HOW THE ALLOCATION MODEL WAS DERIVED

Evidence · Power Law · Monte Carlo · Constrained Portfolio Theory

This note explains how the Bitcoin allocation grid on the scorecard was built. It is written for a first-time holder. The model answers one question: how much Bitcoin belongs in a liquid portfolio, given how long the money can stay invested and how large a loss the owner can sit through. It is a rules file, not a price target and not advice.

1. The universe and the scoreboard

Eleven liquid assets were scored on the same four numbers: long-run compound return (CAGR), annualised volatility, maximum drawdown, and a crude Sharpe (excess return / volatility). The working set that survived is seven names.

Asset	Role	Priors used in the book
Bitcoin	Apex convexity	Plan 30% for 4y if Strong Oversold, then 24%. Vol ~45%. Cycle MDD ~55%.
Gold	Ballast in two regimes	~12% recent decade. Vol ~16%. MDD ~26%.
MAG7	Highest non-BTC mean; shares the cap with BTC	~37% 10y-class mean. Vol ~28%. MDD ~52%.
Nasdaq-100	Preferred US growth core at ≥3y	~21% 10y (QQQ). Vol ~19–22%. MDD ~33% this cycle.
S&P 500	Preferred 1y core; residual at long horizon	~15% 10y (SPY). Vol ~15%. MDD ~21–24% this cycle.
Bonds	Duration only — not a 60/40 blend	~2.5% nominal. Vol ~7%. MDD ~18% (2022).
Cash	Spending reserve	Real ≈ minus M2 (5–7%/yr), not 0%.

Cash is not “safe return.” Fiat buying power falls with money-supply growth; the model treats USD cash as a negative-real Asset. That is why it shrinks as horizon lengthens.

Sharpe on a raw ten-year Bitcoin print looks spectacular and is mostly unusable: the same sample that produces a high Sharpe also contains −80% years. The optimizer therefore does not maximise Sharpe. It maximises a planned compound return subject to a volatility cap and a stress-drawdown budget.

2. Bitcoin as apex asset

Three properties, not a slogan, put Bitcoin at the centre.

Supply. A 21 million hard cap and a declining issuance schedule. That is the opposite of USD M2, which has grown on the order of 5–7% a year over long US samples. Gold shares scarcity; it does not share portability, divisibility, or settlement at Bitcoin’s cost.

Adoption path — the power law. Price has followed a power law in time since inception with unusual stability. The family used on the scorecard is

$$P = 10^{(-16.493)} \times t^{5.688}$$

where t is days since 3 January 2009 and the residual scale is 0.20 in log10. Sixteen years after genesis the mid-line has not needed a new exponent. That persistence is the empirical case for treating Bitcoin as an adoption curve.

As of 10 September 2026 the mid-line sits near *$151,000*. Spot near *$77,000* is below the mid — between the −2σ band (~$60,000) and the −1σ band (~$95,000). The 200-week average and the −2σ band are why the book may use the Strong-Oversold overlay.

What the same unchanged law maps forward from that date:

Horizon	Mid-line	−2σ band	+2σ band	Mid-trend vs today's mid
+4y · Sep 2030	**~$482,000**	~$192,000	~$1.21m	~34% / year
+6y · Sep 2032	**~$796,000**	~$317,000	~$2.00m	~32% / year
+8y · Sep 2034	**~$1.26m**	~$503,000	~$3.17m	~30% / year

If spot only rejoined the mid in four years, the catch-up CAGR from $77,000 would be steeper (~58%). The allocation model does not spend that catch-up. It plans 24–30% over four years and about 26% over ten, below the power-law mid-trend, to be conservative.

Holding-period survival. Daily prices 18 July 2010 to 10 September 2026:

Horizon	Windows	Share that finished down	Worst window
1 year	5,534	27% (36% in the last 8y)	−84%
2 years	5,169	16% (22% in the last 8y)	−66%
3 years	4,803	**0.67%**	−35%
4 years	4,438	**0%**	+32%

That table is why three- and four-year books are core and one- and two-year books are tactical. Latest completed windows to 10 September 2026: three-year CAGR +44%, four-year CAGR +37%. Those are history.

3. The Bitcoin path the optimizer is allowed to believe

The model does not feed the optimizer 37–44%. It feeds a faded path: 30% in years 1–4 only if the 5-zone tape is Strong Oversold (near the 200-week average and the power-law −2σ band); otherwise the four-year floor is 24%. After year 4 the plan is 24%. The ten-year blend is about 26%.

