CHAOS LEDGER

Beyond mNAV: A New Valuation and Credit Framework for Bitcoin Treasury Companies

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Executive Summary

Bitcoin Treasury Companies ("BTC-TCs") represent one of the most significant structural innovations in corporate finance in decades. Around 200 publicly listed corporations now hold Bitcoin ("BTC") as a balance sheet reserve asset, collectively commanding roughly 1.1 million Bitcoin, representing $78 billion in value and about 5% of total Bitcoin supply (notably, the aggregate value is dominated by a small number of large holders who have successfully implemented this treasury strategy). Yet the market lacks a definitive framework for valuing these entities or the layered credit instruments they issue. This paper provides those frameworks:

1. We introduce Adjusted Multiple of Net Asset Value (Adj. mNAV) as a means of more accurately assessing common shareholder value – and a suite of adjusted valuation metrics including Clearing mNAV, Adjusted BTC-per-share, Adjusted BTC Yield, and an Adjusted mNAV Payback metric.
2. We decompose the mNAV premium into four components: Regulatory Premium (serving investors who cannot hold Bitcoin directly), Leverage Premium (access to flexible institutional financing), Accretion Premium (present value of future BTC-per-share growth), and Speculation Premium (momentum and sentiment-driven residual). This decomposition enables investors to distinguish between structural and speculative sources of value, identify mispricing across companies, and assess which premiums are durable versus transient.
3. A new credit rating framework is required for the preferred equity instruments issued by BTC-TCs in place of traditional credit analysis centered on interest coverage and leverage ratios. We propose a Bitcoin collateral-based framework built on two dimensions: solvency (Bitcoin overcollateralization) and liquidity (a new Bitcoin Interest Coverage Ratio that assesses Adj. operating cash flow, USD reserves, and probability-adjusted capital markets access). The framework maps composite BTC credit scores to traditional rating equivalents as a starting point to bridge BTC-backed credit to traditional credit markets.

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About Chaos Ledger

Established in 2025, Chaos Ledger is a next-generation Bitcoin credit asset manager specializing in Bitcoin-backed credit instruments and related strategies. For inquiries, please contact us at: contact@chaosledger.com.

Bitcoin Treasury Company Basics

In August 2020, Strategy (formerly known as MicroStrategy) converted $250 million of idle cash into Bitcoin ("BTC"), acquiring 21,454 BTC at an average price of roughly $11,650. Only weeks later, it deployed its remaining $175 million to buy an additional 16,796 BTC. This unconventional capital allocation strategy reflected its then-CEO (and current Executive Chairman) Michael Saylor's frustration with low real yields, which were quietly eroding the purchasing power of the company's accumulated earnings.

By converting all its cash to BTC, Strategy inverted the logic of corporate treasury management: instead of treating cash as the risk-free baseline and volatility as something to minimize, it embraced a scarce, bearer monetary asset as its primary reserve asset. Instead of optimizing around balance sheet stability like its peers, it optimized around long-term monetary appreciation.

What began as a defensive hedge against monetary debasement has since evolved into the prototype for an entirely new asset class – a radical and novel path for corporations to store value, raise capital, and orient toward long-term value creation through balance sheet strength.

What is a Bitcoin Treasury Company?

A Bitcoin Treasury Company ("BTC-TC") is any public or operating entity that holds a substantial amount of Bitcoin as a primary balance sheet reserve asset. Today, more than 100 publicly traded companies hold over 100 BTC, and more than 50 hold over 1,000 BTC. In aggregate, these companies hold approximately 1.1 million BTC – about 5% of total supply and around $78 billion in dollar value. We believe capitalizing a company with Bitcoin can be a rational economic decision in acknowledgement of Bitcoin's fixed supply, decentralized nature, censorship-resistant qualities, and historical asymmetric return profile. In an era of currency debasement and compressed real yields, Bitcoin offers corporations a reserve asset optimized for long-term purchasing power rather than short-term nominal stability.

Before outlining our BTC Treasury Company valuation framework, it is essential to distinguish between two fundamentally different BTC Treasury Company models:

- **Pure-Play:** companies that fully capitalize their balance sheets with Bitcoin and actively leverage the capital markets to accumulate more. Notable examples include Strategy ($MSTR), Metaplanet (3350.JP), and Strive ($ASST).

- **Diversified:** companies that allocate only a portion of surplus cash to Bitcoin as a reserve diversification strategy. Notable examples include Tesla ($TSLA), Coinbase ($COIN), and Block ($XYZ).

Both models contribute meaningfully to institutional Bitcoin adoption. However, they should not be valued identically. The former transforms Bitcoin into the core operating mandate of the firm, using equity, debt, and structured instruments as tools to compound BTC accumulation. The latter treats Bitcoin as a passive treasury asset. *This paper focuses on the Pure-Play BTC-TCs that have gone "all-in" on Bitcoin and are deliberately reshaping traditional finance to acquire more of it. For investors, this is where the literature and general understanding are the least developed.*

BTC-TC Valuation Framework

Fundamentally, the Enterprise Value ("EV") of a BTC-TC can be decomposed into two core components: Net Asset Value ("NAV") and mNAV ("multiple of NAV"). The "earnings" equivalent for BTC-TCs is BTC Yield.

NAV: At its foundation, the company's intrinsic value is tethered to the Bitcoin it holds in secure custody. Because BTC typically represents the overwhelming majority of assets, fluctuations in Bitcoin's price are the primary driver of changes in NAV, and by extension, the baseline driver of market capitalization (after deducting balance sheet debt).

$$\text{NAV} = \text{Amount of BTC owned} \times \text{BTC Price}$$

mNAV: However, Enterprise Value does not necessarily equal NAV – the distinction between a BTC-TC and a Bitcoin spot ETF is structural. A Bitcoin spot ETF is a passive vehicle designed to provide 1:1 exposure to Bitcoin; it cannot make active capital allocation decisions, structure liabilities, or issue securities to accumulate more BTC. Critically, an operating company can engage in these capital markets activities. This flexibility introduces a second valuation layer:

$$\text{mNAV} = \frac{\text{Enterprise Value}}{\text{NAV}}$$

mNAV represents the market's assessment of management's ability to create – or destroy – value beyond the underlying Bitcoin holdings. An mNAV premium (i.e., mNAV > 1.0x) signals investor confidence in the company's ability to compound BTC accumulation through its capital markets strategy; an mNAV discount signals skepticism. In essence, NAV reflects the nominal value of the asset base, and mNAV reflects the value created or destroyed by a BTC-TC's capital markets strategy.

BTC-per-share: One metric that can be used to assess the effectiveness of a BTC-TC's capital markets strategy is BTC-per-share, which represents the amount of BTC per common share outstanding, enabling an investor to measure their dilution-adjusted Bitcoin exposure.

BTC Yield: Pure Bitcoin accumulation alone, however, does not justify an mNAV premium as accumulation can be funded by an equal amount of shareholder dilution – it is management's ability to demonstrate Bitcoin accretion net of dilution that matters; essentially, management's ability to grow BTC-per-share over time. This value accretion (or dilution) can be represented quantitatively through BTC Yield, which measures the % change in BTC-per-share over two periods. As such, a key value proposition for investing in a BTC-TC is the forward expectation that positive BTC Yield can be generated, and thus the amount of BTC per share goes up over time without the investor needing to put in additional capital.

Combining the above metrics, total BTC-TC investment returns can be summarized as follows:

$$\text{BTC-TC Return} = \text{BTC Return} + \text{BTC Yield} + \%\Delta\ \text{mNAV Premium}$$

If BTC is the benchmark, then the alpha opportunity for investors is as follows:

$$\text{Alpha} = \text{BTC Yield} + \%\Delta\ \text{mNAV Premium}$$

Critically, it is this mNAV premium that enables BTC-TCs to issue equity in an accretive manner to acquire Bitcoin, known as "accretive dilution" – if a BTC-TC trades at, and maintains a 2.0x mNAV, every dollar of BTC purchased increases the company's valuation by two dollars. The market has broadly understood equity issuances to be accretive when mNAV > 1.0x – though we'll address the nuances around accretive dilution later in this paper. Consider the following mathematical example that illustrates how BTC Yield can be generated through accretive dilution:

1. ABC Corp. has a market cap of $200 (20 shares outstanding, $10 per share) and an NAV of $100 (assume each BTC is worth $1) → mNAV of 2.0x, BTC-per-share of 5
2. ABC issues 2 additional shares at $10 each (proceeds of $20) via an at-the-market (ATM) offering, diluting its shareholders by 10%
3. The $20 of proceeds is used to purchase BTC → NAV increases to $120 (20% increase)
4. Although shareholders have been diluted by 10%, NAV has increased by 20% – BTC-per-share has increased from 5 to ~5.5 (~9% BTC Yield)

Although shareholders are diluted by the ATM issuance, the transaction can still be economically accretive. When equity is raised above NAV, the company acquires more Bitcoin than the dilution from additional issuance, resulting in an increase in BTC-per-share. *The expectation of ongoing BTC*

Yield supports the mNAV, which in turn sustains access to equity issuances allowing the BTC-TC to continue generating incremental BTC Yield. To date, the process of issuing equity at a premium to NAV has been the primary method by which BTC-TCs have generated BTC Yield for their shareholders.

