

AMUN

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# STATE OF CRYPTO



Amun's quarterly insights  
into the digital asset industry

AMUN

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# State of Crypto

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## State of Crypto Foreword

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This report provides an in-depth overview of the state of crypto in the fourth quarter of 2019, from 1 October to 31 December — offering Amun’s own view on the industry, a recap of the most important news items of the quarter, a look at the key data points of the most important crypto assets, and an overview of our current products. In addition, we have included two of our research reports: our investment theses for both BNB and Tezos.

It almost goes without saying that the fourth quarter of this year has been a uniquely eventful one for the industry and we hope this report will help you understand it better.



Among the dark times and sideways prices of the last quarter of 2019, crypto has seen some very positive beacons of light, including models to understand the industry that have undeniably worked and models that the future of the industry can be based on. This is what our quarterly report is focused on.

One theme or model that the Amun team has found especially interesting is that of exchanges. Crypto asset exchanges were considered as fringe players within the wider financial ecosystem but now the largest have consistently created innovative products whilst posting impressive margins. It's one thing to dismiss exchanges like Coinbase and Binance as minor players, but such a view quickly becomes unconvincing once one takes a look at their growth and how quickly they've gone from initial launch to reaping billions of dollars in both revenue and in daily trading volumes. How far away are they from the NYSE? From SIX? From JPX? We're not looking at random exchanges in San Francisco or Malta: if these exchanges are able to pull off their ambitious plans, we're looking at the next NYSE.

On the other side, a lot of criticism has (rightfully in our opinion) been made about the impact of Bitcoin's (and other crypto assets') use of Proof of Work mining — as a way to ensure the economic security of their ledger — on the environment. The primary question from critics is whether the positive economic and social goods which can come from Proof of Work crypto assets outweigh the potential environmental harm.

This is something that the Amun team has discussed internally and in our State of Crypto podcast, and we believe that the use of Proof of Stake as a means to ensure the economic security of a crypto asset's ledger can provide a viable alternative to Proof of Work, though it is still early days. Platforms such as Tezos and Cosmos are the testing ground, before the most anticipated Proof of Stake blockchain platform — Ethereum 2.0 — launches in the coming years.

This is an exciting time in crypto, and the growth in exchanges and Proof of Stake crypto assets are two areas of the industry that make us feel particularly bullish. As such, this report contains our investment theses for BNB — the exchange token launched by Binance, the world's largest exchange — and Tezos (XTZ) — a leading Proof of Stake crypto asset. In the last quarter we have successfully launched two ETPs for the aforementioned crypto assets: the Amun Tezos ETP (AXTZ) and the Amun Binance BNB ETP (ABNB).

In addition, this report summarizes the largest news stories of this quarter within the crypto asset industry. These three months have been dominated by news of various nation states' growing interest in the industry — particularly China's — and also the growth in the availability of crypto asset derivatives markets in both regulated and unregulated frameworks. Our intention is that this quarterly overview will help you better understand the last quarter of 2019 within the crypto asset industry so you can make better decisions as fellow market participants, product developers, and investors.

