Editor's Letter

Best-Case Scenario for the Long-Term Expected Return on a 60/40 Portfolio

"Those who have knowledge, don't predict. Those who predict, don't have knowledge. " Lao Tzu, 6th Century BC Chinese Poet

"If you can look into the seeds of time, and say which grain will grow and which will not, speak then unto me. " William Shakespeare

Introduction

The 60/40 portfolio plays a central role in asset management. Many pension funds and endowments use a portfolio consisting of 60% in equities and 40% in bonds as the benchmark. There is no real theoretical reason as to why this allocation should serve as benchmark, and it not the purpose of this essay to argue its merits. Rather I will attempt to do something that Lao Tzu advised against it more than 2,500 years ago – develop an estimate of the best-case scenario for expected return on the 60/40 portfolio.

Note that I am not going to predict the expected or the most likely rate of return on this portfolio, rather I will give an estimate of its expected return if the economy remains the its current "goldilocks" state. Based on many common valuation metrics (e.g., PE ratio), many analysts claim that US equity markets are overvalued. For instance, the current PE ratio for S&P500 is about 40% above its long-term mean. Does this mean US equity markets will experience decades of negative or no returns as the PE ratio reverts to its normal level? It is hard to say.

Using valuation metrics from the past 100 years, US equity markets look overvalued currently, but it is also possible that US equity markets were grossly undervalued for most of the 20th century. Perhaps investors were demanding too high a risk premium because of their experiences with the Great Depression and WWII. It is hard to argue that investors are irrational and wrong now while they were rational and right in the past. In other words, current valuation metrics could be high for some fundamental reasons and they may never revert to their long-term means. It is a fact that financial theory has little to say about the right levels valuation metrics (e.g., the PE ratio) as they all depend on the risk premium demanded by investors, which depends on their degree of risk aversion. Maybe past investors were just too risk averse. We have no way of knowing it. So, one of the assumptions I make is that equity markets are neither undervalued nor overvalued, and, therefore, the current valuation metrics will neither expand nor shrink. I will make a few other assumptions that would make my estimates of expected returns the best-case scenario for the 60/40 portfolio.

I report that the best-case scenario for the 60/40 portfolio is an annual real return of 4.29% and an annual nominal return of 6.38% assuming 2% inflation. What are the implications of this simple analysis? A recent report by NASRA.ORG shows that the average rate of return assumed by public pension funds is 7.56%, more than a full percentage point higher than the best-case scenario presented here.[1] That is, these funds are counting on outperforming their benchmark by a full percentage point per year over the next 10 years. If they fail to achieve this level of performance, their underfunded statuses are likely to widen even further. The most viable path for these funds is to increase their allocations to global equity and fixed income markets and hope that they outperform their US counterparts. Also, they should consider increased allocations to alternatives if they have the knowledge to select and manage alternative asset classes.

The 60/40 Portfolio

Since I am going to provide an estimate of the best-case scenario for the 60/40 portfolio, it is useful to see how it has performed in the past and why, which is discussed later. I will be using S&P500 and Ibbotson Associates Indices to measure performances of equity and bond markets. I could use more global equity and fixed income indices, but then my data will have limited history, and more importantly, my data regarding dividends, earnings and buybacks will be even more limited. My bond index is an equally weighted average of 3 indices produced by Ibbotson Associates: Intermediate and long-term government bonds and long-term corporate bonds. For equity index I will use the S&P500 index, which ignores the small cap segment of the market. US small cap stocks have outperformed the large cap stocks since 1950. However, lack accurate historical estimates of earnings and dividends prevents me from including small cap and foreign markets in this analysis.

Using the above two indices and rebalancing annually, Exhibit 1 and Exhibit 2 (next page) display the performance of this portfolio since 1950. I could go back further to 1925, but I did not want to include the periods covering the Great Depression and WWII in my analysis. The analysis, therefore, covers almost 70 years of global economic growth and relative peace.

