# The Floor Held

## FTX and What 2022 Proved About Bitcoin's Structural Support

**Alexander Mooij**
Bitcoin Power Law Observatory — btcpowerlaw.nl
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## Abstract

In November 2022, Bitcoin spent thirty consecutive weeks below its 200-week moving average — at the trough, 32% beneath it.

The power law floor held at 0.99×.

This divergence is the subject of this paper. The 200 WMA is behavioral memory: a four-year rolling average of actual closing prices, encoding every bull cycle peak and bear capitulation. The power law floor is structural: derived from the adoption curve, it requires no price history and grows independently of market action. For three completed cycles, both metrics tracked each other closely and the difference seemed theoretical. The 2022 crash was the natural experiment that separated them.

We additionally show that the WMA's position above the floor is not independent corroboration of the floor's validity — it is a mathematical consequence of how floors are defined. The FTX crash did not threaten the floor. It proved it.

## 1. Introduction

The 200-week moving average occupies a particular place in Bitcoin market analysis. Across three completed halving cycles, it had never been meaningfully breached. Long-term investors treated it as the ultimate support — the level at which every major bear market had found its floor. Its empirical record was clean.

The power law floor occupies a different position. Defined as 0.432 times the Santostasi trend — a function of time alone — it requires no price history, encodes no market behaviour, and is indifferent to whether Bitcoin has ever traded. It simply describes where the adoption curve says Bitcoin belongs on any given day.

For most of Bitcoin's history, these two metrics have told approximately the same story. They have converged at cycle bottoms, diverged during bull runs, and returned to proximity during the subsequent bear. The floor-convergence framework published on this observatory treats this alignment as evidence: multiple independent methods pointing at the same number strengthen the case for each.

This paper examines whether that independence holds.

We show that the 200 WMA's position above the floor is a mathematical consequence of the floor definition — not an independent validation of it. We further identify the only natural experiment in Bitcoin's history where the two metrics diverged completely: the FTX collapse of November 2022. In that event, the WMA failed catastrophically while the floor held at 0.99×.

The result reframes the floor-convergence argument. The floor is not proven by the methods that agree with it. It is proven by the method that failed to challenge it.

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## 2. The Experiment

### 2.1 The FTX Collapse

On November 8, 2022, FTX — at the time the world's second-largest cryptocurrency exchange — halted customer withdrawals. Within 72 hours it had filed for bankruptcy. What followed was the most severe sustained breakdown of Bitcoin's primary long-term support indicator in its history.

From the week of November 6, 2022, Bitcoin's price spent **45 of the next 65 weeks** below its 200-week moving average. The streak was not brief. The longest uninterrupted period below the WMA ran for **30 consecutive weeks**, from early November 2022 through late May 2023. At the nadir — the week of November 20, 2022 — Bitcoin closed at $16,292, **31.9% below its 200 WMA** of approximately $23,900.

By any historical standard, the 200 WMA had broken down as a support metric.

## 2.2 The Floor

Against this backdrop, the power law floor — 0.432 times the Santostasi trend on that date — sat at approximately $16,450.

Bitcoin's closing price on November 20, 2022 was $16,292.

**Price / floor = 0.991×.**

The floor held to within 0.9%.

