



BLOCK 30 FINANCIAL

Market Indexes and Financial Products

White Paper | October 2020

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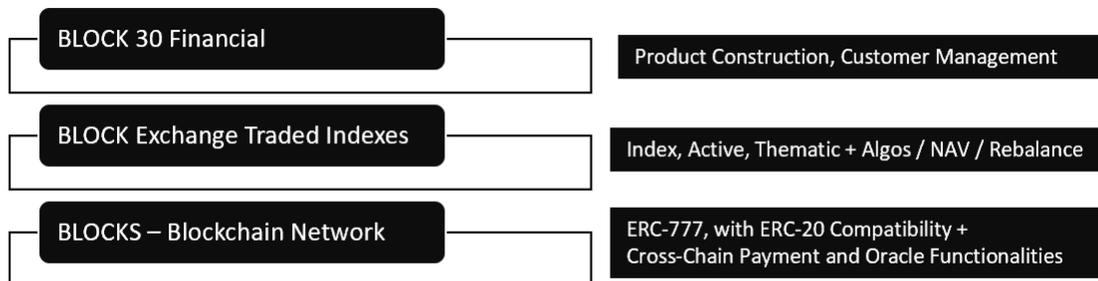
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- BLOCK Indexes deliver multifactor tracking for new digital trading markets
- BLOCK ETX products are outperforming all \$63 Trillion of Mutual Funds and ETFs
- BLOCK 30 Financial is working on building smarter financial products on blockchain and across multiple asset classes

Abstract

- Through the use of a new technology called blockchain, financial products can now be architected with smarter product wrappers (“tokenization”) and automated behaviors (“smart contracts”), that may hold implications for how assets are traded, packaged, and protected among peers (DeFi), brokerages, financial service providers and institutions.
- As a means of testing this migration, BLOCK 30 Financial has demonstrated the use of a new, open source blockchain technology (BLOCKS Network), to develop a series of financial indexes and products for consumers, financial service providers and institutional investors, starting first with digital assets.
- The BLOCKS Network uses ERC-777 and ERC-20 backwards compatibility from the Ethereum blockchain, as well as cross-chain oracle functionalities such as Chainlink, and global payment and settlement layers such as the Stellar Network.
- These multi-factor BLOCK Indexes, and BLOCK Exchange Traded Index (ETXs) products, deliver indexed, thematic and active investment strategies to retail customer or institutional portfolios, helping add new shape and easier paths to investment into digital assets.
- BLOCK Exchange Traded Index (ETXs) also hold implications for stocks, bonds, digital assets, asset and fund management, credit and loan origination, derivatives and other financial product lines are issued in the future.
- Additional BLOCK ETX product features such as 24/7 uptimes, oracle functionality, efficient rebalancing, gas fee reductions, price discovery, matching engines, fractional shares, smart contracts (automated payouts, time locks, etc.), faster settlement and payouts are also being explored on the BLOCKS Network.
- Beta Test Results: BLOCK ETX products are outperforming all \$63 Trillion of unlevered Mutual Funds and ETFs in calendar year 2020.



Simplifying Blockchain For Broader Adoption and Investment

In recent decades, the centralization of financial markets has occurred around large brokerages, service providers and mega cap stock consolidation. In countries like the United States, fully 84% of the stocks are owned by only 10% of households [2].

These market conditions have occurred against a backdrop of accelerated quantitative easing and fiat currency printing by national governments, resulting in an 86% increase in the US money supply over the last 36 months alone [3].

This kind of extreme wealth concentration, against the backdrop of an increased fiat money supply, has historically been a recipe for market corrections and social unrest.

In places like Venezuela, for example, a country rich in natural resources and the largest proven oil reserves in the world, the historical mismanagement of national currency and wealth distribution has had disastrous consequences for its citizens.

According to the International Monetary Fund (IMF), Venezuela will have suffered a 200,000% inflation rate in 2019 [4], rendering their currency almost totally worthless. Over 4.5 million people are leaving the country per year, contracting their GDP by over 35% annually [5] and rendering key staples like food, medicine, and water in short supply for too many.

In the United States, Goldman Sachs issued inflation-based currency concerns in a July 2020 report on the US Dollar, noting that after \$2.8 trillion added to the Federal Reserve's balance sheet this year alone, and potentially more stimulus coming, that "expanded balance sheets and vast money creation spurs debasement fears...which could great a greater likelihood that at some time in the future, after economic activity has normalized, there will be incentives for central banks and governments to allow inflation to drift higher to reduce accumulated debt loads." [6]

While the global markets are daily determining how to weigh the value of traditional safe haven assets like Gold, and new digital asset investments like Bitcoin, the recent backdrop of 1) an OECD-predicted contraction of 4.5% in Global GDP [7], 2) accelerating national debt loads, and 3) stimulus based fiat money supply increases, present an interesting confluence of circumstances for the decades ahead in alternative investments.

Digital Assets as Alternative Investment and Underlying Technology

With the advent of Bitcoin in 2009, new opportunities for decentralized financial networks were proposed. This new underlying technology, called blockchain, holds potential for new trading markets around stocks, bonds, physical and personal assets in ways that are governed directly by the people that own them - eliminating unnecessary bureaucracy, fee layers and middlemen.

Through a well architected decentralized financial ("DeFi") network like BLOCKS, opportunities for improved global, peer-to-peer ("P2P") trading and financial markets are unlocked.

The BLOCKS Network delivers the financial technology architecture necessary to create primary and secondary trading markets, products, derivatives, currencies, asset and credit markets between people, rather than corporations and institutions.

BLOCKS is a decentralized financial network that will allow people to trade assets they own with one another, rather than through institutions, with the goal of creating further financial inclusion and instruments for wealth creation and distribution through more autonomous economic behavior, products and free-market pursuits.

In addition to basic portfolio diversification, investment returns and Sharpe Ratio considerations, rationale for investment into digital assets can be made across the consumer, corporate and governance layers with the following potential rationale:

- A fixed supply currency hedge vs. fiat currencies
- Peer-to-peer decentralized network technology (Trade. Track. Invest. Pay.)
- Fortune 500 development tool for decentralized customer data applications
- Government technology for improved GDP grids and citizen-driven data autonomy

The efforts of The BLOCKS Team have been to simplify, index, and commoditize the above digital finance activities into investable, and tradeable, units of measure for anyone around the world with access to an internet connection, smartphone, tablet or computer device.

The Birth of Pooled Financial Products in Mutual Funds and ETFs

On March 21, 1924, Edward G. Leffler invented the first pooled Mutual Fund, Massachusetts Investment Trust (MIT), taking in \$392,000 in Assets Under Management (AUM), with the Dow closing the day at 95.87 points. [6]

To its credit, the MIT has continued to modestly outperform the major indexes for investors nearly one hundred years post-inception. Four years later in 1928, State Street Capital would be formed nearby in Boston, MA, becoming a long-time powerhouse in themed investment products, still widely available today.

These mutual fund financial products were divided into two camps, closed-end funds and open-end funds, which had different parameters for how investor funds were represented, managed, and accessed.

Although the closed-end funds were more popular in the Roaring 1920's, their exposure to leverage had strong consequences during the Stock Market Crash of 1929 and were soon eclipsed by inflows into open-ended funds for the remainder of the century.

