

CRYPTO SYNTHETIC INDEX FOR ALL MARKET CONDITIONS

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Table of Contents

Table of Contents	1
1 / Key Takeaways	2
2 / Introduction	3
3 / Research Design & Methodology	5
3.1 Asset Universe	5
3.2 Benchmarks for Comparison	6
3.3 The Strategy Model	6
4 / Tests & Results	7
4.1 Advantage: Extreme Risk Control	7
4.2 Disadvantage: Lower Absolute Return	8
4.3 DRP Strategy Positioning	8
4.4 Summary	10
5 / Directions for Improvement	11
5.1 Source of the Problem	11
5.2 Increasing Volatility Tolerance	12
5.3 Testing & Results	12
5.4 Analysis of Allocation Logic	13
6 / Outlook	15
7 / References	16
8 / New Binance Research Reports	17
About Binance Research	18
Resources	19

1 / Key Takeaways

- This report aims to address the challenges that the inherent high volatility of the cryptocurrency market poses to investors. While the traditional HODL (long-term hold) strategy is simple, it entails tremendous psychological pressure and capital drawdowns during the process.
- A Solution for Crypto Volatility: The report introduces a strategy based on Ray Dalio's "All-Weather" Risk Parity concept to manage the extreme volatility of the crypto market. The core idea is to balance risk contribution rather than capital allocation, giving smaller weights to more volatile assets like Bitcoin.
- The Ultra-Safe Strategy (DRP): A Dynamic Risk Parity (DRP) portfolio was backtested, showing a 3.55% annualized return with extremely low volatility (0.99%) and a near-zero maximum drawdown of -0.18%. This strategy functions like an "enhanced on-chain money market fund," offering principal safety with the potential for asymmetric upside from small crypto and gold holdings.
- The Optimized Growth Strategy: To achieve higher returns, a "Target Volatility" strategy was tested, aiming for an 11% annualized volatility. This approach yielded a 15.01% annualized return, outperforming the S&P 500 ETF (14.71%) but with significantly lower risk and a maximum drawdown of just -10.50% compared to the S&P 500's -23.93%.
- Diversification and Productization: The success of these models relies on a disciplined volatility control mechanism and diversifying returns across three sources: crypto beta, gold as a hedge, and risk-free yield from treasuries. The report suggests these strategies can be packaged into transparent, on-chain DeFi index products for easy investor access.

2 / Introduction

As the crypto market matures, investor demand is rising for robust, rules-based approaches that go beyond high-volatility speculation. Drawing on Ray Dalio's "All-Weather Strategy" and the core idea of risk parity, we consider the potential of a dynamically rebalanced portfolio composed of major crypto assets (BTC, ETH, BNB), stablecoins, tokenized Treasuries, and gold.

Our objective is to build and consider the potential of an "all-weather" portfolio using only crypto-native instruments—avoiding direct exposure to traditional securities due to regulatory and liquidity considerations—whose risk–return profile is comparable to, or even superior to, classic benchmarks (such as risk parity indices, the 60/40 stock–bond mix, or the S&P 500), evaluated by volatility, drawdowns, and robustness under stress.

The Challenge: Volatility

The cryptocurrency market is known for its astonishing return potential—and equally astonishing volatility. For the vast majority of crypto investors, the investment journey is a "roller-coaster experience": huge unrealized gains in bull markets followed by severe drawdowns in bear markets. Such violent swings not only test psychological resilience but also erode the foundation of long-term compounding.

Core question: Is there a systematic, rules-based on-chain strategy that can help investors break free from the emotional shackles of "either going all-in at the top or panic-selling at the bottom," thereby achieving smoother and more sustainable capital growth?

The Potential Solution: From Capital Weighting to Risk Weighting

This report argues that the answer lies in shifting from a "capital-weighted" allocation mindset to a "risk-weighted" allocation mindset.

