PRASOS

QUARTERLY REPORT

Q3 2018

in collaboration with dcresearch

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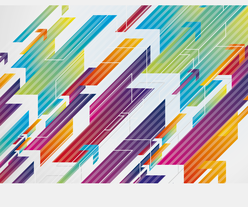
FOREWORDS

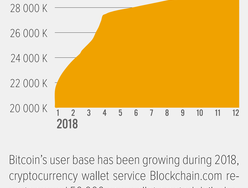
Bitcoin, the digital asset that just celebrated its 10 year anniversary, has been attracting investor attention by offering potentially high returns with relatively low correlation to other traditional asset classes. Bitcoin's nature as digital payment method and its scarcity in terms of limited supply has also driven many investors to call bitcoin as **"digital gold"**. Bitcoin was founded shortly after the notorious 2008 subprime crisis and following recession, by mysterious person or group called Satoshi Nakamoto. The following text included in bitcoin genesis block: "The Times 03/Jan/2009 Chancellor on brink of second bailout for banks", can be interpreted as a statement questioning fractional-reserve banking system [1]. In summary, Satoshi's core objective was to create "peer-to-peer electronic cash system". That objective was fulfilled completely and rest of the bitcoin's developing story will be among significant financial innovations of our time.



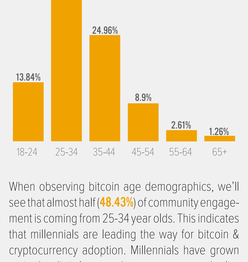
In the Q3 report we'll dive deep into bitcoin & cryptoassets, including topics within: Cryptocurrency market caps, exchanges, decentralized exchanges, and tech adoption. With Asset Summary, we'll explore asset correlations, indices, network health, layer 2 solutions, and bitcoin fundamentals. **The report aims to provide value for investors, clients, and individuals,** by delivering a complete quarterly overview of the industry.

Since 2008, the initially small bitcoin scene has evolved into a full-scale industry with hundreds of exchanges, blockchain software companies, and other participants. On top of the bitcoins underlying technology, called blockchain tech, other technological solutions have emerged. Nowadays blockchain technology is considered as one of the mainstream tech trends, among big data, AI, and so on. Why is bitcoin such a valuable contributor to any portfolio? Part of it derives from its significant returns, anything that rises 850% over the span of 4+ years will stand out in a portfolio analysis. Bitcoin's main value propositions for investors are: Growth, diversification, hedge, and security. Bitcoin, at its core, is **scarce programmable digital money.** By the fundamentally built-in digital scarcity, only 21 million bitcoins will ever exist. Bitcoin is probably the most asymmetric investment opportunity for retail investors.

The market sentiment has evolved from Q4 2017 astonishing bull market to stable low-volatility market in 2018. The **bitcoin's underlying fundamentals remain strong,** and we expect new technologies, like Lightning Network and Blockstream Liquid to uplift the market. New institutional players are also joining the game, ICE Bakkt offering physically settled bitcoin derivatives will launch on 24th January 2019 [2]. Bitcoin belongs to every portfolio as it's seen by many as an excellent hedge against traditional asset classes (see P16 Correlations). The asset will maintain its indelible position as it is a hedge against systemic risk and traditional assets classes. Bitcoin promises to deliver a sound currency for more decentralized future society.



Bitcoin's user base has been growing during 2018, cryptocurrency wallet service Blockchain.com reports around 50 000 new wallet created daily during this year. Blockchain.com currently edges to 30 million wallet users (graph above) [3]. Bitcoin's hashrate is currently around 50 million terahashes per second (TH/S), hashrate has been growing along 2018 (see P16). **The growing hashrate tells about miner confidence and healthy infrastructure.**



When observing bitcoin age demographics, we'll see that almost half (**48.43%**) of community engagement is coming from 25-34 year olds. This indicates that millennials are leading the way for bitcoin & cryptocurrency adoption. Millennials have grown up in the digital age and cryptoassets are the linear next step. The 2nd largest age range is 35-44 year olds at **24.96%**, followed by 18-24 year olds at **13.84%** and 45-54 year olds at **8.9%**. The rest (55 years+) make up around **4%**. For younger and older age groups, bitcoin is the representation of new kind of fully user controlled asset, a scarce resource that challenges current and upcoming paradigms.

BITCOIN'S VALUE PROPOSITIONS TO INVESTORS

GROWTH

The pioneering blockchain industry is developing with escalating pace and new projects are constantly gaining traction. The mass adoption in bitcoin & blockchain tech and tokenization in general will continue to evolve rapidly in coming years.

DIVERSIFICATION

Bitcoin with a low historical correlation to traditional markets, is an emerging asset class to consider as a part of the portfolio diversification. Even just 1-5% allocation to bitcoin has been historically impacting portfolio performance favorably.

HEDGE

Bitcoin can be seen as a potential hedge to traditional asset classes. Built-in features like 21 million hard cap, inflation free structure, and antifragile blockchain make bitcoin a store of value.