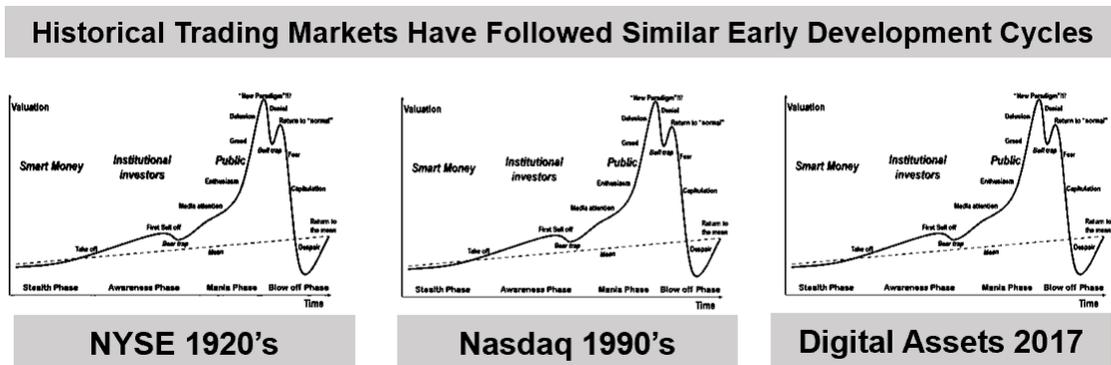
The primary purpose of these pooled funds was to offer multiple stocks, strategies, and management activities via a singular basket or holding, to both retail investors and institutional investors. Since then, pooled investment funds have become some of the most popular financial products in the world and have given birth to concepts in both centralized and decentralized finance.

As a manifestation of his socio-cultural views of the Roaring 20's, Leffler saw the new financial product construct of Mutual Funds as a means of spreading investor risk out over a number of assets, tempering the enthusiasm of singular stock promotion by retail investors.

This thematic tension can still be seen in at play in today’s capital markets, between more traditional Wall Street fund managers on CNBC who focus on diversification and dividends, versus retail investors on commission-free digital trading platforms, like Robin Hood, who may be more inclined towards singular asset moves and day trading.

The Importance of Market Indexes for Global Trading Markets

Historically, market indexes have been critical for the early development of tracking, segmentation, and shape of new historical trading markets. The process of price discovery around (a) singular assets and (b) overall new markets can take decades to form, as retail and institutional investors weigh the implications of transformative new technologies, like blockchain, on new and existing sectors of the GDP and economy. [9]

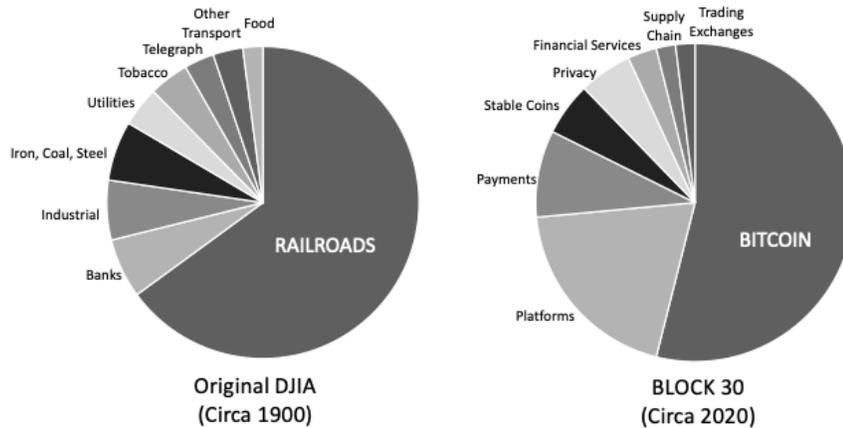


It is important that these indexes call on a variety of market vitals beyond just market cap and nominal share price, which can be manipulated and impermanent as sole source constructs for developing lasting indexes.

In 1912, Charles Dow gave rise to modern indexing with his interpretation of the Dow Jones Industrial Average (DJIA). His intent was to provide shape to new trading markets on the New York Stock Exchange (NYSE), by categorizing and grouping the major market movers of the time into a traceable number that investors could use to track the overall gains, losses, and sector movements of the market. [10]

It consists today of thirty constituent assets (DOW 30), rather than the original twelve. Although it was dependent on a relatively flawed methodology tied to market cap weightings and nominal share price, it is still widely used as a major index, nearly one hundred years later.

Similar indexing challenges are seen in the digital asset trading markets, where Bitcoin reflects an outsized portion of today’s overall market cap dominance.

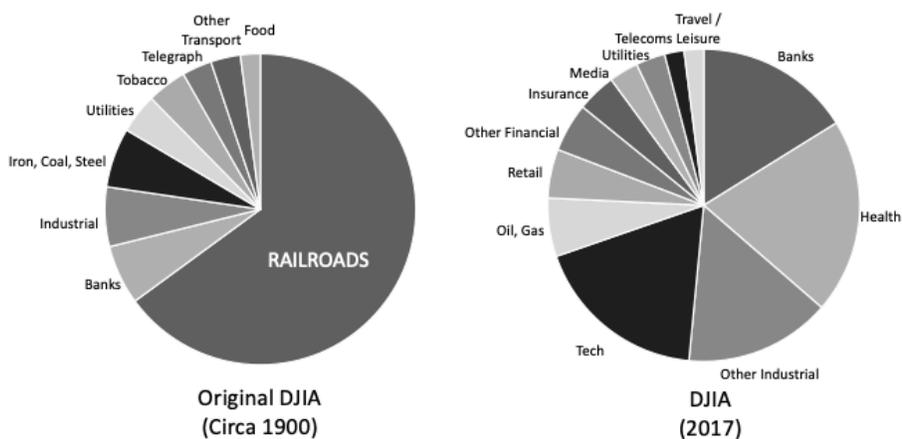


Multi-Factor Index Methodologies Deliver Improved Accuracy

As thematic sectors and constituent assets change inside an index, the use of market cap and nominal share price as the primary weighting tool can be problematic for accurate tracking and market monitoring over decades of time.

At the turn of the 20th century, it would have been impossible for the Dow Jones team to imagine that railroad stocks, which comprised about the same index weighting share that Bitcoin does now in the BLOCK 30 Index, would give way to aerospace, wireless, and internet companies as the seminal technologies and majority index constituents just one hundred years later.

If anything is certain, it is that constituent sectors and assets change over time within any lasting market index, no matter the asset class.



The BLOCK 30 Index

The BLOCK 30 Index was designed to deliver more precise market vitals around not just market cap and nominal share price, but other inputs, such as: sector balance, trading volume and on-chain activity.

We have accounted for these trends by developing an index that accounts for (a) Multi-Factor methodologies, and (b) a BLOCK 30 Constant, which responds reflexively to the market dominance of Bitcoin over time, ensuring that the BLOCK 30 Index will be as relevant a century from now as it is today.