Best Regards,

**Hany Rashwan, CEO of Amun**



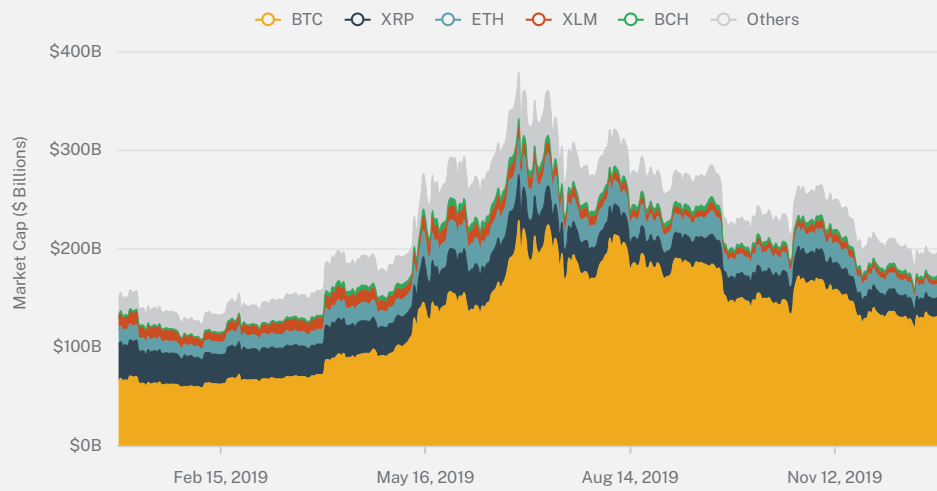


Figure 1: Crypto Asset Market Cap in Billions

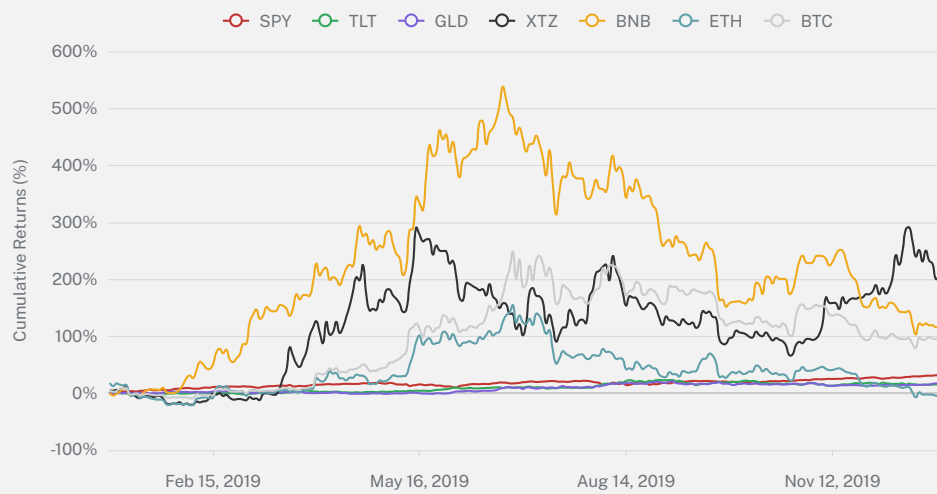


Figure 2: Crypto Asset Cumulative Returns

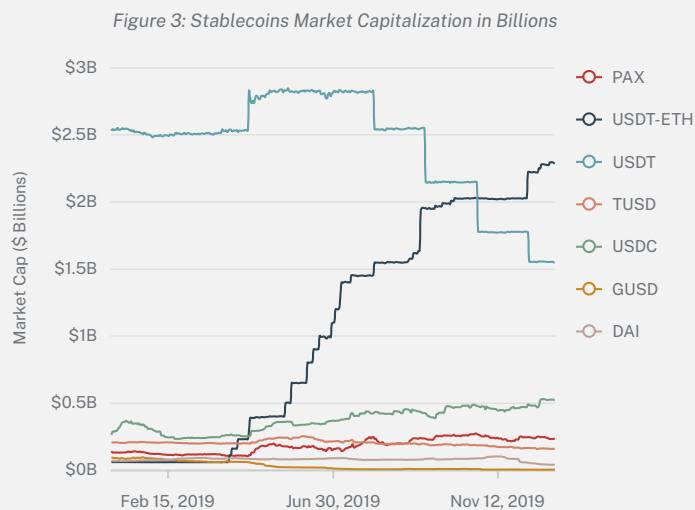


Figure 3: Stablecoins Market Capitalization in Billions

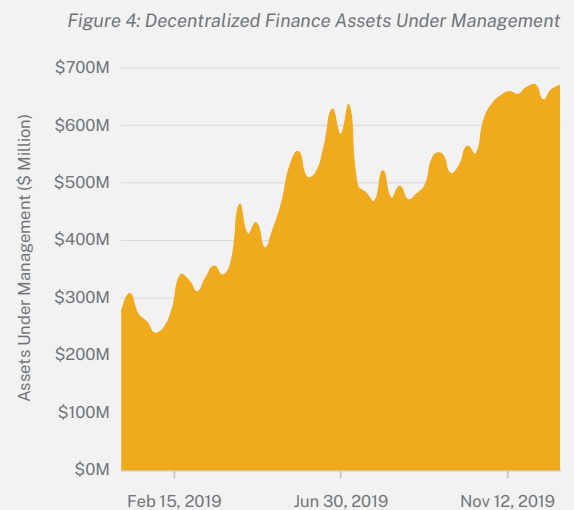








Figure 4: Decentralized Finance Assets Under Management

The four charts on the previous page paint a good picture of the crypto asset market for both the final quarter of 2019, as well as the entire year. Fig. 1 shows that from the start of the year to the summer of 2019, the crypto asset market underwent a large resurgence from the depths of the bear market. The final quarter of the year was marked by noticeable volatility due to macroeconomic factors such as concerns over the influence of China on the industry.





Despite a great deal of volatility throughout the year, as Fig. 2 shows, some of the top-performing crypto assets — all of which are included in our ETP suite — drastically outperformed the common market benchmarks such as SPY, TLT, or GLD with the exception of ETH over the last year. The primary factors for these assets' movements can be attributed to: renewed faith within the industry following the bear market, the growth in the crypto asset derivatives market, and product announcements from Facebook and the People's Bank of China which will be key drivers of mainstream adoption, though there remains valid regulatory and ethical concerns over both digital currency projects. The success of both XTZ and BNB can be attributed to fundamental growth in both of their blockchains — through the success of Tezos' first on-chain governance proposals and the launch of Binance Chain respectively.

Fig. 3 and Fig. 4 show two data points which are great examples of totally new growth areas within the industry that we expect to continue to be key drivers of growth in the coming year. Despite the vast amount of controversy surrounding Tether (USDT), Tether still remained the most popular stablecoin by both market capitalization and trading volume. However, the unexpected change was that the amount of USDT issued on Ethereum (USDT\_ETH) became greater than that on the Omni Protocol (USDT) — signifying Ethereum's increasing popularity as a platform for financial settlement. In addition, as Fig. 4 shows, the size of its Decentralized Finance (DeFi) ecosystem doubled over the last year. Whilst DeFi's assets under management (AUM) are still dominated by the Maker/Dai credit facility, there was also noticeable growth in decentralized lending protocols like Compound. One trend we can expect to see in 2020 is a further explosion in DeFi AUM given the launch of multi-collateral Dai and the likelihood of a wider range of decentralized financial instruments entering the market.

## Amun Single Trackers

	<b>ABCH</b> AMUN BITCOIN CASH ETP CH0475552201
	<b>ABNB</b> AMUN BINANCE BNB ETP CH0496454155
	<b>ABTC</b> AMUN BITCOIN ETP CH0454664001
	<b>AETH</b> AMUN ETHEREUM ETP CH0454664027
	<b>AXRP</b> AMUN RIPPLE XRP ETP CH0454664043
	<b>AXTZ</b> AMUN TEZOS ETP CH0491507486

## Amun Indexes

	<b>ABBA</b> AMUN BITCOIN SUISSE ETP CH0496484640
	<b>HODL</b> AMUN CRYPTO BASKET INDEX CH0445689208
	<b>KEYS</b> AMUN BITWISE SELECT 10 ETP CH0475986318
	<b>MOON</b> AMUN SYGNUM PLATFORM WINNERS INDEX ETP CH0508793459

# State of Crypto

## Quarterly Updates

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### Business

In an unexpected turn **Mercado Pago, Visa, eBay, Stripe, PayPal, Booking Holdings, and Mastercard** have all dropped out of the Facebook-related Libra Association. Despite this, the remaining 21 members of the Libra Association signed the inaugural charter. The initial board members are Calibra co-founder David Marcus, Andreessen Horowitz general partner Katie Haun, Xapo CEO Wences Cesares, PayU general counsel Patrick Ellis, and Kiva chief strategy officer Matthew Davie.

**Bakkt**, the subsidiary of the Intercontinental Exchange (ICE), went live in December 2019 with three new products — a custody product, Bitcoin options and Bitcoin cash-settled futures contracts (on ICE Futures Singapore). These product launches form part of a wider effort from Bakkt to expand the types of products they offer. Over the next year the firm is expected to expand their custodial offering and launch their consumer payments application in collaboration with Starbucks. On a sidenote, Bakkt's CEO Kelly Loeffler also announced that she would be stepping down from her position in order to join the United States Senate on January 1st.

In November, the market was buoyed by news out of China about the **Chinese government's** stance on Bitcoin, crypto asset exchanges, and blockchain technology. As part of the 18th collective study of the Political Bureau of the Central Committee for China's Communist Party, President Xi Jinping was quoted as saying that the country needs to "seize the opportunity" afforded by blockchain

technology. Conversely, news also broke within the same month about an official notice signed by the Shanghai Internet Finance Rectification Agency and the Shanghai Bureau of the People's Bank of China which ordered that regulators in each district in Shanghai must search and inspect local crypto-exchange related businesses.

There were several other significant developments. The Chinese financial news source Caijing reported in early December that the **People's Bank of China (PBOC)** is expected to soon launch the tests of its digital yuan in Shenzhen and Suzhou. This represents the next step in the rollout of China's digital currency project which we expect to make significant progress throughout 2020.

Crypto asset exchange **Poloniex** announced that it was spinning out of its parent company Circle into a brand new company, with the aim of spending \$100 million to develop its new exchange platform.

