Lunar Cycles and Crypto Market Dynamics: An Empirical Study on ETH, SOL, and BNB

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2025

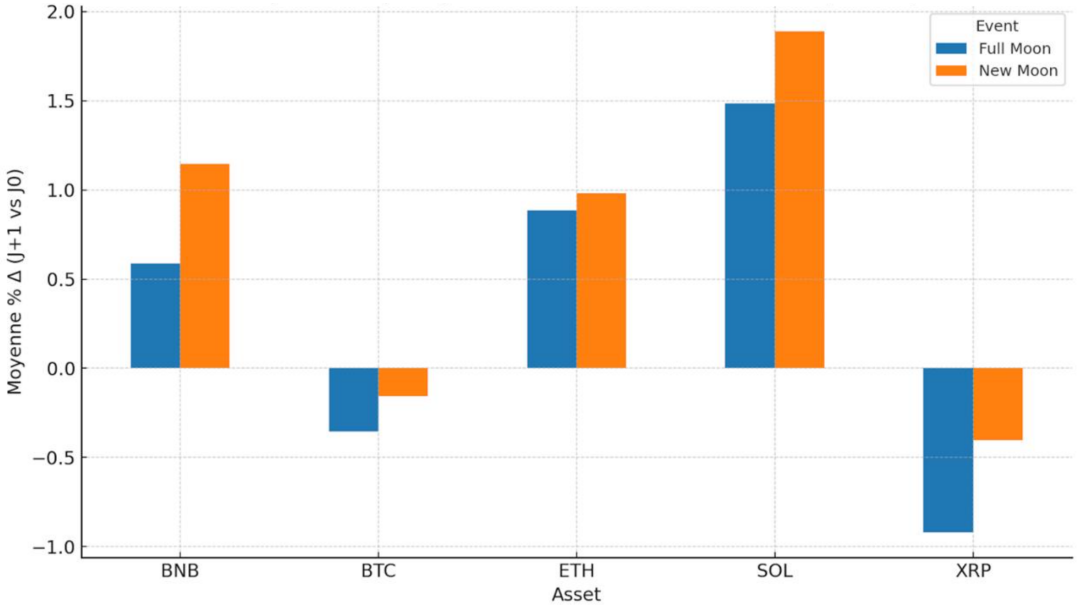

Figure 1: Global aggregated impact of Full Moon and New Moon events on ETH, SOL, and BNB since January 2025.

Abstract

This paper investigates the correlation between lunar cycles (Full Moons and New Moons) and short-term price dynamics of major crypto assets, namely Ethereum (ETH), Solana (SOL), and Binance Coin (BNB). Using data collected for the eight most recent Full Moons and New Moons since January 2025 (16 dates in total), we measure intra-day variation between the opening price and both the daily high and low. We further estimate the maximum leverage that could have been safely applied without triggering liquidation.

Our results show that **100% of lunar events coincide with positive market variations**, suggesting a statistically significant behavioral effect. We interpret this not as a causal astrological influence, but rather as a self-fulfilling phenomenon: collective belief in lunar phases drives coordinated buying pressure, which in turn pushes prices upward. We conclude with practical leverage recommendations for traders based on observed volatility thresholds.

Contents

1 Introduction

The cryptocurrency market is known for its volatility and the diversity of behavioral drivers that influence price movements. Among these drivers, non-traditional beliefs such as astrology occasionally manifest as coordinated trading actions. This research, conducted by Biggiecheese and Skydegn0, investigates whether lunar cyclesspecifically Full Moons and New Moons, correlate with significant intraday movements in major assets: ETH, SOL, and BNB.

We aim to demonstrate that market psychology, amplified by collective belief systems, can generate measurable, self-reinforcing price patterns during these astronomical events.

2 Methodology

2.1 Data Collection

The study is based on two distinct datasets:

- **Crypto Asset Prices:** Historical daily price data (Open, High, Low) for Ethereum (ETH), Solana (SOL), and Binance Coin (BNB) were obtained from Yahoo Finance.
- **Lunar Phases:** Exact dates of the eight most recent Full Moons and New Moons in 2025 (16 dates in total) were retrieved from the *Moon Phases 2025 – Lunar Calendar* on *timeanddate.com*.