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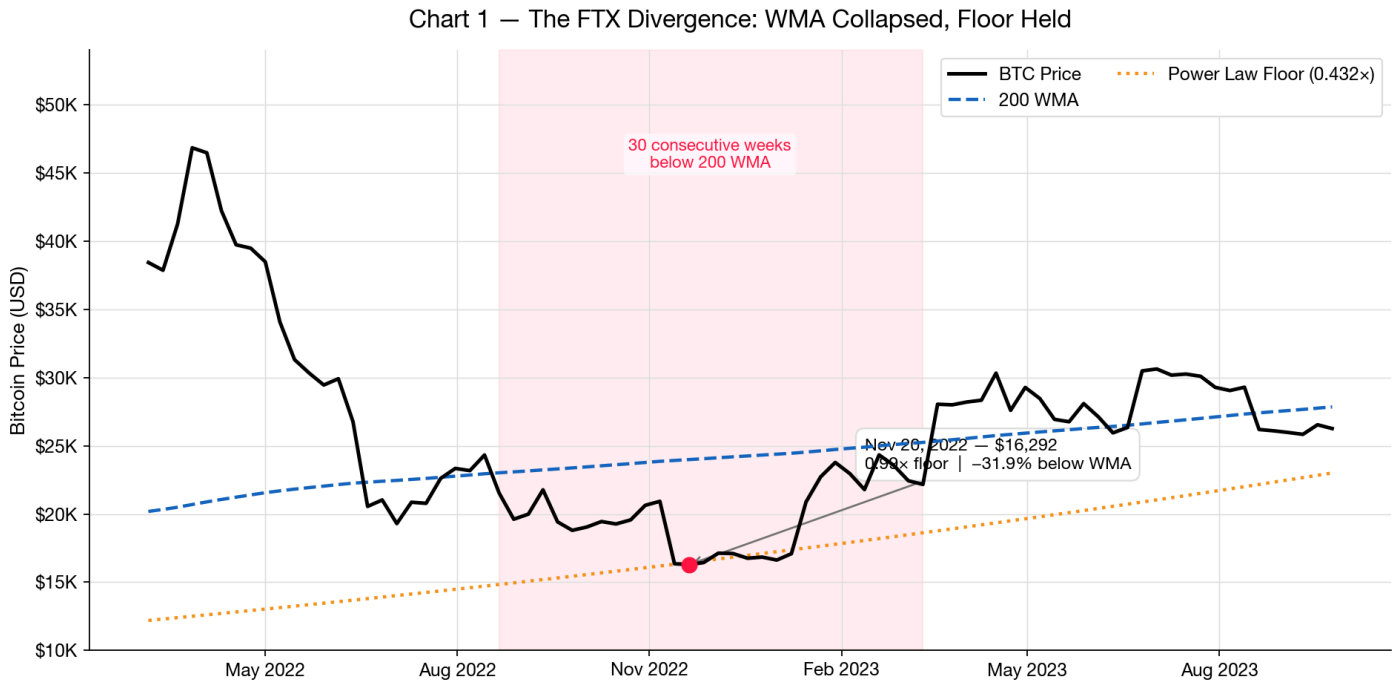


*Chart 1 — The FTX Divergence. Bitcoin weekly closing price (black), 200 WMA (blue dashed), power law floor (orange dotted), March 2022 – September 2023. Red shading marks the 30-week WMA breach corridor. Trough: Nov 20, 2022 at $16,292 (0.99× floor, −31.9% below WMA).*

### 2.3 What the Divergence Shows

The 200 WMA and the power law floor are often treated as different expressions of the same underlying reality. In November 2022, they gave opposite signals. The WMA said support had failed. The floor said price was at structural bedrock.

Only one of them was right.

This divergence is not incidental. It is the key to understanding what each metric measures and what weight each should carry. The sections that follow explain why the divergence happened, what the historical record looks like across all four cycles, and what the two metrics are actually telling different kinds of investors.

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## 3. Two Metrics, Two Definitions

### 3.1 The 200-Week Moving Average

The 200 WMA is computed from price history alone. On any given date, it is the simple arithmetic mean of the last 200 weekly closing prices — approximately 3.84 years of data.

This makes the 200 WMA a record of human behaviour. It encodes every phase of the market over the preceding four years: the euphoria of bull runs, the capitulation of bear markets, the quiet accumulation periods in between. When prices have been high for an extended period, the WMA is high. When external shocks drive prices below the mean of recent experience, the WMA descends only gradually — it carries the memory of everything that came before.

The 200 WMA has no predictive model of what Bitcoin *should* be worth. It has no opinion about adoption curves, network effects, or power law dynamics. It knows only what prices have been. In this sense it is entirely backward-looking: a four-year trailing consensus on market value.

### 3.2 The Power Law Floor

The power law floor is computed without any reference to price. It is defined as:

```
floor(t) = 0.432 × trend(t)
         = 0.432 × 10^(logA) × t^β
```

where *t* is days since genesis (January 3, 2009), β = 5.688, and logA = −16.493. The floor multiplier 0.432 is the empirically calibrated mean of cycle bottom multipliers across completed cycles.

