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Do Extreme Bitcoin Price Movements Persist or Reverse? Evidence from Daily Bitcoin Returns

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Abstract

Bitcoin is characterized by large daily price fluctuations, yet the direction of price adjustment following extreme movements remains uncertain. While previous research documents both momentum and reversal in cryptocurrency returns, this study examines whether extreme daily Bitcoin movements are followed by continuation or reversal and whether the response varies with shock direction, severity, and post-event horizon. Daily BTC-USD closing prices from 17 September 2014 to 31 July 2026 are used to construct percentage log returns. Extreme positive and negative movements are identified using symmetric thresholds of 3%, 5%, and 7%. Subsequent cumulative returns are evaluated over one-, three-, and five-day horizons. Statistical inference combines parametric and non-parametric tests, exact binomial tests of reversal frequency, and regressions with heteroskedasticity and autocorrelation consistent standard errors. The findings show that Bitcoin does not exhibit a uniform post-extreme-return pattern. Moderate positive shocks display evidence of short-horizon continuation, particularly at the 3% and 5% thresholds. Negative extreme movements exhibit a stronger tendency toward reversal, with reversal frequencies significantly above 50% at several thresholds and horizons. However, formal comparisons of conditional mean returns following positive and negative shocks generally fail to establish statistically significant directional asymmetry. The results suggest that momentum and reversal can coexist within Bitcoin and depend on the magnitude, direction, and horizon of the initiating movement.

Keywords: Bitcoin, Cryptocurrency, Extreme Returns, Momentum, Price Reversal, Overreaction, Market Efficiency

1. Introduction

Bitcoin has developed from a relatively small digital asset into a globally traded financial instrument characterized by continuous trading and substantial price variation. Unlike conventional equity markets that operate within fixed trading sessions, Bitcoin trades continuously throughout the week. Its uninterrupted market structure and high volatility create frequent episodes in which prices rise or fall by several percentage points within a single day. Such movements create an important empirical question: what typically happens after an unusually large Bitcoin return?

Two competing forms of short-run price behaviour are possible. A large return may be followed by mov

ement in the same direction, producing price continuation or momentum. Alternatively, an extreme movement may be followed by a return in the opposite direction, creating price reversal. In the broader market-efficiency literature, predictable patterns following publicly observable information are important because they may indicate delayed adjustment, temporary mispricing, risk compensation, or market frictions rather than purely independent price changes [1].

Existing cryptocurrency evidence does not provide a single universal answer. Research on price overreaction has identified systematic price behaviour after unusually large cryptocurrency movements, while other studies report momentum following abnormal returns. Broad cross-sectional evidence also finds widespread short-term reversal among cryptocurrencies but shows that the largest and most tradable coins can instead exhibit daily momentum [2, 3, 4, 5].

Bitcoin-specific evidence likewise suggests that continuation and reversal may coexist. High-frequency research finds both intraday momentum and reversal, while studies of negative Bitcoin shocks report stronger subsequent correction after adverse movements. Quantile-based evidence also links overreaction to sharp Bitcoin declines [6, 7, 8].

These findings indicate that the relevant question may not be whether Bitcoin is universally characterized by momentum or reversal. Post-event behaviour may instead depend on the characteristics of the initiating price movement. A moderate positive shock, a severe positive shock, and a severe negative shock need not generate identical subsequent dynamics. Likewise, an effect observed one day after an event may disappear or strengthen when cumulative returns are considered over several days.

The present study therefore examines Bitcoin-specific post-extreme-return behaviour along three dimensions: direction, severity, and horizon. Extreme returns are classified separately as positive and negative using fixed thresholds of 3%, 5%, and 7% in absolute daily log-return terms. Price responses are then measured over one-, three-, and five-day horizons. This structure makes it possible to determine whether continuation or reversal is stable across alternative definitions of an extreme movement and whether the pattern changes as the post-event horizon expands.

The study uses daily BTC-USD data extending from 17 September 2014 to 31 July 2026. The long sample provides 4,335 valid daily return observations. Rather than defining extreme observations through a model-dependent procedure, transparent fixed thresholds are used. All qualifying extreme observations are retained, including consecutive extreme days, so that the results characterize behaviour following every observable extreme Bitcoin return satisfying the predefined criteria.