Given the importance of the mNAV premium, this begs the question – what drives mNAV and what is the "fair" mNAV for a given BTC-TC? We strongly believe that variant views on mNAV are what will differentiate successful investors in this asset class. When mNAV becomes excessively elevated relative to future growth potential and capital market conditions, risk increases and discipline is warranted. *When mNAV compresses below the level fundamentals justify, leaning in will then provide substantial asymmetric upside opportunity.*

The table below outlines common scenarios in which high or low mNAV levels are justified and when they may instead signal market inefficiency – we explore mNAV valuation in the following section:

	Reasons for Multiple	**Reasons for Misprice**
mNAV Premium	• Credible path to accumulating more BTC efficiently and quickly • Cheap, diversified capital markets resources • Trustworthy management with a good track record • Regulatory advantages • Strong cash-flowing underlying business • Additional ways to make BTC productive	• Market euphoria (common during parabolic upward movements in BTC) • Misguided opinions on management capability or durability of moats

mNAV Discount	• Lack of credible or sustainable go-forward strategy to accumulate BTC • Value-destructive track record by management • Overly complicated capital structure or capital markets strategy • Over-levered balance sheet • Underlying business is weak or declining, dragging performance	• Depressed sentiment (common during prolonged periods of BTC downturn) • Lack of understanding or appreciation of BTC accumulation strategy • Underappreciated capital structure design • Undervaluation of the underlying business

Adjusted Valuation Metrics

mNAV (Enterprise Value / NAV) provides an objective view into the valuation of the entire capital structure for a BTC-TC. However, mNAV as a metric does not paint the full picture for common equity investors if the company holds debt or preferred equity on its balance sheet: when senior instruments are outstanding, not all of NAV is attributable to common equity holders – preferred and credit investors have liquidation preferences or outstanding principal that grant seniority to the BTC collateral. As such, we propose a new metric of Adjusted mNAV to better represent the economic reality of common equity investors, calculated as:

$$\text{Adjusted mNAV} = \frac{\text{Market Capitalization}}{\text{Adjusted NAV}}$$

$$\text{Adjusted NAV} = \text{NAV} - \text{Liquidation Preference of Preferreds} - \text{Outstanding Debt Principal}$$

Adjusted mNAV ("Adj. mNAV") takes into account the liquidation preference and outstanding principal of these preferred and credit instruments when calculating how accretive or dilutive an equity issuance is *to the common equity holders*.

In the same way that one would calculate BTC-per-share, now we can calculate Adjusted BTC-per-share, defined as:

$$\text{Adjusted BTC-per-share} = \frac{\text{Adjusted NAV}}{\text{Share Count}}$$

In the same vein as BTC-per-share, Adj. BTC-per-share tracks the Adj. NAV per common share – we think the latter is a better representation of the economic value that each common share holds. It is

important to note that while BTC-per-share is a metric that is priced in Bitcoin and does not fluctuate based on the dollar price of Bitcoin, Adj. BTC-per-share takes into account the dollar price fluctuations of Bitcoin given that *the par value of these preferred and credit instruments is priced in dollars, not Bitcoin*. For example, there are periods when headline BTC-per-share can remain flat while Adj. BTC-per-share increases, demonstrating the appreciation in the value of the underlying collateral relative to the outstanding liabilities.

Adjusted BTC Yield: From Adj. BTC-per-share, we can derive an additional metric to analyze Bitcoin accretion and accumulation efficiency of these BTC-TCs. Adj. BTC Yield is the % change in Adj. BTC-per-share from beginning period to ending period. Notably, whereas BTC Yield is fully denominated in BTC, Adj. BTC Yield accounts for the change in BTC's dollar price.

Adjusted BTC Yield vs BTC Yield: The BTC Yield metric was invented at a time prior to BTC-TCs accumulating significant senior liabilities on their balance sheet. With the evolution of their capital markets strategies that increasingly involve *the issuance of preferred and credit instruments senior to the common equity*, dilution-adjusted metrics (i.e., BTC-per-share, BTC Yield) must consider the *dollar-denominated liabilities* to represent the true economic reality of the common equity holders.

Adj. BTC Yield vs BTC Dollar Gain: BTC Dollar Gain is an existing metric that measures the dollar value of a BTC-TC's Bitcoin accretion, calculated by multiplying BTC Yield for the period by the beginning-of-period BTC holdings and the end-of-period market price of BTC. At first glance, readers may draw parallels between Adj. BTC Yield and BTC Dollar Gain as both metrics quantify the dollar value of a BTC-TC's Bitcoin accretion. However, given BTC Yield does not account for a BTC-TC's senior liabilities, BTC Dollar Gain does not capture the full economic impact of that accretion for the common equity. In contrast, Adj. BTC Yield explicitly incorporates the capital structure.

We can illustrate the advantages of Adj. BTC Yield using the following example:

1. Assume ABC Corp. has a NAV of $100 and trades at an mNAV of 1.5x → $150 Enterprise Value
2. ABC has $50 of liabilities with 10 common shares outstanding → $100 of market cap ($10 per share) – ABC has an Adj. NAV of $50 ($100 NAV – $50 of liabilities)
3. BTC-per-share is currently 10, while Adj. BTC-per-share is 5. Adj. mNAV is 2.0x ($100 market cap / $50 Adj. NAV)

4. Assume mNAV stays constant at 1.5x, and that ABC issues 10 additional shares at $10 per share (total of 20 shares outstanding) to purchase BTC with the proceeds
5. Thus, NAV increases to $200, EV trades up to $300, and the market cap is equal to $250 ($300 EV – $50 liabilities). Adj. NAV is now $150 ($200 NAV – $50 of liabilities)
6. BTC-per-share has remained constant at 10 ($200 NAV / 20 shares)
7. Adj. BTC-per-share has increased from 5 ($100 Adj. NAV / 10 shares) to 7.5 ($150 Adj. NAV / 20 shares), which is reflected by the increase in share price ($12.5 per share vs. $10 per share)

In the example above, if we were to only analyze BTC-per-share, BTC Yield would be 0% – as well as BTC Dollar Gain – and would imply that equity investors have not gained anything; however, when analyzing the Adj. BTC-per-share, the new equity issuance has generated a 50% Adj. BTC Yield.

Now a reader might notice that BTC-per-share has remained constant despite the equity issuance at an mNAV > 1.0x – equity issuances at mNAV > 1.0x in theory should always be accretive to BTC-per-share. The constancy of BTC-per-share in the prior example is attributable to the senior liabilities on the company's balance sheet that necessitate a higher mNAV for equity issuances to be accretive when purchasing BTC. We define this hurdle as the Clearing mNAV, which is positively correlated with the amount of debt and preferred equity in the BTC-TC's capital structure:

$$\text{Clearing mNAV} = 1 + \frac{\text{Notional Value of the Debt} + \text{Preferred}}{\text{NAV}}$$

The Clearing mNAV indicates the point at which an equity issuance would be dilutive rather than accretive when acquiring Bitcoin – *equity issuances at an mNAV that is less than the Clearing mNAV are dilutive to the common shareholder base, even if the mNAV is >1.0x*. Intuitively, if a portion of NAV is attributable to the more senior debt and preferred holders, this artificially inflates the amount of BTC attributable to each common share. Therefore, new equity investors must pay a large enough mNAV premium to compensate for the artificially higher existing BTC-per-share for the equity issuance to not be dilutive.

Does equity issuance increase BTC-per-share?

	mNAV > Clearing mNAV	**mNAV < Clearing mNAV**
mNAV > 1x	Y	N
mNAV < 1x	N/A	N

Going back to the previous example, the equity issuance of $100 was neither accretive nor dilutive on a BTC-per-share basis because ABC Corp's mNAV was equal to the Clearing mNAV. At the same time, common equity holders were made better-off because the Adj. BTC-per-share (the BTC value that truly belongs to the common equity) has increased.

Another interesting scenario to analyze would be when mNAV trades at >1.0x, but due to a large amount of senior credit obligations, the Adj. mNAV trades at <1.0x, making common equity issuances to purchase Bitcoin non-accretive for common equity holders. Consider the following example:

1. ABC Corp. has issued 10 common shares ($10 per share) and $100 of preferred equity with a 1.0x liquidation preference, using the proceeds to purchase Bitcoin → NAV is $200.
2. ABC trades at 1.0x mNAV → EV of $200.
3. The preferred equity trades up to $120 notional. Assuming a constant 1.0x mNAV → the market cap decreases to $80 ($8 per share).
4. ABC has an Adj. NAV of $100 ($200 NAV – $100 liquidation preference) → Adj. mNAV of 0.8x ($80 market cap / $100 Adj. NAV).
5. If ABC issues 1 additional common share (11 shares outstanding) → NAV increases to $208, Adj. NAV increases to $108, EV increases to $208 (constant 1.0x mNAV), the market cap increases to $88
6. Adj. BTC-per-share decreases from 10 to ~9.8 → although mNAV trades at 1.0x, because Adj. mNAV is <1.0x, the equity issuance is dilutive
7. Since mNAV < Clearing mNAV (1.5x), BTC-per-share also decreases from 20 to 18.9
8. In this instance, any equity issuances for Bitcoin purchases would be *dilutive to the common equity shareholders*. The BTC-TC should *not* issue equity to purchase Bitcoin even if the company's mNAV trades at >1.0x because its Adj. mNAV is < 1.0x

Note: An interesting phenomenon occurs with equity issuances when Adj. mNAV is <1.0x – although this accumulation is ultimately dilutive on an Adj. BTC-per-share basis, it actually increases Adj. mNAV. In the previous example, post-issuance, Adj. mNAV is now ~0.81x.

The previous example has shown that to most accurately assess whether equity issuance is accretive to common equity holders, BTC-TCs should primarily look at their Adj. mNAV – if it is > 1.0x, then equity issuance is accretive, and vice versa. BTC Yield analysis using mNAV and Clearing mNAV can be used as secondary references. Additionally, any preferred equity issuance does not change Adj. BTC-per-share on Day 1, even though it does increase BTC-per-share – the accretive effect of credit issuance over time is determined by the differential in BTC price appreciation vs. the outstanding principal or liquidation preference, which remains static.

