Kerrisdale Capital

June 2024

Riot Platforms, Inc. (RIOT)
Headed For a Mine Collapse

We are short shares of Riot Platforms, a $3bn bitcoin miner that does a far better job playing energy arbitrage games and issuing stock than generating shareholder value by mining crypto. Bitcoin mining is easily among the worst business models for a public company we have ever encountered: unpredictable revenue, capital intensive, extremely competitive, a pure commodity product, and lately drawing intense regulatory scrutiny even in crypto-friendly places like Texas where Riot has 100% of its bitcoin production. Given these drawbacks it is not surprising Riot has never produced positive cash flow or generated a decent return. What *is* surprising is why Riot's shareholders accept excessive management compensation and serial dilution. Riot has issued over $507m in stock (*18% dilution*) through April alone, with the latest slug at prices in line with the current stock price. Shareholders should ask themselves, if management thinks it is a better trade to sell Riot shares and HODL bitcoin, why should I not do the same?

Lured by cheap energy and a lax regulatory environment, bitcoin miners like Riot fell in love with Texas in recent years. Now the honeymoon is over. In a pattern repeated across the globe from Kazakhstan to Kosovo, persistent concerns over the industry's impact on the environment and other externalities have resulted in efforts to strengthen oversight and pass legislation that would limit lucrative financial incentives for miners in Texas. A clear sign of how the business environment for miners has soured in Texas occurred in March when Navarro County commissioners voted against a tax abatement for Riot's key growth project in Corsicana. We believe Riot investors are oblivious to shifts in state and local politics and headline risk as we approach another summer which will test Texas' fragile electric grid.

All of this comes at a time when bitcoin miners are grappling with sharp cuts to unit profitability in the aftermath of the latest block reward halving. As May production figures and 2Q results roll in, investors will be better positioned to grasp the poor all-in unit economics of an industry that never made much sense even pre-halving.

We think US crypto mining promoters tend to have a narrow view of the competitive landscape, focusing on mainly the US-listed companies when in reality all are engaged in a *global* race to gain share and mine bitcoin at the lowest possible cost. Not a day goes by without a new, significant mining project in South America, Middle East and Africa, while a torrent of Chinese equipment continues to flow into Russia. Competition abroad will only continue to intensify and it strains credulity that US-listed companies, with public company expenses, high labor costs, equipment tariffs, all while doling out millions in executive compensation, will be long-term low-cost producers and therefore market share winners in this extremely commodity industry.

Gone are the days when investors searching for a bitcoin proxy had to settle for a bitcoin miner. With numerous low fee bitcoin ETFs and ETPs, why own shares in a company like Riot, which has seen bitcoin holdings per share and bitcoin production per share steadily decline, versus simply owning bitcoin itself. Riot is a fundamentally poor way for investors to express a view on bitcoin and over the long-term shares have a much greater chance of being diluted into dust than outpacing gains from the new digital gold.

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Company Overview

Capitalization and Summary Financials

$ Millions except per share data	
RIOT share price	$10.00
Common shares outstanding	289
Market capitalization	**$2,888**
PV of operating lease liabilities	24
Less: cash and equivalents [1]	705
Less: bitcoin holdings @ spot	636
Total enterprise value	**$1,674**
11% stake in Bitfarms [1]	103

Financial Summary ($ mm)	2022A	2023A	2024E	2025E
Bitcoin mined	5,544	6,626	4,949	4,761
Ending hash rate capacity (EH/s)	10	12	30	41
Ending rigs (000's)	89	113	172	212
Average bitcoin price	$28,421	$28,944	$67,610	$85,000
Mining	157	189	343	405
Hosting	37	27	0	0
Engineering	65	64	14	15
Total revenue	259	281	357	420
Growth (y/y)	*22%*	*8%*	*27%*	*18%*
Mining cost of revenue (ex. depreciation)	74	97	212	302
Power curtailment credits allocated to mining	(12)	(47)	(67)	(67)
Mining gross profit	95	139	197	169
Margin	*60%*	*74%*	*57%*	*42%*
Adjusted EBITDA (ex. SBC)	(67)	214	586	286
memo: change in FV of bitcoin	0	(185)	(484)	(210)
Operational EBITDA (ex. BTC gains)	(67)	29	102	76
Depreciation & amortization	108	252	206	207
Stock-based compensation	25	32	95	97
Diluted shares outstanding	156	180	310	350
Purchases of PP&E	(148)	(194)	(174)	(160)
Deposits on equipment	(195)	(230)	(311)	(208)
Total capex	(343)	(424)	(485)	(368)
Proceeds from common stock issuance / ATMs	305	778	757	500
Free cash flow (operational EBITDA less capex)	(411)	(395)	(383)	(292)
Valuation				
EV / revenue	6.5x	6.0x	4.7x	4.0x
EV / Operational EBITDA	-24.9x	57.2x	16.4x	22.1x
EV / EH	172.6x	135.0x	56.6x	41.3x

Source: Kerrisdale forecast, historicals based on RIOT SEC filings.

1. *Per Riot press release announcing rejected bid for Bitfarms the company has more than $700m in cash on hand and 9.25% stake in Bitfarms (subsequently increased to 11.3% ~44.9m shares). See Appendix for further discussion of the proposed Bitfarms transaction.*

