OUR VALUE MOMENTUM TREND PHILOSOPHY

EXECUTIVE SUMMARY

Our Value Momentum Trend (VMOT) ETF seeks to capture three factors:

1. Value Factor
2. Momentum Factor
3. Trend-Following Factor

Value, is a strategy that focuses on the common stock of firms with low prices relative to fundamentals. The strategy has been discussed for nearly a century and the intellectual father of the approach is Benjamin Graham. Graham's most famous student, Warren Buffett, has inspired legions of investors to adopt a value philosophy.

Momentum, is a strategy that focuses on the common stock of firms that have strong relative past performance. Momentum, is generally considered to be more controversial than value, because the strategy refutes the core premise of the efficient market hypothesis, which states that stock prices always reflect fundamental values. Nonetheless, Eugene Fama, the 2013 co-recipient of the Nobel Prize in Economics and father of the efficient market hypothesis, admits the following with respect to momentum: *"The premier anomaly is momentum."*[1]

Trend-following, the third component of our VMOT strategy, has been advocated by professional investors for many years as a risk-management technique. The basic idea behind trend-following is to invest in market risk when the trend is positive, otherwise, avoid market risk. The objective of trend-following is to avoid downtrending markets and minimize large losses.

We combine these three concepts into one system via our Value Momentum Trend (VMOT) ETF (visually depicted below). The goal of the ETF is to track the Value Momentum Trend Index ("VMOT Index"). The VMOT Index seeks to deliver a global alternative equity exposure that can serve as a compliment (or a supplement) to a broad-based buy-and-hold equity index portfolio.

AUTHORS:

Jack R. Vogel, Ph.D.
Managing Member

Wesley R. Gray, Ph.D.
Executive Managing Member

PLEASE READ IMPORTANT DISCLOSURES AT THE END OF THIS DOCUMENT.

VALUE MOMENTUM TREND (VMOT)

After years of researching stock investment strategies, we have identified three factors in which we have strong conviction:

- **Value investing:** buy cheap stocks
- **Momentum investing:** buy stocks with strong relative strength
- **Trend-following:** invest in market risk if markets are trending

Alpha Architect has developed their own algorithm that seeks to effectively capture these three exposures via their Value Momentum Trend Index methodology ("VMOT Index"). The Fund seeks track the VMOT Index.

The VMOT ETF seeks to deliver a *TRANSPARENT* and *SYSTEMATIC* approach to combining focused value, momentum, and trend exposures into one unified process. We hope this piece helps investors better understand our approach.

Also, we want to be clear up front regarding the VMOT ETF. First, the VMOT ETF tracks the VMOT Index. The Index is complex and requires that an investor understand the mechanics of the approach. Second, because the VMOT Index is unique, the Index (and hence the ETF) has the potential to deviate wildly from broad-based global equity indexes. Therefore, the ETF is only appropriate for investors with a long-term investment horizon, a willingness to invest the time to understand the processes, and the ability to stomach underperformance relative to standard global equity benchmarks.

In short, the VMOT ETF is *NOT* for everyone.

