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Dual Investment Strategies

Gate Research: Options Selling and Bitcoin Dual Investment Strategies

Abstract

This study builds a fully executable dual-currency (BTC/USDT) investment strategy based on options-pricing principles, using implied volatility (IV) as the core entry factor. By

combining IV signals with Bitcoin's market-cycle classification, we construct a rule-based framework where "IV determines entry, and market cycle determines direction." The results show that this approach delivers strong and repeatable returns across Bitcoin's structurally volatile environments. This framework also lays the groundwork for developing more complete multi-tenor, multi-strike option-selling portfolios in future research.

1. Research Background and Methodology

1.1 Research Background

As the Bitcoin market expands, derivatives trading has increasingly become a core tool for investors to manage risk and capture attractive returns. Among these instruments, dual-currency investment products have gained significant popularity due to their simple structure, transparent payoff, and adaptability across different market conditions.
However, the market lacks systematic quantitative research on how dual-currency strategies perform across distinct Bitcoin cycles—bull, bear, and range-bound markets. In particular, there is limited empirical analysis on incorporating implied volatility (IV) into the decision-making framework to identify optimal entry points.
Given Bitcoin's cyclical volatility patterns and the fact that returns for such products are primarily driven by option-seller risk exposure, it is essential to backtest whether dual investments can deliver stable returns under varying market regimes. Moreover, under clearly defined "high-volatility entry windows," how should one determine directional bias, and what returns can be expected?
This study aims to provide investors with a quantitatively grounded framework for dual-currency strategies through systematic backtesting and structural analysis.

1.2 Research Methodology

This study employs a four-part research framework:
Part 1: Dual-Currency Mechanism & Case Analysis

- We explain the fundamental principles, payoff structure, and representative examples of dual-currency products to establish the foundation for later strategy decomposition and quantitative backtesting.

Part 2: Bitcoin Market Cycle Classification

- Before building trading strategies, we categorize market conditions—bull, bear, and range-bound—based on Bitcoin's price behavior to define the contextual framework for backtesting.

Part 3: Using Implied Volatility (IV) as the Entry Signal

- Based on the logic that increasing volatility enhances option-seller returns, IV is used as the key indicator for entry timing. Before doing so, we verify that changes in Bitcoin's implied volatility influence both upward and downward price moves. Unlike the S&P 500's VIX, which mainly reflects downside fear, Bitcoin's IV is *bidirectional*, responding to both rallies and sell-offs.

Part 4: Core Historical Backtesting Procedure

We define thresholds using IV percentiles over the past year and select IV30 > 70% as the entry signal, identifying all qualifying dates since 2023 and mapping them to different market cycles.

Strategy direction is then based on market regime: "high-sell" (MA100 + 2σ) in bull markets, "low-buy" (MA100 − 2σ) in bear markets, and a mixed mean-reversion strategy ("low-buy + high-sell") in range-bound markets.

After direction is determined, we evaluate whether a dual-currency position would be exercised—i.e., whether the "low-buy" or "high-sell" target is reached—based on tenor and strike selection.

- Finally, we build a simplified model for estimating dual-currency premiums and annualized yields (APY), drawing from the Black–Scholes framework and industry-standard assumptions, and use this to complete the backtest.

1.3 Data Collection

Due to data availability constraints, all data in this study cover the period from January 1, 2023 to October 31, 2025. Specifically:

- Bitcoin price, S&P 500, and S&P 500 VIX data are sourced from *Investing*.
- Bitcoin IV30 is sourced from *TradingView*, which essentially reflects *Deribit's DVOL* data.

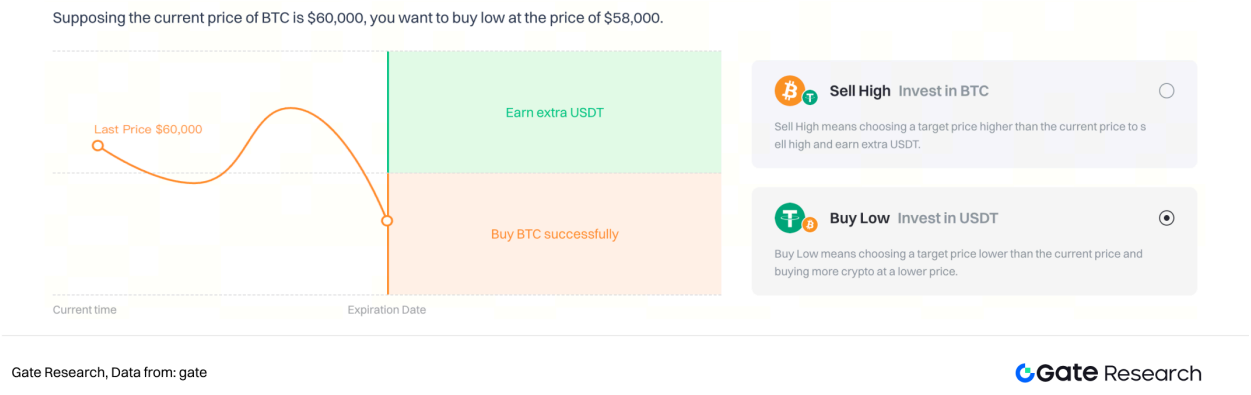
2. Overview of the Dual Investment Mechanism