Another important way to determine a fair mNAV is to analyze the investment hold period necessary for BTC Yield to "pay back" the mNAV premium. This payback period can be measured through the mNAV Payback, defined as the period of time – months, quarters, years – for an investor to have the same nominal exposure to Bitcoin as directly investing in Bitcoin. Until the mNAV premium is recouped, an investor gains less Bitcoin exposure per dollar through a BTC-TC's common equity compared to a direct Bitcoin investment. The higher the mNAV premium or the lower the BTC Yield, the longer the mNAV Payback. A longer mNAV Payback extends an investor's exposure to the risk of: 1) mNAV premium compression, and 2) BTC Yield decay.

Accordingly, we can define mNAV Payback through the following formula:

$$y_0 = \frac{y_0}{\text{mNAV}} (1 + \text{BTC Yield})^n$$

where: n = period of time; y_0 = initial investment

$$\text{mNAV Payback} = \frac{\ln(\text{mNAV})}{\ln(1 + \text{BTC Yield})}$$

As an example, if we assume a BTC-TC trades at a constant mNAV of 2.0x with a constant BTC Yield of 15% for the next 5 years, then the mNAV Payback is ~5 years:

ASSUMPTIONS

Initial Investment	100
mNAV	2.0
BTC Yield	15%

BTC NAV PROJECTION

Year	0	1	2	3	4	5
BTC NAV	50.0	57.5	66.1	76.0	87.5	100.6
Bitcoin Delta		7.5	8.6	9.9	11.4	13.1

Total BTC Delta	**50.6**
Total BTC NAV	**100.6**

There are, however, several important nuances regarding mNAV Payback. First, *future BTC Yield is likely to decline as NAV grows* – it becomes more difficult to grow at the same rate when Bitcoin holdings are 100,000 BTC vs. 100 BTC, for example. The current definition of mNAV Payback is

static, using historical BTC Yield that is not necessarily representative of go-forward expectations. Second, *future Bitcoin accumulation must be discounted by the projected Bitcoin return rate given the opportunity cost of reduced Bitcoin exposure.* The appropriate discount rate is dependent on the individual investor's discretion, but a discount rate ought to be applied. Finally, Adj. mNAV and Adj. BTC Yield – rather than the non-adjusted metrics – provide a more complete picture for analyzing the economic gains of common equity investments.

To illustrate how these factors can impact an investor's returns, assume a BTC-TC has a go-forward, constant BTC Yield of 20% for the next 5 years and trades at a constant mNAV of 2.0x. Similar to discounting cash flows, we discount future BTC Yield by Bitcoin's expected return rate – in this case, assuming 20% CAGR over the hold period – to account for the opportunity cost and reduced Bitcoin exposure from investing in a BTC-TC instead of directly investing in Bitcoin.

ASSUMPTIONS

Discount Rate	15%
Initial Investment	100
Adj. mNAV	2.0x
Adj. BTC Yield	20%
BTC Yield Decay	5%

BTC NAV PROJECTION WITH YIELD DECAY

Year	0	1	2	3	4	5
Adj. Bitcoin Yield		20%	19%	18%	17%	16%
BTC NAV	50.0	60.0	71.4	84.3	98.7	114.8
Bitcoin Delta		10.0	11.4	12.9	14.5	16.1
NPV BTC Delta		8.7	8.6	8.5	8.3	8.0

Total NPV BTC Delta	**42.1**
Total BTC Holdings	**92.1**

We can express these modifications to the mNAV Payback formula by substituting the adjusted versions of mNAV and BTC Yield:

$$y_0(1+r)^n = \frac{y_0}{\text{Adj. mNAV}}\Big((1+\text{Adj. BTC Yield})(1-d)\Big)^n$$

$$\text{Adj. mNAV Payback} = \frac{\ln(\text{Adj. mNAV})}{\ln\left[\big((1+\text{Adj. BTC Yield})(1-d)\big)/(1+r)\right]}$$

where: d = Adj. BTC Yield decay factor; r = discount rate

Note: The net Adj. BTC Yield after discounting must be greater than the gross discount factor (1+r); mNAV must be greater than 1.0x.

mNAV Decomposition

Our second element of analysis involves the decomposition of mNAV into the primary components driving the premium (or discount) to book value. For simplicity, we are treating this section as a discussion on mNAV premium as a concept, since the individual drivers of the premium apply to both mNAV and Adj. mNAV (and other adjusted metrics). We propose that there are four primary drivers of mNAV premium: 1) Regulatory Premium, 2) Leverage Premium, 3) Accretion Premium, and 4) Speculation Premium. This decomposition of mNAV allows investors to identify the individual economic drivers behind why a BTC-TC trades above (or below) its Bitcoin NAV. The following formula provides a conceptual framework to decompose mNAV:

$$mNAV\ Premium = P_{reg} + P_{lev} + P_{acc} + P_{spec}$$

Component	Definition	Key Drivers
$P_{reg} = Regulatory\ Premium$	Value from serving investors that are unable to, or are disadvantaged in, investing or holding Bitcoin directly	ETF restrictions, mandate constraints, custody limitations, tax treatment
$P_{lev} = Leverage\ Premium$	Valued derived from flexible capital markets access and leverage profile	Reduced liquidation and duration risk, capital markets access, bespoke financing options
$P_{acc} = Accretion\ Premium$	Present value of future BTC-per-share growth	Historical BTC Yield, go-forward BTC Yield expectations, issuance capacity, current mNAV premium
$P_{spec} = Speculation\ Premium$	Residual value driven by momentum, options activity, and investor sentiment	Options open interest, BTC correlation, short interest, etc.

Regulatory Premium

Regulatory Premium represents the first source of mNAV premium and is the value an investor gains from owning shares of a BTC-TC instead of directly investing in Bitcoin due to different regulatory treatments or constraints pertaining to equity vs. digital asset ownership.

First, BTC-TCs present an opportunity for institutional and individual investors to invest in Bitcoin in regions where Bitcoin spot ETF access is limited. Prior to 2024, most U.S. investors did not have an easy way to access Bitcoin via their brokerage accounts, which often required them to either invest directly through a cryptocurrency exchange or invest in Bitcoin-tracking funds, such as a Bitcoin futures ETF. Although U.S. investors now have easy access to a large selection of Bitcoin spot ETFs, only ~11 countries and jurisdictions offer Bitcoin spot ETFs or equivalent products (e.g., Canada or Hong Kong) as of this writing. Even if an investor is able to access Bitcoin through a cryptocurrency exchange, they may feel more comfortable indirectly holding their Bitcoin through BTC-TCs which offer the advantage of professional Bitcoin custody. Investing in BTC-TCs could also enable investors to better manage their broader portfolio through a traditional brokerage.

Mandate constraints can also prevent investors from investing directly in Bitcoin. For example, a long-only equity investor's mandate prevents them from allocating to digital assets at all, but they would be able to gain Bitcoin exposure via an investment in a BTC-TC – digital assets are broadly considered a separate mandate and often only crypto-focused investors are able to invest directly in spot Bitcoin or Bitcoin futures.

In other instances, investments in BTC-TCs can provide a significant tax treatment advantage compared to investing directly in Bitcoin – currently in Japan, cryptocurrencies can be taxed up to a maximum of ~55% while equities are taxed at a long-term capital gains rate of ~20%, putting crypto investors at a tax disadvantage (new proposed laws in 2026 will likely reduce the overall tax rate to ~20% for digital asset investments).

Prior to the approval of Bitcoin spot ETFs, regulatory access was the primary driver for mNAV premiums and potentially explains why certain stocks have traded at >2.0x mNAV given the constraints on adoption. However, as access to Bitcoin increases over time, we expect the mNAV premium assigned to regulatory access to be eroded away. We speculate that investor mandate occlusion will be the primary structural driving force behind continued Regulatory Premium for BTC-TCs – capital allocators are likely to continue to perceive Bitcoin as a high-risk, high-volatility asset that prevents them from allocating meaningfully to any Bitcoin strategy due to fixed annual liabilities and greater comfort levels with allocating to traditional asset classes such as equities or fixed income.

Leverage Premium

In simple terms, a BTC-TC's Leverage Premium can be viewed as the premium derived from flexible capital markets access and proprietary financing solutions.

First, access to leverage through a corporate entity structure can be more attractive than relying on traditional forms of leverage or derivatives as a BTC-TC's corporate structure removes liquidation and duration risks during instances of market correction. BTC-TCs remove duration risk by providing an investor perpetual leveraged exposure to Bitcoin without time decay or rolling options. Other leveraged Bitcoin products suffer from the issues of high fees (1-3% expense ratios) and volatility decay (the phenomenon where the constant oscillation in price causes an investor to be worse off than just investing in the underlying). Although leveraged Bitcoin perpetuals do exist and provide similar exposure, these derivatives are subject to liquidation risk in the event of a sudden market correction.