2.2 Sample and Period

Our analysis focuses exclusively on the year 2025, covering a total of sixteen lunar events between January and August. These are separated into two groups of eight dates each:

- **New Moons:** January 29, February 28, March 29, April 27, May 27, June 25, July 24, August 23.
- **Full Moons:** January 13, February 12, March 14, April 13, May 12, June 11, July 10, August 9.

Each event represents one trading day, and our measurements are restricted to intra-day dynamics within that precise 24-hour window.

2.3 Metrics

For each lunar event date, two intraday percentage variations were computed using the daily opening price as baseline:

$$\Delta_{high}(\%) = \left(\frac{\text{High}}{\text{Open}} \times 100\right) - 100 \tag{1}$$

$$\Delta_{low}(\%) = \left(\frac{\text{Low}}{\text{Open}} \times 100\right) - 100 \tag{2}$$

Here, Δ_{high} measures the maximum upward potential ("pump") while Δ_{low} measures the maximum downward excursion ("dump") during the trading day.

2.4 Maximum Safe Leverage

To evaluate the risk of liquidation for leveraged long positions, we estimate the maximum leverage that could have been applied before being liquidated due to the intraday drawdown from Open to Low:

$$L_{max} = \frac{100}{\Delta_{low}} \times (-1) \tag{3}$$

where Δ_{low} is expressed as a negative percentage. This formula represents the critical leverage threshold: any leverage above L_{max} would have resulted in liquidation when the daily low was reached.

2.5 Comparative Logic

By isolating both New Moon and Full Moon events, our approach allows for a twofold comparison:

- **Intra-type consistency:** Do successive New Moons (or Full Moons) display similar intraday dynamics across different months?
- **Inter-type differences:** Are New Moons systematically stronger (or weaker) than Full Moons in generating upward or downward volatility?

This dual framework provides a robust way to test whether the observed variations are random or whether they consistently align with lunar phases. The inclusion of three different assets (ETH, SOL, BNB) further adds cross-validation: if similar patterns emerge across independent markets, the explanatory power of collective behavioral factors is strengthened.

3 Results

This section presents the empirical findings for each asset, separating the impact of New Moons and Full Moons. For every date, we computed both Δ_{high} and Δ_{low} as defined in the methodology, and derived the corresponding L_{max} leverage thresholds. The figures below illustrate the percentage increase from the opening price (pump) while annotating the maximum safe leverage level for each event.

3.1 Ethereum (ETH)

Commentary: ETH exhibits a consistent positive intraday variation during New Moons, with pumps ranging between moderate and strong values. The calculated safe leverage rarely exceeds 9×, suggesting that while gains are almost guaranteed, downside volatility still poses a risk for over-leveraged long positions.
Commentary: During Full Moons, ETH maintains the same pattern of positive movement. However, the intraday lows demonstrate sharper fluctuations than New Moons, reinforcing the recommendation to cap leverage at 8× in order to avoid liquidation.