2.1 Definition

Dual Investment is a structured financial product built on the logic of *earning yield* + *conditional asset conversion*.

For BTC-based products, investors subscribe using BTC or USDT and earn a fixed return over a set period. Whether conversion occurs at maturity depends on the relationship between the settlement price and the investor's target price.

Figure: How to Use Dual Investment



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2.2 Mechanism

Dual Investment is essentially a yield-enhancement product with embedded option characteristics, featuring:

1. The investor deposits one asset (e.g., BTC or USDT) and agrees to exchange it for another at a preset target price (strike) on the expiration date.
2. Unlike standard options, subscriptions cannot be cancelled or redeemed early once confirmed.
3. The offered yield varies with market volatility but becomes fixed once subscribed.
4. At maturity, the investor receives the agreed return regardless of whether conversion is triggered—making it a conditional fixed-income product from the investor's perspective.
5. Depending on whether the target price is reached at settlement, investors receive either the original asset or the alternate asset.

Its core mechanism is equivalent to the investor lending assets to the platform, which then *sells a short-term European option* on the investor's behalf:

- Choosing High Sell is economically equivalent to selling a call option (Sell Call);
- Choosing Low Buy is equivalent to selling a put option (Sell Put).

The platform prices the product using option pricing factors (IV, tenor, strike, etc.), which correspond to the option premium received when selling calls or puts.

2.3 Yield Calculation

Table: Dual Investment – High Sell

Maturity Condition	Payout Formula	Settlement Currency
Spot < Target Price	Principal × (1 + APR) × (Tenor / 365)	BTC
Spot ≥ Target Price (Conversion Triggered)	Principal × Target Price × (1 + APR) × (Tenor / 365)	USD

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Table: Dual Investment – Low Buy

Maturity Condition	Payout Formula	Settlement Currency
Spot > Target Price	Principal × (1 + APR) × (Tenor / 365)	USD
Spot ≤ Target Price (Conversion Triggered)	Principal / Target Price × (1 + APR) × (Tenor / 365)	BTC

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Example: BTC/USDT Dual Investment (Deposit BTC)

- *Current BTC price: $100,000*
- *Strike price: $95,000*
- *Tenor: 7 days*
- *Annualized yield (APR): 25%*

If the investor deposits 1 BTC, the outcomes at maturity are:
If BTC price ≤ $95,000 after 7 days:

- The investor receives 1 BTC + interest (settled in BTC).

If BTC price > $95,000 after 7 days:

- The investor's BTC is sold at $95,000, and they receive USDT + interest (settled in USDT).

2.4 Comparison with Option Payoff Structures

Why is Dual Investment essentially equivalent to being the *seller of an option*?
Although investors earn a positive yield regardless of whether conversion is triggered, the underlying payoff mechanics resemble those of selling options. In options—being a zero-sum game—one side always loses. For option sellers, losses come from selling calls too low or selling puts too high, meaning the loss equals the difference between the spot price and the strike price when exercised.
The same logic applies to Dual Investment: when the market price breaches the target price and conversion is triggered, this is equivalent to an option being exercised.
Therefore, Dual Investment payoffs mirror Sell Put and Sell Call payoff diagrams.
For Low Buy, if spot falls below the strike, the "missed upside" is effectively a growing loss:

- *loss = K - Spot*.

For High Sell, if spot rises above the strike, the loss is:

- *loss = Spot - K*.