Several complementary statistical procedures are employed. Mean and median cumulative post-event returns are examined using one-sample t-tests and Wilcoxon signed-rank tests. Reversal frequencies are evaluated using exact binomial tests against a 50% benchmark. Positive and negative event groups are compared using Welch's t-test and the Mann-Whitney U test. Finally, event-direction regressions are estimated with heteroskedasticity and autocorrelation consistent Newey-West standard errors to address dependence created by overlapping multi-day post-event windows.

The evidence indicates that Bitcoin's response to an extreme daily return is conditional rather than uniform. Moderate positive shocks display evidence of continuation over short multi-day horizons. Negative extreme returns, in contrast, exhibit a greater tendency toward reversal, with statistically significant reversal frequencies at several threshold-horizon combinations. Nevertheless, direct statistical comparisons between post-event mean returns following positive and negative shocks are generally insignificant. The evidence therefore supports within-group continuation and reversal patterns more strongly than it supports a broad claim of directional asymmetry in conditional means.

The study contributes updated Bitcoin-specific evidence by jointly examining shock direction, fixed severity thresholds, and multiple short post-event horizons over a long daily sample. The results suggest that momentum and reversal can coexist within a single highly liquid cryptocurrency and that their relative importance depends on the characteristics of the initiating movement.

2. Literature Review

2.1 Price Overreaction, Momentum and Reversal

The behaviour of asset prices following unusually large returns is related to the broader debate surrounding market efficiency and behavioural finance. In an informationally efficient market, easily exploitable predictable return patterns should be limited once relevant risks and trading frictions are considered. Behavioural explanations, however, allow temporary deviations arising from delayed reaction, excessive reaction, herding, limited attention, or other market frictions [1].

Two opposing empirical patterns can result. Momentum occurs when returns continue in the direction of the initiating movement, whereas reversal occurs when subsequent returns move against it. A reversal following an unusually large movement is consistent with an overreaction interpretation, but reversal alone does not identify a causal behavioural mechanism. Large movements may incorporate genuine information as well as temporary order imbalances, and their subsequent behaviour can therefore differ across markets and events.

2.2 Evidence from Cryptocurrency Markets

Cryptocurrencies provide an especially relevant environment for examining post-event return behaviour because they are continuously traded and can experience substantially larger daily movements than mature conventional asset classes.

An early multi-asset study by Caporale and Plastun evaluates unusually large returns in Bitcoin, Litecoin, Ripple, and Dash and finds that subsequent price behaviour differs from that observed after ordinary trading days [2].

Using Bitcoin, Ethereum, and Litecoin, Caporale and Plastun find that unusually large daily movements often retain their direction into the subsequent trading period [3]. Their results are not completely uniform, however, since positive abnormal Bitcoin returns are among the cases in which subsequent behaviour is contrarian.

Evidence from twelve cryptocurrencies across daily and higher-frequency observations also indicates that overreaction-type episodes occur frequently. Borgards and Czudaj further show a modest predominance of downside overreaction events relative to upside events, supporting the possibility of direction-sensitive adjustment [4].

Across a very large cryptocurrency cross-section, Zaremba et al. find that yesterday's winners and losers often move back toward their previous levels [5]. Importantly, this tendency weakens with market liquidity; among the most actively traded digital assets, return persistence becomes more prominent.

Wen et al. report both intraday momentum and reversal using high-frequency cryptocurrency data. For Bitcoin, the patterns change with large price jumps, liquidity conditions, monetary-policy announcements, and the COVID-19 period. Their evidence directly supports the view that momentum and reversal can coexist rather than represent mutually exclusive descriptions of cryptocurrency markets [6].

Using hourly Bitcoin observations and several alternative definitions of a price shock, Miralles-Quirós and Miralles-Quirós report stronger corrective behaviour following adverse movements, with the

response becoming clearer over longer post-shock intervals [7]. This result provides a direct basis for separating positive and negative extreme movements.