South Korean exchange **Upbit** was hacked for 342,000 ETH (worth around \$50 million at the time). Following the hack, the exchange froze all deposits and withdrawals from its wallet but have said that it will cover all losses associated with the incident.

Finally, Switzerland's central bank, the **Swiss National Bank (SNB)**, and the Bank of International Settlements (BIS) are reportedly exploring a blockchain-based digital currency.



## Investment

The **European Union (EU)** has launched a €400 million blockchain and AI fund. The EU and the European Investment Fund (EIF) has put together €100 million and the fund is expected to bring in €300 million from external investors.

Bitcoin miner maker **Canaan** set a \$100 million target for a US IPO in November where it's aiming to offer 10 million America depositary shares with a price between \$9 and \$11 each. The firm updated its IPO application with the SEC down from its placeholder raise target of \$400 million in October.

**Figure Technologies**, a blockchain-powered financial services startup founded by former SoFi CEO Mike Cagney, has closed a \$103 million Series C round led by Morgan Creek Digital.

**Morgan Creek Digital** has so far raised \$61 million for its second blockchain fund and is targeting a total raise of \$250 million.

**Layer1**, a Bitcoin mining company, has raised \$50 million in a Series A round from Peter Thiel, Shasta Ventures, and others at a \$200 million valuation.

**Digital Asset**, the company behind the open source DAML smart contract language, has raised \$35 million in Series C funding in a round led by the Australian Securities Exchange (ASX) and Jefferson River Capital.

**PeerNova**, an enterprise blockchain software startup that helps banks and financial institutions simplify data processes, has raised \$31 million in a round led by Mosaik Partners.

Andreessen Horowitz, Paradigm, and others have backed **Compound**, the decentralized lending protocol, for its \$25 million Series A funding round.

**Bison Trails**, a Libra Association member, has raised a \$25.5M Series A from Blockchain Capital, Kleiner Perkins, and others to expand its blockchain infrastructure offerings.

**SKALE Network**, a blockchain scalability platform, has raised \$17.1 million with investors including Arrington XRP Capital, Multicoine Capital, and Winklevoss Capital.

**NuCypher** has raised \$10 million from Y Combinator, Bitmain, Polychain Capital, and others.

Token sales platform **CoinList** has raised \$10 million in a new funding round, with backing from Polychain Capital, Twitter CEO Jack Dorsey, and others.

**Arweave**, a decentralized storage startup, has raised \$5 million in a fundraising round from Andreessen Horowitz, Multicoine Capital, and Union Square Ventures.

Crypto asset research startup **Messari** announced it has closed a \$4 million funding round, led by Uncork Capital with participation from Blockchain Capital, CoinFund, and others.

Cryptocurrency risk management platform **TRM Labs** has raised \$4.2 million from investors including PayPal Ventures, Initialized Capital, Blockchain Capital, and Y Combinator.

## Regulation

The U.S. Securities and Exchange Commission (SEC) halted **Telegram's** alleged \$1.7 billion unregistered digital token offering which the firm had been conducting in the run-up to the now-delayed launch of the Telegram Open Network (TON) blockchain.

**Block.one**, a blockchain building company, agreed to pay \$24 million to settle charges with the U.S. SEC for conducting an unregistered initial coin offering (ICO) between 2017 and 2018.

Cryptocurrency firm **Longfin Corp.** has been ordered by a federal court in New York to pay the U.S. SEC around \$6.8 million in penalties and disgorgement for conducting a fraudulent public offering and falsifying revenues.

Boston-based **Nebulous**, makers of the Sia network for decentralized data storage, has settled with the U.S. SEC for \$225,000 over a \$120,000 unregistered securities offering and conversion scheme.

**Veritaseum** and founder Reggie Middleton have settled with the U.S. SEC, agreeing to pay \$9.5 million and to accept a permanent bar on offering crypto assets.

Ivan Manuel Molina Lee, President of **Crypto Capital**, has been arrested by Polish authorities according to local news reports. This is the company that was reportedly unable to return the \$850 million entrusted to it by Bitfinex, as revealed by the New York Attorney General's (NYAG) investigation into Bitfinex and Tether.

The United Kingdom's tax authority, **Her Majesty's Revenue and Customs (HMRC)**, issued taxation guidance stressing that crypto assets like Bitcoin are neither currency nor securities.

The U.S. SEC has rejected a Bitcoin ETF proposal from **Bitwise Asset Management** in conjunction with NYSE Arca.

Superintendent Linda Lacewell of the **New York Department of Financial Services (NYDFS)** announced that the NYDFS will modify their approval process for crypto assets.

Heath Tarbert, chairman of the **U.S. Commodity Futures Trading Commission (CFTC)**, says that it isn't clear whether Facebook's Libra digital asset should be considered a security or not.

A **European Commission** official says that the commission plans to bring in new regulations for crypto, including Facebook's Libra.

**BitMEX**, a crypto asset derivative exchange, and its founder, Arthur Hayes, have been hit with a \$300 million lawsuit.

Having been requested by the **Swiss parliament** to look into the potential of creating a central bank digital currency (CBDC), the Swiss government concluded that it would introduce risks to financial stability.

The **China Securities Regulation Commission (CSRC)** is reportedly setting up a technology bureau and is appointing Yao Qian, the former head of China's CBDC, as its department chief.

**LedgerX**, a crypto asset derivatives issuer, has announced that its CEO and COO Paul and Juthica Chou have been placed on administrative leave.

## Technology

Multi-collateral Dai, the next upgrade of the **Maker DAO** decentralized stablecoin system wherein multiple types of crypto assets are available to be used as collateral, was officially launched following a governance vote using the Maker (MKR) token in November.

The **Tezos** network officially deployed its third ever on-chain protocol upgrade through its governance process. The upgrade, dubbed “Babylon”, affects various parts of the Tezos network including aspects of its consensus algorithm, smart contract functionality, and governance mechanism.

The **Ethereum** network has officially completed its latest hardfork, dubbed “Istanbul”. This was a non-contentious hardfork which contained six Ethereum Improvement Proposals (EIPs) which addressed issues such as Denial-of-Service attack resilience, interoperability, and smart contract gas costs.

**Facebook’s Libra** testnet has logged over 51,000 transactions and deployed 34 projects, according to a developer update released by the Libra Association in mid-November.

The privacy-focused **Brave** browser reported that it had hit a milestone of 10 million monthly users.

**dYdX**, a non-custodial crypto asset derivatives exchange built on Ethereum, has announced that it will discontinue support for 0x-based markets. 0x is a decentralized exchange protocol also built on Ethereum.

EOS block producer “**EOS New York**” has published data showing that six registered block producers on the EOS network are controlled by a single entity.