Risk parity is a portfolio construction philosophy whose core idea is not to allocate equal capital to each asset, but to make each asset's contribution to total portfolio risk roughly equal.

A simple analogy: Imagine a seesaw, with a 100 KG adult (a high-volatility asset like BTC) on one end, and a 25 KG child (a low-volatility asset like on-chain stablecoins or tokenized Treasuries) on the other. To balance the seesaw, the child must sit farther from the fulcrum. In a portfolio, this means higher-volatility assets should be assigned smaller capital weights, while lower-volatility assets should be assigned larger capital weights, so that risk is balanced.

Mathematical expression: The simplest implementation is inverse-volatility weighting:

$$weight(i) \propto \frac{1}{volatility(i)}$$

This implies that if BTC's volatility is 20 times that of a Treasury token, then BTC's capital weight in the portfolio might be only 1/20 of the Treasury token's weight.

Through this approach, total portfolio risk is no longer dominated by a single high-volatility asset; rather, it is shared across all assets, thereby delivering more resilient performance across different market environments.

3 / Research Design & Methodology

3.1 Asset Universe

Risk-On Assets:

- **BTC (Bitcoin)**
 - **Role:** Digital gold; the strongest market consensus as a store of value.
 - **Characteristics:** Relatively high volatility; highly correlated with macro liquidity.
 - **Portfolio significance:** Represents crypto market “beta” and institutional capital flows.
- **ETH (Ethereum)**
 - **Role:** Leading smart contract platform; infrastructure of the DeFi ecosystem.
 - **Characteristics:** High correlation with BTC but with more independence; affected by DeFi/NFT cycles.
 - **Portfolio significance:** Represents the growth potential of the blockchain application ecosystem.
- **BNB**
 - **Role:** Utility token of the BNB Chain ecosystem; practical utility.
 - **Characteristics:** Distinctive supply-demand dynamics.
 - **Portfolio significance:** Diversification enhancement: Compared with the more “speculative” nature of BTC/ETH, BNB’s stronger utility-driven profile adds some diversification.
 - **Deflationary mechanics:** Its burn mechanism creates supply dynamics distinct from BTC/ETH.
- **Gold (Tokenized Gold)**
 - **Role:** The oldest store of value; widely recognized as fiat’s counterpart.
 - **Characteristics:** Low long-term correlation with both equities and bonds; among the more liquid RWA assets on-chain.
 - **Portfolio significance:** Increases non-crypto-native exposure and strengthens diversification.

Stable Assets (Risk-Off / Stabilizing):

- **USDC/USDT:** Highly liquid, reputable fiat stablecoins; used as cash and trading media.

- **On-chain Treasuries (RWA - T-Bill):** Tokens backed by real short-term U.S. Treasuries (e.g., OUSG) or their yield proxies. They offer near risk-free carry and are excellent hedges against crypto risk.

3.2 Benchmarks for Comparison

1. HODL BTC: 100% Bitcoin.
2. HODL Gold: 100% gold.
3. Static crypto equal-weight strategy (4% BTC, 3% ETH, 3% BNB, 10% gold, 80% Treasuries).
4. Static crypto-TradFi hybrid strategy (fixed-proportion bond + crypto mix).
5. TradFi risk parity strategy (using the RPAR Risk Parity ETF as a proxy).
6. Dynamic stock-bond allocation (using the Putnam Dynamic Asset Allocation fund as a proxy).

3.3 The Strategy Model

Core strategy: Dynamic Crypto Risk Parity (**DRP**).

Weight calculation: Inverse-volatility weighting. Compute 24-month rolling volatility for the five assets in the pool, and assign weights based on the inverse of volatility; rebalance quarterly.

- Due to limited history for on-chain Treasury tokens, use SPDR Bloomberg 1-3 Month T-Bill ETF (BIL) as a proxy data source.
- Assume all dividends and distributions are reinvested.