This makes the floor a statement about structural position. It describes where Bitcoin has historically bottomed relative to the growth trajectory implied by its adoption curve. It requires no price data to compute for any future date. It is, in this sense, entirely forward-looking — or more precisely, time-dependent rather than price-dependent.

### 3.3 Why They Look Equivalent

For most of Bitcoin's history, the 200 WMA and the floor have pointed at similar levels. This convergence is real, but it arises from a common cause rather than from independent agreement.

Both metrics are downstream of Bitcoin's long-term growth. The floor grows because the adoption-curve trend grows. The 200 WMA grows because actual prices grow, and actual prices grow because the adoption curve grows. They converge not because they are measuring the same thing, but because they share the same upstream driver.

When that driver is smooth and undisturbed — when Bitcoin's price evolves through normal halving cycles without external shocks — the two metrics track together. When an external shock disrupts the price record without disturbing the adoption curve, they separate. FTX was that shock.

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## 4. The Tautology

### 4.1 The Circular Argument

The floor-convergence argument runs approximately as follows: multiple independent methods agree on where Bitcoin's floor is; their agreement strengthens the case for each method individually.

The inclusion of the 200 WMA in this list of methods creates a logical problem.

In any cycle where the floor holds — where prices do not breach 0.432× trend — the 200 WMA must also be above the floor, by construction. An average of prices that are all above some minimum must exceed that minimum. The WMA's position above the floor in such cycles is not evidence that the floor is correct. It is a consequence of prices having stayed above the floor. The argument is circular.

More precisely: the 200 WMA confirms the floor only in cycles where the floor already held. It cannot confirm the floor in cycles where the floor fails, because in those cycles the WMA will fall with the price. The WMA adds no predictive weight to the floor's validity. It is a lagging witness, not an independent corroborator.

## 4.2 The Mathematical Form

This circularity has a precise mathematical expression. For a price trajectory that follows the power law exactly, the ratio of the 200 WMA to the current trend price is:

```
WMA_trend(T) / trend(T) = (1/200) × Σ_{k=0}^{199} (1 − 7k/T)^β
```

where $T$ is the current age of Bitcoin in days and $\beta = 5.688$. This ratio is a pure function of age — it depends only on how old Bitcoin is and on the steepness of the power law exponent. It does not depend on actual prices.

The ratio increases monotonically with $T$. As Bitcoin ages, the 200-week lookback window covers a proportionally shorter span of its history. The oldest weekly data points in the window were produced when the trend was lower, but their distance from the current trend shrinks as $T$ grows. The WMA approaches the current trend asymptotically over time.

## 4.3 The Crossover Date

This ratio equals the floor multiplier (0.432) exactly once, at **T = 4,347 days: November 28, 2020**.

Before that date, the 200 WMA of the theoretical trend line was below the floor. After it, the WMA permanently exceeded the floor, and the gap has been widening ever since.

The date is not incidental. November 28, 2020 was the day Bitcoin closed above $19,783 for the first time — breaking its 2017 all-time high after three years. The structural crossover of WMA

above floor and the beginning of Bitcoin's new price era are simultaneous. Whether this reflects causation, correlation, or coincidence is outside the scope of this paper, but the timing is exact.

