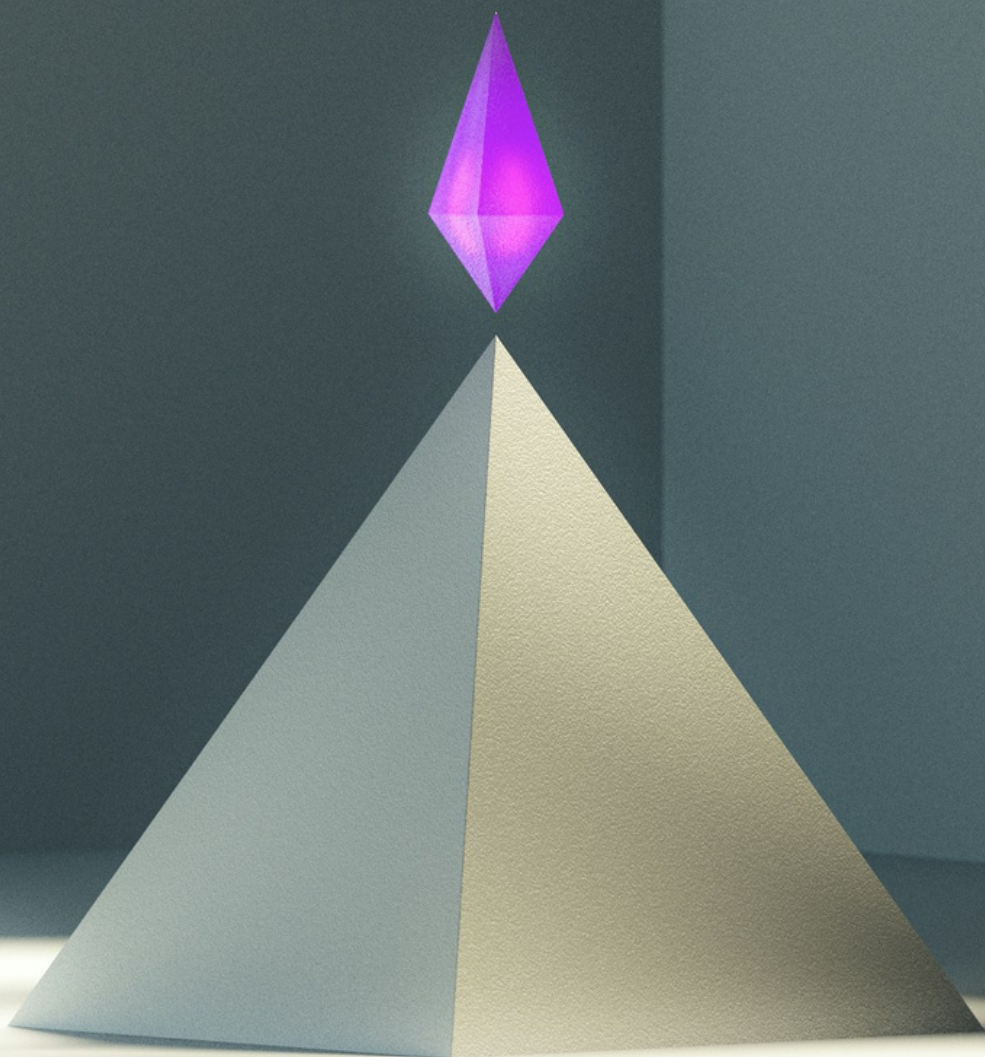


DIGITAL ASSETS
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Introducing the MarketVector™ Crypto Heat Index

When To Play Offense or Defense



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1. Introduction

Institutional investors often face the challenge of balancing offensive and defensive positioning within their portfolios. Behavioral biases and emotional responses tend to exacerbate this challenge—encouraging aggressive risk-taking during favorable market conditions, such as leveraging to increase crypto exposure or concentrating in high-growth sectors, while prompting defensive actions, such as panic selling, during periods of market stress.

“ *I don't know why the planets orbit the sun. That doesn't mean I can't predict them*

Jim Simons

A more disciplined framework that integrates both proactive offense and prudent defense can help investors develop a coherent strategy. Such an approach not only enhances consistency across market cycles but also improves the likelihood of maintaining adherence to long-term objectives during both favorable and adverse environments.