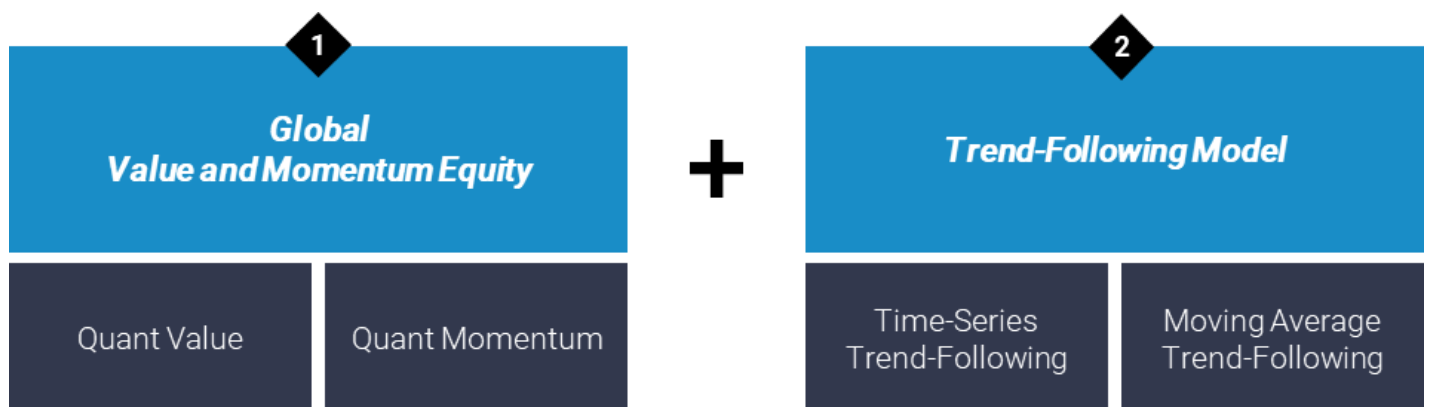## VALUE MOMENTUM TREND INDEX PROCESS

The goal of the Value Momentum Trend (VMOT) Index is to capture Global Value and Momentum Equity exposures while simultaneously minimizing the chance of extreme losses (i.e., drawdowns).

The systematic process can be broken into three distinct aspects, which we explore in-depth, so investors have a clear understanding of the approach.

Here are the three elements of the Index:

1. Global Value and Momentum Equity
2. Trend-Following Model
3. Putting it all together

Here is a visual depiction of the process:

Charts presented are for illustrative purposes only.

VALUE MOMENTUM TREND (VMOT)

The Alpha Architect Quantitative Value Index ("QVAL Index"), the Alpha Architect International Quantitative Value Index ("IVAL Index"), the Alpha Architect Quantitative Momentum Index ("QMOM Index"), and the Alpha Architect International Quantitative Momentum Index ("QMOM Index"), are used to construct the Global Value and Momentum Equity element of the VMOT Index. The fundamentals of these Index-based approaches to value and momentum investing are fully captured in our white paper on value investing and our white paper on momentum investing.[23]

We summarize the core ideas below:

QUANTITATIVE VALUE INDEX: The Index seeks to buy the cheapest highest quality value stocks[4]

1. **Identify Universe:** Our universe generally consists of mid- to large-capitalization U.S. exchange-traded stocks.
2. **Remove Outliers:** We conduct financial statement analysis with statistical models to avoid firms at risk for financial distress or financial statement manipulation.
3. **Screen for Value:** We screen for stocks with low enterprise values relative to operating earnings.
4. **Screen for Quality:** We rank the cheapest stocks on their long-term business fundamentals and current financial strength.
5. **Investment with Conviction:** We seek to invest in a concentrated portfolio of the cheapest, highest quality value stocks. This form of investing requires disciplined commitment, as well as a willingness to deviate from standard benchmarks.
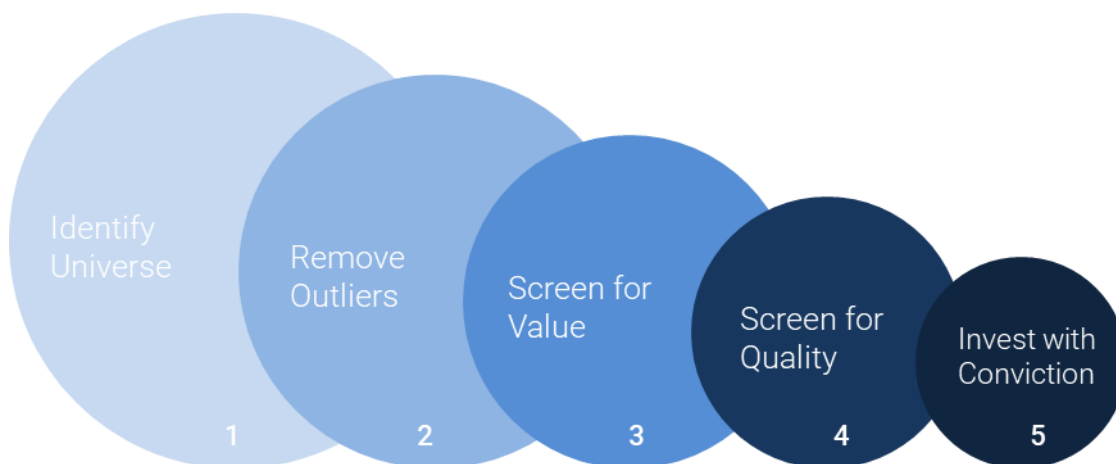

Portfolio characteristics of the QVAL Index:

- 40 to 50 stocks
- Equal-weight
- Quarterly rebalanced (international is semi-annually rebalanced)
- 25% sector/industry constraint
- No financials
- Pre-trade liquidity requirements

QUANTITATIVE MOMENTUM INDEX: The Index seeks to buy stocks with the highest quality momentum[5]

1. **Identify Universe:** Our universe generally consists of mid- to large-capitalization U.S. exchange-traded stocks.
2. **Core Momentum Screen:** We rank stocks within our universe based on their past twelve-month returns, ignoring the first month.
3. **Momentum Quality Screen:** We screen high momentum stocks on the "quality" of their momentum—we focus on stocks with a "smoother" return path towards their high momentum status.
4. **Seasonality Screen:** We take advantage of certain seasonal aspects applicable to momentum investing, which determines the timing of our rebalance.
5. **Invest with Conviction:** We seek to invest in a concentrated portfolio of stocks with the highest quality momentum. This form of investing requires disciplined commitment, as well as a willingness to deviate from standard benchmarks.