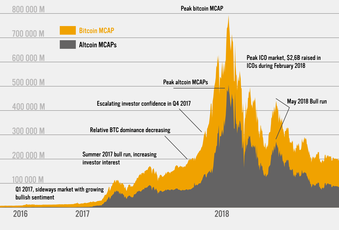
DECENTRALIZED VALUE

Global, decentralized, censorship-resistant & programmable asset with proven 10-year track record, showing outstanding staying power. With 99,98% uptime since inception, every subsequent day online makes bitcoin more robust, secured by built-in incentive structure [4].

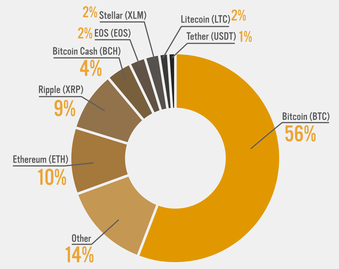
INDUSTRY OUTLOOK

CRYPTOASSET MCAPS

Bitcoin's MCAP was relatively dominant compared with altcoins during Q1 2017. Altcoin market caps started to rise significantly between Q2-Q3 2017. One of the main factors behind "altcoin rally" was the increasing amount of Initial Coin Offering (ICO) funding rounds, mainly built on Ethereum ERC20 tokens. The amount of ERC-20 ICOs escalated from Q2 2017, 12 months into Q2 2018, when a slowdown in amount of ICOs could be seen. As the "ICO rally" slowed down, bitcoin once again regained dominance, currently around 56% (30.10.18).



Why did the market peak at the end of Q4 2017? The cryptocurrency market is still mainly driven by retail investors, with potential institutional investors showing interest. A significant segment of "new" retail investors invested in said ICOs & altcoins, e.g. Ripple (XRP) rose 35,159% during 2017. The retail investors who bought alternative cryptocurrencies in 2017 also sold them off quickly when sentiment changed in early Q1 2018. Unlike altcoins, bitcoin has been around since 2008 and has many "holders" within its community, these holders of bitcoin asset are willing to remain in their positions, additionally increasing bitcoin's long-term staying power and dominance.



Comparing the cryptocurrency market caps shows bitcoin leading the asset class as most "dominant" currency with **56%** nominal dominance.

There has been some discussion about the relevance of market cap metric within cryptocurrency market. MCAP is only a relevant metric when it's supported by volume relative to MCAP, and when volume comes from a broad group of participants that are representative of market demand. Many altcoins do not fit the said criteria, so one could argue that the "real" bitcoin dominance is well over 56%. Additionally some altcoins have ERC20 background and therefore might be listed 2x on the list (as individual assets and part of ETH MCAP).

By J. Lansky's definition (and research), cryptoasset is a networked system that meets the following criteria [5]:

A. It does not require a centralized authority.

B. It keeps an overview of cryptocurrency units and their ownership.

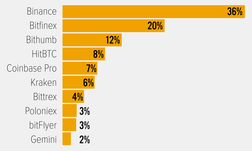
C. The system defines whether new cryptocurrency units can be created (if new crypto units can be created, the system defines the circumstances of their origin and how to determine the ownership of these new units).

D. Ownership of cryptocurrency units can be proved exclusively cryptographically. The system allows transactions to be performed in which ownership of the cryptographic units is changed. A transaction statement can only be issued by an entity proving the current ownership of these units.

E. If two different instructions for changing the ownership of the same cryptographic units are simultaneously entered, the system performs at most one of them.

EXCHANGES

Especially during the 2017 bull market, bitcoin scene saw a huge influx of new exchanges. The cryptocurrency market has been enormously profitable for exchanges, as a benchmark, in 2017 alone Coinbase generated $1B in revenue and $380M in profit [6].



In the chart we've compared the relative volumes of 10 biggest cryptocurrency exchanges year-to-date (YTD 13.11.18). Binance leads the chart here, with around **36%** of the volume. Bitfinex comes second with **20%** of the volume, the company was founded during 2012 in Hong Kong and has close ties to stablecoin Tether (USDT), Bitfinex shares common shareholders and management with Tether [7]. Other notable exchanges listed here are Korean Bithumb, with ~ **11%** volume, and U.S. Coinbase Pro (**7%**) & Kraken with **6%**.

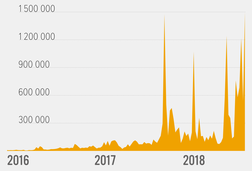
Exchanges have different practices, including reporting volume and financial statements etc. Exchanges also operate in vastly different jurisdictions, which affect their operating efficiencies.

Unfortunately there are signs that imply that some exchanges engage in wash trading to inflate their trade volume numbers. Sylvain Tribes has made extensive research about exchange wash trading [8]. The methods used by Coinmarketcap to determine the trade volume, even with the adjusted volume, have been questioned by several industry members. Adjusted volume on CoinMarketCap is gathered data from spot markets excluding markets with no fees and transaction mining.

DECENTRALIZED EXCHANGES

The blockchain scene is evolving rapidly, one of the recent trends has been the emergence of decentralized exchanges (DEX), which promise to offer a service with more privacy and reduction of fees. Decentralized exchanges don't usually support fiat conversions, additionally DEXes don't have to be compliant with KYC / AML regulations.