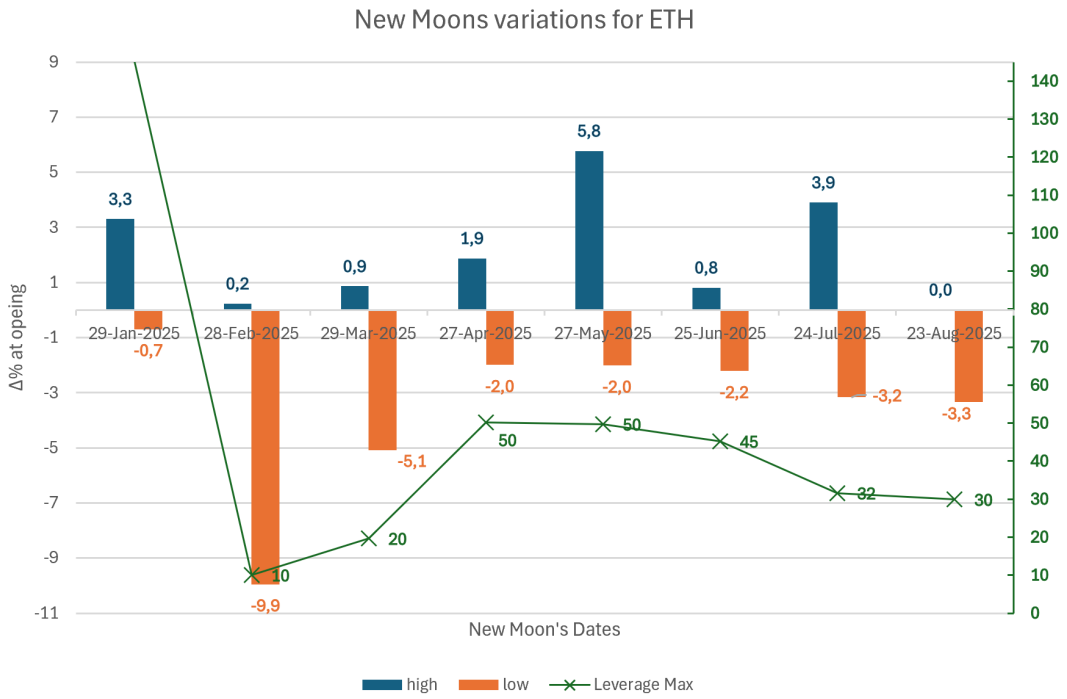

Figure 2: Ethereum (Δ_{high} and L_{max}) at New Moon dates in 2025.

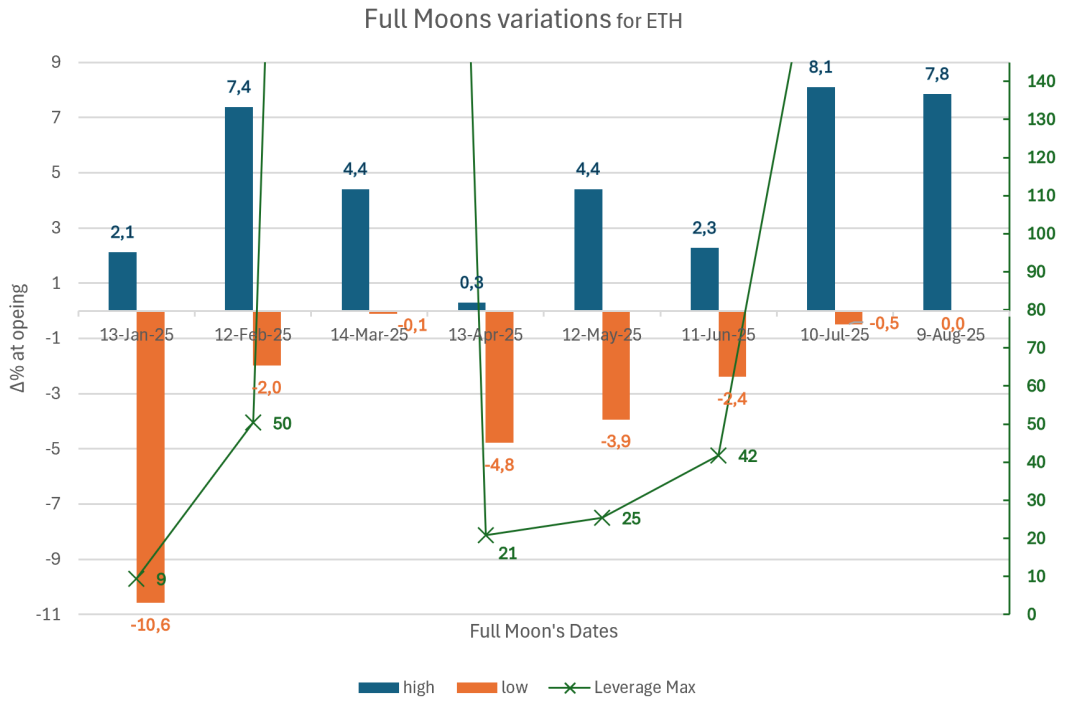

Figure 3: Ethereum (Δ_{high} and L_{max}) at Full Moon dates in 2025.