BLOCK 30 Index Calculation – A Multifactor Methodology for a New Trading Market

BLOCK 30 constituent assets are ranked through a proprietary combination of market capitalization, trading volume, sector balance and in-depth due diligence on market conditions. The index aims to build a similar distribution of position concentrations as standard equity indexes. The index is defined as follows:

$$\begin{aligned}
 & \text{Index Level on day } t = \text{IndexLevel}_t \\
 & \text{IndexLevel}_0 = 3,000 \\
 & \text{IndexLevel}_t = \text{IndexLevel}_{t+1} + \text{DailyPointReturn}_t \\
 & \text{Set of digital asset rankings} = S = \{1, 2, \dots, 30\} \\
 & \text{Set of digital asset unit prices} = C = \{C_i\}, i \in S \\
 & \text{RebalanceAssetWeight}_i = \frac{B_i}{\sum B_i} \quad i \in S \\
 & \text{Thus} \\
 & \sum \text{RebalanceAssetWeight}_i = 1 \\
 & \text{For asset } I \text{ and month } m, \text{ at time } x \text{ of rebalance,} \\
 & \text{AssetPoints}_{im} = \text{RebalanceAssetWeight}_{im} \times \text{IndexValue}_x, i \in S \\
 & \sum \text{AssetPoints}_{im} = \text{IndexLevel}_x \\
 & \text{To generalize further, at any time } t: \\
 & \sum \text{AssetPoints}_{it} = \text{IndexLevel}_t \\
 & \text{DailyPointReturn}_t = \sum \text{AssetPoints}_{it-1} \times \left[1 + \frac{C_{it} - C_{it-1}}{C_{it-1}} \right] \\
 & \text{AssetPoints}_{it} = \text{AssetPoints}_{it-1} \times \left[1 + \frac{C_{it} - C_{it-1}}{C_{it-1}} \right] \\
 & \text{AssetPoints}_{it+1} = \frac{\text{AssetPoints}_{it}}{\text{Divisor}} \times \left[1 + \frac{C_{it+1} - C_{it}}{C_{it}} \right] \\
 & \text{Where, Divisor} = \frac{1}{k} \\
 & C_1 = \text{unit price of the lower ranking digital asset} \\
 & C_{30} = \text{unit price of the highest-ranking digital asset} \\
 & \text{Rankings are decided by exposure at the time of Rebalance (R)} \\
 & B = \text{BLOCK 30 Constant}
 \end{aligned}$$

The model utilizes the following approach: C1 is the unit price of the lowest-ranking asset and C30 is the unit price of the highest-ranking asset. Rankings decide exposure at the time of rebalance, where B is the “BLOCK 30 Constant”—a constant that can be determined by committee.

AssetPoints are adjusted during times of rebalance and RebalanceAssetWeights are constant throughout the month. AssetPoints can also be adjusted by a divisor if a split or reverse split occurs before the time of rebalance.

The divisor is a constant that will be assigned at the time of a split or reverse split such that the IndexValue is unaffected at the time of the split. For example, let k represent the ratio of a split to a given digital asset i . If the k -for-1 split occurs at time t , and assuming all other variables are held constant, then IndexValue will be adjusted proportionately to the split.

The asset rankings (1 through 30) are calculated by ranking each month the eligible assets in ascending order based on the average daily digital asset volume.

The BLOCK 30 Constant - Building for Decades of Relevance

The BLOCK 30 Constant was developed to help reflexively track Bitcoin or other future mega caps as outsized contributors to the market movements in the digital asset trading markets, to ensure that the BLOCK 30 Index is as pertinent one hundred years from now as it is today.

A higher BLOCK 30 Constant weights larger cap digital assets such as Bitcoin and Ethereum more heavily, whereas a lower BLOCK 30 Constant weighs the smaller cap digital assets more, based on market conditions.

The BLOCK 30 Constant is adjusted quarterly, or in certain conditions more frequently, such that the dispersion between the largest and smallest asset exposures in the index best represent the makeup of the broader digital asset market.

Because of the still relative immaturity and volatile nature of digital assets as a trading category, the BLOCK 30 Constant allows for a touch of “active” management in an otherwise passive investment index. This ensures future relevance for the BLOCK 30 Index, by allowing the computation to accurately reflect the dominant assets of the industry as it evolves over decades time.

BLOCK Indexes are already in use in the global markets, and The BLOCKS Team will be making an announcement in Calendar Year 2021, regarding a signed partnership between one of the world’s most prominent indexing firms, headquartered in the United States, with indexes and financial products that have appeared on networks like CNBC, Fox Business, Bloomberg and in areas ranging from online retail, to solar, batteries, mining, industrials and blockchain.

BLOCK Indexes will also be made available for API and embedded HTML widgets on digital exchanges, market coverage networks and websites in the near future.

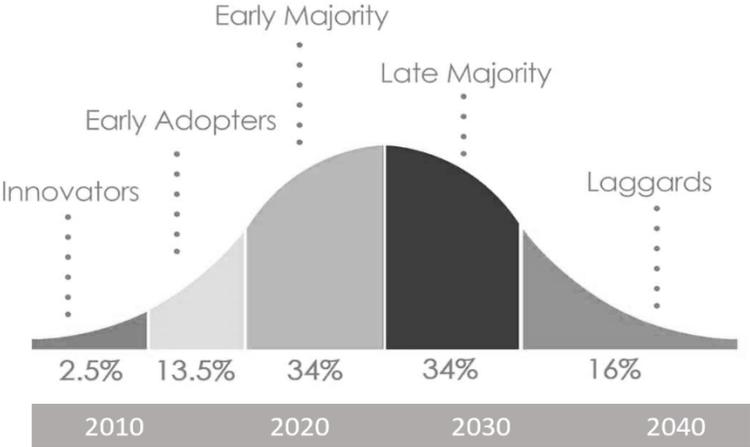
A New Era of Decentralized Financial Products

On both the NYSE and the Nasdaq, historical market indexes and pooled investment financial products have delivered shape, stability, and returns to retail and institutional investors.

In 2020, for example, the iShares ETFs by Blackrock product line will boast over 900 ETFs and nearly \$2 Trillion in AUM [7]. These financial products are often underpinned by market indexes, themed segmentation, and rebalancing decisions that guide the composition of constituent assets inside each ETF. [8]

Driving Mid-Market Inflows into Blockchain Investment

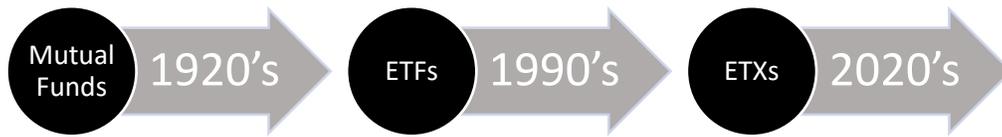
We propose that the fundamental nature of these basket financial products constructs is a proven method for driving long-term inflows into any asset class. The BLOCKS Network can be used to develop similar product lines in the digital asset trading markets, to help welcome new, mid-market retail and institutional investors.



A New Era of Digital Financial Products Will Be Required

Further, the underlying use of digital technologies like blockchain – most notably around asset tokenization and smart contracts – will allow for lower fees, faster speeds, and more flexible product construction than predecessor product lines like Mutual Funds and ETFs.

The implications for the tokenization of stocks, bonds, physical assets, personal assets, and decentralized financial networks are highly promising and will require new financial products, such as the BLOCK 30 Financial – Exchange Traded Index (ETX) product lines detailed in the paragraphs below.



Modern Portfolio Theory Supports Digital Asset Investing

As retail investors and institutions begin using the BLOCK 30 Index and BLOCKS as a means of tracking, creating, and redeeming financial products, Modern Portfolio Theory is supportive of digital asset investing across not only more speculative base of pyramid, retail, or mid-market portfolios, but also of high net worth (HNW) portfolios as well.

Modern Portfolio Theory (MPT) is based on maximum expected returns based on a given level of market risk. It was popularized by Harry Markowitz in his paper “Portfolio Selection,” which was published to the Journal of Finance in 1952 [11]. He would go on to win a Nobel Prize for this work [12].

MPT states that the risk and return characteristics of a particular investment should be evaluated based on how the investment affects the overall portfolio's risk and return. It has been of particular interest in the traditional asset market for investors when constructing portfolios using ETFs, as it can be used to optimize a portfolio by reducing risk for a stated level of expected return.