VALUE MOMENTUM TREND (VMOT)
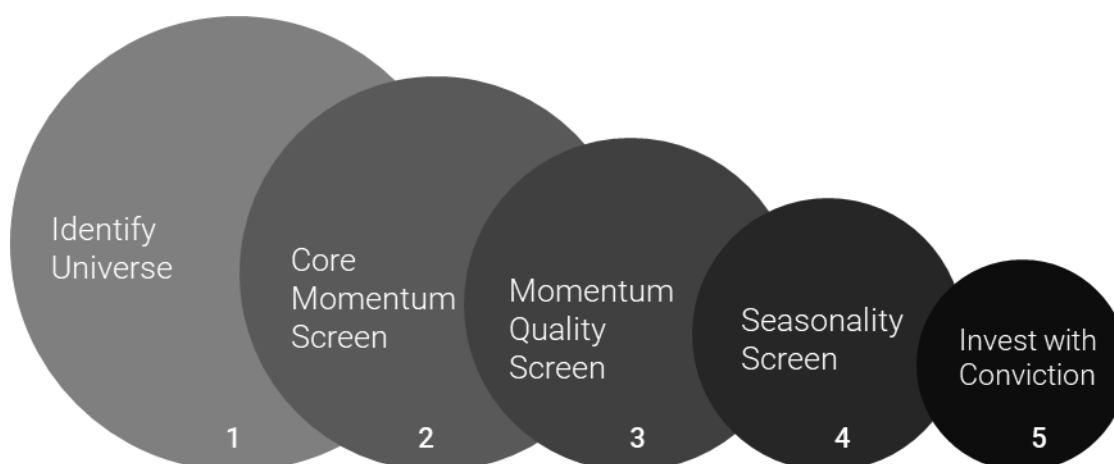
Portfolio construction characteristics:

- 40 to 50 stocks
- Equal-weight construction
- Quarterly rebalanced
- 25% sector/industry constraint
- Pre-trade liquidity requirements

Building our Global Value and Momentum Equity Portfolio

The VMOT ETF tracks the Value Momentum Trend Index (VMOT Index). The ETF accesses the Alpha Architect global value and momentum exposures by investing in four underlying ETFs that seek to track the performance of the Alpha Architect Indexes:

Ticker	Index
QVAL	Alpha Architect Quantitative Value Index
IVAL	Alpha Architect International Quantitative Value Index
QMOM	Alpha Architect Quantitative Momentum Index
IMOM	Alpha Architect International Quantitative Momentum Index

Since the underlying ETFs (QVAL, IVAL, QMOM, and IMOM) generally hold 40-50 stocks, VMOT is generally invested in a portfolio of 180-200 U.S. and International stocks.

The Value Momentum Trend Index (which our VMOT ETF tracks), must determine how to allocate across the underlying value and momentum indices. The Index deploys an allocation system that relies on equalizing risk exposures (as opposed to dollar exposure) across the 4 underlying ETFs (QVAL, IVAL, QMOM, and IMOM). The VMOT Index weighting process is often referred to as a "risk-parity approach," or a "volatility-weighted approach." The downside of risk-parity position weighting is that this approach creates an added layer of complexity. To mitigate the concerns associated with complexity, the Index follows a simple risk-parity approach that uses a 3-year look back to estimate volatility. The VMOT Index annually rebalances the portfolio weights to minimize the potential frictional costs associated with highly dynamic risk-parity weighting systems.