Chevapatrakul and Mascia use quantile autoregression to examine Bitcoin return persistence across the distribution. They find evidence consistent with overreaction during days of sharp Bitcoin declines and during weeks of market rallies, further suggesting that return dependence is not constant across market states [8].

2.3 Research Gap and Hypotheses

Prior studies establish that cryptocurrency markets can exhibit overreaction, continuation, and reversal, but they commonly use multiple cryptocurrencies, cross-sectional portfolios, high-frequency observations, model-defined abnormal returns, or shorter samples. The present study adopts a deliberately transparent Bitcoin-only design and asks how subsequent behaviour changes jointly with shock direction, fixed shock severity, and post-event horizon.

H01: Subsequent Bitcoin returns following extreme daily price movements do not differ significantly from zero.

H11: Subsequent Bitcoin returns following extreme daily price movements differ significantly from zero.

H02: The probability of reversal following an extreme Bitcoin return does not differ significantly from 50%.

H12: The probability of reversal following an extreme Bitcoin return differs significantly from 50%.

H03: Post-event Bitcoin returns do not differ significantly between extreme positive and extreme negative movements.

H13: Post-event Bitcoin returns differ significantly between extreme positive and extreme negative movements.

3. Data and Methodology

3.1 Data and Sample

Daily Bitcoin prices denominated in U.S. dollars (BTC-USD) are obtained from Yahoo Finance. The final sample extends from 17 September 2014 to 31 July 2026, covering 4,336 price observations and 4,335 valid daily return observations. Bitcoin's natural seven-day trading calendar is retained because the study examines Bitcoin independently rather than matching it to a conventional exchange calendar.

The full return sample has a mean daily log return of approximately 0.114%, a median of 0.105%, and a standard deviation of 3.497%. The minimum daily return is -46.47% and the maximum is 22.51%. Excess kurtosis is approximately 11.92, indicating a heavy-tailed return distribution and motivating the use of non-parametric tests alongside conventional parametric inference.

Table 1: Descriptive Statistics

Measure	Value
Start Date	2014-09-17
End Date	2026-07-31
Price Observations	4,336
Return Observations	4,335
Mean Return (%)	0.114
Median Return (%)	0.105

Measure	Value
Standard Deviation (%)	3.497
Minimum (%)	-46.473
Maximum (%)	22.512
Skewness	-0.707
Excess Kurtosis	11.919

3.2 Return Construction

Daily percentage log returns are calculated as follows.

$$r_t = 100 \times [\ln(P_t) - \ln(P_{t-1})] \quad (1)$$

Here, P denotes the BTC-USD closing price and t denotes the calendar day. Expressing log returns in percentage terms allows the event thresholds to be interpreted directly.

3.3 Identification of Extreme Events

Extreme Bitcoin movements are defined using three symmetric absolute return thresholds, c = 3%, 5%, and 7%. A positive extreme event satisfies:

$$r_t \geq c \quad (2)$$

A negative extreme event satisfies:

$$r_t \leq -c \quad (3)$$

The use of three predetermined thresholds avoids basing the empirical conclusion on a single definition of an extreme movement. The 3% threshold captures relatively frequent large daily movements, while the 5% and 7% thresholds progressively isolate more severe events. All qualifying events are retained. Consecutive extreme movements are not removed because the objective is to characterize the response following every observable extreme Bitcoin day satisfying the predefined threshold.

Table 2: Extreme Event Counts

Threshold	Positive Events	Negative Events	Total Events
3%	575	510	1085
5%	249	254	503
7%	129	113	242

3.4 Post-Event Return Horizons

For every extreme event, cumulative post-event returns are calculated over one-, three-, and five-day horizons.

$$CAR_{t,h} = \sum_{j=1}^{h} r_{t+j} \quad (4)$$

For h = 1, the measure is the next-day Bitcoin return. The three- and five-day measures capture whether the initial post-event response strengthens, weakens, or changes direction over a short multi-day horizon.

