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SOLIDUS LABS RESEARCH REPORT
JUNE 2026

The Ex Files

A Systematic Cross-Venue, Cross-Asset Study
of Execution Quality in Digital Asset Markets

Executive Summary

On June 11, 2026, the SEC proposed rescinding Rule 611 - validating the core thesis of this report: that in modern financial markets, best execution must be multidimensional, principles-based, and evaluated across venue, asset, size, and time simultaneously - not reduced to a single rigid rule or a single consolidated price like the NBBO. This Solidus Labs research report provides empirical proof of that thesis - and a glimpse into the future of best execution across digital asset, tokenized securities, and beyond.

Through a systematic cross-venue, cross-asset analysis of execution quality in digital asset markets, we analyzed taker-side intra-candle spread at one-second frequency across eight venues spanning five categories - centralized exchanges (CEX), three broker-dealers (BD-1, BD-2, BD-3), an onchain order book (Hyperliquid), a proprietary AMM on Solana (SolFi), and a constant-product AMM on Ethereum (Uniswap) - for BTC and ETH over the period February 1 through April 29, 2026.

Primary Findings

VENUE CATEGORY	Venue category is the dominant predictor. Broker-dealers and deep CEXes are interchangeable inside half a basis point below \$10K. Above \$100K, order-book venues - onchain or offchain - demonstrate materially superior execution. AMMs deteriorate dramatically: Uniswap reaches 165 bps on BTC.
ONCHAIN VS. OFFCHAIN	Hyperliquid (onchain CLOB) is competitive with offchain incumbents across both BTC and ETH. The structural divide is not onchain vs. offchain - it is order book vs. AMM-style execution.
BROKER-DEALER DISPERSION	One broker-dealer maintains mean spread under 1 bps across the full size range on both BTC and ETH. The remaining broker-dealers are competitive at small sizes but degrade significantly at institutional size - a profile consistent with route-through rather than inventory internalization.
ASSET SENSITIVITY	Cross-venue ranking is not asset-agnostic. CEX spreads run roughly 2x wider on ETH than BTC at every size bucket. AMM and PropAMM execution quality is a property of the (venue, asset) pair rather than the venue alone.
TIME OF DAY	Time-of-day effects are systematic. Broker- dealers tighten during the Asia session and widen through the US session - one broker- dealer shows a 3-5x intraday ratio on BTC. CEX and onchain order books show the inverse pattern.
DAY OF WEEK	Weekend microstructure diverges by category. CEX and Hyperliquid tighten on weekends while broker-dealers widen - the clearest empirical signal that the two categories serve structurally different client bases.

The practical implication: optimal venue selection is conditional on asset, size regime, and time of day simultaneously. Any single-axis benchmark will mis-state execution cost for a non-trivial slice of flow. A defensible best execution regime must evaluate cost conditional on (venue, asset, size, time) jointly, not marginally.

Historical and Current Context

[On June 11, 2026, the SEC proposed rescinding Rule 611 and Rule 610\(e\) entirely](#) – citing two decades of unintended consequences including liquidity fragmentation, dark pool proliferation, and compounding compliance costs. The proposal replaces a rigid trade-through mandate with FINRA Rule 5310's principles-based best execution duty: the same framework this report applies to digital asset markets. For the first time, the regulatory logic governing equities is catching up to the architecture digital assets already demand. Atkins is applying digital asset market logic to equities, not the other way around. The data in these pages is the empirical foundation the financial markets of tomorrow require.

Best Execution (BestEx) is a foundational principle of modern financial markets, representing the obligation of brokers to execute their clients' investment decisions with diligence, fairness, and transparency. [FINRA's Rule 5310](#), formally effective in 2012 but in practice the direct successor to NASD Rule 2320, requires that brokers "shall use reasonable diligence" to execute trades such that "the resultant price to the customer is as favorable as possible under prevailing market conditions." This obligation is reinforced by a constellation of SEC frameworks and rules.

The National Best Bid and Offer (NBBO) consolidates quotes from exchanges into a single best bid and offer, providing a national reference price against which execution quality can be measured. [Regulation NMS](#), promulgated by the SEC in 2005, modernized this framework for the electronic trading era. Rule 611 prohibits trading centers from executing orders at prices inferior to protected quotes displayed on other venues; Rule 605 requires market centers to publish monthly execution quality statistics; and Rule 606 requires broker-dealers to disclose order routing practices, including Payment for Order Flow (PFOF) arrangements, in which financial incentives to route to particular market makers may explicitly conflict with the interests of brokers' customers.

In frontier markets such as digital assets, analogous best execution frameworks have not yet been fully developed. The absence of a consolidated, NBBO-equivalent feed for crypto was a recurring theme during the prolonged era of Bitcoin spot ETF rejections. From the first denial of a Bitcoin trust application in 2017 through the SEC's rejection of a major asset manager's conversion application in 2022 – which was ultimately vacated by the D.C. Circuit Court of Appeals in August 2023 – the SEC consistently cited the fragmented, unregulated nature of underlying crypto spot markets, and the absence of surveillance-sharing agreements with venues of "significant size," as central grounds for denial. At the time, the digital asset industry struggled to demonstrate to regulators that a credible best execution standard could be measured, let alone applied or enforced.

The digital asset market has since matured considerably, driven by regulatory developments both domestically and abroad. The European Union's Markets in Crypto-Assets Regulation ([MiCA](#)) entered into force in 2024, establishing the first comprehensive crypto market structure framework in a major

jurisdiction, including [mandatory best execution requirements under Article 78](#). In the United States, the passing of the [GENIUS Act](#) in July 2025 – establishing a framework for stablecoins – and the advancing [CLARITY Act](#) – which passed the House in July 2025 and cleared the Senate Banking Committee 15–9 on May 14, 2026, now awaiting a full Senate floor vote – represent progress toward regulatory normalization that has already led to deepening institutional adoption. Institutional participants are increasingly demanding the tools to measure, monitor, and report on execution quality, and regulators are beginning to engage with the practical realities of how digital asset trades are actually executed.

The advent of tokenized securities and the SEC’s consideration of an “innovation exemption” for tokenized stocks has further heightened the need for tools to measure execution quality consistently and comprehensively – across offchain and onchain venues alike. Securities trading simultaneously on onchain and offchain venues cannot rely on NBBO-style infrastructure that does not yet exist for onchain markets. The conditional EQ framework this report describes is exactly what tokenized securities will require from launch.

Research Overview

This study analyzed realized intra-trade price dispersion across a heterogeneous set of crypto execution venues. The motivation is to compare execution quality on a like-for-like basis across centralized exchanges, broker-dealers, onchain orderbook venues, automated market makers, and proprietary market makers – venues that do not share a single consolidated tape, and that in several cases do not publish an order book at all.

Across the February 1 to April 29, 2026 window, centralized exchanges and broker-dealers dominate the small- and mid-size regime with sub-1 bps median spreads. Onchain venues are competitive only at the small end: Hyperliquid is the only non-CEX venue to print in the same order of magnitude as the offchain incumbents, while Uniswap-style constant-product AMMs run an order of magnitude wider in BTC and a half order of magnitude wider in ETH. The most striking single finding is that the Solana proprietary AMM in the dataset is roughly 5x tighter on ETH than on BTC – evidence that PropAMM execution quality is anchored to which asset the pool operator inventories, rather than to the PropAMM venue category itself.