While traditional sentiment measures rely on surveys, Google trends, or subjective factors, the MarketVector™ Crypto Heat Index focuses exclusively on market structure: breadth, momentum, and relative strength. By doing so, it translates objective market dynamics into a sentiment indicator that signals both opportunity and risk.

The rationale for developing the Heat Index is twofold. First, digital asset markets are highly cyclical, with outsized moves often occurring at sentiment extremes. Capturing these extremes systematically can provide a significant edge in timing and allocation decisions. Second, existing tools either focus narrowly on Bitcoin or incorporate non-market data prone to noise. The Heat Index addresses these gaps by grounding its signal in the collective behavior of a top 100 crypto universe, ensuring robustness, transparency, and applicability across market regimes.

This approach ensures the indicator serves a dual purpose: as a descriptive tool for understanding current market sentiment, and as a prescriptive mechanism for generating allocation signals. For institutional investors, it provides a standardized, rules-based measure of market psychology usable for asset allocation purposes and for meeting fiduciary responsibilities. By grounding its signal in objective market data, the index offers a verifiable and repeatable framework for managing risk and exposure.

2. Methodology

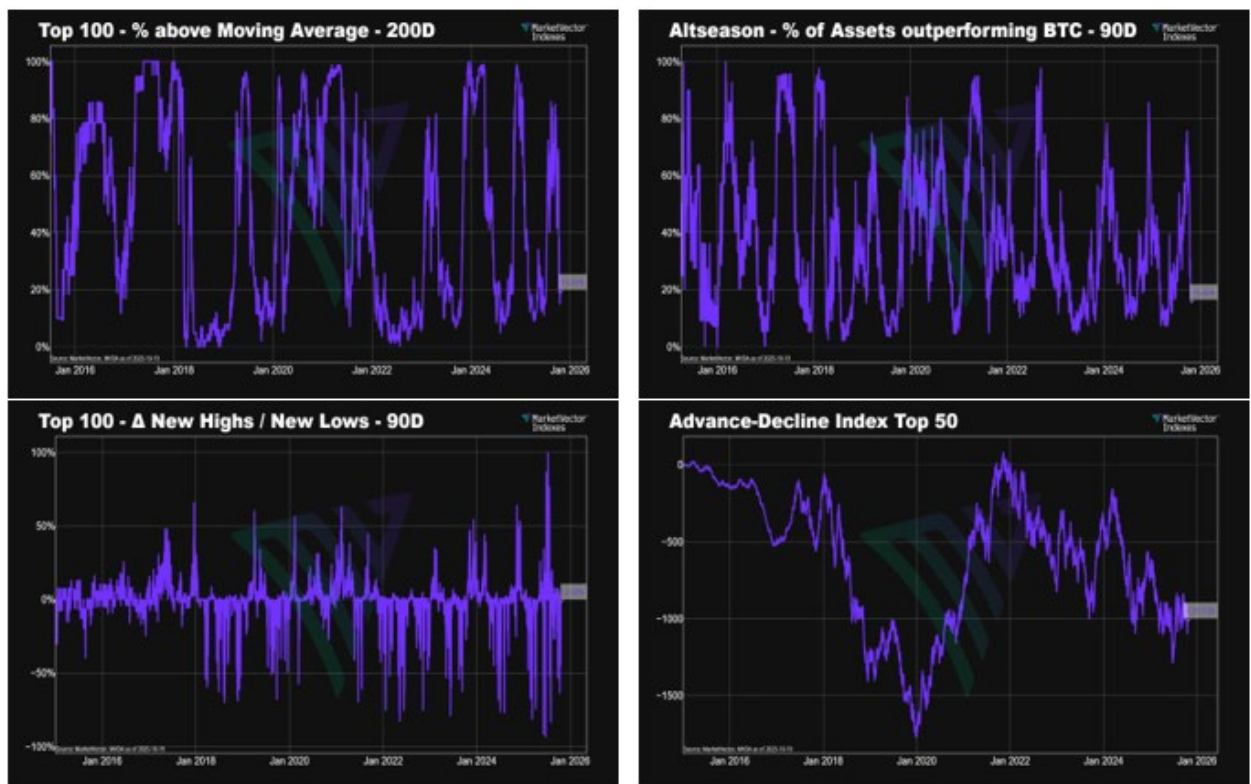
2.1 Composite Structure

The Crypto Heat Index is designed as a composite measure of price behavior, aggregating several dimensions of participation and trend strength into a single normalized score. Each of the four underlying components are equally weighted and represent a distinct element of the crypto market's internal health:

- Percentage of Top 100 Assets Above 200-Day MA – Captures the share of assets maintaining a long-term uptrend, reflecting overall confidence and staying power of bullish sentiment.