ELEMENT #2: TREND-FOLLOWING MODEL

Timing the market is difficult, and perhaps impossible. Every investor wants to get high returns with no risk, but this is impossible to achieve. However, while achieving zero risk with equity-like returns is unrealistic, the goal with the VMOT Index is to accept the fact that the strategy will bear substantial risk, but at the same time, the Index seeks to minimize the chance of _extreme risks_ by avoiding downtrending markets via the VMOT Index Trend-Following Model.
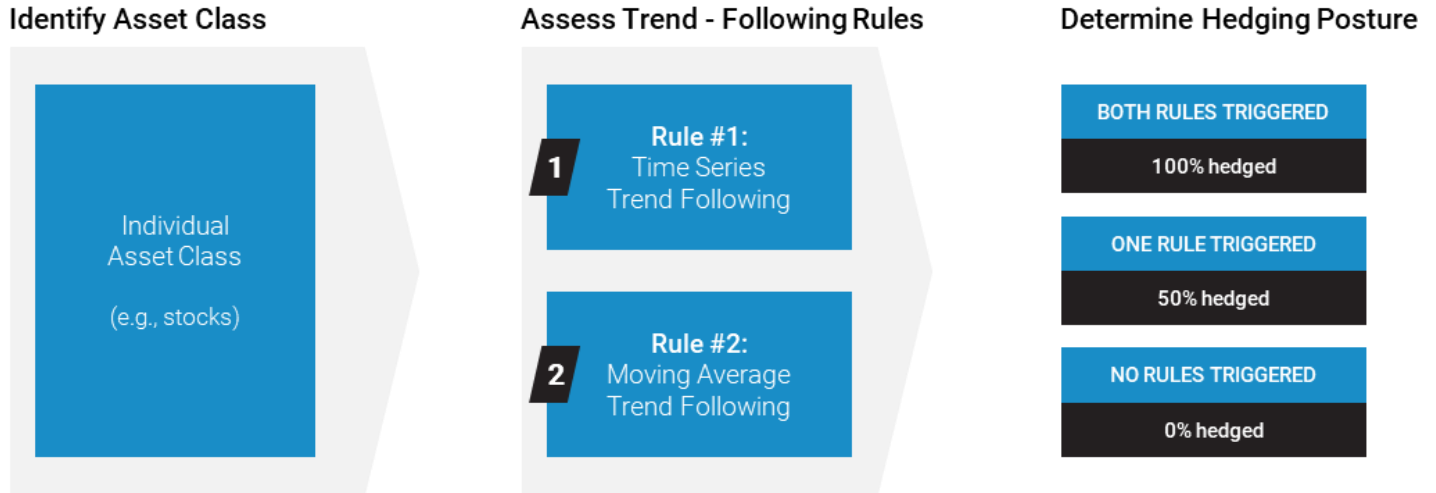
The VMOT Index Trend-Following Model does not seek to eliminate risk, and in some cases could increase the risk. The Trend-Following Model simply seeks to avoid downtrending markets via portfolio hedging.

VALUE MOMENTUM TREND (VMOT)

Our Trend-Following Model consists of two types of trend-following measures:

- Time Series Trend Following (TMOM)
- Moving Average Trend Following (MA)

A visual depiction of how the model works is below:

The granular details of the VMOT Index trend following system and the associated calculations are described below. The Index independently deploys the Trend-Following Model across the U.S. and the International equity portfolios, which implies that we can have different hedges for the U.S. portfolio and the International portfolio.

Trend-Following Rules for the U.S. Value and Momentum Equity Portfolio (QVAL and QMOM)

The VMOT Index will hedge the U.S. portfolio by shorting a representative broad-based U.S. market index ETF when either one or both of the following conditions are met. First, the Index will hedge if the U.S. equity markets' total return over a rolling twelve calendar month period is less than or equal to U.S. Treasury bill returns over the same period. Second, the Index will hedge when the U.S. equity markets' twelve month moving average exceeds current prices. There is a 50 percent weight to each rule. If both rules are triggered the Index's U.S. equity portfolio will be fully hedged; if one rule is triggered the Index's U.S. equity portfolio will be 50 percent hedged; and if no rules are triggered the Index's U.S. equity portfolio will have no hedge.

Trend-Following Rules for the International Value and Momentum Equity Portfolio (IVAL and IMOM)

The VMOT Index will hedge the international portfolio by shorting a representative broad-based international securities index ETF when either one or both of the following conditions are met. First, the Index will hedge if the international equity markets' total return over a rolling twelve calendar month period is less than or equal to the returns of the U.S. Treasury bill over the same period. Second, the Index will hedge when the international equity markets' twelve month moving average exceeds current prices. There is a 50 percent weight to each rule. If both rules are triggered the Index's international equity portfolio will be fully hedged; if one rule is triggered the Index's international equity portfolio will be 50 percent hedged; and if no rules are triggered the Index's international equity portfolio will have no hedge.

