De-Risking Portfolios

A Framework for Managing Market Volatility

InvestEd | May 2019

pfm

Introduction

Lowering the risk level of a multi-asset class investment portfolio can be a challenge; however, we think the process should be straightforward, rational and prepared ahead of time. At PFM, we believe being prepared for worsening market or economic conditions is an integral part of a consultative, client-centric approach to portfolio management. To seek to achieve our goal of minimizing or avoiding unnecessary risk, we create a framework that (i) defines portfolio risks, (ii) creates multiple downside scenarios, (iii) identifies levers we can use, and (iv) designs particular investment allocations.

Defining Risk

To understand how to de-risk portfolios we have to define risk by finding a measure for it. Once we have a measure for risk, we can identify sources of risk or the components that contribute to that measure. Risk is typically defined as portfolio or strategy volatility, that is measured by the standard deviation of historical returns. However there are many other definitions of risk. For example, loss of principal is another measure for risk, defined by the absolute dollar loss of the portfolio.

We should also consider if we are trying to reduce absolute risk or relative risk. In other words, are we trying to reduce overall portfolio volatility and reduce absolute downside as measured in dollars, or are we trying to reduce portfolio volatility relative to the portfolio benchmark, commonly called Tracking Error (or Active Risk in academic literature)?

For the purpose of this discussion, we will define risk as volatility or standard deviation of portfolio returns. We will also aim to reduce portfolio risk by focusing on relative risk reduction or the Tracking Error (Active Risk).

Our goal here is not to prevent catastrophic or sudden down movement, which would be market timing that we do not believe can be done effectively or consistently. The purpose is to understand secular trends and adjust the portfolio accordingly. This is in line with tactical asset allocation. We monitor both the economy and the markets and aim to make shorter term portfolio adjustments with a two to three quarter view on asset allocation.

Sources of Risk

To evaluate sources of risk, we have to identify the degree to which different allocations and strategies contribute to portfolio risk.

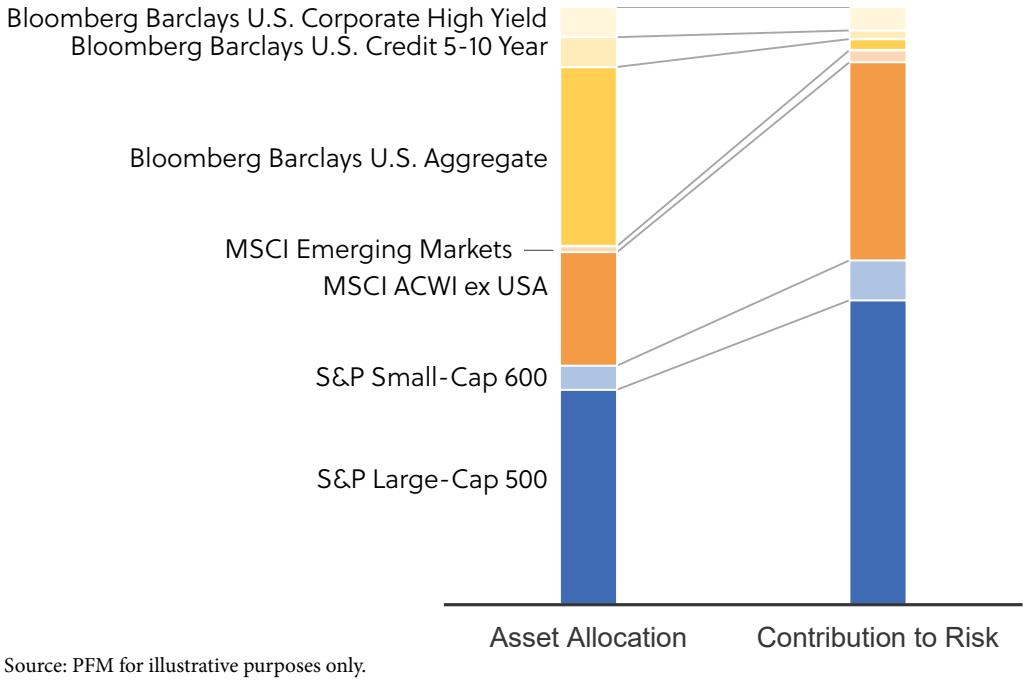
A typical 60% equity and 40% fixed income portfolio may consist of the S&P 500 large-cap equity index at 60% of the portfolio and the Bloomberg Barclays Aggregate Index at 40% of the portfolio. However, most portfolios are more complex and below, we show an example of a portfolio that combines two domestic equity indices, two international equity indices, and three fixed income indices. This portfolio allocation is 40% domestic equity, 20% international equity, and 40% fixed income. Allocation and risk for each individual allocation are depicted in the far right columns.