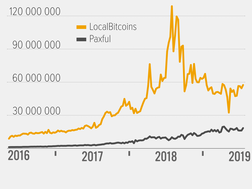
Most DEXes lack significant transaction volumes though. The reason behind low volumes lies in current DEX functionality, relative to centralized exchanges. Majority of decentralized exchanges only support very basic market functions, lacking features margin trading and stop-loss. So DEXes still need to improve a lot to reach liquidity, scalability, and functionality of the traditional centralized exchanges.



Bisq decentralized exchange (graph: global weekly volume) has seen steady growth in transaction volume during Q3 2018. Especially XMR/BTC pair (Monero) has been driving the volume up lately.

P2P EXCHANGES

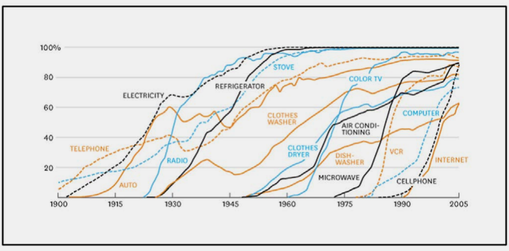
In addition to traditional crypto exchanges, peer-to-peer exchanges have an established position in the market. The chart above shows a comparison of LocalBitcoins and Paxful volumes since 2016, two of the biggest P2P exchanges currently. Localbitcoins (founded in 2012) volume has been tracking the cryptocurrency market price action closely, rising sharply in Q4 2017, while recording ATH (all time high) in weekly volume at ~ $129,5 million in 23.12.2017. Since Q4 the volume has been dropping during Q1 and Q2, now stabilized in Q3, around $50 million weekly volume. Paxful's volume has been growing modestly but steadily through 2016, 2017 & 2018.



Interestingly Paxful's volume stayed steady even at the "crypto hype" bull market during Q4 2017. Another interesting player in P2P market is Hodl Hodl, founded in 2017. Hodl Hodl's volume data is not currently public. Hodl Hodl advertises that they don't need to comply with KYC/AML regulation(s), making them attractive for privacy-focused users. These P2P exchanges are also part of bitcoin over-the-counter market, the bitcoin OTC market is estimated to be around 3x the size of traditional exchange market [9].

ESCALATING TECH ADOPTION

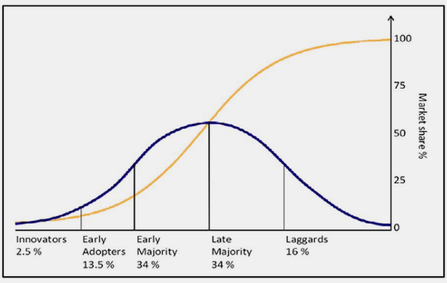
The pace of technology mass adoption is speeding up, new technological innovations, like bitcoin, will be adopted faster than ever.



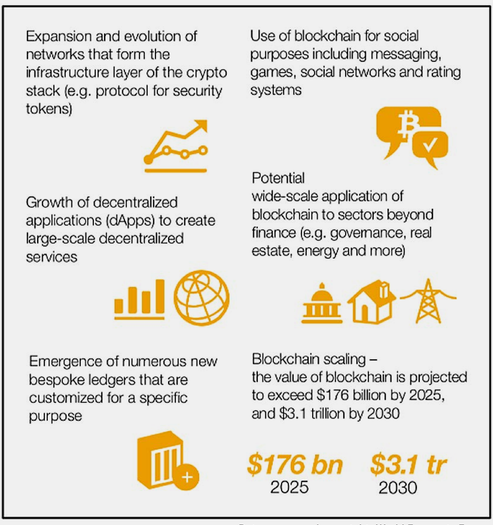
Data source: Michael Felton, The New York Times.

It took decades for the telephone to reach 50% of households, beginning before 1900. It took five years or less for cell phones to accomplish the same penetration in 1990.

Bitcoin and other blockchain technologies challenge traditional industries, forcing them to change and enhance their practices and business models.



When we place bitcoin in technology adoption curve, it's clear that we're still at Innovators or Early Adopters phase. Early Majority is yet to enter the market.



Data source and copyright: World Economic Forum.

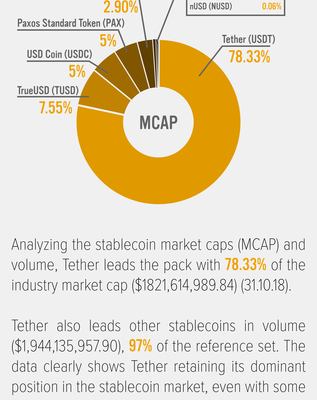
The World Economic Forum estimates huge expansion and growth of blockchain technology related infrastructure. The overall value of blockchain tech is projected to exceed $176 billion by 2025, and $3,1 trillion by 2030.

STABLECOINS

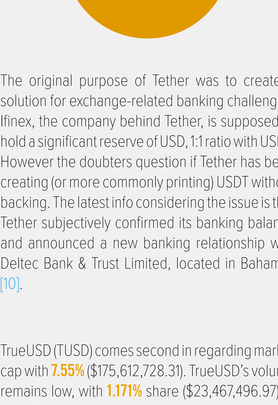
Another emerging trend is the rise of stablecoins, with assets like Tether (USDT), TrueUSD (TUSD) and USD Coin (USDC) in the game. Stablecoins are created for the purpose of having a stable value, usually these stablecoins are linked to USD.

