



Horizon Kinetics Blockchain Development ETF (BCDF)

Semi-Annual Report 2024 Commentary

Technology Innovators vs. Technology Beneficiaries (There's a Difference)

A common thought as it relates to economic progress is that newly created companies are the end beneficiaries of technological development. Start-ups are the pioneers, the adapters, and the beneficiaries of profound shifts in capabilities that allow competition and growth to flourish in areas where progress has stagnated. The story goes that a new technology is presented that either makes an older service redundant through increased efficiencies or creates an entirely new service that did not exist previously. Nascent companies are given the opportunity to disrupt incumbents or target areas of expansion untouched by larger, more established firms.

Of course, there are plenty of examples that justify such thinking. The largest companies in the world are the pioneers of the internet age. Not a single one of the top five of the S&P 500 has been around for over 50 years, a comparatively small amount of time when sized up against the oldest operating companies in the world.

But the determination of the eventual victors of the blockchain age requires a deeper analysis than a simple binary allocation to pioneers and an avoidance of established firms. To illustrate this point it is worthwhile to highlight the economics of the very different types of industries that are tied to one of the very newest and globally impactful technologies.

Blockchain Basics, A Review

Cryptocurrency mining, for instance, is an entirely new industry that owes its existence to the creation of blockchain technology. For those unfamiliar, crypto mining is the process of packaging valid transactions in that currency—basic transfers—into blocks of data, let's say in 10-minute blocks of time, in a way that links each consecutive block of transactions to the previous block. This is how many of the different blockchains are updated and the linkage of this data is how the term “blockchain” was derived.

Bitcoin mining is engineered to be extremely competitive, where participants use specialized computers to perform a vast number of computations in an effort to successfully mine the next block of transactions. A successful miner is rewarded with some cryptocurrency and potential fees (also in the form of cryptocurrency) from participants that transacted within the block. Miners, motivated by the block reward, provide the base level infrastructure for many of the most popular cryptocurrencies in the world, including Bitcoin. Validation is part of mining, and while validation can be performed separately from the mining process, miners are significant contributors to the security of the blockchain. The security of the system resides in the large population and wide distribution of miners, the idea being that it would be extremely difficult for an attacker to manipulate a sufficiently decentralized blockchain without a single point of failure. This is an extreme simplification, but is only meant to provide background for a discussion of the economics of the companies involved in this process.



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The companies engaged in this practice are unquestionably pioneers. They are providing a service that did not exist prior to the advent of cryptocurrency. The industry has grown extensively in terms of market cap, driven by the exuberance of those looking for pure-play exposure to the blockchain and crypto markets. It is also worth noting that nearly all of these companies have been highly *unsuccessful* from an earnings perspective. As of the most recent financial releases, the top ten crypto mining companies had a collective retained deficit of \$5.8 billion dollars (FactSet, most recent quarterly filing), and that is largely after the consideration of revised accounting standards that now allow mark-to-market recognition of crypto assets—that is, even after allowing for the appreciation of their crypto holdings.

Blockchain technology, which only emerged as the result of the Bitcoin whitepaper in 2008, with the first bitcoin mined in 2009, already supplies the infrastructure for trillions of dollars' worth of assets across the world. Miners are a direct representation of that infrastructure. Without mining to maintain and secure the transaction record, these digital assets could not exist in their current capacity, so there is a clear demand for these services. Moreover, as obvious as it might seem once one is familiar with the industry basics, crypto mining must be a profitable endeavor over the long-term for proof-of-work crypto to exist. If not, miners will simply shut down their operations and the infrastructure that allows the system to operate will collapse. In one sense, this is no different than a farmer who can't go one more season if the selling price is below production cost. With crypto miners, though, they can turn their servers off (or on) pretty quickly. So why have so many of these companies performed so poorly on an operating basis?

Many in the industry either misunderstand, or ignore, the three driving vectors of the Bitcoin equilibrium.

<u>Vector</u>	<u>Explanation</u>
Hash Rate	This is the computational power in the entire network, the sum of the capacity of all the mining rigs/servers/machines. Given the defined supply issuance, a miner that controls 5% of the hash rate would typically expect to collect 5% of the reward.
The Halving	The reward per Bitcoin block is cut in half every four years. This is the baked-in protocol, part of Bitcoin's monetary policy. Eventually the reward will be cut to 0, meaning that the asset (or currency) will be subject to increasing scarcity.
Cost to Mine	Mining servers or rigs are highly specialized—they are good for no other function—and depreciate over time. There is an upfront cost to purchase, and a continued cost to procure electricity and hosting facilities.



