# Measuring Risk in Crypto Options

## Market Study on Crypto Options Risk

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MerQube

Kaiko

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## Introduction

As of 2026 the Bitcoin options market runs on two parallel tracks. The first is the crypto-native market, where options trade directly on BTC around the clock. The second is the regulated US market, where options on spot Bitcoin ETFs give traditional investors Bitcoin exposure through familiar infrastructure. That structure broadens access but also adds a derivative layer, as the underlying is the ETF, not BTC itself.

Deribit (acquired by Coinbase in 2025) dominates that crypto-native first segment, as it had a first mover advantage of eight years. Launched in 2016, Deribit holds the largest share of global BTC options volume and open interest. While the platform runs 24/7 with no calendar restrictions, US traders and residents of the UK and Canada are excluded entirely from accessing it.

Options on BlackRock's iShares Bitcoin Trust ETF (IBIT) dominate access for traditional investors. Launched on Cboe in November 2024, the underlying is the Nasdaq listed ETF, which means strike prices are quoted at the ETF level and require conversion to BTC equivalent for direct comparison with options data from Deribit.

## Comparing Crypto Native and ETF Options

Options on BlackRock's iShares Bitcoin Trust went live on November 19, 2024. Within 24 hours, open interest stood at 271,000 contracts worth $1.5bn. Three weeks later it crossed the $10bn threshold. This speed of adoption had no precedent in crypto derivatives.

The growth trajectory tells us the complete story. IBIT options hit $20bn in open interest by mid-May 2025, $30bn by mid-July, $40bn by mid-September, and $50bn by early October. At the peak on October 9, open interest reached 7.8mn contracts worth $53.3bn. For context, ProShares' futures-based BITO ETF accumulated over 7mn trades across its entire three-year lifespan, whereas IBIT surpassed that volume in months.

Call interest dominated from day one, but the composition evolved. The call-to-put ratio started above 4.3:1 in the first week of trading, and by mid-2025 had compressed to roughly 2:1, before settling around 1.8:1 at year end. That compression signals a maturing market. Early activity was directionally bullish, and as the product scaled, hedging demand caught up.

The expiry structure expanded alongside participation. At launch, IBIT listed 13 expiries across 5 time buckets, the time buckets being: less than 2 weeks, 2-6 weeks, 6-10 weeks, 10-16 weeks and greater than 16 weeks. By May 2025, that had grown to 24, with the number of expiries beyond 16 weeks rising from 3 to 11. This matters for institutional users as longer-dated options allow for portfolio insurance and structured products that shorter tenors cannot support.

The analysis of open interest by expiry bucket confirms this. The share of OI in the longest bucket (>16 weeks) ranged between 15% and 43% over the period, frequently rivalling or exceeding shorter-dated buckets. Open interest for longer tenors can run as high or sometimes higher than shorter durations. This is not just short-term speculation. It points to medium-term risk taking and tail risk hedging by institutional participants.

The December 2025 expiration brought the expected year-end unwind. Open Interest fell from a November peak of roughly $49bn (7.9mn contracts on October 31) to $33.7bn (6.8mn contracts) by year-end. Both the magnitude and the pattern mirror what happens on Deribit around quarterly expiries. The December drop was not unique to IBIT.

Other spot ETF options have not kept pace. Activity on Fidelity's FBTC and Grayscale's GBTC remained flat through 2025, creating a lopsided market where IBIT is the only ETF product with enough liquidity to reliably extract pricing signals. For the purpose of this report, all ETF options analysis refers to IBIT.

### Market Structure and Specifications

IBIT options and Deribit's BTC options share the same underlying exposure but differ in their specifications. Deribit lists European-style options, exercisable only at expiration, with monthly expiries falling on the last Friday of each month. By contrast, IBIT options are American-style options, exercisable at any time before expiration, with monthly expiries on the third Friday. IBIT options tend to have daily and weekly expiries as well which allows precise hedging and position taking for the investors. In addition, Deribit settles in BTC, whereas IBIT options settle in shares of the ETF, denominated in USD.

**Exhibit 1: Option Contract Details for BTC and IBIT**

| | DERIBIT BTC-USD | IBIT |
|---|---|---|
| Underlying | Bitcoin | IBIT Shares |
| Option Type | European | American |
| Contract Size | 1 BTC | 100 IBIT Shares (0.057 BTC) |
| Min & Max Size | 0.1 BTC and no max | 1 and 250,000 Contracts |

These structural differences have practical consequences for risk measurement and liquidity. European options have cleaner pricing models because early exercise is not a factor. The structure leads to clustering around monthly expiries, particularly the front month, which creates consistent and predictable liquidity.

American options require additional assumptions, particularly around timing and carry costs. The mismatch in exercise style means volatility surfaces derived from each venue are not directly comparable without adjustment.

Trading hours create another major divergence: Deribit operates 24/7, 365 days a year, whereas IBIT follows CBOE's schedule, closing for U.S. holidays and weekends, which produces brief pricing dislocations around market closures. For example, during Martin Luther King Jr. Day closure in January 2025, BTC hit a record level of around USD 109k and developed an inverted term structure for its implied volatility[1], which lasted for a short period. CBOE was closed during this period and this inversion was not reflected in IBIT implied volatility. The front-month IBIT options were not trading while crypto-native markets continued to price.

## Options Market and Open Interest Trends

BTC open interest on Deribit has grown in stages since 2023. This started from a low base that remained relatively flat until 2024, where peaks began to climb. By 2025, OI was setting new records with each cycle, building through monthly expirations and resetting lower before climbing again.

The December 2025 expiration was the high-water mark. Open interest peaked near $50bn heading into year-end, then dropped to $20bn as the largest single expiration in Deribit's history cleared the books. The scale of that drop confirms how much activity had accumulated in longer-dated positions. When those positions expired, the unwinding was sharp.

IBIT's growth trajectory mirrored Deribit's cyclical pattern but at a significantly accelerated pace. IBIT grew from zero to $53.3bn at peak in under a year, but this growth was not linear: it followed a staircase pattern, with OI building through each monthly cycle and resetting lower after expiry rollovers before climbing again. Starting from zero in November 2024, open interest crossed $20bn by summer 2025, then $30bn, before peaking above $50bn in October. After that peak, OI settled back toward $35bn. This post-peak stabilization reflects a more measured market. Early participants were directionally bullish and building exposure. The cohort that replaced them is hedging, managing duration, and sizing positions more conservatively.

Both venues grew structurally through 2025, but the character of that growth differed. Deribit's expansion was gradual, built over years, with deep roots in crypto-native institutional flow. IBIT's was explosive, compressed into twelve months, driven by new entrant demand. The December reset at both venues shows how aligned the two markets have become: the same macro calendar, the same year-end unwind, but different participant bases executing it.

While calls dominated on both venues, the dynamics differed. On IBIT, the call-to-put ratio compressed from 4.3:1 at launch to 1.8:1 by December 2025. The early skew toward calls reflects the directional bias of initial adopters. This gradual compression shows hedgers and structured product desks entering the market. During the April 7-11 tariff shock, the ratio dropped to 1.56:1, the lowest reading in the dataset, as put demand spiked.

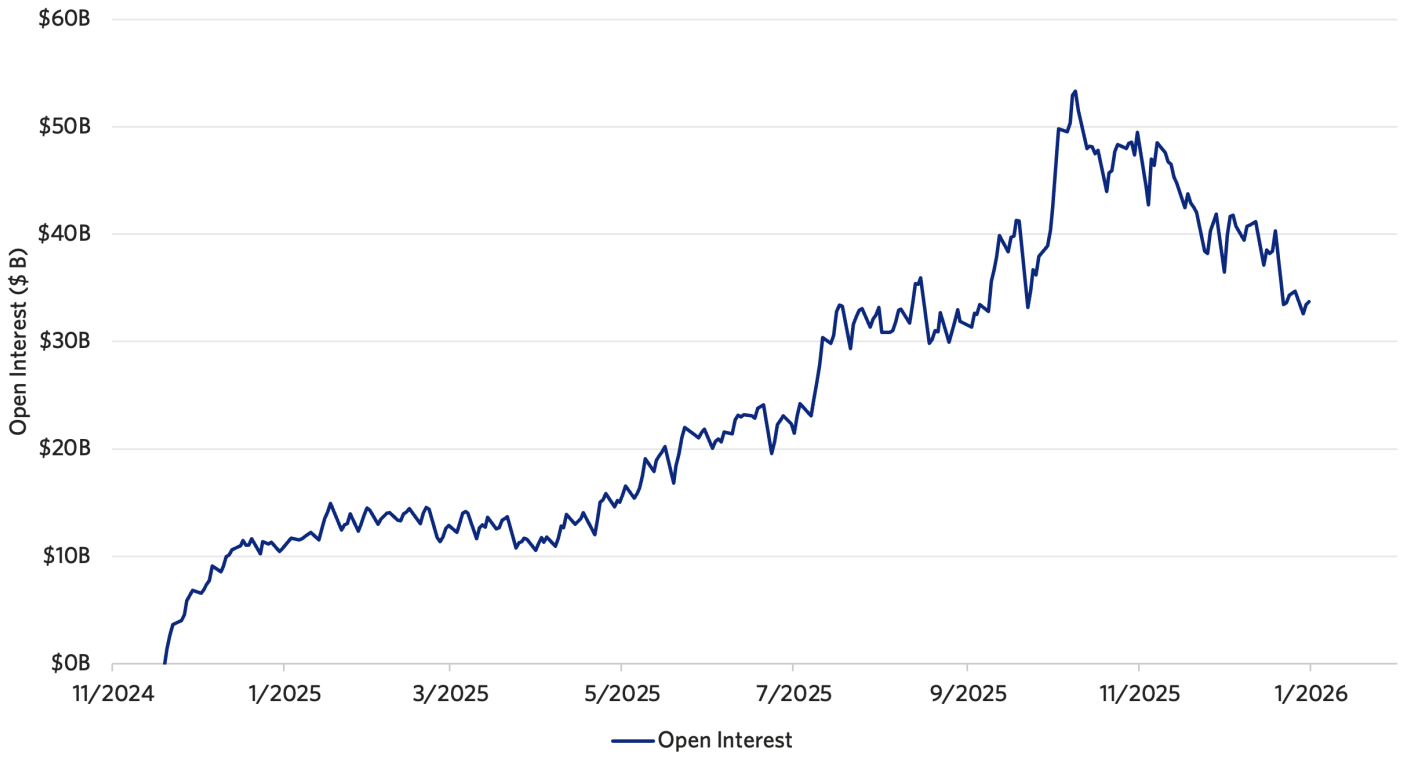
The expiry mix has also evolved during this period. Open interest in IBIT's longest-dated bucket (>16 weeks) routinely accounted for 30-40% of total OI. In late March 2025, it peaked at 38% of total notional. It suggests participants are using IBIT for strategic positioning, not just tactical trades.