- Altcoin Season Indicator (All 100 Components) – Measures the breadth of rotation into altcoins relative to Bitcoin, signaling speculative risk appetite when smaller assets begin to outperform Bitcoin over a 90-day period.
- Net New Highs (All 100 Components) – Tracks the balance between 90-day highs and lows across all constituents of the [MVDA100](#), providing insight into whether broad market participation supports or diverges from prevailing trends. The rolling 30-day delta of new highs minus new lows indicates whether an uptrend is underpinned by expanding leadership (more highs) or a downtrend is reinforced by widening weakness (more lows).
- Advance-Decline Line Slope (Top 50) – Examines the short-term slope of advancing versus declining assets in the top 50 MVDA coins over a rolling 30-day period, giving a pulse on leadership breadth and whether market gains are concentrated or widely shared.

Figure 1: Breadth & Trend Indicators



Source: MarketVector, as of October 15, 2025.

This methodology is grounded in **classic, time-tested market breadth principles** widely used in traditional finance.

The Heat Index is constructed entirely from the constituents of the [MarketVector™ Digital Assets 100 Index](#). This index is rebalanced monthly and dynamically reflects the evolving composition of the crypto asset landscape. As a result, the Heat Index is always calculated on the current top 100 assets, ensuring that it represents a real-time snapshot of the most relevant market dynamics rather than a static universe.

By combining long-term momentum, speculative rotation, broad coin participation, and leadership breadth, the composite index ensures no single narrative dominates the sentiment assessment. This construction reduces the bias of survey-only measures and instead captures how deeply participation runs across different segments of the market. Each component is mapped to a common 0–1 scale using robust min–max normalization based on the 5th and 95th percentiles to reduce outlier impact. After aligning dates, we take a weighted average (equal weights by default) to get a daily composite in [0,1], where higher values indicate broader and stronger market participation.

Importantly, these sub-indicators are not intended to forecast returns individually. Rather, their power lies in their combination: when they collectively signal strength or weakness, they reflect an alignment of market forces that often coincides with turning points. The equal weighting of components avoids overfitting, enhances transparency, and ensures that the index is sensitive to broad-based dynamics instead of niche drivers.

2.2 Sentiment Zone

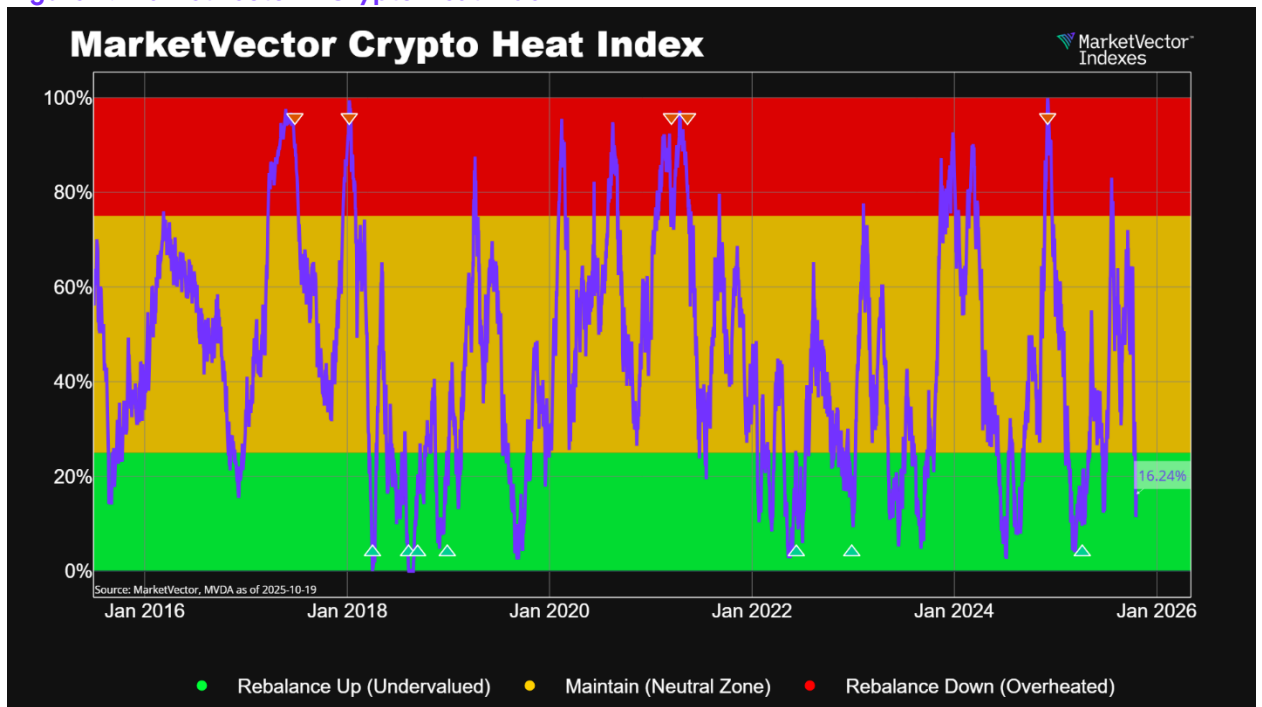
Building on this composite structure, the Heat Index delineates sentiment zones to facilitate actionable decisions. The Index not only classifies sentiment into distinct percentile-based zones but also embeds systematic rebalancing signals. This logic is derived from a combination of percentile thresholds and short- vs. medium-term trend alignment:

- A buy signal is triggered when the Heat Index is below the 25% threshold (Capitulation zone) and its 20-day SMA crosses above the 50-day SMA. This ensures that entry points are concentrated in periods of extreme pessimism with early signs of trend reversal. Additionally, the strategy rebalances upward whenever the Heat Index reaches the 1st percentile or lower to capture very rapid extreme movements that cannot be detected quickly enough by the MA crossover system alone.
- A sell signal is triggered when the Heat Index exceeds the 75% threshold (FOMO/Euphoria zones) and its 20-day SMA crosses below the 50-day SMA. This ensures that exits occur during phases of extreme optimism that begin to lose structural momentum. Additionally, the strategy rebalances downward whenever the Heat Index reaches the 99th percentile or higher to capture very rapid extreme movements that cannot be detected quickly enough by the MA crossover system alone.

These rules are fully embedded in the construction of the Heat Index, meaning that the indicator itself functions as both a descriptive sentiment measure and a prescriptive signal generator. The moving average crossover helps to identify when trend and breadth in extreme zones is turning. The final Heat Index values, including SMA-based adjustments, are mapped into zones that carry direct allocation meaning:

- 0–25%: Rebalance up → Add Exposure
- 25–75%: Yellow Zone → Neutral / Hold
- 75–100%: Rebalance down → De-risk

Figure 2: MarketVector™ Crypto Heat Index



Source: MarketVector, as of October 15, 2025

The rebalance triggers are indicated via the white triangles. The aim of the indicator is to capture the majority of the crypto cycles for long-term allocators; it's not meant to be a short-term trading indicator. A signal is just triggered if the Heat Index is in the extreme zones is showing a trend reversal via less breadth, weakening trend, less highs or lows.

2.3 Data Sources

The MVDA Index draws price and volume data from reputable cryptocurrency exchanges, filtered by an exchange benchmark. Historical data for backtesting spans from December 31, 2014, to the present. The backtest explicitly mitigates survivorship bias by using only point-in-time eligible constituents—assets that met the index criteria at each historical rebalance date. Monthly rebalances reflect the actual composition of the top 100 digital assets as they existed at that time, including assets that subsequently declined or were delisted. This ensures the backtest does not benefit from hindsight knowledge of which assets would ultimately succeed. All calculations are performed once per day using UTC 00:00 closing prices. The sub-indicators consider all index components on an equal-weight basis. Data integrity is ensured through cross-validation against multiple sources to prevent anomalies from single-provider errors.