	Jan 1950-Dec 2017			Jan 1990-Dec 2017		
	Geometric Annual Total Return	Arithmetic Annual Total Return	Annualized Std	Geometric Annual Total Return	Arithmetic Annual Total Return	Annualized Std
S&P 500	11.31%	11.48%	11.90%	9.80%	10.12%	12.04%
Bonds	6.13%	6.21%	7.13%	7.22%	7.24%	7.10%
60/40 Portfolio	9.46%	9.37%	7.72%	9.04%	8.97%	7.47%
Inflation	3.51%	3.46%	1.25%	2.42%	2.40%	1.15%

Exhibit 1: Performance of the 60/40 Portfolio and its Constituents
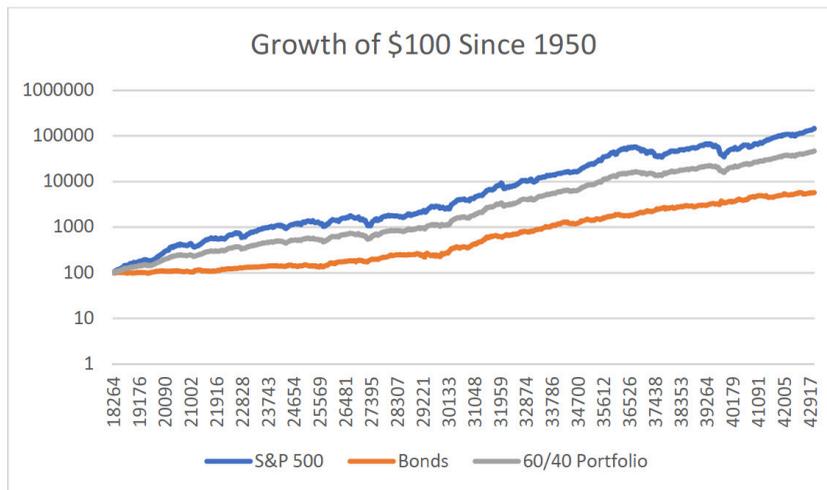*Source: Morningstar*

Exhibit 2: Growth of the 60/40 Portfolio and its Constituents
Source: Morningstar

It is important to note that the above figures represent total returns from these asset classes – i.e., dividends and coupons have been reinvested.

Current State of Markets

Before I present my estimate of the best-case scenario for the 60/40 portfolio, I will briefly review the current state of both equity and bond markets.

Equity Markets

By historical standards, US equity markets are rather expensive. Exhibit 3 displays the historical values of the S&P 500 PE and CAPE ratios. The PE ratio is calculated by dividing the current value of the index by its trailing 12-month nominal earnings. The Cyclically Adjusted PE (CAPE) Ratio is like regular PE ratio except that inflation-adjusted earnings from the previous 10 years are used to calculate the ratio. Exhibit 4 displays current and historical averages of these two measures.

Current levels of PE and CAPE ratios are significantly higher than their historical averages. If these ratios were to revert to their historical means, then the returns from US equities will be negative for the next several years in future. A number of other valuation metrics may be used to make the same point. For instance, the ratio of the equity markets capitalization is close to all time high and is higher by 108% compared to level we saw in 1950.
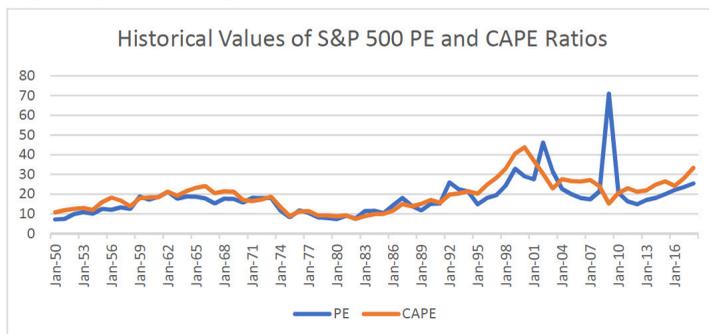

Exhibit 3: Historical Values of S&P500 PE and CAPE Ratios
Source: Robert Shiller's Website

1950-2017	Current Value	Historical Mean	Percentage Above Historical Mean
PE Ratio	25.39	17.86	42%
CAPE Ratio	33.31	19.43	71%

Exhibit 4: Historical and Current Values of S&P 500 PE and CAPE Ratios
Source: Robert Shiller's Website

Not only valuations are stretched but measures of corporate performance are also abnormally high. For instance, as reported by Standard and Poor's, the current profit and operation margins for S&P 500 companies are respectively 11.9% and 10.2%, nearly 100% higher than what we observed in 1994.