Crypto asset exchange **BitMEX** has added support for native Segwit (bech32) addresses for Bitcoin withdrawals, helping users save money on transaction fees.


Crypto asset exchange **Kraken** has announced that it is launching its own staking service for customers in December.

Crypto asset exchange **Bitfinex** has integrated a compliance tool from blockchain analysis firm Chainalysis to monitor crypto asset transactions in “real-time”.

**MakerDAO** has proposed a new security feature to prevent an exploit which could have theoretically led to a loss of the collateral in the Dai stablecoin system. The proposal would add a 24-hour governance delay on newly deployed ‘executive contracts’ which had been voted on by MKR holders. This is in response to a blogpost released by developer Micah Zoltu warning of the security vulnerability.

The next major update of **Ethereum**, dubbed “Ethereum 2.0 Phase 0”, is entering into its final stage of development before deployment. The Ethereum Clients of both Parity Labs and Prysmatic Labs have announced support for Ethereum 2.0’s first public multi-client public testnet, the Sapphire testnet.

**JPMorgan Chase’s** blockchain payments platform is looking to expand its Interbank Information Network (IIN) — built on Quorum, a permissioned blockchain whose infrastructure is based on Ethereum — to Japan as early as January 2020.



In **October**, Amun and Binance announced a partnership to launch the Amun BNB ETP (ABNB) on the regulated segment of the SIX Swiss Exchange.

In **October**, Amun and Bitcoin Suisse announced a partnership to launch the Amun Bitcoin Suisse BTC/ETH ETP (ABBA), the world's first CHF-denominated crypto ETP.

In **November**, Amun launched the Amun Tezos ETP (AXTZ) on the regulated segment of the SIX Swiss Exchange. As a Proof-of-Stake-based crypto asset, AXTZ will offer staking rewards in partnership with Coinbase Custody.

In **November**, Amun announced that it had received an admission to trade seven crypto ETPs in Germany on Börse Stuttgart. In addition, Amun had received an admission to list six crypto ETPs on the BX Swiss Exchange.

In **December**, Amun and Sygnum, a leading digital asset bank, announced that they had launched the Amun Sygnum Platform Winners Index ETP (MOON). The ETP is a useful vehicle for gaining exposure to foundational blockchain protocols.

In **December**, Amun announced that Finansinspektionen, the Swedish Financial Supervisory Authority (SFSA), has approved our Base Prospectus. This approval clears the way for Amun to expand its current set of product offerings of digital asset ETP into the European Union.

## State of Crypto

# Key Quotes

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“We must take the blockchain as an important breakthrough for independent innovation of core technologies.”

**Xi Jinping**

PRESIDENT OF THE PEOPLE'S REPUBLIC OF CHINA



“When David Marcus [Facebook’s head of Libra] came to talk to us about Libra initially, he framed it in ways that were appealing to us about financial inclusion [...] As we learned more about [Libra] and saw the amount of things that were still left to do and the amount of things we still had to do on our own roadmap outside of Libra.”

**Daniel Schulman**

PRESIDENT AND CEO OF PAYPAL

“Facebook already filters content — some people say with bias, some people say it’s great, they’re protecting my safe space [...] So do we want filtered speech or free speech? Do we want filtered transactions or freedom?”

**Warren Davidson**

UNITED STATES CONGRESSMAN

“For us, cryptocurrency is already a significant issue and we can project out pretty easily that it’s going to become a bigger and bigger one. Whether or not that is the subject of some kind of regulation as the response is harder for me to speak to.”

**Christopher Wray**

DIRECTOR OF THE FEDERAL BUREAU OF INVESTIGATION

“There is no common infrastructure to move money around the world at a low cost that is available to everyone [...] If there was a stable low-volatility, scalable version of Bitcoin that we could use today, my life would be so much simpler.”

**David Marcus**

CO-FOUNDER OF LIBRA, FACEBOOK

## State of Crypto

# Crypto Jargon

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A **Blockchain** is an append-only, decentralized ledger that can be used to store data (such as transaction history) in a censorship-resistant way.

**Crypto assets** are digital assets whose global transaction history is stored on a blockchain. They include cryptocommodities (representation of digital resources), cryptocurrencies (alternatives to fiat), and cryptotokens (exchanged for digital goods and services).

A **Crypto Exchange** is a platform that enables the exchange of crypto assets for other crypto assets or fiat currencies.

A **Digital Wallet** is software that interacts with blockchains to facilitate the storage of crypto assets.

A **Halving Event** is when the number of new coins rewarded to miners per block is cut in half.

The **Hash Rate** is the combined number of computations (hashes) performed by all miners within a network per second.

A **Token Sale**, also known as an initial coin offering (ICO), is a fundraising mechanism for blockchain projects where tokens are generated and sold to investors.

**Mining** is a mechanism where individuals within a network solve computationally difficult proofs of work in order to confirm transactions and add new blocks to a blockchain.

**On-chain** refers to information and transactions that are executed and stored explicitly on a blockchain.

**Proof of Stake (PoS)** is a mechanism that selects block creators based on a participant's stake, such as the number of tokens they hold or how long they have participated on the network.

A **Proof of Work (PoW)** is a piece of data which is difficult to produce but easy for others to verify and which satisfies certain requirements. They are often used in the consensus mechanisms of crypto asset networks.

A **Smart Contract** is digital code typically programmed onto a blockchain that enforces a previously-agreed-upon transaction based on preset conditions.

**Stablecoins** are crypto assets which aim to have similar volatility to widely-used fiat currencies like the US dollar.

**Zero-Knowledge Proofs (ZKPs)** enable an individual to provide proof to a verifier that a certain asset or information exists without revealing details about the asset or information itself.

**Binance Coin (BNB)** is a crypto asset issued by the crypto exchange Binance and is used to pay service fees on the exchange.

**Bitcoin (BTC)** was created in 2009 and is the first and most popular crypto asset.

**Bitcoin Cash (BCH)** is a fork of Bitcoin and aims to be a medium for payments.

**Ether (ETH)** is the native crypto asset of the Ethereum blockchain and is used to pay for transaction and smart contracts fees on the network.

**EOS (EOS)** is the EOS.IO network token used to build and run decentralized applications on the network.

**Litecoin (LTC)** is a fork of Bitcoin with a focus on offering faster and cheaper transactions.

**Ripple (XRP)** is a token issued on the Ripple network that focuses on facilitating the transfer of fiat currencies via the network.

**Tether (USDT)** is a stablecoin pegged to the US dollar created by iFinex Ltd.

**Tezos (XTZ)** is a token issued by the Tezos network and is used to vote on Tezos governance decisions and pay for transaction and smart contract fees.