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The Economics—and Dis-Economics—of Crypto Mining

The analogies to mining have limitations, and these have perhaps had a hand in the poor performance of some of the publicly traded crypto mining companies. Unlike many other industries, increasing productive capabilities does not always increase production in bitcoin mining. Unlike gold mining, for instance, in which more investment in exploration and production will result in greater supply, there is a defined and limited issuance of rewards for the entire bitcoin mining industry—it's a fixed pie regardless of whether you put \$1 or \$1 billion into additional computing power. Increasing one's hash rate does not increase the portion of this fixed reward if competitors do the same.

As well, mining rigs have their own markets, fluctuating in price and innovating in ways that make prior models obsolete. This is a legitimate risk that has befallen some operators who invested substantial capital in the then-latest-model rigs, only to find that a new generation of far more profitable rig released not that long thereafter has effectively reduced their own block rewards, their return on invested capital, and the value of their own equipment.

And then there is the fact that Bitcoin implements a halving mechanism, which cuts the number of tokens per reward in half every four years. This is why target hash rates by a crypto miner seeking rapid growth (via rapid capital deployment) without consideration of long-horizon or full-cycle profitability makes little sense and has led to such poor results. Admittedly, these vectors can change quickly, but the major differentiating factor between participants has been discipline in capital deployment.

A technology that becomes commoditized—as so many world-changing technologies have—can provide a wide range of positive externalities but minimal benefit to those firms that make that technology available to others. Television programmers made tons of money; the U.S. television makers ceded their commoditized market to low-cost overseas manufacturers. The most direct exposure to blockchain, the mining community (which is also the most direct, reflexive choice of equity investors) has provided the technological infrastructure that has benefited others more than themselves. This scenario will likely improve over the course of time, but there may be additional difficulties before reaching that point.

The Croupier's Way to Profit from Blockchain

We've chosen a different route with our blockchain allocations. Many of our portfolio companies have established, proven business models that exhibit substantial optionality from the incorporation of blockchain or the adoption of digital assets, yet without the capital or valuation risks. The businesses themselves are old, but they've been able to adapt with new eras and technologies across many decades, in some cases across centuries, of operations.

Take the stock exchange business model. These are some of the oldest continuing businesses available to investors today, and while much has changed since their establishment, they substantially provide the same functions as in prior centuries.



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Stock Exchange	Current Owner	Year Established
Philadelphia Stock Exchange	Nasdaq Inc.	1790
New York Stock Exchange	Intercontinental Exchange	1792
London Stock Exchange	London Stock Exchange Group	1801
Frankfurt Stock Exchange (Boerse Frankfurt)	Deutsche Boerse AG	1808
Toronto Stock Exchange	TMX Group	1861
Tokyo Stock Exchange	Japan Exchange Group	1878
Osaka Stock Exchange	Japan Exchange Group	1878

Source: oldest.org, Japan Exchange Group

The open outcry system of yesteryear has largely gravitated towards electronic trading platforms with vastly enhanced accessibility. There was a time when the limitations of the manual process of trade recognition—yes, on paper tickets—forced the exchanges to cut back on trading hours. Now, increased volume and open interest are pushing exchanges to gauge the demand for 24/7 trading. Market information can be transmitted in real time to global participants. Settlement times have shortened from five days to one. These companies have incorporated cloud computing and have shown interest in the utilization of AI. New products and asset classes have been integrated seamlessly. And all have been additive to, not threats to, profitability.

We've explained these businesses as beneficiaries of optionality of blockchain-based assets. In success mode, the incorporation of blockchain could meaningfully enhance their offerings. Some examples of almost endless possibilities would be same day settlement with guaranteed accuracy, automation of legal and compliance functions through smart contracts, instant access to actionable data where appropriate, and a whole new asset class to service alongside more traditional offerings. Yet, in failure mode—if somehow the blockchain experiment fails—the various securities exchanges would continue to operate in their current robust capacity with little deterioration of their core business. We've actually seen a recent example of this.

Cboe recently announced they are winding down their digital asset spot market, which they entered (announced in late 2021) through the acquisition of a digital asset company that operated a spot market, regulated futures exchange, and regulated clearinghouse. Cboe cited a lack of regulatory clarity in the digital asset space, and are choosing to focus their efforts on their core competencies in the derivatives markets (as opposed to spot transactions). To be clear, the company will continue to offer cash-settled bitcoin and ether futures contracts on their Cboe Futures Exchange, and their Cboe Clear Digital operations will continue. The company still lists crypto ETPs on their equity exchange, which have been



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wildly successful from an asset and volume perspective. While the company may revisit digital spot market operations, it is fair to say that the initiative was unsuccessful.

