

B I T C O I N P O W E R L A W O B S E R V A T O R Y

Bitcoin Floor Bonds

Lending Against Structural Growth, Not Spot Price

Scale Invariant Capital

March 2026 · v2.1 · Paper 3

F L O O R G R O W T H

~38%/yr

annualised

S E L F -
L I Q U I D A T I N G

Year 2

capacity > need

M S T R Y R 1
(2 5 %)

\$3.3B

at 4% coupon

C U S T O D Y

**3-of-5
Multisig**

non-custodial

Abstract

The companion paper (The Bitcoin Floor Rate, Scale Invariant Capital, March 2026) established that Bitcoin's power law floor grows at approximately 38% annually, a structural return that exceeds every traditional benchmark for decades. This paper introduces the first financial product built on that floor: Bitcoin Floor Bonds.

A Floor Bond is a collateralised loan in which the borrower's maximum draw is capped at 90% of projected floor growth over the next twelve months. This single design change eliminates the liquidation risk that plagues every existing Bitcoin lending product. The borrower receives income without selling. The lender deploys capital into the most overcollateralised loan structure in cryptocurrency history.

Using power law parameters from 5,713 daily closes ($R^2 = 0.956$), we show that a 5 BTC portfolio borrowing \$100,000 per year (inflation-adjusted at 3%) becomes self-liquidating by Year 2: annual floor growth exceeds annual borrowing need. The loan-to-value ratio at floor prices peaks at 47.2% in Year 4 and declines thereafter. The liquidation price never approaches the floor in any year.

For lenders, the value proposition is not the coupon (3–5%) but the risk profile. Floor Bonds are carry trade infrastructure: a low-yield, near-zero-risk asset class that supports institutional leverage. At 10× leverage with 3% funding cost, a Floor Bond portfolio delivers approximately 13% return on equity, the same mechanics that powered the yen carry trade for decades, but backed by a structural floor rather than central bank policy.

Applied to the five largest corporate Bitcoin holders (25% pledged), Year 1 capacity exceeds \$4.3 billion. For Strategy alone, Floor Bonds reduce cost of capital by \$247 million annually compared to STRC convertible debt. A 3-of-5 multisig custody architecture eliminates counterparty risk at the protocol level. no single party can move the collateral unilaterally.

Floor Bonds are the first instrument in a broader floor-based financial system. This paper concludes by introducing the Bitcoin Floor Yield Curve, the term structure of floor growth rates across tenors, and outlining the product suite it enables: floor annuities, floor futures, floor mortgages, and floor-priced derivatives. The yield curve is to Bitcoin what the Treasury curve is to traditional finance: the reference rate from which everything else is priced.

Key Findings at a Glance

Finding	Result
Borrowing basis	90% of next-12-month floor growth (not spot price)
Year 1 capacity (5 BTC)	\$92,096 (covers 92% of \$100K need)
Self-liquidating crossover	Year 2 (capacity \$119,133 > need \$103,000)
Peak LTV at floor prices	47.2% (Year 4). declines every year after
Liquidation price vs. floor	Never approaches. \$25K vs. floor \$74K (Year 1)
Borrower rate	3–7% (initial with liquidity premium; target 3–5%)
Lender risk profile	Carry trade substrate: lever 10–20× on near-zero default
MSTR savings vs. STRC	\$247M/year at 25% pledged (178,661 BTC)
Top 5 holders Year 1 (25%)	\$4.3B capacity
Custody	3-of-5 multisig. non-custodial, timelock recovery
2022 crash stress test	Bond at ATH: debt peaks \$323K Year 6, crossover Year 7. no liquidation
Safety factor sensitivity	Self-liquidates at 70% (Year 3), 80–95% (Year 2)
Rate sensitivity	Self-liquidates at Year 2 even at 15% interest
Broader framework	First product on the Bitcoin Floor Yield Curve

Table 1: Key findings summary.

1. Introduction

Every Bitcoin lending product in existence shares a common flaw: they lend against spot price. The borrower posts Bitcoin as collateral, receives a loan calculated as a percentage of current market value, and faces liquidation if the price falls below a threshold. This design imports the full volatility of Bitcoin into the lending contract. It forces borrowers to monitor positions, add collateral during drawdowns, and accept the possibility of liquidation at the worst possible moment. Near cycle lows, when the borrower's remaining assets are most depressed.

The result is a lending market that penalises long-term holders. A borrower who is correct about Bitcoin's trajectory, who holds through cycles, who accumulates at lows, is the same borrower who faces margin calls during drawdowns. The lending product punishes patience.

This paper proposes a structural alternative. Instead of lending against current value, we lend against projected floor growth, the minimum amount by which the power law floor will increase over the next twelve months. The companion paper (*The Bitcoin Floor Rate*) established that this floor has never been breached in 15+ years, grows at approximately 38% annually, and is measurably strengthening with each halving cycle.