**Zcash (ZEC)** is fork of Bitcoin with an increased focus on privacy through the use of zero-knowledge proofs.



## Research Report

# BNB Investment Thesis

This research report presents Amun's investment thesis for the BNB crypto asset. In this analysis, we begin with an overview of the crypto asset and its parent exchange before discussing the market opportunity of BNB. Next, we delve into the key value proposition of BNB and outline the crypto asset's primary value drivers. Finally, we touch on the impact of various allocations of BNB on an institutional investor's portfolio and highlight the asset's main risks.

DATA AS OF OCTOBER 2019

## BNB Investment Thesis

# Introduction

Created by Binance, the world's most popular crypto asset exchange, BNB was launched as an ERC-20 token on the Ethereum blockchain as a result of a \$15M token sale held by Binance on July 1, 2017 to finance the exchange's development and early operations.

Since the launch of Binance's native blockchain for their decentralized exchange, BNB has migrated to a new blockchain called Binance Chain. BNB acts as the fuel for the whole Binance Chain and Binance ecosystem — given that transaction fees are paid for in BNB for a variety of applications — as well as a means for an investor to enjoy various discounts and promotions on Binance's products. We show the key metrics for BNB below (Fig. 1).

Notably due to the use of a token burn mechanism — wherein a certain amount of BNB is burned and removed from the crypto asset's total circulating supply, based on the amount of tokens (in USD dollars) equivalent to 20% of Binance's proceeds raised from its trading volume.

Figure 1: BNB Key Metrics

BNB Key Metrics		As of October 22, 2019
Ticker	BNB	
Price (USD)	\$18.31	
Circulating Supply (BNB)	185,474,825 BNB	
Market Capitalization (USD)	\$3,396,044,045.75	

For the rest of this report<sup>1</sup>, we'll adapt Multicoin Capital's definitions<sup>2</sup> of the key terms within the Binance ecosystem, which are as follows:

- **Binance:** The entire international brand for the crypto asset company which is based in Malta.
- **Binance Centralized Exchange (CEX):** Binance's main crypto asset exchange platform.
- **Decentralized Exchange (DEX):** An exchange which is not entirely controlled by a central operator or where the exchange does not have control over a user's assets.
- **Binance Chain:** Binance's native blockchain that hosts Binance's decentralized exchange.
- **Binance DEX:** The decentralized exchange that runs on Binance Chain.
- **Binance Fiat-Crypto Exchanges:** The entities being established in jurisdictions around the world (e.g. Uganda, Singapore, Jersey, and the United States) by Binance and its partners to facilitate fiat-crypto exchange.

No single chart tells the story of Binance's tremendous growth since the summer of 2017 better than that of BNB's performance (Fig. 2).



Whilst, like any financial asset, BNB's value at any point is driven to an extent by speculation and changes in wider crypto-market conditions, the crypto asset is also closely tied to significant developments in Binance and the company's range of products — such as Binance's early rise to prominence during the initial coin offering bubble, the launch of Binance Chain, its token burns, and the increasing non-exchange-related use cases for BNB. In general, Binance is well positioned to continue its strategy of expanding into avenues such as futures, margin trading, lending, fiat-crypto on-ramps, and stablecoin-related initiatives. We believe that Binance is well placed to eventually succeed in a number of these verticals.

Given BNB's key value driver is the success of Binance, the crypto asset is also well placed to benefit from Binance's continued dominance.

However, it should be noted that Binance and BNB also shoulder a number of noticeable risks, any one of which could negatively affect the success of both. Most noticeably, Binance and BNB are vulnerable to some degree of regulatory risk due to Binance's wide range of listings, the regulatory status of BNB in the United States, and roadblocks they could face with their fiat-crypto on-ramps.

# BNB Investment Thesis

## Background

### Organization

Binance is an organization currently domiciled in Malta — though the majority of the team is distributed around the world. The company allows users to trade crypto assets through spot, options, futures, and margin trading. Binance is known for using a strategy of regulatory arbitrage to base its operations in regions most favourable towards crypto assets — having already moved their headquarters several times, from China to Japan and then to Malta. The organization chart (Fig. 3) outlines the key people within Binance, including Changpeng Zhao, its CEO.



**Changpeng Zhao**  
CEO OF BINANCE



**Gin Chao**  
CHIEF STRATEGY OFFICER



**Ted Lin**  
CHIEF GROWTH OFFICER



**Yi He**  
CHIEF MARKETING OFFICER



**Wei Zhou**  
CHIEF FINANCIAL OFFICER



**Ella Zhang**  
HEAD OF BINANCE LABS

Figure 3: Key Binance Personnel

### Binance Exchange

Binance's exchange product at first offered only a crypto-crypto spot trading platform but has since expanded to fiat-crypto on-ramps, a futures platform, and margin trading. The exchange's early unique selling point was that it offered an easy way for investors to access the less popular tokens which may have recently undergone a token sale. In addition, the exchange's rise to prominence can also be attributed to the ease with which it allowed investors to access the long tail of crypto assets.

Moreover, the product expertise from the members of the Binance executive team, who have experience at other companies such as Blockchain.com and OkCoin, also helped. Binance's main revenue generator is the trading fees it makes when customers use the products in the Binance ecosystem. As a result, its revenue is a function of the volume of its numerous trading pairs. The following chart (Fig. 4)<sup>4</sup> shows the growth in trading volume on Binance's spot exchange since its inception.

## Binance Chain and Decentralized Exchange

As previously mentioned, one key value proposition of BNB is the role that it plays in Binance Chain — Binance’s native blockchain. The primary use case of Binance Chain is to facilitate activity on Binance’s decentralized exchange which provides an alternative marketplace for issuing and exchanging crypto assets in a more decentralized manner than through the Binance centralized exchange.

Decentralized exchanges typically afford users more freedom and censorship resistance of their assets, as well as the ability to easily build third-party tools and applications on top of the platform. The chart (Fig. 5) below compares volume across Binance DEX to Uniswap — one of the more popular Ethereum-based decentralized exchanges<sup>5</sup>.