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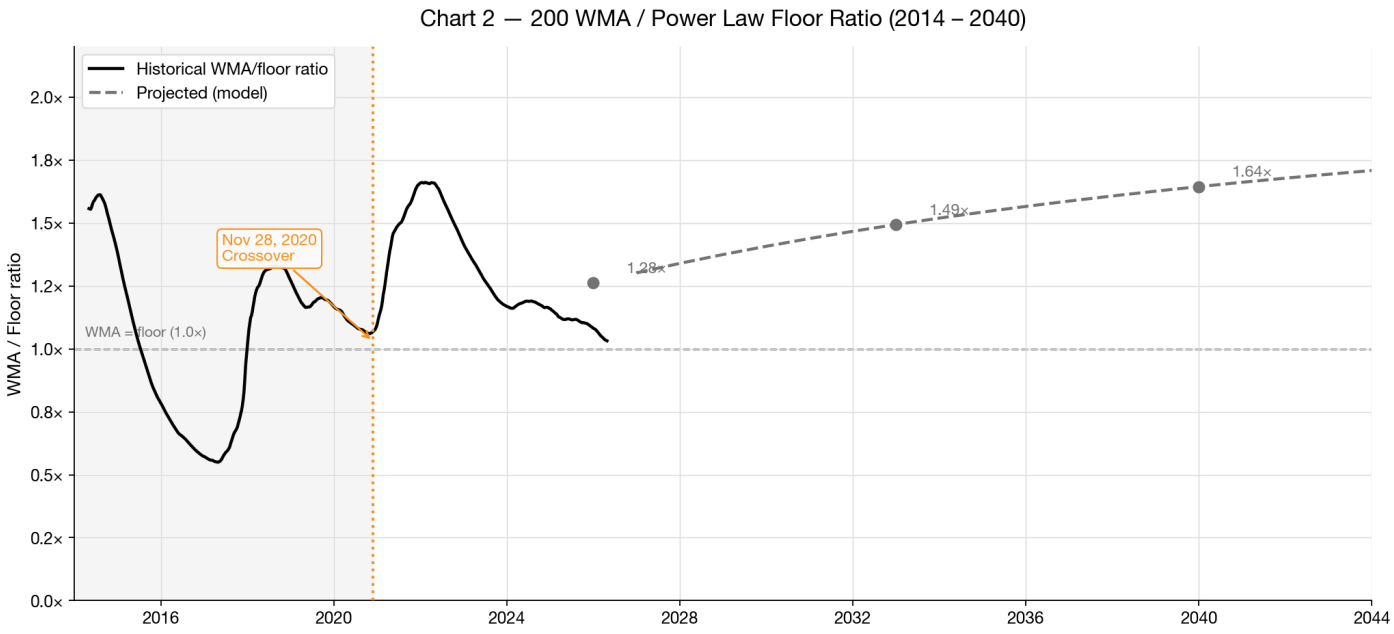


*Chart 2 — WMA/Floor Ratio 2014–2040. Historical ratio (black) with grey shading indicating the pre-crossover era when WMA < floor. Orange vertical line marks the Nov 28, 2020 crossover. Dashed grey line shows the projected theoretical ratio through 2040, with milestone values labelled.*

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## 4.4 The Widening Gap

The gap between the 200 WMA and the floor grows with every passing year. In absolute terms, this gap is already substantial:

| Date | Trend | Floor (0.432×) | WMA of trend | WMA above floor |
|---|---|---|---|---|
| Nov 2020 (crossover) | $16,615 | $7,178 | $7,178 | — |
| May 2026 (today) | $136,776 | $59,087 | $75,463 | +$16,376 (+27.7%) |
| Jan 2030 | $226,769 | $97,964 | $131,214 | +$33,250 (+34%) |

| Date | Trend | Floor (0.432×) | WMA of trend | WMA above floor |
|---|---|---|---|---|
| Jan 2033 | $857,218 | $370,318 | $553,193 | +$182,875 (+49%) |

This matters practically. A price move to the floor today requires Bitcoin to trade well below its 200 WMA for an extended period. A floor touch in 2030 would require sustained trading approximately 33% below the WMA of that time. The floor is not becoming more accessible as Bitcoin matures — it is becoming a deeper structural event with each cycle.

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# 5. Four Cycles

## 5.1 The Full Breach Record

The following table presents the complete 200 WMA breach history across Bitcoin's completed cycles, with cycle boundaries defined by halving dates.

| Cycle | Period | Weeks below WMA | Longest streak | Deepest breach | Price/floor at trough |
|---|---|---|---|---|---|
| C2 | Nov 2012 – Jul 2016 | 5 (4.5%) | 3 weeks | −1.1% | **0.87× (floor breached)** |
| C3 | Jul 2016 – May 2020 | 1 (0.5%) | 1 week | −3.2% | 1.10× |
| C4 | May 2020 – Apr 2024 | 45 (22.0%) | **30 weeks** | **−31.9%** | **0.99× (floor held)** |

| Cycle | Period | Weeks below WMA | Longest streak | Deepest breach | Price/floor at trough |
|---|---|---|---|---|---|
| C5 | Apr 2024 – present | 0 (0.0%) | — | — | 1.62× |