Spreads scale super-linearly with trade size in the order-book venues but much more gently in broker-dealer flow that internalizes ticket-by-ticket. The cross-venue ranking is not asset-invariant: every venue’s relative position shifts between BTC and ETH, and the magnitude of the shift is largest in the AMM and PropAMM categories.

Venue Category and Size Sensitivity

1.1 Overview

Pooling all taker-side candles at the one-second frequency, the five venue categories order themselves consistently across BTC and ETH. At small trade sizes, broker-dealers and centralized exchanges are functionally indistinguishable on spread. The divergence emerges with scale — and at institutional sizes (\$100K+), the gap between venue categories is not marginal. It is structural.

Broker-dealers (BD-1, BD-2, BD-3). Tightest at the small-ticket end, with BD-2 at 0.17 bps on BTC and 0.27 bps on ETH. The internalization model lets retail-sized flow trade against operator inventory at the desk’s mid-mark.

Centralized exchanges (CEX-1, CEX-2). CEX-1 (0.56 bps BTC, 1.13 bps ETH multi-fill mean) anchors the cross-venue benchmark. CEX-2 prints tight headline numbers (0.07 bps BTC, 0.13 bps ETH) on a fraction of the volume.

Onchain order book (Hyperliquid). Hyperliquid (0.82 bps BTC, 1.71 bps ETH) is competitive with mid-tier CEXes on BTC and roughly 1.5× wide on ETH — the only onchain venue in the dataset whose execution cost is in the same order of magnitude as the offchain incumbents.

Proprietary AMM (SolFi on Solana). SolFi prints 14.36 bps on BTC but only 2.57 bps on ETH. The five-fold asymmetry reflects what the operator is willing to inventory, not venue architecture.

Constant-product AMM (Uniswap on Ethereum). Uniswap is the widest venue in every regime and the only venue where >\$100K candles cross into double-digit-percent territory: 165 bps on BTC, 54 bps on ETH at the largest size bucket.

1.2 AMM Execution: Constant-Product and Proprietary

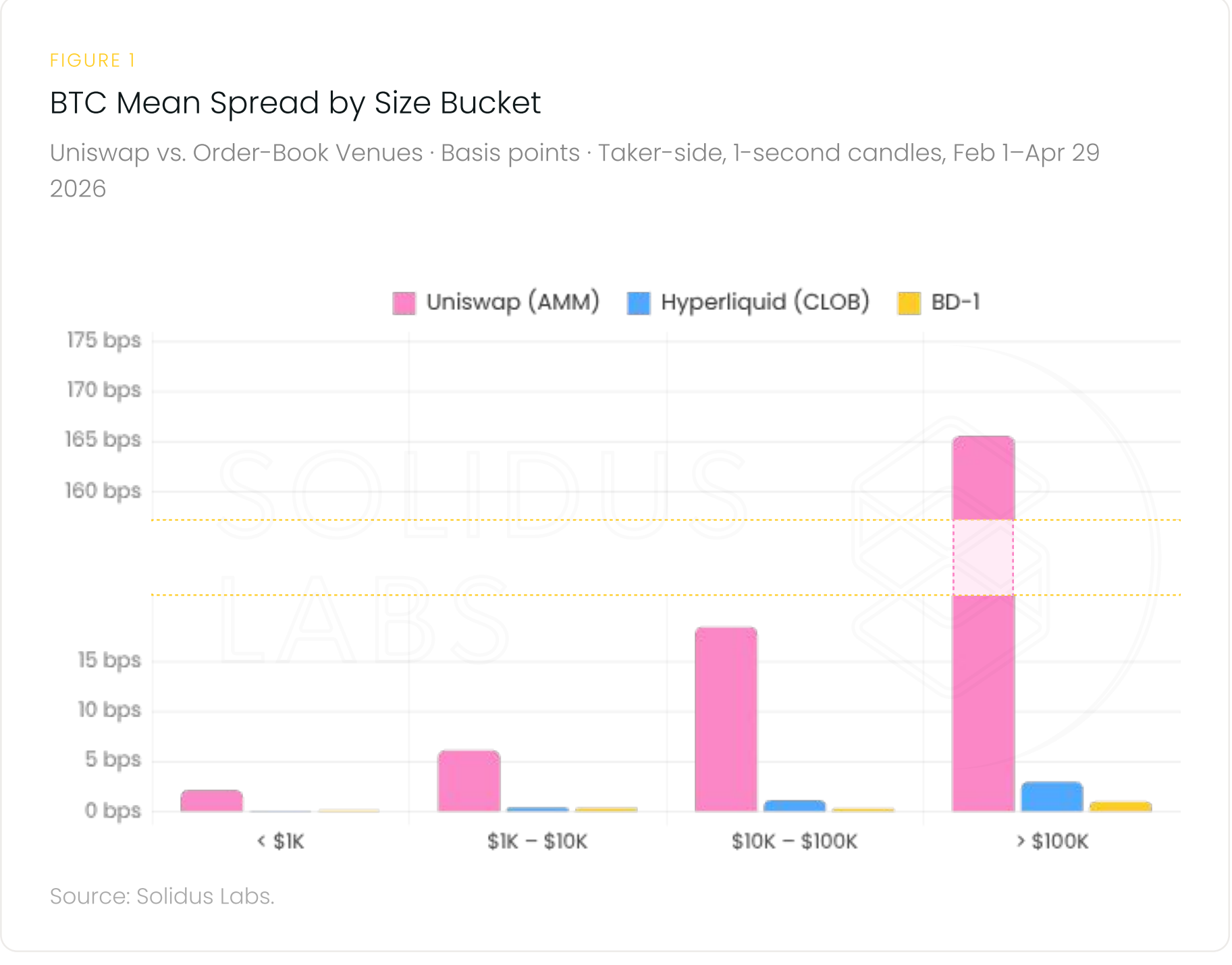
UNISWAP MEAN SPREAD ON >\$100K BTC

165 bps

vs. 2.96 bps on the best onchain order book. Same size. Same asset. Same moment in time.

TRADE SIZE	UNISWAP (AMM)	HYPERLIQUID (CLOB)	BD-1	UNISWAP VS. BEST ORDER BOOK
< \$1K	2.15 bps	0.08 bps	0.13 bps	+2.02 bps
\$1K – \$10K	6.11 bps	0.38 bps	0.36 bps	+5.75 bps
\$10K – \$100K	18.46 bps	1.11 bps	0.31 bps	+18.15 bps
> \$100K	165.54 bps	2.96 bps	0.98 bps	+164.56 bps

Table 1: BTC Mean Spread by Size Bucket — Uniswap vs. Order-Book Venues. Source: Solidus Labs, Feb 1 – Apr 29, 2026. 1-second combined candles, taker-side only.



PropAMM execution quality is a property of the (venue, asset) pair — not the venue alone. Approving a PropAMM as a routing destination is not a venue decision. It is a position contingent on one operator's undisclosed balance sheet.