Asset Allocation and Volatility (Standard Deviation)

Asset Class	Index	Asset Allocation	Standard Deviation
Domestic Equity	S&P Large-Cap 500	36.0%	13.4%
	S&P Small-Cap 600	4.0%	17.8%
International Equity	MSCI ACWI ex USA	19.0%	16.8%
	MSCI Emerging Markets	1.0%	21.3%
Fixed Income	Bloomberg Barclays U.S. Aggregate	30.0%	3.2%
	Bloomberg Barclays U.S. Credit 5-10 Year	5.0%	5.4%
	Bloomberg Barclays U.S. Corporate High Yield	5.0%	9.0%

Sources: PFM, Bloomberg, data from 2014-2018.

This allocation and risk profile, combined with historical correlations, gives an insightful picture of risk sources. Based on the above asset allocation and standard deviations, we calculate contribution to risk for each sub-asset class (strategy) in the portfolio as shown below.

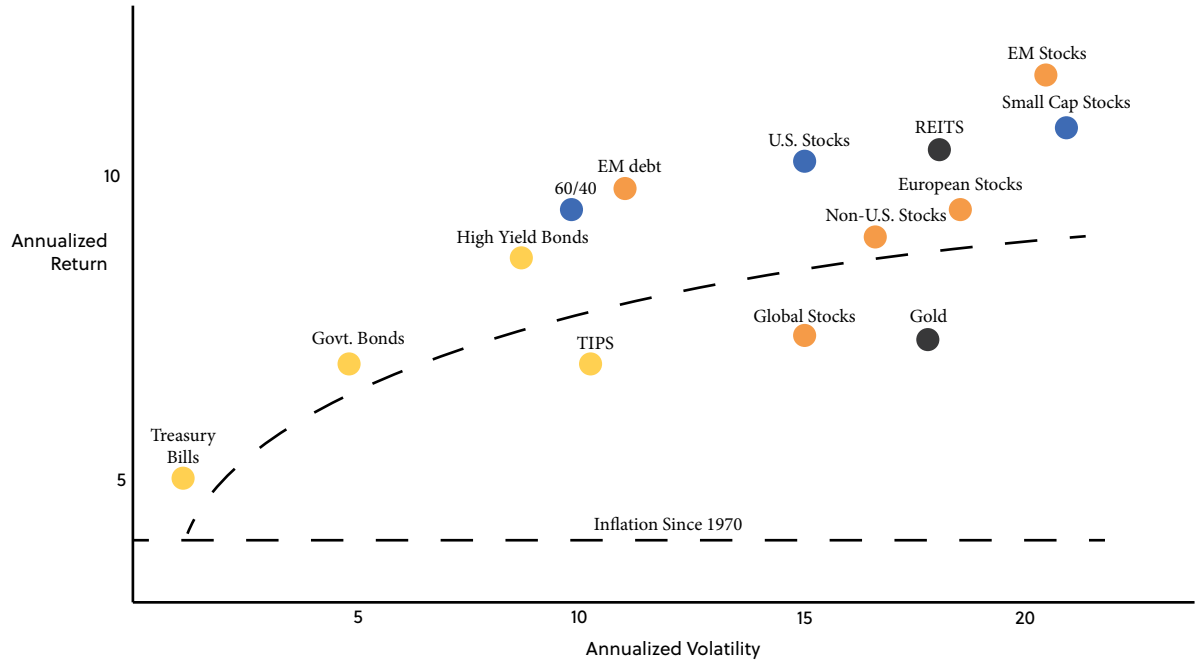


Source: PFM for illustrative purposes only.

In this hypothetical 60/40 portfolio, equity exposure contributed 92.8% to portfolio risk and fixed income contributed 7.2% to portfolio risk. We also note that a domestic equity allocation of 40% contributes 57.6% to risk, an international equity allocation of 20% contributes 35.2% to risk, and a fixed income allocation of 40% contributes only 7.2% to total portfolio risk.

Based on this portfolio, if we define a simple measure of risk per unit of investment (contribution to risk divided by allocation), the international equity has the highest measure of 1.8 (35.2%/20%), the domestic equity measures at 1.4 (57.6%/40%), and fixed income measures at 0.2 (7.2%/40%).

It is intuitive to us that International equity is the most risky allocation. This is in line with the classic risk return chart that we are accustomed to.



For illustrative purposes only.

Defining Risky Market Scenarios

Risk assessment is a moving target and never final. To manage this, we define a set of economic and market scenarios that need to be monitored because they could potentially trigger our move into a less risky portfolio comprised of more defensive allocations.