So how did this impact the company's financials? They recorded an \$81 million write down on the impaired assets in Q2 2024, in addition to a \$460 million impairment in Q2 2022. At face value this may seem a dramatic amount, but not when viewed against the company's significant profitability. Collective earnings over the prior 3 years, which should account for additional acquisition related expenses related to that acquisition, amounted \$1.6 Billion. Net margin over the period, inclusive of nearly any charge related to the digital asset initiative, was over 14%. And the growth profile remains sound. Trailing 12-month Net Income for the entire business as of June 2024 was \$765.9MM. That is more than an 18% increase over the prior year. The "failure" of Cboe's Digital spot market had minimal impact on the operating results of the entire business. In fact, this is what exchanges do with new products – they test and refine different contract types and terms until they find one with the characteristics that attract participants and volumes:

- Cboe is the primary listing exchange for six spot Bitcoin ETPs. Bitcoin ETP volume has been a significant addition to exchange volume.
- Cboe has filed for rule changes to allow them to list Bitcoin ETP options on their platforms, and options are higher-spread products and themselves create more avenues for trading and arbitrage.
- Cboe has followed up with additional Ethereum ETP listings in July. Their crypto offerings have actually expanded since the write-off of the digital spot market.

This is an important example to explain why we've positioned the portfolio in this way. Regulated exchanges were pivotal in the approval process for crypto ETPs in the United States. Global bitcoin derivative contract volumes have grown substantially, at an 81% annualized rate from 2018-2023. YTD June 2024 has already nearly matched the entirety of 2023¹. And we continue to see promise in the eventual offering of spot crypto assets on regulated exchanges.

The status of incumbent has never stopped these companies from innovating, for they are the financial crossroads of the entire economy, where capital is mobilized, where risk is taken on and laid off or hedged. And while the benefits may not be immediately available to see, the pathway to adoption is clear. Legitimization of the new digital asset class will flow through the regulated exchanges of the world, and they will profit whether or not the technology producers of digital assets do or not.

¹ fia.org



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Horizon Kinetics Blockchain Development ETF Top 10 Holdings (%) as of June 30, 2024	
CACI International Inc	7.5%
Deutsche Boerse AG	6.2%
Cboe Global Markets Inc	5.6%
Intercontinental Exchange Inc	5.5%
TMX Group Ltd	5.4%
Urbana Corp	5.0%
Japan Exchange Group Inc	5.0%
Galaxy Digital Holdings Ltd	4.9%
London Stock Exchange Group PLC	4.7%
WisdomTree Inc	4.6%

Important Risk Disclosures

Please consider carefully a fund’s investment objectives, risks, charges and expenses. For this and other important information, obtain a statutory prospectus and summary prospectus by contacting 646-495-7333. Read it carefully before investing. The performance data quoted represents past performance and does not guarantee future results. Investment return and principal value of an investment will fluctuate so that an investor’s shares, when sold or redeemed, may be worth more or less than their original cost. Current performance may be higher or lower than the performance quoted.

The Horizon Kinetics Blockchain Development ETF (Symbol: BCDF) is an exchange traded fund managed by Horizon Kinetics Asset Management LLC (“HKAM”).

Investing involves risk, including the possible loss of principal. Shares of any ETF are bought and sold at market price (not NAV), may trade at a discount or premium to NAV and are not individually redeemed from the Fund. Brokerage commissions will reduce returns. The Fund’s investments in securities linked to real assets involve significant risks, including financial, operating, and competitive risks. Investments in securities linked to real assets expose the Fund to potentially adverse macroeconomic conditions, such as a rise in interest rates or a downturn in the economy in which the asset is located.

The Fund is non-diversified, meaning it may concentrate its assets in fewer individual holdings than a diversified fund. Therefore, the Fund is more exposed to individual stock volatility than a diversified fund.

Fund holdings and sector allocations are subject to change at any time and should not be considered recommendations to buy or sell any security.



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The Fund invests in foreign securities which involve greater volatility and political, economic and currency risks and differences in accounting methods. These risks are greater for investments in emerging markets.

The Fund may invest in the securities of smaller and mid-capitalization companies, which may be more volatile than funds that invest in larger, more established companies. The fund is actively managed and may be affected by the investment adviser's security selections.

Diversification does not assure a profit or protect against a loss in a declining market.

Fund holdings and sector allocations are subject to change at any time and should not be considered recommendations to buy or sell any security. Please see the schedule of investments for a complete list of holdings.

Associated Risk of Investing in Blockchain Development Companies. The Fund will invest in Blockchain Development Companies. At times, Blockchain Development Companies may be out of favor and underperform other industries or groups of industries or the market as a whole. In such event, the value of the Shares may rise and fall more than the value of shares of a fund that invests in securities of companies in a broader range of industries.

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