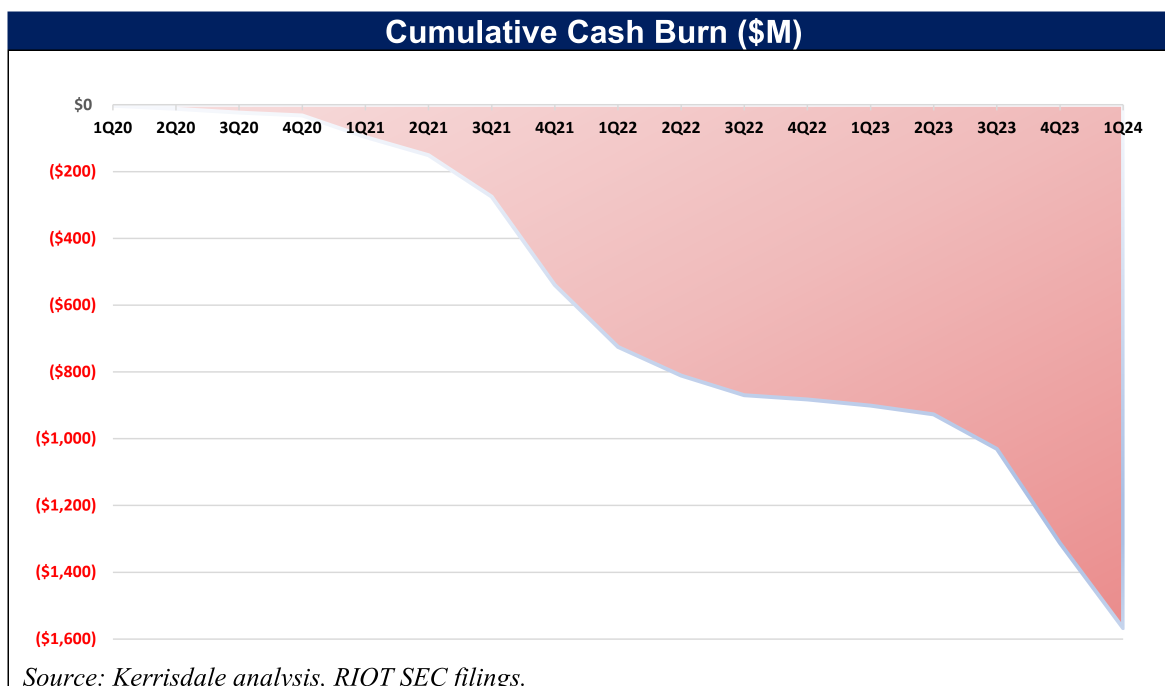
Headquartered in Castle Rock, Colorado, Riot Platforms is a vertically integrated bitcoin mining company. The company engages in institutional-scale mining at two locations in Texas: Rockdale (Milam County) and a site under development in Corsicana (Navarro County). Rockdale is believed to be the largest single bitcoin mining facility in North America with 700 MW of developed capacity, 113k mining rigs, and deployed hashrate (a measure of computing power) of 14.7 EH/s as of April.

Substations that power the initial 400 MW of capacity at Corsicana were energized in April and miners at the facility have begun hashing. If fully developed, the facility is anticipated to have a capacity of 1 GW, underscoring the intense power demands of bitcoin mining. 1 GW is enough electricity to power roughly 750,000 homes.

Corsicana is a huge undertaking that is drawing pushback among concerned local citizens. Both CEO Jason Les and Chairman Benjamin Yi have financial and software backgrounds not greenfield data center project management and engineering. Les co-founded a software company in Singapore and was a professional poker player for nearly 14 years before joining Riot's board. Due to concerns related to the project's consumption of power and water, in March Navarro County Commissioners declined to approve creation of a reinvestment zone which would have positioned Riot to receive tax abatements for the facility (more on this later).

In advance of the recent halving of bitcoin rewards (explained here), Riot, along with many of its peers, has outlined aggressive, capital intensive plans to increase capacity. Corsicana is integral to that strategy. The first phase of development (including high-voltage power substation and transmission facilities to supply power and water to the mine) will cost approximately $333m of which $91m remained as of the last quarter (p.14). To equip the facility, Riot has executed purchase orders with MicroBT for 99,840 immersion-cooled M56 and M66 series WhatsMiners for *$453m* (F-24). These will be received and deployed primarily at Corsicana by mid-2025 (p. 33). Corsicana is the main driver behind Riot's goal of doubling hashrate to 31.5 EH/s by the end of 2024, increasing to 41 EH/s by the end of 2025 (see: Appendix for more detail).

Riot's business model is dysfunctional, characterized by seemingly endless capital spending, lack of operating leverage, unpredictable revenue, poor returns, and negative cash flow.

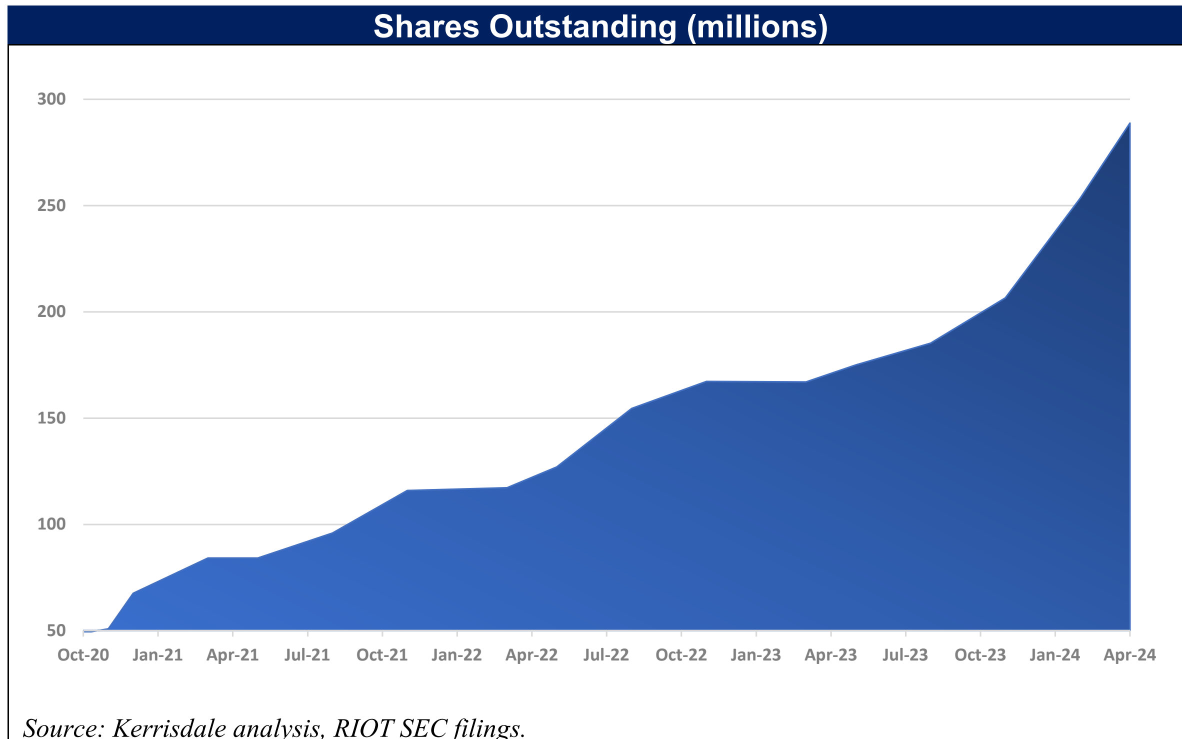


Source: Kerrisdale analysis, RIOT SEC filings.

Because Riot incinerates cash, the company has mostly relied on ATM stock offerings to fund operations. Since 2020, Riot has issued approximately *$2.3 billion* in common stock, increasing its shares outstanding 6-fold. Through just the first four months of this year, Riot has issued 41m shares (18% dilution versus shares outstanding of 231m as of January 1st , p.4) at an average price of $12.38, with $154m in stock sales in April alone at an average of $10.63, in line with the current stock price (p.15-16).