While for the past several years analysts have been predicting a decline in these margins, we have seen further increases in these margins. Several reasons have been put forward to support the current high valuations of equities.

· Structural changes in the economy support higher EPS growth. Technology companies, which dominate the US equities in terms of profitability and market cap could be able to maintain higher EPS growth rates because of their global reach.

· Moderation in the US business cycles makes equities less risky, reducing the risk premium demanded by investors. The PE ratio is inversely related to the risk premium demanded by investors and therefore a lower risk premium supports a higher PE ratio.

- Lower real interest rates support higher EPS. The PE ratio is inversely related to the discount rate (i.e., the required rate of return) applied by investors to corporate cash flows.
- Increased market and political powers of certain companies could lead to more stable EPS, leading to lower risk premium demanded by investors.

I am going to assume that for these and other reasons the current elevated valuation and profitability levels are sustainable going forward.

Bond Markets

There has been a strong secular decline in US interest rates since 1982, which has led to strong performance for all fixed income instruments. Despite the recent rise interest rates, they are still close to lowest levels we have seen since 1950s (see Figure 5)

Not only the levels of US rates are low by historical standards, the spreads between corporate and Treasury bonds are close to all-time lows as well. There are several reasons for the current state of fixed income markets. Low expected inflation, expansionary monetary policies practiced by most central banks, aging populations in advanced economies and changes in the structure of many economies from industrial to service economies.
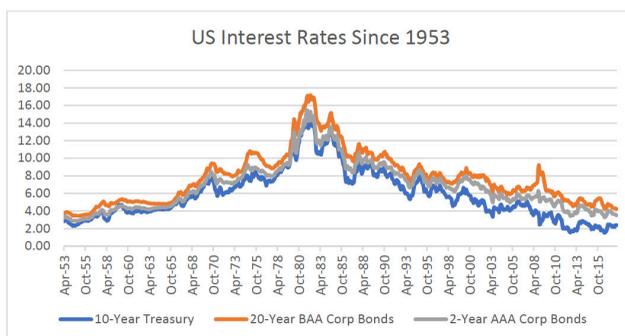

Exhibit 5: US Interest Rates
Source: Federal Reserve Bank of St. Louis

Similar to my assumption regarding equity markets, I will assume that the current real and nominal rates will prevail going forward. Of course, there is a possibility that interest could decline to lower levels improving the performance of bond portfolios. However, this scenario is most consistent with slowing economies and poor performance in equity markets. Therefore, the most optimistic scenario is for interest rates to remain at their current levels creating an environment conducive to further increase in equity market prices.

Sources of Returns on Equities and Bonds

Here I discuss components of annual returns to equities and bonds. The total annual rate of return on equities can be expressed as

Total Rate of Return = (1 + Growth of EPS)×(1 + Growth of PE Ratio) + Dividend Yield - 1

Since 1950, the figures for the above sources of returns have been

We can see that since 1950 the annual compounded total real return on S&P 500 has been 7.54%. This has come about because of 2.25% real growth rate in EPS, 1.82% growth rate in the PE ratio and 3.55% dividend yield.[2] The growth of the PE ratio shows how US equities have steadily become more expensive during the past 70 years. While it is possible that the PE ratio will continue to expand, it appears the path of least resistance is a decline in the PE ratio.