	Ticker	Launch	Platform	Collateral	Ownership	Jurisdiction	Team location	Funding
Crypto Franc	XCHF	October 2018	Ethereum ERC-20	ETH	Swiss Crypto Tokens AG	Switzerland	Switzerland	NA
Dai	DAI	December 2018	Ethereum ERC-20	ETH	Maker (MKR) Token Holders	Switzerland	US	$12.000.000
Digix Gold Token	DGX	May 2018	Ethereum ERC-20	Gold	Digix Global PTE LTD	Singapore	Singapore	$1.300.000
Gemini Dollar	GUSD	September 2018	Ethereum ERC-20	USD	Gemini Trust Company LLC	US	US	NA
Globcoin	GLX	TBL	Ethereum ERC-20	15 fiat pairs, gold	RCS	Switzerland (Zug)	Switzerland	NA
HelloGold	GOLDX	Q1 2018	Ethereum ERC-20	Gold	Hellogold SDN BHD	Malaysia	Malaysia	$7.700.000
Huobi Stablecoin	HUSD	October 2018	Ethereum ERC-20	Underlying stablecoin	Huobi Global.	Singapore	Singapore	NA
Paxos Standard	PAX	September 2018	Ethereum ERC-20	USD	Paxos Trust Company LLC	US	US	$93.000.000
SAGA	SGA	TBL 2018	Ethereum	Fiat	Non-profit foundation	Switzerland	Israel	$30.000.000
Tether	USDT, EURT	October 2014 (Realcoin)	Ethereum ERC-20	USD, EUR	iFinex	BVI	Distributed	NA
TrueUSD	TUSD	March 2018	Ethereum ERC-20	USD	TrueCoin LLC	US (Delaware)	US	$25.700.000
USD Coin	USDC	September 2018	Ethereum	Fiat	Circle INC	Cayman Islands	US	$20.000.000

Stablecoins offer features like 24/7 access, fast transfers, programmability, and micro & macro payments. The growing stablecoin market is currently at its pioneering phase and upcoming developments will be interesting to follow.



It's pretty clear that stablecoins don't focus on competing with bitcoin or other PoW (Proof of Work) cryptocurrencies, instead their market fit consists of bringing liquidity to users & institutions preferring centralized low-volatility assets.



Analyzing the stablecoin market caps (MCAP) and volume, Tether leads the pack with **78.33%** of the industry market cap ($1821,614,989.84) (31.10.18).

Tether also leads other stablecoins in volume ($1,944,135,957.90), **97%** of the reference set. The data clearly shows Tether retaining its dominant position in the stablecoin market, even with some controversy considering banking relations and possible fractional reserve model.

The original purpose of Tether was to create a solution for exchange-related banking challenges. Ifinex, the company behind Tether, is supposed to hold a significant reserve of USD, 1:1 ratio with USDT. However the doubters question if Tether has been creating (or more commonly printing) USDT without backing. The latest info considering the issue is that Tether subjectively confirmed its banking balance and announced a new banking relationship with Deltec Bank & Trust Limited, located in Bahamas [10].

TrueUSD (TUSD) comes second in regarding market cap with **7.55%** ($175,612,728.31). TrueUSD's volume remains low, with **1.171%** share ($23,467,496.97) of the reference set.

Paxos Standard Token (PAX) and USD Coin (USDC) have **5%** MCAPs each with **1.460%** (PAX) and **0.026%** (USDC) of the overall volume.

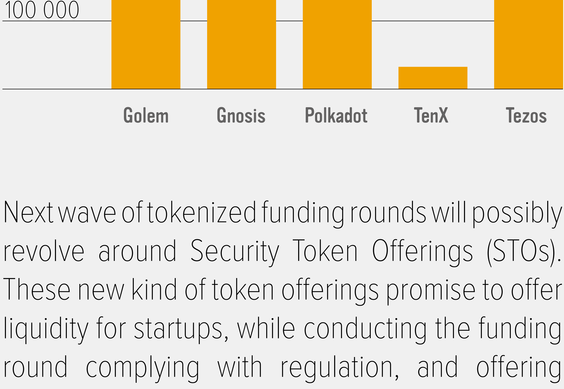
Maker organizations Dai stablecoin (DAI) reaches **2.90%** of the market cap, with low volume. Gemini's GUSD counts for **0.52%**.

We're expecting to see big influx of stablecoins in 2018-2019 and number of newcomers are waiting to challenge the current industry leading Tether (USDT).

TOKEN MARKET

The well-known ICO market peaked between Q4 2017 and Q1 2018. ICOs, or Initial Token Offerings, promised to solve an age-old problem in corporate fundraising: How to access broader market of retail investors? ICO rounds, including security and utility tokens, which were allocated to investors, attracted lot of interest among retail investors. The amount of funds raised within ICOs grew from $103 million in April 2017, to $2,6 billion in February 2018. The value proposition was clear, however market quickly overheated and the combination of hastily prepared ICO concept and inexperienced retail investors did not provide good results.

