund, but as we've seen, that may not turn out to be true over any particular period of time. In choosing an asset allocation, we take into account future potential returns so as to choose an allocation that can meet our investment objectives – i.e. retirement at a certain age.

---

[1] Volatility is most often measured using daily data but it may be measured at other periodicities.

In the June 2018 Newsletter we analyzed the relationship between risks, returns, and securities prices relative to cash flows. There I explained how securities valuation changes impact both returns and risks going forward. As a starting point for explaining asset allocation, we'll simplify by focusing on a static analysis of risks and returns.

Using data for the S&P 500 stock index from Professor Robert Shiller of Yale University, I calculated the return for the stock market since 1881 at 9.1% annualized.[2] Adjusted for inflation, that drops to a real return of 6.5%. Over this period the largest draw down was 82%. This extreme draw down level was reached in June 1932 during the great depression. The Federal Reserve learned an important lesson during that downturn and since then has acted to lessen the severity of banking crises. Consequently, it is highly unlikely we'd see such an event again in the U.S. market. The largest draw down since 1935 was 49% (in 2009). For purposes of this newsletter, we'll use 50% as our measure of stock market draw down risk. On the basis of its multiple to trailing ten year inflation adjusted earnings, the S&P 500 is currently valued similarly to where it was in September 2001. Since that time the annual return for the S&P 500 has been 8%. We will use this as our expected long run return on the stock market.

Because fixed income securities have predetermined contractual cash flows, assessing risks and returns depends greatly on the current promised rate of interest. Also, we must take into account the length of time over which the bonds payoff. In the early 1980's ten-year U.S. treasury bonds paid interest of 15%. If someone held such a bond for 10 years, they earned 15%. In contrast, today the ten-year treasury rate is 2% and therefore holding that bond to maturity cannot provide a 15% return. Thus our best estimate for fixed income returns is the current yield. These yields usually depend on maturity of the debt obligations but currently short term and long term fixed income securities offer similar interest rates.

The Barclays High Yield Bond Index ETF has a current yield of 5.6%. The average maturity of bonds in this index is 4.16 years. For this type of bond, the interest rate is fixed to maturity of the bond. Another type of fixed income security pays interest based on shorter maturity rates which reset periodically. In particular most loan funds have interest rates that reset every three months. Securities with changing interest rates are described as floating rate investments. This feature significantly reduces the risk of price changes due to changing interest rates. An example is the Invesco Senior Loan exchange traded fund (ETF). It currently pays interest at 5.1%. The closed end funds that we use to invest in fixed income securities have higher yields. Both our Short Term and Long Term Income portfolios currently yield about 7.6% (before fees).

In order to estimate the potential draw down risk for fixed income securities we need to combine the potential changes in several variables with the key risk characteristics of the securities in the portfolio. There are three main risks that can cause a decline in the value of a fixed income portfolio:

1. Increases in the level of risk free interest rates
2. Increases in credit risk spreads required – i.e. higher yields on risky bonds

---

[2] This is the annual geometric mean over the period – the data ends September 2018.

3. Decreases in the prices for closed-end funds relative to underlying bond values – meaning increasing discounts to net asset value.

We also need to take into account the time frame over which such changes could occur because monthly interest earned on the portfolio would offset price changes over time.

When estimating of draw down risk I assume the level of risk free rates could rise by 1.9% over two years. In the last 20 years the largest move seen was 2.06% over 35 months[3]. For credit spreads I assume they can rise by 6% over 2 years. From current levels, I assume that closed-end fund discounts could widen by 7.7%.

The sensitivity of the price of bonds to the level of interest rates is measured by rate duration – which is related to the bond interest rate and how long that interest rate is paid. A floating rate bond will have rate duration of less than .2 meaning a 1.9% increase in the level of interest rates would reduce its price by 0.38%. Likewise the sensitivity of risky bond prices to changes in credit spreads is measured by spread duration – which is approximately the same as the interest rate duration (as measured assuming the bond rate were fixed to maturity). Increasing closed end fund discounts directly reduces their prices on a one for one basis.

As an example, the California Tax Exempt portfolio is 100% in closed end funds, it has rate duration of 12 and spread duration of 0 (because it is all investment grade debt). If we assume that the closed end fund discounts increased at exactly the same time as interest rates over a 2 year period we can estimate our draw down risk for this portfolio as 12 * 1.9% + 7.7% less 8.8% interest earned over 2 years = 21.7%. This would be an extreme case but it highlights the importance of understanding correlations among risk factors and combining asset classes to mitigate such extreme events.

Before we move on to discuss how we use asset allocation to reduce risk, note that cash or money market investments are unaffected by the risk factors discussed so far. In terms of draw down risk, allocations to money market funds serve to reduce overall portfolio risk. The price we pay for this is returns that are unlikely to exceed the rate of inflation and therefore don't contribute to meeting return objectives.