3.5 Classification of Reversal and Continuation

Following a positive extreme event, a negative cumulative subsequent return is classified as reversal and a positive subsequent return as continuation. Following a negative extreme event, a positive cumulative subsequent return is classified as reversal and a negative subsequent return as continuation. Reversal frequency is calculated as follows.

$$RF = \frac{\text{Number of reversal observations}}{\text{Number of valid extreme events}} \times 100 \quad (5)$$

Under a neutral directional benchmark, reversal and continuation would each occur with probability 0.5.

3.6 Statistical Procedures

A one-sample t-test evaluates whether the mean cumulative post-event return differs from zero. The Wilcoxon signed-rank test provides a non-parametric assessment of whether post-event returns are centred around zero. An exact two-sided binomial test evaluates whether reversal frequency differs from the 50% benchmark. Positive and negative event groups are compared using Welch's unequal-variance t-test and the Mann-Whitney U test.

Finally, a simple event-direction regression is estimated among extreme-event observations.

$$CAR_{t,h} = \alpha + \beta\ NegativeShock_t + \varepsilon_t \quad (6)$$

NegativeShock equals one for a negative extreme event and zero for a positive extreme event. The intercept therefore represents the average post-event return following positive extreme movements, while the coefficient on NegativeShock represents the difference between subsequent returns following negative and positive events. Because all extreme observations are retained, multi-day post-event windows can overlap. Regression inference is therefore based primarily on heteroskedasticity and autocorrelation consistent Newey-West standard errors, using maximum lags of one, three, and five for the corresponding horizons.

4. Results

4.1 Descriptive Evidence and Event Incidence

Large daily Bitcoin movements occur frequently in the sample. The ±3% definition produces 1,085 extreme observations, the ±5% definition produces 503, and the ±7% definition produces 242. Positive and negative event counts remain sufficiently balanced at each threshold to permit meaningful comparisons.

Table 3: Post-Event Cumulative Returns

Threshold	Shock	Horizon	N	Mean (%)	Median (%)	t p-value	Wilcoxon p-value
3%	Positive	1	575	0.127	-0.026	0.411	0.717
3%	Positive	3	575	0.716	0.503	0.007	0.003
3%	Positive	5	575	1.037	0.593	0.004	0.012
3%	Negative	1	510	0.177	0.502	0.404	0.012
3%	Negative	3	510	0.346	1.051	0.285	0.030
3%	Negative	5	510	0.768	1.245	0.053	0.001
5%	Positive	1	249	0.121	0.122	0.656	0.649
5%	Positive	3	249	0.761	0.892	0.089	0.034
5%	Positive	5	249	1.207	0.809	0.040	0.078
5%	Negative	1	254	0.182	0.316	0.587	0.197
5%	Negative	3	254	0.594	0.757	0.194	0.203
5%	Negative	5	254	0.491	1.135	0.414	0.122
7%	Positive	1	129	-0.529	-0.669	0.196	0.091
7%	Positive	3	129	-0.191	-0.502	0.777	0.837
7%	Positive	5	129	0.600	0.661	0.475	0.583

Threshold	Shock	Horizon	N	Mean (%)	Median (%)	t p-value	Wilcoxon p-value
7%	Negative	1	113	0.451	0.620	0.443	0.193
7%	Negative	3	113	1.379	1.433	0.062	0.058
7%	Negative	5	113	1.293	2.448	0.194	0.059

4.2 Behaviour Following Positive Extreme Returns

The results show evidence of short-horizon continuation following moderate positive Bitcoin shocks. At the 3% threshold, the mean one-day post-event return is approximately 0.127% and is not statistically different from zero. The pattern becomes stronger over longer horizons. The mean three-day cumulative return following a positive 3% event is approximately 0.716%, with a t-test p-value of 0.007 and a Wilcoxon p-value of 0.003.

At the five-day horizon, the average cumulative return rises to approximately 1.037%. The t-test p-value is 0.004 and the Wilcoxon p-value is 0.012. The result also remains statistically significant under HAC inference, with $p = 0.013$ at three days and $p = 0.021$ at five days.

Directional frequencies support the continuation interpretation. Following positive 3% events, only 44.17% of three-day cumulative responses are reversals, implying continuation in 55.83% of observations. The exact binomial test rejects the 50% benchmark with $p = 0.006$. At five days, continuation remains more frequent than reversal, although the difference from 50% is not statistically significant.