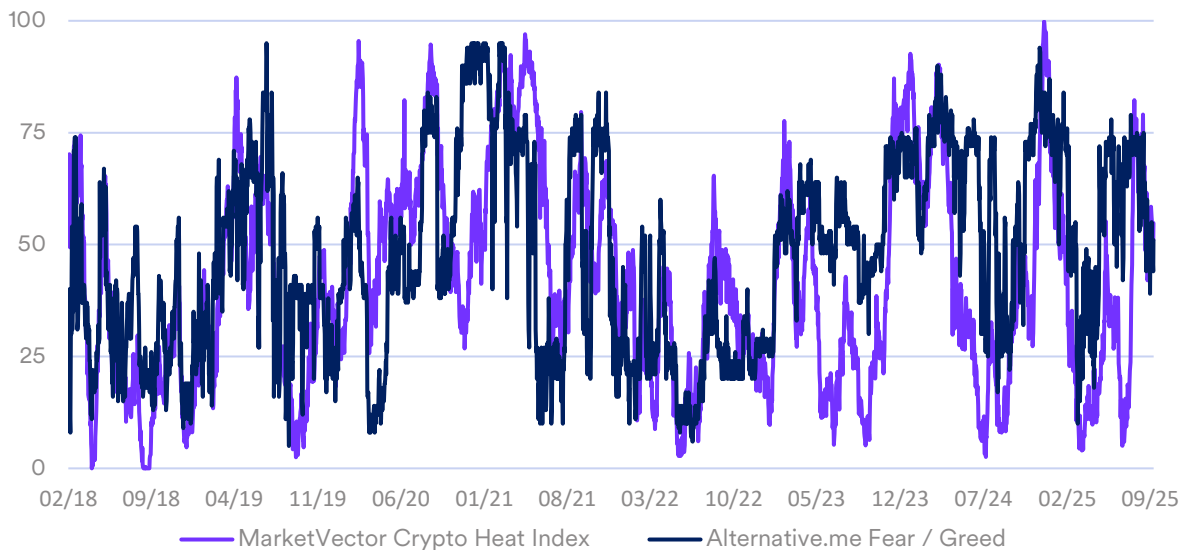
3. The Heat Index vs. Legacy Sentiment Tools

This section explains the key differences between the Heat Index and other sentiment tools, backed by historical data, to help institutional investors evaluate its suitability for their needs. We focus on how the Heat Index's price-based approach provides a more reliable tool for decision-making in crypto markets compared to sentiment tools like the Fear & Greed Index, which includes subjective elements such as social media trends and surveys.

The Alternative.me Crypto Fear & Greed Index is widely cited but differs significantly in scope, methodology, and robustness. While it is a useful psychological barometer for gauging general market mood, it tends to lag real-time structure shifts and may be prone to noise from speculative or social-driven metrics. Social media sentiment is particularly susceptible to bot activity, influencer manipulation, and speculative "hype cycles," making it unreliable for the rigorous, rules-based decision-making required by institutional investors.

In contrast, the Crypto Heat Index is built exclusively on price participation, breadth, relative strength, rotation, and speculative trends, providing a structural sentiment readout rooted in actual participation dynamics of the crypto market. This makes it less susceptible to manipulation or hype, which can distort social-based indicators. This focus on replicable and transparent data is a fundamental advantage that aligns with institutional standards for verifiability and auditability.

Figure 3: MarketVector™ Crypto Heat Index vs Fear & Greed over time



Source: MarketVector, alternative.me, time period February 1, 2018 to September 9, 2025

While there is a moderate similarity between the indicators (correlation of 0.57), the MarketVector™ Heat Index often indicates extreme levels more frequently. This is especially important for investors seeking to generate rebalancing signals for asset allocation. The Heat Index's greater sensitivity (with a standard deviation of 23.5 vs. 21.6 for Alternative.me Fear & Greed) means it responds quicker to market shifts. By detecting more extremes and reacting faster to price changes, the Heat Index helps capture cycles without waiting for rare or delayed signals. A trend-based filter helps investors to identify key points where the market trend is still extreme but weakening, enabling proactive adjustments to crypto exposure (e.g., increasing in capitulation or reducing in euphoria).

The Heat Index is designed to serve as a systematic rebalancing tool, a process known as **volatility harvesting**. This approach positions the strategy not as a simple market-timing tool but as a systematic process of **buying low and selling high** by opportunistically adjusting exposure based on a rules-based signal. This framework is well-suited for a highly volatile asset class like crypto and is a compelling selling point for an audience focused on disciplined risk management.