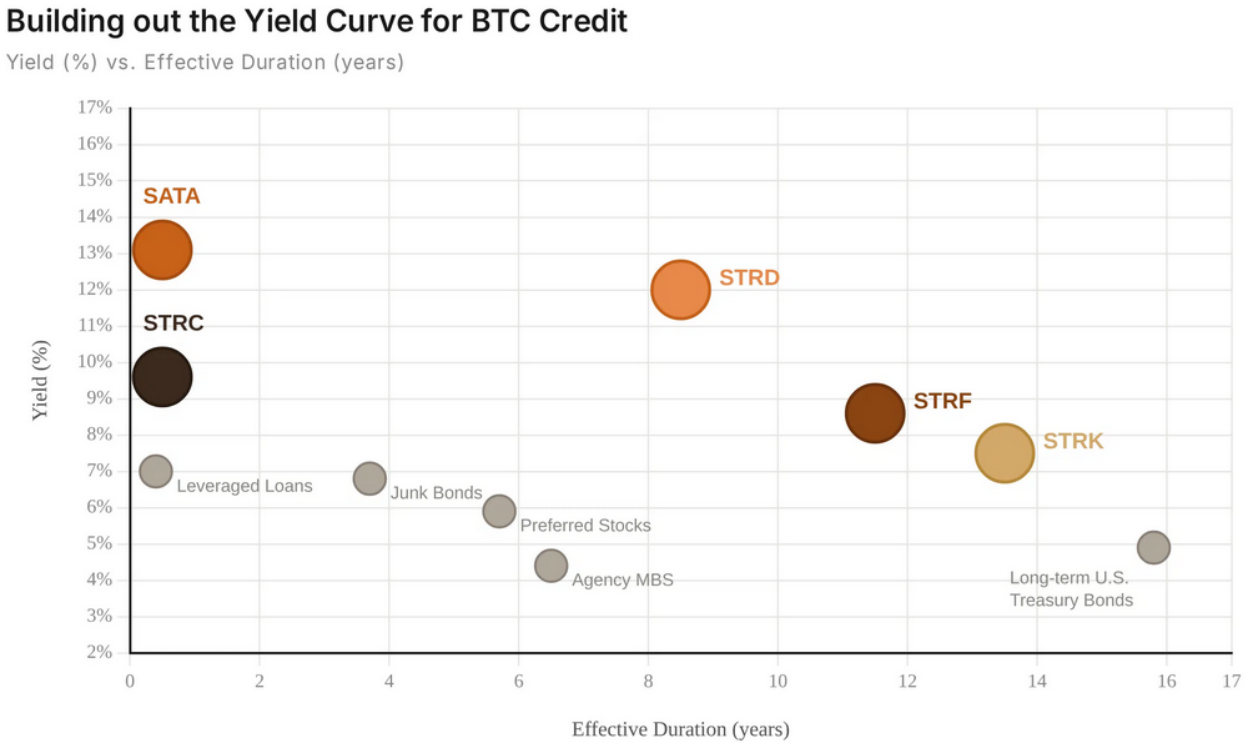
Another source of Leverage Premium is the unique capital market access and bespoke financing solutions available to BTC-TCs, facilitating their ability to raise additional capital that is not typically available to the average investor. As we'll discuss later, BTC-backed credit instruments are unique methods of accessing new sources of capital to fund Bitcoin acquisitions that a retail or institutional investor would not have access to – this proprietary access to new pools of capital combined with the overall flexibility of corporate leverage warrant an mNAV premium. The wider the company's funding base, the less reliance it has on a single capital markets channel which can enable the company to continuously raise capital to acquire BTC.

As an example, there is a great diversity of preferred equity issuances that a BTC-TC can issue:

- **Level 1:** Funds BTC purchases via selling equity at an mNAV premium. Their fundraising ability is proportional to their mNAV premium, making Bitcoin acquisitions dependent on prevailing market sentiment.
- **Level 2:** One authorized preferred share class, which a BTC-TC can issue even if the company's mNAV trades below 1.0x. This enables the company to accumulate BTC across a wide range of market conditions. However, if market sentiment deteriorates, the preferred equity could trade at a discount, making the cost of additional preferred equity issuances more expensive as the effective yield rises.
- **Level 3:** A more advanced funding structure involves offering multiple classes of preferred equity with differentiated risk-return profiles. For example, by structuring senior cumulative preferreds alongside junior non-cumulative preferreds, a BTC-TC can broaden its addressable investor base and maintain capital access across a wider range of market conditions. In periods of stress – when preferred securities may trade at a discount – the company could theoretically continue issuing junior, non-cumulative preferred equity, which provides greater flexibility if dividends were ever deferred. *To be clear, skipping a dividend payment is never desirable, even for non-cumulative securities, as it can impair market confidence and future capital markets access.* However, investors in junior preferred instruments are compensated for this

incremental risk through higher yields. The existence of multiple preferred tiers therefore enhances capital structure resilience, improving the company's ability to raise capital consistently while aligning risk with investor appetite.

- **Level 4:** The next level entails preferred instruments that span the credit yield curve. Issuing preferred securities across different effective duration buckets broadens a BTC-TC's investor base by appealing to distinct fixed-income mandates. Shorter-duration or floating-rate preferreds attract capital focused on rate protection and lower volatility, while longer-duration fixed or convertible preferreds appeal to income investors willing to assume greater rate sensitivity in exchange for higher yield or equity upside. Furthermore, when a BTC-TC has preferred securities spanning different effective durations, it gains the flexibility to issue capital where the yield curve is most attractive at a given moment. For example, if short-term rates are elevated and long-end yields are lower, the company can lean towards issuing longer-duration preferreds. Conversely, if the yield curve is steep, BTC-TCs can favor shorter-duration or floating-rate instruments. In effect, duration optionality becomes capital structure optionality: the ability to tap whichever segment of the yield curve offers the most favorable pricing, improving funding efficiency and capital structure resilience.



The following chart shows the current investable universe of BTC-backed preferred instruments which span different yields and effective durations

- **Level 5:** In addition to multiple tiers of preferred instruments, a company may have preferred shares authorized in multiple capital markets, which further widens the range of market conditions under which it is accretive to raise capital.

Overall, we view Leverage Premium as a structurally durable source of mNAV premium – BTC-TCs with access to lower cost of capital and broader financing options will be able to trade at a higher mNAV premium compared to competitors. All else equal, a BTC-TC domiciled in a country with a lower risk-free rate should trade at a premium compared to a BTC-TC domiciled in a country with a higher risk-free rate. Similarly, a BTC-TC with access to a variety of financing solutions should command a higher mNAV premium compared to BTC-TCs that are only able to finance their Bitcoin acquisition strategy through equity issuances.

Accretion Premium

Accretion Premium represents the premium ascribed to the present value of future BTC-per-share growth (i.e., BTC Yield). As a reminder, BTC Yield is the % change in BTC-per-share over two periods. As such, a higher BTC Yield drives a higher accretion premium, which translates to a higher mNAV. However, not all BTC Yield is created equal, and certain capital markets operations are more efficient than others in driving Accretion Premium.

BTC Yield can be generated through three primary sources: 1) equity issuances, 2) preferred / credit issuances, and 3) operating cash flows. We can define aggregate BTC Yield as:

$$BTC\ Yield = Y_{equity} + Y_{credit} + Y_{OCF}$$

	Advantages	**Disadvantages**
Equity Issuances	• No liability created – all BTC acquired belong to the common equity holders	• Dilution of the shareholder base, even if the dilution is accretive • Diminishing returns as the positive circularity between mNAV premium and BTC Yield cannot be sustained over the long run
Preferred / Credit Issuances	• No equity dilution	• Fixed (and often cash) liability • No accretion to the common equity holders on Day 1

Operating Cash Flows	• No equity dilution • No liability created	• Diverts cash flow from reinvestment into operating activities (e.g., R&D, S&M) that could increase future cash flows

Equity, thus far, has been the primary way through which BTC-TCs have raised capital to buy Bitcoin. Increasingly, BTC-TCs are exploring the use of credit / fixed income instruments – such as secured debt, convertible notes, and preferred equity – to increase their BTC holdings. As shown in the above table, the company raises capital without immediately diluting common shareholders and deploys the proceeds into additional Bitcoin. The table below outlines the main types of fixed liabilities that BTC-TCs have utilized in the past.

	Advantages	**Disadvantages**
BTC-backed Loan	• No upfront shareholder dilution	• Secured by BTC resulting in liquidation risk if BTC falls below a predetermined threshold • Loan must be paid back in full upon maturity – additional equity dilution risk if BTC purchased through the loan is worth less than loan value upon maturity
Convertible Debt	• Minimal to zero interest payments • No upfront shareholder dilution	• Convertible debt arbitrageurs pin the stock rangebound through gamma trading • Shareholder dilution upon equitizing of the instrument. If share price < strike price upon maturity, additional capital needs to be raised to pay back the bond in cash
Perpetual Preferred Equity	• Perpetual in nature; no forced redemption or maturity • Zero common shareholder dilution	• Due to novelty premium, wide credit spreads • Places a perpetual cash burden on the company

Among the various fixed-income instruments used to accumulate Bitcoin, we believe preferred equity is structurally the most advantageous for BTC-TCs because its perpetual nature aligns naturally with the long-duration profile of Bitcoin itself. Bitcoin is not a cash-flowing asset with a defined maturity: it

is a long-horizon monetary asset expected to compound at a faster rate than other major assets over the long term. Financing with short- or medium-term debt introduces refinancing and maturity risk. If Bitcoin's price is below the loan's effective strike at maturity, the company may be forced into distressed refinancing, asset sales, or large one-time equity issuances. In such cases, the capital structure – not the BTC thesis – becomes the primary risk for BTC-TCs. Perpetual preferred equity mitigates this mismatch. While preferred equities carry a fixed dividend obligation, they do not impose a hard maturity wall. This reduces the risk of forced deleveraging and allows management to remain focused on long-term BTC accumulation rather than near-term refinancing cycles. *In essence, perpetual preferred equity represents duration-matched leverage against a long-duration asset.*

Consider the following numerical example which demonstrates the amplification effect of preferred equity issuances relative to equity issuances:

1. ABC Corp. has a market cap of $150 ($2 per share, 75 shares outstanding) with $150 NAV ($1 per BTC for 150 BTC)
2. ABC issues $100 of preferred equity that pays $10 into perpetuity (10% yield at issuance) – proceeds are used to purchase BTC
3. NAV increases from $150 → $250. BTC Yield is 67% as a result of the transaction. *Note, however, that Adj. NAV, and thus Adj. BTC Yield, does not change because the new BTC acquired is attributable to the preferred shareholders who have a liquidation preference over the common equity.*
4. In 5 years, assuming that BTC grows at a 30% CAGR, the baseline growth algorithm for the common equity is:
    a. Day 1 BTC of $150 increases to $556.9 ($150*1.3^5)
    b. $100 of purchased BTC increases to $371.3 ($100*1.3^5)
    c. Assuming the $10 annual dividends are funded through issuing additional common equity at a 1.0x mNAV, the total cost of dilution over 5 years is ~10 additional shares