MPT shows that an investor can construct a portfolio of multiple assets that will maximize returns for a given level of risk. An investor can reduce a portfolio's risk by holding a combination of assets that do not have a fully positive correlation.

Implementing a diversified basket of digital assets, such as with the BLOCK 30 Index, can reduce unsystematic risk—that is, risk specific to a given digital asset, and thus the overall risk of the portfolio.

Expected Portfolio Return

$$E(R_p) = \sum w_i E(R_i)$$

Where R_p is the return of portfolio, R_i is the return of asset i , w_i is the portfolio weight of asset i .

Portfolio Return Variance

$$\sigma_p^2 = \sum w_i^2 \sigma_i^2 + \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij}$$

Where σ is the standard deviation of the period returns on an asset, p_{ij} is the correlation coefficient between the returns of assets i and j ; $\sigma_i\sigma_j p_{ij}$ is the sample covariance of returns of assets i and j ($cov(i, j)$)

Portfolio return volatility (standard deviation)

$$\sigma_p = \sqrt{\sigma p^2}$$

BLOCK 30 Correlation Matrix

The diversification between digital assets, market capitalizations, and sectors will lead to a more accurate representation of the digital asset market conditions. This is best represented by a correlation matrix of the BLOCK 30 index constituents.

	BTC	ETH	XLM	XMR	TRX	XTZ	LTC	ADA	LINK	DGB	BAT	NEM	VET	BCH	ZEC	XRP	IOTA	DCR	XVG	NEO	ZRX	ZIL	ICX	ATOM	ETC	REP	BNT	OMG	COMP	LRC		
BTC	1.00																															
ETH	0.90	1.00																														
XLM	0.89	0.86	1.00																													
XMR	0.54	0.91	0.84	1.00																												
TRX	0.78	0.83	0.68	0.83	1.00																											
XTZ	0.66	0.75	0.68	0.70	0.45	1.00																										
LTC	0.54	0.36	0.40	0.60	0.50	0.14	1.00																									
ADA	0.81	0.87	0.91	0.78	0.61	0.74	0.16	1.00																								
LINK	0.76	0.93	0.79	0.79	0.76	0.71	0.18	0.83	1.00																							
DGB	0.79	0.85	0.84	0.71	0.57	0.74	-0.01	0.88	0.84	1.00																						
BAT	0.85	0.78	0.83	0.83	0.76	0.57	0.55	0.74	0.72	0.64	1.00																					
NEM	0.41	0.49	0.32	0.48	0.58	0.26	0.21	0.33	0.48	0.33	0.39	1.00																				
VET	0.74	0.83	0.85	0.74	0.62	0.66	0.14	0.95	0.85	0.82	0.73	0.35	1.00																			
BCH	0.48	0.28	0.31	0.59	0.39	0.31	0.87	0.17	0.12	-0.02	0.47	0.18	0.12	1.00																		
ZEC	0.88	0.88	0.84	0.92	0.68	0.78	0.51	0.85	0.79	0.74	0.77	0.40	0.79	0.57	1.00																	
XRP	0.61	0.49	0.54	0.61	0.60	0.06	0.85	0.27	0.37	0.18	0.61	0.26	0.28	0.57	0.48	1.00																
IOTA	0.84	0.76	0.80	0.82	0.75	0.37	0.73	0.66	0.68	0.54	0.84	0.37	0.64	0.53	0.77	0.83	1.00															
DCR	0.29	0.05	0.21	0.29	0.24	-0.07	0.71	0.00	-0.06	-0.17	0.42	0.03	0.07	0.59	0.17	0.58	0.47	1.00														
XVG	0.72	0.68	0.75	0.65	0.51	0.59	0.19	0.83	0.63	0.73	0.76	0.24	0.81	0.18	0.70	0.25	0.62	0.25	1.00													
NEO	0.80	0.84	0.66	0.86	0.91	0.55	0.43	0.62	0.77	0.61	0.76	0.57	0.65	0.38	0.70	0.48	0.67	0.25	0.53	1.00												
ZRX	0.84	0.87	0.85	0.78	0.75	0.63	0.25	0.82	0.87	0.85	0.87	0.44	0.81	0.14	0.74	0.43	0.75	0.09	0.75	0.76	1.00											
ZIL	0.76	0.80	0.81	0.68	0.54	0.72	0.02	0.91	0.78	0.90	0.69	0.30	0.85	0.03	0.74	0.13	0.56	-0.05	0.88	0.59	0.83	1.00										
ICX	0.78	0.88	0.76	0.84	0.70	0.85	0.28	0.80	0.85	0.78	0.73	0.44	0.75	0.33	0.85	0.26	0.62	-0.05	0.64	0.76	0.81	0.77	1.00									
ATOM	0.63	0.65	0.56	0.70	0.73	0.39	0.49	0.51	0.70	0.41	0.74	0.46	0.64	0.41	0.61	0.55	0.69	0.48	0.49	0.78	0.66	0.42	0.55	1.00								
ETC	0.48	0.31	0.33	0.57	0.31	0.49	0.64	0.28	0.16	0.14	0.41	0.16	0.18	0.59	0.64	0.29	0.42	0.35	0.24	0.35	0.18	0.17	0.47	0.31	1.00							
REP	0.80	0.82	0.85	0.81	0.63	0.75	0.24	0.92	0.80	0.81	0.80	0.43	0.90	0.32	0.87	0.25	0.66	0.12	0.83	0.68	0.83	0.85	0.83	0.61	0.43	1.00						
BNT	0.74	0.84	0.84	0.70	0.57	0.65	0.10	0.95	0.87	0.86	0.70	0.32	0.95	0.04	0.79	0.28	0.65	-0.04	0.81	0.56	0.83	0.89	0.74	0.53	0.11	0.87	1.00					
OMG	0.70	0.82	0.65	0.71	0.77	0.53	0.19	0.66	0.85	0.71	0.75	0.53	0.68	0.07	0.63	0.33	0.63	0.03	0.58	0.81	0.88	0.69	0.79	0.70	0.11	0.71	0.70	1.00				
COMP	0.45	0.79	0.51	0.27	0.31	0.53	0.62	0.58	0.70	0.11	0.47	0.45	0.42	0.50	0.64	0.57	0.52	0.46	0.49	-0.10	0.46	0.57	0.45	0.51	0.56	0.40	0.53	0.42	1.00			
LRC	0.72	0.89	0.71	0.74	0.79	0.59	0.06	0.80	0.91	0.81	0.65	0.53	0.81	-0.01	0.68	0.25	0.58	-0.14	0.63	0.83	0.84	0.79	0.81	0.60	0.05	0.75	0.81	0.87	-0.20	1.00		

*September 20, 2019 to September 22, 2020 11:59 PM PST

Correlation is measured on a scale of -1.0 to 1.0 where a 1.0 is a perfect correlation, 0 is no correlation, and -1 is a perfect negative or inverse collation between two assets. The small and mid-cap digital assets tend to exhibit lower correlations between one another than large cap digital assets.

As can be shown in the correlation matrix, the BLOCK 30 Index assets do not have a fully positive correlation (ranging from -.20 to 1). This pattern can therefore reduce a portfolio's overall risk according to modern portfolio theory.

Boosting Portfolio Sharpe Ratio Through Digital Asset Allocation

The Sharpe Ratio is a commonly used metric to determine risk-adjusted return. The higher the Sharpe Ratio a given investment class has, the better its returns have relative to the amount of risk that is being taken.

