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When Bitcoin Moves Most

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Some conditions came with more large Bitcoin price swings than recent volatility would suggest. None of them said which way the price would go. This note sets out what held up under pre-registered tests on 30-minute prices from January 2020 to mid-June 2026, what did not, and the limits.

In brief

- **US inflation releases, from 2022 onwards.** In the four hours around a US consumer price (CPI) release, large swings were about 25 to 30 percentage points more frequent than expected. Once the first hour after 08:30 New York time is excluded, about 8 to 13 points remain.
- **A sharp rise in expected volatility.** After the options market's own volatility index (Deribit DVOL) jumped over a day, large swings in the next four hours were about 4 to 6 points more frequent.
- **A fast build-up of leveraged bets.** After open interest in Bitcoin futures rose sharply over a day, large swings over the next three days were about 6 to 8 points more frequent. Five stress episodes carry most of this.
- **US interest-rate decisions.** The day of a Federal Reserve statement was more volatile than expected, mainly in the hours around the statement. This was less consistent from year to year.
- **Direction: nothing.** No measure tested, including order flow, funding, implied volatility, equities, the dollar and bond yields, predicted whether the price would rise or fall.

The question we asked

Can anything tell us in advance that Bitcoin is about to make an unusually large move, beyond what its recent volatility already implies?

We defined an unusually large move as a price range bigger than four in five of the comparable ranges over the previous month. By that definition such moves happen about one time in five. Each test asked whether a condition made them more frequent than a model of recent volatility, time of day and day of week predicted.

The data were 30-minute Bitcoin prices from 1 January 2020 to 15 June 2026. Results were found on January 2024 to mid-June 2026 and checked, once and unchanged, on 2020 to 2023.

What we found

Three conditions held up on both the newer and the older data and were rebuilt independently. A fourth is weaker.

CONDITION	WHAT HAPPENED	SAMPLE	STRENGTH OF EVIDENCE
US CPI release in the next 4 hours	Large 4-hour swings about 30 points more frequent (2024 to mid-2026) and 25 points (2020 to 2023)	29 and 47 releases	Held up on both periods. Near zero in 2020 and 2021; present from 2022. With the first hour after the release removed, about 8 to 13 points remain
Deribit DVOL up sharply over 24 hours (top tenth of the last two months)	Large 4-hour swings about 6 points more frequent (2024 to mid-2026) and 4 points (2020 to 2023)	275 and 263 separate episodes	Held up on both periods
Futures open interest up sharply over 24 hours (top tenth of the last two months)	Large 3-day swings about 8 points more frequent (2024 to mid-2026) and 7 points (2020 to 2023)	101 and 124 separate episodes	Held up on both periods; five stress episodes carry most of the effect
Federal Reserve statement in the next 24 hours	Large 24-hour swings about 22 points more frequent (2020 to 2023)	30 statements	Weaker. About a third sits in the statement hours and most of the rest in five days. Negative in 2021; about 7 points and not significant in 2024 to mid-2026

A point is a percentage point of probability. For scale: if recent conditions implied a one-in-five chance of a large swing, 25 to 30 points more is roughly one in two.

The CPI and Federal Reserve results describe when large moves cluster around scheduled US news. Our own earlier, descriptive work had seen price ranges widen at Federal Reserve statement hours; these tests measure the size for Bitcoin, net of recent volatility, under rules fixed in advance.

What did not work

Direction. No measure tested predicted whether the price would rise or fall over the next 4 or 24 hours: perpetual and spot order flow, implied volatility, funding rates, long/short ratios, the S&P 500, VIX, the dollar and the US 10-year yield. Of fifteen pre-registered rules on 2024 to mid-2026, none passed; six had samples large enough to rule out even small effects, and nine were too small to judge.

Combining measures. Models combining groups of measures did not beat recent volatility out of sample.

Quiet before, calm after. There was no measurable lull in the days before CPI or Federal Reserve events, and no measurable calm in the day after.

Size of the surprise. Days with a bigger move in the US 2-year yield did not reliably bring bigger Bitcoin swings. A link seen on Federal Reserve days in 2024 to mid-2026 (19 statements) did not recur in 2020 to 2023 (77 events).

How we tested it

1. **Rules written down first.** Each condition, threshold and outcome was fixed and locked before any result was computed.
2. **Compared with a shuffled market.** Each result was set against thousands of copies of the same data with the condition slid to random dates, so ordinary clustering of volatility could not pass as a finding.
3. **Corrected for testing many ideas.** Thresholds were tightened for the number of rules tested together.
4. **Checked on older years.** Anything that passed on 2024 to mid-2026 was re-tested once, unchanged, on 2020 to 2023.
5. **Rebuilt independently.** The three main results were recomputed from a written description alone, by a separate process that had not seen the original code or numbers. All six figures matched.
6. **Reviewed for faults.** An independent review checked each design before it was locked and each result after it was run.

The View From The Edge

Bitcoin's risk is partly scheduled. The clearest result here is not a pattern in charts but a calendar: since 2022, the hours after a US inflation release have carried a measurably higher chance of a large move.

Size of move and direction of move are different questions. Conditions that raised the chance of a large swing did not tell us which way it would go. Every directional measure we tested came back empty.

The record matters more than any one result. Most of what we tested found nothing, and we report that alongside what held up. The two results that rest on the fewest episodes are marked as such above.

Basis and limits

Risk, not direction. These results describe when large swings have been more frequent. They say nothing about which way the price moved.

Small samples. The event results rest on 29 to 47 releases and 30 statements; the open-interest result leans on five stress episodes.

One era for CPI. The CPI effect is near zero in 2020 and 2021 and appears from 2022. Why it switched on is not tested here, so it may also switch off; 2026 to date is the weakest year since, at about 16 points.

Past periods only. Data from July 2026 onwards are held back for one final check, due from July 2027 for the volatility-index result.

The independent rebuild was carried out by a separate automated process from a description written by the same research team, on the same data table. It confirms the calculation, not the choice of method.

Sources

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