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

Hossein Kazemi
CAIA Association & Isenberg School of Management, University of Massachusetts
July 2018

"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

1 Introduction

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

Rather than predicting the expected or the most likely rate of return on this portfolio, I will give an estimate of its expected return if the economy remains in 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 the 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? The answer is not crystal clear.

Using valuation metrics from the past 100 years, US equity markets look overvalued, but it is also possible that US equity markets were grossly undervalued for most of the 20th century. Perhaps because of their experiences with the Great Depression and WWII, investors were demanding too high a risk premium. 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 (e.g., low interest rates), and they may not revert to their long-term means anytime soon. It is a fact that financial theory has little to say about the right levels of 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 4.20% and assuming 2% inflation, an annual nominal return of 6.29%. What are the implications of this analysis? A recent report by NASRA.ORG shows that the average rate of return public pension funds expect to earn

on their portfolios 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 will worsen even further. What can these funds do? The obvious answer is that they should have more realistic expectations and should consider a combination of lower payouts to beneficiaries and higher contributions to the funds. Regarding asset allocation, they should consider expanding beyond US equities and bonds and hope that they perform far better than they have done in the past. Global equity markets appear to be cheaper than the US markets and could produce higher returns going forward. Increased allocations to alternative asset classes can help too. However, to the get the full benefits of their allocations to alternative asset classes, asset allocators must make sure that they have the knowledge and the skill to select and manage alternative asset classes and fund managers.

According to this report, portfolios consisting of traditional asset classes are unlikely to generate the level of returns required by most pension funds and endowments. While portfolios of alternative asset classes do not generally generate eye-popping returns, they could provide steady returns in 7%-12% range, which is higher than the best-case scenario for a traditional 60/40 portfolio.

2 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 (discussed later). I will be using S&P500 and Ibbotson Associates Indices to measure the performance of equity and bond markets. I could use more global equity and fixed income indices, but then my data will have a 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 the equity index, I will use the S&P500, which ignores the small-cap segment of the market. US small-cap stocks have outperformed the large-cap stocks since 1950. However, the lack of 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 Figure 1 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, Robert Shiller's Website, and Author's Calculations

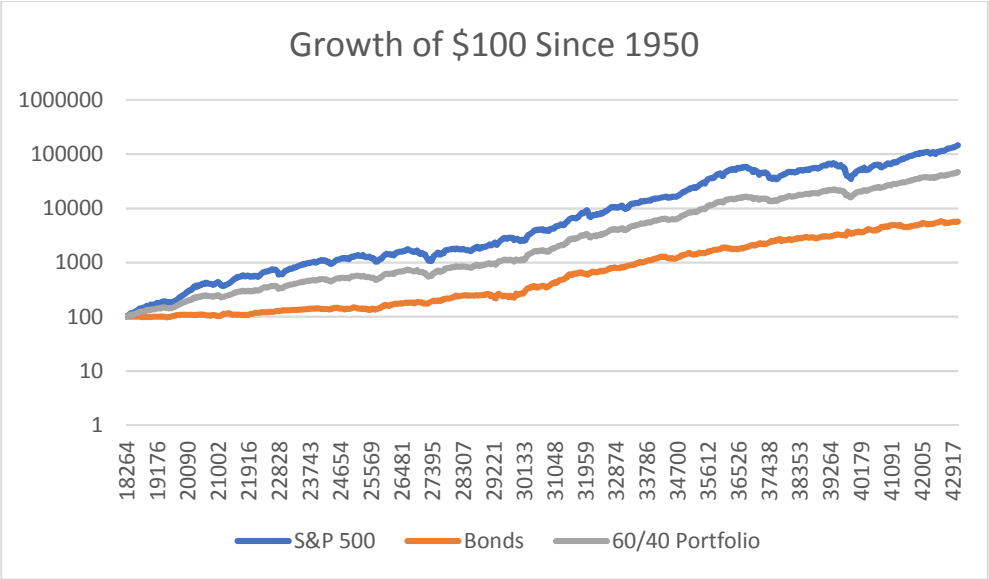

Figure 1: Growth of the 60/40 Portfolio and its Constituents
Source: Morningstar, Robert Shiller's Website, and Author's Calculations

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

3 The Current State of the 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.

3.1 Equity Markets

By historical standards, US equity markets are rather expensive. Figure 2 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 the regular PE ratio except that inflation-adjusted earnings from the previous 10 years are used in the denominator. Exhibit 2 displays current and historical averages for these two measures.