Riot management touts the strength of its balance sheet and bullish investors may note the $1.3bn in cash and bitcoin the company holds but we regard these as an illusion. Riot's balance sheet is purely a function of looting retail shareholders through non-stop dilution. Riot burns cash and the nature of its business does not allow it to stop for any prolonged period without a reduction in bitcoin mining production. If Riot were to stop issuing stock it would be forced to start drawing down on its cash and bitcoin holdings.

Shares Outstanding (millions)



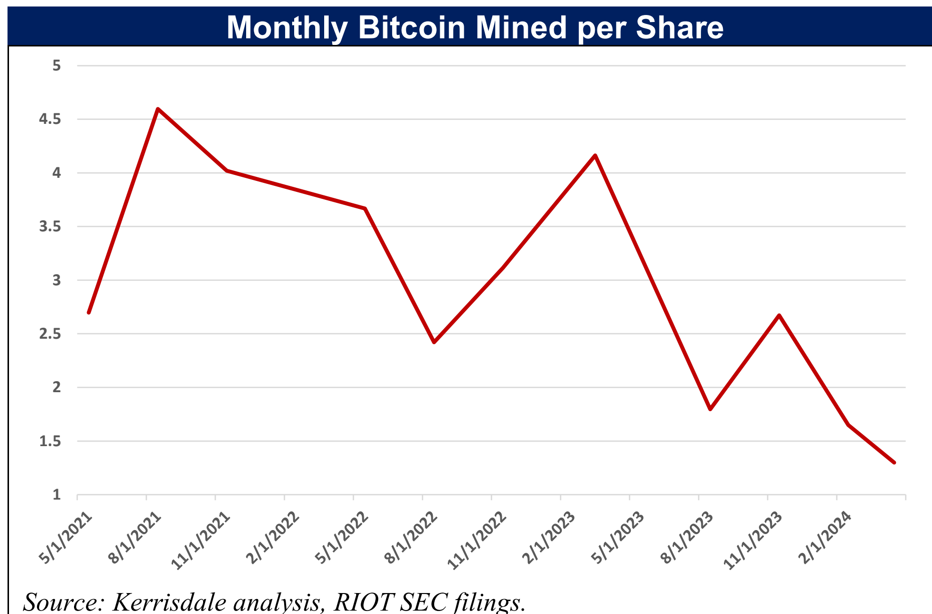
Source: Kerrisdale analysis, RIOT SEC filings.

The stock printing is set to continue. As of March 31, there is $206m in performance based restricted stock that is expected to vest over the next 2.3 years ($90m per year for a company that only generated $280m in revenue last year). CEO Jason Les and Executive Chairman Benjamin Yi have received $51m in stock awards *each* over the last three years (in addition to nearly $1m in salary each in 2023, p.53).

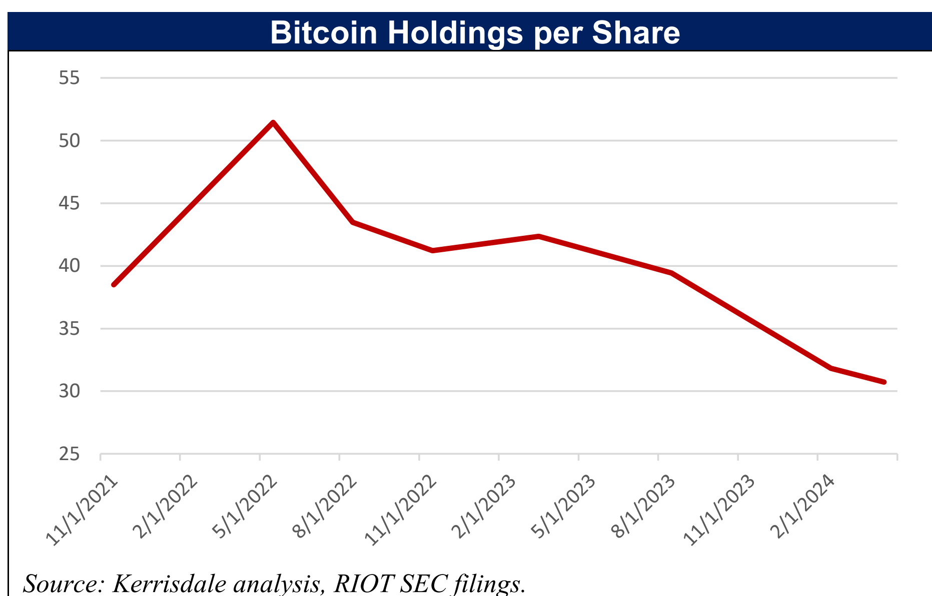
Though the company describes its growth plan as "fully-funded" (p.14) and uses its bitcoin holdings and/or cash to pay executives and fund expansion at Rockdale and Corsicana, we believe the company's preferred capital allocation strategy remains reloading ATM facilities and diluting shareholders. At the annual shareholder meeting next week, Riot will ask shareholders to double the number of common shares authorized for issuance to 680m.

A unique, fundamental challenge in mining bitcoin is its "difficulty adjustment" which dynamically regulates the rate new blocks are discovered depending on how many miners are competing at any given time. If the price of bitcoin rises it naturally draws in an influx of miners or mining rigs, which then ramps up the difficulty of mining bitcoin. Consequently, as more computational power is directed towards mining, the cost of mining equipment and electricity also tends to rise, making it impossible for individual miners to remain competitive without further investment. Riot's business is the financial equivalent of a hamster wheel (that spins faster every 4 years upon halving).

Thus, despite all the cash burn and executive compensation in March 2024, Riot mined [425](#) bitcoins, 17% *less* than what it mined two years ago despite having tripled the amount of computing power chasing the opportunity – and this was *before* the halving. The combination of Riot's inability to increase bitcoin production and perpetual stock sales has resulted in sustained declines in both bitcoin production per share and bitcoin held per share.



Source: Kerrisdale analysis, RIOT SEC filings.



Source: Kerrisdale analysis, RIOT SEC filings.

We argue these two important metrics fundamentally negate the relative attractiveness of owning Riot shares versus simply owning bitcoin. Simply put, if a mining company is not delivering an increasing amount of bitcoin production or ownership on a per share basis, shareholder gains are purely driven by the change in bitcoin price. Investors can now easily gain exposure to bitcoin through low-fee ETFs and ETPs while sidestepping headaches like production delays, regulatory changes (as discussed shortly), and, particularly in Riot's case, further dilution.

