

Practical Asset Allocation©

**Tom Robinson, Chief Investment Officer & CEO
Robinson Global Investment Management LLC
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One of the most important parts of a disciplined investment process is the determination of the right strategic asset allocation that provides a rate of return necessary for an individual to meet their financial objective(s) while at the same time matching their ability and willingness to take risk. This paper provides an applied practical approach to performing a strategic asset allocation.

Determining Asset Classes

The first step is determining what asset classes and what level of detail should be included. Each investor or advisor will have their own preferences on these decisions. One important factor is the availability of data for the level of asset classes chosen. At a minimum, you need to have a forecast for each asset class over the planned investment horizon of:

- Future expected returns
- Future expected variation (standard deviation)
- Future expected correlations of the asset class with other asset classes.

One way of determining asset classes is presented in Exhibit 1 with different levels of detail. One advantage to a more detailed approach as in the last column is to be disciplined about explicitly including both value and growth investments and specific types of alternative securities. More detail could also be provided such as types of bonds (government, corporate, floating rate, inflation protected). An advantage of a moderate or broad approach is to provide more flexibility in implementing the allocation.

My personal preference is somewhere in the more moderate range without being too broad or too detailed. I use MoneyGuidePro, a software product for financial planning/asset allocation, which includes the following asset classes as defaults:

- Cash
- Short Term Bonds
- Intermediate Term Bonds
- Long Term Bonds
- Large Cap Value
- Large Cap Growth
- Mid Cap
- Small Cap
- International Developing Markets
- International Emerging Markets

- Alternatives (Real Estate and Commodities)

Exhibit 1

Selected Asset Class Possibilities

Broad Asset Classification	Moderate Asset Classification	Detailed Asset Classification
Fixed Income Securities	Cash & Equivalents	Cash & Equivalents
	Short Term Bonds	Short Term Bonds
	Intermediate Term Bonds	Intermediate Term Bonds
	Long Term Bonds	Long Term Bonds
Equity Securities	Large Capitalization Stocks	Large Cap Value
		Large Cap Growth
	Mid Cap Stocks	Mid Cap Value
		Mid Cap Growth
	Small Cap Stocks	Small Cap Value
		Small Cap Growth
	International Developing Market Stocks	Developed Market Value
		Developed Market Growth
International Emerging Market Stocks	Emerging Market Value	
	Emerging Market Growth	
Alternative Investments	Alternative Investments	Real Estate
		Commodities
		Private Capital
		Alternative Strategies

Determining Input Factors for Efficient Portfolios

Most optimizing software has historical data on expected returns, standard deviation, and correlations for asset classes. For designing a forward-looking portfolio, however, we need estimates of what these will be over the planned investment horizon. In my experience, using historical data for standard deviation and correlations is a common and reasonable approach. Returns on the other hand are best estimated based on a number of factors:

- Economic outlook including inflation
- Interest rate outlook including the yield curve
- Expected risk premium on different types of equity or other investments based partially on historical risk premia (the return that equities typically require over and above government bonds)
- Current valuation of the asset class.

For example, historically large capitalization stocks have historically had an equity risk premium of about 5.5% over 20-year treasury bonds.¹ At the time of writing this paper, 20-year U.S. Treasury bonds were paying 2.1% so a reasonable expected of the expected return on U.S. large capitalization stocks would be 7.6%. We must keep in mind that this is still an estimate based on history – risk premia can change.

We should also look at the current price level of the market for U.S. to assess what investors in the aggregate may be estimating as future expected returns. One method is to look at the current price to earnings ratio of large capitalization stocks. More precisely many use the cyclically adjusted price to earnings ratio (CAPE) ratio.² As I write this article the CAPE ratio has been about 30. Using Finke's analysis in the article cited a CAPE ratio of about 30 would imply an expected return on U.S. large stocks over the next 10 years of 5.5%.

Combining these two estimates one using 20-year treasury yield expectations and one using a 10-year price earnings model, a reasonable estimate of long-term large capitalizations stocks in today's environment looks to be about 6.5% (the midpoint of these two basic models).

Similar models can be used for the other asset classes, and we should also consider how they fit together. For example, small capitalization stocks generally carry more risk than large capitalization stocks so we would expect a model to give us a higher than 6.5% return for small capitalization stocks.