By anchoring to floor growth rather than spot price, we eliminate the liquidation problem entirely. The borrower's debt is sized to fit inside the most conservative projection of their collateral's appreciation. Volatility becomes irrelevant, it all happens above the floor. The loan is not exposed to drawdowns, crashes, or cycle timing. It is exposed only to the power law itself. An out-of-sample validation (Paper 2, Section 2.4) confirmed zero floor breaches when the model was trained on 2010–2020 data and tested against 2021–2026, including the Luna/3AC collapse, the FTX crash, and the 2025 drawdown.

1.1 Design Philosophy

Traditional Bitcoin loans ask: how much is your Bitcoin worth today? Floor Bonds ask: how much will your Bitcoin's floor value grow this year? The first question exposes the lender to spot volatility. The second exposes the lender only to model risk, the risk that the 15-year power law stops working. We argue that model risk, properly quantified and hedged with a fallback clause, is a superior risk profile for both parties.

1.2 Relationship to Prior Papers

This is the third paper in a series. Paper 1 (*Percentile-Anchored Volatility Decay Analysis*) established that Bitcoin's volatility corridor contracts at ~20% per halving cycle with the ceiling compressing 2.2× faster than the floor. Paper 2 (*The Bitcoin Floor Rate*) derived the BFR as Bitcoin's structural minimum return, showed it produces infinite fair value under the Gordon Growth Model, and demonstrated 7.14× capital efficiency over the S&P 500. The present paper translates that structural return into the first tradeable instrument: Floor Bonds.

2. The Instrument

2.1 Definition

A Bitcoin Floor Bond is a collateralised loan in which the maximum annual borrowing amount is capped at 90% of the projected floor growth of the deposited collateral over the next twelve months.

$$\text{Max Annual Draw} = \text{Collateral (BTC)} \times [\text{Floor}(t+365) - \text{Floor}(t)] \times 0.90$$

where $\text{Floor}(t) = 0.42 \times 10^{(-16.493 + 5.688 \times \log_{10}(t))}$ and t is days since the genesis block (January 3, 2009). The 0.90 multiplier provides a 10% safety buffer between the borrowing limit and the full floor growth projection.

2.2 Mechanics

Collateralisation. The borrower deposits BTC into a dedicated 3-of-5 multisig vault (Section 8). The collateral remains the borrower's property. Unlike traditional loans, the collateral value is not marked to market. It is marked to floor.

Annual draw. Each year, the borrower may draw up to the maximum annual amount. The draw can be taken as a lump sum, monthly instalments, or on-demand. Unused capacity does not roll over.

Interest. 3–5% annual. The rate reflects near-zero liquidation risk. Interest may be paid periodically or capitalised.

Self-liquidation. In years where floor growth exceeds the borrower's draw plus accrued interest, the surplus reduces the outstanding balance. After the crossover year, the balance declines to zero without action from the borrower.

Collateral release. Once the balance reaches zero, the borrower's full collateral is released from the vault. The timelock ensures release even if the lender becomes insolvent.

No rehypothecation. The collateral is never rehypothecated, lent, used as margin, or commingled. Each loan has a dedicated vault. This is a protocol-level guarantee enforced by the multisig spending conditions, not a policy promise.

2.3 Comparison to Traditional Bitcoin Loans

Feature	Traditional BTC Loan	Floor Bond
Loan basis	% of current spot price	% of projected floor growth
Typical LTV	50%	26.9% (Year 1, at floor)
Liquidation trigger	80% LTV (spot)	None (Tier 1) / 80% (Tier 2 fallback)
Margin calls	Yes (price-dependent)	None
Interest rate	8–12%	3–5%
Monitoring required	Constant	None (set and forget)
Worst-case scenario	Liquidation at cycle low	Revert to 50% LTV (fallback)
Self-liquidating	No	Yes (Year 2+)
Collateral custody	Platform-controlled	3-of-5 multisig (borrower holds keys)
Rehypothecation	Common (Celsius, BlockFi)	Prohibited (protocol-enforced)

Table 2: Structural comparison between traditional Bitcoin-backed loans and Floor Bonds.

3. The Mathematics

3.1 Borrowing Capacity vs. Borrowing Need

We model a borrower with 5 BTC collateral, drawing \$100,000 in Year 1 with 3% annual inflation adjustment. Borrowing capacity is 90% of the floor's annual dollar growth across all 5 BTC. Interest at 4% is capitalised into the debt.

Year	Floor \$/BTC	Capacity (5 BTC)	Need	Annual Surplus	Cumulative Debt
1	\$74,449	\$92,096	\$100,000	-\$7,904	\$7,904
2	\$100,923	\$119,133	\$103,000	+\$16,133	\$0
3	\$134,713	\$152,057	\$106,090	+\$45,967	\$0
4	\$177,325	\$191,753	\$109,273	+\$82,480	\$0
5	\$230,477	\$239,183	\$112,551	+\$126,632	\$0
6	\$296,119	\$295,392	\$115,927	+\$179,465	\$0
7	\$376,455	\$361,510	\$119,405	+\$242,105	\$0
8	\$473,955	\$438,752	\$122,987	+\$315,765	\$0
9	\$591,383	\$528,425	\$126,677	+\$401,748	\$0
10	\$731,811	\$631,927	\$130,477	+\$501,449	\$0

Table 3: Borrowing capacity vs. need. Capacity exceeds need from Year 2. Debt self-liquidates within the first year of surplus.