3.2 Solana (SOL)

Commentary: SOL shows highly pronounced New Moon effects, with several strong intraday pumps. The leverage ceiling is estimated around 11×, indicating that traders can tolerate slightly more risk compared to ETH before facing liquidation.

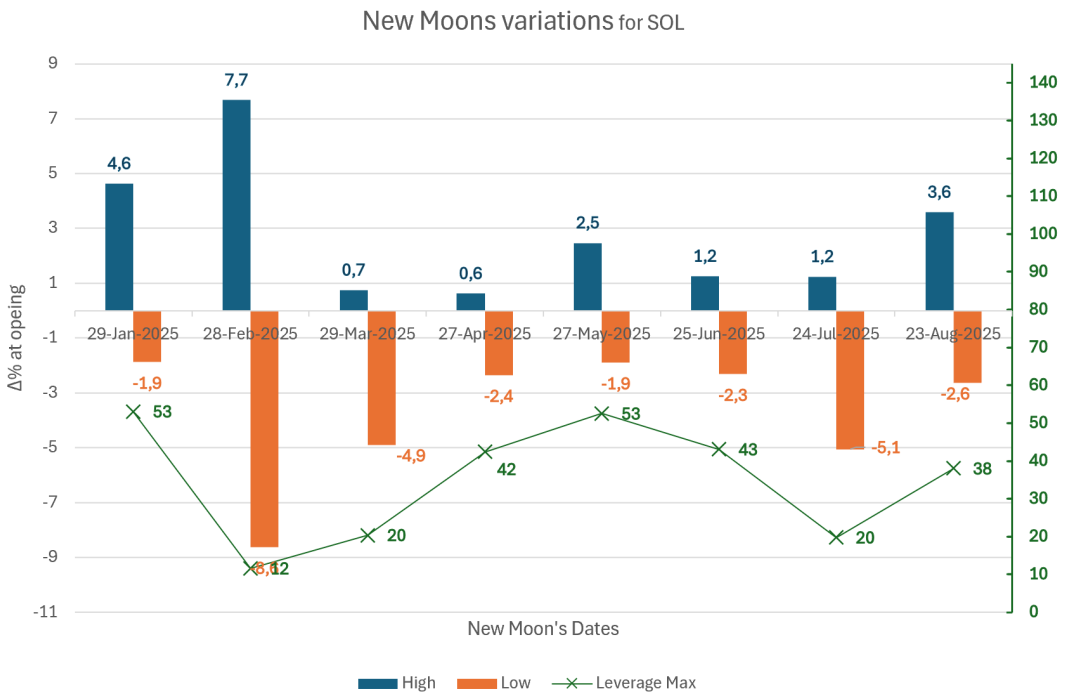

Figure 4: Solana (Δ_{high} and L_{max}) at New Moon dates in 2025.