1.3 Broker-Dealer Execution: The Size-Slope Divergence

Evaluated on pooled headline spreads, broker-dealers appear nearly identical. The pooled headline is dominated by retail-sized candles where every broker-dealer internalizes efficiently. The divergence becomes visible only in size-bucketed analysis.

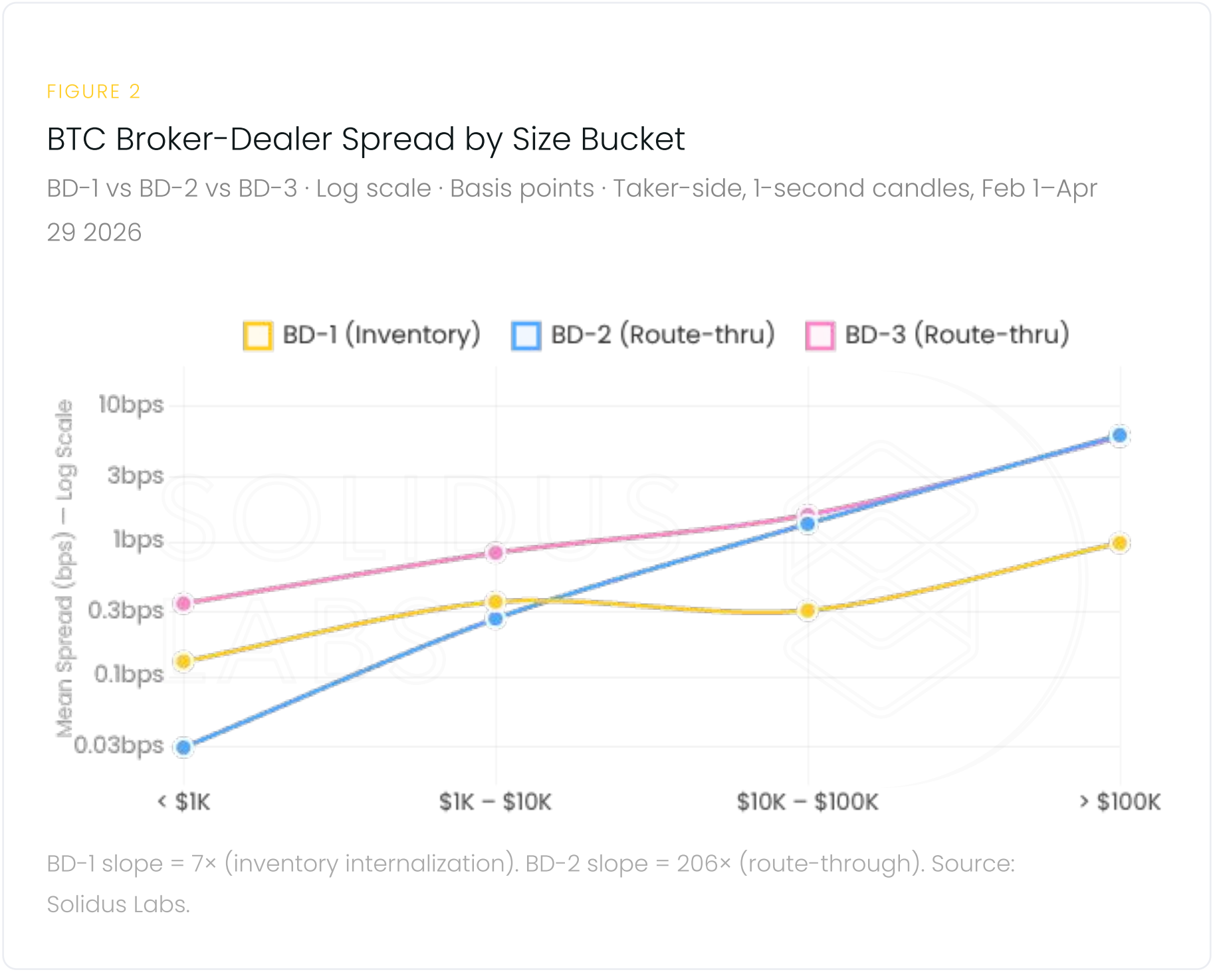
BD-2 SIZE SLOPE ON BTC

206×

0.03 bps at <\$1K to 6.17 bps at >\$100K. The pooled headline reports 0.17 bps and captures none of this.

BROKER-DEALER	< \$1K	\$1K – \$10K	\$10K – \$100K	> \$100K	SLOPE	MODEL
BD-1	0.13 bps	0.36 bps	0.31 bps	0.98 bps	7×	Inventory internalization
BD-2	0.03 bps	0.27 bps	1.36 bps	6.17 bps	206×	Route-through
BD-3	0.35 bps	0.83 bps	1.58 bps	5.97 bps	17×	Route-through

Table 2: BTC Broker-Dealer Spread by Size Bucket. Source: Solidus Labs, Feb 1 – Apr 29, 2026.



The 206× slope on BD-2 reflects classical limit-orderbook behavior: tight at the top of book, expensive past local depth. BD-1’s 7× slope is consistent with genuine inventory internalization — a model that absorbs trade size without proportional cost escalation. BD-1’s structural flatness is the most consistent in absolute terms, starting at 0.13 bps at the smallest size and ending at 0.98 bps at the largest.

BROKER-DEALER	< \$1K ETH	\$1K – \$10K	\$10K – \$100K	> \$100K ETH
BD-1	0.02 bps	0.09 bps	0.22 bps	0.75 bps
BD-2	0.05 bps	0.52 bps	3.19 bps	8.39 bps
BD-3	0.52 bps	1.06 bps	3.54 bps	11.15 bps

Table 3: ETH Broker-Dealer Spread by Size Bucket. Source: Solidus Labs, Feb 1 – Apr 29, 2026.

At sub-\$1K, all broker-dealers cluster inside a basis point. At >\$100K, one holds 0.98 bps while others reach 6.17 bps. The gap is invisible in any pooled number. It appears only in size-bucketed analysis — which most institutional evaluation frameworks never request.

Cross-Asset Routing: BTC and ETH Are Not the Same

The cross-venue ranking is not asset-invariant. Every venue's relative position shifts between BTC and ETH, and the magnitude of the shift is largest precisely where it costs the most — at institutional trade sizes and in the AMM and PropAMM categories.

2.1 BTC — Cross-Venue Ranking and Trade-Size Sensitivity

Below \$1K. CEX-2 (0.01 bps), CEX-1 (0.01 bps), and BD-2 (0.03 bps) are essentially tied. Hyperliquid (0.08), BD-1 (0.13), BD-3 (0.35) follow inside a single basis point. SolFi PropAMM (2.84) and Uniswap (2.15) are already an order of magnitude wider before any sizing pressure has been applied.

Above \$100K. CEX-1 at 3.30 bps, Hyperliquid at 2.96 bps, BD-3 at 5.97 bps, BD-2 at 6.17 bps, BD-1 at 0.98 bps — BD-1 remains the tightest broker-dealer at large size, and Hyperliquid is competitive with the deep CEX. SolFi at 13.26 bps and Uniswap at 165.54 bps are structurally unsuitable for institutional-size BTC flow.