A Monte Carlo mixture — 50,000 draws, weighted Base 60% / Bull 30% / Bear 10% — was used as a cross-check, not as the weights. The median four-year print of that mixture sat near the 24–25% floor, which is why 24% is the planning number the book will not spend above without the Strong-Oversold overlay.

From about **$77,000**, 24% for four years is about **$180,000**; 30% is about **$215,000**; a 26% ten-year blend is on the order of **$780,000**. Those are planning paths.

4. Correlation is a regime, not a constant

A single covariance matrix is a poor description of Bitcoin. Four regimes were built and stress-tested.

Regime	What correlation does	Design implication
Isolated early years	BTC vs S&P 500 ≈ 0.05	Diversifier.
Crisis (COVID, 2022)	BTC vs S&P 500 ≈ 0.68	Size the winter as if Bitcoin is high-beta risk.
ETF-era risk-on	BTC vs Nasdaq-100 ≈ 0.75	BTC + MAG7 + Nasdaq can become one line.
Gold-beta (2025–26)	BTC vs gold ≈ 0.56; equity ρ low	Do not raise Bitcoin just because equity ρ is ~0; keep the gold floor.

The optimizer is run on a strategic matrix and then re-priced on the crisis matrix. Conservative four-year volatility moving from about 11% to 13% under crisis correlation is accepted; unconstrained 50% Bitcoin is not. Rebalance trigger: if 30-day ρ(BTC, Nasdaq-100) exceeds about 0.60, treat Bitcoin + MAG7 + Nasdaq as one factor and cut MAG7 first.

5. Modern portfolio theory — with the constraints that make it usable

Unconstrained Markowitz on these priors wants too much Bitcoin. A 37% MAG7 mean and a 30% Bitcoin mean with incomplete correlation will run to the 80% hard cap and call it optimal. That book does not survive a −55% Bitcoin year.

The solver (SLSQP) maximises the piecewise ten-year compound return subject to: weights sum to 100% and are long-only; a portfolio volatility cap of about 13% / 20% / 26% for Conservative / Moderate / Aggressive; a stress-drawdown cap of about 22% / 32% / 40%; a convexity cap of Bitcoin + MAG7 only (about 18% / 35% / 50% at four years and beyond); a gold floor of 16% / 12% / 8%; a bonds floor as duration of 18% / 8% / 4%, after 60/40 was retired; and a Bitcoin hard cap of 80% on the single-Asset methodology (multi-asset Aggressive at ten years stops at 50%). Nasdaq-100 sits outside the convexity cap so it can compete with the S&P 500 on its own ten-year stats (QQQ ~20.7% versus SPY ~15.3%).

That is why four-year Moderate is 23% Bitcoin, not 50%: the cap and the drawdown budget bind before the mean does.

6. Short horizons are not the same book, shorter

One- and two-year weights use the last-eight-year hit rate, not a scaled four-year solution. Over that window Bitcoin finished down on 35.5% of one-year days (worst −84%) and 21.5% of two-year days (worst −66%). The S&P 500 was down on 17% of one-year days but almost never below −20% (0.2%). The Nasdaq-100 was down on 15% of one-year days with a fatter left tail (5.3% below −20%).

Rule for Bitcoin: weight at 1y or 2y equals the four-year weight times (1 minus the red-day share) squared. That produces 4% / 8% / 12% at one year and 6% / 14% / 20% at two years. Residual risk budget goes to the S&P 500 first at one year and to the Nasdaq-100 first at two years and beyond.

7. What the first-time investor is looking at

Default card: four years, Moderate, 23% Bitcoin, with gold 12%, MAG7 12%, Nasdaq-100 28%, S&P 500 14%, bonds 8%, cash 3%. Conservative at the same horizon is 10% Bitcoin; Aggressive is 35%. Weight then rises with horizon to 22% / 34% / 50% at ten years.

Conservative / Moderate / Aggressive are drawdown budgets. Conservative keeps most of the book in gold, bonds, cash and the S&P 500, so a typical Bitcoin cycle costs the whole portfolio mid-single digits to low teens. Moderate is the default: enough Bitcoin to matter over a cycle, with a planned stress drawdown around 30%. Aggressive accepts a cycle-sized hit of roughly a third of the book in exchange for more compounding.

Pick a horizon you will not spend; select a risk profile you feel comfortable with and use the grid for how much to allocate to Bitcoin, based on the metrics above.