4 / Tests & Results

We have two sets of test results: (A) a low-volatility DRP akin to an “enhanced cash/T-bill” profile, and (B) an “optimized growth” variant targeting ~11% annualized volatility, compared with SPY and Putnam and will be discussed in Section 5.

- Start Balance (US\$): 10,000 for all series.
- Backtest Period 01/01/2020 to 08/31/2025
- Lookback Period: 24 months
- Rebalancing: Rebalance monthly

Figure 1: Performance Comparison of the Dynamic Risk Parity Strategy vs. Benchmark Assets and Portfolios

Metric	Dynamic Risk Parity	SPDR Blmbg 1-3 Mth T-Bill ETF	Putnam Dynamic Asset Allocation	iShares Core 60/40 Balanced Allocation	Bitcoin	XAUUSD	Static Allocation
Start Balance US\$	10,000	10,000	10,000	10,000	10,000	10,000	10,000
End Balance US\$	12,186	11,542	16,058	14,732	150,463	22,725	20,287
Annualized Return (CAGR)	3.55%	2.56%	8.72%	7.08%	61.35%	15.59%	13.30%
Standard Deviation	0.99%	0.67%	12.01%	11.79%	66.00%	14.43%	8.43%
Best Year	7.13%	5.19%	17.56%	15.75%	303.16%	31.39%	28.04%
Worst Year	1.17%	-0.10%	-15.72%	-15.65%	-64.27%	-3.66%	-5.81%
Maximum Drawdown	-0.18%	-0.16%	-20.12%	-20.75%	-73.01%	-17.69%	-9.24%
Sharpe Ratio	1.19	-1.45	0.54	0.41	1.01	0.9	1.2
Sortino Ratio	3.63	-1.51	0.8	0.61	2	1.74	3.02

Source: Tradingview, Binance Research, as of October 9, 2025

4.1 Advantage: Extreme Risk Control

- **CAGR of 3.55% exceeds that of the pure bond proxy (2.56%).** Even in the worst calendar year, the strategy still achieved a positive 1.17% return—stronger than short-term bond funds.

- **Volatility of only 0.99%:** An order of magnitude lower than robust traditional strategies, yielding an exceptionally smooth NAV curve.
- **Maximum drawdown of only -0.18%:** Effectively zero drawdown—nearly identical to pure short-term bond products. During the backtest period (including the bear market after the 2021 peak and the FTX collapse), the portfolio never experienced meaningful drawdowns. By contrast, even gold's maximum drawdown reached 17.7%. For extremely risk-averse investors, this allocation is highly compelling.
- **Sharpe ratio as high as 1.19:** Despite the modest return, the very low risk (denominator) lifts the Sharpe above direct Bitcoin exposure (1.01) and gold (0.90), proving that the portfolio earns highly efficient returns per unit of risk taken.
- **Sortino ratio of 3.63:** This down-side-risk-focused measure is the highest among peers, reaffirming the strategy's outstanding ability to avoid losses.

4.2 Disadvantage: Lower Absolute Return

Although DRP's annualized return exceeds that of pure bond funds, it is far lower than all other comparison strategies. This is an inherent outcome when a risk parity model balances assets with vastly different volatilities.

4.3 DRP Strategy Positioning

We consider DRP strategy as a supplement of cash managing strategy.

Below is a comparison of DRP as a cash management approach with pure on-chain Treasuries and mainstream stablecoin yield strategies:

Figure 2: Dynamic Risk Parity (DRP) vs. Other On-chain Cash Management Solutions

	Dynamic Risk Parity (DRP)	Pure On-chain Treasuries (e.g., OUSG, BUIDL)	Mainstream Stablecoin Yield (e.g., Aave/Uni LP, USDe)
Return Potential	Enhanced: Treasury yields as the base, layered with a micro (1–5%) allocation to crypto/gold for long-term growth potential	Stable: Returns strictly anchored to short-term U.S. Treasury rates; virtually no upside surprise	High Volatility: Highest potential returns but extreme volatility; can be negative (e.g., when funding rates turn negative)