2.2 ETH — Cross-Venue Ranking and Trade-Size Sensitivity

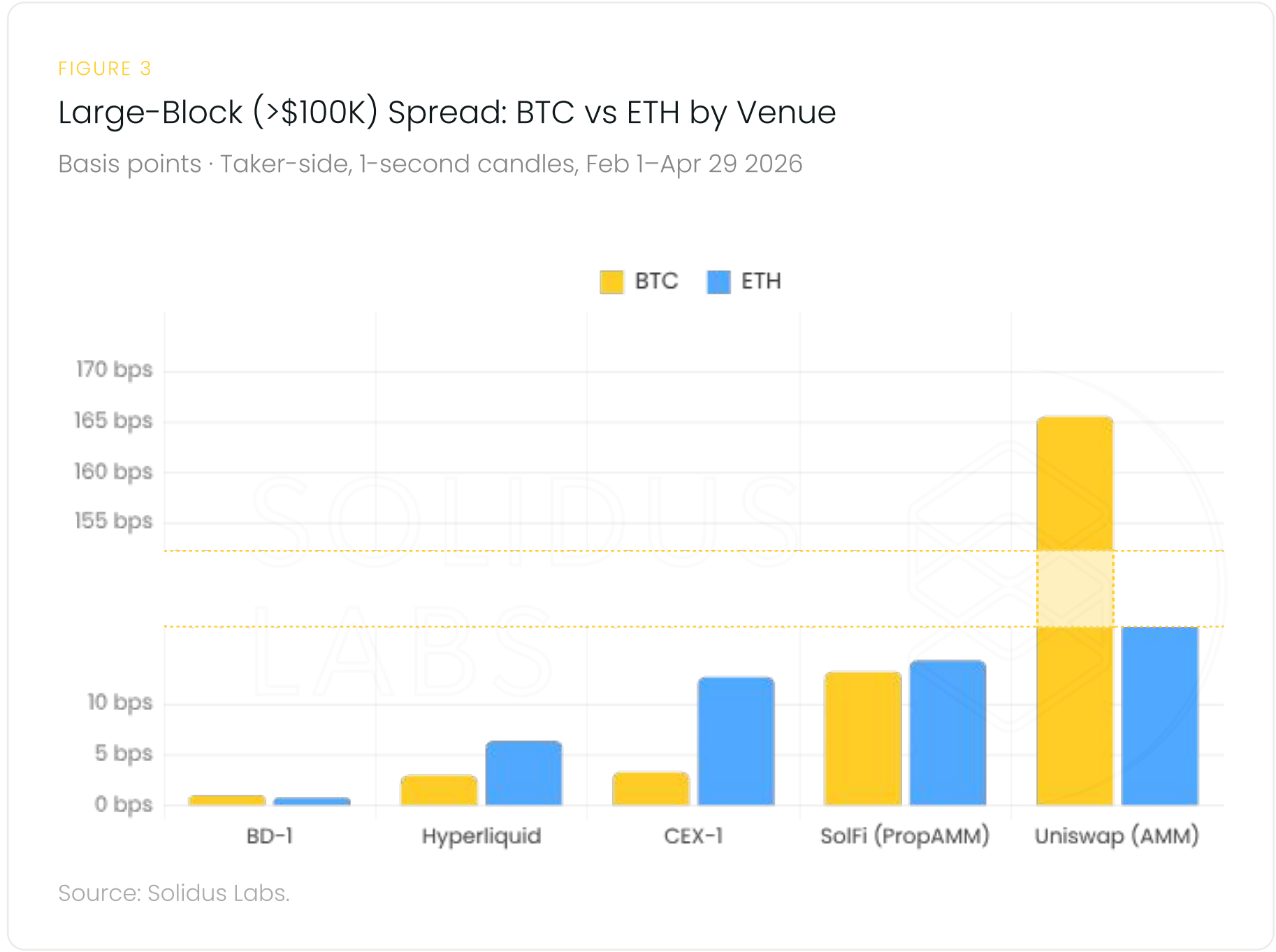
ETH preserves the gross ordering of venue categories but reshuffles individual venues and tightens some of the slopes. Two findings are structurally significant:

Hyperliquid inverts vs. BTC at institutional size. At >\$100K ETH, Hyperliquid (6.39 bps) is the cheapest book in the entire dataset — meaningfully tighter than the deep CEX at 12.72 bps. On large BTC, Hyperliquid is mid-pack. A routing rule that treats both assets the same will pay the wrong rate on one of them every time.

SolFi PropAMM is effectively a broker-dealer-quality venue on ETH at mid-sizes. At \$1K–\$10K on ETH, SolFi at 1.09 bps is mid-pack with the order-book venues for the first time in the entire dataset. At institutional sizes, however, SolFi converges back to 14.36 bps.

VENUE	BTC > \$100K	ETH > \$100K	ETH/BTC RATIO	ROUTING IMPLICATION
BD-1	0.98 bps	0.75 bps	0.8×	Flat on both. Robust to asset choice.
Hyperliquid	2.96 bps	6.39 bps	2.2×	Cheapest ETH book. Beats all CEX.
CEX-1	3.30 bps	12.72 bps	3.9×	ETH nearly 4× worse than BTC.
SolFi (PropAMM)	13.26 bps	14.36 bps	~1×	Symmetric at institutional size.
Uniswap (AMM)	165.54 bps	53.79 bps	0.3×	ETH 3× cheaper — still material.

Table 4: Large-Block (>\$100K) Spread by Asset. Source: Solidus Labs, Feb 1 – Apr 29, 2026.



2.3 BTC vs. ETH: Three Cross-Asset Patterns

CEX spreads run roughly 2× wider on ETH at every size bucket. CEX-1’s multi-fill mean is 0.56 bps on BTC versus 1.13 bps on ETH, and the same ratio appears cell-by-cell across the trade-size, hour-of-day, day-of-week, and session cuts.

AMM execution quality flips with the underlying asset's chain. Uniswap on Ethereum is dramatically wider on BTC than on ETH because BTC on Ethereum is a wrapped synthetic with shallower native pools. SolFi on Solana is wider on BTC than ETH because the pool operator chose to inventory the ETH side more aggressively. AMM and PropAMM execution quality is a property of the (venue, asset) pair, not the venue alone.

The broker-dealer tier is consistent across assets in ranking, shape, and leader behavior — but differs in level. BD-1, BD-2, and BD-3 land in the same order on both assets. BD-1’s structural flatness holds on both, under 1 bps mean spread up through the >\$100K bucket.

Any framework that evaluates venue quality without specifying the asset is answering a question that was not asked. The cross-asset shift at the institutional end is a 2×–10× reordering, not a noise effect.

Time-of-Day Effects

All broker-dealers in the dataset (with BD-1 on BTC as the exception, which remains comparatively flat) tighten during the Asia window and widen through the US session, regardless of where the operator's desk is regulated.