Riot's diminished scarcity value as a "bitcoin proxy" does not appear lost on the market. Despite bitcoin advancing 74% YTD, shares of Riot are down -37%. Since the introduction of ETFs at the start of the year, the historical correlation between shares of Riot and the price of bitcoin has collapsed (see: Appendix), which is appropriate because Riot has never been an elegant way to express a bullish view on bitcoin.

Executives at Riot's peer, Marathon Digital, have tried to defend the relevance of bitcoin mining stocks versus bitcoin ETFs by comparing its shares to that of oil and gold producers which "generally track their respective underlying commodity." The problem with the analogy is two-fold: 1) oil and gold producers do not have their unit economics literally halved every four years, which requires spending furiously in advance of those dates, and 2) a gold miner's unit costs to physically extract gold from its particular mine is not made dynamically more difficult by competitors across the globe buying the same mining equipment from the same two suppliers (China-based Bitmain and MicroBT control north of 90% of the ASICs used to mine bitcoin). We've never come across an industry with as few barriers to entry as bitcoin mining.

Challenged Mining Economics Post-Halving

> *The public market guys, some of them are playing the momentum game and others have no idea what they're investing in. When you watch the Q2 numbers come out in July and if we stay at kind of BTC $50-$70k range* ***the music is going to end here****… People are going to start to sell out of these stocks and realize that they [publicly listed miners] made the wrong investment decision over the years, prioritizing growth over operational efficiencies."*
>
> — Senior executive, leading provider of products and services to bitcoin mining industry

As the name of the event implies, April's halving of block rewards resulted in the profitability of mining being cut in half overnight (all else equal). After averaging ~$108 PH/s/day in March, hashprices (the expected value of 1 PH/s of hashing power per day, *i.e.*, a measure of how much a miner can expect to earn from a specific quantity of computing power) fell as low as $45 PH/s/day by the end of April. With a recent push back to $70k/BTC, spot hashprices currently sit at around ~$56 PH/s/day.

Despite the best efforts of miners to prepare for the halving we expect gross margins to remain positive but compress significantly for most in the industry in the coming months. The graver economic issue for public companies is (and always has been) below the gross profit line, where significant non-mining related corporate costs and the constant need to invest in hardware raises the all-in cost to mine bitcoin to a level where nearly all publicly traded miners are effectively unprofitable.

Note, when miner management teams describe their cost to mine, they generally focus solely on power costs or incremental cash costs. While important, limiting discussion of unit economics to these items is highly misleading. A more fulsome view of all-in breakeven costs on a per coin basis should include non-power mining costs (insurance, ground rent), cash SG&A, stock-based compensation, mining equipment depreciation, and, for some, interest expense. These are very real costs for all publicly traded mining companies and some like Riot have shown very little financial leverage off these cost items as operations have scaled (SG&A was a mind-boggling

73% of revenue for Riot last quarter).

Stock-based compensation in particular for Riot is a considerable expense which is functionally no different than issuing shares and taking the cash proceeds to pay executives, and yet some Wall Street analysts routinely ignore this expenditure. We believe institutional investors hold companies more accountable for these items. A (refreshingly candid) public miner management team we spoke with admitted to us that executives at many of its US-listed miner peers believe they can get away with a less than fulsome portrayal of costs because their retail shareholder bases lack sophistication. When the CFO of the largest miner by market capitalization, Marathon Digital, was asked point blank by a retail investor on the last quarterly call about the company's current breakeven price for bitcoin, the executive gave a vague, rambling response which did not answer this basic question. On the same call, the CFO also had the audacity to describe their ATM facility as a "low cost of capital." Low cost is not the same as easy access. According to Bloomberg, Marathon's equity cost of capital is 19% (and Riot's is 17%).

Below we walk through our analysis of unit economics for the largest public miners by market capitalization immediately post-halving.

Illustrative Post-Halving Bitcoin Mining Unit Economics

	RIOT	MARA	CLSK	WULF	CIFR
Fleet efficiency (J/TH) [1]	27.7	24.5	23.1	24.6	29.0
Consumption in kw/EH/s	27,700	24,500	23,050	24,600	29,000
1Q24 power cost (kwh) [1]	$0.038	$0.065	$0.043	$0.039	$0.027
Electricity cost per BTC	**$31,848**	**$48,183**	**$29,989**	**$29,028**	**$23,691**
May operating hash rate [2]	13.4	21.1	18.0	7.6	8.0
Share of global network hash rate	2.3%	3.6%	3.0%	1.3%	1.4%
BTC mined per day	10.6	16.7	14.3	6.0	6.3
1Q24 other mining and hosting opex ($M) [1]	$8.6	$10.7	$8.1	$1.7	$2.2
Other mining opex per day	$93,978	$117,363	$88,681	$18,385	$24,396
Other operating cost per BTC [3]	$8,856	$7,012	$6,221	$3,050	$3,844
Direct cost to mine per BTC	**$40,704**	**$55,196**	**$36,210**	**$32,078**	**$27,535**
1Q24 cash SG&A ($M) [1][4]	$24.0	$23.9	$16.1	$8.0	$10.8
Cash SG&A per day	$263,736	$262,242	$176,374	$87,670	$118,637
Cash SG&A per BTC [3]	$24,853	$15,668	$12,373	$14,543	$18,696
Direct cost + SG&A per BTC	**$65,557**	**$70,864**	**$48,584**	**$46,620**	**$46,231**
Add: Interest (income) / expense	($8,082)	$825	$786	$6,792	($668)
Add: Mining equipment depreciation (3yr life) [3][5]	$51,566	$51,124	$43,767	$24,307	$24,343
Add: Stock-based compensation per BTC [3]	$33,138	$34,085	$7,553	$12,634	$14,403
Total cost to mine per BTC	**$142,178**	**$156,897**	**$100,689**	**$90,353**	**$84,307**

Source: Kerrisdale analysis. Assumes network hashrate of 590 EH/s per Hashrateindex.com, 144 blocks per day, 3.25 BTC rewards per block post-having, an implied 32.8 hours to mine 1 BTC per EH/s, and perfect uptime.

1. *Per respective company's 1Q24 earnings presentations, and 1Q24 quarterly SEC filings. Riot's disclosed power cost of 3.8c / kWh is net of $5.2m in power curtailment credits and excludes $3.5m in power costs to remaining hosting client (p.3)*
2. *Operating hashrate per May monthly production update for all except MARA which is as of April 2024. Reported operating hashrate of 8.8 EH/s for Riot adjusted for 112 in BTC equivalents ($65k average BTC price) from $7.3m received in energy credits.*
3. *Cost per coin calculated using reported cost item divided by days in period to derive cost per day. This is divided over daily bitcoin production to provided cost per bitcoin mined. Riot reported $32m in stock-based compensation in 1Q24.*
4. *Riot cash SG&A per company guidance of $22-$25m in cash expenses per quarter going forward as disclosed on the last earnings call.*
5. *Assumes 3 years useful life, in line with Riot's accounting treatment for mining equipment.*

The analysis above summarizes unit economics on a per bitcoin mined basis for the largest publicly traded miners by using recently provided KPIs for May (the first full month post-halving) and reported 1Q24 cost items. The exercise is admittedly a challenging one. Disclosures and the treatment of cost items are inconsistent among miners and Riot, along with everyone else on a global basis with access to capital, is actively engaged in growing capacity to improve on these economics. Nevertheless, as an illustrative snapshot we believe the analysis captures the challenged profitability of mining immediately post-halving, even for the theoretically best positioned within the industry.