Figure 4: Heat Index vs Fear & Greed

Feature	MarketVector™ Crypto Heat Index	Alternative.me Fear & Greed Index	Institutional Relevance
Scope	Top 100 Crypto Assets	Mostly Bitcoin-focused	Broader scope provides a more comprehensive view of market breadth.
Data Frequency	Daily	Daily	Both provide timely data, but the MVDA's inputs are more reliable for systematic decisions.
Sub-Indicators	4 market structure & price-based	6 mixed indicators (volatility, surveys, Google Trends, social, etc.)	Relies on objective, market-based data, which is more reliable and auditable than subjective proxies.
Breadth Coverage	Full market (Top 100)	Primarily price + sentiment proxies	Captures broad market dynamics and is less susceptible to single-asset manipulation.
Normalization	Quantile-based, robust to outliers	Static scoring system	The professional approach ensures the signal is balanced and not skewed by outliers.
Use Cases	Market timing, allocation decisions	General mood gauge	Designed for systematic, rules-based strategies that institutional investors require for repeatable processes.

4. Application Example: Dynamic Allocation Strategy

4.1 Signal Overlay

If we plot the signals against the [MVDA Index](#), they effectively capture the cycle lows and highs for long-term oriented investors. These signals are intended to capture the larger bull and bear market cycles and are not meant as short-term trading signals. While we don't catch the absolute market tops and bottoms, the indicator effectively captures the top and bottoming ranges.

Notably, the final sell signal for the 2021 bull market was generated on May 13, 2021. While the crypto market reached a new all-time high in November 2021, accounting for the fact that November represented only a marginally higher high compared to May, investors following the rebalancing signal would have avoided the 50% interim drawdown during the summer months. Additionally, the November high was not accompanied by market breadth—a structural divergence that typically signals underlying weakness.

Figure 5: MVDA Index and rebalancing signals (green = buy, red = sell)



Source: MarketVector, time period December 31, 2014 to October 16, 2025

The indicator did not capture the COVID-19 crash, as such black swan events occur with a velocity of trend and breadth changes that exceeds the index's detection capabilities. However, the Heat Index can effectively capture external shocks when the market has sufficient time to digest the news and reflect it in structural indicators. An example is the buy signal generated on April 7, 2025, which identified the broader risk market low caused by the Trump tariff announcement on April 2, 2025.

The long-term effectiveness of these signals is summarized in Table 1. To evaluate the accuracy and relevance of the trading signals, the performance of each signal was measured over its active period. For each buy signal, the return was calculated from the date of generation until the occurrence of the subsequent sell signal. Conversely, for each sell signal, the return was measured from that date until the following buy signal. This approach captures the realized performance of each signal interval and enables a direct comparison between long and short phases. The results are reported as Signal-to-Signal Performance, representing the cumulative return achieved during each signal period.

Table 1: Signal Accuracy – Cumulative Return per Signal Cycle

Date	Signal	Bitcoin	Top 100	Large-Cap (Top 20)	Mid-Cap (Rank 21-50)	Small-Cap (Rank 51-100)
26.06.2017	SELL	181%	143%	142%	59%	153%
08.01.2018	SELL	-52%	-65%	-64%	-78%	-73%
31.01.2018	SELL	-30%	-49%	-47%	-60%	-58%
02.04.2018	BUY	701%	357%	396%	64%	4%
10.08.2018	BUY	763%	462%	492%	188%	76%
12.09.2018	BUY	786%	574%	606%	256%	155%
28.12.2018	BUY	1398%	885%	919%	539%	340%
03.10.2019	BUY	582%	532%	525%	737%	486%
16.03.2021	SELL	-48%	-41%	-41%	-38%	-58%
13.05.2021	SELL	-41%	-51%	-49%	-64%	-69%
10.06.2022	BUY	230%	185%	199%	51%	40%
27.12.2022	BUY	473%	322%	338%	163%	133%
03.12.2024	SELL	-18%	-31%	-29%	-53%	-69%

Source: MarketVector, MVDA, BBR, MVDALC, MVDAMC, MVDASC, as of October 16, 2025

An outlier in this analysis was the 2017 bull run—one of the strongest in crypto history. Following a sharp drawdown in June 2017, markets rebounded with exceptional momentum. Even investors who simply rebalanced down to their model allocation maintained participation in the ensuing upside, underscoring the resilience of a disciplined, rules-based framework.