The 5% positive-event sample shows a similar but weaker pattern. The mean three-day cumulative return is approximately 0.761%, and the mean five-day return is approximately 1.207%. The conventional t-test identifies the five-day mean as significant at approximately the 5% level, but after HAC correction the corresponding p-value is 0.068. The directional result remains informative: after positive 5% events, the three-day reversal frequency is 43.37%, implying continuation in 56.63% of observations, with an exact binomial p-value of 0.042.

The most severe positive events behave differently. Following positive 7% shocks, the mean next-day return is approximately -0.529%, suggesting short-run reversal rather than continuation, but the average is not statistically significant. No stable continuation pattern is identified across the longer horizons. Overall, moderately large positive Bitcoin gains show clearer persistence than the most extreme positive events.

Table 4: Reversal and Continuation Frequencies

Threshold	Shock	Horizon	N	Reversal (%)	Continuation (%)	Binomial p-value
3%	Positive	1	575	50.26	49.74	0.934
3%	Positive	3	575	44.17	55.83	0.006
3%	Positive	5	575	46.09	53.91	0.066
3%	Negative	1	510	56.67	43.33	0.003
3%	Negative	3	510	58.04	41.96	0.000
3%	Negative	5	510	57.45	42.55	0.001
5%	Positive	1	249	49.00	51.00	0.800
5%	Positive	3	249	43.37	56.63	0.042

Threshold	Shock	Horizon	N	Reversal (%)	Continuation (%)	Binomial p-value
5%	Positive	5	249	45.78	54.22	0.205
5%	Negative	1	254	51.97	48.03	0.572
5%	Negative	3	254	55.91	44.09	0.069
5%	Negative	5	254	56.30	43.70	0.052
7%	Positive	1	129	55.81	44.19	0.218
7%	Positive	3	129	51.94	48.06	0.725
7%	Positive	5	129	47.29	52.71	0.597
7%	Negative	1	113	55.75	44.25	0.259
7%	Negative	3	113	60.18	39.82	0.038
7%	Negative	5	113	60.18	39.82	0.038

4.3 Behaviour Following Negative Extreme Returns

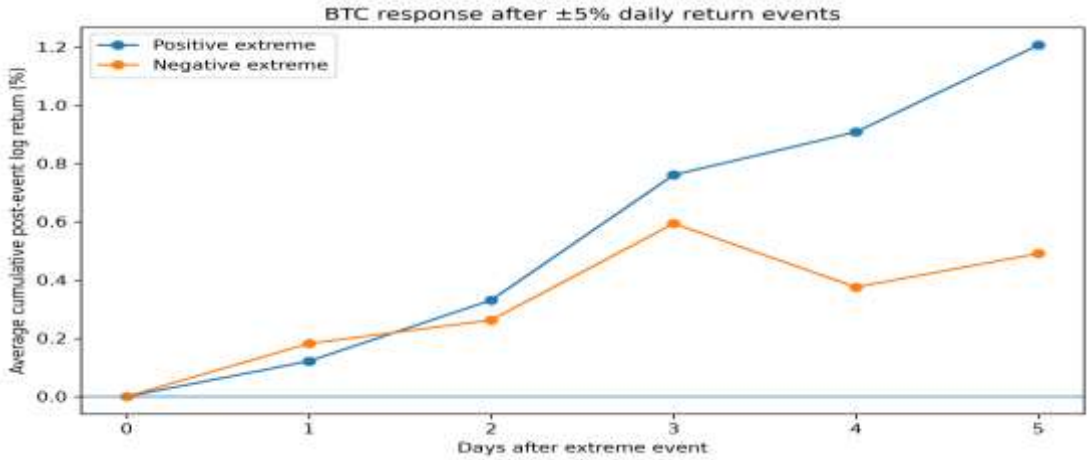
Negative events produce a particularly consistent directional pattern. At the 3% threshold, the mean next-day return following a negative extreme event is approximately +0.177%. Although the mean does not differ significantly from zero under the t-test, the Wilcoxon test produces $p = 0.012$.