The analysis underscores how focusing on power costs or even “direct costs” is not a reliable reflection of unit profitability. For example, Riot enjoys attractive power costs to mine bitcoin (~$32k), a characteristic which has earned it the reputation of being a “low-cost producer” by bullish analysts. However, if one includes cash SG&A, an egregious amount of stock-based compensation, and the cost of rapidly depreciating mining equipment, the all-in cost for Riot to sustainably mine bitcoin soars to over $140k per coin. As a seasoned bitcoin mining consultant flatly summarized for us, “the math doesn’t math on pubco [publicly traded] miners.”

The inefficiency of Riot’s operations is also evident in the company’s EBITDA per hashrate. An efficient “low-cost” miner should be among the best in generating operating cash flow from its fleet. Riot screens as the worst among its closest peers while also among the worst when it comes to share dilution though ATM issuance.

Riot: Worst of Breed EBITDA Profitability Combined With High ATM Issuance

	RIOT	MARA	CLSK	WULF	CIFR
YTD 2024 (thru April) ATM Issuance ($)	**$512**	$564	$529	$63	$75
YTD 2024 (thru April) Share Dilution	**18%**	12%	22%	10%	6%
1Q24 reported adj. EBITDA	$246	$529	$182	$32	$63
Less: Gain on FV of BTC	(234)	(489)	(120)	0	(41)
1Q24 operational EBITDA	$12	$40	$62	$32	$22
1Q24 deployed hashrate (EH/S)	12.4	27.8	16.4	8.0	7.7
EBITDA / (EH/S)	**$0.94**	$1.44	$3.79	$3.99	$2.92
1Q24 revenue	$79	$165	$112	$42	$48
1Q24 SG&A	$58	$76	$26	$15	$19
as % revenue	**73%**	46%	23%	35%	40%
1Q24 stock based compensation	$32	$52	$10	$7	$8
as a % of revenue	**40%**	31%	9%	16%	17%
1Q24 cash SG&A	$26	$24	$16	$8	$11
as a % of revenue	**32%**	14%	14%	19%	22%

Source: Kerrisdale analysis, 1Q24 Form 10-Q SEC filings, 1Q24 deployed hashrate per respective company’s monthly production updates and/or 1Q24 earnings press release.

Riot’s “Power Strategy” (AKA Regulatory Arbitrage)

Grid reliability during extreme weather has been a key concern for Texans since winter storm Uri crippled the state in 2021, leaving millions freezing in the dark and 246 dead. It was especially tone deaf when last August Riot bragged about “showcasing the benefits of [its] unique power strategy” which netted the company a combined $31m in demand response revenue and power credits (worth 1,136 BTC in total) while Texas residents suffered record heat. It also stoked ongoing debate over the level of crypto mining participation in grid incentive programs, the logical conclusion of which we believe will result in new regulation.

Two separate payment streams make up the eyepopping amount Riot earned last August from not mining bitcoin. $24m was earned under a 345 MW long-term power purchase agreement

(PPA) with TXU which allows Riot to sell power back to the grid when not mining in exchange for credits against future power costs based on the spread between the spot power price and a low 2.5c / kWh net fixed power price (p.10). Last August, Riot operated 95,904 Antminer S19 series mining rigs. Even assuming perfect uptime, based on the stated power consumption of these machines, (~3,000 watts per rig according to Bitmain's specifications) 345 MW under this power contract more than covers all of Rockdale's power needs. (Note, Riot does not currently have a similar fixed power-price contract for Corsicana (p.25).

Riot earned $7m last August under ERCOT's ancillary market demand response programs. Under this arrangement, the company competitively bids to sell ERCOT the option to control Riot's electrical load in certain hours. Riot receives a cash payment regardless of whether ERCOT asks it to curtail or not (F-28). Curtailment requests from ERCOT are rare, less than 3% of the time according to Marathon Digital's CEO (and confirmed in our conversations with other industry participants).

In all of 2023, Riot earned $22m in demand response revenue (12% of total mining revenue), equal to ~760 bitcoins at 2023 average prices. This may seem like a manageable level of risk in the event lawmakers curb grid incentives, but as previously mentioned, post-halving, Riot along with the rest of the mining industry is grappling with diminished profitability. With bitcoin now twice as hard to mine, ways to generate revenue away from mining bitcoin have become commensurately more important.

While there is nothing lawmakers can do about the energy credits earned under the PPA, they are right to scrutinize Riot's participation in incentive programs. The question lawmakers should be asking is given the presence of such a favorable power contract during skyrocketing power prices, why was Riot bidding aggressively in the ancillary market? It would have been more lucrative to be price responsive and fully curtail, capturing the massive spread between fixed and spot power prices rather than tie up any portion of its load in less profitable ancillary obligations. Ironically, although the amount Riot earned last summer was substantial, based on our research from a purely economic standpoint the company left money on the table. Why would they do that?

Substandard Operations

Based on interviews with an industry participant and a former Rockdale mining technician, we believe Rockdale lacks the proper infrastructure and facility design to curtail as effectively as it should. Rockdale is massive, the largest bitcoin mining facility in North America. Powering down and then subsequently ramping up over *a hundred thousand servers* across multiple buildings is not as easy as it is for the vast majority of miners running orders of magnitude smaller, simpler operations. For Riot, curtailment is a complex engineering problem.

According to the industry source who has detailed knowledge of the Rockdale facility, Riot's air-cooled infrastructure has top mining racks that do not receive sufficient air flow, which leads to heat pockets, pressure imbalances, and hot air being circulated improperly – design issues which don't lend well to the dust, heat and humidity of East Texas. This view of "substandard operating conditions" and criticisms of Rockdale's design are core allegations in two ongoing legal disputes between Riot and two of its former hosting customers (F-40).

The Rockdale facility has also endured self-inflicted operational hiccups. In December 2022, Riot disclosed how pipes in buildings F and G (tent-like structures which housed immersion-cooled miners, the technology currently being deployed at Corsicana) "were damaged" during a

severe winter storm. What management left out was according to our source, the pipes in question were dry cooler pipes which froze and then burst because they were not properly drained during sub-freezing temperatures. 25% of the company's capacity and equipment worth tens of millions was affected by this operational incompetence.