With the except of a few successful ICO projects, many failed to deliver and there were also cases of retail investors losing money in outright scams [11]. The ICO projects still hold significant amount of Ether (ETH), as seen in the lower chart. Golem holds around $46M worth of ETH, Polkadot close to $38 million. Gnosis and Tezos have around $25M balance each. Also TenX project liquidated most of their cryptoassets and now has close to $100M cash. These balance sheets allow the biggest ICOs to continue their projects well into future, even with ETH price dropping lower.



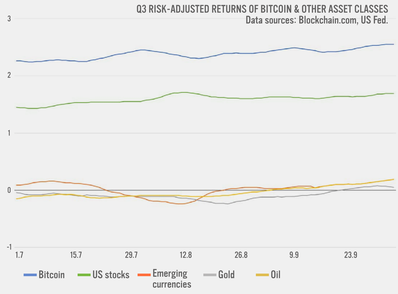
Next wave of tokenized funding rounds will possibly revolve around Security Token Offerings (STOs). These new kind of token offerings promise to offer liquidity for startups, while conducting the funding round complying with regulation, and offering sound investor protection.

ASSET SUMMARY

RISK-ADJUSTED RETURNS

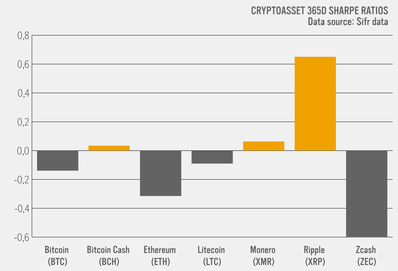
Sharpe ratio is a measure used for calculating risk-adjusted returns. The calculation solves the issue of misleading total returns by taking the average return earned above the risk-free rate per unit of volatility or total risk, an absolute measure of risk. Risk adjusted returns are calculated using Sharpe Ratio over a 4 year holding period. (Source: Woobull Charts)

During Q3 2018, bitcoin's Sharpe ratio was between 2,2 and 2,6, indicating very good returns relation to the level of additional risk. During Q3, US Stocks relative sharpe ratio was between 1,4 and 1,7, showing good results. Other asset classes are showing poorer performance in the chart, emerging currencies, gold, and oil all have Sharpe ratios close to 0.



The historical returns of bitcoin have compensated for the high degree of volatility, yielding a higher Sharpe ratio, making bitcoin's performance unique compared with more traditional asset classes.

Although gold's Sharpe ratio (avg. -0,09) is far away compared with bitcoin's (avg. 2,38), bitcoin is probably getting closer to gold as an asset class. In May 2020 bitcoin's issuance will drop by 328 500 BTC, escalating buying pressure, and consequently bitcoin's monetary inflation will be close to gold. Looking back at history, during the gold standard period, gold was around 10 times more valuable as a percentage of global financial assets than it is today.



Studying the risk adjusted returns during a shorter time frame, we see that 365-day Sharpe ratios between cryptoassets show variability among different cryptoassets. Cryptocurrency market has been historically quite correlated and driven by the major cryptoassets' price action such as bitcoin's and ethereum's [12]. Ripple (XRP) leads the reference group with **0,65** Sharpe ratio. From purely investment perspective, Ripple offered outstanding results in 2017, rising 36018%. Bitcoin Cash (BCH), Litecoin (LTC), and Monero (XMR) have remained close to zero Sharpe ratio. Zcash (ZEC) has dropped to **0,6**. Bitcoin's (BTC) Sharpe ratio is at **-0,14**, while Ethereum's (ETH) drops to **-0,31**. Risk and reward of an cryptoasset investment should be assessed in tandem to better analyzed investment decision and the underlying protocol investment thesis itself.

CORRELATIONS

What makes bitcoin an alluring add to every investors portfolio is its historical low correlation with traditional market, bitcoin's role as a safe haven during broader general market downturns and recessions is yet to be seen. The chart on right side shows bitcoin correlation with other asset classes, based on one-month rolling results from 31.12.2016 through 30.9.2018.

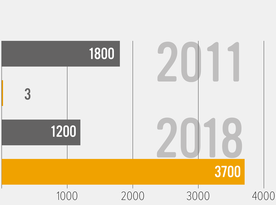
Asset	Correlation with BTC
S&P 500 Index	0,23
COMEX Gold Index	-0,05
Nasdaq Composite	0,12
Bloomberg Commodity Index	-0,14
Barclays Capital Bond Index	0,05
Euro (EUR)	0,01
British Pound (GDP)	-0,18
Swiss Franc (CHF)	-0,19
Chinese Reminbi (RMB)	-0,03
Russian Ruble (RUB)	0,05
Brazilian Real (BRL)	-0,01

Bitcoin has weak positive relationship (0,23) with the Standard & Poor's 500 index (S&P 500), consequently bitcoin is only weakly correlated with MCAPs of 500 large companies listed on NYSE or NASDAQ.

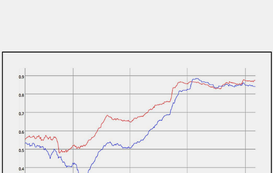
Bitcoin has no linear relationship with COMEX Gold Index (0,05), showing practically no correlation with the gold market, so far.

Relationship with Nasdaq Composite is moderately positive, showing some correlation with common stock and similar securities listed on NASDAQ stock market.