For example, at a macro level, we observe the trend line for GDP growth and manufacturing output, to name a few measures. At a corporate level we monitor earnings growth for different geographic regions and various capitalization levels. We review this in conjunction with credit spreads to assess any weakness within the credit markets, as evidenced by widening spreads. This is an assessment that we are continually undertaking as portfolio strategists, and it drives the overall asset allocation as well as sub-asset class allocation across the portfolios.

Some of the economic indicators we watch are GDP (domestic and international regions), inflation, manufacturing and service PMIs, and ISM data. Some of the financial market indicators we monitor are earnings and sales growth (domestic and international), yield curves, and credit spreads (i.e. investment grade and high yield spreads over Treasuries).

In periods of deteriorating fundamentals, based on our qualitative assessments of various downside scenarios, we aim to position our portfolios to generate better risk-adjusted returns than their respective blended benchmarks.

Using Levers to Lower Risk

We previously identified sources of risk and we can now focus on how to implement our view to help lower overall portfolio risk using certain levers. Our levers exist at both a portfolio and a strategy (asset or sub-asset class) level.

For example, at a portfolio level, we seek to reduce risk by underweighting international equity or overweighting fixed income. At the individual strategy level we have more options. For example, in a domestic equity portfolio, we can decrease the allocation to small-cap stocks. In an international equity portfolio, we can decrease allocation to emerging markets. In a fixed income portfolio, we can decrease allocation to credit.

Designing Investment Allocations

In the defensive portfolio depicted below, we reduced overall equity exposure from 60% to 50% by decreasing domestic and international equity exposure and increasing fixed income exposure. We reduced assets that contribute more to risk and added assets that contribute less to risk. Specifically, domestic equity was reduced by 6%, and international equity was reduced by 4%, while the fixed income allocation was increased by 10%.

Asset Class	Original Asset Allocation	Defensive Asset Allocation
Domestic Equity	40.0%	34.0%
International Equity	20.0%	16.0%
Fixed Income	40.0%	50.0%

Looking at the sub-asset class level provides an even more detailed view on how higher risk-contributing assets are reallocated to lower risk-contributing assets. We reduced the riskier small-cap allocation more than the less risky large-cap allocation. We removed riskier emerging markets allocation entirely and reduced overall international equity exposure. We also reduced the corporate fixed income allocation and increased the safer U.S. aggregate allocation.

Asset Class	Index	Original Asset Allocation	Defensive Asset Allocation
Domestic Equity	S&P Large-Cap 500	36.0%	32.0%
	S&P Small-Cap 600	4.0%	2.0%
International Equity	MSCI ACWI ex USA	19.0%	16.0%
	MSCI Emerging Markets	1.0%	0.0%
Fixed Income	Bloomberg Barclays U.S. Aggregate	30.0%	45.0%
	Bloomberg Barclays U.S. Credit 5-10 Year	5.0%	2.5%
	Bloomberg Barclays U.S. Corporate High Yield	5.0%	2.5%

With a more defensive portfolio, the contribution to risk from overall equity exposure decreased to 91.9% and contribution to risk from fixed income exposure increased to 8.1%, as expected. Within the equity class, the riskier international equity contribution to risk decreased by 4.5% to 33.6%, while less risky domestic equity increased slightly by 1.2% to 58.3%.

Asset Class	Original Asset Allocation Contribution to Risk	Defensive Asset Allocation Contribution to Risk
Domestic Equity	57.6%	58.3%
International Equity	35.2%	33.6%
Fixed Income	7.2%	8.1%

Sources: PFM, Bloomberg, data from 2014-2018

Portfolio Rebalancing

An important part of de-risking a portfolio includes a discussion of portfolio rebalancing, which has been shown to reduce portfolio risk and improve risk-adjusted returns. Portfolio rebalancing refers to reallocating all assets back to the portfolio's initial composition after one or more assets have grown faster than others.

For example, suppose in a strong bull market that the equity portion of our 60/40 portfolio returns 10% while the fixed income portion returns 3%. The difference in returns will push the value of the equity portion higher than the 60% target. In this case, the risk contribution to the portfolio from the equity portion grows along with it, and it will be larger than the risk contribution from the original 60/40 allocation. The solution is to rebalance assets back to the initial portfolio proportions.

Portfolio rebalancing is an important aspect of managing portfolio risk. Systematic rebalancing helps us to stay within target risk contribution and avoid unexpected drawdowns, while seeking to improve risk-adjusted returns. In other words, we would like to continuously maintain contribution to risk from equity and fixed income allocations in line with our tactical views.

Conclusion

It would not be wise for an institutional investor (or any other investor for that matter) to make quick, reactive decisions. A better process would be to employ thoughtful planning and investment practices to choose and stay within the desired levels of risk.

At PFM, our approach is to identify, but not necessarily predict, declining economic and market conditions, define what an adverse scenario would look like, and aim to deploy a defensive portfolio based on the level of de-risking required.