Table 1 depicts the 2020 year to date returns for both the S&P 500 and for the BLOCK 30 Index. Although the BLOCK 30 Index exhibited over 4 times greater risk than the S&P 500, it also

exhibited over a 50X gain over the S&P 500 for 2020. [13] Thus, the BLOCK 30 Index has a considerably higher Sharpe Ratio (3.46) than the S&P 500 (0.21).

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma}$$

Where R_p = average rate of return, R_f = the risk-free rate, σ = standard deviation

Category	S&P 500	BLOCK 30
Return (YTD*)	2.6%	140.1%
Standard Deviation (YTD*)	9.1%	40.3%
Sharpe Ratio	0.21	3.46

*January 1, 2020 to September 22, 2020 11:59 PM PST

Table 1: YTD return, standard deviation and Sharpe Ratio, S&P 500 vs BLOCK 30 Index

Table 2 depicts a sample investment portfolio in which an individual has varying amounts of exposure to the BLOCK 30 Index, where the remaining portfolio allocation is in the S&P 500.

For example, the fifth column in Table 2 has 25% of an investor’s portfolio allocated to the BLOCK 30 Index, and the remaining 75% is allocated toward the S&P 500. As is evidenced by the data, the greater exposure one has to the BLOCK 30 Index, the higher the average return and the Sharpe Ratio

BLOCK 30 Exposure	3%	5%	10%	25%	50%
Return	6.7%	9.5%	16.4%	37.0%	71.4%
Sharpe Ratio	0.31	0.37	0.54	1.02	1.8

Table 2: Sharpe Ratio vs increase in BLOCK 30 Index exposure

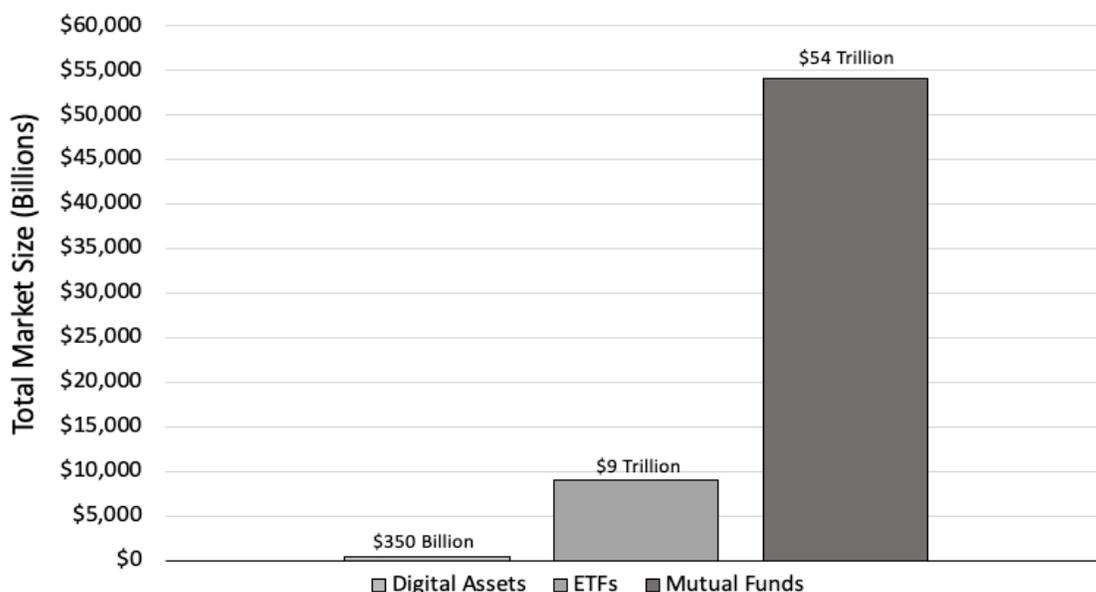
This finding is further substantiated by an article published by two researchers at Yale University, “Risk and Returns of Cryptocurrency.” [14] The study finds that the Sharpe Ratios of Bitcoin, Ethereum, and Ripple at their daily levels are 50-70% higher than traditional asset classes.

Their study focused on individual assets and not basket products like the BLOCK 30 Index, which may have even further lack of correlation with traditional markets.

According to MPT, The BLOCK 30 Index more efficiently optimizes portfolio diversity by delivering a higher Sharpe Ratio when constructing an optimized investment portfolio for multi-asset strategy exposure and risk-adjusted returns.

Digital Assets Still Early, Ready for Mid-Market Inflows

Although digital assets have been the top performing asset class of the last decade, the amount of inflows into the asset category have largely been confined to a speculative group of early adopters.



The aim is to build migration bridges from highly centralized and aging traditional finance layers to new, more decentralized financial products that empower individual customers in terms of financial inclusion, new peer-to-peer or micro-trading markets, and overall personal data autonomy.

Digital Assets <u>[15]</u>	ETFs <u>[16]</u>	Mutual Funds <u>[17]</u>
\$350 Billion	\$9 Trillion	\$54 Trillion

BLOCK Exchange Traded Indexes (ETXs)

BLOCK 30 Financial, utilizing the BLOCKS Network – a decentralized, open source, blockchain financial network – has developed a series of financial services product lines called BLOCK Exchange Traded Index (ETXs).

BLOCK Exchange Traded Index (ETX) products have outperformed all available, unlevered Mutual Funds and ETFs through the third quarter of Calendar Year 2020.

Customers can use BLOCKS, the utility token of the BLOCKS Network, to purchase BLOCK Exchange Traded Index (ETX) products in order to receive discounts and further product access to BLOCK ETX products.

Depending on the digital exchange or mobile application on which they are being offered, BLOCK ETXs will also be available for purchase (“onboarding”), using fiat or digital assets.

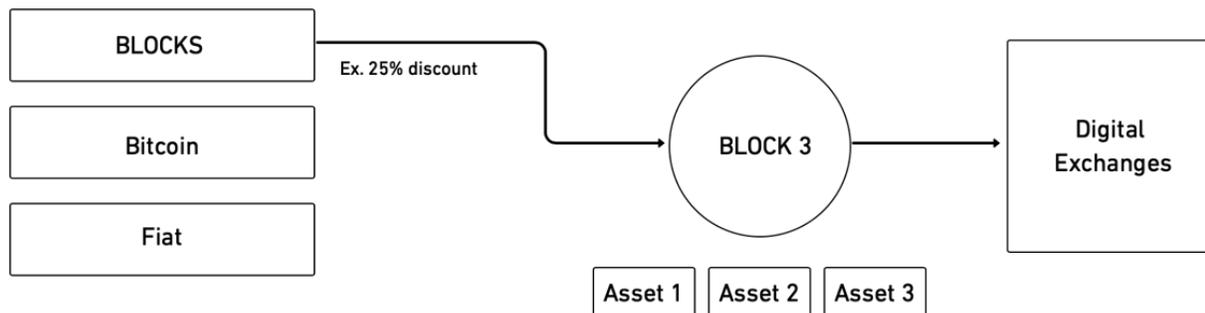
BLOCK ETXs vs. Mutual Funds and ETFs

BLOCK Exchange Traded Index (ETX) products are currently delivered in three formats by BLOCK 30 Financial:

1. BLOCK Index ETXs
2. BLOCK Thematic ETXs
3. BLOCK Active ETXs

These BLOCK ETX products can be used by decentralized exchanges (DEX's), centralized exchanges (CEX's), Fund and Asset Managers, General Partnerships (GP's), Limited Partnerships (LPs), or Loan Originators, to create baskets of multi-asset strategies for investors, ranging from simple, financial product baskets to complex, levered derivatives products. [18]

Top Performing ETFs	Returns YTD (%)	BLOCK ETXs	Returns YTD (%)
TAN – Invesco Solar ETF	81.1%	BLOCK Government	155.2%
ARKG – ARK Genomic Revolution ETF	79.4%	BLOCK 5	154.7%
ARKW – ARK Next Generation Internet ETF	78.9%	BLOCKS Platform	151.9%
ARKK – ARK Innovation ETF	75.6%	BLOCKS 10	149.7%
ONLN – Proshares Online Retail ETF	67.6%	BLOCKS DeFi	142%



BLOCK Index ETXs

Indexed financial products are essentially an attempt to provide investors with passive exposure to an overall market index, similar to the Dow Jones Index (DJIA) of thirty constituent assets or the S&P 500 of five hundred constituent assets.