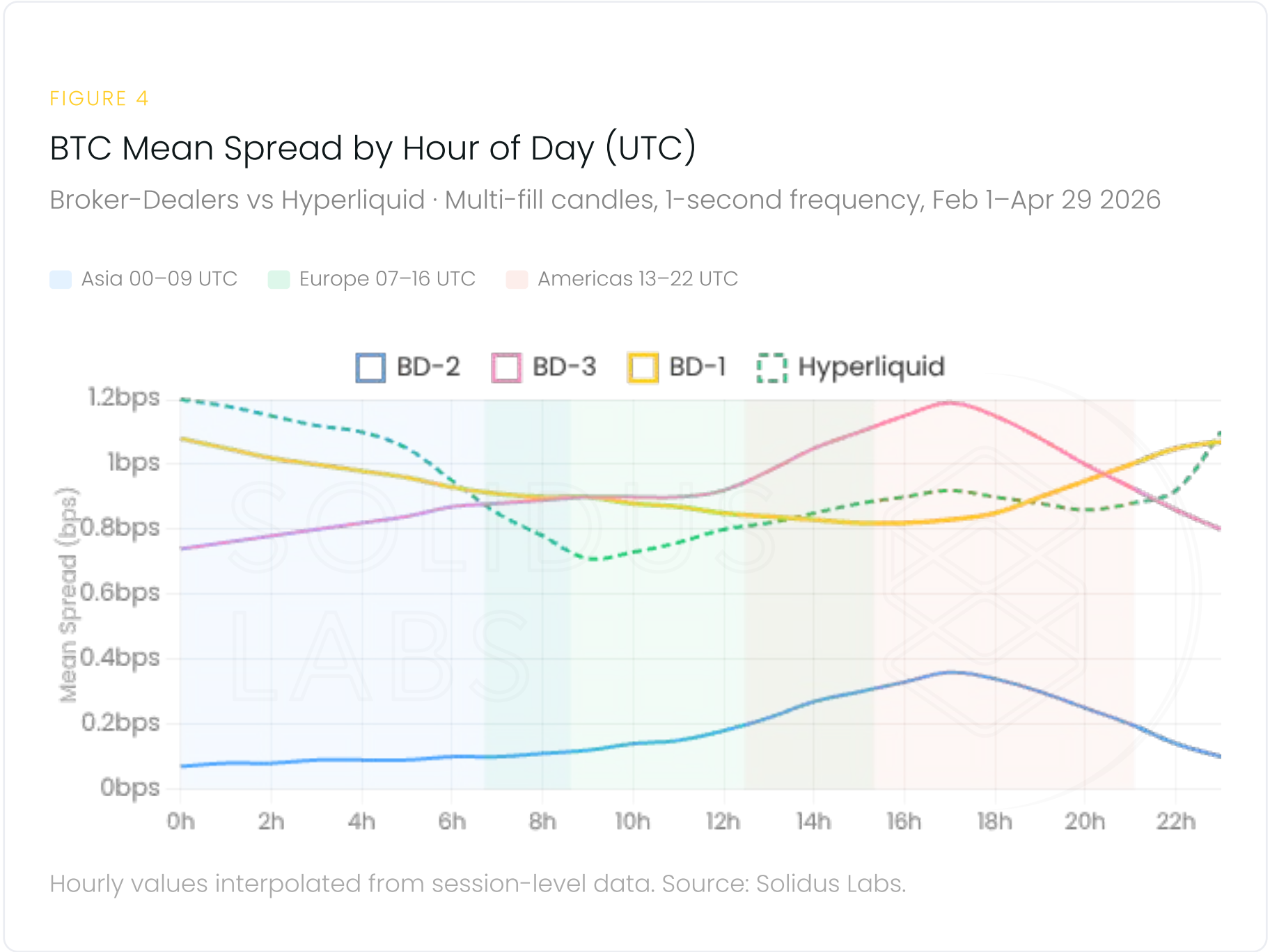
BD-2 INTRADAY SPREAD RATIO ON BTC

3–5×

Asia session: 0.07–0.10 bps. Americas session: 0.18–0.36 bps. The most expensive window is the one most institutional desks instinctively choose.

VENUE	ASIA (00–09 UTC)	EUROPE (07–16 UTC)	AMERICAS (13–22 UTC)	INTRADAY RATIO
BD-2	0.07–0.10 bps	0.12–0.20 bps	0.18–0.36 bps	3–5×
BD-3	0.74–0.88 bps	~0.90 bps	0.90–1.19 bps	~1.6×
BD-1	~1.08 bps	~0.90 bps	~0.72–1.36 bps	Flat
Hyperliquid	Quietest	0.71 bps (tightest)	Peak activity	Inverted vs. BD

Table 5: BTC Spread by Market Session — Per Broker-Dealer. Source: Solidus Labs, Feb 1 – Apr 29, 2026.



BD-1's comparative flatness across the day is consistent with its internalization model: pricing off internal marks rather than CEX top-of-book means less exposure to US-session volatility. The Asia-tight/US-wide pattern in BD-2 and BD-3 may reflect thinner one-way taker flow in Asian hours reducing adverse selection, or denser cross-exchange arbitrage keeping prices aligned during those hours.

One broker-dealer shows a 3–5× intraday spread ratio on BTC. Its Asia session is its best. Its US session is its most expensive. The mechanism is not fully observable. The cost is.

Production routing logic should incorporate session-conditional venue weights. Routing broker-dealer-bound flow during the Americas session while routing CEX-bound flow during Asian hours produces the worst of both worlds simultaneously — a two-mistake combination achievable with a single static policy.

Day-of-Week Effects

Crypto markets trade seven days a week, so any weekday/weekend dispersion is likely real microstructure rather than calendar noise — particularly when the analysis spans 89 days of continuous data. The CEX and onchain CLOB venues tighten on weekends; broker-dealers widen. This is the clearest empirical signature in the dataset that the two categories serve structurally different client bases.