Relationship with national currencies: Euro, Chinese Reminbi and Russian Ruble is no linear. There's weak positive correlation with British Pound and Swiss Franc.



Bitcoin and gold are often compared as long-term sources of value, bitcoin has also been called as "digital gold". The chart on the above compares the price of bitcoin and gold from 2011 to 2018. Bitcoin's price grew from $3 to $3700, 118 000%. Whereas gold's price dropped 33%, from $1800 to $1200. This comparison shows bitcoin as vastly superior asset class. However bitcoin's MCAP ($74B) is only 1% of gold's market cap ($7,4T).



Data source: Coinmetrics.

The cryptoasset market has seen strong correlation in 2018. Litecoin (red BTC-LTC) and Ethereum (blue BTC-ETH) are following bitcoin's price action. There has been an increasing correlation among the major pairs (currently between 0,5-1) since the broader adoption of tokens and ICO-hype during end of 2017 and early 2018 as seen in the chart. The chart on above uses 180d spearman correlation.

The chart below shows cryptocurrency (BTC, LTC, ETH, XRP and XMR) 180-day correlation. (as of 13 Nov 2018, source Sifr Data)

The correlation results shows strong positive relationship (0,5 to 1) amongst said cryptocurrencies. Bitcoin (BTC) has especially strong positive correlation with Litecoin (LTC) (0,85) and Ethereum (ETH) (0,81), slightly less correlated with Monero (XMR) (0,8). Bitcoin shows somewhat less correlation with Ripple (XRP) (0,63), however BTC-XRP correlation can still be interpreted as strong.

Bitcoin (BTC) is still the source of liquidity for cryptocurrency market, causing high correlation between bitcoin & altcoins.

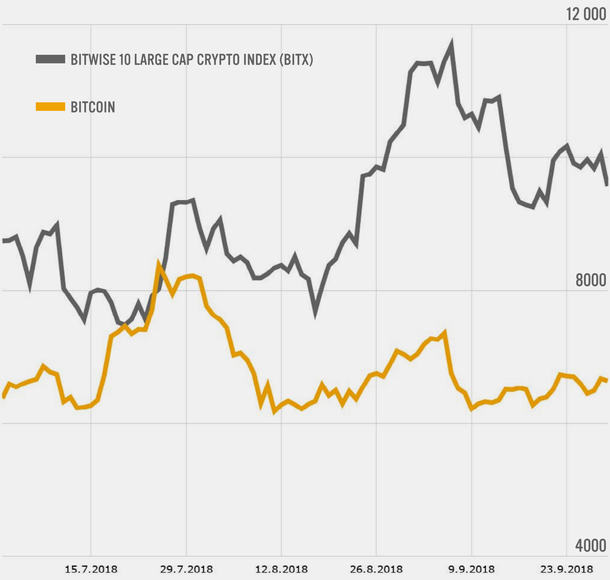
	BTC	ETH	XRP	BCH	XLM	LTC	XMR	DASH	XEM	ETC	ZEC	REP	*NXT	*SPX	*VIX	*GLD	*TNX
BTC	1	0,81	0,63	0,8	0,73	0,85	0,8	0,7	0,75	0,66	0,77	0,59	0,75	0,01	0,04	-0,17	0,04
ETH	0,81	1	0,71	0,83	0,68	0,89	0,79	0,74	0,76	0,69	0,79	0,68	0,71	0,04	-0,03	-0,19	0
XRP	0,63	0,71	1	0,7	0,68	0,7	0,61	0,58	0,64	0,54	0,59	0,51	0,59	0,08	-0,03	-0,2	0,01
BCH	0,8	0,83	0,7	1	0,72	0,87	0,76	0,74	0,73	0,64	0,75	0,6	0,71	0,05	0,02	-0,18	0,05
XLM	0,73	0,68	0,68	0,72	1	0,73	0,66	0,63	0,7	0,55	0,71	0,55	0,66	0,06	0,03	-0,16	0,01
LTC	0,85	0,89	0,7	0,87	0,73	1	0,8	0,77	0,8	0,69	0,79	0,65	0,71	0,02	0,03	-0,21	-0,01
XMR	0,8	0,79	0,61	0,76	0,66	0,8	1	0,73	0,75	0,59	0,74	0,62	0,71	-0,01	0,05	-0,23	0,05
DASH	0,7	0,74	0,58	0,74	0,63	0,77	0,73	1	0,68	0,62	0,74	0,61	0,62	-0,02	0,08	-0,14	0,02
XEM	0,75	0,76	0,64	0,73	0,7	0,8	0,75	0,68	1	0,54	0,71	0,6	0,65	-0,02	0,05	-0,22	0,05
ETC	0,66	0,69	0,54	0,64	0,55	0,69	0,59	0,62	0,56	1	0,64	0,61	0,59	0,01	0,04	-0,22	0,02
ZEC	0,77	0,79	0,59	0,75	0,71	0,79	0,74	0,74	0,71	0,64	1	0,59	0,69	0,01	0,06	-0,2	0,02
REP	0,59	0,68	0,51	0,6	0,55	0,65	0,62	0,61	0,6	0,61	0,59	1	0,61	-0,07	0,1	-0,12	0,01
NXT	0,75	0,71	0,59	0,71	0,66	0,71	0,71	0,62	0,65	0,59	0,69	0,61	1	0,01	0,03	-0,14	0,06
*SPX	0,01	0,04	0,08	0,05	0,06	0,02	0,01	0,02	0,02	0,01	0,01	0,07	0,01	1	0,84	0,02	0,34
*VIX	0,04	0,01	-0,03	0,02	0,03	0,03	0,05	0,08	0,05	0,04	0,06	0,1	0,03	-0,84	1	-0,05	-0,36
*GLD	-0,17	-0,19	-0,2	-0,18	-0,16	-0,21	-0,23	-0,14	-0,22	-0,22	-0,2	-0,12	-0,14	-0,02	-0,05	1	-0,13
*TNX	0,04	0	0,01	0,05	0,01	-0,01	0,05	0,02	0,05	0,02	0,02	0,01	0,06	0,34	-0,36	-0,13	1