[1] Kaiko's Data Debrief, "Why IBIT Options Traders Paid a Premium for Protection", September 29, 2025.

## Exhibit 2: BTC-USD Daily Open Interest on Deribit in USD

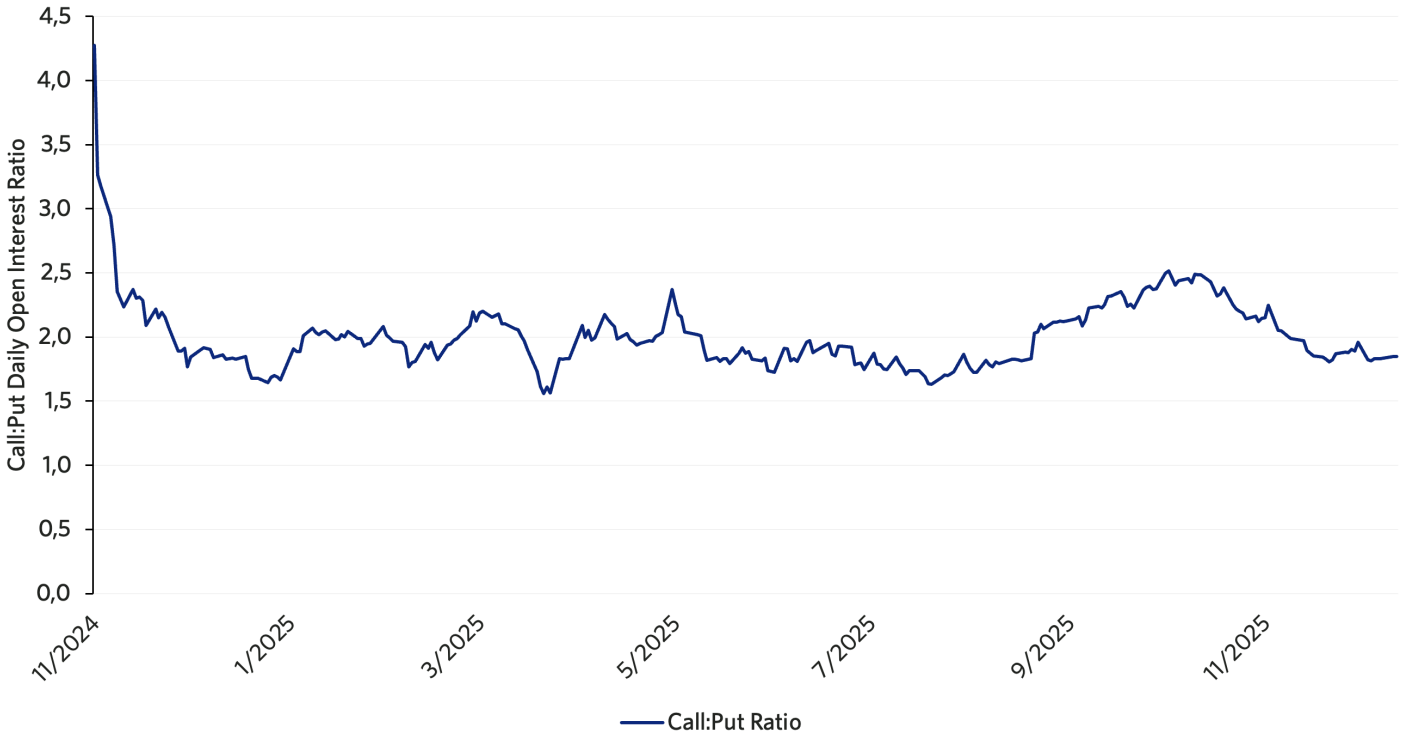

Source: Kaiko

## Exhibit 3: IBIT Daily Open Interest in USD



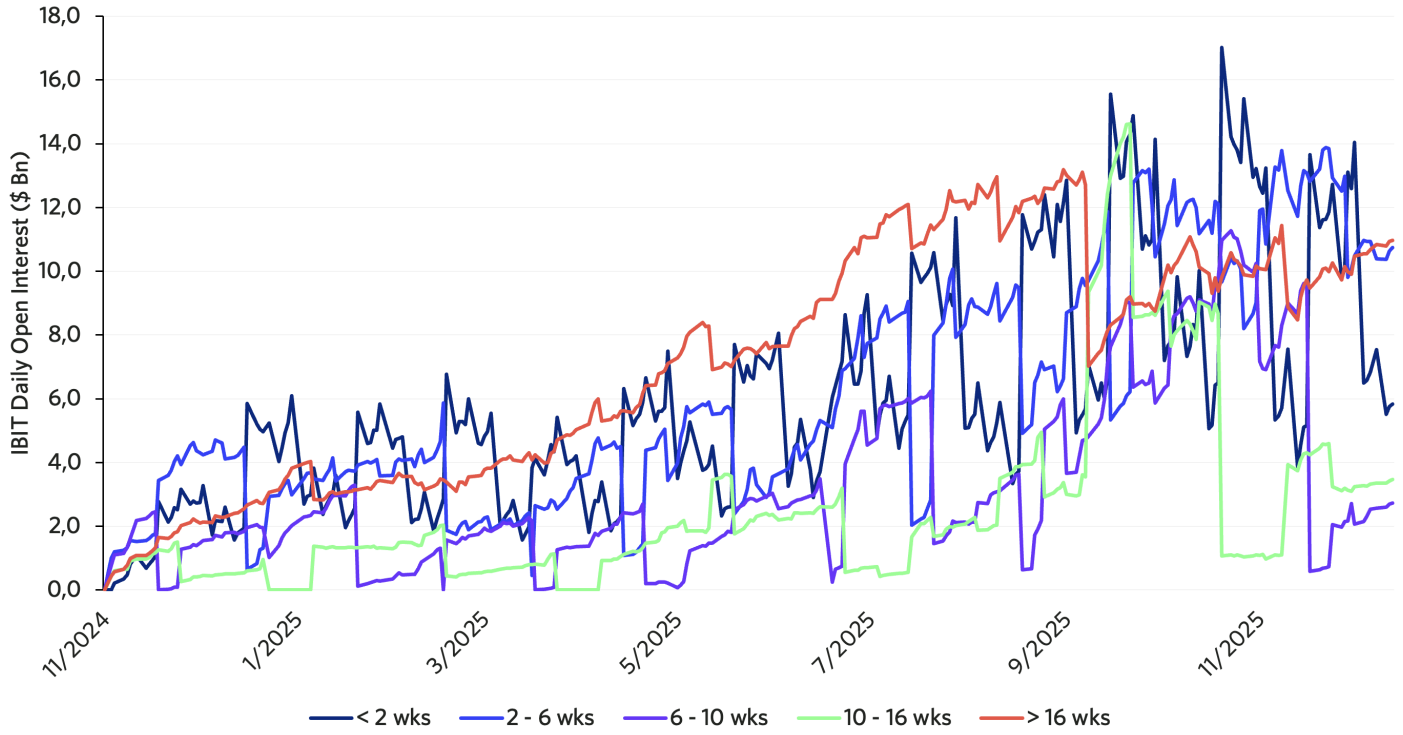

Source: MerQube

**Exhibit 4: IBIT Call:Put Daily Open Interest Ratio**




Source: MerQube

**Exhibit 5: IBIT Daily Open Interest split by Expiry Bucket (Notional in $ Bn)**




Source: MerQube

## Retrospective on the Main Market Highlights in 2025

The year 2025 was not a clean bull run. It was macro-driven as sentiment whipsawed, and occasionally brutal. The April US tariff announcement - colloquially termed 'Liberation Day' - hit crypto like a traditional risk asset and BTC sold off sharply alongside equities. Rotations

between BTC, altcoins, and stablecoins followed within hours as participants repositioned around shifting liquidity expectations. At the same time, the call-to-put ratio on IBIT fell to its lowest reading in the dataset, and the options market had priced the shock before most analysts had named it.

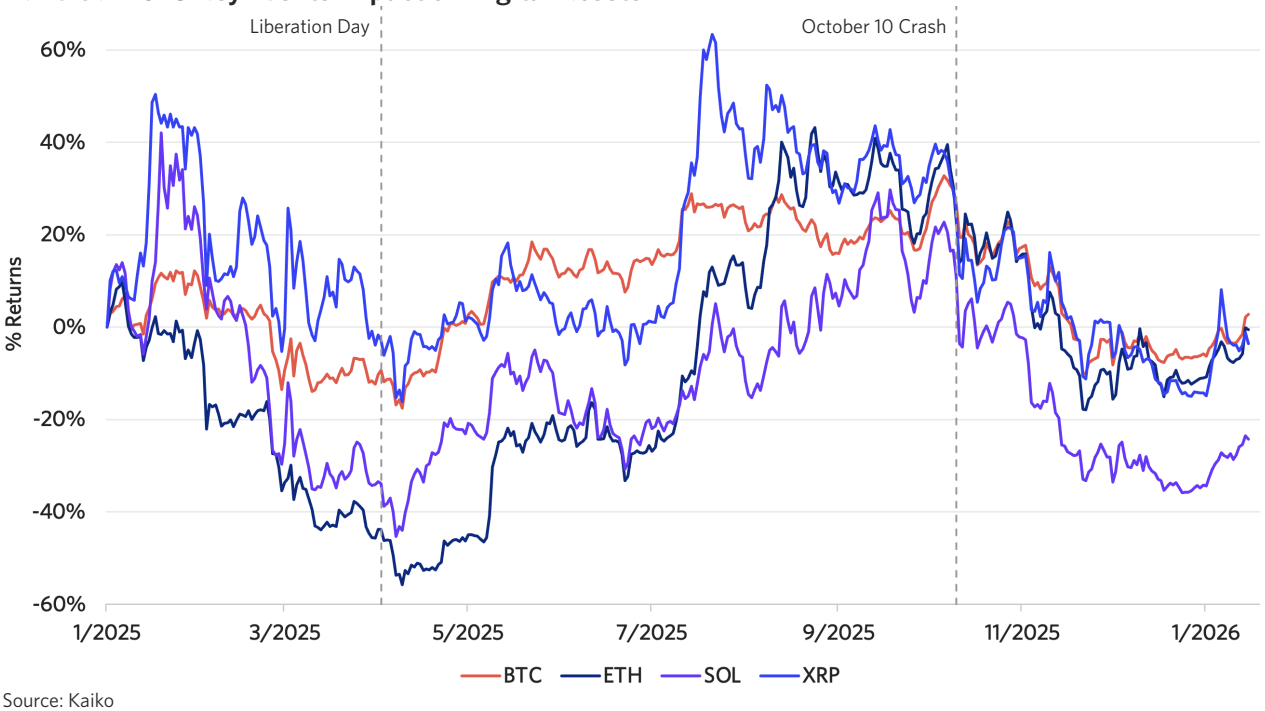
BTC's path to new all-time highs above $120k was not a straight line; it was a staircase - sharp rallies followed by consolidation, each step driven by new entrant demand and deepening market structure. The ascent was real, but so was the fragility underneath it.