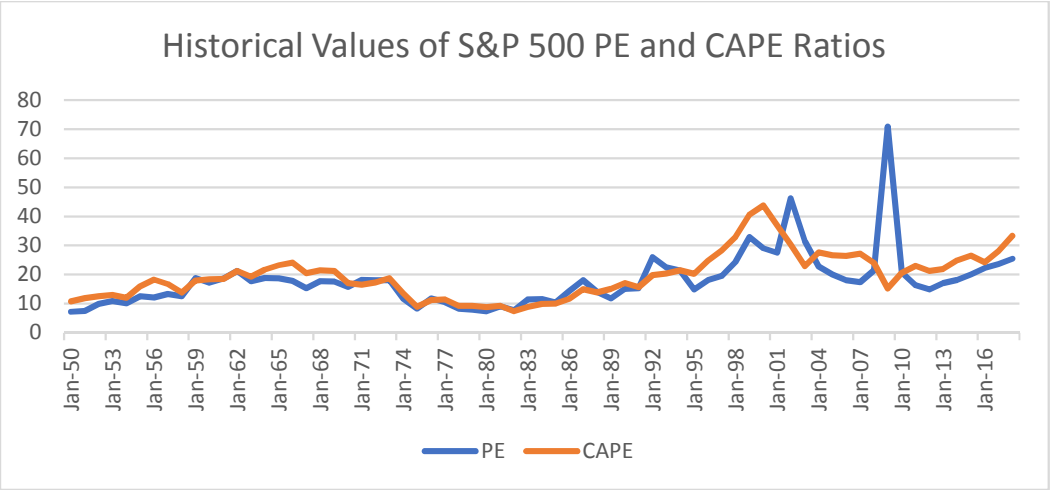

Figure 2: Historical Values of S&P500 PE and CAPE Ratios
Source: Robert Shiller's Website

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

Exhibit 2: Historical and Current Values of S&P 500 PE and CAPE Ratios
Source: Robert Shiller's Website

Current levels of the 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. 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 the level we saw in 1950.

Not only are valuations stretched, but measures of corporate performance are also abnormally high. For instance, as reported by Standard and Poor's, the current profit and operating margins for the 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 them.

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 regarding 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.

3.2 Bond Markets

There has been a strong secular decline in US interest rates since 1982. This has led to a strong performance for all fixed income instruments. Despite the recent rise in interest rates, they are still close to the lowest levels we have seen since the 1950s (see Figure 3)

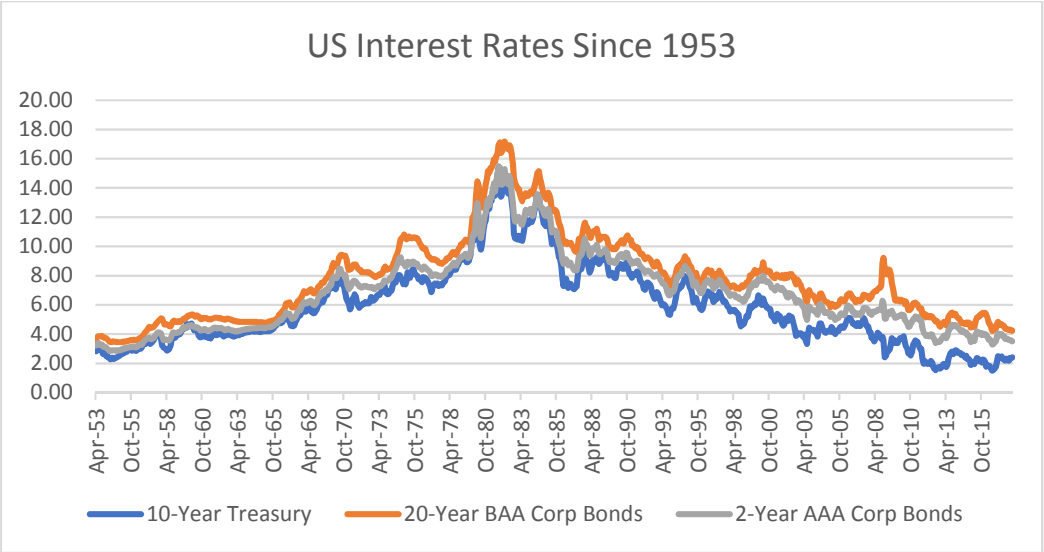

Figure 3: US Interest Rates
Source: Federal Reserve Bank of St. Louis

Not only are the levels of US rates low by historical standards, but the spreads between corporate and Treasury bonds are also close to all-time lows. 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.