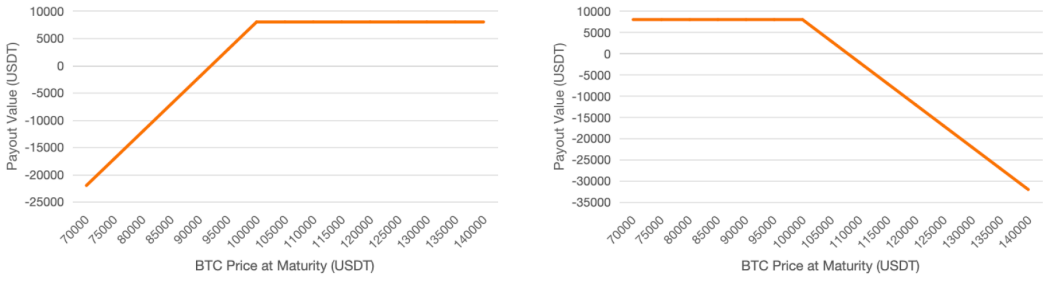
Thus, including this opportunity cost, the effective payoff becomes:

- Fixed yield: Principal × APR × Days / 365
- Low Buy: Yield = Fixed yield − Max(K − Spot, 0)
- High Sell: Yield = Fixed yield − Max(Spot − K, 0)

Example (Low Buy):

- If BTC ≥ K at maturity → not exercised → earn interest only.
- If BTC < K → forced to buy at K → equivalent to Sell Put with linear downside.

Figure: Potential payoff profiles of Sell Put / Dual Investment Low-Buy (left) and Sell Call / Dual Investment High-Sell (right)



Understanding this structure is critical for strategy design, as the key is setting the strike: not too close (to avoid early exercise), but not excessively far OTM. Proper use of Dual Investment's yield-locking mechanism allows investors to capture both safety margin and additional return.

2.5 How "Greeks" Influence Returns

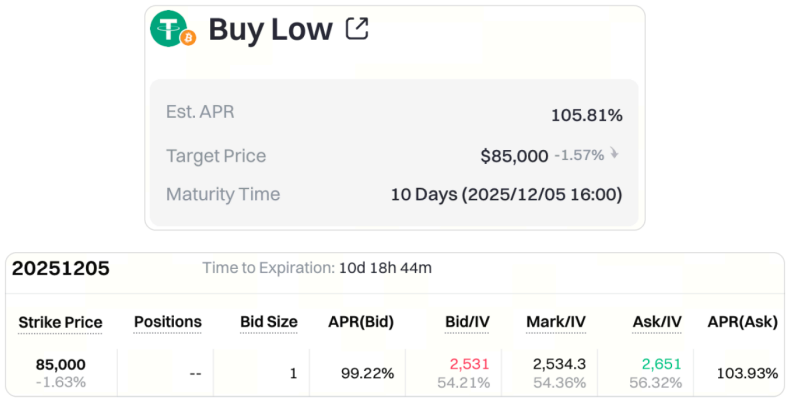
Option Greeks measure how option prices react to different risk factors, helping investors evaluate and manage payoff dynamics. Since dual investment products are fundamentally linked to option pricing, do Greeks also affect dual investment returns?
The core of option returns is the premium, and its approximate relationship with APR is:
APR ≈ (Option Premium / Principal) ÷ Time
Three major Greeks drive premium changes:

- Delta: Sensitivity to price movements
- Gamma: Rate of change of delta, affecting premium jumps near the strike
- Vega: Sensitivity to implied volatility (higher IV → higher premium)

For dual investment, the APR shows similar patterns:

- Spot price closer to strike → higher APR
- Higher IV → higher APR
- Shorter tenor → more APR variability

These behaviors resemble Delta, Gamma, and Vega. However, unlike true option pricing (e.g., Black-Scholes), dual-investment APR is *not* derived from risk-neutral valuation. Exchanges convert option premiums into a simplified "yield," adding non-linear adjustments. Thus, APR is not equal to the real annualized option return.
Notably, dual-investment APR is often higher than the equivalent option's annualized premium because it includes an additional "principal lock-up compensation," similar to a collateral or staking fee.
Figure: Buy Low APR vs. Put Options APR



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Conclusion:

Dual-investment APR = Discounted option premium + principal lock-up compensation, rather than true option pricing.

Because APR behaves *as if* influenced by Greeks, a strategy that leverages these three features—spot proximity to strike, elevated IV, and short-tenor volatility—may help dual-investment products perform across bull, bear, and ranging markets.

3. Bitcoin Market Cycle Classification

We now move into the core strategy section of this report. In this part, we discuss the trading logic of dual-investment products and the corresponding back-tested returns under different market cycles. Since dual investment is essentially a short-option strategy, its risk–reward profile varies significantly across market regimes, making accurate cycle classification a key foundation for strategy design.

For defining market cycles, we adopt a mainstream technical bull–bear classification framework, further refined by incorporating Bitcoin's deviation from its moving-average mean.