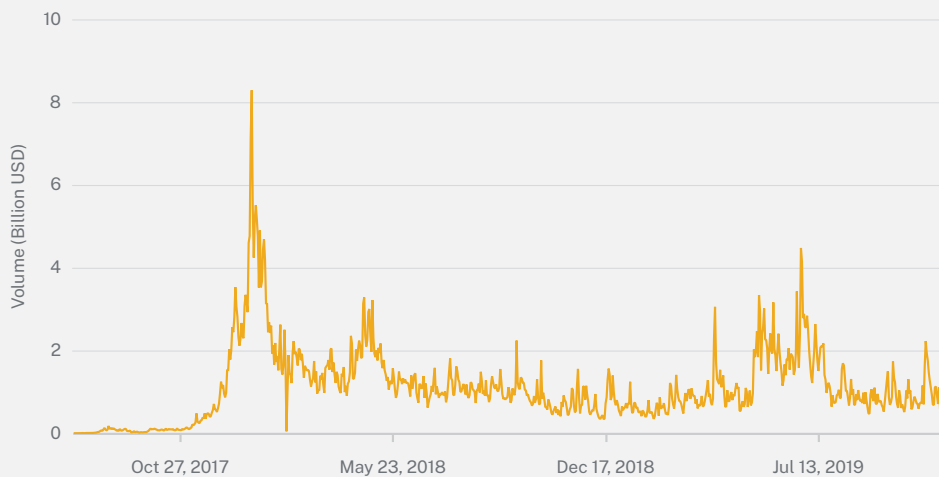


Figure 4: Binance Spot Trading Volume

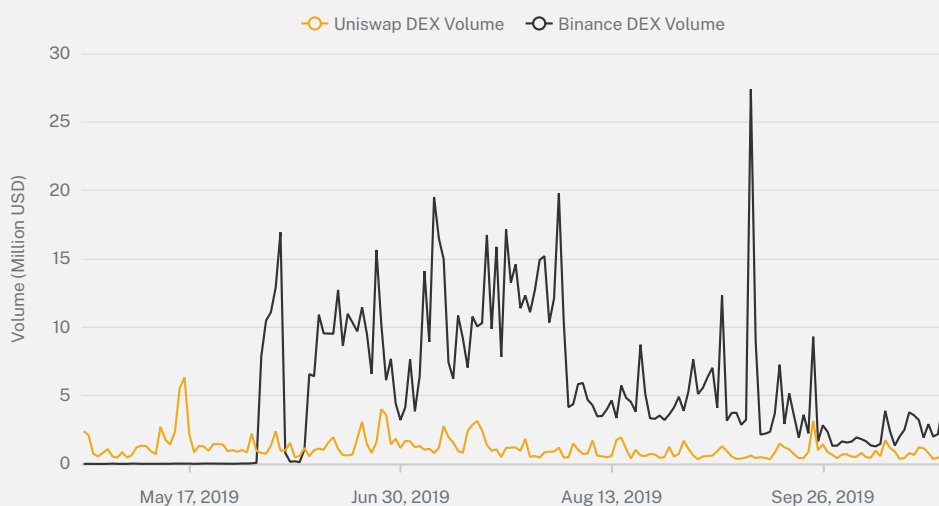


Figure 5: Binance DEX and Uniswap Volume

While Uniswap certainly isn't the most popular decentralized exchange, it ranks highly, especially for certain crypto assets such as Maker (MKR) and Dai (DAI). Since Binance DEX's launch in March 2019, its volume has consistently been greater than Uniswap; for example, between July and September 1 2019, Binance DEX's average volume was around \$8.38 million compared to \$1.11 million for Uniswap. We can compare other popular decentralized exchanges to Binance DEX by taking a sample of their various 24-hour trading volumes (Fig.6)<sup>6</sup>.

Figure 6: Exchange Trading Volumes

24H Trading Volumes	As of October 21, 2019
Binance DEX	\$4,365,955
IDEX	\$895,065
OasisDEX	\$393,395
Kyber	\$858,507
Uniswap	\$760,177
RadarRelay	\$112,998

Even in this case, Binance DEX is generating greater trading volumes than the other Ethereum-based decentralized exchanges. The key reasons for this are, first, the rapid appreciation of BNB since the launch of Binance Chain which has helped in turn to drive interest in other assets which trade with BNB (all trades on Binance DEX are, by default, BNB-denominated) and second the fact that Binance Chain has optimized for throughput over decentralization — making it an easier platform to use for settlement of exchange trades when compared to Ethereum which is more optimized for smart contract and token issuance.

Binance Chain uses a Tendermint Byzantine Fault Tolerant (BFT)<sup>7</sup> consensus mechanism to facilitate a blockchain which allows users to send and receive BNB and other tokens. This has allowed the blockchain to be designed with both low latency (i.e. blocks are finalized every second on average) and low costs in mind. The initial validators are selected from 'trusted members of the Binance community' — likely at this point to come exclusively from Binance's internal team<sup>8</sup> and partners. However, the aim is for more members to be added to the Binance blockchain as the ecosystem matures — in a similar way to other delegated proof of stake or BFT crypto assets such as EOS, NEO, or Cosmos.



# BNB Investment Thesis

## Market Opportunity

### The Exchange Landscape

The chart<sup>9</sup> below (Fig. 7) plots trading volume for some of the most popular crypto asset exchanges, including Coinbase, Bitfinex, Poloniex, and Binance since the latter's launch in the summer of 2017.

It helps visualize how quickly Binance's spot exchange has managed to dominate the industry; for example, since its launch Binance has garnered around 32.53% of total trading volume out of the selected exchanges in USD terms, compared to 24.04% for OKEx, 11.32% for Bitfinex, 7.97% for Bittrex, 7.83% for Coinbase, 4.68% for Poloniex, 4.54% for Bitstamp, and 1.29% for Gemini.

### Listings

An integral part of Binance's growth strategy has been its ability to benefit from becoming the premier platform for the trading of the long tail of the crypto asset market. The best example of this is the period immediately following Binance's launch, when the exchange managed to rise to prominence by listing recently-made-liquid tokens from projects which had conducted token sales. This can be seen by the bar chart<sup>10</sup> (Fig. 8) where Binance's number of spot trading pair listings is compared to that of its main competitors. Binance currently stands out as the exchange with the most trading pairs at 556 with its nearest rivals being OKEx with 407 and Bitfinex with 453.