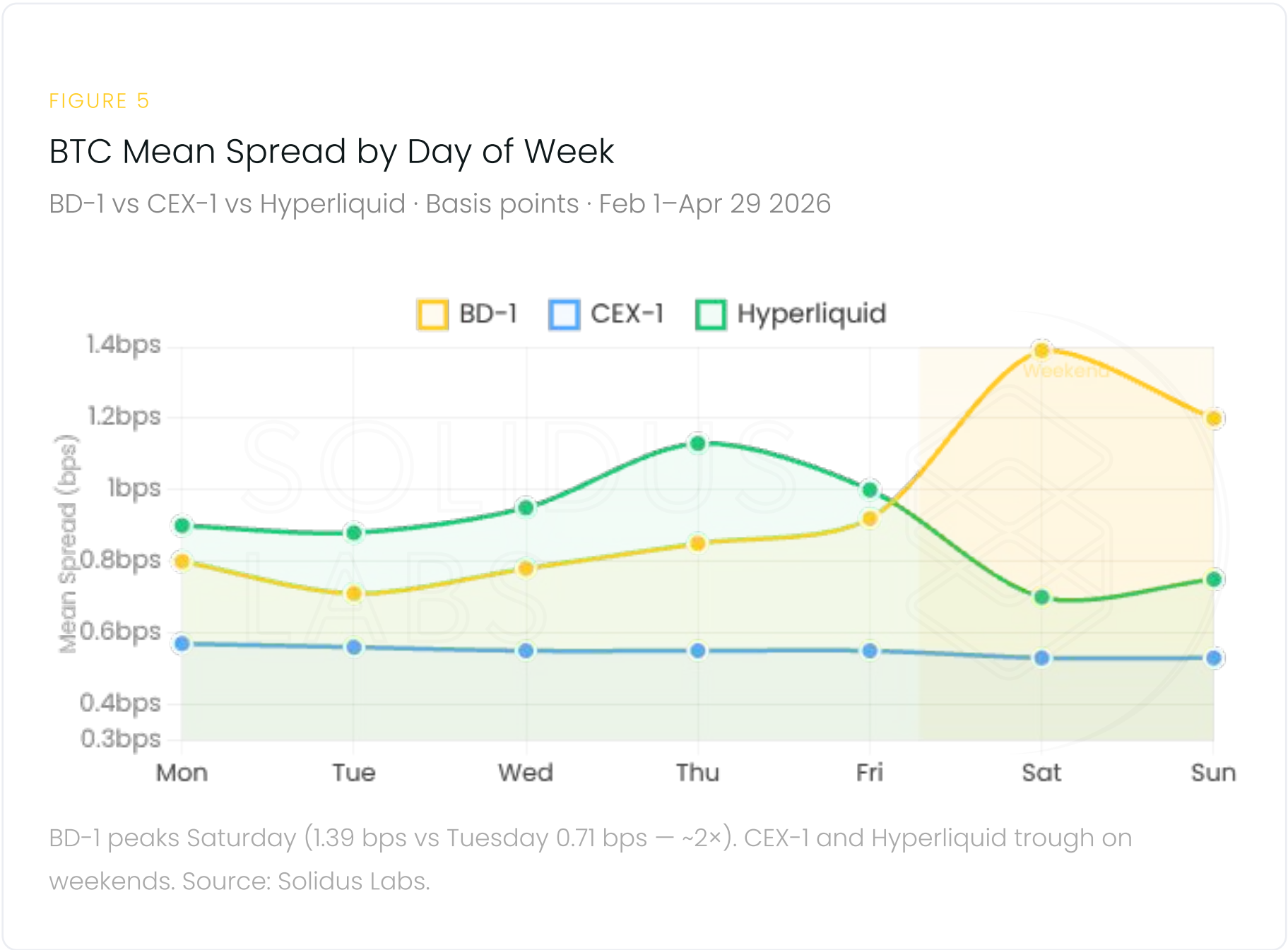
BD-1 WEEKEND WIDENING

~2×

1.39 bps on Saturday vs. 0.71 bps on Tuesday. CEX-1 and Hyperliquid move in the opposite direction — tightening on weekends.

VENUE	MONDAY	TUESDAY	THURSDAY	SATURDAY	SUNDAY	WEEKEND EFFECT
CEX-1	0.57 bps	—	—	0.53 bps	0.53 bps	Tightens ↓
Hyperliquid	—	—	1.13 bps	0.70 bps	—	Tightens ↓
BD-1	—	0.71 bps	—	1.39 bps	—	Widens ↑ (~2×)

Table 6: Day-of-Week Spread — BTC, Key Venues. Source: Solidus Labs, Feb 1 – Apr 29, 2026.



BD desks quote tighter when institutional clients are at their screens; CEX and onchain venues see retail-heavy weekend flow that is price-taking across both sides and tightens the realized range.

Uniswap on ETH shows the clearest AMM weekend anomaly: Sunday is the widest day at 20.50 bps mean, while Saturday is the tightest at 12.70 bps. The spread between them — 7.80 bps — is wider than the entire multi-fill mean spread of any broker-dealer in the dataset at any size bucket.

A routing engine that treats Saturday the same as Tuesday compounds a systematic, avoidable cost across every weekend of the year. Weekend routing should be category-aware: CEX and onchain CLOB flow is structurally cheaper on weekends; broker-dealer flow is structurally more expensive.

The Single-Axis Benchmark Blind Spot

The findings in Sections 1 through 4 share a common characteristic: none of them are captured by a standard pooled per-venue spread. A single-axis benchmark is constitutionally incapable of detecting what the data shows, because the cost is conditional — it varies with size, session, day of week, and asset simultaneously.

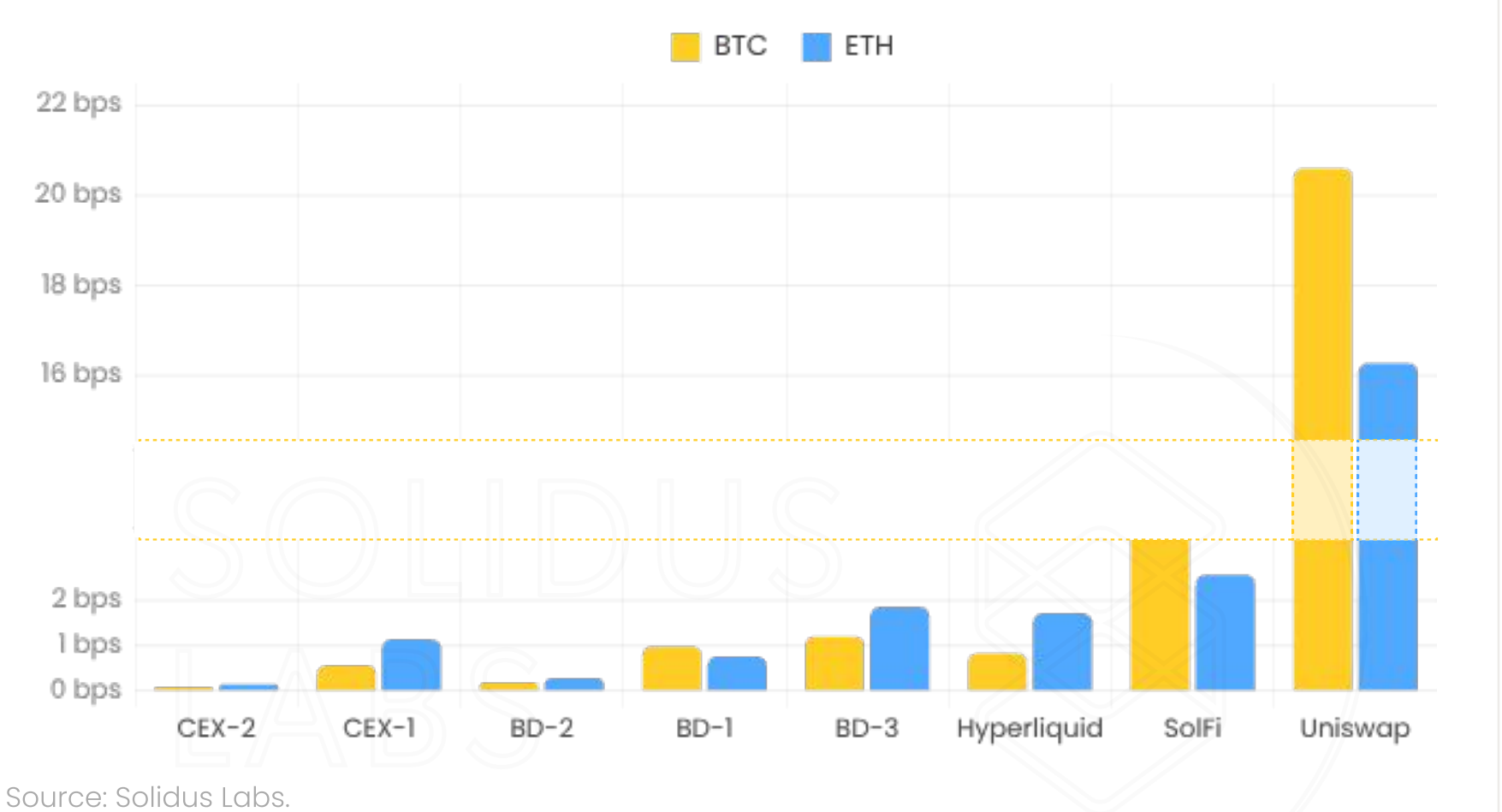
WHAT STANDARD REPORTING SHOWS	WHAT IT SILENTLY OMITS	COST ON \$500K
BD-2: 0.17 bps (excellent)	6.17 bps at >\$100K — 36× higher	\$258
BD-1: 0.98 bps (adequate)	0.98 bps at >\$100K — flat. Best in class.	Correctly stated
Uniswap: 5.47 bps (noted)	165.54 bps at >\$100K on BTC	\$8,129
No session adjustment	3–5× BD intraday ratio. Not captured.	\$145
No weekend adjustment	BD weekend spread nearly 2×. Not captured.	\$340
No asset split	Hyperliquid cheapest for large ETH, not BTC. Not captured.	\$317