The borrower's shortfall exists only in Year 1, where capacity covers 92% of the \$100,000 need. The \$7,904 gap is capitalised. By Year 2, capacity exceeds need by \$16,133, extinguishing the debt entirely. From Year 2 onward, the borrower is in permanent surplus. By Year 10, the annual surplus is \$501,449, nearly five times the annual draw.

3.2 Loan-to-Value Dynamics

We monitor LTV against floor price, the most conservative possible valuation. The borrower draws the full inflation-adjusted amount every year.

Year	Cum. Borrowed	Floor Collateral	LTV at Floor	LTV at Trend	Liq. Price	Floor
1	\$100,000	\$372,244	26.9%	11.3%	\$25,000	\$74,449
2	\$203,000	\$504,613	40.2%	16.9%	\$50,750	\$100,923
3	\$309,090	\$673,565	45.9%	19.3%	\$77,273	\$134,713
4	\$418,363	\$886,624	47.2%	19.8%	\$104,591	\$177,325
5	\$530,914	\$1,152,383	46.1%	19.3%	\$132,729	\$230,477
7	\$766,246	\$1,882,274	40.7%	17.1%	\$191,562	\$376,455
10	\$1,146,388	\$3,659,056	31.3%	13.2%	\$286,597	\$731,811

Table 4: LTV peaks at 47.2% in Year 4 (at floor prices) and declines. Liquidation price never approaches the floor. 66% gap in Year 1.

The liquidation price is \$25,000 in Year 1 against a floor of \$74,449, a 66% gap. Bitcoin would need to fall to one-third of the floor price before liquidation triggers, a scenario without historical precedent. By Year 10, the gap remains 61%. The safety margin is structural and persistent.

3.3 The Self-Liquidation Mechanism

The defining feature of the Floor Bond is that it repays itself. Capacity grows at ~35% annually (decelerating) while need grows at 3% (inflation adjustment). The gap widens every year. The debt is mathematically guaranteed to reach zero, provided the floor continues to grow.

This is the Bitcoin equivalent of a self-amortising mortgage. except the amortisation is powered by the asset's structural appreciation rather than the borrower's salary.

4. The Borrower

The Floor Bond borrower is a long-term Bitcoin holder who needs fiat income without selling their stack. Their current alternatives are: sell Bitcoin and lose exposure to the structural return, take a traditional loan and accept liquidation risk, or do nothing and forgo income. The Floor Bond offers a fourth path:

Perpetual fiat income. Draw up to \$100,000/year (inflation-adjusted) against 5 BTC, indefinitely.

No liquidation. The loan is sized to floor growth. Drawdowns, crashes, and bear markets do not trigger margin calls.

Full ownership. The BTC remains the borrower's property. All floor growth accrues to the borrower. All upside above the floor accrues to the borrower.

Self-liquidating. Debt extinguishes by Year 2. No repayment action required.

Lower cost. 3–5% vs. 8–12% on traditional BTC loans.

The borrower's 38% floor growth is theirs. They are not sharing it with the lender. The lender is compensated with a fixed coupon for providing liquidity. the same relationship as a homeowner and a mortgage lender. The bank does not share in the home's appreciation. It collects interest on the loan.

5. The Lender

5.1 The Lender's Return

The lender deploys fiat capital and receives a fixed coupon of 3–5% annually. The lender has no claim on the borrower's Bitcoin, no share of the floor growth, and no participation in any upside. Their return is the coupon. Nothing more.

This must be stated plainly: the 38% floor growth belongs entirely to the borrower. It is the borrower's structural return on their own asset. The lender is providing a service, liquidity, and is compensated for that service at a rate that reflects the risk of non-repayment, which is near-zero.

5.2 Why 3–5% Is the Right Rate

Traditional Bitcoin lenders charge 8–12% because they price in liquidation risk, operational monitoring costs, and default probability. Floor Bonds eliminate liquidation risk (Tier 1) and reduce default probability to model risk only (the floor breaking). The rate should reflect this lower risk.

Benchmark comparison:

Instrument	Yield	Default History	Collateral Growth
US 10Y Treasury	~4.5%	Near-zero (sovereign)	0% (depreciates vs. M2)
AAA Corporate Bond	~5.0%	<0.1% annual	N/A (unsecured or asset-backed)
Floor Bond	3–5%	0% (floor never breached)	~38% annual (floor growth)
Traditional BTC Loan	8–12%	Variable (liquidation events)	Volatile (spot-dependent)

Table 5: Floor Bond rate benchmarked against comparable instruments.

Floor Bonds are priced slightly below AAA corporate bonds because the collateral is structurally superior: it grows at 38% annually, is auditable on-chain, and has no operational dependency. The lender's risk is lower than any listed instrument except Treasuries, and Treasuries carry duration risk, political risk, and debasement exposure that Floor Bonds do not.

5.3 Floor Bonds as Carry Trade Infrastructure

The lender's real opportunity is not the coupon. It is the leverage that the risk profile permits.