*Note: P/floor values are measured on the same weekly sample date as the WMA analysis. C2's absolute daily minimum (August 24, 2015, $209) corresponds to a trend multiplier of 0.37× — meaning price was 0.37× the trend, or equivalently 0.85× the floor (0.37/0.432). The weekly sample captures the trough at 0.87× floor. The floor was breached in both cases.*

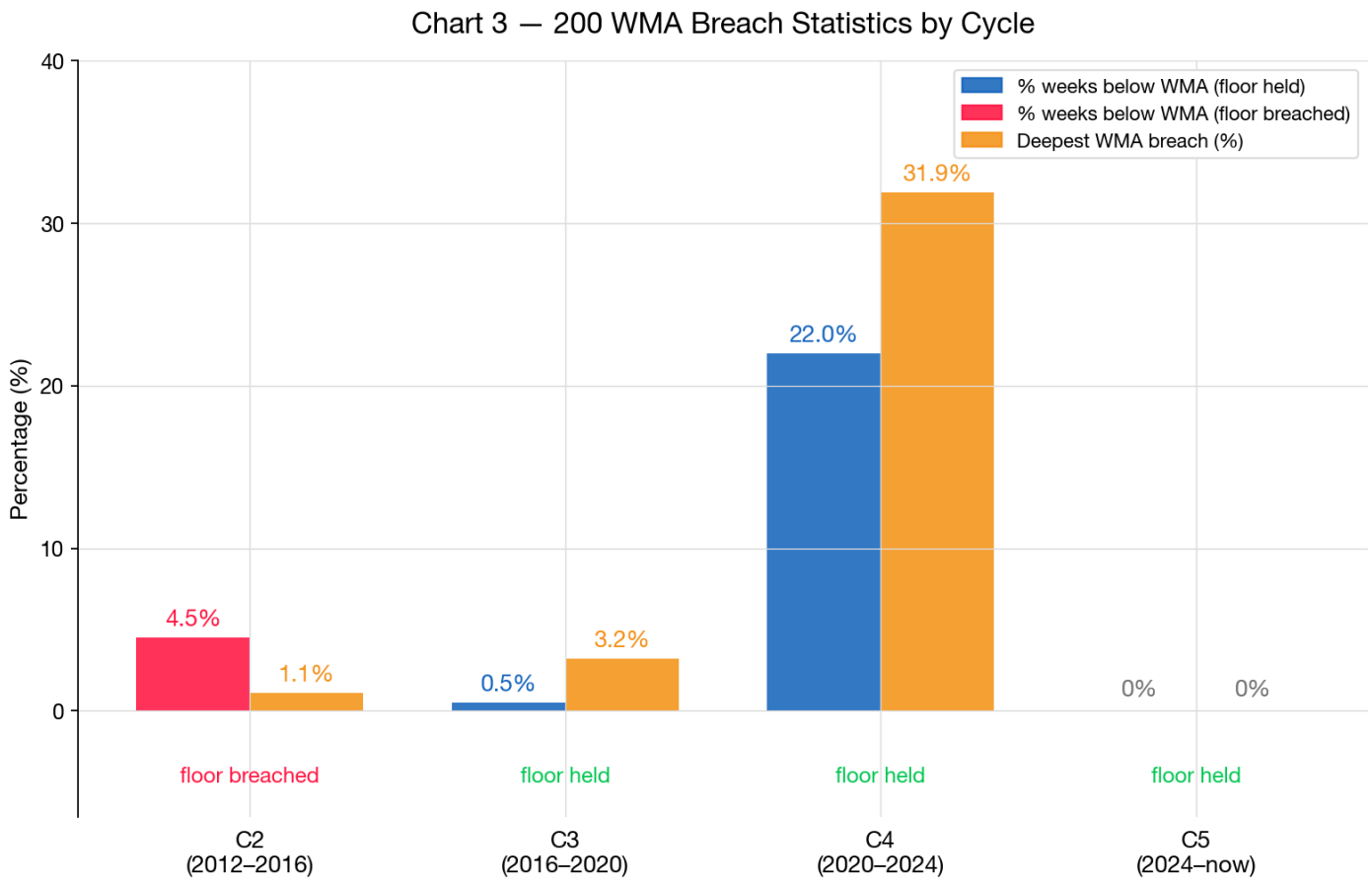


*Chart 3 — 200 WMA Breach Statistics by Cycle. Grouped bars: blue = % of cycle weeks below WMA (floor held); red = % of cycle weeks below WMA (floor breached); orange = deepest single breach. Floor status labelled below each cycle. C4's dominance in both metrics is visually unambiguous.*

