



## MARKET-LINKED PRODUCTS

## MORGAN STANLEY MAP TREND INDEX

### Strategy Overview

The Morgan Stanley MAP Trend Index (the "Index") employs an investment strategy that aims to build a liquid and risk-balanced portfolio. The Index:

- Provides exposure to liquid US-listed ETFs of US and foreign equities, US fixed income, and alternatives such as gold, oil, US dollar and REITS, and has the potential for an allocation to a 2-year US Treasuries Index.
- Employs a disciplined, pre-determined rules-based investing approach with the intent of dynamically investing in assets that exhibit upward trends and paring back investments during market downturns, as well as considering counter-trends or reversals in trend during short-term horizons of equities and alternatives.
- Aims to control risk daily by applying a volatility control overlay whereby the Index adjusts the exposure to the selected portfolio based on a ratio of 5% to the historical realized volatility. The Index's total exposure to the ETF assets is capped at 125% and any unused portion below 100% is moved to a 2-Year Treasury.
- Is calculated on an excess return basis. Specifically, the level of the Index is determined by the weighted return of the notional portfolio of index components, reduced by the return on an equivalent cash investment receiving the 3-month LIBOR and further reduced by a servicing cost of 0.85% per annum.

### Why Is Dynamic Allocation Important?

In different market environments, dynamic allocation can help to achieve more steady returns as the allocation to each asset will be adjusted across different parts of a market cycle. With dynamic allocation, the Index is able to react to changes in market conditions over time and aims for more stable returns.

### Implementing a Trend-Following Investment Strategy

The trend-following investment philosophy means "cut your losses" and "let your profits run on." Developed by an English political economist, David Ricardo, in the 1700s, this investment style is largely behavioral according to price movements and market uptrends and downtrends.<sup>1</sup>

<sup>1</sup> MAP Trend Brochure. Morgan Stanley, p 3.

### Index Overview

Ticker/RIC:	MSUSMAPT
Index Sponsor:	Morgan Stanley
Calculation Agent:	Morgan Stanley & Co. LLC
Index Type:	Excess Return
Currency:	USD
Index Components:	21 (as of 3/7/2019)
Volatility Target:	5%
Index Live Date:	March 7, 2017

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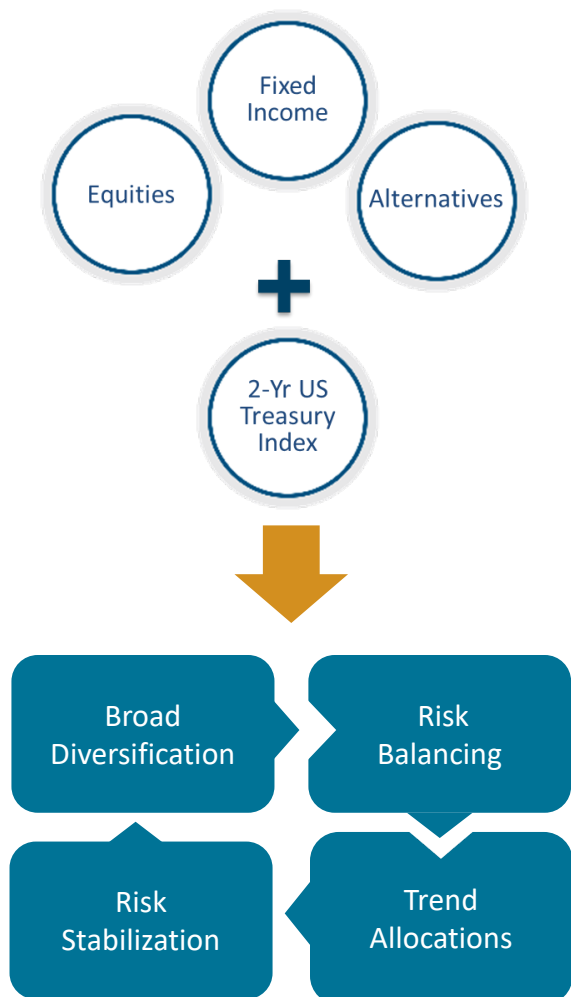
## Index Components\*

ASSET CLASS/ETF	TICKER	MAX EXPOSURE
<b>EQUITIES</b>		
<b>CORE</b>		
SPDR S&P 500	SPY	25%
PowerShares QQQ ETF	QQQ	25%
iShares Russell 2000	IWM	25%
iShares MSCI EAFE	EFA	5%
iShares MSCI Emerging Markets	EEM	5%
<b>OTHERS</b>		
iShares Edge MSCI Minimum Volatility USA	USMV	5%
iShares Nasdaq Biotechnology	IBB	5%
iShares Select Dividend	DVY	3%
<b>FIXED INCOME</b>		
<b>CORE</b>		
iShares 20+ Year Treasury Bond	TLT	25%
iShares 7-10 Year Treasury Bond	IEF	25%
iShares iBoxx High-Yield Corporate Bond	HYG	25%
iShares iBoxx Investment Grade Corporate Bond	LQD	5%
iShares Core US Aggregate Bond	AGG	5%

ASSET CLASS/ETF	TICKER	MAX EXPOSURE
<b>OTHERS</b>		
iShares TIPS Bond	TIP	5%
iShares JPMorgan USD Emerging Markets Bond	EMB	5%
iShares US Preferred Stock	PFF	3%
<b>ALTERNATIVES</b>		
SPDR Gold Shares	GLD	10%
Unites States Oil	USO	10%
Vanguard REIT ETF	VNQ	10%
The PowerShares DB US Dollar Index Bullish Fund	UUP	10%
<b>SHORT TERM TREASURIES</b>		
2-Year US Treasury Index	Any excess budget	100%

\*As of May 23, 2019.

## Index Construction



### Step 1 Compute Risk Budget Weights

The historical realized volatility of each ETF asset is calculated by giving more weight to more recent data. The risk budget weight for each ETF is proportional to its liquidity-driven maximum allowable exposure and the inverse of its realized volatility. **More weight is given to lower-volatility assets and vice versa.** Risk budget weights are normalized at 100%.

### Step 2 Analyze Asset Price Trends

Each day, the recent price trend of each ETF is monitored by comparing the current ETF price to its short-term and long-term exponential moving averages. A range from 0 to 1 is the average of a long-term and short-term measure, with smoothing if necessary.

### Step 3 Determining Portfolio Weights

Trend signals from Step 2 are combined with normalized risk budget weights from Step 1 to derive the portfolio weights and each ETF is assigned this weight. Any remaining weight is assigned to the 2-Year US Treasury Index, such that the total assigned weights sum 100%.

### Step 4 Applying Volatility Target

On a daily basis, a volatility control overlay is applied whereby the Index adjusts the exposure to the selected portfolio based on a ratio of 5% to the historical realized volatility. The index's total exposure to the ETF assets is capped at 125%. Any unused portion below 100% is allocated to the 2-Year US Treasury.

### Calculating the Index Value

Is calculated on an excess return basis. Specifically, the level of the Index is determined by the weighted return of the notional portfolio of index components, reduced by the return on an equivalent cash investment receiving the 3-month LIBOR and further reduced by a servicing cost of 0.85% per annum.

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