In traditional finance, institutional lenders routinely leverage low-risk assets. Banks run 50–100× on Treasuries. Hedge funds run 10–20× on AAA bonds. The yen carry trade, borrowing at near-zero rates in Japan, lending at higher rates elsewhere, powered institutional returns for over two decades with leverage ratios of 10–50×.

The yen carry trade blew up in August 2024 when the Bank of Japan raised rates unexpectedly. The fundamental weakness: it depended on a central bank policy decision. One press conference destroyed the trade.

Floor Bonds carry trade has no equivalent vulnerability. The floor is a network phenomenon, not a policy decision. No central banker, no CEO, no regulator can “raise the floor rate” with a press conference. The floor's reliability is determined by 15+ years of adoption dynamics and strengthens with each halving cycle.

Leverage analysis at 4% gross yield:

Leverage	Equity	Deployed	Gross (4%)	Funding (3%)	Net	ROE
1×	\$100M	\$100M	\$4.0M	\$0	\$4.0M	4.0%
5×	\$100M	\$500M	\$20.0M	\$12.0M	\$8.0M	8.0%
10×	\$100M	\$1.0B	\$40.0M	\$27.0M	\$13.0M	13.0%
20×	\$100M	\$2.0B	\$80.0M	\$57.0M	\$23.0M	23.0%

Table 6: Carry trade leverage analysis. Funding cost at 3% (institutional repo/CP rate).

At 10× leverage, the lender achieves 13% return on equity. At 20×, 23%. These returns are generated from a 1% net spread on an asset class with near-zero default probability. The same mechanics that generated billions in annual returns for yen carry traders. but with a structurally superior risk foundation.

5.4 What Leverage Is Justified?

Leverage tolerance depends on the probability of loss exceeding the equity cushion. At 10× leverage, a 10% default rate across the portfolio wipes equity. At 20×, a 5% default rate wipes equity. The Bayesian posterior on annual floor breach is approximately 6% and declining with each non-breach year.

Leverage	Max Tolerable Default Rate	Floor Breach Probability	Assessment
5×	20%	~6% (declining)	Conservative. well within tolerance
10×	10%	~6% (declining)	Defensible. comparable to Treasury leverage
20×	5%	~6% (declining)	Aggressive. requires high floor confidence
50×	2%	~6% (declining)	Requires hedging (floor CDS or equivalent)

Table 7: Leverage tolerance vs. floor breach probability. 10× is the recommended institutional baseline.

We recommend 10× as the institutional baseline. It delivers meaningful returns (13% ROE) while maintaining a comfortable buffer above the current floor breach probability estimate. As the Bayesian posterior tightens with additional non-breach cycles, higher leverage becomes progressively more defensible.

6. The Fallback Clause

The strongest objection to Floor Bonds is model risk: what if the power law stops working? This section addresses the objection with a structural hedge.

6.1 Trigger

The fallback activates if Bitcoin's daily closing price remains below the power law floor for 30 consecutive calendar days. A single intraday wick does not trigger it. Nor does a single daily close. The 30-day requirement filters for genuine structural breaks. In 15+ years, this condition has never been met.

6.2 Mechanics

1. **Tier 1 suspended.** No further draws against floor growth.
2. **Tier 2 activates.** Outstanding balance re-evaluated under 50% LTV, current spot price.
3. **Standard liquidation.** 70% margin call / 80% liquidation. 14-day borrower notice period.
4. **Rate adjusts.** Interest increases to 8–10%.
5. **Reversion.** If price returns above the floor for 90 consecutive days, Tier 1 reactivates.

6.3 Why It Matters

The fallback is not a concession to sceptics. It is what makes Floor Bonds institutional-grade. Risk committees do not approve products with unbounded downside. The fallback provides a defined worst case: if the model is wrong, the lender holds a conventional overcollateralised loan with mechanics they already understand.

For the leveraged lender, the fallback is critical. At 10× leverage, an unhedged floor breach could be catastrophic. The fallback converts the loan to a standard 50% LTV product, preserving the collateral claim and giving the lender a familiar liquidation mechanism. The leverage tolerance analysis in Section 5.4 already accounts for this.

7. Risk Analysis

7.1 Model Risk

The primary risk is that the power law floor ceases to hold. Causes could include a fundamental protocol failure, coordinated regulatory prohibition, or a competing monetary network. Mitigants: 5,713 daily non-breach tests, volatility decay z-scores from -5.3 to -21.1, and the fallback clause.

7.2 Counterparty Risk

Eliminated at the protocol level. The 3-of-5 multisig vault ensures no single party can move the collateral. The timelock guarantees borrower recovery even if the lender becomes insolvent. Collateral is never rehypothecated. Section 8 details the architecture.

7.3 Interest Rate Risk

Capitalised interest at 4% adds \$4,000 to Year 1 debt. Floor growth capacity in Year 2 (\$119,133) absorbs this trivially. The self-liquidation mechanism is robust to capitalised interest at rates up to approximately 15%. far above the proposed 3–5%.