Rather than do this analysis yourself, you might rely on others. Many software packages come with expert forecasts of asset class returns. For example, a large well respected investment management firm, AQR, regularly makes public their capital market assumptions. Using a model partially based on the CAPE ratio and a 5 to 10 year investment horizon, they currently estimate a real return of 3.6% for US stocks.³ A real return is after the impact of inflation so the nominal return considering inflation would be 6.2% given their 10 year U.S. inflation estimate of 2.6%. AQR also presents estimates for both developed and emerging international markets stocks which are all currently higher than those for the U.S. Their outlook for bonds, U.S. and international is for a negative real rate of return.

Creating an Efficient Frontier

With inputs in hand, you will need to use an optimizer program, generally built into financial planning software, to compute an efficient frontier. The efficient frontier

¹For example: <https://www.duffandphelps.com/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates>.

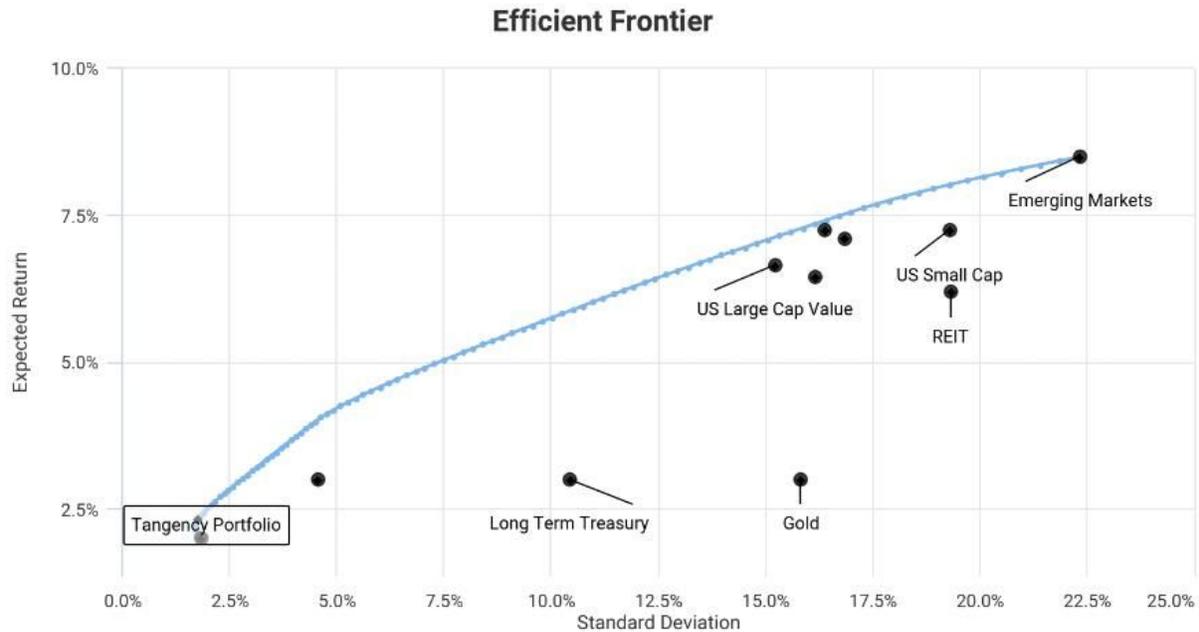
² Michael Finke, The Remarkable Accuracy of CAPE as a Predictor of Returns, Advisor Perspectives, July 20, 2020 available at <https://www.advisorperspectives.com/articles/2020/07/20/the-remarkable-accuracy-of-cape-as-a-predictor-of-returns-1>.

³ <https://www.aqr.com/Insights/Research/Alternative-Thinking/2022-Capital-Market-Assumptions-for-Major-Asset-Classes>

represents the optimal portfolios which represent the maximum amount of expected return given each risk level (standard deviation). Below is an efficient frontier generated from www.portfoliovisualizer.com which has a free version you can use.

Exhibit 2

Efficient Frontier



The blue line is the efficient frontier. Portfolios are available on the line and below the line. No possible portfolios exist above the line. Note at the extreme to the right would be a portfolio of 100% emerging market stocks. This is efficient but very risky and unlikely to be tolerable for most investors. A 100% US Large Cap Value portfolio is a little below the efficient frontier. This portfolio would have an expected return of 6.65% and an expected standard deviation of 15.22%. A better portfolio would be the one on the frontier directly above this data point which would be as follows:

- 12% large cap value
- 12% mid cap
- 41% international developed markets
- 27% emerging markets
- 8% Long term treasuries

This portfolio has the same risk as 100% US Large Cap Value but a higher expected return of about 7.15%. Note that this portfolio is in the upper right part of the efficient frontier, so it is most likely for higher risk tolerant individuals.