The October 10th crypto liquidation cascade, also known as the "10/10 crash", illustrated that perfectly. The catalyst was limited, but the trigger was amplified into a cascade of liquidations that widened spreads and forced a sharp price reset, ultimately pushing the market back toward more defensive positioning. Thus, BTC was able to reach prices exceeding $120k but ended the year 2025 with an overall negative performance.

**Exhibit 6: BTC-USD Price in 2025**


Source: Kaiko

**Exhibit 7: 2025 Key Events Impact on Digital Assets**




Source: Kaiko

## Features of IBIT Options

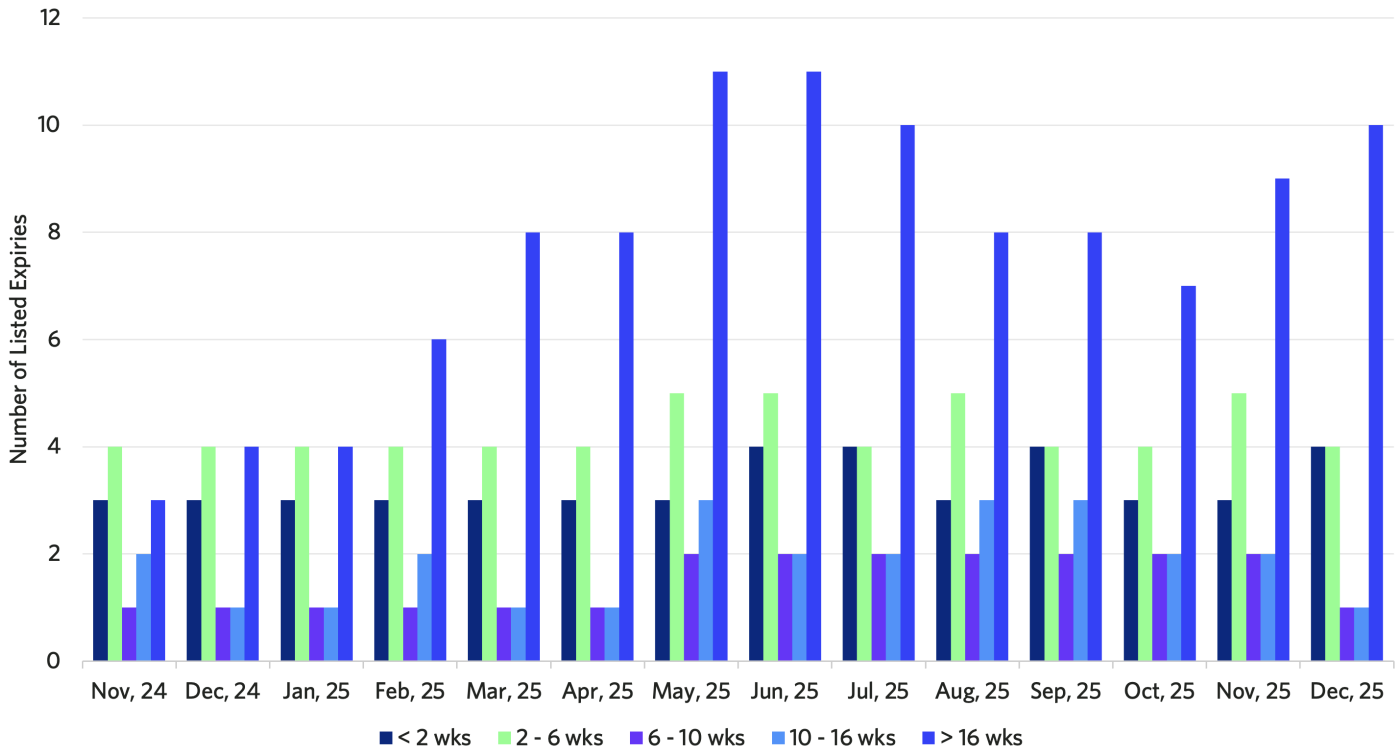
The IBIT maturity curve lengthened substantially between November 2024 and December 2025. At launch, the product was short-dated by design: short maturities drove activity, while longer expiries were listed but thinly used.

Building on that early short-dated profile, the market began to shift in spring 2025. Long-dated listings, particularly those beyond 16 weeks, accelerated sharply and became the primary driver of growth in total listed expiries (Exhibit 8). By year-end, as shown earlier in Exhibit 5, long-dated OI was a structural feature of the market, not a footnote.

At the same time, short-term activity intensified. In IBIT options with less than 2 weeks to expiry, both open interest (Exhibit 9) and volume (Exhibit 10) climbed through 2025, with calls running consistently ahead of puts (Exhibit 11). More open positions, more trading activity, and more directional bullish exposure were all prominent at the front end of the curve. IBIT options were simultaneously used for long and short positioning as distinct participant groups in the market used the same product for very different purposes.

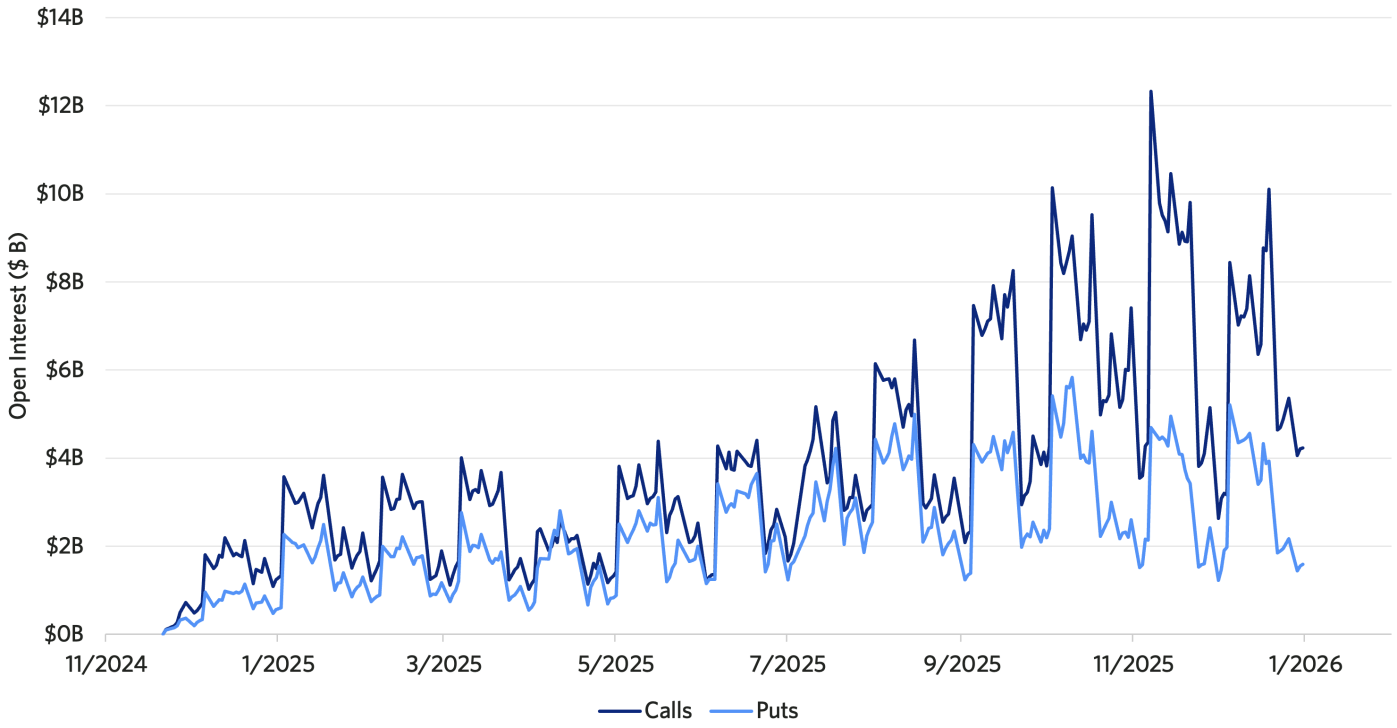
An interesting development was seen in the listing of strikes for IBIT options. At the start of 2025, call options had a maximum strike around 200% of the spot. By the end of the year, this improved to a maximum strike of 250% of the spot (Exhibit 12). In contrast, put options were initially listed at up to 25% - 50% of the spot which changed to 10% in March and finally ended the year at just above 0% (Exhibit 13). This indicates the demand from institutional users for deep tail hedges on an underlier that had experienced volatility in excess of 50%.