Yield Stability	High: Majority of returns from Treasuries; enhancement volatility negligible	Extremely High: Single, stable income source; fully follows Federal Reserve policy	Low: Return sources (lending demand, funding rates) shift rapidly, with sharp daily fluctuations
Volatility/Drawdown	Near-zero: Algorithm nearly offsets risk-asset volatility; drawdowns negligible	Extremely Low: As long as the issuer does not default, asset volatility is minimal	Low with tail risk: Generally stable day to day, but “black swan” risks (stablecoin depegs, protocol exploits) can cause instant large losses
Issuer/Counterparty Risk	Diversified: Risk spread across relatively safe on-chain Treasuries and decentralized crypto networks	Concentrated: Risk concentrated in a single token issuer (e.g., Ondo, Franklin Templeton) and its custodians	Medium–High: Depends on protocols (e.g., Aave) and collateral (e.g., USDC) issuers, or derivative exchange counterparties
Asset Security	Extremely High: End-to-end self-custody; no third-party trust required. Strategy logic, holdings, and rebalance records fully public and verifiable on-chain	Extremely High: End-to-end self-custody; no third-party trust required	Medium: Requires trust in third-party protocols; on-chain operations slightly complex

Source: Tradingview, Binance Research, as of October 9, 2025

Key Merit 1: Structural Risk Diversification

1. Relative to pure on-chain Treasuries, DRP allocates across a basket of decentralized assets for diversification.
2. The inclusion of cryptocurrencies and gold gives the portfolio stronger anti-inflation characteristics versus pure debt.
3. Compared to DeFi stablecoin yield strategies, DRP offers higher controllability. Stablecoins or DeFi protocols may face black-swan risks (USDC depegs, Aave hacks, USDe hedge-model failure under extremes). DRP is driven by a public, transparent, and simple mathematical model, with a fully self-controlled rebalancing process that does not require trusting third-party custody.

Key Merit 2: Asymmetric Upside Potential

1. While DRP’s historical return (3.55%) may appear modest, positioned in the “money market fund” category it is uniquely attractive.
2. Its base return comes from the majority allocation to Treasuries, ensuring performance does not materially lag pure Treasuries.

3. Its “enhancement” comes from the 1–5% crypto and gold sleeve. This sleeve is so small that its drag in bear markets is negligible, yet it acts like a “free option” on long-term crypto growth. Investors maintain near-Treasury principal safety while gaining upside optionality—a classic “win-more-when-right, lose-less-when-wrong” asymmetric profile.
4. Compared to derivative-based protection structures, this spot-based portfolio avoids paying time value and implied volatility, reducing costs and operational complexity.

4.4 Summary

Viewed as an “enhanced on-chain money market fund,” this allocation excels, effectively “taming” high-risk crypto assets into an ultra-low-risk investment tool and achieving resilience across conditions—delivering stable outcomes in dry or wet seasons alike. For investors seeking absolute principal safety, it offers a novel on-chain solution. Moreover, with the Federal Reserve entering a new rate-cutting cycle and Treasury yields potentially falling toward ~3% by 2026, demand for yield-enhanced, low-risk strategies is likely to rise.