From a retail investor or institutional investment perspective, BLOCK ETX Index financial products can be used to gain long term, passive exposure to the performance of an overall asset class, in this case, the digital asset trading markets.

BLOCKS for Product Construction

In this case, BLOCK ETX Index products are digital asset baskets that have been selected based on stability of governance, term of existence, contribution to the digital space, strength of community, and asset economics, such as money supply inflation, scarcity, and utility.

The BLOCK Index ETX product lines currently come in the form of baskets as small as the BLOCK 3, while scaling up to the BLOCK 30, which holds a basket of thirty digital assets, and is intended as a market equivalent to the DOW 30 (ETF: DIA) on the traditional markets.

BLOCKS for Product Purchase

In order to purchase BLOCK ETX Index products, a customer will deposit or transfer fiat currency or digital assets like BLOCKS into a wallet account. This account can then be used to purchase the financial products on decentralized or centralized digital trading exchanges.

BLOCKS for Product Discounts and Feature Unlocks

If using BLOCKS to purchase these products, customers will receive reduced trading fees, quarterly AUM fee discounts or have access to further BLOCK ETX product unlocks that may not be available via Bitcoin or other digital assets.

BLOCKS as a Synthetic Basket of Tokenized Assets

Once onboarded, these BLOCK Index ETX assets become synthetically represented baskets of “one-click” financial products that retail or institutional investors can purchase on both decentralized and centralized digital exchanges in the form of a smart contract.

BLOCKS Delivers A Smart Contract That Governs the Investment Relationship

The BLOCK Index ETX gives permission to a peer, fund manager, or digital exchange, to allocate and manage the purchase and sale of the underlying assets in the form of a NAV, which provides synthetic exposure to investors across the prescribed asset mix.

Within The BLOCKS Network, financial products such as BLOCKS ETXs will contain smart contracts that can be programmed so that peers, fund managers or digital exchanges can manage an agreed upon mix of assets, strategies, and distributions.

Smart contracts can be used to automate trading and execute rebalancing adjustments, to keep the breakdown and distribution of assets within an acceptable range to investor and fund manager and ensure timely payouts and automated contract behaviors in terms of payments and distributions.

Utilizing the BLOCKS Network, BLOCK 30 Financial will also be working to deliver BLOCK ETXs that provide price matching, trade order optimization, liquidity awareness, gas fee reductions and increased trading speeds in the creation, redemption and rebalancing.

Price Matching and Oracle Functionality For a Decentralized Future

The BLOCKS Network has also architected for the use of off-chain and cross-chain oracles such as Chainlink, Coinbase Pro API and other plugin partners, to help discover optimal pricing, liquidity and trade execution measures, which can be utilized by BLOCK 30 Financial to develop innovation improvements for customers over coming decades.

Smart Rebalancing Can be Performed for Optimized Long-Term Returns

In the case of BLOCK Indexes, it is recommended that any asset that exceeds 20% of the expected allocation be partially sold to return the exposure to the original level. This surplus will be held in Bitcoin until such a time that the exposure to an asset drops below 20% of the expected allocation and a purchase is required.

Investing in this manner allows profit taking at unusual highs, and increased exposure when assets are undervalued. This can potentially increase the total assets under management while keeping a broad exposure consistent.

BLOCK 30 Financial Trading Algorithms Help Reduce Slippage and Fees

In the case of BLOCK Index ETXs, an internal BLOCKS network algorithm has been constructed in a manner so as to reduce fees at the exchange level.

Small limit orders are placed to fill large orders to avoid slippage and generate much lower *maker* order fees as opposed to *taker* fees, which can reduce the profitability of the smart rebalancing. Executing the proper trades sets the index to the starting asset allocation.

Upon the sale of a BLOCK ETX Index product, all assets can be sold at market prices to return Bitcoin, BLOCKS® or other another liquidation asset of choice to the investor.

BLOCK ETXs	Product Description	Performance (YTD)
BLOCK 3	Basic exposure original UTXO blockchains	179%
BLOCK 5	Mirrored after the “FAANG” group of stocks. Exposure to top digital assets in terms of speed, community and decentralization.	180%
BLOCK 10	Hybrid mix of platform, global enterprise, supply chain, payments and enterprise blockchains	167%
BLOCK 15	Hybrid mix of platform, global enterprise, supply chain, payments and enterprise blockchains	134%
BLOCK 20	Hybrid mix of platform, global enterprise, supply chain, payments and enterprise blockchains with a blend of critical input factors	140%
BLOCK 30	Mirrored after the DOW 30 and a blend of critical inputs such as market cap, price, circulating supply, sector weighting and trading volume	140%

*As of September 21, 2020, based on modeled and back-tested calendar year-to-date returns (Source: BLOCK 30 Financial)

Table 3: BLOCK Index ETXs - Performance (YTD)

BLOCK Thematic ETXs

BLOCK Thematic ETX products provide investors with themed exposure to the digital asset markets across category sectors in which blockchain may be disruptive as an investment or technology construct, including Government, Payments, Supply Chain, Decentralized Finance, and more.

BLOCK Thematic ETX assets are digital assets that, in this case, were selected based on stability of governance, term of existence, contribution to the digital space, strength of community, and asset economics, such as: money supply inflation, scarcity, and utility.

The major difference is that each of the underlying assets in the BLOCK Thematic ETXs is chosen based on the niche being filled by the project. Firms like BLOCK 30 Financial that use the BLOCKS Network to create financial products, give a themed weighting to a specific category or sector, much like a sector is tracked and reported on in the legacy stock markets.

As with BLOCK Index ETXs, it is recommended that any asset that exceeds 20% of the expected allocation should be partially sold by the exchange or fund manager to return the exposure to the original level.

This surplus can be held in BLOCKS or Stablecoins until such a time as when the exposure to an asset drops below 20% of the expected allocation and a purchase is required.

BLOCK ETXs	Product Description	Index Performance (YTD)
BLOCK Payments	Exposure to a mixed basket of payment coins that can be used in lieu of USD vs credit cards, etc.	179%
BLOCK Government	Blockchains being tested for use in things like Universal ID, voting verification, contact tracing, etc. by governments and other public sector agencies.	180%
BLOCK Platform	Allow for the development of blockchain based applications.	167%
BLOCK Global Enterprise	A mixed basket of Fortune 500 blockchains that are being used in automotive, retail, supply chain, etc. for testing on global platforms	134%
BLOCK Privacy	A new era of privacy in payments for those that prefer to remain anonymous in their payments at hotels, remittances, etc.	140%
BLOCK DeFi	A mix of various digital assets that are paving the way for the new wave of blockchain based finance.	140%

*As of September 21, 2020, based on modeled and back-tested calendar year-to-date returns (Source: BLOCK 30 Financial)

Table 4: BLOCK Thematic ETXs - Performance (YTD)

BLOCK Active ETXs

BLOCK Active ETXs can be used to provide investors with enhanced protection and returns during a variety of market conditions, including downside protection.