ELEMENT #3: PUTTING IT ALL TOGETHER

The first two building blocks of the VMOT Index approach consist of the core ingredients of the investment strategy:

1. Global Value and Momentum Equity
2. Trend-Following Model

For the first element, the VMOT ETF owns focused U.S. and International value exposures via the ETFs QVAL and IVAL, as well as U.S. and International momentum exposure via the ETFs QMOM and IMOM. The exposure to these 4 ETFs is allocated based on a risk-parity approach, which seeks to dynamically balance risk exposure across the 4 stock exposures.

VALUE MOMENTUM TREND (VMOT)

For the second element, the VMOT ETF will hedge the U.S. and International equity exposures, independently, and in accordance with the VMOT Index Trend-Following Model.

The third element of the VMOT Index, which the VMOT ETF seeks to track, is understanding how the first and second elements work together in a unified portfolio construct. The first component is straight forward. The ETF purchases the 4 value and momentum ETFs in accordance to their risk-parity weights and rebalances these exposures annually. The second component is a bit more complex and we will spend the remainder of this section explaining how the Trend-Following Model is deployed in the VMOT Index process.

The VMOT Index Trend-Following Model Details

The Trend-Following Model generates 4 total signals; 2 for the U.S. market exposure and 2 for the International market exposure:

- **U.S. Equity Hedge:** Each month end, calculate the 1) Time-Series (TMOM) and 2) Moving-Average (MA) rules, on the S&P 500 Total Return Index.
    - The collective hedge signal is an average of the 2 signals.
- **International Equity Hedge:** Each month end, calculate the 1) Time-Series (TMOM) and 2) Moving-Average (MA) rules, on the MSCI EAFE Total Return Index.
    - The collective hedge signal is an average of the 2 signals.

In the end, the Trend-Following Model identifies how much hedging is required for the Global Value and Momentum Equity portfolio, which consists of QVAL, IVAL, QMOM, and IMOM.

As mentioned previously, the VMOT Index (and thus the ETF) is always fully invested in the Global Value and Momentum Equity portfolio. The VMOT Index's Trend-Following Model manages the overall level of market exposure via hedges (i.e., short positions in passive index ETFs, or futures, that represent U.S. or International stocks).

Let's understand how these hedges are deployed in the portfolio.

There are essentially three states of the strategy for the U.S. equity exposure and the International equity exposure:

1. No hedge ("Long")
2. Partial hedge ("Hedged")
3. Full hedge ("Market Neutral")

No Hedge: The Trend-Following Model signals are both positive, no hedges are deployed.

Partial Hedge: If the Trend-Following Model signals are mixed (i.e., one is positive, one is negative), the portfolio will be 50 percent hedged.

Full Hedge: If the Trend-Following Model signals are both negative, we go to a fully hedged stance.


A Hypothetical Hedging Example

The Trend-Following Model outlined above is a simplified explanation of how the process is applied. In practice, there is a small wrinkle that deserves further explanation: we hedge domestic exposures and the international exposures, independently. Thus, assuming the strategy is roughly 50 percent U.S. and 50 percent International, the strategy can be approximately 0, 25, 50, 75, or 100 percent hedged.

The **hypothetical example** below illustrates how the hedge would be deployed in the portfolio:

- In our hypothetical example, the portfolio is 55 percent in U.S. equity (20 percent QMOM, 35 percent QVAL) and the portfolio is 45 percent in International equity (20 percent IMOM, 25 percent IVAL).
- We calculate the following metrics, which are required inputs in our Trend-Following Model:
    - 12-month cumulative total return on treasury bills are 2%, the S&P 500 Total Return Index is 5%, and MSCI EAFE Total Return Index is -1%.
    - S&P 500 TR Index is above the 12-month moving average and the MSCI EAFE Total Return Index is above the 12-month moving average.

VALUE MOMENTUM TREND (VMOT)

The graph below visually depicts the hypothetical Global Value and Momentum Equity portfolio before considering the Trend-Following Model and associated hedging requirements:

Global Value and Momentum Equity
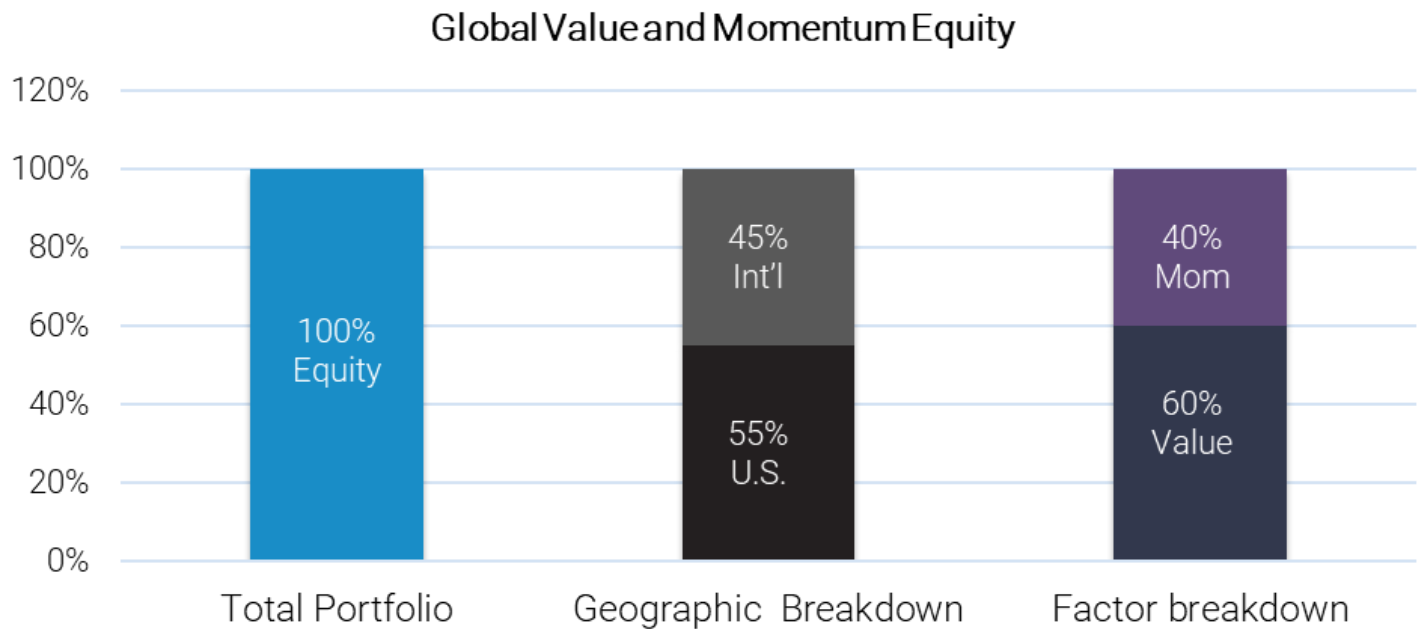
Charts presented are for illustrative purposes only.

We generate the hypothetical VMOT Index's Trend-Following Model signals:

U.S. Signal

- **TMOM:** The S&P 500 TR Index has earned 5% relative to the treasury bill return of 2%.
  - o NO HEDGE
- **MA:** The S&P 500 TR Index is above the 12-month moving average.
  - o NO HEDGE
- **Combined TMOM & MA Signal**
  - o **No Hedge**

International Signal

- **TMOM:** The MSCI EAFE TR Index has earned 1% relative to the treasury bill return of 2%.
  - o Full Hedge
- **MA:** The MSCI EAFE TR Index is above the 12-month moving average.
  - o NO HEDGE
- **Combined TMOM & MA Signal**
  - o **Partial Hedge**

Given the calculations above, the hypothetical VMOT portfolio will look as follows:

- 55% domestic equity: 20% QMOM; 35% QVAL
  - o No domestic hedge
- 45% international equity: 20% IMOM; 25% IVAL
  - o Partial hedge: 22.5% short position in MSCI EAFE TR Index tracking vehicle (ETF or future)

VALUE MOMENTUM TREND (VMOT)