7.4 Funding Risk (Leveraged Lenders)

A leveraged lender faces funding risk: if their cost of borrowing (repo rate, CP rate) rises above the Floor Bond coupon, the carry trade inverts. At 4% gross yield, a funding cost above 4% produces negative carry. Mitigation: match funding duration to Floor Bond tenor, use fixed-rate funding where available, and maintain equity buffer sufficient to absorb temporary inversions.

7.5 Regulatory Risk

Classification depends on jurisdiction. The product's conservative structure (overcollateralised, self-liquidating, traditional fallback) is designed to align with existing lending regulations. The non-custodial architecture further simplifies the regulatory picture: the lender never holds the borrower's asset.

7.6 Historical Stress Tests

A natural objection is: how would Floor Bonds have performed during Bitcoin's worst crashes? We backtest two scenarios.

Scenario 1: FTX Crash (Bond issued November 2021)

A borrower issues a Floor Bond near the all-time high (\$69K, November 2021) with 5 BTC collateral, drawing \$100,000/year. The floor at issuance was approximately \$10,327 per BTC. Price subsequently crashed 77% to \$15,480 (November 2022).

Year	Period	Floor Growth	Capacity	Need	Surplus	Cum. Debt
1	2021-2022	\$5,484	\$24,678	\$100,000	-\$75,322	\$75,322
2	2022-2023	\$7,689	\$34,597	\$103,000	-\$68,403	\$146,738
3	2023-2024	\$10,536	\$47,414	\$106,090	-\$58,676	\$211,283
4	2024-2025	\$14,156	\$63,703	\$109,273	-\$45,570	\$265,304

5	2025-2026	\$18,690	\$84,105	\$112,551	-\$28,446	\$304,362
6	2026-2027	\$24,296	\$109,329	\$115,927	-\$6,598	\$323,135
7	2027-2028	\$31,146	\$140,158	\$119,405	+\$20,753	\$315,307

Table 8b: FTX crash stress test. Worst-case issuance timing. Debt peaks at \$323K in Year 6 but never triggers liquidation. Self-liquidation crossover at Year 7.

The result: even a bond issued at the worst possible moment (near an all-time high, immediately before a 77% crash) survives. The debt accumulates for six years but the floor keeps growing. By Year 7, capacity exceeds need, and the debt begins declining. At no point does the LTV approach liquidation thresholds, because the loan is sized to floor growth, not spot price. The crash is irrelevant to the loan mechanics.

Critically: this is a worst-case backtest. A bond issued at the 2021 peak faces the maximum timing penalty. A bond issued today (March 2026) benefits from a floor that is 5× higher in absolute terms, producing commensurately larger dollar capacity. The 2022 stress test demonstrates robustness at extreme entry points. Current conditions are dramatically more favorable.

7.7 Sensitivity Analysis

Safety factor sensitivity

The 90% safety factor is the base case. We test the self-liquidation crossover across the range 70–95%:

Safety Factor	Year 1 Capacity	Year 1 Shortfall	Crossover Year	Year 5 Surplus
70%	\$71,630	-\$28,370	Year 3	\$73,480
80%	\$81,863	-\$18,137	Year 2	\$100,056
90% (base)	\$92,096	-\$7,904	Year 2	\$126,632
95%	\$97,212	-\$2,788	Year 2	\$139,920

Table 8c: Safety factor sensitivity. Even at 70%, self-liquidation occurs by Year 3. The mechanism is robust across all tested factors.

At 70% (Grok's suggestion), the Year 1 shortfall increases to \$28,370 and the crossover delays to Year 3. But the product still works. The trade-off is clear: lower safety factor means larger Year 1 debt accumulation but wider safety margin against model error. The choice between 70% and 90% is a risk preference, not a structural vulnerability.

Interest rate sensitivity

Self-liquidation crossover is remarkably insensitive to the interest rate. At 90% safety factor:

Interest Rate	Crossover Year	Comment
3%	Year 2	Conservative
5%	Year 2	Base case upper bound
7%	Year 2	With liquidity premium
10%	Year 2	Stress scenario
15%	Year 2	Extreme stress

Table 8d: Interest rate sensitivity. Self-liquidation at Year 2 across all tested rates up to 15%.

The floor's 38% growth rate so dramatically exceeds any plausible interest rate that the crossover is invariant. This is the most powerful robustness result in the paper: even if lenders demand 10–15% (reflecting maximum scepticism), the product still self-liquidates on schedule.

Liquidity premium and initial pricing

Floor Bonds initially lack a secondary market. Lenders will demand a liquidity premium above the theoretical fair rate. If this pushes the effective rate to 5–7% rather than 3–5%, the self-liquidation mechanics are unaffected (Table 8d). The rate range 3–5% is a maturity target as secondary markets develop. Initial issuance at 5–7% is realistic and fully compatible with the framework.

Fallback trigger validation

The 30-day floor breach trigger requires an objective oracle. We propose three independent price feeds (e.g., Bitstamp, Coinbase, Kraken daily closing prices), with the trigger confirmed only if all three report below-floor closes for 30 consecutive days. The independent custodian in the 3-of-5 multisig validates the trigger before any fallback action proceeds. This prevents manipulation by any single party.