BLOCK Active ETXs are complex trading strategies that have been developed, coded, and simulated over the past 4 years over a variety of asset pairs.

BLOCK 30 Financial - Proprietary Trading Algorithms

The top-performing trading strategies have been converted into algorithmic trading bots on The BLOCKS Network that allow clients to actively trade in the digital asset markets with significantly reduced trade risks.

The most important risk that these active strategies avoid is emotional decision-making. Everything is done automatically so that each trade decision is deliberate and emotionless. This gives active traders peace of mind while taking advantage of market volatility.

BLOCK ETXs – Built for 24/7, Digital Trading Markets

Since the algorithms are online 24 hours a day, there will never be a scenario in which a perfect buy or sell was missed because of distraction or human error. Avoiding human error and biases in decision making is key in these active strategies.

This procedure combines the diversification of a well-balanced portfolio, the benefit of taking advantage of market swings, and the freedom to choose assets in which clients are interested. There is also the option to simply select one digital asset as well.

As profits or losses are taken, this increased or decreased capital is immediately spread to all assets under management within the iteration of the active strategy, so that we give maximum exposure to each ideal trading opportunity as profits are taken or exposure reduced if our overall balance is reduced.

The benefit is that the asset mix balance is maintained throughout the trading process. The expectation is to increase the total assets under management while keeping a diversified exposure to the selected group of assets.

The BLOCK 30 Financial trading algorithms are constructed in a manner so as to reduce fees at the exchange level. Small- limit orders are placed to fill large orders over time, so that we can avoid slippage and generate much lower *maker* order fees as opposed to *taker* fees, which can reduce the profitability of the smart rebalancing.

In some cases, a balance of BLOCKS or Stablecoins should be held for a period of time until a good buying opportunity presents itself. Upon liquidation of the BLOCK Active ETXs, all assets will be sold at market prices to return BLOCKS® or other assets to the client, at their option.

BLOCK ETXs	Product Description	Index Performance (YTD)
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BLOCK Oscillators	A trading strategy based on three common indicators	111%
BLOCK MACD & VI	Block 30 version of MACD and VI strategy	105%
BLOCK RSI Fractals	Taking advantage of trends in the RSI	79%
BLOCK RSI Momentum	Finding momentum changes in RSI	74%
BLOCK Candle Body Fractals	Finding trends where body trendlines break	65%
BLOCK RSI 60/40	Tracking new breaks of the 40 and 60 RSI values	61%

*As of September 21, 2020, based on modeled and back-tested calendar year-to-date returns (Source: BLOCK 30 Financial)

Table 5: BLOCK Active ETXs - Performance (YTD)

Let us use the BLOCK Active ETX Oscillators product as an example, which is designed to capture returns for investors based on price fluctuations in the market, in both up and down conditions.

BLOCK 30 Financial creates a value based on the difference between the extreme price fluctuation from one period to the next, separating these in to two groups, one for the positive price movement and one for the extreme price decrease. These are trended for the most recent 14-day periods. Next we take the largest price move between the most recent two time periods—and sum these for the most recent 14 cases.

Finally, we normalize the data by dividing our positive price movement by the total average price movement to get a value. We do the same for the lesser swing and compare these two data points. A resulting indication of directional trend is revealed--and when positive, we send a signal to buy. If not, the signal is to sell.

We also take into consideration the movement of a fast and slow exponential moving average. These are subtracted and smoothed to make a trend that we can track on an incremental basis. If our difference is larger than the smoothed line, this will indicate a good buying opportunity. If the difference is negative, we would sell.

Combining these two calculations will give us more confidence in the projected direction of the trend and will be the basis of this specific strategy.

Product Code Backtesting

The following result is from one of our BLOCK ETX Active management products, in this case the BLOCK MACD&VI Strategy.

Here you can see actual trades that the BLOCK Active Strategy ETX: MACD & VI would have produced for the investor. Each buy and sell is marked on the chart for the BTC/USD. As can be seen, not every trade is a winner, but the client would have benefited from placing these trades.



Breakdown of Results

These are the specific results of the trade simulation charted above. The amount of profits would have been \$10,483.97 with an initial investment of \$10,000 (\$20,483.97 would be the current balance). This is a brief summary of the trade results of the simulation. From six open and closed Buy/Sell iterations a return of \$10,483.97 would have been generated with a drawdown of 4.21%.

BLOCK 30 MACD & VI	Overview	Performance Summary	List of Trades
	All	Long	Short
Net Profit	\$10,483.97 (104.84%)	\$10,483.97 (104.84%)	\$41.04 (0.41%)
Gross Profit	\$11,234.67 (112.35%)	\$11,234.67 (112.35%)	\$0 (0.0%)
Gross Loss	\$750.70 (7.51%)	\$750.70 (7.51%)	\$41.04 (0.41%)
Max Drawdown	\$743.60 (4.21%)	-	-
Buy & Hold Return	\$4,226.11 (42.26%)	-	-
Sharpe Ratio	0.584	-	-
Profit Factor	14.966	14.966	0
Max Contracts Held	2	2	0
Open PL	\$858.19 (4.19%)	-	-
Commission Paid	\$443.88	\$443.88	\$0.00
Total Closed Trades	6	6	0
Total Open Trades	1	1	0
Number Winning Trades	4	4	0
Number Losing Trades	2	2	0
Percent Profitable	66.67%	66.67%	N/A
Avg Trade	\$1,747.33 (17.47%)	\$1,747.33 (17.47%)	N/A
Avg Win Trade	\$2,808.67 (28.09%)	\$2,808.67 (28.09%)	N/A
Avg Loss Trade	\$375.35 (3.75%)	\$375.35 (3.75%)	N/A
Ratio Avg Win / Avg Loss	7.483	7.483	N/A
Largest Win trade	\$4,647.97 (35.69%)	\$4,647.97 (35.69%)	N/A
Largest Losing Trade	\$505.32 (2.86%)	\$505.32 (2.86%)	N/A

Avg # Bars in Trades	29	29	0
Avg # Bars in Winning Trades	38	38	0
Avg # Bars in Losing Trades	13	13	0

BLOCK ETXs - Creation and Redemption

BLOCK 30 Financial has developed two forms of product lines: Custodial and Non-Custodial. For custodial illustrations, the Block ETX price is reflected by a Net Asset Value (NAV), as a way to standardize pricing. Clients receive added unlocks, discounts and staking opportunities when purchasing the products in BLOCKS.

Non-Custodial Options

Initially, for ease of regulatory and compliance, BLOCK 30 Financial products will be offered in a totally non-custodial fashion on the BLOCK 30 Financial website; meaning that all product purchases and rebalancing will be performed through a secure API call that is automated on behalf of the customer.

Customer Controlled Product Lines

BLOCK 30 Financial clients will follow instructions to generate a trade API key. This will be encrypted, submitted, and stored securely so that any trade decisions will be processed by our servers using these trade keys. All balancing, entering, and exiting positions will be handled remotely.

As a non-custodial product, each index will be reflected on the client’s dashboard as a total value of invested funds plus or minus gains and losses. Because each client will purchase a BLOCK Index ETX asset and contribute a specific amount of investment to a product, the net asset value will be specific to the customer based on investment and return.