The chart below depicts the Trend-Following Model signals and associated hedge requirement:
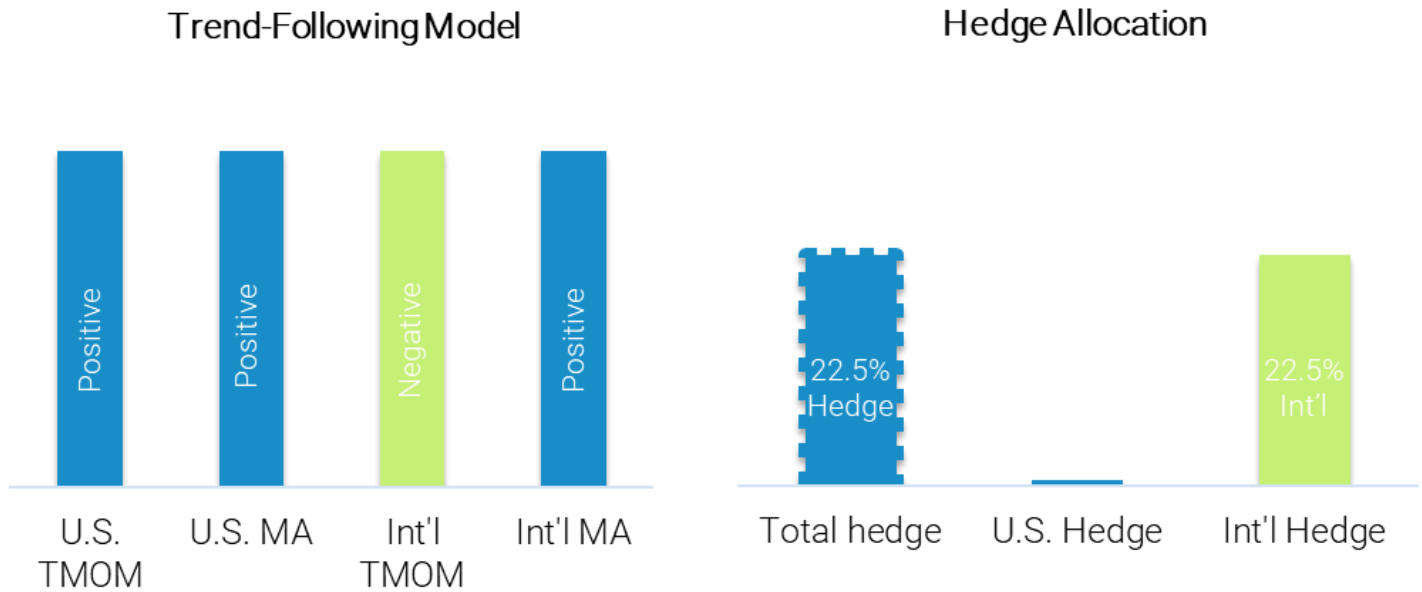
Charts presented are for illustrative purposes only.

The final VMOT ETF portfolio will be fully allocated to QVAL, IVAL, QMOM, and IMOM and there will be a 22.5 percent hedge in the form of a short position in international passive equity (leftmost column in the graph below). If we break the VMOT portfolio via geography (middle column in the graph below), we have a 45 percent allocation to International Equity, which is partially hedged at 50 percent, and a 55 percent allocation to U.S. Equity, which has no hedge. From a factor exposure perspective (rightmost column in graph below), the VMOT portfolio is 40 percent momentum (20% QMOM and 20% IMOM) and 60 percent value (35% QVAL and 25% IVAL). The momentum portfolio is 25 percent hedged[6] and the value portfolio is approximately 20.83 percent hedged[7].
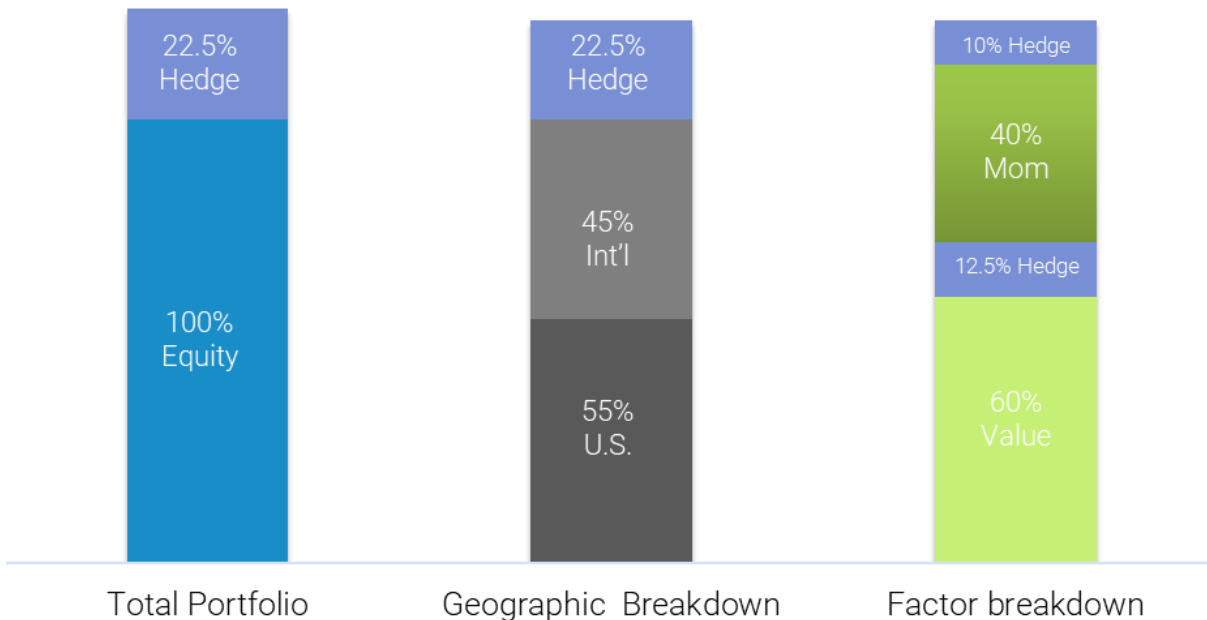
Charts presented are for illustrative purposes only.