Asset Correlation and Risk

Correlation is the statistical measure of how variables move together. If variables are 100% correlated they move in lockstep in the same direction. If their correlation is -100% they always move in opposite directions. A zero correlation means there is no predictability between the variables. In the example calculation of the California Tax Exempt portfolio draw down risk above, the calculation assumed that the closed-end fund discounts had -100% correlation with the Treasury interest rate so that an extreme increase in the Treasury rate would correspond with an extreme downward move in prices relative to net asset value (CEF discounts widening). In fact the correlation is slightly positive (10%) meaning we would expect the discount to move in our favor when interest rates are moving against us. This is because increasing closed-end fund discounts, as well as

---

[3] More recently we had an increase of 1.38% over the 8 months ended 12/31/2013.

increasing credit spreads, are indicative of a market in which investors are becoming more risk averse and biding down prices of risky assets. In such an environment there is a shift of money towards government bonds which pushes prices up and yields down. In a risk loving market, where good growth is expected, treasury rates rise but credit spreads decrease and closed-end fund discounts are reduced – meaning risky asset prices rise. In setting optimal asset allocations we want to take advantage of low or negative correlations among our asset holdings. The table below shows the correlation matrix for the risk variables we are discussing. In this table, Muni is short for California Tax Exempt. Keep in mind that increases in interest rates and credit spreads imply decreases in prices.

Correlations Table	10 Year Treasury rate change	High Yield Spread change	S&P 500 Return	High Yield CEF discount change	Muni CEF discount change
10 Yr Treasury rate	100%	-44%	34%	6%	10%
High Yield Spread	-44%	100%	-71%	-28%	-28%
S&P 500 Return	34%	-71%	100%	6%	6%
High Yield CEF discount	6%	-28%	6%	100%	51%
Muni CEF discount	10%	-28%	6%	51%	100%

We can also quantify these relationships using a statistical technique called regression which effectively provides an estimate of how much one variable will change depending on the change in another variable. Using that we find that the high yield spread change is on average equal to -1.32 times the change in the 10 year treasury yield.

Allocation Trade Offs

As I mentioned earlier the most important thing in choosing an allocation is your ability to avoid selling an asset class after it has declined in value – successful investors sell high and buy low, not the other way around. Besides the psychological urge to sell, sometimes you will need to liquidate assets to pay retirement or college costs. Since you never want to be a forced seller after a decline in the market, you should always maintain some portion of money in assets that would be unaffected by a market panic. In my simplified analysis of allocations that follows, I will assume we always maintain 10% of assets in the investment grade bond category. Such bonds are very likely to rise in value if there is a steep stock market decline.

To keep things relatively simple I'll illustrate the decision process by choosing how to split the other 90% of the portfolio between stocks and high yield bonds. In general the goal is to aim for the highest expected return such that you can remain invested assuming the possible draw down actually happens. The table below uses the data discussed earlier and assumes the draw down takes 2 years to reach bottom.

Asset Allocation				
Investment Grade Bonds	High Yield Bonds	Stock	Average Expected Return	Drawdown risk
10%	90%	0%	5.29%	-3%
10%	80%	10%	5.53%	-8%
10%	70%	20%	5.77%	-12%
10%	60%	30%	6.01%	-17%
10%	50%	40%	6.25%	-21%
10%	40%	50%	6.49%	-26%
10%	30%	60%	6.73%	-30%

In the current market environment, the additional long term expected returns available for ramping up risk are relatively uninspiring. In any case, my sense is that it is rare that investors can really tolerate losses much higher than 25% and there are many who cannot tolerate more than 15%.

Current Equity Market Risks

The discussion about equity draw down risks in the first part of this newsletter put forth an assumption of a 50% decline for equity market draw down risk. As explained in the June 2018 newsletter the likelihood of large losses depend upon the current levels of market valuations. One such measure comes from Professor Robert Shiller of Yale University. His measure is called the Total Return Cyclically Adjusted Price to Earnings Ratio – TR-CAPE for short. Using data from Professor Shiller's website I analyzed the frequency of draw downs experienced according to starting valuation levels since 1881. In the past when valuation levels were similar to today, investors subsequently experienced a 40% or higher draw down roughly 33% of the time. In this environment your equity allocation should be small enough that you can endure such a draw down without selling out at the bottom.

Conclusion

In the June 2018 Newsletter we analyzed the relationship between risks, returns, and securities prices relative to cash flows. There I explained how securities valuation changes impact both returns and risks going forward. In particular higher prices that result from high recent returns imply that future prospective returns are declining while risks of loss are increasing – and vice-versa for recent declines in prices and valuations. The key insight that I hope you will take away is that price declines that might cause you to sell out are actually indicative of higher returns and lower risk in the future. Therefore it is of upmost importance that you are able to withstand likely draw downs that come along so as to stay invested as future returns are increasing.

Contact Information: RayMeadows@BerkeleyInvestment.com 510-367-3280