In sum, because Rockdale's shoddy infrastructure doesn't always allow it to fully and/or responsively curtail, particularly during times of extreme heat, Riot took the approach of bidding aggressively into programs it knew would not get called often, figuring "if we're going to be stuck online, we might as well get paid."

Riot is not breaking any rules by participating in demand response, but it is taking advantage of them in a way they were not originally designed. Every day, well-run bitcoin mining facilities are presented with a remarkably simple, market-based economic decision based on the price of power and the price of bitcoin: mine bitcoin or shut down. This is precisely why Texas mining industry lobbyists call bitcoin miners "economically perfect consumers of electricity." The ability to respond to prevailing power prices allows the majority of mines in Texas to operate without a fixed-price power contract (timestamp: 57:12). *Riot is an anomaly*. For Riot, the economic decision is even easier because shutting down during a heat wave can net the company tens of millions in value from *not* mining bitcoin based on the terms of their power contract.

Riot's participation in the ancillary market and receipt of millions in Texas payor dollars to be *unresponsive* to soaring power prices rewards the company for the inefficiency of its operations. And none of it is necessary. At the end of a Texas Senate Committee of Business and Commerce hearing last March, a representative from ERCOT unequivocally stated a reduction in bitcoin miner participation in demand response would have no bearing on procuring ancillary services and limiting their involvement would not put the grid at risk (timestamp: 1:15:09). The only reason Riot can engage in this form of regulatory arbitrage is because the rules were written well before bitcoin miners ever flocked to Texas and the legislation's original drafters never contemplated the unique business models of bitcoin miners.

If incentives can be used by a company with a flawed business model to offset substandard operations, we think it is time to rethink the incentives. Thankfully, so do some Texas state senators.

S.B. 1751

Last March, Texas state senators Lois Kolkhorst, Donna Campbell, and Robert Nichols, all Republicans, sponsored S.B. 1751 (dubbed by critics as the "anti-bitcoin mining bill") which would cap miner participation in demand response programs to 10% and eliminate property tax abatements on certain mining property. The bill was passed unanimously by the Senate Committee on Business and Commerce. The Chair of that committee is Senator Charles Schwerner. Riot's Rockdale facility *is in his district*. Though the bill eventually failed in the House, lawyers who keep close tabs on the body have advised us that something similar to S.B. 1751 is likely to be revived in the next legislative session beginning January 2025. We have sent letters to Senators Schwerner, Kolkhorst, Campbell, and Nicols with the findings of our research given their continuing interest in the matter (visit our website to see a copy of our letter).

Corsicana Does not Think Riot is a Good Investment (We Agree)

In March, after receiving a slew of emails and phone calls from concerned citizens, Navarro County Commissioners voted unanimously against creating a reinvestment zone for Riot's Corsicana facility, dealing a blow to the company's efforts to receive tax abatements for the site. Riot is now scrambling with a full court press promising a "multi-million dollar capital investment" (another cost item unlikely to be captured in Wall Street analysts' cost to mine) and donating to little league teams to drum up support from the community ahead of returning for abatements in the future. For a state that has historically embraced bitcoin mining (and all other manner of industrial activity including shale fracking) this represents a striking shift and its significance should not be overlooked. Local officials in the community in which Riot has staked its financial future recognized the industry's penchant for overpromising jobs, raised alarms around the facility's energy and water use, and determined incentivizing further expansion was "[not] a good investment."

We believe Corsicana made a wise decision. As part of our research, we conducted a lengthy recorded interview with a former mining technician at Riot's Rockdale mine. He described his over year-long stint as "harrowing" and the overall operations as "ramshackle" with numerous health and safety violations. We also found certain details regarding the company's purchase of Chinese mining equipment which throws cold water on Riot's commitment to supporting domestic manufacturing and local economic development. We have sent letters to the Navarro Country Commissioners Court and community activists with our findings (see our website for more).

US-Listed Miners Are Competing in a Global Race They Cannot Win Long-Term

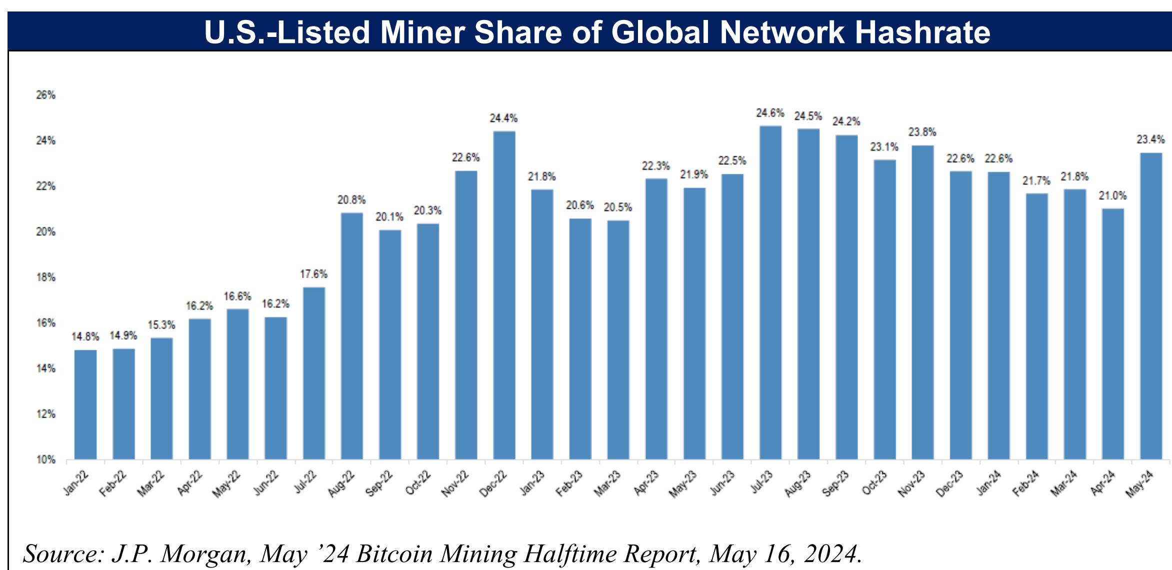
We believe US based retail investors have a myopic view of mining industry competition, focusing on how Riot fares against CleanSpark, Marathon, Terawulf, etc., and are less aware of changing dynamics internationally. In reality, however, there are far more competitors that exert direct influence on US mining profitability than could ever be captured in a comp sheet.