BTC PRICE & NAV PROJECTION

Year	BTC Price	Adj. NAV	Shares	Issuance Price	Adj. NAV/Share
0	$1.0	150.0	75	—	$2.0
1	$1.3	225.0	78.3	3.0	$2.9
2	$1.7	322.5	80.8	4.1	$4.0
3	$2.2	449.3	82.6	5.6	$5.4
4	$2.9	614.0	83.9	7.4	$7.3
5	$3.7	828.2	84.9	9.9	$9.8

d. The cost of dilution is inversely proportional to the mNAV of equity issuances – if dividends were issued at a 1.2x mNAV, the cost of dilution becomes ~8 additional shares (10/1.2)
e. In 5 years, NAV will increase to $928.2 ($556.9 + $371.3) or ~67% higher intrinsic value than if no preferred equity was issued
f. Adj. NAV is equal to NAV minus the preferred equity outstanding, which is $828.2.
g. **Ending BTC Yield:** [(250/84.9)/(150/75)] – 1 = 47%
h. **Ending Adj. BTC Yield:** [($828.2/84.9) / ($150/75)] –1 = 388%
i. By comparison, investing solely in BTC would have generated a 271% return over the same period

As demonstrated in the example, the NAV is ~67% higher by issuing preferred equities to acquire BTC compared to zero preferred equity issuances. Interestingly, the large variance between BTC Yield and Adj. BTC Yield is explained by the fact that the latter metric takes into account BTC's price appreciation in dollar terms throughout the period. BTC Yield decreases from 67% to 47% as the continued equity issuances to fund ongoing dividend obligations dilute the common equity. Meanwhile, Adj. BTC Yield fully reflects the value that accrues to the common equity holders due to BTC's price appreciation.

The worked example above assumes a 30% CAGR. The following table shows outcomes across a range of assumptions:

BTC CAGR	NAV Without Preferreds	NAV With Preferreds	Cumulative BTC Returns (%)	Adj. BTC Yield (%)
15%	$301.7	$502.8	+101%	+124%
20%	$373.2	$622.1	+149%	+197%
30%	$556.9	$928.2	+271%	+388%

A helpful way is to think of the BTC-TC + preferred shares model is as follows:

1. Issue fixed liability perpetual instruments to purchase BTC (e.g. $10 dividends per share on a $100 par value preferred stock).
2. Use proceeds to purchase BTC, assumed to have an annual growth rate higher than the dividend yield for perpetual preferred shares for the next 20 years.
3. After paying out the fixed dividend payments, the excess BTC growth accrues to the common equity shareholders.
    a. Preferred equity investors gain exposure to BTC but with dampened levels of volatility. More importantly, they lock in $10 of perpetual annual yield.
    b. Common equity holders gain amplified BTC performance if BTC outperforms the liabilities on the balance sheet.
    c. *Critically, the incremental dilution needed to cover fixed dividend obligations decreases as Bitcoin appreciates*
4. However, this model is contingent on BTC appreciating at a rate that exceeds the company's annual dividend obligations. Should BTC growth fall short of the required annual distributions, issuing additional preferred equity would be dilutive and ultimately destructive to shareholder value.

Thus, a BTC-TC that is able to issue preferred equity at a lower dividend yield relative to other BTC-TCs merits a structurally higher mNAV. A lower dividend yield increases the spread between Bitcoin's expected long-term price appreciation and the fixed obligation owed to preferred holders. The wider the spread, the greater the proportion of Bitcoin's excess returns will accrue to the common equity. In general, BTC-TCs should target issuing credit instruments for BTC accumulation as a more accretive means of growing Adj. BTC-per-share rather than via common equity issuances – even if Adj. mNAV >1.0x, there are trade-offs in the degree of accretiveness based on the Adj. mNAV and the yield commanded by the credit instruments.

Speculation Premium

Speculation Premium represents the residual mNAV premium (or discount) after stripping the mNAV premium derived from the regulatory, leverage, and accretion advantages a BTC-TC may have – this is the premium applied based on momentum, options activity, or general investor sentiment (both positive and negative) and is the mNAV premium unexplained by BTC-TC fundamentals. Speculation Premium can be calculated as:

$$P_{spec} = \text{mNAV Premium} - (P_{reg} + P_{lev} + P_{acc})$$

Useful indicators for Speculation Premium include but are not limited to: 1) options open interest ("OI") to market capitalization ratio, 2) changes in implied volatility, 3) correlation to BTC momentum, and 4) short interest. Elevated indicators can signal excess Speculation Premium (e.g., gamma squeezes, FOMO-driven sentiment).

Speculation Premium is an important component of mNAV to analyze as it is oftentimes the primary driver of mNAV compression during risk-off environments and Bitcoin bear markets, and the first to collapse compared to other components of mNAV – it inflates during euphoria and vanishes during stress. Excess Speculation Premium compression can drive mNAV to trade below 1.0x and indicate an undervalued BTC-TC, which presents a mean-reversion arbitrage opportunity. Investors can also take advantage of cross-company arbitrage opportunities, where the Speculation Premium for one company may trade at a premium or discount compared to another similar BTC-TC.

Even though Speculation Premium can drive a BTC-TC's mNAV in the short term, we believe in the long run, mNAV reverts to its "fair value", determined by fundamental drivers of mNAV:

$$\text{Fair mNAV} = 1 + P_{reg} + P_{lev} + P_{acc}$$

Bitcoin-backed Credit

As demonstrated, perpetual preferred equity instruments – which are part of an emerging sub-asset class of BTC-backed credit – are central to the long-term success of BTC-TCs. As Bitcoin matures into a global monetary asset, we can expect layered, BTC-backed credit structures to develop, similar to the sovereign bonds, corporate credit, and structured products that have evolved around traditional reserve assets. The following section analyzes BTC-backed credit as a standalone investment.

From first principles, capital allocates toward assets with the highest risk-adjusted returns. In equilibrium, low-yield credit commands capital only if it offers materially lower impairment risk; otherwise, rational allocators rotate into higher-yielding instruments until spreads normalize. BTC-backed credit instruments today offer elevated yields (10%+) compared to traditional high-yield benchmarks such as the iShares iBoxx $ High Yield Corporate Bond ETF (HYG), which yields closer to 5%. In conventional credit markets, higher yield is typically accompanied by weaker asset coverage or deteriorating credit fundamentals. *For investors who share the view that BTC is a strong long-term store of value, the current yield spread appears inverted relative to collateral strength*. We believe this phenomenon is driven by 3 market rationales: 1) novelty risk around BTC as collateral, 2) unfamiliarity around dividends funded by common equity issuance, and 3) minimal credit history and performance. As institutional familiarity improves and performance history lengthens, we expect spreads on BTC-backed credit instruments to compress toward levels more consistent with the underlying asset coverage and capital structure protections. Spread compression, however, will be gradual, driven by the accumulation of on-time payment history and the development of recovery frameworks, rather than a sudden repricing event.

<u>Market Rationale #1: Novelty risk of BTC as collateral</u>

Many market participants do not view BTC as having any intrinsic value and regard BTC's volatility as a credit-negative when viewing it as collateral. To the first point, it is beyond the scope of this paper to discuss why we view BTC as a strong, appreciating store of long-term value.

Our response to the second point is as follows: High underlying asset volatility does not automatically translate into high volatility for credit instruments backed by that asset. Through issuing materially overcollateralized credit backed by BTC, BTC-TCs dampen Bitcoin's price volatility at the credit layer while concentrating residual volatility in the common equity. For example, BTC's 30-day realized volatility has averaged 50–80% historically, whereas the various preferred securities issued by Strategy have exhibited significantly lower 30-day volatility in the range of 22–36%. This differential reflects

the seniority and overcollateralization of BTC-backed credit instruments – which can remain overcollateralized during significant BTC drawdowns.

Empirically, higher collateral coverage has corresponded with lower observed price volatility in these instruments, and as the asset class matures and trading liquidity deepens, volatility has shown signs of gradual compression. In essence, Bitcoin's volatility is a feature that drives its long-term return potential. Through disciplined structuring – adequate coverage ratios, conservative leverage, and thoughtful capital stack design – BTC-TCs can meaningfully reduce the probability that short-term BTC price dislocations translate into credit impairment.

Assuming BTC has intrinsic value, we believe BTC's characteristics make it, in many ways, a *superior* form of collateral relative to some traditional assets. BTC is a globally traded, bearer reserve asset with deep liquidity and continuous price discovery. Its value is marked in real time across multiple exchanges, allowing creditors to monitor collateral coverage dynamically rather than relying on quarterly disclosures or lagged appraisals. Unlike unsecured credit – or even many forms of secured lending and private credit – BTC-backed structures offer a level of transparency that is difficult to replicate elsewhere because collateral balances can be verified on-chain. Creditors are not dependent on management representations about asset existence or subject to opaque, model-based valuations, nor must they rely on infrequent third-party appraisals that may prove stale in stressed environments. In this sense, BTC reduces informational asymmetry.

BTC-backed credit also offers an unusually high degree of transparency with respect to use of proceeds. In traditional unsecured or even secured corporate debt, investors are typically provided only broad guidance – "general corporate purposes," "capital expenditures," or "refinancing" – and capital may sit idle or be deployed over an extended period. The link between issuance and productive asset deployment can be diffuse and difficult to monitor. By contrast, a BTC-TC issuing preferred equity typically has a singular, clearly articulated objective: to acquire Bitcoin. In some cases, proceeds are deployed within *one hour* of receiving the issuance proceeds, and the resulting BTC holdings can be verified on-chain and marked to market in real time. Investors therefore benefit from both immediacy of deployment and transparency of outcome.