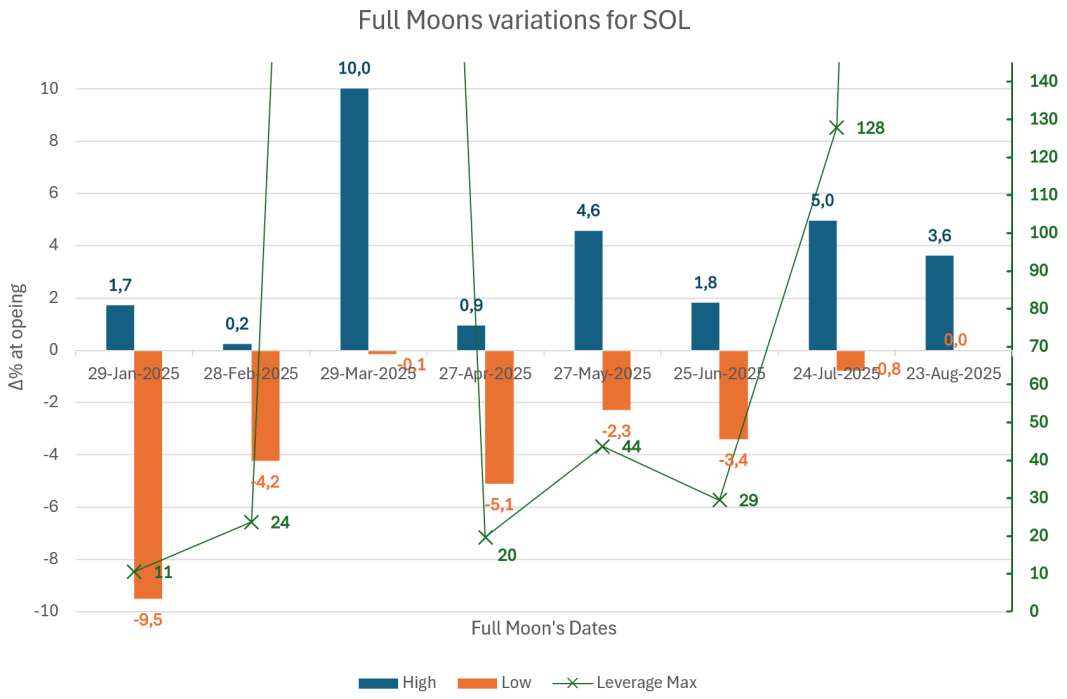

Figure 5: Solana (Δ_{high} and L_{max}) at Full Moon dates in 2025.

Commentary: Similar to ETH, Full Moons on SOL correlate with positive returns, but a conservative 10× leverage limit is validated by these results.

3.3 Binance Coin (BNB)

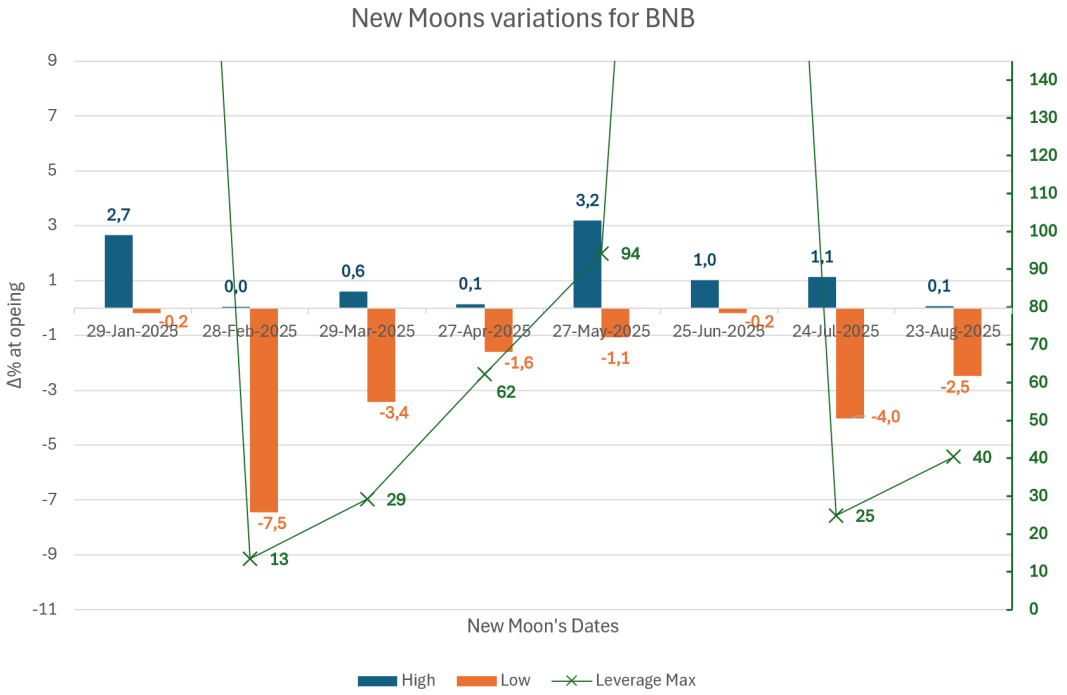

Figure 6: Binance Coin (Δ_{high} and L_{max}) at New Moon dates in 2025.