Table 7: What Standard BestEx Reporting Captures vs. What the Data Shows.

FIGURE 6

Headline Mean Spread by Venue — BTC & ETH

Pooled across all trade sizes, times, and days · Basis points · Feb 1–Apr 29 2026



Any single-axis benchmark — a pooled per-venue spread, a category-level league table, or a one-size-fits-all routing heuristic — will mis-state execution cost for a non-trivial slice of flow. A defensible BestEx regime must evaluate cost conditional on (venue, asset, size, time) jointly, not marginally.

5.1 Regulatory Context

The regulatory environment is accelerating in ways that make the benchmarking gap increasingly consequential. On June 11, 2026, the SEC proposed rescinding Rule 611 – the single most significant validation of the multidimensional BestEx framework this report describes. MiCA Article 78 is already in force across the European Union. The SEC's 2026 examination priorities explicitly name execution quality as a review focus. The Atkins NMS roundtable in September 2025 reinforced that best execution must be multidimensional, not rule-based – a position Atkins acted on directly with the June 11 rescission proposal. The CLARITY Act cleared the Senate Banking Committee in a 15–9 bipartisan vote on May 14, 2026. The direction of travel is no longer ambiguous. Institutions that future-proof their compliance and trading operations now will be best positioned for what comes next.

REGULATION	JURISDICTION	STATUS	BESTEX RELEVANCE
MiCA Article 78	European Union	In force 2024	Mandatory best execution for crypto intermediaries
GENIUS Act	United States	Passed July 2025	Stablecoin framework — first US crypto market structure law
CLARITY Act	United States	Advancing 2026	Passed House July 2025; Senate Banking Committee 15–9 May 14, 2026 — awaiting Senate floor vote
SEC Rules 611 Rescission Proposal	United States	Proposed June 11, 2026	Rescinds trade-through mandate; shifts equities to principles-based BestEx — the same framework this report applies to digital asset markets
SEC 2026 Exam Priorities	United States	Active now	Name best execution and order routing as explicit review focus
Atkins NMS Roundtable	United States	Sept 2025	Best execution must be multidimensional rather than rule-based. Precursor to the June 11, 2026 rescission proposal
SEC Innovation Exemption — Tokenized Securities	United States	Under consideration 2026	Cross-venue EQ analysis across on- and offchain venues becomes a day-one requirement

Table 8: Regulatory Timetable.

Cost Summary

Direct execution costs only — the observable spread gap between what was paid and what was available. Excludes regulatory examination costs, enforcement exposure, client remediation, and reputational consequences.

The base case applies to a hypothetical institution running \$1B in annual digital asset volume, with a BTC/ETH split of 85/15 — consistent with the distribution observed across broker-dealer flow in this dataset. Large-block fractions (>\$100K notional) follow the same dataset distribution: 47% of BTC flow and 25% of ETH flow at institutional size.

6.1 AMM Routing - Large BTC Flow

ANALYZED SPREAD GAP

162.58 bps

Uniswap vs. best available order book on >\$100K BTC. None of this appears as a fee — it appears as price, embedded in the fill, invisible in standard cost accounting.

AMM ALLOCATION OF LARGE BTC FLOW	RELEVANT ANNUAL NOTIONAL	AVOIDABLE ANNUAL COST
1% (minimal DeFi exposure)	\$4.0M	\$65K / year
2%	\$8.0M	\$130K / year
5% (moderate DeFi exposure)	\$20.0M	\$325K / year
10%	\$40.0M	\$650K / year
20% (active DeFi participation)	\$80.0M	\$1.3M / year

Table 9: 162.58 bps gap applied to the relevant fraction of \$400M large-block BTC annual flow on a \$1B book. Scale linearly — a \$5B book at 10% AMM allocation produces \$3.2M in annual avoidable cost from this finding alone.

6.2 Findings 2–5 Combined

FINDING	PRACTICE	ANALYZED GAP	ANNUAL COST ON \$1B BOOK	DRIVER
2	BD selection — large BTC	5.19 bps	\$207K	Choosing BD-2 over BD-1 on >\$100K BTC — invisible in pooled headline spreads
3	ETH routing — large ETH	6.33 bps	\$23K	Routing large ETH to CEX rather than Hyperliquid — a ranking that inverts vs. BTC
4	BD flow — US vs. Asia session	0.29 bps	\$9K	Executing BD flow during the Americas session rather than the Asia window
5	BD flow — weekend vs. weekday	0.68 bps	\$19K	Routing BD flow on weekends when desks widen; CEX tightens
2–5	All four practices	—	\$259K / year	Fully additive — each applies to a different slice of flow

Table 10: Applied to a \$1B annual book with BTC/ETH split and large-block fractions consistent with dataset distribution.

6.3 The Benchmarking Multiplier

Every figure above is recoverable: identify the routing pattern, update the policy, capture the spread going forward. Finding 6 — the static benchmark — is what prevents that identification from occurring. A pooled per-venue spread will not surface the 162.58 bps AMM gap at large size. It will not surface the 5.19 bps broker-dealer selection gap. It will not surface the session differential or the weekend effect. It reports a number that is technically accurate and operationally blind. The avoidable cost compounds, quarter after quarter, inside a compliance report that says everything is fine.