5 / Directions for Improvement

5.1 Source of the Problem

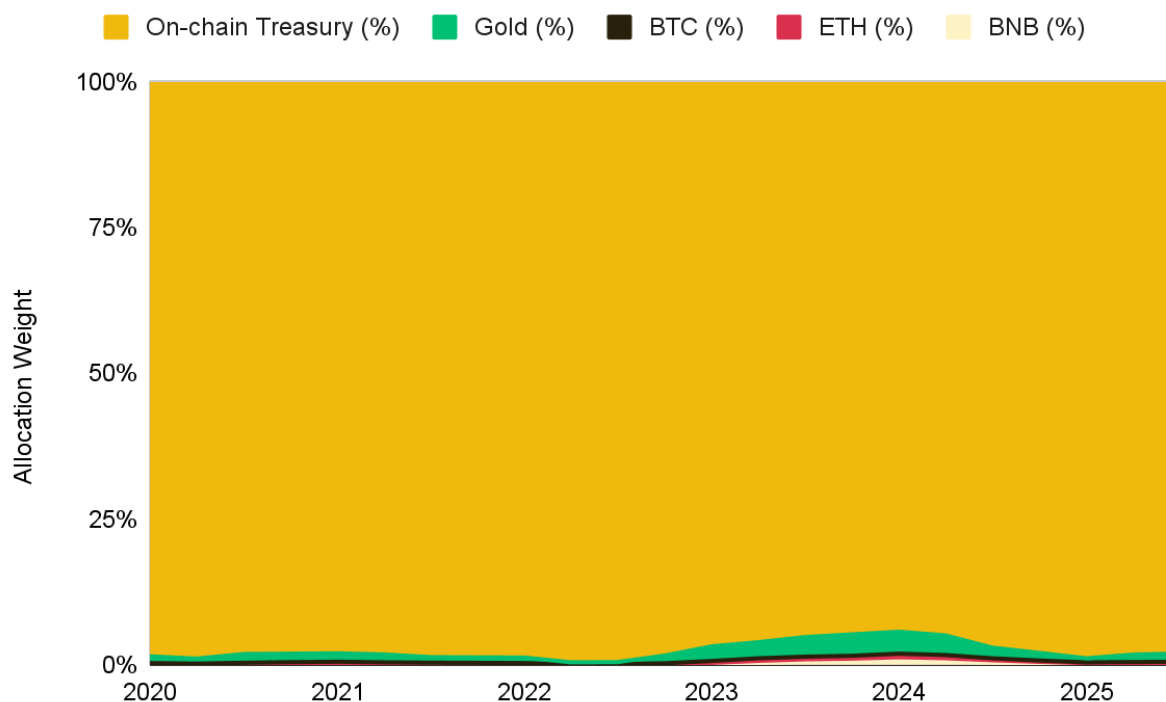
We must acknowledge that while simple risk parity constraints risk, it also constraints upside potential.

Examining quarterly weight shifts under this approach, the total weight of risk assets (BTC, ETH, BNB, Gold) is persistently very low—mostly 1–5%. During periods of severe market turbulence (e.g., 2022), the total risk-asset weight fell below 1%.

This is because the volatility of cryptocurrencies and gold is tens or even hundreds of times that of short-term Treasury ETFs. To equalize their risk contributions with Treasury ETFs, the model must give them extremely small capital weights.

If, however, the target audience comprises crypto investors willing to accept some volatility for higher long-term returns, we can adjust the “Crypto Risk Parity Index” accordingly.

Figure 3: Quarterly Allocation Weight of the DRP Strategy Over Time



Source: Tradingview, Binance Research, as of October 9, 2025

5.2 Increasing Volatility Tolerance

Next, we can try a Target Volatility Strategy, which pre-sets the portfolio's maximum volatility tolerance—e.g., an annualized target volatility of 5% or 10%. The model dynamically adjusts risk-asset exposure to maintain this target level. This forces higher risk-asset weights than DRP in stable markets, potentially capturing more return while keeping total risk far below HODL.

5.3 Testing & Results

Using a 24-month historical volatility lookback with quarterly rebalancing, we target an 11% portfolio volatility—similar to the risk level of the Putnam Dynamic Asset Allocation (a stock–bond hybrid strategy). Results:

Figure 4: Backtest Results-Optimized Growth Strategy (11% Target Volatility) vs. Market Benchmarks