A portfolio of 100% intermediate bonds is also below the frontier with a long term expected return of 3% and standard deviation of about 4.5%. Moving directly up to the efficient frontier would lead to a portfolio of:

- 8% U.S. Large Cap Value
- 4% U.S. Small Cap
- 10% International Developed Markets
- 2% International Emerging Markets
- 76% Intermediate Treasuries

This portfolio has the same expected risk as 100% Intermediate Bonds but a higher return of 4%. This portfolio is at the lower left end of the efficient frontier and is most likely appropriate for lower risk tolerant individuals.

The results of the optimization look precise, and they are, but only given the inputs used. We need to understand that the inputs are estimates. We cannot predict the future with certainty. The only certainty is that the factors influencing markets will change in the future and reality will deviate from our forecast. While some investment managers use the outputs of the optimization program directly, it is more common to develop a set of model portfolios based on the results which represent portfolios reasonably close to the efficient frontier. Some sample portfolios at a moderate asset class levels might look something like Exhibit 3. Details would also be available for the breakdowns within each asset class.

Exhibit 3

Sample Model Portfolios

Model Portfolio	Fixed Income	Equities	Alternatives
Capital Preservation	70%	30%	0%
Balanced	50%	50%	0%
Total Return	35%	60%	5%
Capital Growth	20%	75%	5%
Equity Growth	5%	90%	5%

Client Risk Tolerance

To match a client with a portfolio near the efficient frontier we need to know their risk tolerance (willingness to take risk). Ideally, we would also like to know their risk capacity (ability to take risk) and the return needed from a portfolio to meet their investment objectives. What is the difference between risk tolerance and risk capacity?

“... tolerance relates to an individual’s emotional limit of acceptable risk; capacity refers to the financial capacity to withstand market losses. These two factors are not necessarily correlated. For example, it is not uncommon to find an investor with significant assets and modest demands on those assets such that a

significant market loss would not affect the ability to maintain the individual's desired quality of life (i.e., high-risk capacity). However, that same investor might be unwilling to invest any significant portion of the portfolio in stock and might well bail out of whatever stock allocation there was in a significant bear market (i.e., low-risk tolerance)."⁴

The most critical factor is risk tolerance, if an investors behavior would be significantly impacted by their emotional limit for risk they may be included to "sell everything" at the worst possible time (after a significant market correction but before a recover). If there is a significant gap between risk tolerance and risk capacity, we should work with the client over time to understand the difference and the impact on how we select a portfolio.

Measuring risk tolerance is an art, with some science behind it. There are a variety of questionnaires available some of which have board data sets as to how people have responded so that an individual's answers may be compared to that data set.⁵ FinaMetrica provides their questionnaire and sample comparisons to their data set on their website.⁶ These sophisticated questionnaires collect responses to demographic data and responses to questions designed to measure risk tolerance.

Questions can range from simple questions asking how the individual would self-rate their risk tolerance to more complex questions designed to elicit more subtle preferences. For example, consider the following simple pair of questions.

1. Do you feel that you are more or less comfortable with risk relative to others your age?
2. If you had to put a number on it from 0 to 100, where 50 is the average for someone your age, what would that number be?

A more complex pair of questions based on the work of Kahneman and Tvesky might be:

1. Choose (a) or (b)
 - (a) You win \$80,000
 - (b) You have an 80% chance of winning \$100,000 (or a 20% chance of winning nothing)
- 2.. Choose (a) or (b)

⁴ Evensky, Harold, Stephen M. Horan, and Thomas R. Robinson. The New Wealth Management: The Financial Advisor's Guide to Managing and Investing Client Assets. Hoboken, NJ: J. Wiley, 2011. Page 57.

⁵ See for example <https://www.riskprofiling.com/>.

⁶ https://www.riskprofiling.com/WWW_RISKP/media/RiskProfiling/Downloads/Jean-John-Sample-US-s3-0.pdf