180-DAY CORRELATION BETWEEN CRYPTOASSETS AND OTHER ASSET CLASSES

Data source: Sifr data

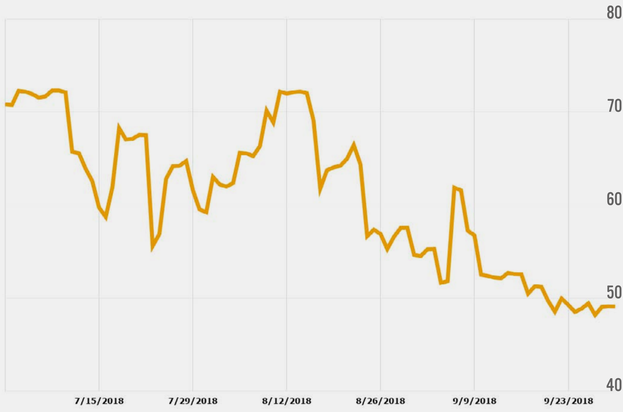
INDEXES

Here's a comparison between Bitwise Large Cap Crypto Index (BITX) and bitcoin. BITX tracks the total return of the 10 largest cryptoassets, as measured and weighted by free-float and 5-year inflation-adjusted market capitalization. (Source: Bitwise)



Q3 2018 BITWISE 10 LARGE CAP CRYPTO INDEX (BITX) PERFORMANCE COMPARED WITH BITCOIN (BTC)
Data source: Bitwise

On October 3th, Bitwise and exchange & wallet provider Abra launched BIT10 crypto-based index product, that allows users to gain exposure to 10 largest cryptoassets with 1 investment, starting with $5 minimum investment [13].



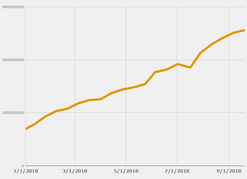
BITCOIN'S PRICE VOLATILITY DURING Q3
Data source: BitMEX

Bitcoin's price volatility has decreased during Q3, following the decreasing volume. Price volatility is computed as the standard deviation of log-returns for the past 31 days, scaled by the square root of 365 to annualize, and expressed as a percentage.

NETWORK HEALTH

Bitcoin's hashrate is zooming higher in 2018, indicating high levels of miner confidence. Bitcoin mining is the backbone of the Bitcoin network. Miners provide security and confirm bitcoin transactions. Without bitcoin miners, the network would be attacked (51% attack), and dysfunctional. Raising hashrate tells about healthy networks healthy infrastructure. The main functions of bitcoin mining are:

A. Issuance of new bitcoins.
B. Confirming transactions.
C. Network security.



BITCOIN HASHRATE
Data source: BitcoinWisdom

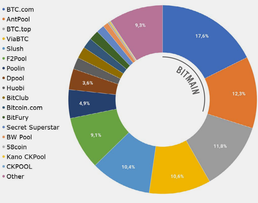
Bitcoin's hashrate usually moves up & down with the price, and mining difficulty is programmed to adjust with each situation. If the hashrate drops with the price, some institutional miners with larger cost base might cease operations, possibly making room for smaller more profitable mining ops.

In Proof of Work (PoW) cryptocurrencies like bitcoin, nodes typically are set up to recognize the blockchain with the most blocks (and therefore the most hashing power) as the correct version of history. Miners with > 50% of the network hashing power can take advantage of this by sending funds to one address on the main chain, while sending the same funds to another address on a forked copy of the blockchain that they are silently mining with more hashing power than the main chain.

Since other nodes only know about the main chain, they will see the first transaction as valid, and exchanges, etc will accept this transaction as valid. This malicious node can later release these silently mined blocks, and other nodes will accept this as the new 'correct chain' since it is longer. This will cause the original transaction to effectively disappear, and nodes will recognize the funds as being sent to the address from the new chain instead. This is known as a 'double spend' attack.

The theoretical cost of a 51% attack would currently be $8,7 billion, making it highly unlikely, if we don't count sophisticated state-level threat. The attack would also consume around $6 million per day in electricity cost alone [14].