8. Custody Architecture

The history of Bitcoin lending is a history of custody failures. Celsius, BlockFi, FTX, Voyager. Each collapsed because collateral was commingled, rehypothecated, or held by a single custodian. Floor Bonds must not repeat this. The custody architecture is a core product feature, not an implementation detail.

8.1 The 3-of-5 Multisig Vault

Each Floor Bond creates a dedicated vault:

Key Holder	Role	Signs When
Borrower (Key 1)	Owner	Always required for any movement
Borrower (Key 2)	Backup	Recovery / dispute resolution
Lender	Creditor	Collateral release or fallback liquidation
Independent Custodian	Neutral arbiter	Dispute resolution; fallback validation
Timelock (automated)	Dead man's switch	Auto-releases after maturity + 90 days

Table 8: 3-of-5 multisig vault. The borrower's Key 1 is required for all transactions under normal operation.

8.2 Failure Scenarios

Lender goes bankrupt: Borrower holds 2 keys. Timelock auto-releases after grace period. BTC is never trapped.

Custodian disappears: Borrower (2 keys) + lender (1 key) = 3 of 5. Vault is still accessible.

Borrower loses a key: Backup key + lender + custodian can still execute. Standard multisig recovery.

Platform hacked: There is no platform wallet. Each loan has a dedicated vault. No commingling, no hot wallets, no omnibus accounts.

8.3 Technical Implementation

Built on native Bitcoin primitives. Miniscript defines spending conditions. PSBTs coordinate signatures. Output descriptors enable recovery and audit. Each key holder uses a dedicated hardware signing device. No key material touches an internet-connected device. Every vault address is published and auditable on-chain in real time. Proof of reserves is not a quarterly attestation. It is a permanent, cryptographically verifiable property.

This architecture is proven. Unchained Capital runs collaborative 2-of-3 multisig lending today. Casa provides 3-of-5 vaults. Revault was designed for institutional vault management. Floor Bonds extend these with floor-growth lending mechanics.

9. Institutional Analysis

9.1 STRC Comparison

Strategy (formerly MicroStrategy) currently issues convertible debt at approximately 11.5% (STRC). These instruments are equity-linked: the bondholder receives a coupon plus conversion optionality into MSTR stock. The coupon compensates for equity risk.

Dimension	STRC (Convertible Debt)	Floor Bonds
Coupon	~11.5%	3–5%
Collateral	MSTR equity (indirect BTC)	Bitcoin floor (direct)
Downside	Stock crash → bond declines	Floor breach (0 in 5,713 days)
Cost of capital	High (equity risk premium)	Low (near-zero liquidation)
Maturity	Fixed (5–7 years)	Perpetual (self-liquidating)
Coupon source	Company cash flow	Floor growth (no operational dependency)
Lender leverage	Limited (equity volatility)	10–20× (carry trade substrate)

Table 9: STRC vs. Floor Bonds. Floor Bonds are cheaper, simpler, and more leverageable.

For Strategy at 25% pledged (178,661 BTC), the Year 1 cost comparison: STRC at 11.5% costs \$378M/year. Floor Bonds at 4% cost \$132M/year. Annual savings: \$247M. Over 10 years: \$8.2B in reduced cost of capital.

9.2 Top Holder Capacity

Floor Bond capacity for the largest corporate Bitcoin holders (25% of holdings pledged):

Entity	BTC Held	25% Pledged	Year 1 Capacity	10-Year Total
Strategy (MSTR)	714,644	178,661	\$3.3B	\$109.0B
Tether	96,369	24,092	\$444M	\$14.7B
MARA Holdings	53,200	13,300	\$245M	\$8.1B
Twenty One Capital	37,229	9,307	\$171M	\$5.7B
Metaplanet	35,102	8,776	\$162M	\$5.4B

Table 10: Top 5 corporate holder capacity. BTC holdings as of March 2026 (Arkham Intelligence).

Including ETF issuers and sovereign holdings:

Entity	BTC Held	25% Pledged	Year 1	10-Year
BlackRock (iShares)	761,801	190,450	\$3.5B	\$116.2B
Fidelity (FBTC)	471,000	117,750	\$2.2B	\$71.8B
US Government	328,372	82,093	\$1.5B	\$50.1B

Table 11: ETF and sovereign holder capacity.

Combined Year 1 capacity (all eight entities, 25% pledged): approximately \$11.5 billion. Ten-year cumulative: \$380.9 billion. Every entity on this list is currently sitting on billions in untapped floor growth. Those monetising through expensive equity-linked instruments or failing to monetise at all are leaving structural value on the table.

10. The Floor Yield Curve and the Product Suite

Floor Bonds are the first instrument. They are not the last. The floor growth rate at different tenors forms a natural yield curve, the Bitcoin term structure, and it enables a complete product suite analogous to traditional fixed income.

10.1 The Yield Curve

Tenor	BFR	Floor Price	\$ Growth/BTC	Product Priced Here
1 year	37.9%	\$74,449	\$20,466	Floor Bonds
3 years	33.5%	\$134,713	\$80,730	Floor Futures
5 years	30.0%	\$230,477	\$176,494	Floor Annuities
10 years	23.7%	\$731,811	\$677,828	Floor Mortgages
20 years	17.8%	\$4,547,262	\$4,493,279	Floor Retirement Wrappers
30 years	14.6%	\$23,319,567	\$23,265,584	Floor Perpetuities

Table 12: The Bitcoin Floor Yield Curve. BFR decelerates along a known path. Each tenor anchors a product family.