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 rates 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 increases in equity prices.

4 Sources of Returns on Equities and Bonds

Here I discuss components of annual returns to equities and bonds. The total compounded annual rate of return on equities can be approximated as:[2]

$$\textit{Total Rate of Return} = \textit{Growth of EPS} + \textit{Growth of PE Ratio} + \textit{Dividend Yield} \qquad (1)$$

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

	Contribution to Annual Total Return Since 1950			
S&P500 Index	Growth of Earnings	Growth of PE	Dividend Yield	Total Return
Nominal Values	5.69%	2.08%	3.54%	11.31%
Real Values	2.15%	2.08%	3.54%	7.77%

Exhibit 3: Components of Returns to S&P 500
Source: Robert Shiller's Website and Author's Calculations

Since 1950, the annual compounded total real return on S&P 500 has been 7.77%. This has come about because of 2.15% real growth rate in EPS, 2.08% growth rate in the PE ratio and 3.54% dividend yield.[3] The growth of the PE ratio shows how US equities have steadily become more expensive during the past 67 years. While it is possible for the PE ratio to expand further, it appears the path of least resistance is a decline in the PE ratio.

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

$$\textit{Total Rate of Return} = -\textit{Change in Yield to Maturity} \times \textit{Duration} + \textit{Yield to Maturity} \qquad (2)$$

Since 1950, changes in the yield to maturity have contributed very little to the total return on bonds as interest rates increased from 1950 to 1982 and then started to decline. They are close to their 1950s level now. Because of the rise in interest rates, for 1950-1982 annual returns on bond portfolios were almost 1% less than the yields observed in 1950.

5 Best-Case Scenario

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

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

- **The 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 67 years we saw a post-WWII economic expansion, the rapid increase in productivity, and an expanding young population. It is important to note that in recent years productivity growth has slowed down, and the US population is growing at a much slower pace.
- **The 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 even more expensive.
- **Dividend Yield**. The dividend yield has steadily declined in recent years, standing at 1.836% currently. This decline in dividends has been by an increase in the amount of share buybacks by corporations. 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, close to an 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 3.54%.

The best-case scenario for bonds is somewhat easier to develop. We can assume that there will be no secular rise or decline in real interest rates going forward. The 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 (1.96% in real terms given a 2% inflation rate). I am now prepared to develop the best-case scenario for a 60/40 portfolio with annual rebalancing

	Real Returns		Nominal Returns 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 Returns			
PE Stays Equal to 25.39	5.70%		7.81%	
PE Declines to 20	3.29%		5.36%	
	Bond Returns			
Bond Returns Scenarios	1.96%	1.67%	4.00%	3.71%

Exhibit 4: The Best-Case Scenario for the 60/40 Portfolio
Source: Author's Calculations

The best-case real and nominal returns are presented in the blue colored cells while the more realistic real and nominal returns are presented in the orange colored cells. The best-case scenario for the 60/40 portfolio is 4.20% real return and 6.29% nominal return per year. This best-case scenario comes about

because of 5.70% 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 annual real return on the 60/40 portfolio is expected to be 2.64%, translating to 4.69% in annual nominal terms.

As mentioned in the introduction, these results have significant implications for pension and endowment funds. The average expected return assumed by public pension funds is 7.56% per year, more than a full percentage point higher than the best-case scenario presented here. Given that most public pension funds are underfunded, this points to a future where a combination of cuts to beneficiaries and increased contributions will become necessary. Having more realistic expectations about their portfolios' performance is essential before these funds and their sponsors begin to develop the set of actions needed to reduce the deficit that these funds currently have.

---

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

[2] Important to note that the annual dividend yield and the annual growth rates of earnings and the PE ratio need to be adjusted for their volatility in order to measure their contributions to the compounded total annual return.

[3] Note that real values of PE growth rate and dividend yield are equal to their nominal values as both are ratios of nominal values which are adjusted equally by inflation.