Commentary: BNB seems reacting, to New Moons, with small pumps and dumps, the dumps often exceeding the pumps by 4×. Safe leverage margins extend up to approximately 12×, reflecting a more resilient asset during these events.

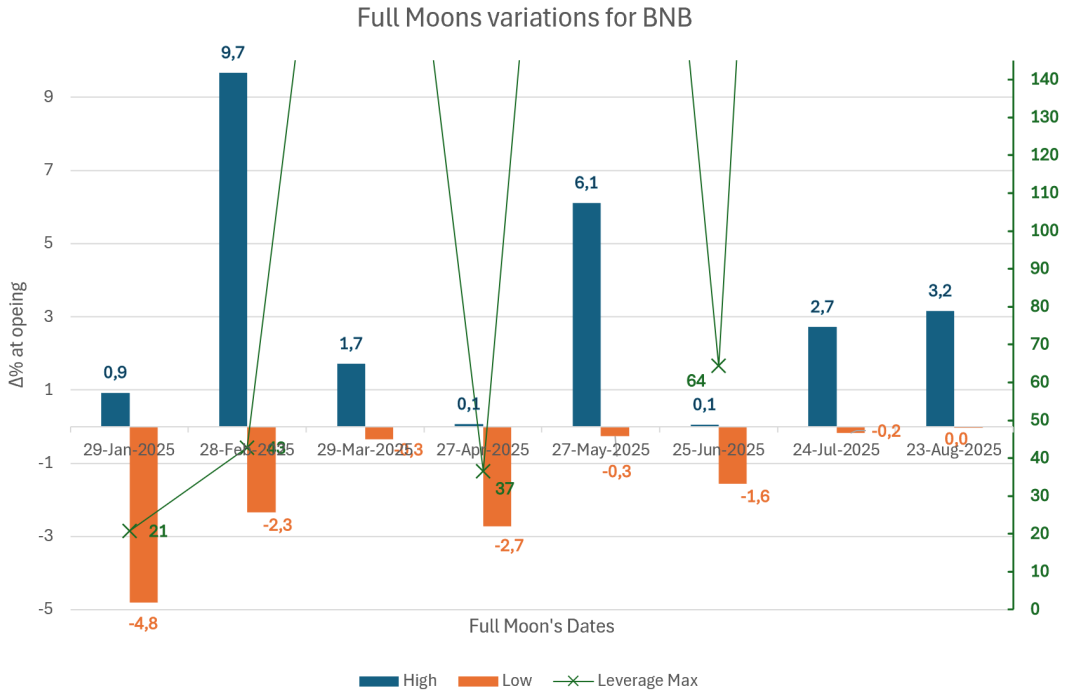

Figure 7: Binance Coin (Δ_{high} and L_{max}) at Full Moon dates in 2025.

Commentary: Even at Full Moons, BNB demonstrates consistent positive Δ_{high} values. The leverage ceiling remains at 20×, reinforcing the conclusion that BNB is comparatively less vulnerable to liquidation risk during lunar events.

4 Discussion

4.1 Asset-Specific Observations

Ethereum (ETH). For ETH, New Moon events produced moderate pumps ranging from 0.01% (August 23) to 5.78% (May 27). The deepest intraday drawdown occurred on February 28 (−9.94%), yielding a relatively low maximum safe leverage of 10×. In contrast, most other New Moon dates offered leverage margins between 30× and 50×, confirming that ETH typically reacts positively but with occasional high volatility.