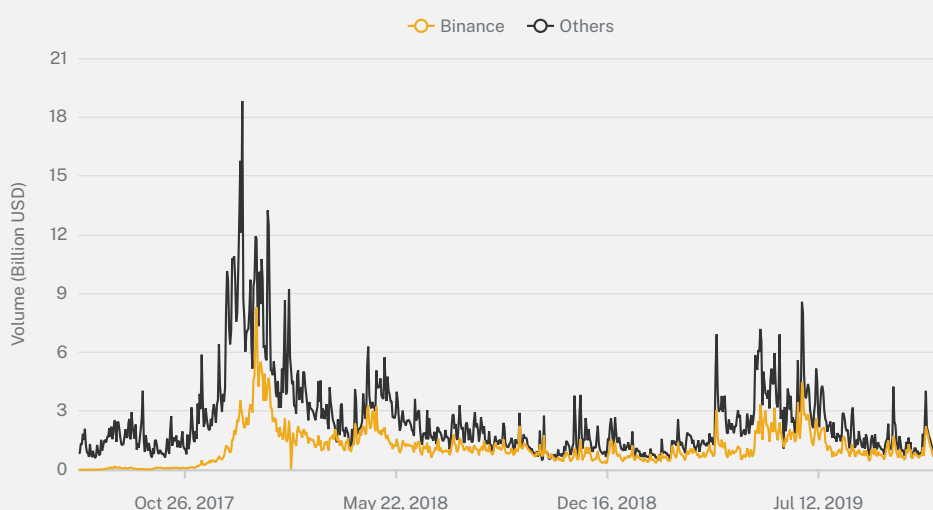


Figure 7: Comparison of Exchange Volume

It is important to note that for exchanges like Bitstamp, Gemini, and Coinbase, their exchange-listing growth strategy has been different from Binance — they have optimized for offering a smaller range of trading pairs with a focus on fiat on-ramps and the listing of a smaller range of the most popular crypto assets. It goes without saying that thus far the exchange-listing growth strategy used by Binance, OKEx, and Bitfinex seems to have been more successful from a business perspective — though this could change going forward as regulators take a more heavy-handed approach to ensuring exchanges follow the appropriate security and secondary market laws. To highlight Binance's exchange-listing strategy we show the growth in trading pairs on Binance<sup>11</sup> over time (Fig. 9) as estimated using the Binance API.

## Understanding BNB

The price of BNB at any given point is determined by the demand and supply for the token on secondary markets. The demand for the token is a function of its various use cases.

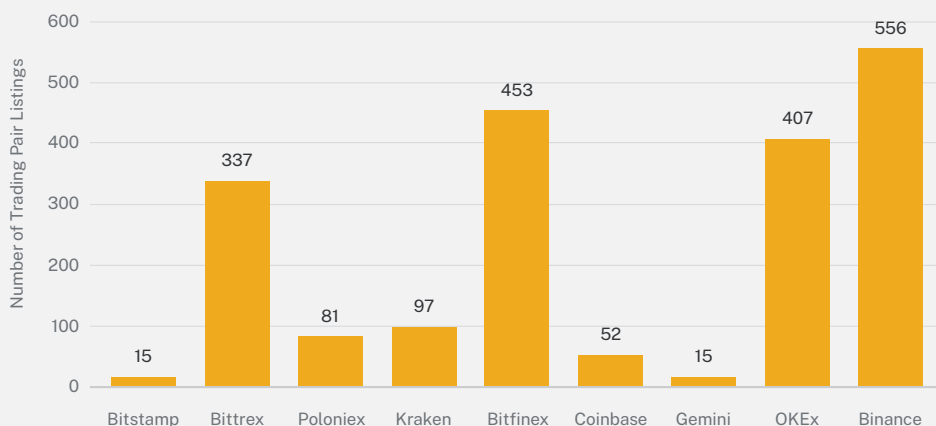


Figure 8: Comparison of Exchange Trading Pairs

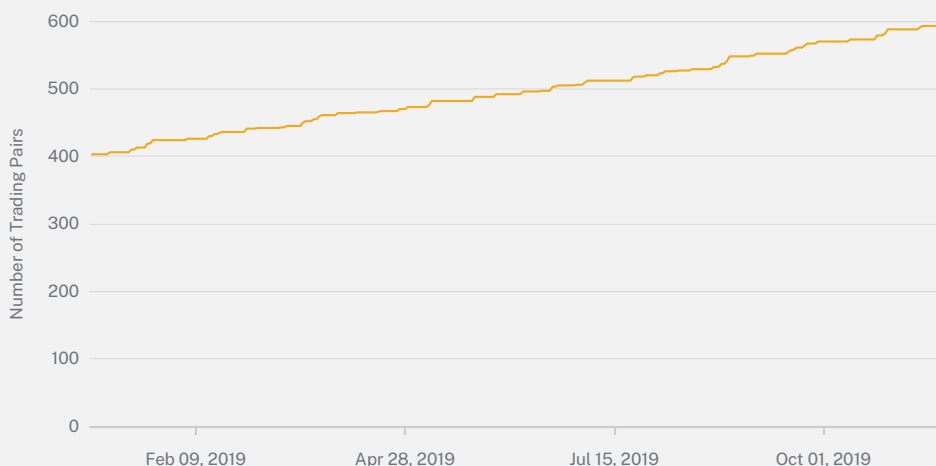


Figure 9: Growth in Binance's Trading Pairs

Note that there is a slight discrepancy in the data for Fig. 9 and Fig. 8 due to inconsistencies in the underlying canonical data source.

**BNB Quarterly Burns** — Binance has committed to using 20% of proceeds from fees made from trading volume to burn BNB to reduce the asset's circulating supply up to a maximum of 100M BNB. This burn is carried out once a quarter and as of October 22 2019, a total of 14,524,134 BNB has been burned (See Fig. 10 and Fig. 11). In addition, the token burn gives us an indication of Binance's estimated profits which were around \$447 million in 2018 and over \$380 million thus far in 2019. Please note that the quarterly profit figures are only estimates of Binance's financial performance.

Quarter	Burn Amount (BNB)	% of BNB Supply	BNB Price (USD)	Burn Amount (USD)	Est. Profit (USD)
Q3 2017	986,000	0.49%	\$1.50	\$1,500,000	\$7,500,000
Q4 2017	1,821,586	0.91%	\$21.96	\$40,300,000	\$201,500,000
Q1 2018	2,220,314	1.11%	\$13.52	\$30,000,000	\$150,000,000
Q2 2018	2,528,767	1.26%	\$12.93	\$33,200,000	\$166,000,000
Q3 2018	1,642,985	0.82%	\$10.34	\$16,200,000	\$81,000,000
Q4 2018	1,623,818	0.81%	\$5.83	\$10,000,000	\$50,000,000
Q1 2019	829,888	0.41%	\$18.79	\$15,600,000	\$78,000,000
Q2 2019	808,888	0.43%	\$29.47	\$23,838,000	\$119,190,000
Q3 2019	2,061,888	1.10%	\$17.79	\$36,700,000	\$183,500,000