A broader review of the major buy and sell signals across the full crypto universe confirms that the Heat Index performs strongest for **Bitcoin** during extended cycles. The signal effectively captures structural shifts in sentiment and market breadth, highlighting its robustness as a cyclical timing framework.

That said, the **classic large-cap basket investor** continues to benefit meaningfully. The signal remains generally valid across capitalization tiers, though the amplitude of returns diminishes toward smaller coins. This illustrates how speculative segments tend to lag during recoveries and deteriorate faster in downturns.

Interestingly, the Heat Index also functions as a **reliable short signal**. Negative returns during Sell-to-Buy periods confirm its utility as a systematic **de-risking mechanism**—not merely a bullish timing tool, but a framework that identifies when to play offense or defense within a diversified allocation.

4.2 Portfolio Backtest

The indicator is optimally deployed as a rebalancing signal rather than an outright buy and sell decision. Given the high volatility of crypto markets, particularly during upward movements, absolute timing of market turns is challenging. By using this signal to rebalance and manage allocation risk, investors maintain partial exposure throughout the cycle, enabling them to capitalize on volatility. In asset management, this process is known as volatility harvesting—a systematic approach to buying low and selling high through disciplined rebalancing.

This process is well suited for the index, as the aim is to capture bottoming and topping ranges, not single tops or bottoms. **This section provides an illustrative example of how the Heat Index can be implemented within an asset allocation framework. The specific allocation ranges and asset mix shown here represent one possible implementation; users can adapt the methodology to their own risk tolerance, regulatory constraints, and investment objectives.** The analysis compares an active asset allocation model using Heat Index signals to trigger rebalancing decisions versus a model portfolio that rebalances on a fixed quarterly schedule. Quarterly rebalancing was selected as the benchmark as it represents a common institutional practice that balances transaction costs with portfolio drift management.

Model Portfolio: The model portfolio (benchmark) is based on liquid ETFs and our [MVDA index](#), which serves as a proxy for the crypto market. It has a fixed allocation and quarterly rebalance.

	Global Equities (ACWI)	Crypto (MVDA)	T Bills (BIL)	Gold (GLD)
Model Portfolio	50%	20%	10%	20%

Heat Strategy (Using the Heat Index rebalancing Signals).

	Global Equities (ACWI)	Crypto (MVDA)	T Bills (BIL)	Gold (GLD)
Starting Portfolio	50%	20%	10%	20%
Risk-On-Portfolio	50%	30%	0%	20%
Risk-Off Portfolio	50%	10%	20%	20%

The benchmark and the active allocation model, our Heat Strategy, start with the Model Portfolio. Whenever the Heat Index causes a rebalancing signal, crypto will either be rebalanced down to 10% when we are in the heat zone or it will be rebalanced up to 30% when we are in the capitulation area. The allocation is taken or recycled to short-term treasuries. The backtest starts on December 31, 2014.

Figure 6: Cumulative Returns Comparison



Figure 7: Drawdowns Comparison



Source: MarketVector, time period December 31, 2014 to October 16, 2025

4.3 Performance Metrics

The performance charts demonstrate that both approaches generate strong absolute returns, reflecting the benefits of crypto allocation within a diversified portfolio. However, the Heat Strategy delivers a compelling incremental benefit: an additional 11.55 percentage points of annualized CAGR, while increasing maximum drawdown by only 6.6 percentage points and volatility by 5.44 percentage points. This asymmetric risk-return profile is reflected in superior Sharpe and Sortino ratios. To provide a comprehensive view, key performance metrics include:

Table 2: Performance Metrics

Metric	Heat Strategy	Benchmark
Total Return	3806.68%	1373.49%
CAGR	39.81%	28.26%
Sharpe Ratio	1.30	1.16
Sortino Ratio	1.89	1.66
Calmar Ratio	0.99	0.84
Max Drawdown	-40.06%	-33.46%
Annualized Volatility	25.08%	19.64%
Longest DD Period (days)	747	825
Average DD Period (days)	30	26

Source: MarketVector, time period December 31, 2014 to October 16, 2025

The higher Sharpe and Sortino ratios for the Heat Strategy, in particular, demonstrate enhanced risk-adjusted returns. While the maximum drawdown is modestly higher for the Heat Strategy (40.06% vs. 33.46%), this is attributable to the higher crypto allocation during risk-on periods (up to 30% vs. the benchmark's fixed 20% allocation). Despite this increased exposure during favorable conditions, the superior risk-adjusted returns and the shorter longest drawdown period (747 vs. 825 days) demonstrate a more favorable risk-reward profile. The strategy achieves higher absolute returns while spending less time in drawdown recovery, reflecting the effectiveness of systematic de-risking during euphoric market phases.