VALUE MOMENTUM TREND (VMOT)

The VMOT Index Trend-Following Model rules are assessed once a month, based on the closing prices and returns for the S&P 500 Total Return Index (U.S. trend calculations) and the MSCI EAFE Total Return Index (International trend calculations). We use these indices to generate our trend signals which translate into hedge positions that manage the net market exposure we will take in the U.S. and International markets. We use these indices, as opposed to calculating trend signals on the underlying ETFs (QVAL, QMOM, IVAL, IMOM), because we believe that market-cap weighted indices are more indicative of the overall trend of the market. Thus, if the market (either U.S. or International) is trending up, we seek market risk exposure. However, if the market trends are negative, we prefer to hedge our market exposure.

THE ALTERNATIVE NATURE OF THE VALUE MOMENTUM TREND STRATEGY

The VMOT Index tries to capture the three factors that we believe are the most effective: Value, Momentum, and Trend. Based on the process described above, we hope investors recognize that the VMOT ETF, which seeks to follow the VMOT Index, is complex and very different than traditional broad-based global passive equity exposures. Performance may deviate substantially (both positively and negatively) from these traditional exposures. So, while the VMOT strategy may be perceived as a global "equity" allocation to some investors, we want to emphasize that the Trend-Following Model associated with the VMOT Index creates an equity exposure that may act very differently than traditional buy-and-hold long-only equity funds. Investors should keep this in mind when attempting to benchmark the VMOT ETF against long-only global benchmarks and may consider benchmarking the VMOT ETF against long/short alternative equity benchmarks.

CONCLUSION

The VMOT ETF seeks to follow the VMOT Index, which is a complex index process that seeks to capture the focused value premium (i.e., Quantitative Value), the focused momentum premium (i.e., Quantitative Momentum), and seeks to minimize large drawdowns by avoiding downtrending markets via a Trend-Following Model. Each of the Index's elements can be used in specialized cases and to solve specialized problems. However, the goal of the Value Momentum Trend Index, which the VMOT ETF seeks to track, is to capture value, momentum, and trend factors in one unified approach. For some investors, this may be a more appropriate approach, as opposed to utilizing the individual value, momentum, and trend components. We leave this up to the investor and/or their advisors to determine.

In the end, the VMOT process seeks to deliver focused exposure in what we believe are the three most robust factors in investing: value, momentum, and trend.

VALUE MOMENTUM TREND (VMOT)

---

[1] Fama, E. and K. French, 2008, Dissecting Anomalies, *The Journal of Finance,* 63, pg. 1653-1678.
[2] https://alphaarchitect.com/etfsite/wp-content/uploads/2017/12/Philosophy_final.pdf
[3] https://alphaarchitect.com/etfsite/wp-content/uploads/2017/12/Quantitative_Momentum_philosophy_final.pdf
[4] This outlines the typical approach for US stocks, but a similar approach is used for International stocks.
[5] This outlines the typical approach for US stocks, but a similar approach is used for International stocks.

[6] For this example, we allocate the International hedge (22.5%) to the Momentum factor by multiplying the International hedge (22.5%) to the ratio of International Momentum allocation (20%) over the Total International allocation (45%)—hence the calculation is (22.5%)*(20%/45%) = 10% allocation to the Momentum factor. Since, in our example, there is a 40% allocation to the Momentum factor (20% unhedged position in QMOM and a 20% partial hedged position in IMOM position), the momentum factor is 25% hedged (10% hedge / 40% total momentum factor investment).

[7] For this example, we allocate the International hedge (22.5%) to the Value factor by multiplying the International hedge (22.5%) to the ratio of International Value allocation (25%) over the Total International allocation (45%)—hence the calculation is (22.5%)*(25%/45%) = 12.5% allocation to the Value factor. Since, in our example, there is a 60% allocation to the Value factor (35% unhedged position in QVAL and a 25% partial hedged position in IVAL position), the value factor is 20.83% hedged (12.5% hedge / 60% total value factor investment).