The reversal-frequency evidence is stronger. After a negative 3% movement, 56.67% of next-day observations reverse direction, with an exact binomial p-value of 0.003. Over three days, the reversal frequency rises to 58.04%, with $p < 0.001$. At five days, reversal remains high at 57.45%, again with $p < 0.001$. The average five-day cumulative return is approximately +0.768%; its t-test p-value is approximately 0.053, while the Wilcoxon test is significant at $p = 0.001$.

Negative 5% events show the same direction but weaker statistical evidence. Reversal frequencies rise from approximately 51.97% at one day to 55.91% at three days and 56.30% at five days, with the longer-horizon binomial p-values close to conventional significance. At the most severe negative threshold, approximately 60.18% of events reverse over both three and five days, and both frequencies differ significantly from 50% with $p = 0.038$.

Taken together, the negative-event results indicate that large Bitcoin declines are more frequently followed by positive cumulative returns than by continued losses, with the clearest evidence at the 3% threshold and again for severe 7% declines over multi-day horizons.

Figure 1: Average Cumulative Return Following 5% Extreme Bitcoin Movements



4.4 Positive-versus-Negative Comparisons

The separate event groups display different continuation and reversal patterns, but direct statistical comparisons provide weaker evidence of asymmetry. At the 3% and 5% thresholds, Welch's tests and Mann-Whitney tests generally fail to reject equality between the positive- and negative-shock samples. At the 7% threshold, the one-day mean response is approximately -0.529% after positive events and +0.451% after negative events. The Mann-Whitney test yields $p = 0.039$, while Welch's mean comparison remains insignificant at $p = 0.171$.

The HAC regressions reinforce this cautious interpretation. The NegativeShock coefficient, representing the difference between subsequent mean returns after negative and positive extreme events, is not statistically significant at conventional levels in any of the nine threshold-horizon combinations. Consequently, the evidence provides stronger support for continuation or reversal within specific event groups than for a general claim of directional asymmetry in conditional mean returns.

Table 5: Positive-versus-Negative Shock Comparisons

Threshold	Horizon	Positive Mean (%)	Negative Mean (%)	Welch p	Mann-Whitney p	HAC β	HAC p
3%	1	0.127	0.177	0.847	0.069	0.051	0.841
3%	3	0.716	0.346	0.375	0.861	-0.370	0.375
3%	5	1.037	0.768	0.615	0.604	-0.269	0.610
5%	1	0.121	0.182	0.888	0.491	0.061	0.885
5%	3	0.761	0.594	0.794	0.573	-0.167	0.789
5%	5	1.207	0.491	0.394	0.842	-0.716	0.358
7%	1	-0.529	0.451	0.171	0.039	0.981	0.137
7%	3	-0.191	1.379	0.116	0.111	1.571	0.105
7%	5	0.600	1.293	0.593	0.280	0.693	0.543

5. Discussion

The findings help reconcile apparently competing results in the cryptocurrency literature. Previous studies separately report momentum, overreaction, and short-term reversal. The evidence presented here suggests that these effects need not describe mutually exclusive market regimes. Instead, they can coexist within Bitcoin itself [2, 3, 4, 5, 6].

Moderately large positive returns show the clearest continuation effect. At the 3% threshold, positive shocks are followed by statistically significant positive cumulative returns over both three and five days, and the three-day frequency of continuation is also significantly greater than a neutral 50% benchmark. Positive 5% events similarly display significant directional continuation over three days. This is compatible with earlier evidence of momentum following abnormal cryptocurrency returns and with findings that the largest, most liquid cryptocurrencies can exhibit momentum even when broad cryptocurrency samples display reversal [3, 5].

Bitcoin's liquidity and market prominence may make gradual information incorporation or sustained directional trading plausible following some positive events. Positive shocks may also attract additional attention or trend-following participation. However, investor identities, news, order flow, and sentiment

are not observed in the present analysis, so these interpretations remain possible mechanisms rather than causal findings.