**Exhibit 8: IBIT - Evolution of Listed Expiry**



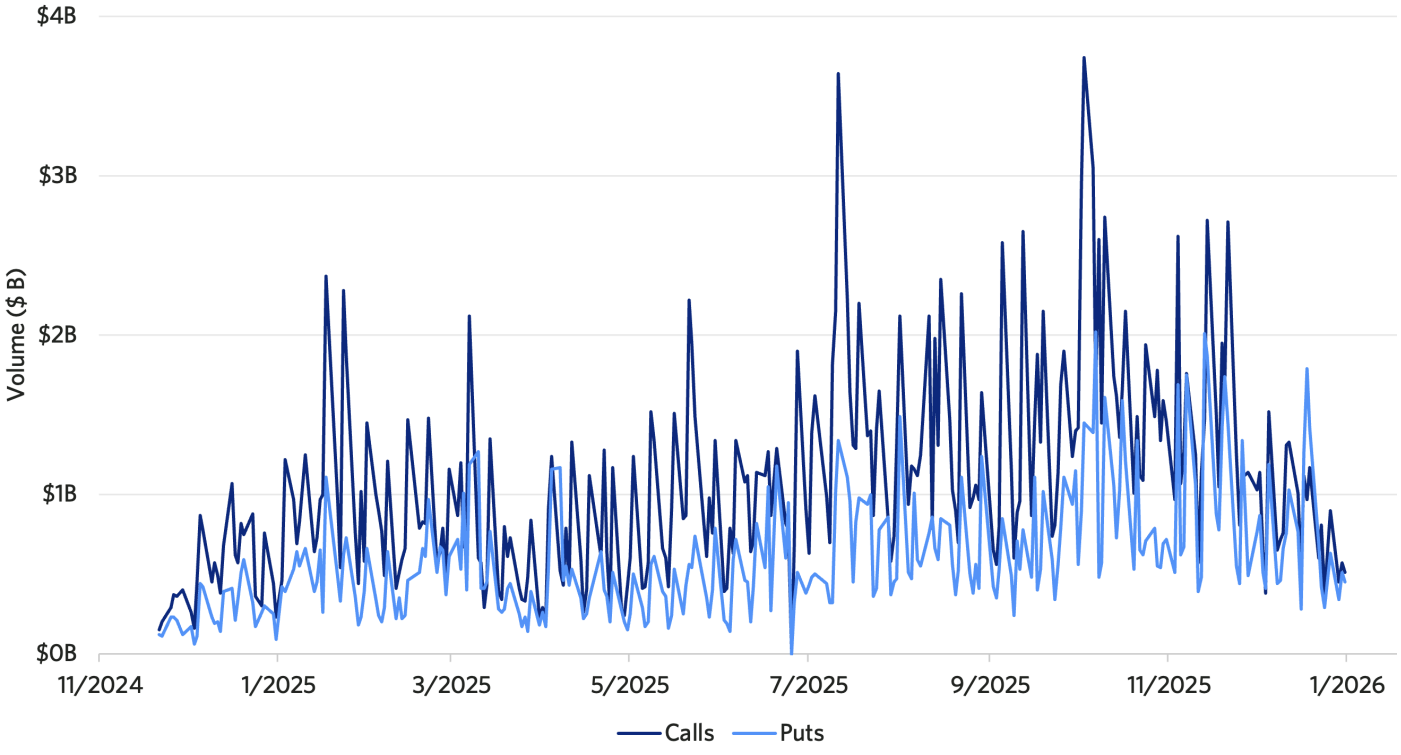

Source: MerQube

**Exhibit 9: IBIT Daily Open Interest Split by Calls and Puts for < 2 weeks Expiry**



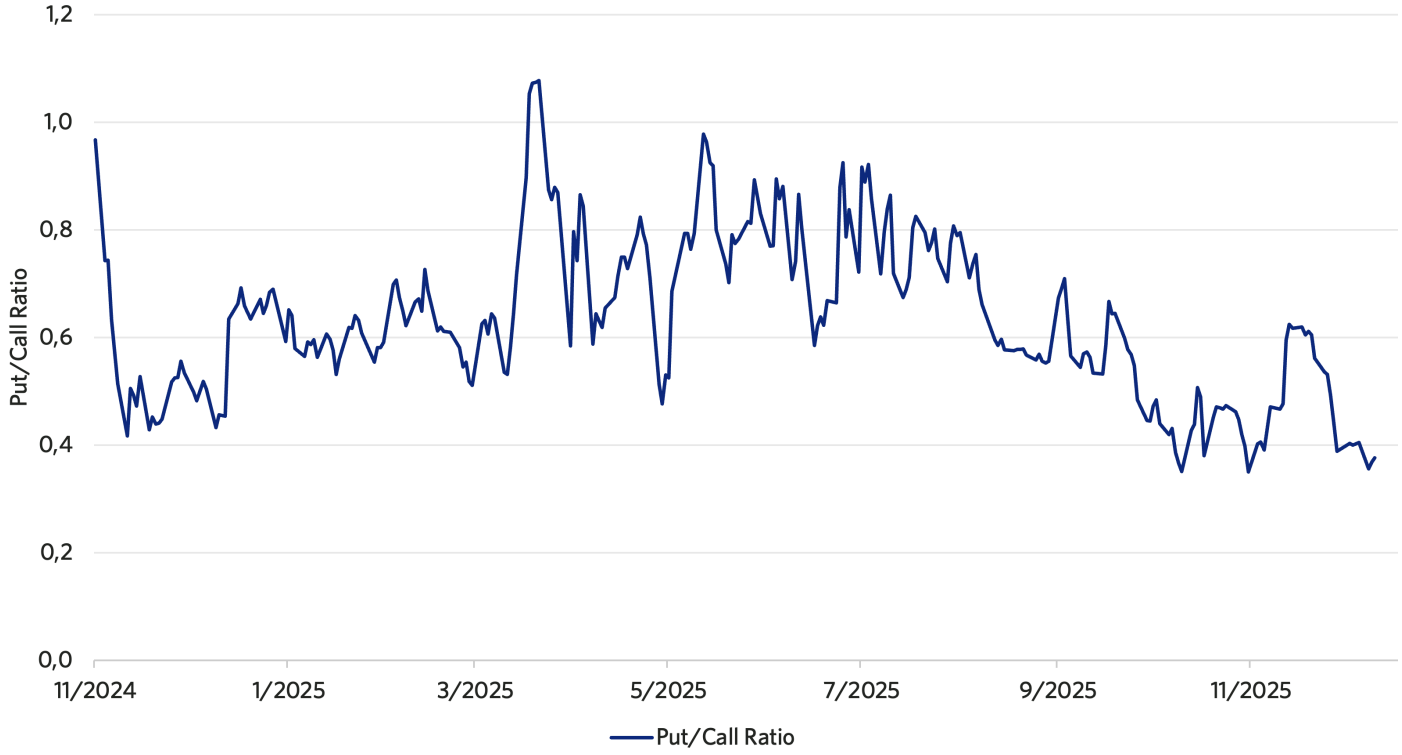

Source: MerQube

**Exhibit 10: IBIT Daily Volume Split by Calls and Puts for < 2 weeks Expiry**



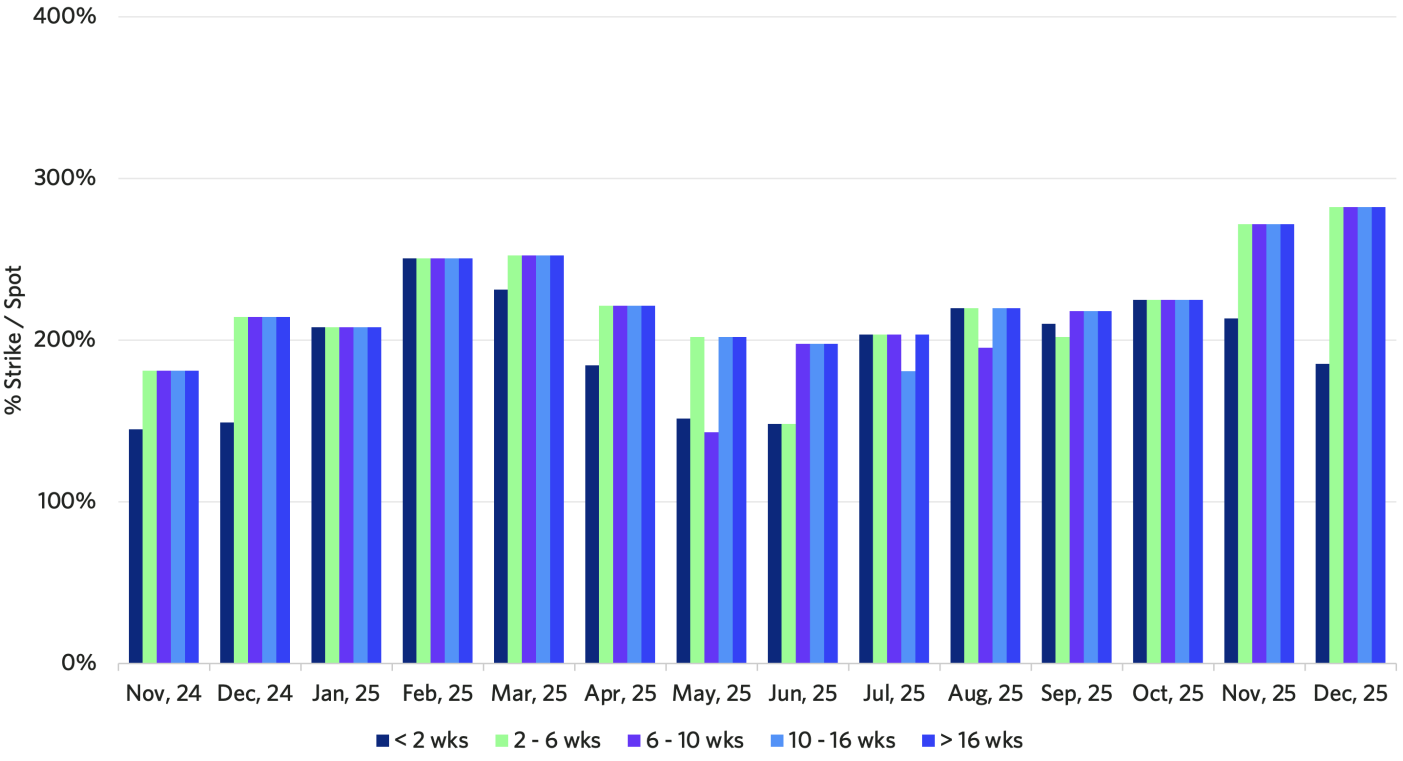

Source: MerQube

## Exhibit 11: IBIT Daily Open Interest Put/Call Ratio for < 2 weeks Expiry



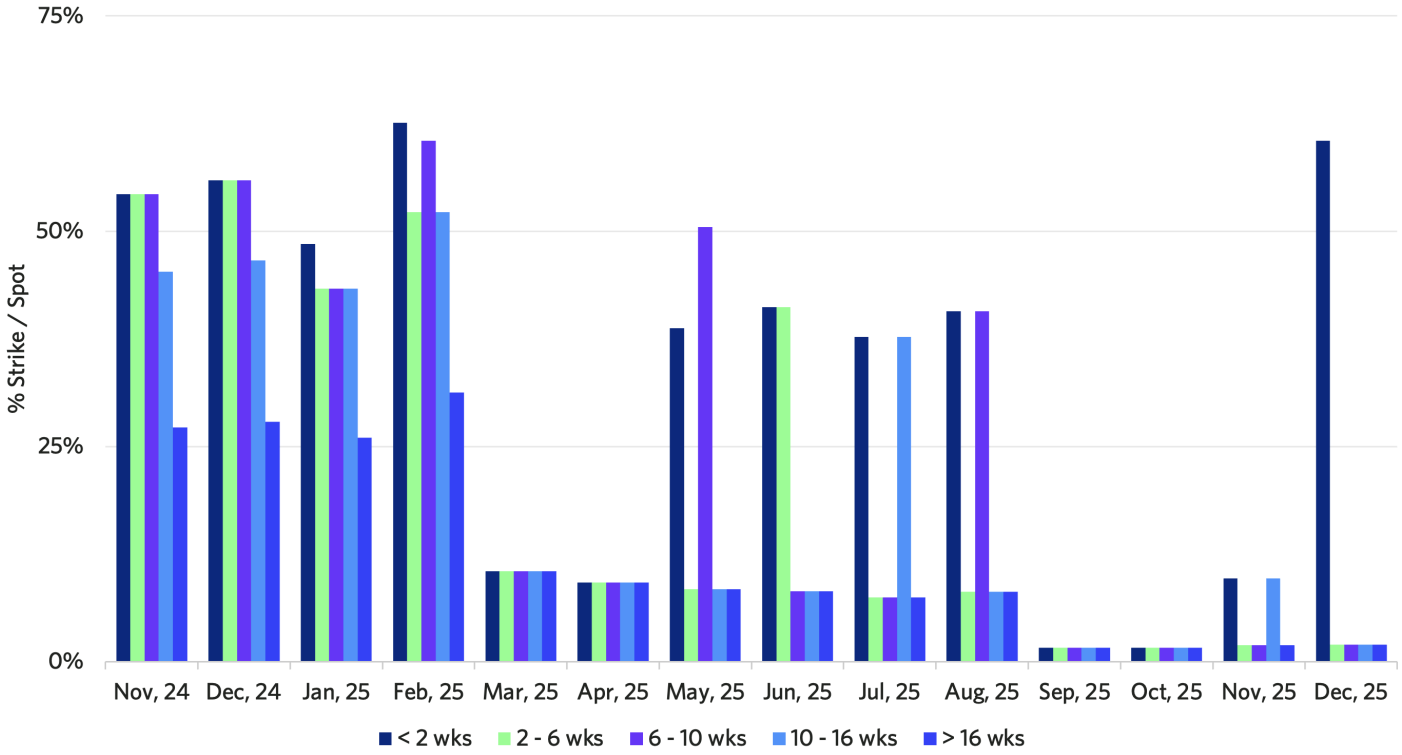

Source: MerQube

## Exhibit 12: IBIT Highest Listed % Strike for Call Options




Source: MerQube

**Exhibit 13: IBIT Highest Listed % Strike for Put Options**




Source: MerQube

# Pricing Risk Across These Markets

## Comparing Volatility Surfaces

The volatility surface is the market's best estimate of future risk across strikes and tenors. By comparing surfaces on IBIT and BTC for the same monthly expiry, measured on the same pricing date, we can isolate how 2 different pools of participants price risk on the same underlying asset.

Both venues use the same ultimate reference: Bitcoin spot measured in US Dollars. To establish a like-for-like comparison, we measure the implied volatility surface as of the last Friday of each month, with options expiring on the last Friday of the following month. This ensures we compare the most liquid BTC expiry on Deribit with an equivalent listed expiry on IBIT. For each of readability, these are referred to as 1-month expiries.

Several technical points are worth noting. Although IBIT's standard monthly expires fall on the third Friday, it also lists options for the last Friday, which enables this comparison. BTC options date is sourced at 4pm Eastern Time to match the IBIT closing window. The analysis in this section focuses on 1-month expiries; readers interested in analysis across other expiry tenors are invited to contact the authors.

In theory, at-the-money implied volatility should be nearly identical, and the data confirms this, as ATM vols tracked closely throughout the study period. In late June 2025, BTC ATM vol for the July expiry sat at 36.6%, while IBIT was at 37.3%, a 0.7 vol points gap. By late November 2025 for the December expiry, the spread was similarly tight: BTC at 44.7% and IBIT at 45.8%. That's intuitive: both markets are pricing variance on the same asset, so any persistent ATM gap would create a straightforward arbitrage. IBIT's American exercise style may contribute a slight early exercise premium (EEP) over BTC's European options, but any persistent gap beyond that would be arbitraged away. The real differences emerge in the wings, as described below.

## Three Phases of Skew

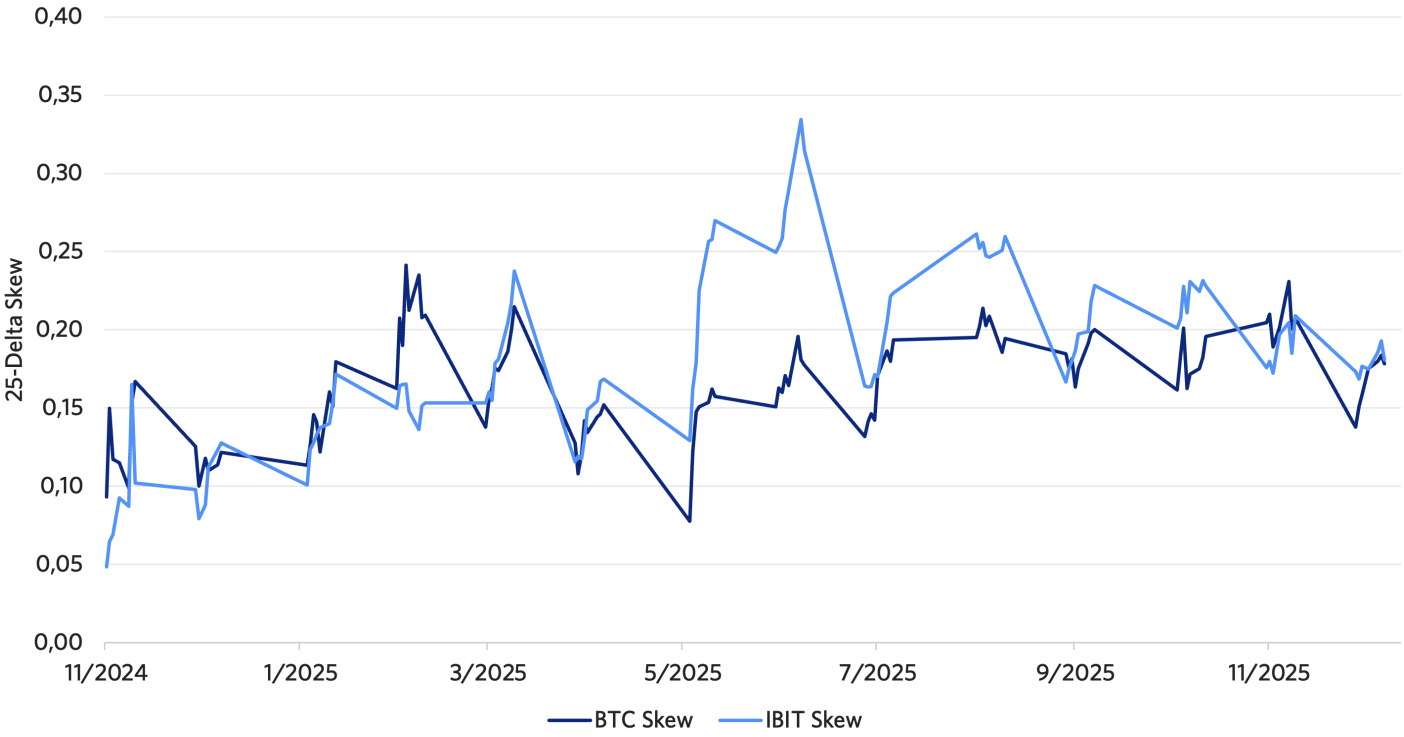
The 25-delta skew measures the difference in implied volatility between out-of-the-money puts and calls at the same delta for a given expiry[2]. A higher skew means the market is charging relatively more for downside protection. Across the full dataset, the monthly BTC skew averaged 16.6% with a range of 7.8% to 24.1%. IBIT averaged 18.2% with a range of 4.8% to 33.4%.

The averages are close, but the ranges aren't. IBIT's interquartile range (7.4%) was nearly 60% wider

[2] See Appendix for Skew definition.

than BTC's (4.7%), meaning that IBIT skew was more volatile, swinging more dramatically in both directions.