Table: Bitcoin Market Cycle Classification

Cycle Type	Determination Criteria	Description
Bull Market	Closing price is 20% above the 100-day moving average	Strong trend, clear direction
Bear Market	Closing price is 20% below the 100-day moving average	One-sided trend, reduced liquidity
Sideways/Consolidation	Closing price fluctuates within ±2 standard deviations	Direction unclear

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Next, we visualize the market cycle using the above criteria. Specifically, we take Bitcoin's MA100 as the baseline and compute the ±1σ and ±2σ rolling standard-deviation bands, then overlay them with spot prices to capture market momentum. The logic is as follows:

- When price remains below MA100 − 2σ, the market is in a subdued phase — a signal of a potential bear market;
- When price remains above MA100 + 2σ, market sentiment is strong — Bitcoin is in a bull-market zone;
- When price oscillates within the ±2σ band, the market is range-bound, with no clear directional trend.

Applying this framework to all Bitcoin data since 2023 yields the cycle segmentation shown in the chart: purple shading represents bull markets, while blue shading indicates ranging markets. Notably, under this technical classification method, Bitcoin has not entered a typical bear-market regime since 2023.

Figure: Bitcoin Price and Rolling Standard Deviation Range

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3.1 Bull Market Periods

The criteria for identifying a bull market are: prices consistently maintain an upward trend. To avoid false short-term breakouts, the following dual confirmation conditions are added on top of the trend:

1. **MA30 and MA100 in a bullish alignment** (short-term moving average crosses above and stays above the long-term moving average).
2. **Bitcoin price stays above MA30 most of the time** (indicating a strong trend and dominant buying pressure).
3. **A sustained drop to the moving averages or below key moving averages** signals the end of the bull market.

From the chart, it is clear that Bitcoin generally trends upward during bull markets, with prices frequently breaking above ±2 standard deviations. According to this classification, there have been three bull market cycles since 2023:

1. **2023/1/21 – 2023/4/19** (Bitcoin price change: 29%)
    1. **Triggers:**
        - **Macro improvement:** Expectations of marginal easing in Fed policy and signals of peak interest rates boosted risk assets.
        - **On-chain inflows:** Long-term holders (LTH) accumulated more, while exchange outflows decreased, showing strong demand.
        - **Market sentiment recovery:** Following the 2022 bear market, investor sentiment bottomed and participants gradually returned.
    2. **Ending factors:**
        - **Technical pullback:** Bitcoin hit prior key resistance levels, triggering short-term profit-taking.
        - **Macro news disturbances:** Sensitivity to interest rate or inflation data caused short-term volatility.
2. **2023/10/24 – 2024/4/13** (Bitcoin price change: 49%)
    1. **Triggers:**
        - **Institutional demand recovery:** Significant inflows into Bitcoin ETFs and exchange-traded products drove prices higher.
        - **Strong on-chain indicators:** Active addresses and transaction volume rebounded, increasing liquidity and market participation.
        - **Improved macro environment:** Decline in the USD index and stable US stocks supported a broader risk-on environment.
    2. **Ending factors:**

        - **Profit-taking:** Large gains prompted short-term investors to realize profits.
3. **2024/11/7 – 2024/12/26** (Bitcoin price change: 22%)
    1. **Triggers:**
        - **Short-term event-driven:** Factors such as presidential election outcomes activated short-term market sentiment.
        - **Technical breakout:** Price surpassed previous highs, triggering bullish signals.
    2. **Ending factors:**
        - **Short-cycle overheating:** Despite strong gains, the overall cycle was brief, leading to rapid profit-taking.
        - **Increased macro uncertainty:** Tight year-end liquidity led some participants to reduce positions.

3.2 Sideways/Consolidation Periods

A sideways market is defined as a neutral period that is neither a bull nor a bear market, where the market lacks a clear direction and bullish and bearish forces are intertwined. Prices typically fluctuate within ±2 standard deviations (2σ), showing a classic range-bound consolidation pattern.

1. **2023/4/20 – 2023/10/23**, sideways period (Bitcoin price change: 8%)
2. **2024/4/14 – 2024/11/06**, sideways period (Bitcoin price change: 15%)
3. **2024/12/27 – present**, sideways period (Bitcoin price change: 15%)

Note: Data is current as of October 30, 2025.

4. Dual Investment Trading Strategy Setup

4.1 Single Option Trading Logic

Since the underlying mechanism of dual investment essentially follows the option seller logic, the applicable market conditions and entry timing naturally align with option pricing and volatility structure.

- **Buy Call:** Long direction and volatility; suitable for early-stage bull markets.
- **Sell Call:** Short volatility and capped upside; suitable for late-stage bull markets or sideways markets.

- **Buy Put:** Short direction and volatility; suitable for early-stage bear markets.
- **Sell Put:** Long volatility convergence and price stabilization; suitable for sideways markets or late-stage bear markets.