Metric	Maximum Return at 11% Volatility	SPDR S&P 500 ETF	Putnam Dynamic Asset Allocation
Start Balance US\$	10,000	10,000	10,000
End Balance US\$	22,092	21,759	16,058
Annualized Return (CAGR)	15.01%	14.71%	8.72%
Standard Deviation	11.91%	17.59%	12.01%
Best Year	28.18%	28.74%	17.56%
Worst Year	-6.24%	-18.17%	-15.72%
Maximum Drawdown	-10.50%	-23.93%	-20.12%
Sharpe Ratio (ex-post)	1.01	0.72	0.54
Sortino Ratio	2.53	1.13	0.8

Source: Tradingview, Binance Research, as of October 9, 2025

It can be observed that this optimized growth strategy comprehensively outperforms market benchmarks and professional dynamic allocation funds:

- **Annualized Return (CAGR: 15%):** The strategy not only avoided sacrificing returns due to risk controls but narrowly outperformed the S&P 500 ETF (14.71%) and substantially

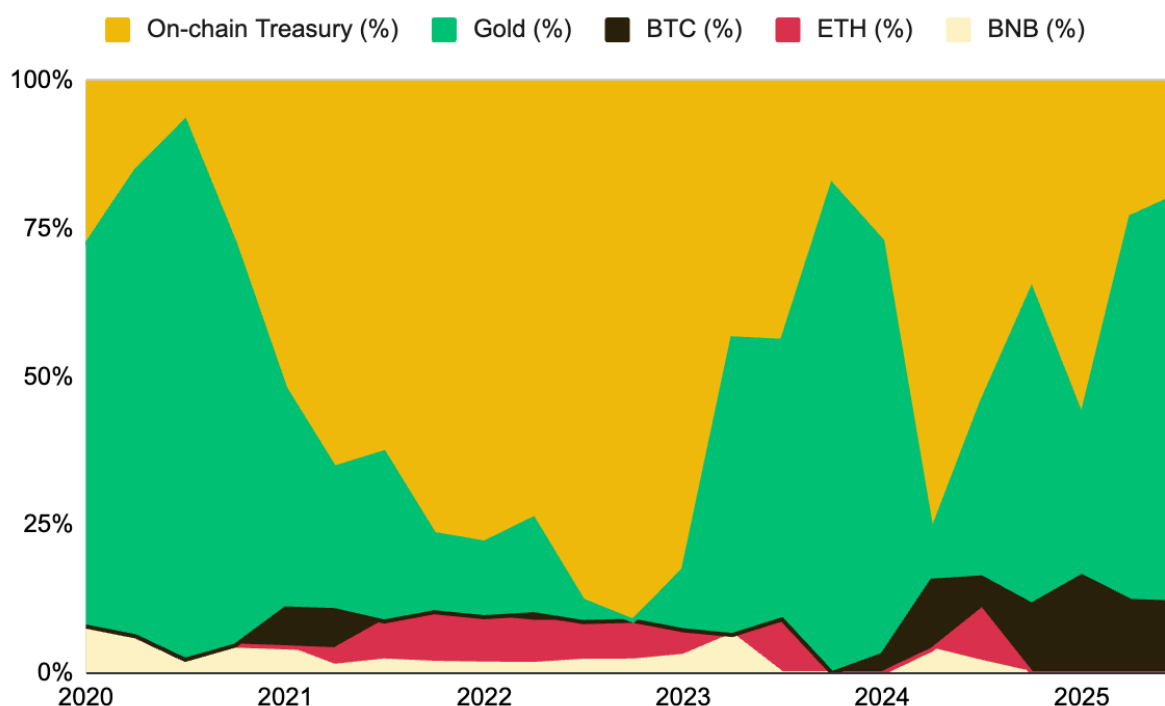
led the professional Putnam dynamic allocation fund (8.72%).