This yield curve is to Bitcoin what the Treasury curve is to traditional finance. Every floor-based product is priced off it. Floor Bonds use the 1-year point. Floor annuities use the 5–10 year points. Floor mortgages use the 10–30 year points. The curve is deterministic (derived from the power law exponent), decelerating (known deceleration schedule), and empirically validated (Paper 2).

10.2 The Product Suite

Floor Annuities (Paper 4 candidate)

Lock BTC, receive monthly fiat payments tied to floor growth. Perpetual. The borrower side of Floor Bonds repackaged as a retirement product. Every financial advisor understands annuities. The floor annuity is the institutional version of bitcoinpension and SATSplanner.

Floor Futures / Forward Contracts

A contract paying the difference between actual floor value at expiry and today's floor. The discount to floor growth creates a tradeable, market-implied floor confidence metric, the first real-time measure of model risk.

Floor Mortgages

Pledge BTC, buy a house. Mortgage payments funded by floor growth. At 38% BFR vs. 6–7% mortgage rates, the collateral outgrows the debt. The house pays for itself. Bridges Bitcoin to the \$12 trillion global mortgage market.

Floor Call Options

European-style calls with strike equal to the current floor price. Isolates upside volatility above the floor. Cheap premium because the floor provides a natural lower bound that Black-Scholes does not account for.

Floor-Backed Insurance

Sell insurance against floor breach. Premium collected = price of model risk. Emerges naturally once the derivatives market develops sufficient liquidity.

Each product is priced off the yield curve. Each is independently viable. Together they constitute a parallel financial system where the reference rate is Bitcoin's floor growth instead of Treasury yields. And every product in this system is structurally superior to its traditional analog because the reference rate is 38% instead of 4.5%.

11. Assumptions and Limits

The power law floor could break. All projections are conditional on its continued validity. The fallback clause mitigates but does not eliminate this risk.

The 90% safety factor is conservative but arbitrary. Sensitivity analysis should test factors from 0.70 to 0.95.

Taxes and fees are not modelled. Jurisdiction-specific tax treatment of loan proceeds varies and affects the economic advantage of borrowing over selling.

The interest rate range (3–5%) is proposed, not market-tested. Actual rates will be determined by lender competition and market confidence in the floor.

Leverage analysis assumes institutional funding at 3%. Actual repo/CP rates vary and affect carry trade economics. Funding rate spikes can temporarily invert the carry.

The carry trade analogy to yen carry is illustrative. Floor Bonds lack the deep liquidity, secondary market infrastructure, and regulatory clarity that yen-denominated instruments enjoy. These are prerequisites for institutional leverage at scale.

The product suite (Section 10) is a roadmap, not a specification. Each product requires its own paper, risk analysis, and implementation design.

This is a working paper. The framework requires peer review, regulatory analysis, and market validation before deployment.

12. Conclusion

Every Bitcoin lending product in existence lends against the wrong thing. They lend against spot price, the noisiest, most volatile measure of Bitcoin's value, and then build elaborate risk machinery to manage the volatility they chose to expose themselves to.

Floor Bonds lend against the signal: the power law floor's structural growth. The borrower receives perpetual income. The lender receives a self-improving collateral position. Both pay less and earn more than under any existing arrangement.

For the borrower, the value is income without liquidation risk. The 38% floor growth is theirs. They keep it. The debt pays itself.

For the lender, the value is not the coupon. The value is the risk profile. Floor Bonds are carry trade infrastructure, a near-zero-risk asset class that supports 10–20× leverage at institutional scale. The same mechanics that powered the yen carry trade, but backed by a structural floor rather than a central bank press conference.

For Bitcoin treasury companies, Floor Bonds reduce cost of capital by billions compared to convertible debt. Strategy alone saves \$247M/year. The top five corporate holders can raise \$4.3B in Year 1 by pledging just 25% of holdings.

The 3-of-5 multisig custody architecture ensures no single party can move the collateral. No rehypothecation. No commingling. No Celsius. No BlockFi. No FTX.

And Floor Bonds are only the beginning. The Bitcoin Floor Yield Curve, the term structure of floor growth rates across tenors, provides the reference rate from which an entire product suite is priced: annuities, futures, mortgages, options, insurance. This is not a single product launch. It is the infrastructure layer for a parallel financial system.

Traditional finance lends against value. Floor Bonds lend against growth. The difference is the difference between a snapshot and a trajectory.

The floor is the signal. Everything above it is noise.

Floor Bonds are the first financial product built entirely on the signal.

The yield curve is the infrastructure that makes the rest inevitable.