In dual investments, the “Sell Call” and “Sell Put” strategies correspond to “High Sell” and “Low Buy”, respectively. Thus, strategy execution can be aligned with the market conditions:

- In late-stage bull markets or sideways markets, the High Sell structure allows investors to bet on limited upside while collecting premiums from higher implied volatility.
- In sideways markets or late-stage bear markets, the Low Buy strategy is more suitable for capturing time value gains from volatility convergence and price stabilization.

Table: Suitable Dual-Currency Strategies for Different Market Conditions

Market Type	Suitable Dual-Currency Strategy	Core Logic
Sideways or slight uptrend	High Sell	Aim to earn interest while being okay with BTC being sold
Sideways or slight downtrend	Low Buy	Aim to earn interest and willing to buy BTC at lower prices
Strong one-sided trend	Not recommended	High exercise risk; may miss the trend or get trapped

4.2 Implied Volatility as an Entry Signal

At this point, it’s essential to highlight the common core of all option-based strategies—the selection based on the level of implied volatility (IV). For option sellers, the higher the IV, the greater the potential returns. This is because higher IV leads to more expensive option pricing.

The APR displayed on platforms is essentially the “equivalent option price” calculated based on the current IV. The underlying logic is: “Low Buy” and “High Sell” → higher IV → more expensive Puts and Calls → higher APR.

From a strategy execution perspective, high IV represents the optimal entry timing. Implied volatility typically spikes when market uncertainty rises—for example, before or after major macro events, during panic selling, or when on-chain metrics show anomalies. This is why many professional investors prefer to build positions around significant events.

4.3 Bitcoin IV vs. S&P 500 VIX

The next question is: if IV is used as a trading signal, it is crucial to first verify whether the weighted composite IV for Bitcoin—used in this analysis—is sensitive to both price increases and decreases. Only after confirming this can we determine whether to choose a "Low Buy" or "High Sell" strategy in a high-IV environment.

It is well-known that the S&P 500 VIX is considered the stock market's fear index. When the stock market falls, VIX often spikes; when the market rises, VIX usually declines. This means VIX is more sensitive to downside movements than to upside movements. But does Bitcoin IV behave similarly?

To address this question, we analyze the correlations between:

- Bitcoin price and BTC IV, and
- S&P 500 and VIX.

Table: BTC vs. BTC IV 30 Correlation Analysis

Market Cycle	Date	Correlation
Uptrend	2023/1/21-2023/4/19	38.70%
	2023/10/24-2024/4/13	23.80%
	2024/11/7-2024/12/26	28.40%
Downtrend	2025/2/26-2025/4/11	-20.80%
Overall		14.80%

Table: S&P 500 vs. S&P 500 VIX Correlation Analysis

Market Cycle	Date	Correlation
Uptrend	2023/6/12-2023/8/7	-42.40%
	2023/12/13-2024/4/9	-69.20%
	2025/6/26-2025/10/31	-80.70%
Downtrend	2024/3/11-2025/4/24	-91.00%
Overall		-77.70%