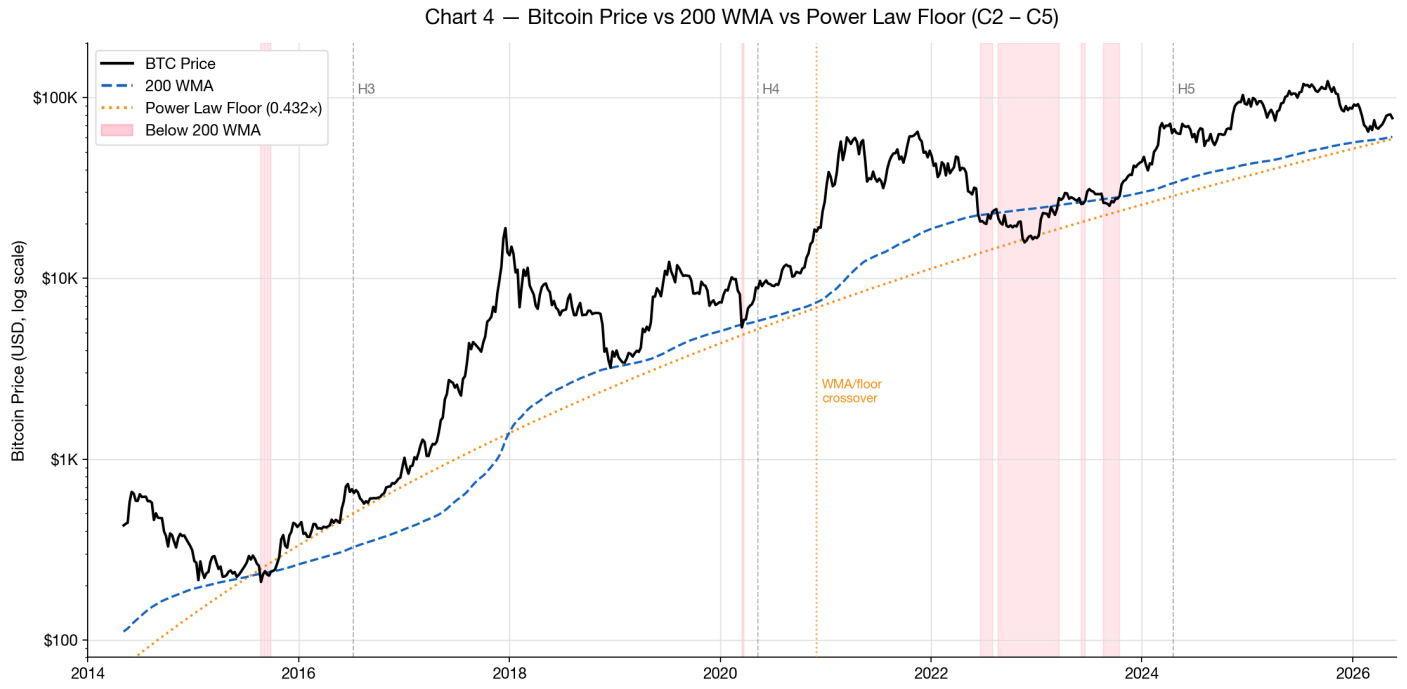


*Chart 4 — Full History C2–C5, log scale. Bitcoin weekly price (black), 200 WMA (blue dashed), power law floor (orange dotted), 2014–2026. Red shading marks all WMA breach periods. Halving dates (H3, H4, H5) marked with vertical lines. Orange dotted vertical marks the Nov 2020 WMA/floor crossover.*

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## 5.2 C2 and C4: Mirror Images

The table reveals a structural symmetry that the aggregate statistics obscure.

**Cycle 2** was a near-perfect WMA-support cycle: five weeks below the average, with the deepest penetration a mere 1.1%. Yet the power law floor was breached. At the cycle trough in August 2015, Bitcoin's price reached 0.37× trend — well below the 0.432× floor. The WMA barely moved; the floor gave way.