US miners are engaged in a highly competitive, global race to gain share and mine bitcoin at the lowest possible cost. We think competition abroad is intensifying and it strains credulity that US-listed companies, with public company costs, high labor costs, equipment tariffs, rising environmental and regulatory scrutiny, all while handing out millions in executive compensation, will be long-term winners mining a commodity like bitcoin.

Nearly every day seems to bring announcement of a new, scaled bitcoin mining project or equipment purchase agreements in places with lax regulations and cheap power (often stranded/excess hydroelectric power) like Argentina, Paraguay, UAE, and even Bhutan. The Chinese are experts in finding these locations to deploy their global duopoly of mining equipment (Bitmain and MicroBT control north of 90%). Lately, Ethiopia has become a hotbed for Chinese investment. Of 21 bitcoin mining companies which struck agreements to purchase cheap hydroelectric power from Ethiopia's state-controlled power regulation agency, 19 are Chinese.

Equipment continues to flow into Russia with a source telling us recently that multiple Chinese equipment brokers reported selling more machines to Russia than the US. The presence of cheap power, cold climate, state-related entities seeking domestic energy demand following the invasion of Ukraine in 2022, as well as entities who view bitcoin mining as a way to circumvent sanctions, has driven rapid growth in Russian mining. There is little visibility into bitcoin mining activity in Russia but their growth has certainly contributed to the overall rapid increase in network hashrate the last few years.

In the two years prior to the invasion of Ukraine, network hashrate increased 75% (from ~112 EH/s to 197 EH/s). In the two years since Russia invaded Ukraine in February 2022, network hashrate has tripled. The network hashrate increase from 2020-2022 took place amid soaring bitcoin prices. Remarkably, hashrate growth the last couple of years has come despite crypto winter triggering a swoon in bitcoin prices in 2022, in addition to rising interest rates. Consequently, despite billions in capital investment and shareholder dilution, the US-listed miner percentage share of network hashrate has remained stuck in the low-mid 20s during this period.



Source: J.P. Morgan, May '24 Bitcoin Mining Halftime Report, May 16, 2024.

All of the geographies mentioned offer plentiful power that is on par with what Riot will pay in Corsicana. What these countries do not face is direct competition from hyper-scalers racing to build out AI datacenters. Goldman Sachs estimates a whopping 47 GW of additional power generation capacity will be necessary to accommodate the growth in U.S. data center power demand by 2030. According to experts interviewed (and Wall Street research such as an April 19th Powering GenAI report form Morgan Stanley), the economics of a bitcoin mine cannot compete with the profit potential of an AI data center, and this surge in AI investment will drive higher long-term costs for zoned land, power, skilled labor, and equipment.

These dynamics are leading some of Riot's peers to pursue building/converting facilities to attract high performance computing (HPC) / AI workloads, but we would caution reading through what this means for Riot. First, Riot is building a greenfield data center project in Corsicana. It doesn't have significant excess infrastructure or operational familiarity/capabilities to offer AI customers seeking a time to market advantage. Rockdale has nameplate access to 700 MW but according to an expert we spoke with suffers from transmission constraints which limit full expansion at the site. Second, Riot's management has indicated zero interest in devoting

capacity to anything but bitcoin mining and was described to us by a wall street analyst who covers the company as bitcoin maximalists who believe the current level of hype in HPC/AI will recede.

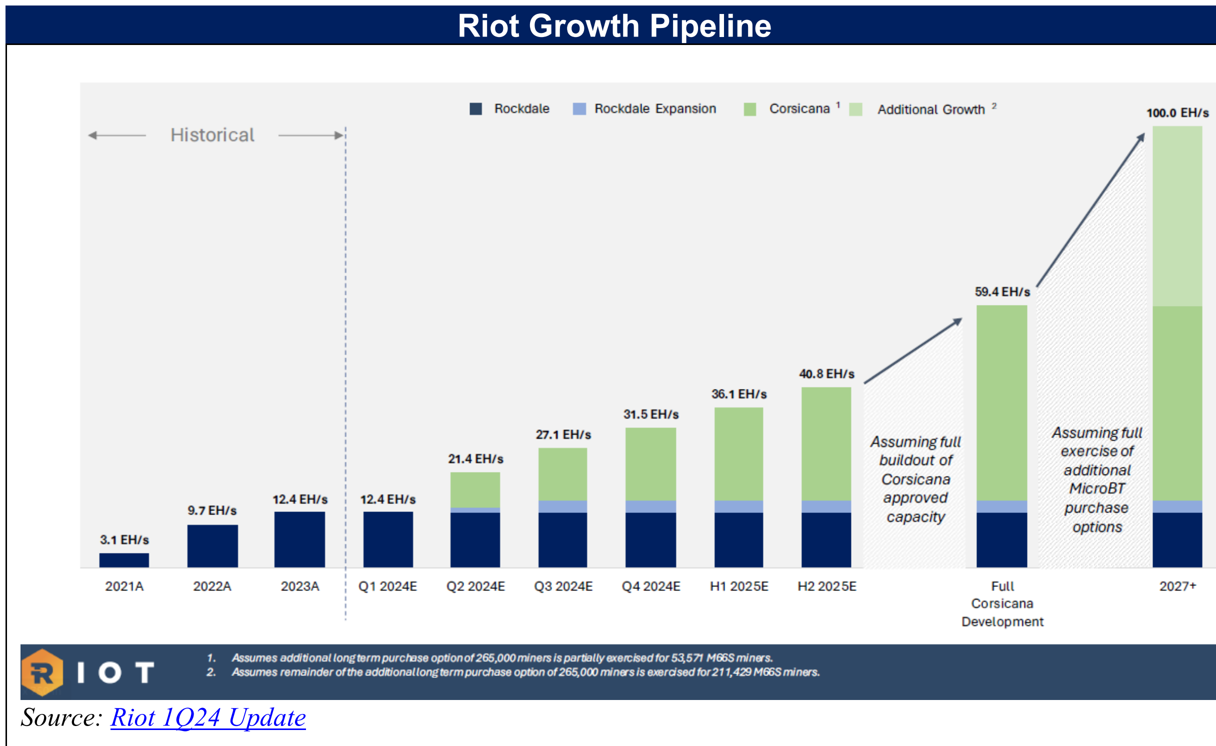
Developing world operators may not enjoy the same access to the latest mining equipment (although the Chinese will sell to anyone who comes up with the cash) but given low overhead and operational costs, many can remain a nagging source of competition even with older, second-hand machines. An unknowable amount of global hashrate comes from miners operating outside of purely economic considerations, with illegal/stolen/state-sponsored power and/or the objective of evading capital controls rather than maximizing profit. We believe U.S. public miners like Riot that are wedded to large and expensive projects under increasingly intense regulatory pressure in Texas are poorly positioned against this globally intense competitive backdrop.