**Exhibit 14: Skew for BTC-USD vs IBIT**




Source: MerQube, Kaiko

This played out in three distinct phases:

**Phase 1:** IBIT skew below BTC skew (November 2024 through early March 2025). In the first months after launch, IBIT skew ran consistently below BTC skew, and the gap was significant. On November 25, 2024, IBIT skew was 4.8% versus BTC at 9.3%. By late February, BTC skew hit 24.1% while IBIT read just 16.5%. The widest single gap came on March 3: BTC at 23.5%, IBIT at 13.6%, a difference of 9.9% in BTC's favor.

This makes sense for a product that faced a significantly imbalanced demand in the initial days. As we established earlier in this paper, the participants trading IBIT options in those early months were directionally bullish (the 4.3:1 call-to-put ratio confirms this), and therefore skew was suppressed. In contrast, BTC with years of institutional put flow from crypto-native funds carried a more balanced demand.

**Phase 2:** IBIT skew surges above BTC skew (late March through early July 2025). The relationship inverted sharply in late March and accelerated through the second quarter. By late May, IBIT skew for the June 27 expiry had jumped to 22.5% while BTC sat at 15.1%. The differential widened even further through June and into early July. On July 1, IBIT skew hit its all-time high of 33.4% for the July 25 expiry. BTC skew on the same date read 18.1%, which at the time represented a spread of 15.4%. IBIT was pricing nearly twice the relative downside premium as BTC.

This was not a one-day anomaly. The entire June to early July window showed IBIT skew persistently above 25%, a level BTC skew never reached in the entire dataset. Convexity, as we will visit in the next section, provides the same story, with IBIT convexity peaking at 22.5% on July 1 versus BTC at 12.0%. The IBIT surface was not just steeper on the put wing, it was dramatically steeper.

This period coincided with the fastest growth phase for IBIT options, and several structural developments help explain the shift. In March, OCC and FDIC both allowed supervised banks to engage in permissible crypto-related activities without prior approval / non-objection, provided the risks were managed appropriately. By April, the number of listed expiries expanded as more monthly contracts were added (Exhibit 8). In July, cash-settled FLEX options on IBIT were listed - a meaningful change, because FLEX / custom tenors are far more usable for institutions than standard-chain products. Also in July, the SEC increased the contract position and exercise limit on

IBIT options to 250,000 contracts, up from 25,000, removing a constraint that had restricted institutional participation.

These changes drove wider adoption amongst institutional users who need to manage tail risk exposures in line with their regulatory and capital requirements. Open interest climbed from $23bn in late June to $33bn by mid-July. New institutional participants entering a product with significant volatility and high capital requirements bid up the cost of protection. Market makers on IBIT, operating within regulated capital frameworks, likely demanded higher premium on deep out-of-the-money puts than their crypto-native counterparts on Deribit. The result was a premium unique to the ETF venue.