**Cycle 4** was the opposite: the WMA collapsed for 30 consecutive weeks, reaching 31.9% below its level. Yet the power law floor held at 0.99×. The floor barely moved; the WMA gave way.

These are mirror images. In C2, the shallow metric (WMA) held while the deeper one (floor) failed. In C4, the deeper metric held while the shallower one failed.

The interpretation is significant. C2's floor breach occurred during Bitcoin's earliest liquid trading period — a time before the floor model had been empirically validated. The floor model's

calibration incorporates C2's trough (0.37×) as part of the distribution from which the mean of 0.432 was derived. C2 is in-sample data. C4's floor survival is out-of-sample validation.

### 5.3 Why C4 Was Different

The FTX collapse was not a normal bear market. It was an external institutional shock: the sudden, fraudulent insolvency of a major market venue, triggering forced liquidations across the industry. This type of shock — driven by counterparty failure rather than adoption-curve dynamics — is precisely the scenario where the WMA and the floor are most likely to diverge.

The 200 WMA carries the memory of the 2020-2021 bull run, during which prices spent extended periods at 2-8× trend. That memory was still fully encoded in the WMA at the time of the FTX crash. When prices collapsed from $69,000 (November 2021) to $16,000 (November 2022), the WMA had no mechanism to reflect this rapidly — it could only average down slowly as new low-price weeks replaced old high-price weeks in the rolling window. The result was an extended period where prices were far below the WMA's estimate of normal value.

The floor, by contrast, had no memory of the 2021 bull run. It simply computed 0.432 × trend(November 2022) and produced $16,450. This figure was right.

### 5.4 Cycle 5

Cycle 5 (April 2024 to present) has produced zero WMA breaches in 93+ weeks of available data. This is consistent with the dramatically compressed volatility of the current cycle: per-cycle sigma has declined from approximately 0.38 in cycles 1 and 2, to 0.26 in cycle 3, 0.25 in cycle 4, and 0.08 in cycle 5 to date. At this level of volatility compression, prices barely deviate from the trend, and the WMA is rarely challenged from below.

The current cycle's lowest price/floor reading of 1.63× (September 2024) — reached during a relatively shallow correction — illustrates how far price has remained above both the WMA and the floor throughout the current period. Whether this reflects permanent volatility compression or simply the early-cycle period remains an open question.

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## 6. What the 200 WMA Actually Tells You

### 6.1 A Regime Indicator, Not a Support Level

The preceding analysis suggests the 200 WMA is mischaracterised when described as a support level. Support implies price will reverse upon reaching it. The C4 evidence is decisive: price spent 30 consecutive weeks below the WMA without the WMA offering any reversal signal. It did not hold.

A more accurate characterisation is that the WMA is a **regime indicator** — a signal about the state of the market cycle, not a price floor.

| Condition | Interpretation |
|---|---|
| Price > 2× WMA | Peak bull regime; historical peak multiples 3–9× |
| Price between 1.2–2× WMA | Normal bull accumulation |
| Price approaching WMA | Late cycle; watch for further deterioration |
| Price slightly below WMA (< 5 weeks) | Normal bear correction; C2/C3 pattern |
| Price below WMA > 10 consecutive weeks | Crisis regime; external shock likely |
| Price at floor (0.432× trend) | Structural support test; adoption curve bedrock |

The boundary between “normal bear correction” and “crisis regime” is approximately 10 consecutive weeks below the WMA. This threshold distinguishes C2 and C3 (where the longest breach was 3 and 1 weeks respectively) from C4 (30 weeks). In real time, a breach exceeding 10 weeks signals that something beyond ordinary bear market dynamics is occurring.

### 6.2 What a WMA Breach Cannot Tell You

Critically, a WMA breach cannot distinguish between two very different scenarios:

1. **External shock** (FTX 2022): price collapses below the WMA and the floor simultaneously, driven by counterparty failure. The adoption curve is undisturbed; price will eventually recover to trend.

2. **Model failure**: the power law relationship breaks down, and price descends below both the WMA and the floor on a sustained basis. This would be a fundamentally different scenario with different implications.

In real time, both scenarios produce the same signal: extended trading below the WMA. The floor provides the additional discriminating data point. In C4, price approached but did not breach the floor, suggesting the adoption curve remained intact. Had price sustained trading below the floor, the interpretation would need to change.