- **End Balance (\$22,092):** After over 5 years of cycles, the strategy's final value also surpassed the S&P 500, proving its long-term compounding capability.
- **Standard Deviation (11.91%):** The strategy precisely controlled volatility near the target range (11%), a risk level comparable to the professional, stability-focused Putnam fund (12.01%), but significantly lower than the S&P 500's 17.59%.
- **Maximum Drawdown (-10.50%):** Maximum drawdown is less than half that of the S&P 500 (-23.93%), and far superior to the Putnam fund (-20.12%).
- **Worst Year Performance (-6.24%):** Similarly, in the worst year, the strategy's loss was only single digits, while the S&P 500 and Putnam fund both suffered losses exceeding -15%.
- **Sharpe Ratio (1.01):** The strategy's Sharpe ratio reached 1.01, not only far exceeding the S&P 500 (0.72) and Putnam (0.54), but also breaking through 1.0, an important threshold for excellent investment portfolios.
- **Sortino Ratio (2.53):** This metric focuses more on downside risk, and the strategy's score is more than double that of the S&P 500 (1.13), again demonstrating its extraordinary ability to control losses.

5.4 Analysis of Allocation Logic

The reason for this strong performance is that this allocation approach can automatically reduce risk asset weights when volatility rises and increase them when volatility falls and trends are favorable, creating a discipline of "participating with the trend, contracting against it." U.S. Treasuries provide a stable foundation, gold offers non-correlated hedging, and a small amount of crypto beta brings the potential for excess upside.

Figure 5: Historical Allocation of the Optimized Growth Strategy (11% Target Volatility)



Source: Tradingview, Binance Research, as of October 9, 2025

Looking at the strategy's rebalancing history, the allocation to gold fluctuates significantly, sometimes reaching as high as 90% (Q3 2020). This is because gold's volatility is often much lower than that of cryptocurrencies. When the model wants to increase risk exposure but finds cryptocurrencies "too hot to handle," gold becomes the perfect compromise. It offers some growth potential without easily "detonating" the 11% volatility budget.

The overall allocation to crypto assets ranges between 1-16%, with rotation among BTC, ETH, and BNB; a large allocation to all of them simultaneously is uncommon.

During several major market downturns (such as the May 2021 deleveraging, the 2022 stock-bond crash, the May 2022 LUNA collapse, the November 2022 FTX incident, and the March 2023 USDC depeg), the portfolio avoided parts of the market decline by significantly increasing its allocation to short-term treasuries.

6 / Outlook

The key success factors for both risk-adjusted allocation strategies above essentially come down to two points:

1. Disciplined Volatility Control Mechanism

Through real-time monitoring of the portfolio's expected volatility, Strategy 1 can continuously balance the risk contribution of each asset, preventing any single asset from causing significant portfolio volatility. Strategy 2 automatically reduces high-volatility asset allocation when portfolio volatility approaches the 11% target, and automatically increases allocation when it is far below the target. This precise control is the fundamental reason it can achieve a high Sharpe ratio.

2. Diversified Alpha Sources

Since crypto assets exhibit highly convergent trends, scientific allocation approaches need to expand uncorrelated alpha sources to capture returns. The above tests are based on three main sources:

1. Crypto Beta: Sharing the growth dividend of the blockchain technology revolution
2. Gold Alpha: Capturing safe-haven premiums during macro uncertainty
3. Cash Management: Obtaining risk-free returns through treasuries

Moreover, these types of strategies have productization potential and **can be packaged as a transparent, verifiable on-chain strategy DeFi index product (such as issuing a \$CRP - Crypto Risk Parity index token)**, providing users with a one-click robust investment option. Looking ahead, as the richness of on-chain assets continues to increase, more targets can be incorporated into portfolios. Consideration can also be given to including on-chain native cash management, such as lending pools or stablecoin swap pools, as allocations, which will be more conducive to constructing portfolios that meet the needs of investors with different preferences.