We believe this alignment between issuance, asset acquisition, and verifiability make BTC a strong collateral for backing credit instruments.

Market Rationale #2: Unfamiliarity with dividend payments raised through equity issuances

In traditional corporate finance, dividends are typically serviced from operating cash flows generated by the underlying business. By contrast, BTC-TCs generally fund preferred dividends through capital markets activities, most commonly via ATM common equity issuances. Because Bitcoin itself does not generate cash flow, cash obligations must be financed externally rather than internally if the company does not sell its BTC to raise cash. Nevertheless, we believe this structure can be sustainable for two reasons.

First, the underlying collateral (BTC) has historically exhibited a return profile that, over full cycles, has materially outpaced the fixed cost of credit. As long as Bitcoin's long-term appreciation exceeds the dividend burden, then the BTC-TC can theoretically always sell off an ever-decreasing piece of its BTC reserves to fund the dividends into perpetuity without any reliance on external financing sources. In other words, the model can be self-sustaining given the presence of a liquid, mark-to-market asset base whose value compounds faster than its fixed obligations, which provides economic assurance that dividends can be met without dependence on external cash flows; however, the company never really *needs* to sell its BTC. The key here is not constant asset sales, but the structural spread between asset growth and liability cost. As long as that spread remains positive over time, preferred dividends are supported by an expanding collateral cushion – the sustainability of this structure depends on the assumed BTC CAGR. At 30% CAGR, the structural spread is wide; at 15% CAGR, the spread narrows significantly but remains positive for instruments with sub-15% dividend yields.

Second, BTC-TCs are typically highly liquid securities, enabling management to access equity capital efficiently and with limited price impact via the ATM. BTC-TCs are highly liquid because their volatility – BTC as a large volatile asset class drives the price fluctuation of a comparatively smaller equity float – invites crypto and equity traders – often using leverage – to gain amplified exposure to BTC, either long or short. As a proof point, Strategy raised ~$1.4bn of equity capital (enough to fund a USD reserve to pay its dividend obligations for 2 years) in *one week in a BTC down market* between 11/23/2025-12/1/2025 while the stock remained relatively flat. This episode highlights the structural strength of the BTC treasury fundraising model, which is enabled by a highly liquid stock: if a company can raise multiple years' worth of dividend coverage in a single week during a market downturn, then it can raise multiples of that fundraising capacity in a normal or favorable market environment over a longer time horizon. As a caveat, we acknowledge that Strategy, being the largest BTC-TC, benefits from higher liquidity than its peers.

While it may appear that common equity shareholders bear the burden of funding preferred dividends through dilution, the economic reality is more nuanced. Preferred equity shareholders receive a fixed

return; common equity retains the full residual upside of Bitcoin's appreciation after fixed obligations are met. If Bitcoin outperforms the cost of capital – as the model assumes – the incremental value created in excess of preferred dividends accrues disproportionately to common shareholders. In that sense, common equity is not subsidizing preferred investors but rather leveraging fixed capital to amplify long-term Adj. BTC per-share growth.

To avoid situations in which BTC-TCs are compelled to issue equity during periods of compressed mNAV or weak market sentiment, we expect more BTC-TCs to establish dedicated USD reserves to fund near-term dividend obligations. For credit investors, a clearly disclosed USD reserve provides tangible visibility into dividend coverage measured in years of fully prefunded obligations. This improves confidence in near-term payment capacity and lowers refinancing risk, while preserving the long-term compounding thesis tied to Bitcoin price appreciation.

Market Rationale #3: Minimal credit history and limited performance

The first perpetual preferred equity instrument was issued at the beginning of 2025 ($STRK), meaning that the oldest BTC-backed credit instrument only has around a year of performance history at the time of writing. By contrast, investors have significant data on the performance history of conventional high-yield instruments and issuers through decades of market history and well-established default studies.

Over time, the BTC-backed credit asset class will mature. With each quarter of uninterrupted dividend payments, each successfully navigated BTC drawdown, and each incremental issuance that deepens secondary liquidity, the preferred equities issued by BTC-TCs will accumulate the seasoning that traditional credit investors require. Furthermore, as the data set lengthens and the market observes performance through both benign and stressed environments, BTC-backed credit will increasingly be evaluated on empirical credit outcomes rather than novelty, allowing the structural strengths of overcollateralization and seniority to become more recognized.

How would BTC-backed credit perform in different interest rate regime?

This is a question that all fixed-income investors must ask themselves before deploying capital. *In the case of BTC-backed credit, the answer is path-dependent.*

Our long-term Bitcoin thesis is rooted in its role as a hedge against fiscal excess and monetary debasement. Yet over the past decade, Bitcoin has often traded like a high-beta technology stock. In periods of falling interest rates and abundant liquidity, capital tends to flow into long-duration, speculative assets whose value depends heavily on future expectations rather than current cash flows.

Because Bitcoin generates no cash flow at all, its price has been especially sensitive to changes in discount rates and risk appetite, behaving as an "ultimate duration asset" in the short- to medium-term.

However, this characterization may not be permanent. As Bitcoin matures and its monetary properties become more widely accepted, *its correlation regime could shift*. In a future environment where rising interest rates reflect fiscal stress, currency debasement concerns, or declining confidence in sovereign balance sheets, hard assets like Bitcoin could increasingly be viewed as a neutral reserve asset rather than a speculative bet. Under such a regime, higher rates – especially if driven by systemic distrust rather than growth – might coincide with stronger demand for Bitcoin as a store of value. *In other words, Bitcoin's correlation to rates may flip from negative to positive.*

We split our macro analysis into two scenarios: negative Rho Bitcoin, where BTC rises as interest rate falls, and positive Rho Bitcoin, where higher rates fueled by concerns of monetary debasement cause Bitcoin to appreciate instead. Here, interest rates generally mean long-end rates, given the perpetual nature (long effective duration) of most BTC-backed credit available in the public markets today – the likely range of outcomes, at least directionally, is tighter for BTC-backed credit than traditional fixed income:

Scenario	Negative Rho BTC	Positive Rho BTC
Interest Rates Fall	• BTC: Positive • General Fixed-Income: Positive • BTC-backed Credit: Positive	• BTC: Negative • General Fixed-Income: Positive • BTC-backed Credit: Neutral / Positive
Interest Rates Rise	• BTC: Negative • General Fixed-Income: Negative • BTC-backed Credit: Negative	• BTC: Positive • General Fixed-Income: Negative • BTC-backed Credit: Neutral / Negative

Ultimately, the performance of BTC-backed credit will be dependent on the correlation of the sub-asset to BTC versus BTC-backed credit's correlation to broader fixed-income dynamics. In positive Rho scenarios, BTC and traditional interest rate effects will offset each other, though the magnitude of this interaction is unclear for now.

Bitcoin-backed Credit Rating Framework

Framework Overview

Given the emergence of the BTC-backed credit sub-asset class, conventional credit rating methodologies are ill-equipped to accurately evaluate the credit risk inherent in these instruments. Thus, we propose a new systematic framework for evaluating the credit strength of BTC-backed credit instruments – while traditional credit frameworks emphasize operating cash flows and leverage metrics, our methodology acknowledges the unique operating conditions of BTC-TCs and the Bitcoin collateral that underpins their creditworthiness. Our framework evaluates two core dimensions: **solvency** (overcollateralization providing protection against principal loss) and **liquidity** (capacity to meet ongoing interest/dividend obligations).

Solvency Metrics (Overcollateralization)

As part of Strategy's issuance of perpetual preferred equities, the company has introduced a credit framework for evaluating BTC-backed credit instruments based on Bitcoin collateral coverage. Core to Strategy's credit risk evaluation framework are three formulas:

- BTC Rating = $\frac{\text{NAV}}{\text{Cumulative Debt at Tranche Level}}$
- BTC Risk = P(BTC Rating <1.0x at end of duration)
- BTC Credit = BTC Risk $\times$ Expected Default Loss $\times$ (1/Duration)

At a fundamental level, BTC Rating assesses how well a BTC-backed credit instrument is collateralized. The collateral base is a key determining factor of the creditworthiness of BTC-backed credit as its intrinsic value is ultimately traced back to the quantity and accessibility of the BTC supporting it. The greater the BTC collateral relative to an instrument's par value, the larger the drawdown it can withstand while remaining overcollateralized. Given BTC's history of repeated >50% declines, robust credit instruments must maintain substantial collateral buffers. That said, a temporary period of under-collateralization does not constitute a default so long as the issuer continues to meet its dividend obligations. To demonstrate BTC Rating numerically, consider the following example:

1. ABC Corp has $100 of NAV, and has $10 outstanding of Senior Class A preferreds and $10 outstanding of Junior Class B preferreds
2. The BTC Rating for the Class A preferreds can be calculated as 100/10 = 10x
3. The BTC Rating for the Class B preferreds can be calculated as 100/(10+10) = 5x

From BTC Rating, we can derive BTC Risk – a forward-looking measure that represents the probability that BTC declines below the credit instrument's effective liquidation or impairment threshold during its duration (Strategy uses Macaulay Duration). While BTC Risk is impacted by the

security's overcollateralization (BTC Rating), it remains sensitive to BTC's volatility and growth rate. All else equal, a higher BTC Rating lowers the likelihood that the instrument breaches coverage levels due to adverse price movements in BTC. However, a limitation of BTC Risk is that the metric is calculated using Macaulay Duration, which is designed for instruments with finite maturities, while BTC-backed credit instruments are typically perpetual and therefore are not subject to maturity risk.