This is the practical case for using both metrics together: the WMA signals crisis; the floor tests the structural hypothesis.

### 6.3 The Receding Relevance of the WMA as a Floor Proxy

As shown in Section 4, the WMA/floor ratio grows permanently with every passing cycle. The WMA is receding from the floor as a proportion of trend:

| Year | WMA / floor ratio |
|---|---|
| 2026 | 1.28× |
| 2030 | 1.41× |
| 2033 | 1.49× |
| 2040 | 1.64× |
| 2050 | 1.78× |

This means that with every cycle, using the 200 WMA as a floor proxy becomes structurally less valid. A price move to the floor in 2033 would require Bitcoin to trade approximately 33% below the WMA of that time for an extended period. This is qualitatively different from 2015, when the WMA and floor were nearly coincident.

In practical terms: investors who use the 200 WMA as a “buy the floor” trigger are increasingly buying a level that is not the floor. The floor is lower, growing more slowly than the WMA, and represents a structurally more severe scenario with each passing cycle.

## 7. Data and Methodology

**Model:** Santostasi power law model. Parameters: β = 5.688, logA = −16.493, genesis date January 3, 2009.

**Floor multiplier:** 0.432× trend. This is the empirically calibrated `floorModel.mean` from the Observatory Monte Carlo engine, fitted to a normal distribution N(0.432, 0.051) with minimum 0.314, derived from cycle bottom multipliers across C2–C4. C2 trough: 0.365×. C3 trough: 0.439×. C4 trough: 0.414×.

**200 WMA computation:** Simple arithmetic mean of the last 200 weekly closing prices. Weekly data sampled from daily price history at 7-day intervals.

**Price data:** `btc_historical.json`, Observatory canonical dataset. Range: July 18, 2010 to March 8, 2026. The 200 WMA is computable from approximately mid-2014 (requiring 200 weeks of data from mid-2010 onwards).

**Cycle boundaries:** Defined by halving dates: C2 (November 28, 2012 – July 9, 2016), C3 (July 9, 2016 – May 11, 2020), C4 (May 11, 2020 – April 19, 2024), C5 (April 19, 2024 – present).

**WMA/trend crossover computation:** Binary search over T (days since genesis) solving WMA_trend(T)/trend(T) = 0.432. Result: T = 4,347 days, November 28, 2020.

**Breach statistics:** Computed by comparing weekly closing price to the 200 WMA for each week in each cycle. “Below WMA” defined as closing price strictly less than the 200 WMA for that week. Streak lengths computed from consecutive weekly observations.

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## 8. Conclusion

The 200-week moving average is useful. It is not, however, what it is commonly described as.

It is not a support level — a price at which buyers reliably materialise and prevent further decline. It is a regime indicator — a measure of how far current prices deviate from the four-year consensus on market value. When that consensus is built from a prolonged bull run, as it was through 2021, a

sudden collapse can drive prices far below the WMA without triggering any structural reversal. C4 lasted 30 consecutive weeks below the WMA, at one point 32% beneath it.

It is not independent evidence of the floor. In cycles where prices stay above the floor, the WMA will also stay above the floor — this is a consequence of the floor holding, not a separate signal of its validity. The WMA is a lagging witness to price history; it cannot confirm a level it did not help create.

And it is not growing toward the floor over time. It is growing away from it. The WMA/floor ratio was near 1.0 at the November 2020 crossover. It stands at 1.28× today and will reach 1.49× by 2033. The two metrics are permanently separating.

What the FTX crash provided was something rarer than a bear market: a moment of forced divergence, in which the metric built from human behaviour and the metric built from first principles were pulled apart by an external shock, and observers could see which one was the load-bearing wall.

The floor held at 0.99×.

This does not prove the floor will always hold. No finite dataset can prove that. What it does establish is that in the most severe institutional shock Bitcoin has experienced — one that broke every other conventional support indicator — the power law floor survived. Its claim to structural status rests not on the methods that agree with it, but on the one catastrophic test it passed.

**The FTX crash did not threaten the floor. It proved it.**

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*v1.0 — May 2026. Canonical model parameters from powerlaw.js. All price data from btc_historical.json. Floor multiplier from residual-params.json.*