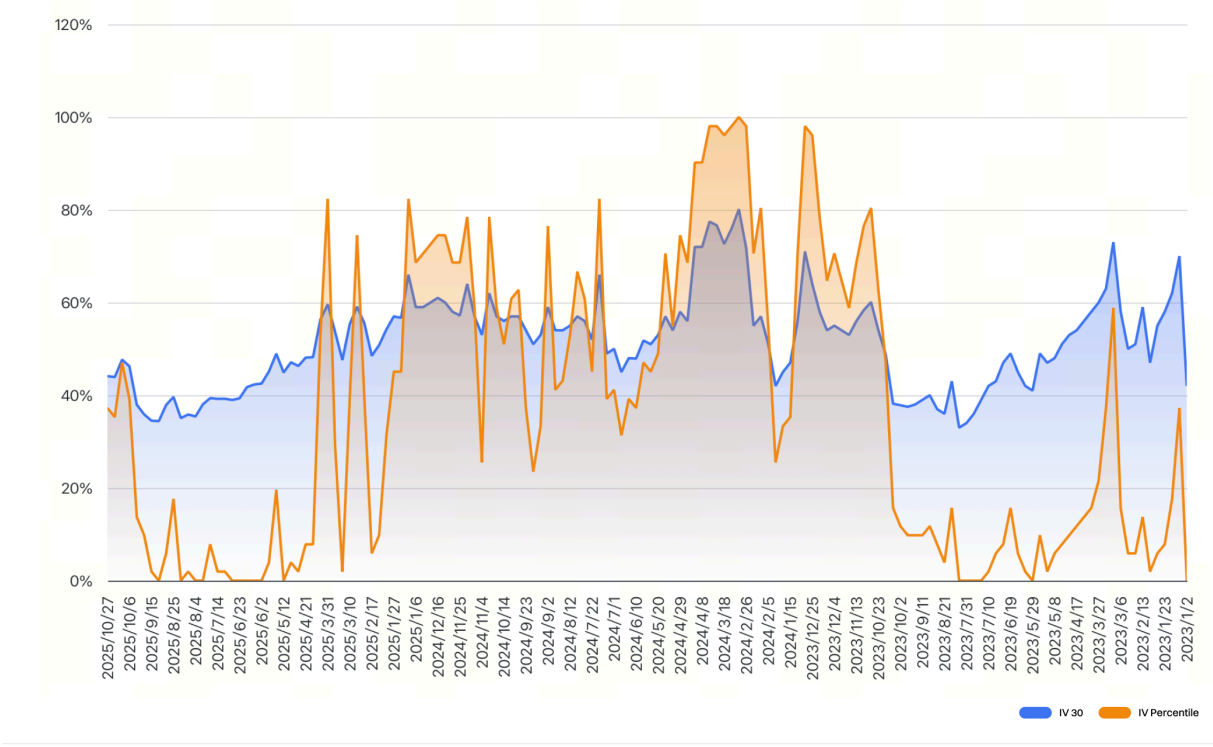
The results show that during Bitcoin uptrends, BTC price and BTC IV move in the same direction; during downtrends, BTC price falls while BTC IV rises. In other words, Bitcoin IV amplifies in both upward and downward movements, exhibiting the “bidirectional sensitivity” traders want to see.
By contrast, the negative correlation between S&P 500 and VIX is pronounced: in rising markets, S&P 500 increases while VIX mostly declines; in falling markets, VIX spikes sharply with rising market fear. This indicates that compared to Bitcoin, which is more “neutral” and sensitive to both directions, VIX is more downside-sensitive.
The reason is straightforward: investors fear losses more than missing gains, so demand for downside protection exceeds that for upside protection. During market stress, low liquidity, or uncertainty, investors rush to buy protection, pushing up VIX.
The key difference with Bitcoin is that upward moves are often explosive, with gains far exceeding those of the S&P 500. Traders also buy Calls, especially at the start of bull markets. Therefore, in the Bitcoin market, high IV not only reflects hedging demand but also signals active trading and expanded volatility, providing higher yield potential for dual-currency investments.

4.4 Enter When IV Percentile > 70%

To control risk while maximizing returns, we use BTC IV 30 Percentile > 70% as the entry signal. Here, IV Percentile represents the position of the current implied volatility relative to the past year. For example:

- IV Percentile = 70% → Current IV is higher than 70% of historical levels over the past year.

The 70% threshold is an empirical “high level,” indicating that market volatility is significantly elevated but not extreme (values >90% usually correspond to panic or extreme events). Entering at this level ensures sufficiently high premiums, allowing the dual-currency investment APR lock-in mechanism to capture high APR effectively.
Figure: Bitcoin IV and IV Percentile



In the chart, the yellow shaded area represents the IV Percentile, and the blue line shows IV 30. Most of the time, IV Percentile is below 50%, with values above 70% mainly occurring during the 2024 bull market.

4.5 Trading Strategy Rules

Combining the above ideas forms a complete trading strategy:

1. Bull Market "Top Escape" – collect interest during an uptrend and sell BTC at higher prices

- IV Percentile > 70%
- BTC price near or above MA100 ± 2σ
- Selected term: 7 days (shorter term generally yields higher returns)
- Target price = Spot × 1.05 (approximately 5% above current price depending on term)

2. Bear Market "Bottom Catch" – collect interest during a downtrend and buy BTC at lower prices

- IV Percentile > 70%

- BTC price near or below MA100 ± 2σ
- Selected term: 7 days
- Target price = Spot × 0.95 (approximately 5% below current price depending on term)

3. Sideways Market – sell high, buy low

- IV Percentile > 70%
- BTC price near –2σ from MA → Low Buy; near +2σ from MA → High Sell
- Selected term: 7 days
- Target price = Spot × 0.95 (for Low Buy); Target price = Spot × 1.05 (for High Sell)

5. Empirical Analysis

5.1 Backtesting Steps

To validate the feasibility of the trading strategy, we backtest according to the previously defined rules, following these steps:

1. Select all dates where IV Percentile > 70% and classify them into bull and bear markets according to the Bitcoin market cycles defined earlier.
2. Apply the MA100 ± standard deviation method to determine trading actions based on Bitcoin's price movements in different market cycles:
    1. **Bull Market:** If price is above +2σ, execute a High Sell; if below, no trade is executed.
    2. **Bear Market:** If price is below −2σ, execute a Low Buy; if above, no trade is executed.
    3. **Sideways Market:** Low Buy near −2σ to MA, High Sell near MA to +2σ; no trade executed near the MA.
3. Set the term to 7 days, with dual-currency target prices:
    1. Low Buy → Target = Spot × 0.95
    2. High Sell → Target = Spot × 1.05
4. Determine whether the currency swap is triggered at expiration based on the chosen direction (Low Buy or High Sell).
5. Calculate APR separately for Low Buy, High Sell, and interest collection.