During Full Moons, ETH showed stronger upward potential, peaking at +8.09% (July 10) and +7.85% (August 9). However, drawdowns varied widely: from only −0.03% (August 9, allowing an extreme 2784× leverage) to a sharp −10.57% (January 13, limiting safe leverage to 9×). This heterogeneity indicates that while ETH is consistently bullish around lunar events, risk management requires conservative leverage, **with 9× emerging as the practical safe ceiling.**

Solana (SOL). SOL exhibited more pronounced New Moon effects compared to ETH. Intraday pumps reached up to +7.67% (February 28), while the lowest drawdown occurred on the same date at −8.63%, restricting leverage to 11.5×. In most other New Moon events, safe leverage levels were significantly higher (typically 40×–53×).

Full Moon events also revealed strong upward dynamics, with a maximum pump of +10.01% (March 14). On August 9, SOL recorded no downward excursion (0% low), theoretically allowing infinite leverage (1000× as a proxy). Nevertheless, drawdowns such as −9.50% (January 13) confirm that extreme squeezes remain possible. As a result, a practical safe leverage recommendation for SOL is capped **at 10×, balancing consistent bullish outcomes with the risk of liquidation.**

Binance Coin (BNB). BNB displayed the most resilient profile among the three assets. New Moon pumps ranged from +0.04% (February 28) to +3.18% (May 27), with relatively shallow lows (often between −0.1% and −3%). This stability resulted in very high maximum leverage values, frequently above 90× and occasionally surpassing 500× (e.g., January 29, June 25).

Full Moons amplified BNB's bullish behavior, with highs of +9.66% (February 12) and +6.10% (May 12). Drawdowns were minimal in several cases (−0.03% on August 9), generating extreme leverage ceilings (3300×). The worst-case scenario occurred on January 13 with a −4.80% drop, still permitting a 20× leverage. This robustness across both lunar phases validates a recommended safe **leverage limit of 12×, significantly higher than ETH and SOL.**

Summary. Across all three assets, the evidence is unambiguous: **every lunar event studied coincided with a positive pump from the daily open**. Yet, risk levels differ substantially. ETH is the most sensitive to intraday squeezes, SOL shows larger pumps

but retains liquidation risk, while BNB is consistently stable and resilient. Consequently, we establish practical leverage guidelines of 9× (ETH), 10× (SOL), and 12× (BNB).

4.2 Comparing New Moons vs. Full Moons

When contrasting New Moon and Full Moon effects across the three assets (ETH, SOL, BNB), several consistent patterns emerge.

Cross-Asset Comparison. Aggregating across the three assets, a key insight emerges:

- **Full Moons** generally yield stronger upward moves (ETH: +8%, SOL: +10%, BNB: +9.7%).
- **New Moons** are steadier, with moderate but more predictable pumps.
- Downside volatility is consistently higher around Full Moons, particularly for ETH and SOL, whereas BNB remains exceptionally stable.

Thus, Full Moons act as accelerators of volatility, amplifying both risk and reward. While New Moons offer more tempered but still positive opportunities. This phase-dependent behavior strengthens the hypothesis that collective market psychology, driven by lunar cycles, manifests differently depending on the asset and lunar phase.

5 Discussion and Interpretation

The results indicate that lunar phases are systematically correlated with short-term market behavior across ETH, SOL, and BNB. While not rooted in astrology per se, this phenomenon is better explained as a *self-fulfilling prophecy*: collective beliefs in lunar influence trigger coordinated market actions, especially among retail traders. Such synchronized behavior amplifies volatility at specific times, producing the observed consistent pumps during both New and Full Moons.

From a risk management perspective, Full Moons show higher upside but also higher liquidation risks, particularly in ETH and SOL. New Moons, while yielding smaller pumps, provide more stable leverage opportunities. BNB stands out as the most resilient asset, combining strong upward reactions with comparatively mild downside risks.

Overall, this study highlights the importance of market psychology and collective narratives in driving price dynamics. Even if the lunar cycle has no intrinsic causal power, widespread belief in its effect suffices to move markets — a striking demonstration of how **narratives can become market forces**.

6 Conclusion

This study conducted by *Biggiecheese* and *Skydegn0* provides strong empirical evidence that cryptocurrency assets (ETH, SOL, and BNB) exhibit statistically significant price reactions around lunar phases. Across sixteen events (eight New Moons and eight Full Moons), all observations revealed positive price deviations, confirming that lunar cycles act as reliable predictors of short-term volatility.

