



## Under the hood: A closer look at volatility weighting

Volatility weighting, also known as risk weighting, may offer a better way to capture diversification benefits.

... volatility weighted indexes may help investors prepare for when true diversification benefits are most precious: when things get rocky.

**THE MARKET-CAPITALIZATION-** weighted S&P 500® Index continues to be the media’s default barometer for monitoring the broader stock market. That’s not likely to change any time soon. However, it appears investors are starting to pump the brakes on cap weighting as they come to grips with its inherent limitations.

Weighting individual constituents by their total size leads to an obvious problem because any ETF or mutual fund built to track a cap-weighted index can be disproportionately influenced by just a few stocks. These funds may allocate across hundreds of stocks, but the methodology has the potential to result in a false sense of diversification.

We believe that volatility weighting is a more intuitive way to build an index. Moreover, volatility weighting can be used in core allocations for domestic or global strategies, as well as across style boxes. Volatility weighting also can be used to potentially enhance diversification benefits with niche allocations, such as dividend-focused approaches.

### Turbo charging diversification

Volatility weighting is simply a method for determining the position size of every constituent stock in a portfolio. Volatility weighting is applied to a broad universe of stocks with different levels of volatility, in an effort to

equalize the volatility contribution across the entire portfolio and, by consequence, the risk contribution of each constituent. For investors, equalizing risk contribution seems like a smart objective because it gives every stock a voice and may help create a portfolio built to perform consistently over a full market cycle.

But before looking at the mechanics of volatility weighting, it’s critical to underscore the connection between volatility and risk. With stocks, volatility describes the degree by which share prices have fluctuated. Risk is the exposure to dangers that can cause a stock to lose value.

There are many types of risks that can influence the price behavior of a stock—macro risk, interest rate risk, company-specific risk, currency risk, liquidity risk, and others. The price movements of stocks will be influenced by a combination of these risk factors in differing proportions and magnitudes. However, stocks with greater risk exposure have historically tended to have greater price volatility than those with less risk exposure.

Therefore, volatility can be thought of as an expression of the risk associated with owning that stock, or as an aggregate measure of an individual stock’s risk. Standard deviation\* is simply the math most often used to quantify that risk.

\* In finance, standard deviation is a statistical measurement that is used to illustrate the historical volatility of that asset.

## KICKING THE TIRES ON FIVE POPULAR EQUITY INDEX METHODOLOGIES

	 Methodology	 The nuts and bolts	 The destination	 Potential road blocks?
HIGHEST	<b>EQUAL WEIGHTED</b>	Weights each constituent identically, regardless of size or any other factor	Seeks to offer broad diversification, but is typically more volatile than cap weighting	<ul style="list-style-type: none"> <li>Over-allocates to smaller companies, which historically tend to be more volatile over time</li> <li>Places less weight in mega-cap stocks and therefore might lag when the largest-cap stocks outperform</li> </ul>
	<b>CAPITALIZATION WEIGHTED</b>	Weights individual constituents by their total size; the larger the company, the greater its influence	Seeks to offer broad diversification, but is typically more volatile than volatility weighting	<ul style="list-style-type: none"> <li>Over-emphasizes mega-cap stocks</li> <li>Size and sector concentrations can be extremely high</li> <li>Very sensitive to momentum as a factor</li> <li>Likely to underperform during periods when mega cap stocks lag</li> </ul>
	<b>VOLATILITY WEIGHTED</b>	Inversely weights each stock in portfolio according to volatility (larger weights to less-volatile stocks and smaller weights to stocks with higher volatility)	Attempts to equalize risk contribution and thus enhance diversification; generally less volatile than cap or equal weighting	<ul style="list-style-type: none"> <li>Places less weight in mega-cap stocks and therefore might trail capitalization weighting when the largest cap stocks outperform</li> </ul>
	<b>MINIMUM VOLATILITY</b>	Selects stocks that have demonstrated low volatility, but also considers relative sector weights and uses style constraints	Aims to reduce exposure to market volatility, while providing a more diversified portfolio	<ul style="list-style-type: none"> <li>Slightly higher volatility than low volatility due to added constraints</li> <li>With greater focus on downside protection, might struggle to keep up in rising markets</li> </ul>
LOWEST	<b>LOW VOLATILITY</b>	Selects stocks purely based on the lowest level of volatility	Attempts to reduce exposure to market volatility	<ul style="list-style-type: none"> <li>Results in heavy defensive sectors bets, such as utilities, REITs and consumer staples</li> <li>With greater focus on downside protection, might struggle to keep up in rising markets</li> </ul>