Conclusion

Large-scale bitcoin mining is a challenging, technologically complex business. A recurring theme among the industry participants we spoke with is the presence of an inverse correlation between those with access to capital and true operational chops. The most profligate issuers of stock paper over their mistakes, chase growth without a disciplined eye toward cost, and have executives featuring financial rather than technical backgrounds – a recipe for failure long-term. We believe Riot is precisely such a company. The inability to efficiently produce bitcoin on a per share basis undermines the sole fundamental reason to own a miner versus bitcoin. Riot shares may periodically spasm during periods of bitcoin excitement, but over the long-term, its true nature as that of a basic manufacturing company whose only competitive advantage is the ability to manufacture more stock at a whim will only disappoint shareholders who will regret not simply buying bitcoin.

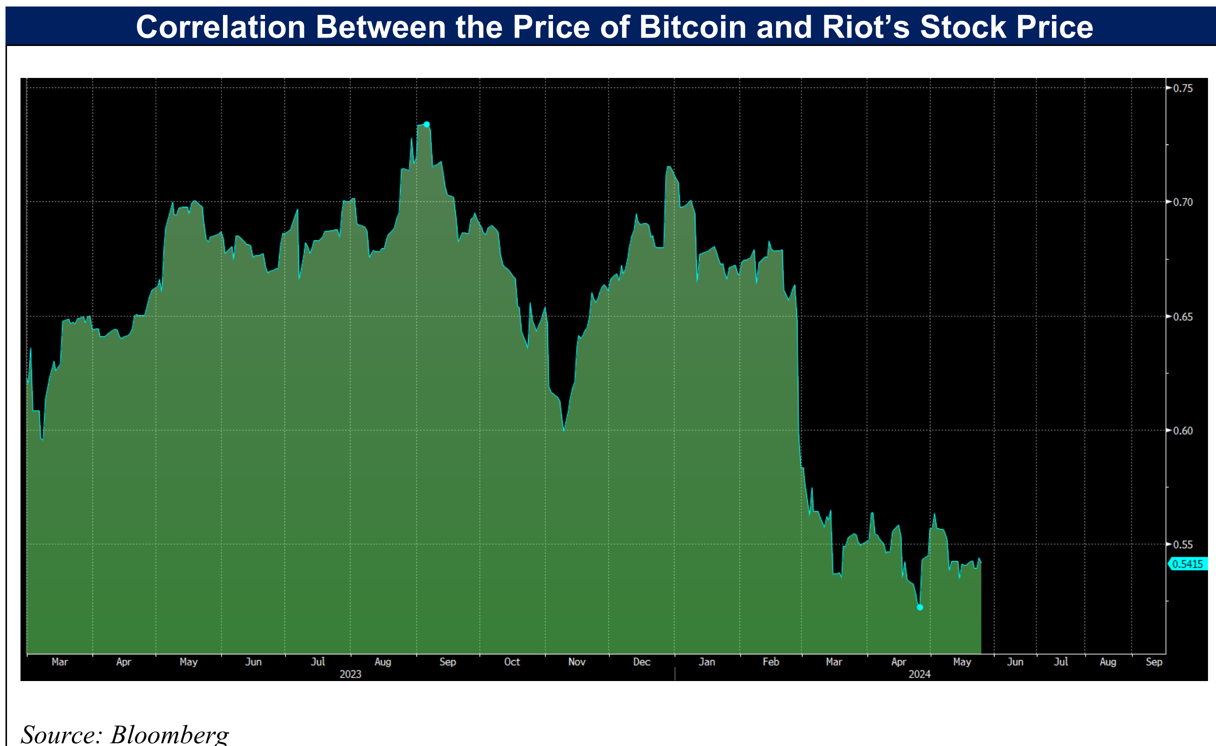
Appendix

Riot Growth Pipeline



Source: [Riot 1Q24 Update]

Correlation Between the Price of Bitcoin and Riot's Stock Price



Source: Bloomberg

Recent Developments

On May 28th, Riot announced that it had made a proposal to acquire Quebec-based bitcoin miner, Bitfarms, at a price of $2.30 per common share (a 20% premium to Bitfarm's share price on April 19th, the last trading day prior to Riot's initial proposal to the Bitfarms' Board). Riot eventually disclosed increasing its ownership in Bitfarms to 11%, becoming Bitfarms' largest shareholder. The proposed cash and stock deal valued Bitfarms' equity at approximately $950m. Bitfarms' Board rejected the offer as undervaluing the company.

Riot's press release does not provide the proposed mix of cash and stock but states the deal would have resulted in Bitfarms' shareholders owning up to ~17% of the combined company. We think the math (as shown below) implies the proposal was heavily weighted toward stock (~65%), resulting in ~59m shares issued to Bitfarms and diluting Riot shareholders ~20% (that is the most a NYSE listed company can issue without requiring stockholder approval, which the release states is not required for the proposed deal). We suspect this material level of dilution is why it was omitted from the press release.

Riot's Proposal to Bitfarms Implies Substantial Share Issuance		
Riot shares outstanding		289
Equity purchase price ($M)		$950
Cash	35%	$333
Stock	65%	$618
Riot share price		$10.50
Shares issued to BITF		59
Dilution to Riot shareholders		20%
Pro forma share count		348
BITF pro forma ownership		17%

Source: Kerrisdale analysis, RIOT SEC filings, Riot press release, May 28, 2024.

The timing of the transaction appears to be an opportunistic attempt to seize on internal turmoil at Bitfarms after the company announced a CEO transition in March. Bitfarms later terminated the CEO after he filed a $27m lawsuit for breach of contract. Strategic reasons for the deal offered by Riot included creating the largest miner globally, geographic diversification, and utilizing Riot's balance sheet.

While the deal would naturally make the combined company bigger, it is unclear if it would make it materially better. Bitfarms' current fleet efficiency is 31 J/TH, considerably worse than Riot's and the worst among Riot's closest peers. Assuming Bitfarms reaches its mid-year target of 12 EH/s, Riot is paying an implied ~$80 per EH/s for inefficient hashrate when it has options to purchase additional miners from MicroBT at $16/TH to install at Corsicana. Given the enormous

sunk costs and growth potential of Corsicana (100 EH/s assuming full exercise of option, p.12), it's hard to see why inorganic expansion is necessary. One would think Riot has its hands full trying to develop East Texas rather than pursuing hostile takeovers in Quebec. The proposed deal would, however, provide it with geographic diversity (Bitfarms operates in Quebec, Paraguay, Argentina, and Washington State) which perhaps says something about the long-term competitive landscape for U.S. miners, even in Texas.

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