5.2 APR Simulation Calculation

Although dual-currency APR combines the option premium-based “simple yield” with principal lock-in compensation, its value is still close to option APR. Therefore, we can approximate dual-currency APR using option pricing models.
Using the common approach, APR is calculated via Black–Scholes to estimate the theoretical Put price PPP (since selling a Put = buying a Put’s premium):

- Let Spot = S_0, Strike = K, Risk-free rate = r (≈0 for crypto), annualized implied volatility = σ, and time to expiration = T (in years).

$$APR \approx P / S_0 \times (365 / T)$$

$$P = Ke \wedge (-rT) * N(-d2) - S_0 * N(-d1)$$

$$d1 = \{ln(S_0 / K)+(r + \sigma \wedge 2 / 2) * T\} / (\sigma * T \wedge 0.5); d2 = d1 - \sigma * T \wedge 0.5$$

Similarly, for Call:

$$APR \approx P / S_0 \times (365 / T)$$

$$C = S_0 * N(d1) - Ke \wedge (-rT) * N(d2)$$

For easier table calculation, we use an industry-tested simplified model under the same IV and term:

$$Sell\ Put\ Premium \approx 7\% \times S_0 \times IV\ 30$$

$$Sell\ Call\ Premium \approx 4\% \times S_0 \times IV\ 30$$

Reason: BTC has a long-term bullish skew → Puts are more expensive, Calls cheaper; 5% OTM Calls are cheaper.
Simplified APR formulas:

$$Sell\ Put\ APR \approx (7\% \times S_0 \times IV30) / (0.95 \times S_0) \times (365 / 7)$$

$$Sell\ Call\ APR \approx (4\% \times S_0 \times IV30) / (1.05 \times S_0) \times (365 / 7)$$

5.3 Backtesting Results

Using these base formulas, we apply the previously defined trading rules, resulting in the following table:
Table: Dual-Currency Trading Strategy Backtest Results

Date	Market Cycle	Dual-Currency Strategy	IV30 Percentile	BTC Closing Price	Dual-Currency Strike Price	BTC Closing Price +7 Days	BTC Weekly Change	Swap Triggered	APR
2025/3/31	Sideways	Low Buy	82%	82,433	78,311	77,826	-6%	Low Buy	229%
2025/3/3		Low Buy	75%	90,892	86,347	81,044	-11%	Low Buy	227%
2025/1/13		High Sell	82%	93,055	97,708	104,630	12%	High Sell	131%
2024/12/30		High Sell	71%	93,387	98,056	100,160	7%	High Sell	117%
2024/12/23	Bull Market	High Sell	73%	94,752	99,490	93,387	-1%	Fixed Interest	119%
2024/12/16		-	75%	105,329	110,596	94,752	-10%	Fixed Interest	121%
2024/12/9		-	75%	98,511	103,436	105,329	7%	Fixed Interest	119%
2024/11/18		High Sell	78%	91,001	95,551	96,780	6%	High Sell	127%
2024/10/28	Sideways	High Sell	78%	68,632	72,064	68,506	0%	Fixed Interest	123%
2024/9/2		Low Buy	76%	58,256	55,343	55,704	-4%	Fixed Interest	227%
2024/7/15		Low Buy	82%	62,929	59,783	67,598	7%	Fixed Interest	254%
2024/5/13		-	71%	62,352	65,470	67,628	9%	Fixed Interest	113%
2024/4/29		High Sell	75%	62,788	65,928	63,941	2%	Fixed Interest	115%
2024/4/15	Bull Market	High Sell	90%	65,084	68,338	66,036	2%	Fixed Interest	143%
2024/4/8		High Sell	90%	71,106	74,661	65,084	-9%	Fixed Interest	143%
2024/4/1		High Sell	98%	69,784	73,274	71,106	2%	Fixed Interest	154%
2024/3/25		High Sell	98%	68,342	71,759	69,784	2%	Fixed Interest	152%
2024/3/18		High Sell	96%	67,815	71,206	68,342	1%	Fixed Interest	144%
2024/3/11		High Sell	98%	71,008	74,558	67,815	-5%	Fixed Interest	151%
2024/3/4		High Sell	100%	65,376	68,645	71,008	9%	High Sell	159%
2024/2/26		High Sell	98%	52,356	54,974	65,376	25%	High Sell	142%
2024/2/19		High Sell	71%	52,156	54,764	52,356	0%	Fixed Interest	109%
2024/2/12		High Sell	80%	48,776	51,215	52,156	7%	High Sell	113%
2024/1/8		High Sell	71%	44,894	47,138	42,652	-5%	Fixed Interest	111%
2024/1/1		High Sell	98%	42,846	44,989	44,894	5%	Fixed Interest	141%
2023/12/25		High Sell	96%	43,402	45,572	42,846	-1%	Fixed Interest	127%
2023/12/18		High Sell	78%	41,433	43,505	43,402	5%	Fixed Interest	115%
2023/12/4		High Sell	71%	41,433	43,504	41,995	1%	Fixed Interest	109%
2023/11/6		High Sell	76%	35,030	36,782	36,928	5%	High Sell	116%
2023/10/30		High Sell	80%	34,467	36,190	35,030	2%	Fixed Interest	119%