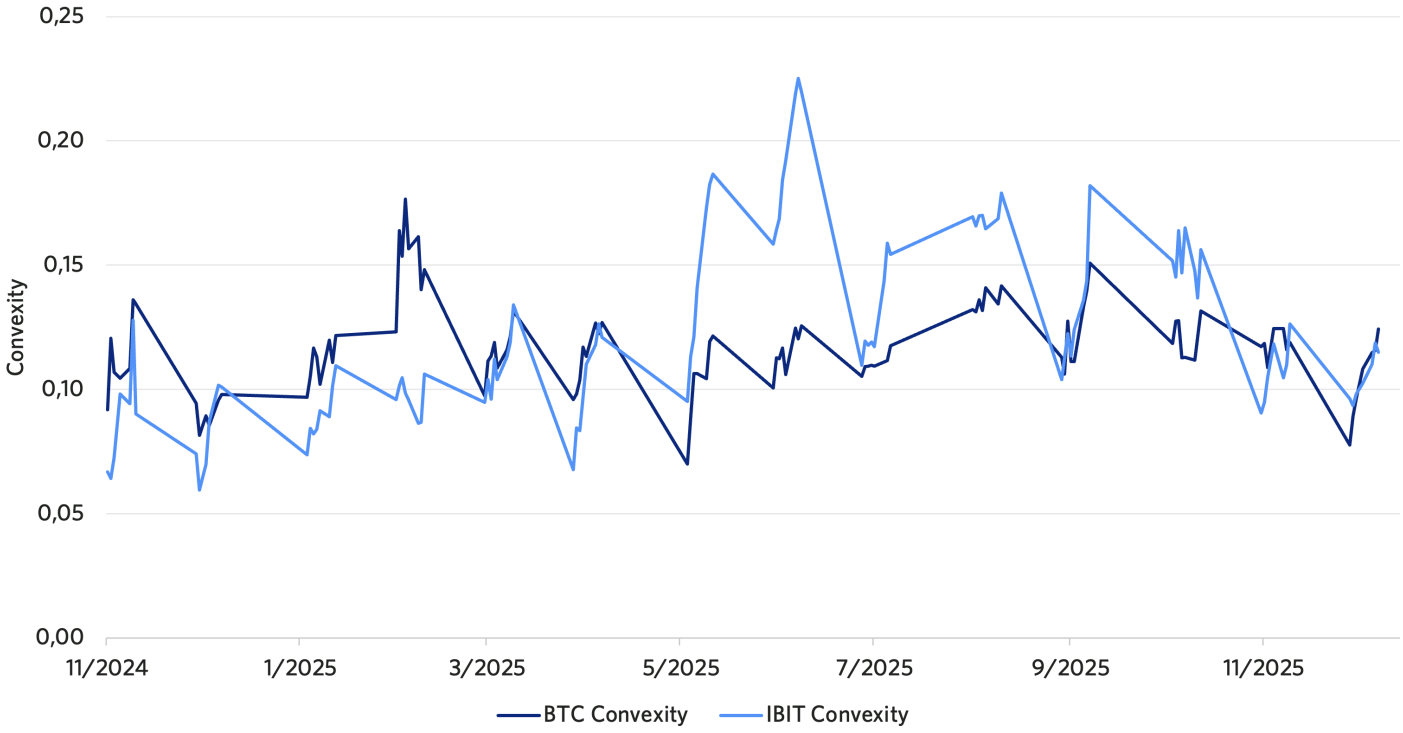
**Phase 3:** Convergence (August through December 2025). After the July peak, the gap narrowed. By late August, the skew differential had compressed to 5% from 7%. By late September, readings were nearly equal. On September 23, BTC skew was 17.6% and IBIT was 17.5% and on September 24, BTC read 18.2% and IBIT 18.0%, essentially indistinguishable.

The convergence deepened through the fourth quarter. For the December 26 expiry, IBIT skew actually fell below BTC skew, flipping back to the Phase 1 relationship. On November 24, BTC skew was 20.5% versus IBIT at 17.6%. On December 1, BTC was 23.1% versus IBIT at 20.5%. We can point to a couple of drivers for the change in skew positioning. The position limit increase to 250,000 contracts is a key driver for sudden convergence in August and September. Higher limits though initially encouraged more participation, but it also allowed larger positions for market makers, which meant more capacity on the put wing and less need to charge an outsized premium for tail risk. There is a reasonable likelihood that the events of "10/10 crash" also led to more crypto-native investors seeking protection in the BTC options market, leading to a higher BTC skew.

## Convexity and the Shape of the Smile

Convexity captures the curvature of the volatility smile[3]. Higher convexity means the wings are priced at a greater premium relative to at-the-money. Over the full period, IBIT convexity averaged 12.2% versus BTC at 11.7%. Close in aggregate, but the distribution was different. IBIT's range was 5.9% to 22.5%, while BTC's was 7.0% to 17.7%. Overall, IBIT convexity had a higher ceiling and a lower floor.

**Exhibit 15: Convexity for BTC-USD vs IBIT**

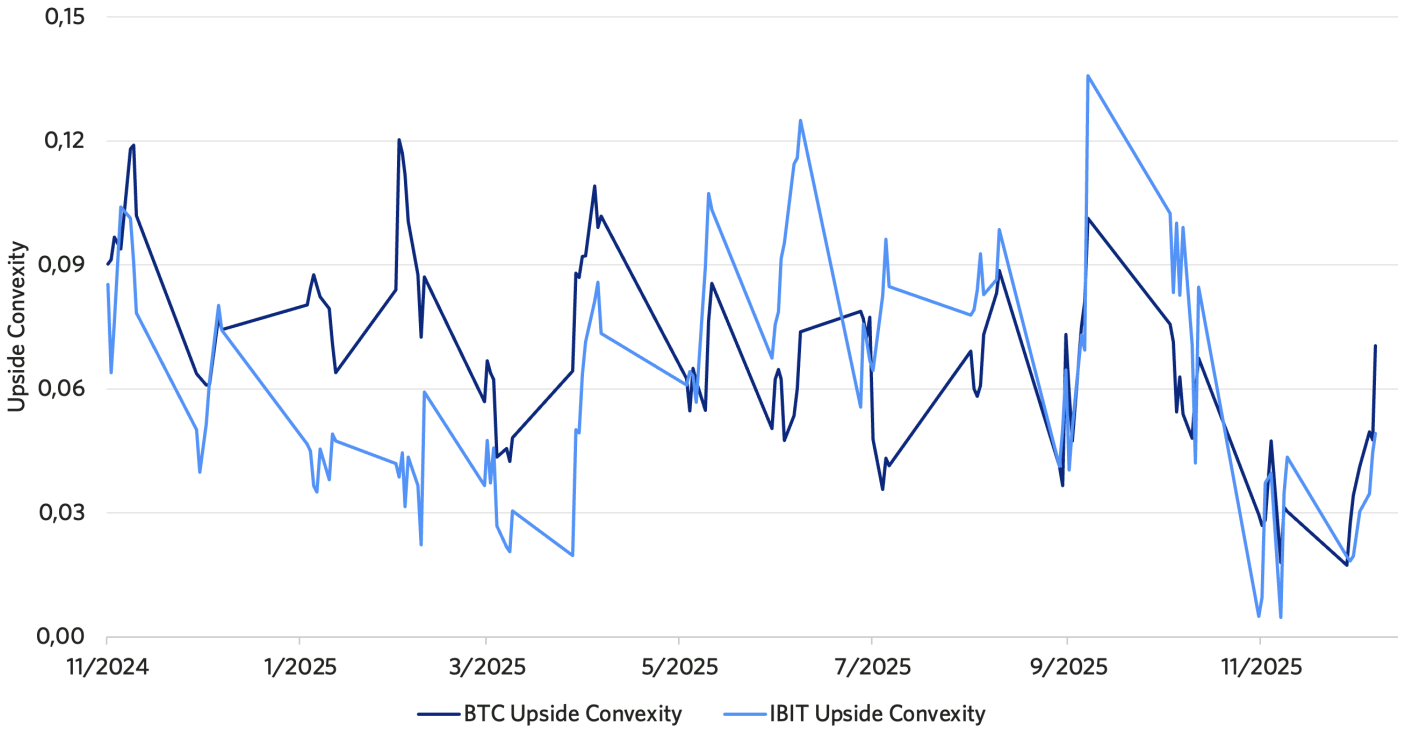



Source: MerQube, Kaiko

[3] See Appendix for Convexity definition.

Upside convexity[4], which isolates the call wing, showed a different pattern. BTC upside convexity averaged 6.8% versus IBIT's 6.2%. The BTC surface was noticeably steeper on the call side for the first half of 2025. This is consistent with the crypto-native market's structural long bias. Deribit participants have historically bid up out-of-the-money calls to capture asymmetric upside in Bitcoin. IBIT upside skew saw a sharp rise from May to July, coinciding with a higher skew and higher investor participation. Towards the end of the year, we see the upside convexity converge with IBIT convexity positioned slightly below BTC.

**Exhibit 16: Upside Convexity for BTC-USD vs IBIT**




Source: MerQube, Kaiko

This combination matters for risk measurement. IBIT surfaces showed higher downside convexity and lower upside convexity than BTC surfaces for most of the year. The smile was asymmetric in a way that favors institutional hedging behavior, showing aggressive pricing on crashes, and more modest pricing on rallies.

## What the Vol Surfaces Show Month by Month

The raw vol surface data supports these patterns visually. In the earliest observation (November 29 for the December 27 expiry, Exhibit 17), the IBIT surface covered a narrower range of moneyness and showed higher vols on the put wing than the BTC surface. IBIT's most extreme put-side point showed a vol of 122% at a moneyness of -0.62. BTC's equivalent point (also at -0.62) showed 97%. We can very clearly observe that IBIT had the steeper surface.