A Glimpse Into the Future of Best Execution

In 2005, then-SEC Commissioner Paul Atkins co-authored a 44-page dissent to Regulation NMS, arguing that instead of a rigid trade-through rule, the SEC should have focused on clarifying brokers' duty of best execution. More than twenty years later, as sitting SEC Chairman, he acted on it – proposing the formal rescission of Rule 611 and Rule 610(e) on June 11, 2026, replacing two decades of rigid trade-through compliance with FINRA Rule 5310's principles-based best execution standard – flexible, multidimensional, evaluated on overall execution quality. That is precisely the framework this report operationalizes for digital asset markets:

Best execution will be multidimensional by design, not by exception.

Execution quality varies up to 168× across venue, asset, size, and time of day simultaneously. Any future regulatory framework that ignores these dimensions will fail for the same reasons Reg NMS has: it will optimize for the average trade at the expense of every trade that deviates from it.

Tokenized securities will require this infrastructure from day one.

Under the old Rule 611 framework, onchain AMMs were effectively locked out of trading tokenized U.S. equities – because an AMM executes deterministically against an algorithmic bonding curve and cannot natively comply with a trade-through mandate. The Rule 611 rescission will remove that structural barrier. As tokenized securities markets develop, assets may trade across onchain and offchain venues simultaneously – and there is no NBBO for onchain markets. That makes the AMM execution data in this report directly relevant to tokenized securities policy, not just digital asset compliance. Uniswap at 165 bps on large BTC is not a theoretical risk. It is a measured cost – and a data point every regulator and institution navigating the next generation of market structure needs to see. The conditional EQ framework this report describes is the only architecture that works across both onchain and offchain venues. Institutions that build it now for digital assets will have the infrastructure ready when tokenized equities demand it.

The institutions building this framework now are ahead of a requirement – but the window is closing fast.

MiCA is in force. The SEC's 2026 examination priorities name execution quality. The CLARITY Act is advancing. Rule 611 rescission is in public comment. A desk that evaluates execution cost across four dimensions simultaneously will systematically outperform one that does not.

The principles of best execution have not changed. What has changed is the market, and our ability to let multidimensional data, not rigid rules, govern how those principles are enforced.

Conclusion

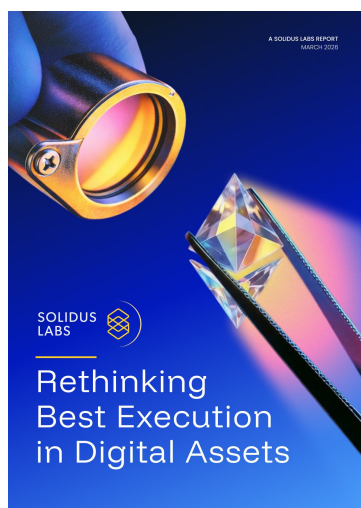
Optimal execution quality in digital asset markets is conditional on four variables simultaneously: venue, asset, size, and time of day. This is the architecture of a mature market structure framework – the same conditional logic that underpins best execution in equities, fixed income, and FX, adapted to an asset class that trades across five structurally different venue types, twenty-four hours a day, seven days a week, onchain and off.

The principles have not changed. Fairness, transparency, diligence – these still define what good execution looks like. What has changed is how those principles must be evidenced and operationalized in a market without a consolidated tape, without protected quotations, and without a mandatory routing competition layer.

In March 2026, Solidus Labs published *Rethinking Best Execution in Digital Assets* – introducing the industry's first Execution Quality (EQ) framework, designed to translate traditional BestEx principles into the fragmented reality of digital asset markets. The data in this report is the empirical foundation that framework requires.

The institutions that build conditional execution quality frameworks now – evaluating cost across venue, asset, size, and time of day jointly, not marginally – will not just reduce execution cost. They will build the audit trail, the governance posture, and the regulatory defensibility that the next phase of institutional digital asset adoption demands.

A defensible execution quality regime is not a theoretical ideal. The data to build it exists. The methodology to apply it exists. The regulatory pressure to adopt it is no longer approaching – it has arrived. The only variable that remains is the decision to act – before auditors decide for you.



This report is a companion to Solidus Labs' March 2026 publication, [Rethinking Best Execution in Digital Assets](#) – the industry's first institutional framework for execution quality in digital asset markets. The Solidus EQ product operationalizes the principles described in both reports: objective measurement, contextual intelligence, and supervisory alignment across on-chain and off-chain venues alike.

Methodology

Study Design

This study analyzed realized intra-trade price dispersion across a heterogeneous set of crypto execution venues. The full dataset covers February 1 through April 29, 2026 (UTC), encompassing 89 calendar days of continuous taker-side trading activity across eight venues.

Core Metric: Intra-Candle Spread

For each venue, taker-side trades were grouped into one-second time windows (candles). For each window, a spread was computed as:

$$\text{spread (bps)} = (\text{high} - \text{low}) / \text{midpoint} \times 10,000 \quad \text{where midpoint} = (\text{high} + \text{low}) / 2$$

Single-trade candles produce high = low and therefore a spread of zero by construction. These are excluded from multi-fill averages.

Venues

CATEGORY	VENUE	JURISDICTION	ASSET PAIRS	NOTES
CEX	CEX-1	Global	BTC, ETH	Primary benchmark; largest volume in dataset
CEX	CEX-2	UAE / APAC	BTC, ETH	Tight headline; low multi-fill volume
Broker-Dealer	BD-1	US-regulated	BTC, ETH	Inventory internalization model; flat size slope (7×)
Broker-Dealer	BD-2	US-regulated	BTC, ETH	Route-through model; 206× size slope on BTC
Broker-Dealer	BD-3	APAC-regulated	BTC, ETH	Route-through model; 17× size slope on BTC
Onchain CLOB	Hyperliquid	Decentralized	BTC, ETH	High-throughput onchain order book; not US-accessible
PropAMM	SolFi	Solana	BTC, ETH	Operator-inventory-driven; 11× BTC/ETH asymmetry at small size
Constant-product AMM	Uniswap	Ethereum	BTC, ETH	Curve-priced; 165 bps on >\$100K BTC

Trade-Size Buckets

BUCKET	NOTIONAL RANGE	INTENDED INTERPRETATION
Small	< \$1,000	Retail and sub-retail flow; all venues internalize well
Mid-small	\$1,000 – \$10,000	Institutional small ticket; first divergence appears
Mid-large	\$10,000 – \$100,000	Institutional mid-size; order-book vs. AMM gap widens
Institutional	> \$100,000	Large block; maximum venue differentiation

Limitations

Realized range vs. quoted spread. The candle high-low blends venue microstructure with short-horizon price volatility. This effect is second order at one-second frequency but affects low-volume venues disproportionately.

Taker-side only. Maker fills are excluded by design. The result is an execution-cost view, not a market-making view.

Cross-quote-pair comparison. Venues are compared across different quote currencies (USD, USDT, USDC). The stablecoin basis may contribute a small amount of apparent spread not attributable to the venue.

Equal-weighted aggregation. Candles are averaged with equal weight rather than notional weighting. A notional-weighted view is a natural next iteration.

Coverage period. Results reflect February 1 – April 29, 2026 only. Findings may not generalize to different volatility regimes or materially different liquidity environments.