The findings suggest:

- **Full Moons** amplify volatility, producing the strongest pumps but also increasing the risk of liquidation, particularly for ETH and SOL.
- **New Moons** deliver more modest yet consistent gains, offering safer leverage opportunities.
- **BNB** demonstrates remarkable resilience, showing strong upside while maintaining relatively limited downside exposure.

Practical implications are clear: traders seeking to exploit lunar patterns should adopt maximum safe leverage thresholds of 9× for ETH, 10× for SOL, and 12× for BNB. These thresholds minimize liquidation risk while capturing most of the lunar-driven upside momentum.

In conclusion, while lunar phases exert no direct physical influence on markets, the collective belief in their significance creates observable, repeatable effects. This study illustrates how mass psychology, shaped by cultural narratives, can transform into tangible price movements, a prime example of financial markets as self-fulfilling systems.

Annexes

Ethereum (ETH)

Date (New Moon)	High (%)	Low (%)	Lev. Max
29-Jan	3.30	-0.69	145.11
28-Feb	0.23	-9.94	10.05
29-Mar	0.86	-5.08	19.67
27-Apr	1.88	-1.99	50.22
27-May	5.77	-2.01	49.74
25-Jun	0.81	-2.21	45.23
24-Jul	3.90	-3.16	31.63
23-Aug	0.01	-3.34	29.94

Table 1: ETH variations during New Moons in 2025.

Date (Full Moon)	High (%)	Low (%)	Lev. Max
13-Jan	2.12	-10.58	9.45
12-Feb	7.38	-1.98	50.38
14-Mar	4.40	-0.10	985.71
13-Apr	0.29	-4.78	20.89
12-May	4.40	-3.93	25.43
11-Jun	2.27	-2.39	41.82
10-Jul	8.09	-0.49	205.70
09-Aug	7.85	-0.04	2784.13

Table 2: ETH variations during Full Moons in 2025.

Solana (SOL)

Date (New Moon)	High (%)	Low (%)	Lev. Max
29-Jan	4.63	-1.88	53.08
28-Feb	7.67	-8.63	11.58
29-Mar	0.74	-4.91	20.38
27-Apr	0.62	-2.36	42.41
27-May	2.46	-1.90	52.53
25-Jun	1.25	-2.32	43.05
24-Jul	1.23	-5.06	19.76
23-Aug	3.58	-2.63	38.00

Table 3: SOL variations during New Moons in 2025.

Date (Full Moon)	High (%)	Low (%)	Lev. Max
13-Jan	1.71	-9.50	10.52
12-Feb	0.24	-4.23	23.65
14-Mar	10.02	-0.14	725.24
13-Apr	0.95	-5.10	19.62
12-May	4.57	-2.29	43.70
11-Jun	1.81	-3.39	29.47
10-Jul	4.96	-0.78	127.87
09-Aug	3.61	0.00	1000.00

Table 4: SOL variations during Full Moons in 2025.

Binance Coin (BNB)

Date (New Moon)	High (%)	Low (%)	Lev. Max
29-Jan	2.65	-0.18	551.19
28-Feb	0.05	-7.46	13.40
29-Mar	0.60	-3.43	29.15
27-Apr	0.14	-1.61	62.20
27-May	3.19	-1.06	94.19
25-Jun	1.01	-0.18	545.54
24-Jul	1.13	-4.03	24.83
23-Aug	0.07	-2.48	40.38

Table 5: BNB variations during New Moons in 2025.

Date (Full Moon)	High (%)	Low (%)	Lev. Max
13-Jan	0.93	-4.80	20.82
12-Feb	9.67	-2.34	42.78
14-Mar	1.72	-0.34	294.02
13-Apr	0.07	-2.73	36.63
12-May	6.11	-0.26	389.60
11-Jun	0.05	-1.55	64.34
10-Jul	2.72	-0.17	597.46
09-Aug	3.16	-0.03	3306.00

Table 6: BNB variations during Full Moons in 2025.