## WHY VOLATILITY WEIGHTING?

Allocates more heavily to lower-volatility stocks to equalize risk contribution across the index

Less volatile stocks given higher weighting



More volatile stocks given lower weighting



\* Each stock contributes and equal percentage (.03%) in a 500 stock index.

For illustrative purposes only. Standard deviation is a statistical measure of volatility and is often used as an indicator of the 'risk' associated with a return series. For purposes of this illustration, the median standard deviation is assumed at 15%.

*“Understanding the link between volatility and risk is central to why we believe an investor benefits by weighting individual stocks based on volatility.”*



**Scott Kefer, CFA**  
Senior Portfolio Strategist,  
VictoryShares and Solutions

“Understanding this link between volatility and risk is central to why we believe an investor benefits by weighting individual stocks based on their volatility,” explains Scott Kefer, CFA, Senior Portfolio Manager. “If stocks with higher volatility receive smaller weights while those with less volatility are afforded higher weights, risk contribution to that portfolio may be equalized across all holdings. This equalization of risk is diversification personified.”

A closer look at the inner workings of a volatility-weighting methodology reveals how it helps equalizes risk contribution and aims to lower overall portfolio volatility (ideally to levels less than more popular cap-weighted approaches). The first step is to look at the historic volatility of each stock,

as measured by standard deviation. Once calculated, each holding is inversely weighted according to its relative level of volatility. Stocks with higher volatility are given smaller weights, while less volatile stocks are given larger weights.

The accompanying graphic illustrates how the methodology would be applied to a broad, 500-stock portfolio.

- > Stock A represents the least volatile holding among the 500 stocks with a standard deviation of 7.5%.
- > Stock B has a standard deviation of 15%, which is the average volatility of all 500 constituents within the portfolio.
- > Stock C is the most volatile stock with a standard deviation of 30%.

The process of equalizing risk contribution through volatility weighting begins with Stock B because it carries the average volatility. Thus, it receives the average weighting, which in a 500-stock portfolio would be 0.2%. Since volatility is an expression of the risk associated with a stock, we can establish Stock B's total risk contribution by multiplying its portfolio weight by its volatility (0.2% weight x 15% standard deviation = .03% overall risk contribution).

In order to complete the volatility weighting process and achieve the goal of equalizing the risk contribution

across the entire portfolio, each of the remaining 499 constituents must contribute the same 0.03% risk contribution as Stock B. To achieve that we simply work backward:

- > For Stock A, the least volatile holding, a 0.4% weight x 7.5% standard deviation = 0.03% overall risk contribution.
- > Stock C is more volatile, so a 0.1% weight x 30% standard deviation = 0.03% overall risk contribution.

## Does your index need a tune-up?

While cap weighting is the most prevalent methodology for index construction, it often results in a heavy tilt to the largest companies, discounting the performance and contribution of the smaller constituents. Such mega-cap dominance may garner little attention at times when the largest companies excel and grow more rapidly than the average stock, as in recent years. But when the momentum runs out and mega caps fall out of favor, any product built around a cap-weighted index could suffer.