Custodial Options – Migrating to More Advanced Custodianship in the Future

Were BLOCK 30 Financial, or other global financial firms or digital exchanges, to move to custodial version of BLOCK ETX products, they would need to create subaccounts on behalf of each client, which will be held at the exchange.

Discounted onramps and offramps will be developed for clients via BLOCKS in order to purchase the products via fiat or digital asset gateways.

This will enable facilitation of all trades and asset movements internally, while still keeping individual records for each client. From an external point of view, the user experience will be identical, except the client won’t have to generate and submit trade keys.

Integrating BLOCK ETXs on Digital Exchanges

When BLOCK ETX products are moved over to an exchange, the exchange will create units that act as asset pairs that will be hosted by an exchange such as BLOCKS / BLOCK 3.

For example, a BLOCK 3 Index ETX could be offered as a USD pair that will track the value of a 50% BTC, 25% LTC, and 25% DGB mix, but be priced at an arbitrary value of \$300. So, at time 0, Block 3 will be introduced to the market at \$300 and represent the value of 3 underlying assets.

Using a real-time market making algorithm, the net change of the basket will follow the associated values of each of the assets that the index represents.

Therefore, as changes in the underlying assets occur, the BLOCK 3 Index ETX would be priced higher or lower and represent gains and losses in the independent market. As a trader purchases a unit of BLOCK 3 with USD, that money will flow into the automated purchase of BTC, LTC, and DGB at their current values.

As prices change, all balancing will be done publicly and will be reflected in an increased or decreased bid and ask price. All rebalancing will be done automatically on the back end, meaning that the client can enjoy passive, diversified exposure to a basket of assets and still take advantage of smart rebalancing, including profit taking and picking up good deals during sudden sell-offs of individual digital assets.

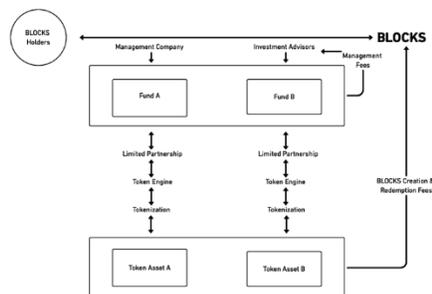
Again, all of this will be reflected in the asset’s market price. Eventually, say that the basket of assets has doubled in value, so that the same index would be priced at \$600. BLOCKS can then be sold back for USD, which will liquidate the underlying assets to return principal to investors the same way the asset was purchased at first.

Developing New Financial Products on Blockchain

There are currently over 7,945 Mutual Funds [19], and 2,096 ETFs [20] listed on the US trading markets alone, meaning that the creation of themed and indexed baskets of financial products is a proven way in which to drive mid-market customers to an exchange.

In the same way that Apple found scale for its mobile device network through the development of Mobile Applications (“Mobile Apps”), The BLOCKS Network has been built upon an open-source financial network that allows for asset managers and products creators to use The BLOCKS Network to develop decentralized, financial product applications (fApps) that have improved access, lower fees and greater data autonomy for their customers on the blockchain.

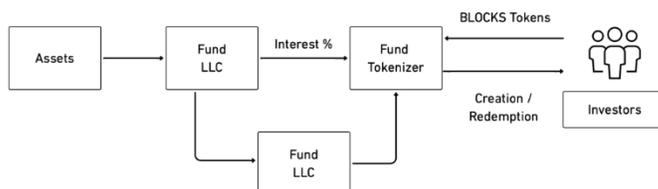
- Fund / Asset Managers
- Financial Service Providers
- Investment Banks
- Private Credit Issuers
- Loan Originators
- Real Estate Brokerages
- Lending Services



BLOCKS can be used to further innovate decentralized financial products for retail and institutional investors beyond traditional stocks and bonds. Through the development of the BLOCKS tokenization platform:

- Originators, fund managers and private credit issuers may unlock new sources of capital and participation from the global markets and marketplaces.
- Unique offerings improve financial access to private credit opportunities in areas such as:

- Art
- Automotive
- Construction
- Marine
- Real Estate



- Personal and business access to asset tokenization opens up new opportunities for asset collateralization to secure financing.
- Tokenized assets can be sold through online marketplaces, which offer fractional ownership and ROI among a pool of investors.

Guarding Personal and Financial Markets Data with Blockchain

A Decentralized Layer For Personal and Financial Data Storage

On an individual level, financial and social data crimes are seen every day in the form of credit card data, social security data, home title transfer, trading and bank account incursions.

As individual, grouped and state-sponsored hacking initiatives grow more well-funded, new blockchain and hybrid blockchain-quantum products will be needed to a) store data, b) protect data, c) protect trading markets.

BLOCKS Network – Enhanced Asset Tokenization and Data Storage

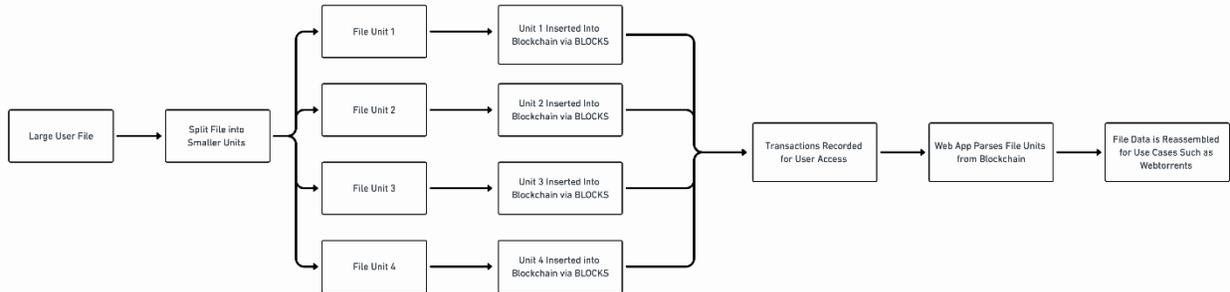
Improved, decentralized financial data and file storage becomes possible with the BLOCKS Network. A large file can be split among several BLOCKS transactions. The file data is then parsed, merged and used to create “infohashes” or “Magnet URIs” when uploaded to webtorrent services. This process decentralizes file storage and content distribution directly through peer-to-peer browser connections, which helps to minimize attack vectors.

A Decentralized Cloud Layer via Blockchain

BLOCKS provides the foundational elements needed to create a decentralized cloud storage layer. By splitting files and saving data among several transactions, individuals and businesses can leverage a global decentralized storage network as an alternative to “Big Data” solutions.

Mitigating Attack Vectors

Reentrancy is a known exploit of smart contracts, and ERC-777 is no exception. This attack can occur when a function makes an external call to an untrusted contract before it resolves any effects. External function calls are inherent in ERC-777s hooks.



Fortunately for the BLOCKS Network, these exploits have already occurred in the wild, and solutions exist to mitigate future exploits. The BLOCKS smart contract will implement reentrancy guards on external functions to mitigate one of the most common exploits. Reentrancy guards, or mutex, places a lock on the contract state, which prevents cross-function reentrancy attacks.

Conclusion

- Blockchain holds promising opportunities for the digital packaging, protection and transfer of financial assets on the global trading markets.
- Starting with the digital asset trading markets, BLOCK 30 Financial has tested and developed a series of products called BLOCK Exchange Traded Indexes (ETXs)
- BLOCK ETXs are built on a new, decentralized financial network called BLOCKS, which has developed open-source tools that allow for the development of personal asset, data transfer and financial products on blockchain.
- BLOCK ETXs are outperforming all \$63 Trillion of listed Mutual Funds and ETFs in calendar year 2020 and hold implications for multiple asset classes in the future.

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