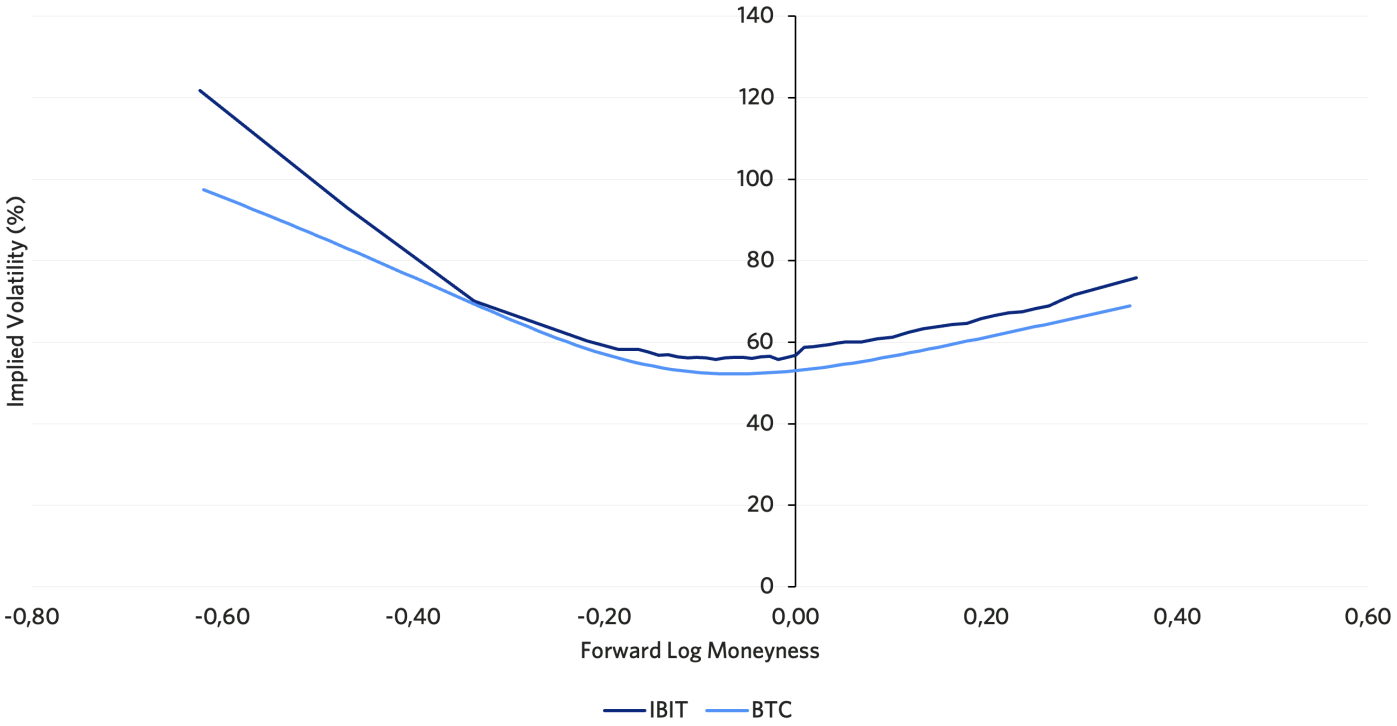
[4] See Appendix for Upside Convexity definition

By January 31 (Exhibit 18), the 1-month expiry surfaces began to converge at the money but diverge on the extremes. IBIT's put wing extended further, reaching -0.66 in moneyness with a vol of 108%.

In February (Exhibit 19), BTC fell 17.7% over the month, the sharpest single-month drawdown in the dataset. The triggers were mainly macro, the incoming US administration's early policy signals drove regulatory uncertainty, and a shift in SEC posture toward crypto added a second layer of repricing. By 28th February, both 1-month volatility surfaces had steepened on the put wing. Convexity on BTC reached its highest reading of the year, where it matched IBIT vol at ~ 83% for log moneyness of -0.47 but a lower ATM vol of 46.5% vs IBIT's 49.5%.

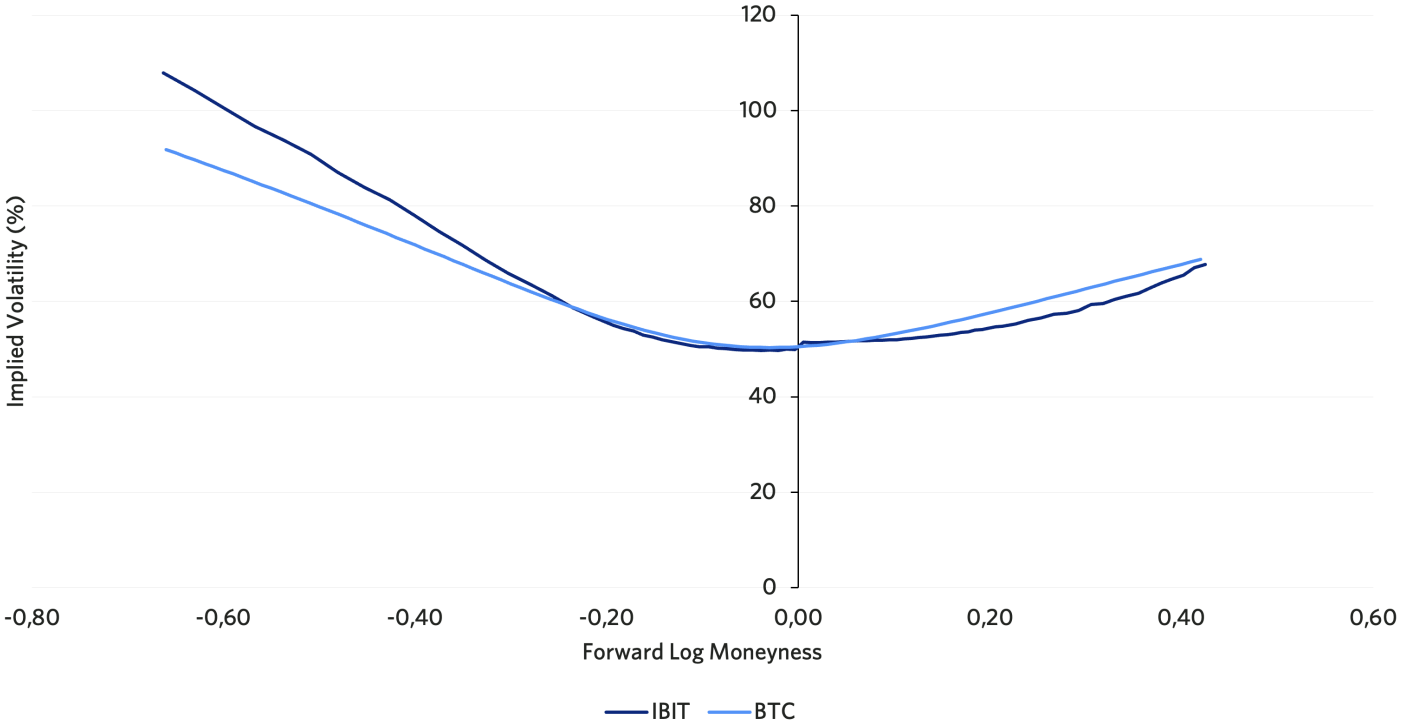
On June 27 (Exhibit 20), the 1-month volatility surface showed the widest divergence in the dataset. IBIT's put wing reached an implied volatility of 135% vs BTC's 91% for a log moneyness of -0.89. The IBIT surface was not just steeper, but had a fundamentally different shape, with far more curvature on the downside.