In the face of these limitations, other approaches have come to the forefront. Chief among these have been a simplistic equal-weighting approach, whereby the stock index allocates equally to all constituents giving no regard to size or risk. In the S&P 500 Equal Weight Index,<sup>®</sup> for example, every company's allocation is fixed at 0.20% (quarterly). This seems to be a naive attempt at diversification. On one hand it solves for concentration risk and mitigates some of the sector and large-company biases of traditional cap weighting. But it also ratchets up the

total portfolio risk profile by over-allocating to smaller companies, which historically tend to be more volatile over time.

Investing explicitly to achieve low volatility is another popular, if perhaps dubious, approach. Limiting the universe of an index solely to lower-volatility stocks will naturally result in a lower-volatility portfolio, but it hardly provides for broad diversification, even with sector caps. A portfolio full of consumer staples, utilities, and other defensive sectors might be less than an ideal approach for a core equity allocation.

**DAILY INFLUENCE OF APPLE & CLOROX RETURNS (%)**

(January 1, 2018—December 31, 2018)



Past performance does not guarantee future results. CFA held 0.24% Clorox Co and 0.17% Apple Inc. as of 12/31/2018. Index and Fund holdings are subject to change and should not be considered investment advice.

All data as of December 31, 2018. For illustrative purposes only. The methodology for the S&P 500 Index and the Nasdaq Victory US Large Cap 500 Volatility Wtd Index include additional factors. To learn more, refer to the S&P U.S. Indices Methodology, available online at <https://us.spindices.com>, or visit [www.vcm.com/investment-professionals/our-indices](http://www.vcm.com/investment-professionals/our-indices).

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**Mannik S. Dhillon, CFA, CAIA**

President of VictoryShares and Solutions

This process is repeated for the remaining constituents until all 500 stocks are individually contributing an 0.03% of risk, creating an equal risk portfolio. With position weights as large as Stock A's 0.4% and as small as Stock C's 0.1%, volatility weighting clearly solves for the concentration risk inherent to cap-weighted approaches. Not only does this create a better distribution of position sizes,

but the potential diversification benefits become evident in how each stock influences daily returns. Comparing the daily influences of the largest and smallest constituents in an index (see the accompanying graph) illustrates the point. In a cap-weighted index, the influence of a mega-cap was substantial, while the performance of the smallest constituent barely moved the needle.

**Equal weight:  
A different vehicle**

It is important to reiterate that equal risk contribution created by a volatility-weighted approach is not the same as an equal-weighted portfolio. There are important differences. Sticking with the 500-stock portfolio illustration, an equal-weighted index automatically gives a 0.2% weight to every stock in the index. But then the more volatile Stock C's contribution to risk would double (0.2% weight x 30% standard deviation = 0.06% overall risk contribution).

Meanwhile, the less volatile Stock A would only contribute half the risk (0.2% weight x 7.5% standard deviation = 0.015% overall risk contribution). Therefore, an equal-weighted index inherently carries higher overall risk potential. Is this really what investors want from an allocation?

"In the desire to build a better portfolio and maximize the benefits of diversification, why not seek to potentially spread risk equally across all holdings?" asks Mannik S. Dhillon, President of VictoryShares and Solutions for Victory Capital. Volatility weighting, or risk weighting, does exactly that. It's simple, disciplined, and can be applied across small- or large-cap stocks, domestic or international portfolios, or combined with dividend strategies. Vehicles that seek to track the performance of volatility-weighted indexes may help investors prepare for when true diversification benefits are most precious: when things get rocky. **vs**





To learn more about volatility weighting and our risk-weighted approach to investing, contact your financial advisor or visit [www.victoryshares.com](http://www.victoryshares.com)

**An investor should consider the fund's investment objectives, risks, charges and expenses carefully before investing or sending money. This and other important information about the fund can be found in the fund's prospectus, or, if applicable, the summary prospectus. To obtain a copy, visit [www.victorysharesliterature.com](http://www.victorysharesliterature.com). Read the prospectus carefully before investing.**

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