The allocation table below indicates the maximum, minimum and average weights for the Heat Strategy.

Table 3: Allocation Statistics for Heat Strategy

Asset	Min Weight	Max Weight
ACWI	15.51%	56.73%
BIL	0.00%	22.62%
GLD	5.47%	25.26%
MVDA	3.88%	76.34%

Source: MarketVector, time period December 31, 2014 to October 16, 2025

5. Limitations and Risks

While the Heat Index demonstrates strong historical performance, it is not without limitations.

Backtest Assumptions and Caveats

- **Black Swan Events:** Rapid black swan events, such as the 2020 COVID-19 market crash, may evade detection due to the velocity of breadth and trend shifts exceeding the index's time horizons. The index is not designed to predict these events, but its rules-based logic can help mitigate their subsequent impact by preventing re-leveraging into a weakened market structure.
- **Survivorship Bias:** The backtest explicitly mitigates survivorship bias by using the [MarketVector™ Digital Assets 100 Index](#) (which accounts for monthly rebalances, ensuring that only point-in-time data is used to avoid look-ahead bias).
- **Transaction Costs and Liquidity:** While not modeled in the backtest for simplicity, real-world trading involves transaction costs and liquidity constraints. Users should consider these factors when implementing the strategy.
- **Overfitting:** The multi-component, equally-weighted structure of the index inherently helps mitigate overfitting by preventing any single narrative from dominating the signal. Over-reliance on backtested results carries a risk, and it should be noted that past performance does not guarantee future results.

The Heat Index should be integrated within a comprehensive risk management framework alongside other portfolio management tools. The index's transparent, rules-based methodology ensures it functions as a systematic allocation signal within multi-layered risk management systems—the standard for institutional practice. All component calculations, data sources, and rebalancing rules are fully disclosed, enabling thorough due diligence and integration into existing investment processes.

5. Conclusion

The MarketVector™ Crypto Heat Index integrates breadth, trend, and SMA-based logic into a single, rules-based sentiment signal. Unlike legacy sentiment tools, it avoids subjective measures and focuses exclusively on objective market structure. The embedded rebalancing rules make it directly applicable to asset allocation frameworks, offering improved risk-adjusted outcomes and enhanced cycle awareness.

The Heat Index serves multiple constituencies across the institutional investment landscape:

- **Asset Allocators and Multi-Asset Portfolio Managers** can use the Heat Index as a systematic rebalancing signal within diversified portfolios, implementing tactical adjustments to crypto exposure based on structural market conditions rather than discretionary judgment.
- **ETF Issuers and Product Developers** can license the Heat Index as the underlying methodology for rules-based crypto allocation products, such as tactical crypto ETFs, dynamic allocation funds, or risk-managed digital asset strategies. The index's transparent, systematic approach provides a defensible framework for product structuring and regulatory filings.
- **Family Offices and Private Wealth Managers** can deploy the index to manage volatile crypto allocations within client portfolios, providing a rules-based framework that helps overcome behavioral biases and delivers transparent decision-making rationale.
- **Pension Funds and Insurance Companies** can utilize the Heat Index as part of their governance and risk management processes, ensuring that crypto allocations remain aligned with their long-term strategic asset allocation while capturing opportunities during market dislocations.
- **Fund Managers and Investment Advisors** can incorporate the Heat Index into their investment process documentation, demonstrating a systematic, auditable approach to managing crypto market timing risk for fiduciary purposes.
- **Research and Strategy Teams** can leverage the Heat Index as a market intelligence tool to monitor crypto market structure, identify regime changes, and inform broader portfolio positioning decisions across multiple asset classes.

As institutional adoption of digital assets accelerates, the Heat Index provides a standardized, transparent methodology for navigating crypto market cycles. By reducing reliance on emotional decision-making and establishing clear rules for exposure management, the index addresses a critical need in the institutional toolkit: converting volatile market dynamics into systematic portfolio decisions. As digital assets mature and regulatory frameworks evolve, institutional-grade sentiment tools like the Heat Index will become essential infrastructure for prudent crypto market participation.

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