S&P 500	Contribution to Annual Total Return Since 1950			
	Growth of EPS	Growth of PE ratio	Dividend Payments	Total Return
Nominal Values	5.84%	1.82%	3.55%	11.31%
Real Values	2.25%	1.82%	3.55%	7.54%

Exhibit 6: Components of Returns to S&P 500
Source: Robert Shiller's Website and Author's Calculations

The sources of returns on bonds are somewhat similar to those of equities. If we consider a par bond, then the total annual rate return on a constant maturity par bond will be

Total Rate of Return = - Change in Yield to Maturity × Duration + Yield to Maturity

Since 1950, the change in the yield maturity has contributed very little to the total return on bonds as interest rates increased from 1950 to 1982 and has since declined to their 1950s level. From 1950-1982, annual returns on bond portfolios were almost 1% less than the yields observed in 1950.

Best-Case Scenarios

In this section I will use the analysis of the previous sections to develop the best-case scenarios for equities, bonds and the 60/40 portfolio.

First, consider equities and return components in equation (1). What are the best-case scenarios for values of these components going forward?

- Real growth rate of EPS: The best-case scenario is to assume the same growth rate going forward. This represents the best-case scenario because during the last 68 years we saw a post WWII economic expansion, rapid increase in productivity, and a young expanding population. Important to note that in fact productivity growth has slowed in recent years and that the US population is growing a slower pace.

- Growth rate in PE ratio: The best-case scenario is that the current elevated PE ratio will persist and will not decline. It will be hard to argue that the PE ratio will expand further making US equity more expensive.

- Dividend yield. The dividend yield has steadily declined in recent years, standing at 1.836% currently. This decline in dividends has been accompanied by increased share buybacks. Since buybacks are identical to special dividends plus a reverse split, we can adjust the above dividend yield to reflect increased use of buybacks as a method of returning cash to shareholders. Last year's buyback rate was 2.2% of outstanding equity and this was close to all-time high. I am going to make the optimistic assumption that the sum of regular dividends and special dividends due to buybacks will equal its historical level of 3.55%.

The best-case scenario for bonds is somewhat easier to develop. We can assume that there will be no secular rise or decline in interest rates going forward. Average yield to maturity on an equally weighted portfolio of 10-year Treasuries, AAA and BAA long-term corporate bonds is approximately 4% per year. I am now prepared to develop the best-case scenario for a 60/40 portfolio with annual rebalancing

The best-case real and nominal returns are presented in blue colored cells while the more realistic real and nominal returns are presented in orange colored cells. We can see that the best-case scenario for the 60/40 offers 4.29% real return and 6.38% nominal return per year. This best-case scenario comes about because of 5.85% annual real return on equities and 1.96% annual real return on bonds. A more realistic scenario is the one involving a slightly lower PE ratio for stocks and slightly higher level of interest rates for bonds. In this case, the real annual return on the 60/40 portfolio is expected to be 2.70%, translating to 4.75% in annual nominal terms.

As mentioned in the introduction, the implications of these results for pension funds are enormous, which are counting on

	Real Values		Nominal Values at 2% Inflation	
	The 60/40 Portfolio			
	Average Yield Stays Equal to 4%	Average Yield Increases to 5%	Average Yield Stays Equal to 4%	Average Yield Increases to 5%
PE Stays Equal to 25.39	4.20%	4.09%	6.29%	6.17%
PE Declines to 20	2.76%	2.64%	4.82%	4.69%
	S&P 500			
PE Stays Equal to 25.39	5.70%		7.81%	
PE Declines to 20	3.29%		5.36%	
	Bonds			
PE Stays Equal to 25.39	1.96%	1.67%	4.00%	3.71%
PE Declines to 20				

Exhibit 7: The Best-Case Scenario for the 60/40 Portfolio
Source: Author's Calculations

outperforming the best-case scenario of the 60/40 benchmark by more than a full percentage per year. Given their underfunded status, such an unrealistic assumption could result in sever financial difficulties for sponsors and beneficiaries. The most viable path for these funds is to increase their allocations to global equity and fixed income markets and hope that they outperform their US counterparts. Also, they should consider increased allocations to alternatives if they have the knowledge to select and manage alternative asset classes.

Hossein Kazemi,

Editor

Endnotes

1 See https://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf

2 Note that dividend yield is defined as the total dividend paid during the previous 12 months divided by the end of the year price.