BTC Credit then converts the probability of collateral breach (BTC Risk) into an annualized loss expectation that can be weighed against the instrument's yield. Conceptually speaking, BTC Rating establishes the structural buffer, BTC Risk estimates the probability that the buffer is breached over the duration, and BTC Credit quantifies what that risk is worth in terms of expected loss for investors.

Given BTC Risk and BTC Credit are sensitive to macro assumptions such as go-forward BTC growth and volatility, they are useful tools for absolute risk assessment but less suited for isolating instrument-specific credit risks. Credit analysis is not meant to predict the most likely or even the expected outcome; its primary function is to determine an instrument's capacity to withstand a severe, yet plausible, downturn – the goal is to evaluate resilience under severely adverse scenarios. By embedding assumptions about future BTC growth, these metrics are no longer measuring resilience in a downturn; they are measuring the probability of a particular bullish macro thesis coming to fruition. This conflates two distinct concepts: investment potential and credit quality. Such a rating would be pro-cyclical, rising in bull markets and collapsing in bear markets, and would fail to provide a stable, cycle-agnostic assessment of the issuer's fundamental creditworthiness.

In contrast, BTC Rating is truly idiosyncratic to each issuer and security, providing a more stable and discriminating basis for relative and isolated credit analyses holding all other factors equal. BTC Rating is calculated based on a single, verifiable factor – the size of the collateral cushion backing each security – which helps to answer the question: how far would the price of Bitcoin have to fall from its current level before the instrument is undercollateralized? By focusing solely on this "distance to default," the BTC Rating provides a clear, objective, and comparable measure of idiosyncratic credit risk – it allows an investor to understand, in concrete terms, the margin of safety embedded in each instrument. An instrument that can survive a 70% drop in Bitcoin price is fundamentally less risky from a credit perspective than one that can only survive a 40% drop, regardless of one's outlook on Bitcoin's future price.

Liquidity Metrics (Bitcoin Interest Coverage Ratio)

Liquidity metrics are the second component in evaluating the creditworthiness of BTC-backed credit instruments. Similar to assessing traditional fiat-based credit instruments, liquidity metrics such as the interest coverage ratio allow investors to assess the company's ability to meet any short-term obligations related to interest payments. However, given some of these BTC-TCs do not generate positive EBIT and have alternative means of generating cash, the traditional interest coverage ratio formula is not particularly useful in assessing a BTC-TC's underlying liquidity. Instead, BTC-TCs have three primary means of meeting interest/dividend obligations:

1. Adjusted Operating Cash Flow ("Adj. OCF")
2. Cash Reserves
3. Access to Capital Markets

First, operating cash flow is the simplest way of meeting interest/dividend obligations, and given some BTC-TCs continue to operate their legacy businesses, this is an efficient means of generating cash necessary to meet interest obligations. Given the different accounting treatment for interest expense and dividend payments, an Adj. OCF metric that adds back interest expenses (and other one-time expenses) offers the most accurate view of operating cash available to meet interest/dividend obligations. Ultimately, the ability to pay interest/dividend obligations via organic cash flow generation is most favorable as these sources are typically uncorrelated to the broader BTC market. The higher the percentage of Adj. OCF to dividend liabilities, the less the BTC-TC relies on capital markets to fill the funding gap, and thus the more creditworthy it is.

Second, Cash Reserves refer to fiat currency set aside to meet future interest obligations. Depending on the size of reserves, Cash Reserves provide a guaranteed source of interest/dividend payments for the next several months or years. Thus, a Cash Reserve can be a credit positive for BTC-backed credit.

Third, BTC-TCs rely on the capital markets as their primary source of funding, and so access to capital markets is a critical lifeline to their ability to meet interest/dividend obligations – the availability of an ATM-like equity issuance tool improves a company's credit profile by enabling opportunistic capital raising when market conditions permit. In situations where a BTC-TC's mNAV trades at <1.0x, it is not accretive to issue equity, dampening investor appetite, and constraining the company's ability to raise additional equity capital to meet interest/dividend obligations (although we have outlined the merits of using Adj. mNAV for analysis, market participants continue to assess equity issuance accretiveness primarily through mNAV, making it the prevailing benchmark for capital markets access). Factors affecting capital markets access include but are not limited to:

- Traded volume / value: Greater trading volume allows the company to raise more equity capital with minimal market impact.
- Float: A larger public float is generally associated with greater stock liquidity.
- Volatility: Higher volatility increases the probability that share price temporarily spikes to elevated levels, creating opportunities to issue equity at favorable prices.

Drawing on these three methods of meeting interest and dividend obligations, we introduce the Bitcoin Interest Coverage Ratio ("BICR") – a new metric designed to more comprehensively assess the liquidity available to a BTC-TC:

$$\text{BICR} = \frac{\left(\text{Adj. OCF} + \text{Cash Reserve} + (\text{P(mNAV}>1.0\text{x)}) \times \text{Equity Issuances}\right)}{\text{Cumulative Interest Expense at Tranche Level}}$$

Notably, a discount is applied to the proceeds raised via equity issuances as this avenue for raising capital becomes constrained once mNAV trades below 1.0x. Adj. OCF and Cash Reserves are more stable, and therefore do not have a discount applied to them when calculating BICR. To calculate this discount, we take the implied volatility of the underlying equity, the implied volatility of Bitcoin, and calculate the probability that the EV will trade below the NAV of the company – we assume a lognormal distribution of Bitcoin's price and the BTC-TC's EV.

$$P(mNAV_t>1) = P\left(\frac{EV_t}{NAV_t}>1\right) = P(\ln(EV_t) - \ln(NAV_t) >0)$$

Note: The BTC-TC's implied volatility will generally be greater than the implied volatility of Bitcoin as these BTC-TCs represent leveraged investments in Bitcoin.

While we use implied volatility to calculate the equity issuance discount – which itself carries the limitations of a forward-looking measure in the context of credit risk assessment – the methodology is flexible and could accommodate realized volatility or a static discount factor instead.

While this paper assumes a lognormal distribution for practical purposes – analytical tractability and industry norms – we acknowledge that the application of a lognormal distribution to Bitcoin has multiple limitations and only represents one method of discounting capital raised via equity issuances:

- Fat Tails: Bitcoin experiences large, abrupt jumps and heavier tails; tails are often underestimated by lognormal distributions.
- Volatility Clustering / Time-varying Volatility: Bitcoin violates IID assumption for log returns as volatility changes over time.

- Asymmetric Effects: Negative and positive shocks of the same magnitude can have materially different impacts on future volatility – the relationship between return shocks and subsequent volatility is not symmetric.
- Discrete Events & Liquidity Freezes: Margin calls, forced liquidations, and the inability to tap capital markets produce non-normal distributions.

Composite BTC Credit Score

Combining the aforementioned credit rating metrics, we propose a composite BTC credit score which integrates solvency and liquidity factors by taking a weighted average score of these solvency and liquidity metrics (we leave it up to the reader to determine the exact weightings for this composite BTC credit score), and map BTC Ratings / BICR and their accompanying composite scores to traditional credit rating equivalents. For reference, a 50/50 weighting between BTC Rating and BICR yields the following hypothetical BTC credit score framework:

Rating	BTC Rating	BICR	Composite Score	Risk Profile
AAA	>5.0x	>5.0x	>85	Exceptional overcollateralization; can withstand >80% BTC drawdowns without impairment. Exceptionally strong interest/dividend coverage
AA	4.0x – 5.0x	4.0x – 5.0x	75–85	Very strong interest/dividend coverage; resilient through severe but not catastrophic scenarios
A	3.0x – 4.0x	3.0x – 4.0x	65–75	Strong interest/dividend coverage; adequate collateral for typical bear market cycles
BBB	2.5x – 3.0x	2.5x – 3.0x	55–65	Moderate collateral with heightened sensitivity to extended drawdowns; ability to meet medium-term interest/dividend obligations
BB/B	1.5x – 2.5x	1.5x – 2.5x	35–55	Adequate collateral but potentially stressed by prolonged downturns; ability to meet short-term interest/dividend obligations
CCC/Below	<1.5x	<1.5x	<35	Potential impairment risk under moderate stress; at risk of missing interest/dividend payments

Hypothetical Example: Strategy $STRF Preferred

Metric	Value	Score
BTC Rating	6.8x	95
BICR	18.6x	100

Composite Score: (95 × 0.50) + (100 × 0.50) = 97.5

Implied Rating: AAA – strong overcollateralization and interest coverage; resilient through severe downside scenarios

Conclusion

In closing, our aim of this whitepaper has been to give investors a clear lens through which to assess the equity and credit securities issued by BTC-TCs. We demonstrate that Adj. mNAV, Adj. BTC-per-share, Adj. BTC Yield, and Adj. mNAV Payback are the measures that most faithfully capture the true accretion economics for the common equity holders. We also decompose mNAV into four underlying drivers – regulatory, leverage, accretion, and speculation – which together provide guidance on the reasoning behind why mNAV diverges across BTC-TCs and where a fair valuation likely resides. For BTC-backed credit, we supplement traditional solvency analysis with a practical liquidity framework, producing a credit assessment approach better suited to the distinctive balance sheets and operating dynamics of BTC-TCs.

We wrote this whitepaper to codify the truths and underlying economics that, in our view, govern this emerging asset class. While thoughtful work on BTC-TCs certainly exists today, our goal has been to systematize the valuation lens in a way that we view is both rigorous and practical.

Part II of our BTC-TC series will build upon the BTC-TC valuation and credit rating framework developed in this paper to discuss potential iterations of what the future of the BTC-backed credit market could look like. We look forward to sharing our thoughts soon...

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Appendix A: Glossary of Terms

Accretive Dilution

The process in which issuing new common equity to purchase BTC increases BTC-per-share because shares are sold at a price reflecting an mNAV premium – each dollar of equity raised purchases more Bitcoin value than the proportional claim surrendered through dilution, resulting in a net increase in BTC-per-share.