BITCOIN HASHRATE DISTRIBUTION, LATEST BLOCKS BY MINING POOL (70)
Data source: Coin Dance



Bitcoin's hashrate distribution (6.11.18) is led by Chinese Bitmain-backed BTC.com with **18%** share of the hashrate, followed by AntPool (**12%**), another Bitmain-backed corporation. With both BTC.com and AntPool, Bitmain grabs 30% share of the global bitcoin mining market. Chinese mining pools dominate the mining scene with ViaBTC, F2pool, and BTC.top within top 10. Another notable mining pool are: Slush (**10%**) from Czech Republic and Bitfury (**2%**) from US. Bitmain's monopoly position might be weakening with possibly failed IPO listing and increasing hardware competition. Bitmain's weakening position would probably redistribute some of the global hashrate outside of mainland China, increasing healthy ecosystem decentralization [15].

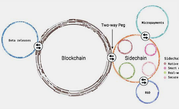
Green(er) mining is becoming more and more popular within bitcoin industry. With the right facilities it's possible to mine cryptocurrencies with greener power (wind, solar, hydro), or with excess energy. Canadian Upstream Data Inc. uses excess stranded natural gas sources, such as vented and flared natural gas at upstream oil and gas facilities, to mine bitcoin in containers. The container can be moved & relocated into areas with excess resources and powered with i.e. methane. Other solutions, like excess power plant electricity utilizing mining containers, are being launched in the market. We see these green solutions as an essential way to moderate mining power consumption [16].

LAYER 2 SOLUTIONS

Scaling has been one of the core questions within bitcoin development scene. Scaling bitcoin is usually implemented on so called "Layer 2" solutions, like Lightning Network, Blockstream Liquid and RSK. Here we'll check the details of latest Layer 2 projects.

Blockstream Liquid

Liquid sidechain by Blockstream targets large financial institutions and exchanges, which will be dealing with large transactions and high volumes. The fast settlements and cheap transactions first deployed by the Lightning can now be had for much greater amounts, albeit with Liquid's native LBTC asset. Liquid includes features like: Port real BTC in and out, secured by trust-minimized 15 party multisig, and built-in optional confidentiality. As anyone who runs a node can issue assets, Blockstream Liquid will be a straight competitor to Ethereum ERC-20.



Data source and copyright: Blockstream Corp

How Liquid works in practice? An exchange converts its bitcoin into "LBTC", the Liquid bitcoin token, which is pegged to actual bitcoin. Once sent there, exchanges can move money around securely and much more quickly than on the main bitcoin main chain. In addition to moving money faster, partners will also be able to on the platform, representing financial instruments, fiat currencies or cryptoassets. Liquid network sidechain went live on 27th September 2018 [17].

RSK

RSK is a smart-contract peer-to-peer platform built on top of the bitcoin blockchain that aims to expand the technological features of bitcoin. Its goal is to add value and functionality to the bitcoin network by the implementation of sophisticated smart contracts as a sidechain. RSK provides a Turing-complete smart contract platform (close to Ethereum) that is connected to the bitcoin main chain through sidechain technology. RSK promises to deliver faster transactions and better scalability features, which also enable new use cases in future [18].

Data source: bl.ocks.org/fyzbit

Lightning Network (LN)

The main goal of LN is to increase the bitcoin network capacity enabling the execution of transfers in a second layer. When sending an LN payment, two parties deposit the funds at one bitcoin address, a so-called channel, in which they can exchange funds a limitless number of times. This maintains bitcoin's security but means small, regular payments don't need to be added to the underlying blockchain until the channel is closed. Lightning has seen the network almost double its capacity within Q3 2018, as the LN's capacity has grown by almost 200%, hitting close to $2 million.

NUMBER OF BITCOIN LN NODES WITH CHANNELS
Data source and copyright: BitcoinVisuals

Lightning network statistics	Value
Number of nodes	3829
Nodes with public ID	2786
Network capacity (BTC)	111,85
Average node capacity (BTC)	0,066
Average node age (BTC)	132,1

How to run your own Lightning Network node? You can run LN with ordinary computer, however your computer will have to download and store 210+ GB of data. The bandwith might also be a challenge. One of the easiest ways to launch & run your bitcoin LN node is to buy a "plug and play" device. Casa offers these ready to use devices, greatly reducing the barrier for LN mainstream adoption.

Data source and copyright: Casa

LINDY EFFECT

The Lindy effect is a theory that the future life expectancy of some non-perishable things like a technology or an idea is proportional to their current age, so that every additional period of survival implies a longer remaining life expectancy. Bitcoin seems to fit well into lindy effect criteria.

During its 10-year lifetime, bitcoin has been able to sustain attacks including:

A. Attempts to hack and damage bitcoin network and protocol.

B. Potentially malicious hard forks.

C. Governments trying to ban bitcoin.

D. The threat of 51% attacks.

Surviving these threats and attacks for 10-years (and counting) showcases the incredible robustness and even antifragility of bitcoin network. And we expect that performance to continue in the long term.

Nassim Taleb (globally famous author and professor) commenting bitcoin & lindy effect:

"Bitcoin is an excellent idea. It fulfills the needs of the complex system, not because it is a cryptocurrency, but precisely because it has no owner, no authority that can decide on it's own fate. It's owned by the crowd, its users."

"Things that have been around for a long time are not "aging" like persons, but "aging" in reverse. Every year that passes without extinction doubles the additional life expectancy. The nonperishable has a life expectancy that increases with every day it survives" [19].

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