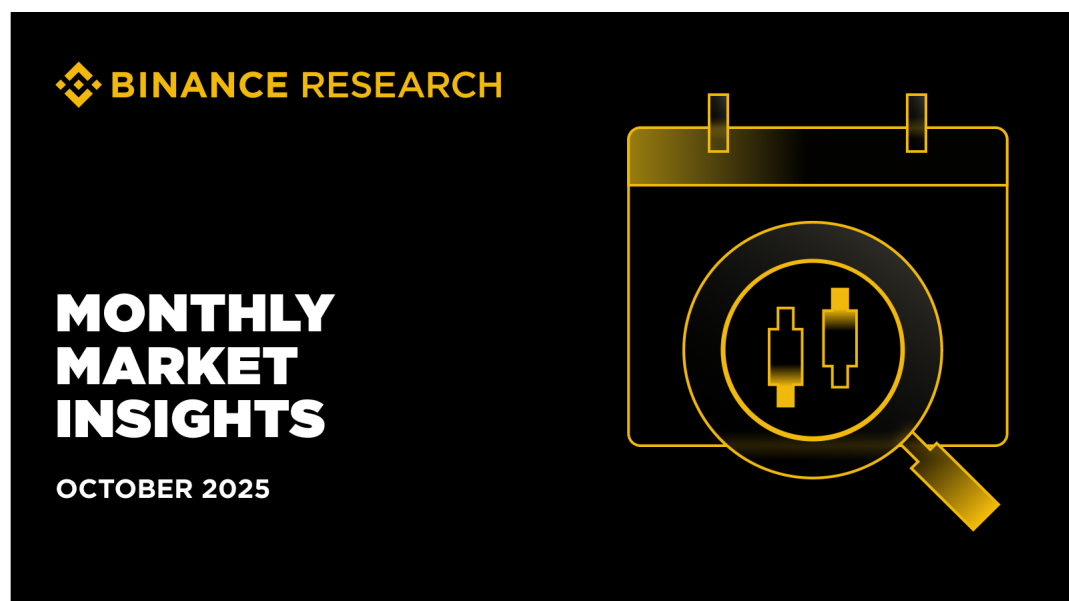
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8 / New Binance Research Reports

Monthly Market Insights - October 2025 [Link](#)

A summary of the most important market developments, interesting charts and upcoming events.



Navigating Crypto: Industry Map [Link](#)

The Industry Map provides an overview of the crypto ecosystem. In this report, we break down different verticals into subcategories, and lay out a few projects in each of them.



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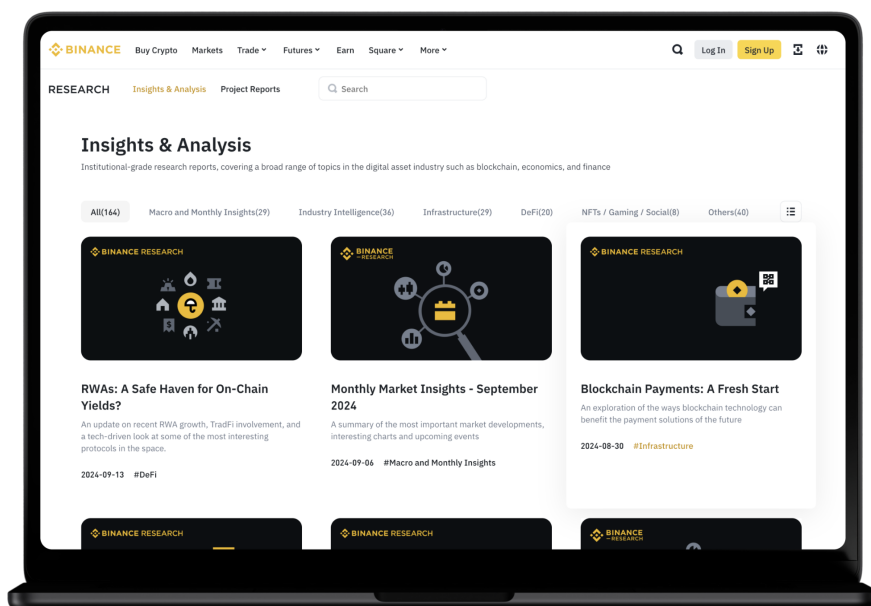
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