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Based on the condition IV Percentile > 70%, a total of 30 high-volatility trading days have been identified since 2023. Among these:

- **2023:** 5 days concentrated within the year.
- **2024:** 22 days spread throughout the year.
- **2025:** 3 days in early January.

This distribution reflects the differences in Bitcoin market volatility structures across different years.
Mapping these 30 days back to bull and sideways markets, the distribution is as follows:

- **Bull Market:** 21 days in total. Among them, 19 days had prices above MA100 + 2σ, indicating extremely high market activity, with clear signals to execute the High Sell strategy. Only 2 days fell outside this threshold and were not traded.
- **Sideways Market:** 9 days in total. Among these, 4 days had prices below MA100 − 1σ, suitable for Low Buy; 4 days were above the moving average, suitable for High

Sell; 1 day remained near the moving average, showing no directional advantage, so no trade was executed.

Based on these rules, a total of 9 actual swaps occurred: 2 Low Buy purchases of BTC and 7 High Sell sales of BTC. Sideways markets contributed 4 swaps (2 Low Buy, 2 High Sell), while bull markets contributed 5 High Sell swaps. Remaining periods were settled with fixed interest.

Performance:

- APR ranged from 109% to 253%, reflecting a pronounced volatility premium characteristic.
- The Low Buy strategy earned higher APR than High Sell due to the downside risk exposure.
- Overall, the strategy produced a robust, logically consistent yield structure across different market cycles.

6. Conclusion

6.1 Strategy Evaluation

Overall, the backtest results of dual-currency investments across different market cycles largely matched expectations, further validating implied volatility (IV) as an effective quantitative entry signal. When IV is at a high percentile, option sellers can collect significantly higher risk premiums, improving the risk-reward profile of the strategy.
In sideways markets, the advantage of the selling strategy is most pronounced:

- During short-term pullbacks, Low Buy captures higher premiums.
- During breakout phases, High Sell locks in additional trend-based gains.

This creates a dual-yield structure: earning premiums + trend profits.
By contrast, in unilateral bull or bear markets, dual-currency investments have limited applicability:

- In bull markets, High Sell risks missing further upside.
- In bear markets, Low Buy may lead to passive BTC acquisition under continued downward pressure.

Hence, during strong trending periods, dual-currency investments are not the optimal strategy.

The trading rules in this study are designed for backtesting; actual implementation should combine technical indicators and macro signals to avoid strategy underperformance during trending markets. For example:

- In overbought conditions, continuously executing High Sell may be feasible.
- In oversold conditions, Low Buy combined with reinvestment strategies can enhance returns.

6.2 Strategy Improvement Directions

The current strategy still has significant optimization potential:

1. **Multidimensional IV Backtesting:** Categorize entry conditions into High IV / Neutral IV / Low IV, calculate average returns and win rates, and analyze sensitivity to IV changes.
2. **Time Structure Optimization:** Compare returns across different terms (e.g., 7D vs. 30D) in bull, bear, and sideways markets, while considering the impact of volatility curve steepness on premiums.
3. **More Flexible Target Prices:** For Low Buy, test multiple strikes from 0.90–0.97 × S_0; for High Sell, test 1.03–1.10 × S_0. Combine different terms (e.g., 1D with 0.98 × S_0, 3D with 0.97 × S_0) to create a parameter space with a more balanced risk-reward profile.

Overall, this study validates the dual-factor framework of “IV-based entry + market cycle directional decisions” and provides clear directions for future strategy refinement and optimization.

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