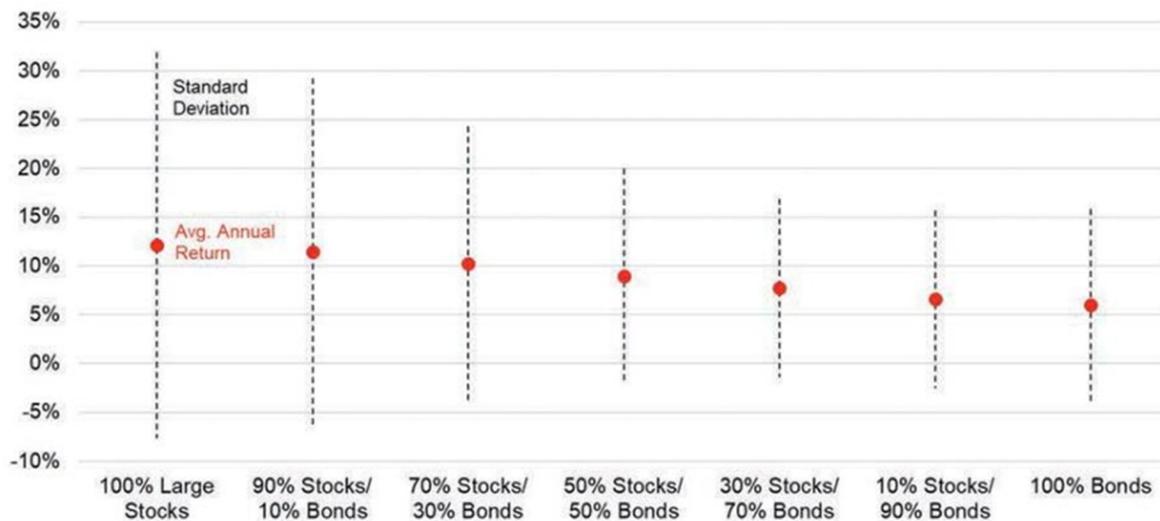
(a) You lose \$80,000

(b) You have an 80% chance of losing \$100,000 (or a 20% chance of losing nothing)

It is useful to include some questions based on typical ranges of investment returns or providing context for potential losses in bad scenarios

For example, based on data on longer term returns and risk from Ibbotson et al, the following graphics shows the long term historical average return and standards deviation of different allocations to stocks and bonds.

Exhibit 2.8: Average Annual Return and Standard Deviation of Large-Cap Stock and Long-Term Government Bond Portfolios (1926–2020)



You might then ask:

1. Given the graphic above what mix of stocks and bonds would you feel would enable you to feel secure about your future goals and be able to sleep at night for that portion of your investments that you might spend during the next 5 years?
2. Given the graphic above what mix of stocks and bonds would you feel would enable you to feel secure about your future goals and be able to sleep at night for that portion of your investments that you Do NOT plan to spend until retirement?

To test what a client might do during a significant market crisis such as the one that occurred in 2008 you could present what their 2008 loss would have looked like with various allocations:

Allocation	Loss
20% Equity/80% Fixed Income	-3%
30% Equity/70% Fixed Income	-8%
40% Equity/60% Fixed Income	-12%
50% Equity/50% Fixed Income	-16%
60% Equity/40% Fixed Income	-20%
70% Equity/30% Fixed Income	-24%
80% Equity/20% Fixed Income	-29%
90% Equity/10% Fixed Income	-33%
100% Equity/0% Fixed Income	-37%

You could then ask:

1. What is the maximum loss in percentage terms you would feel comfortable with in any one year? This is the level at which you would be concerned but would not be inclined to make rash decisions (sell everything at the worst possible moment).

The number of questions can range from 5 to 25. Once the questionnaire is completed you need to be able to score it to determine an overall risk score to compare to your experiences with other clients. Based on this you need to subjectively match the efficient portfolios or model portfolios based on the efficient portfolio line to determine a desirable long-term strategic asset allocation for the investor.

Flexibility Using Ranges or Tactical Shifts

If you are preparing a financial plan for retirement where you need to know estimated returns and variability over a 30-year period (very common) you typically use the 30-year period for estimating returns. Your short-term market expectations might be different. For example, the data used in creating the efficient frontier was for a 30-year period. While our strategic asset allocation might call for intermediate or long-term bonds over the long term, they may be unattractive in the short term. This can be handled by putting tolerance bands around strategic allocations or engaging in tactical shifts. For example, we might say that our long-term bond allocation is 5% but could be plus or minus 2.5%. You could then shift tactically within that range based on shorter term expectations. Another approach is to have a short-term strategic allocation and a longer-term strategic allocation. For example, if you are planning for an investor who is 5 years away from retirement you might have an asset allocation which is slightly more aggressive given their employment income which is bond-like. You could then have a target strategic allocation that would begin upon retirement.

In any case, market assumptions and expectations are going to change each year. I recommend updating the asset allocation periodically (perhaps once a year) or when major assumptions are thought to have changed.

Once the asset allocation(s) have been determined, they should be documented and then the implementation can begin – choosing which investments to use within each asset class.