Negative extreme returns exhibit a different within-group pattern. At the 3% threshold, reversal frequencies are significantly greater than 50% at all three horizons. The same tendency becomes statistically significant again for severe negative 7% movements at the three- and five-day horizons. One possible interpretation is that large downside movements sometimes include temporary selling pressure, liquidation, panic, or overshooting followed by partial recovery. Prior Bitcoin-specific evidence of overreaction after negative shocks is compatible with this interpretation [7, 8].

The results should nevertheless not be described as definitive proof that negative shocks are categorically different from positive shocks. Formal positive-versus-negative mean comparisons and HAC regression coefficients generally fail to reject equality. A finding that negative extreme returns reverse significantly more often than 50% does not automatically imply that their average subsequent return differs significantly from the average following positive shocks. This distinction is central to the interpretation of the evidence.

Shock severity also matters. Continuation following positive 3% and 5% movements weakens at the 7% threshold. Likewise, negative-event reversal is not monotonically stronger as the threshold increases. The 3% group provides particularly consistent evidence, the 5% group is weaker, and the 7% group again shows significant reversal frequencies over longer horizons. A single universal momentum or reversal coefficient would therefore obscure meaningful variation across event categories.

5.1 Practical Implications

The findings have a straightforward practical implication for investors and market participants: an extreme daily Bitcoin movement should not automatically be interpreted as either a momentum signal or a contrarian signal. Moderately large positive movements frequently continue over the next several days, whereas negative extreme movements show a greater historical tendency toward subsequent recovery.

These findings do not demonstrate a profitable standalone trading strategy. Transaction costs, bid-ask spreads, execution constraints, leverage, market impact, and optimized trading rules are outside the scope of the analysis. The objective is to characterize conditional price behaviour rather than to backtest an investment strategy.

6. Limitations

First, the analysis focuses exclusively on Bitcoin. The findings cannot automatically be generalized to Ethereum, alternative cryptocurrencies, or the broader digital-asset market.

Second, daily closing prices are used. Large intraday movements and corrections occurring within the same calendar day are therefore not observed.

Third, the 3%, 5%, and 7% definitions of an extreme movement are fixed in absolute return terms. Their transparency is an advantage, but the same percentage movement can represent different degrees of abnormality across volatility regimes.

Fourth, overlapping post-event windows are retained by design because the study seeks to characterize every qualifying extreme observation. HAC standard errors address serial dependence in regression inference, but clustered periods of extreme activity can still complicate economic interpretation.

Finally, the analysis identifies statistical post-event patterns rather than causal mechanisms. It does not determine whether continuation or reversal is driven by information arrival, investor sentiment, liquidations, market microstructure, institutional activity, or other factors.

7. Conclusion

This study examines whether extreme daily Bitcoin price movements persist or reverse using BTC-USD data from 17 September 2014 to 31 July 2026. Extreme movements are classified using symmetric thresholds of 3%, 5%, and 7%, and subsequent returns are evaluated over one-, three-, and five-day horizons.

The results reject the idea of a single universal post-extreme-return pattern. Moderately large positive Bitcoin movements display evidence of short-horizon continuation. Positive 3% shocks are followed by significant positive cumulative returns over three and five days, while positive 5% shocks also display significant directional continuation over three days, although some mean-return evidence becomes weaker after HAC correction.

Negative extreme events exhibit a stronger tendency toward reversal. Following negative 3% movements, reversal frequencies are significantly above 50% at one-, three-, and five-day horizons. The tendency remains visible at the 5% threshold and becomes statistically significant again for negative 7% events over the three- and five-day horizons.

The evidence therefore indicates that momentum and reversal can coexist within Bitcoin. Their relative importance depends on the direction and severity of the initiating shock and on the period over which subsequent performance is measured. At the same time, direct statistical comparisons between post-event mean returns following positive and negative shocks are generally insignificant. The findings should therefore be interpreted as strong evidence of distinct within-group continuation and reversal tendencies, but weaker evidence of systematic directional asymmetry in conditional mean returns.

The broader implication is that extreme Bitcoin movements cannot be interpreted using a universal contrarian or momentum rule. Future research could extend the framework using volatility-adjusted thresholds, intraday observations, market-liquidity measures, or explanatory variables capable of distinguishing informational shocks from temporary market overreaction.

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