Accretion Premium

The component of mNAV attributable to the present value of expected future BTC-per-share growth. A higher expected BTC Yield supports a higher accretion premium, which in turn justifies elevated mNAV multiples.

Adjusted BTC-per-share (Adj. BTC-per-share)

A modified version of BTC-per-share that accounts for senior liabilities in the capital structure by using Adjusted NAV in the numerator. Unlike standard BTC-per-share, which is denominated purely in BTC, Adj. BTC-per-share incorporates dollar-denominated fluctuations because the par value of preferred and credit instruments is priced in dollars.

Adjusted BTC Yield (Adj. BTC Yield)

The percentage change in Adjusted BTC-per-share over a defined period. Unlike standard BTC Yield, which is fully denominated in BTC, Adj. BTC Yield accounts for the change in BTC's dollar price relative to the dollar-denominated senior liabilities on the balance sheet.

Adjusted mNAV (Adj. mNAV)

A modified mNAV calculation that uses market cap in the numerator and Adjusted NAV in the denominator, providing common equity investors with a more accurate view of value attributable to their shares after accounting for senior claims in the capital structure.

Adjusted mNAV Payback (Adj. mNAV Payback)

A modified version of the mNAV Payback metric that substitutes with Adj. mNAV and Adj. BTC Yield, and incorporates a BTC Yield decay factor and a discount rate reflecting the opportunity cost of reduced Bitcoin exposure.

Adjusted NAV (Adj. NAV)
NAV minus liquidation preferences for preferred shares and outstanding principal for debt obligations. Represents the residual Bitcoin value attributable to common equity holders after satisfying all senior claims.

Adjusted Operating Cash Flow (Adj. OCF)
A modified measure of operating cash flow used in the BICR calculation that adds back interest expenses and other one-time charges to provide the most accurate view of operating cash available to meet interest and dividend obligations.

ATM (At-the-Market Offering)
A securities offering mechanism that allows a company to sell shares incrementally into the public market at prevailing prices, rather than through a traditional underwritten offering.

BICR (Bitcoin Interest Coverage Ratio)
A liquidity metric measuring a BTC-TC's ability to meet interest obligations, taking into account Adj. OCF, Cash Reserves, and probability-adjusted equity issuance capacity.

Bitcoin Treasury Company (BTC-TC)
A public or operating entity that holds a substantial amount of Bitcoin as a primary balance sheet reserve asset and actively employs capital markets strategy to accumulate more.

BTC Credit
A credit metric that converts the probability of a collateral breach (BTC Risk) into an annualized expected loss figure, enabling comparison against the instrument's yield.

BTC Dollar Gain
A metric that measures the dollar value of a BTC-TC's bitcoin accretion, calculated by multiplying BTC Yield by the beginning-of-period BTC holdings and the market price of BTC.

BTC Rating
A solvency metric expressing collateral coverage at each tranche level.

BTC Risk
A forward-looking credit metric representing the probability that Bitcoin's price declines below a credit instrument's effective liquidation or impairment threshold during its duration.

BTC Yield
The percentage change in BTC-per-share over a defined period.

BTC-per-share
The amount of Bitcoin economically attributable to each common share, calculated as total BTC holdings divided by fully diluted shares outstanding.

Clearing mNAV
The minimum mNAV at which a common equity issuance is accretive to BTC-per-share.

Composite BTC Credit Score
An integrated credit rating metric that combines solvency and liquidity metrics by taking a weighted average of BTC Rating and BICR scores.

"Fair Value" mNAV
The theoretical long-run equilibrium mNAV for a BTC-TC, determined by its fundamental drivers and stripped of speculative or sentiment-driven premium – components are Regulatory Premium, Leverage Premium, and Accretion Premium.

Gamma Trading
A hedging strategy employed by convertible bond arbitrageurs who dynamically buy and sell the underlying stock to maintain delta neutrality as price moves. This activity tends to dampen volatility and can "pin" a stock near the convertible's strike price.

Leverage Premium
The premium ascribed to a BTC-TC's access to bespoke financing solutions and leverage profile.

Liquidation Preference
The contractual right of preferred equity holders to receive a specified dollar amount per share before any distributions to common shareholders in the event of liquidation, dissolution, or sale of the company.

Lognormal Distribution
A statistical distribution commonly used to model asset prices, where the logarithm of returns is normally distributed.

Macaulay Duration
A fixed-income concept measuring the weighted average time until a security's cash flows are received.

mNAV (multiple of NAV)
Enterprise Value divided by Net Asset Value.

mNAV Payback Period
The time required for cumulative BTC Yield to compound sufficiently to offset the mNAV premium paid at entry.

NAV (Net Asset Value)
The mark-to-market value of a BTC-TC's Bitcoin holdings.

Perpetual Preferred Equity
A senior equity instrument that pays fixed dividends indefinitely with no maturity date or forced redemption.

Regulatory Premium
The component of mNAV that is attributable to serving investors who cannot hold Bitcoin directly due to mandate constraints, jurisdictional restrictions, tax treatment differences, or custody preferences.

Rho (Interest Rate Correlation)
The directional correlation between Bitcoin's price and interest rate movements.

Speculation Premium
The residual mNAV component after stripping regulatory, leverage, and accretion premiums, reflecting momentum, options activity, and investor sentiment.

USD Reserve (Cash Reserve)
Fiat currency set aside by a BTC-TC to fund near-term preferred dividend and interest obligations.

Volatility Decay
The phenomenon by which leveraged or daily-reset investment products underperform their target multiple over time due to the compounding effect of daily rebalancing in volatile markets.

Appendix B: BTC-TC Key Risks

Negative mNAV momentum

Most BTC-TCs have leveraged exposure to Bitcoin through their capital structures that performs well during a Bitcoin bull market, but can work against the company during sustained Bitcoin declines, creating a cascading effect. This continued downward BTC price movement can continue to compress mNAV creating a "negative circularity" – mNAV is compressed, equity issuances are constrained, and the cost of dilution for dividend obligations increases. However, the downside is bounded by structural floors – liquidation value provides a NAV floor of 1.0x mNAV (assuming non-negative cash flows and a non-value-destructive management team), activist arbitrage incentivizes share buybacks at deep mNAV discounts, and historical mNAV mean-reversion compresses extended dislocations. Prolonged drawdowns can compress mNAV and shut down access to accretive issuance, but truly destructive mNAV collapse remains conditional on capital structure design rather than BTC price volatility alone.

Market Crowding

As the BTC-TC model gains market traction, new entrants compete for: 1) investor capital inflows, 2) NAV premium allocation, and 3) favorable financing terms – new entrants and crowded competition can drive down mNAV premium. BTC-TCs can differentiate through regulatory arbitrage, scale advantage, capital structure innovations, index inclusions, regional monopolies, index inclusion, operating businesses, and management credibility.

However, BTC-TCs' moats can also strengthen with competition, as more corporate demand for BTC validates the asset thesis which can push the BTC price (and therefore NAV) up.

Forced Liquidation

Forced BTC sales represent the most severe downside, crystallizing losses, destroying NAV, and potentially triggering death spirals. Critically, most companies are structured to prevent forced liquidation. Forced liquidations can be driven by creditors or activist activity, wherein equity investors can make the case for a BTC-TC to sell their Bitcoin to buy back shares if the mNAV trades at <1.0x, as selling the BTC to acquire additional shares is an accretive activity on a dollar-per-share perspective. However, in the current market regime, any form of Bitcoin selling (even if accretive to the shareholder) is seen as a form of capitulation of the Bitcoin treasury model, signaling that the BTC-TC no longer has conviction in the Bitcoin asset class.

However, most BTC-TCs that issue preferred or credit instruments are structured in a manner that prevents forced liquidations, often without BTC collateral pledge or leverage covenants. Preferred equities do not have a claim on the NAV unless there is a forced liquidation event. Other credit instruments – such as convertible debt – have long-dated maturities, are often zero coupon, and offer a margin of safety during prolonged Bitcoin market corrections. Finally, operating cash flows can mitigate the risk of forced liquidations by providing the necessary cash to service interest/dividend obligations, or purchase additional BTC as collateral.

Regulatory Risk

Regulatory changes can remove sources of mNAV premium or create new tax burdens for BTC-TCs. For example, Bitcoin spot ETF approvals in Japan and more favorable tax treatment for cryptocurrency trading would remove a significant portion of Metaplanet's regulatory premium.

Custody Risk

The loss of Bitcoin through theft, hack, key loss, or custodian operation failure is catastrophic and unrecoverable, wiping out significant portions of collateral and equity value. Potential attack vectors include exchange hacks, cold storage failures (private key loss), insider theft, social engineering, and custodian bankruptcy.

However, this risk factor is mitigated by:

1. Mature custody infrastructure: most BTC-TCs use reputable custodians to store their BTC and there have been no losses or security breaches to date.
2. Regulatory oversight with consistent third-party audits, including regular proof-of-reserves attestation.
3. BTC custody insurance covering theft, errors & omissions, offline storage loss, and online storage loss.
4. Segregated accounts and multiple cold wallets prevent single points of failure. Multi-signature wallets prevent single insider theft.

Shareholder Activism Risk

BTC-TCs that persistently trade at a discount to its NAV could experience activist shareholder pressure to liquidate the BTC held on the balance sheet and redistribute proceeds to shareholders. While this pressure can be difficult to resist, capitulating to it carries a significant strategic cost – by unwinding the BTC position to satisfy near-term demands, the company permanently forfeits any future price appreciation on the liquidated holdings for the sake of a short-term pricing dislocation that may be transient and self-correcting over time.

Governance Risk

Given the limited operational complexity of running a BTC-TC, their capital allocation strategy and leverage decisions tend to be managed by a small number of key executives, meaning the departure of these individuals could materially affect the company's go-forward BTC strategy.

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