## Exhibit 17: 1-Month Implied Volatility Surface for BTC-USD vs IBIT, 29 November 2024



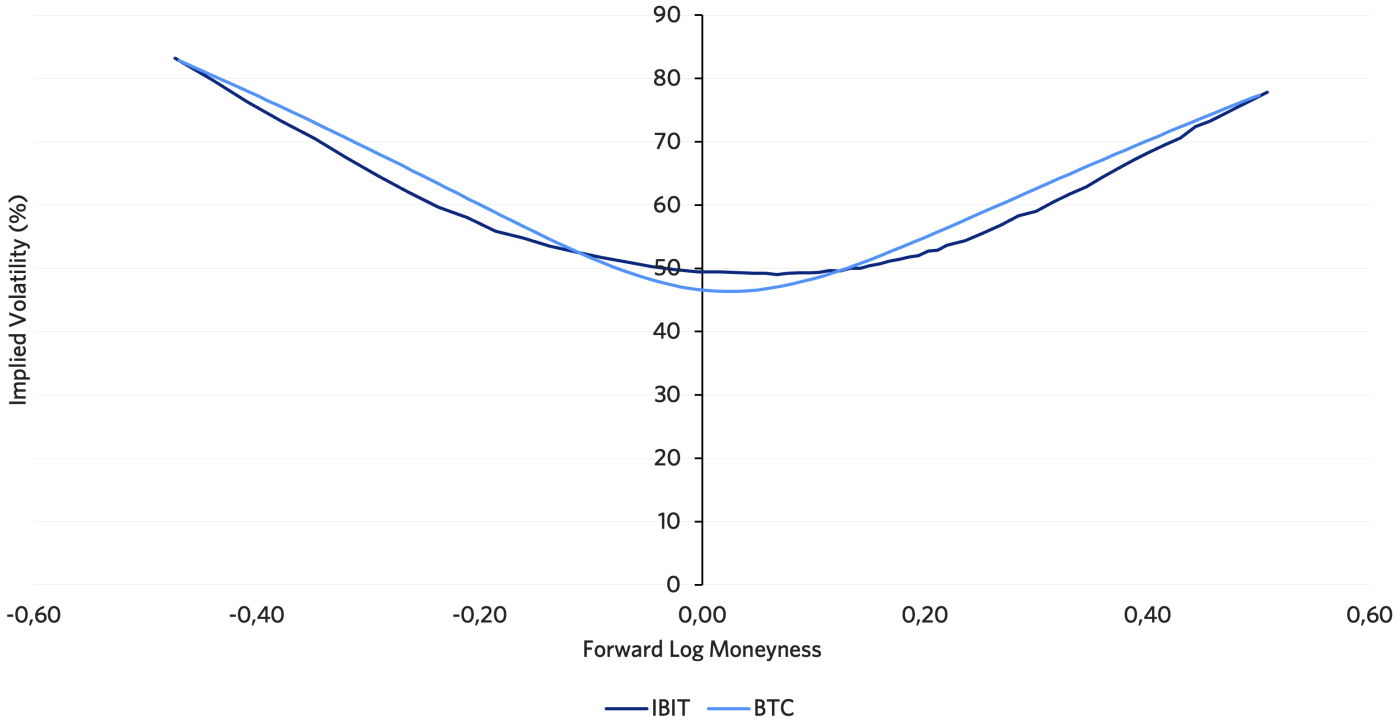

Source: MerQube, Kaiko

## Exhibit 18: 1-Month Implied Volatility Surface for BTC-USD vs IBIT, 31 January 2025



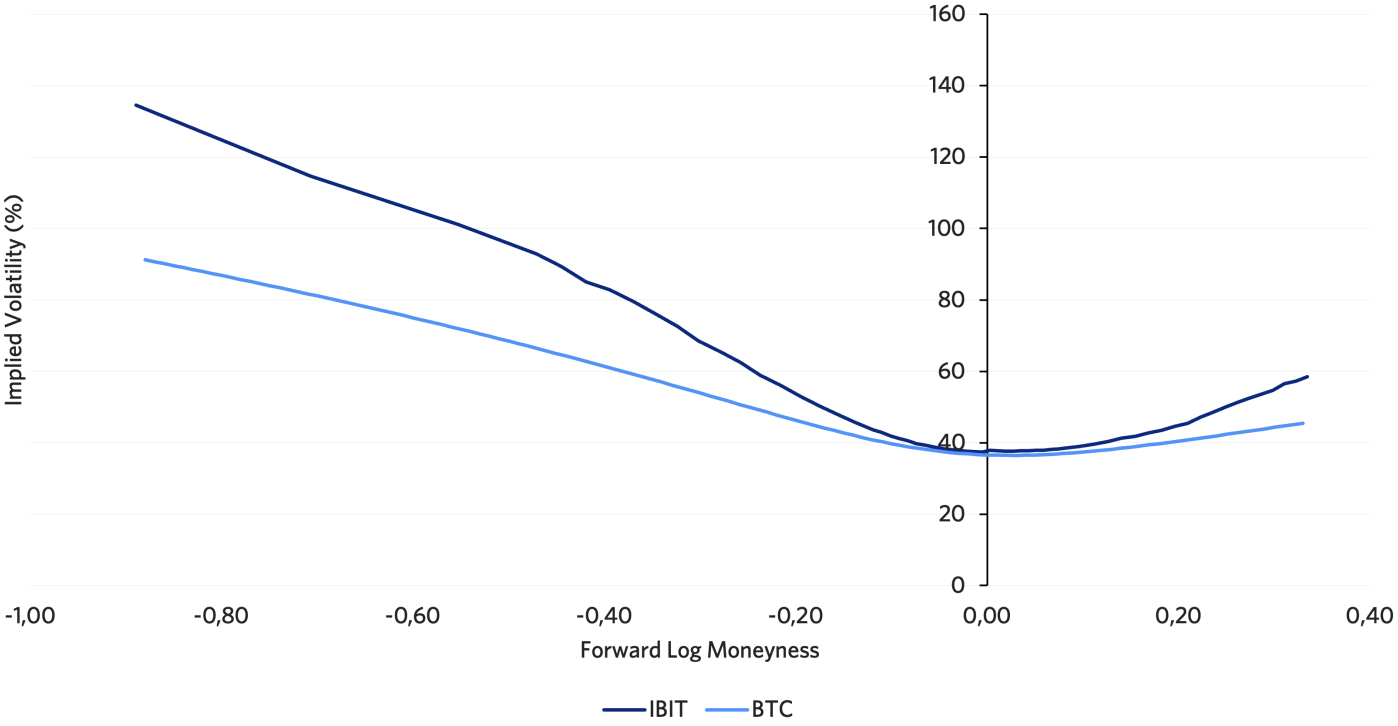

Source: MerQube, Kaiko

**Exhibit 19: 1-Month Implied Volatility Surface for BTC-USD vs IBIT, 28 February 2025**



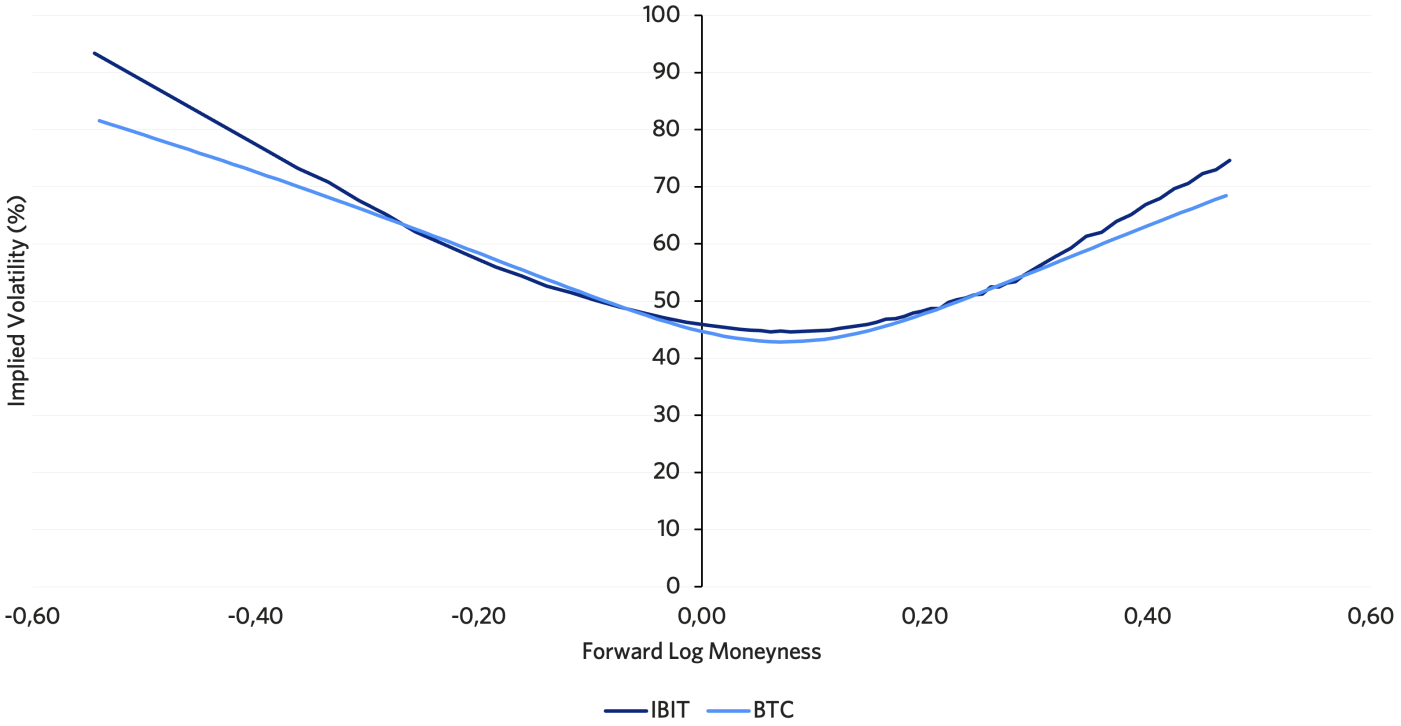

Source: MerQube, Kaiko

**Exhibit 20: 1-Month Implied Volatility Surface for BTC-USD vs IBIT, 27 June 2025**




Source: MerQube, Kaiko

**Exhibit 21: 1-Month Implied Volatility Surface for BTC-USD vs IBIT, 28 November 2025**




Source: MerQube, Kaiko

By November 28 (Exhibit 21), the 1-month surfaces had largely realigned. IBIT still showed slightly higher vols on the deepest put-side points (93% volatility versus BTC's 82% at log moneyness of -0.54), but the shapes were similar and the ATM crossover was tight.

## Implications for Risk Measurement

These patterns have practical consequences for anyone building risk models across venues. First and foremost, using Deribit-derived volatility surfaces as a proxy for IBIT risk would have significantly underestimated tail risk for much of 2025. The June-July period, when IBIT skew ran 15 points above BTC, would have produced materially different risk estimates depending on which surface was used.

Second, the convergence in the second half of 2025 suggests the structural premium was not a permanent feature of the market. It was a function of capacity constraints (position limits), participant composition (early adopters skewing bullish), and market-maker capital costs. As those frictions eased, pricing aligned.

## Conclusion

Our core finding is that the two venues, despite sharing the same underlying asset, priced risk materially differently for most of 2025.

This divergence had some identifiable causes. In the earlier months of our analysis, IBIT's participants were directionally bullish. By mid-2025, the relationship had inverted. New entrants hedging into a product with constrained position limits and concentrated liquidity bid up crash protection on IBIT to remarkably high skew levels that exceeded BTC's skew over the entire dataset. However, by the end of 2025, with position limits on IBIT expanded to 250,000 contracts, the participant base broadening and massive liquidations on leveraged BTC positions, the gap narrowed, and the two 1-month volatility surfaces had largely aligned.

This has direct consequences for risk measurement: anyone using Deribit-derived surfaces as a proxy for IBIT exposure would have materially underestimated tail risk during the June to July window. The surfaces were not interchangeable, they were pricing the same asset through two different lenses, shaped by different participant constraints, capital costs, and trading conventions.

The convergence in the second half of 2025 is an encouraging signal. It suggests price discovery is working and that the structural premium was a function of the market having yet to mature, rather than being a permanent feature. The late-2025 flip, where BTC skew exceeded IBIT skew for the December expiry, raises the more interesting forward-looking question. As IBIT options liquidity deepens with greater institutional involvement, the regulated venue may consistently price tail risk more efficiently. This will lead to greater support for the emergence of new structured products market which in turn leads to a deeper, more mature market. If that holds, the structural fear premium does not disappear, but it shifts towards Deribit, driven by crypto-native participants who have consistently factored in the possibility of a catastrophic downside.

One year of data is not enough to call that a trend but the direction is clear. IBIT is no longer a footnote in crypto derivatives. It is a major investment vehicle, with its own volatility dynamics, its own participant base, which can behave independent of BTC options. Thus, treating its options market as a derivative of Deribit is no longer appropriate.

# Appendix: Methodology

This Appendix defines the metrics – skew, convexity and upside convexity – used in Section 2. All the metrics are computed from the implied volatility smile, parameterised by log-moneyness. The following variables are used throughout:

$x = log(K/F)$ = log-moneyness

$\sigma(x)$ = implied volatility as a function of log-moneyness

where,

$x_0 = 0\ (ATM)$

$x_- = ln(0.75)$

$x_+ = ln(1.25)$

## 1. Skew (downside skew)

Measures downside asymmetry relative to ATM:

$$Skew = \sigma(x_-) - \sigma(x_0)$$

A higher skew indicates the market is pricing more risk into downside moves relative to at-the-money levels.

## 2. Convexity (smile curvature)

Measures total curvature around ATM:

$$Convexity = \frac{\sigma(x_-) + \sigma(x_+)}{2} - \sigma(x_0)$$

Higher convexity means both wings (puts and calls) are elevated relative to ATM, indicating greater expected tail risk in both directions.

## 3. Upside Convexity

Measures upside asymmetry relative to ATM:

$$Upside\ Convexity = \sigma(x_+) - \sigma(x_0)$$

A higher upside convexity indicates the market is pricing more risk into upside moves, typically reflecting demand for out-of-the-money call options.

## About MerQube

MerQube is an innovative technology provider offering design and calculation solutions for rules-based investment strategies and passive solutions. Launched in 2019 by a team of index industry veterans and technology experts, MerQube was created as a technology-driven answer to the most sophisticated rules-based investment strategies. MerQube now has approximately USD 27 billion in assets tracking its indices. For more information, please visit **www.merqube.com**.

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