Appendix A: Extended Capacity Schedule

Year	Floor	BFR	Capacity	Need	Surplus	Cum. Surplus
1	\$74,449	37.9%	\$92,096	\$100,000	-\$7,904	-\$7,904
2	\$100,923	35.6%	\$119,133	\$103,000	+\$16,133	+\$8,229
3	\$134,713	33.5%	\$152,057	\$106,090	+\$45,967	+\$54,196
4	\$177,325	31.6%	\$191,753	\$109,273	+\$82,480	+\$136,676
5	\$230,477	30.0%	\$239,183	\$112,551	+\$126,632	+\$263,308
6	\$296,119	28.5%	\$295,392	\$115,927	+\$179,465	+\$442,773
7	\$376,455	27.1%	\$361,510	\$119,405	+\$242,105	+\$684,878
8	\$473,955	25.9%	\$438,752	\$122,987	+\$315,765	+\$1,000,643
9	\$591,383	24.8%	\$528,425	\$126,677	+\$401,748	+\$1,402,391
10	\$731,811	23.7%	\$631,927	\$130,477	+\$501,449	+\$1,903,840

Table A1: Extended schedule with cumulative surplus.

Appendix B: Methodology Notes

Power law parameters: Santostasi ($\log A = -16.493$, $\beta = 5.688$). $R^2 = 0.956$. Genesis: January 3, 2009.

Floor multiplier: $0.42 \times \text{trend}$ (~5th percentile of empirical log residuals).

BFR formula: $\text{BFR}(t) = ((t + 365.25) / t)^\beta - 1$.

Borrowing capacity: $90\% \times \text{BTC} \times [\text{Floor}(t+365) - \text{Floor}(t)]$. Recalculated annually.

Interest: 4% annual (midpoint), capitalised in debt. Robust to rates up to ~15%.

LTV: Cumulative borrowed / (BTC \times floor price). Floor used as conservative bound.

Liquidation price: Cumulative borrowed / (BTC \times 0.80). Standard 80% threshold.

Leverage analysis: $\text{ROE} = (\text{Gross yield} \times \text{leverage}) - (\text{Funding cost} \times (\text{leverage} - 1))$. Assumes 3% institutional funding.

Holder data: Arkham Intelligence and BitcoinTreasuries.NET, March 2026.

Appendix C: Indicative Term Sheet

Term	Specification
Instrument	Bitcoin Floor Bond
Issuer / Lender	Institutional capital provider (bank, fund, or treasury company)
Borrower	BTC holder depositing collateral into dedicated multisig vault
Collateral	Bitcoin, held in 3-of-5 multisig vault (borrower retains keys)
Max Annual Draw	$90\% \times \text{Collateral (BTC)} \times [\text{Floor}(t+365) - \text{Floor}(t)]$
Interest Rate	3–5% annual (fixed or floating, negotiated at issuance)
Interest Payment	Capitalised (added to balance) or paid quarterly at borrower's election
Maturity	Perpetual (self-liquidating). Borrower may close at any time.
Self-Liquidation	Surplus floor growth reduces balance. Zero balance → collateral released.
Rehypothecation	Prohibited. Protocol-enforced via multisig spending conditions.
Tier 1 (Normal)	Floor-growth mechanics. No margin calls. No liquidation.
Tier 2 (Fallback)	Activates on 30-day floor breach. 50% LTV, 80% liquidation, 14-day notice.
Reversion	Tier 1 reactivates after 90 consecutive days above floor.
Custody	Dedicated 3-of-5 multisig vault per loan. Bitcoin-native (Miniscript/PSBT).
Timelock Recovery	Auto-release to borrower at maturity + 90 days. Lender insolvency protection.
Governing Law	Jurisdiction-dependent. Bilateral agreement between borrower and lender.
Audit	On-chain. Vault address published. Real-time proof of reserves.

Table C1: Indicative term sheet for a standard Floor Bond.

References

- [1] Scale Invariant Capital. (2026). Percentile-Anchored Volatility Decay Analysis. BTC Power Law Observatory, Paper 1.
- [2] Scale Invariant Capital. (2026). The Bitcoin Floor Rate: Valuing Bitcoin from Its Structural Minimum Return. Paper 2.
- [3] Santostasi, G. (2024). Bitcoin and the power law. Working paper. $\log A = -16.493$, $\beta = 5.688$.
- [4] Bengen, W. P. (1994). Determining withdrawal rates using historical data. *J. Financial Planning*, 7(4), 171–180.
- [5] Gordon, M. J. (1959). Dividends, earnings, and stock prices. *Review of Economics and Statistics*, 41(2), 99–105.
- [6] US Dept. of Housing and Urban Development. (2023). HECM Program Statistics.
- [7] Strategy Inc. (2026). STRC Senior Convertible Notes. SEC Filing. Holdings: 714,644 BTC.
- [8] Arkham Intelligence. (2026). Who Owns the Most Bitcoin in 2026. Research report.
- [9] Unchained Capital. (2024). Collaborative custody: A multisignature approach to Bitcoin lending.
- [10] Poelstra, A. et al. (2019). Miniscript: Composable Bitcoin Script. Blockstream Research.
- [11] Plan C [@TheRealPlanC]. (2026). Median exponent decay analysis. X, March 9, 2026.
- [12] Burger, H. C. (2019). Bitcoin's natural long-term power-law corridor of growth.