Figure 10: Binance Quarterly Burns Overview

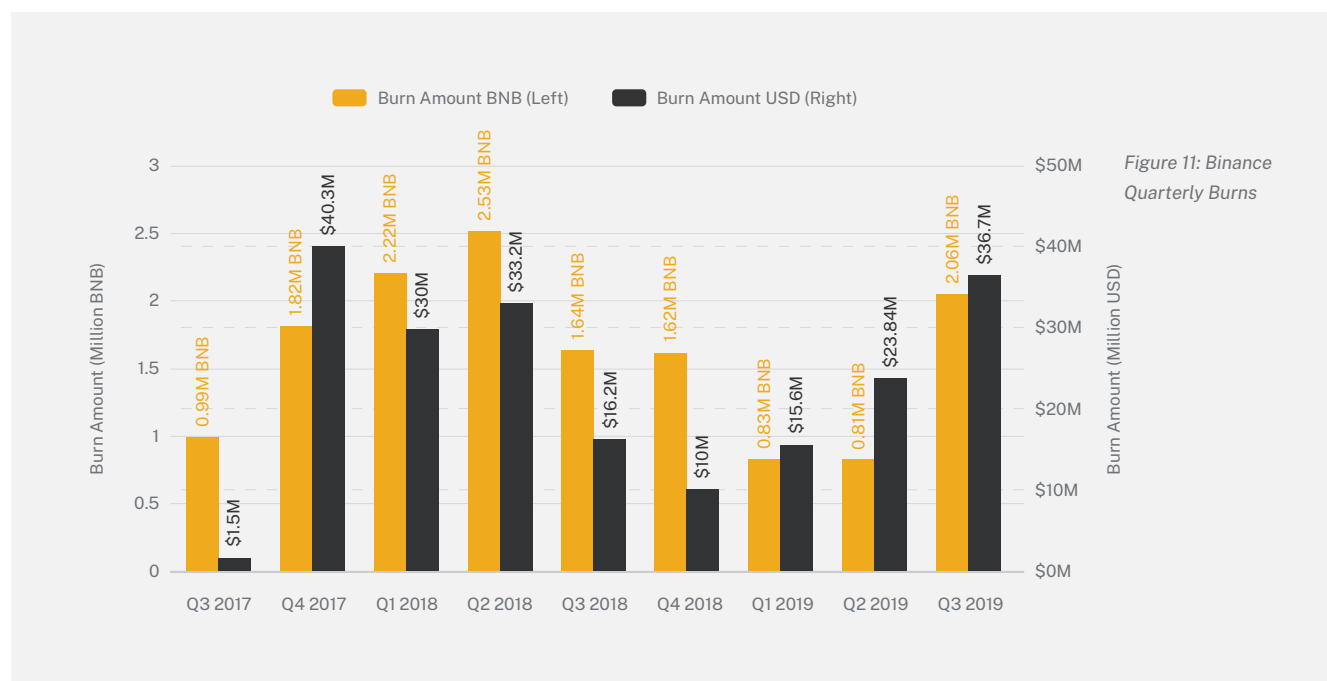


Figure 11: Binance Quarterly Burns

**Discounts** — In addition, BNB offers users a number of discounts and privileges associated with the exchange such as discounts on trading fees, the ability to participate in the token distribution lottery on Binance Launchpad<sup>12</sup>, as well as non-exchange use cases like payments for goods. The tables below (See Fig. 12 and Fig. 13) show the fee discount schedule on Binance's CEX and DEX respectively.

Quarter	Discount Rate
1st Year (July 2017)	50%
2nd Year	25%
3rd Year	25%
4th Year	12.5% (est.)
5th Year	6.25% (est.)

Figure 12: Binance CEX Fees Schedule

Transaction Type	Pay in Non-BNB Asset (Estimated Equivalent)	Pay in BNB
New Order	0	0
Cancel (No Fill)	0.00025 BNB	0.00005 BNB
Order Expire (No Fill)	0.00025 BNB	0.00005 BNB
IOC (No Fill)	0.0001 BNB	0.000025 BNB

Figure 13: Binance DEX Fees Schedule

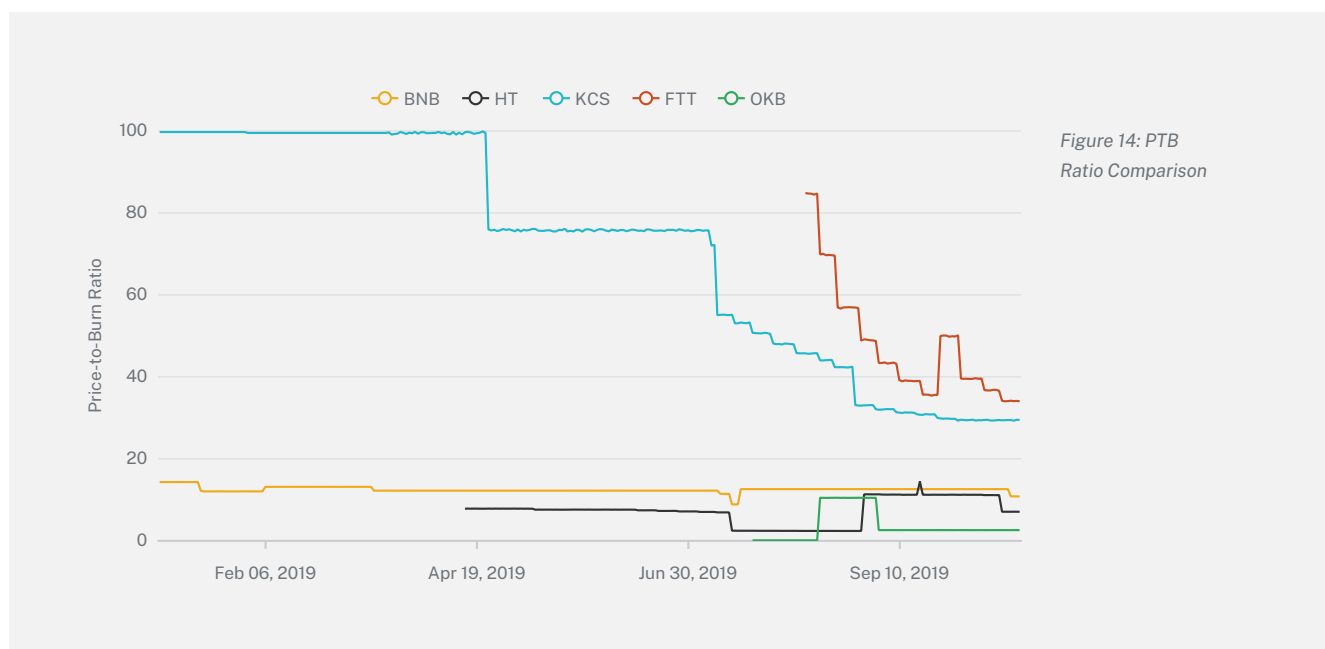
## Price-to-Burn Ratio

Undoubtedly, the key data point for BNB is the quarterly token burn mechanism. Given Binance's financial success to date, its burn mechanism is even more attractive when compared to other crypto assets which also use a similar mechanism. To do such a comparison, we introduce the Price-to-Burn Ratio (PTB) defined as follows:

$$PTB = \frac{\text{Market Capitalization (USD)}}{\text{Cumulative Amount Burned (USD)}}$$

Where **Market Capitalization** is the total dollar value of all the circulating units of a given crypto asset (which is equivalent to the market capitalization of a stock), and **Amount Burned** is the cumulative USD amount of the crypto asset burned.

The PTB allows for comparisons of the relative value of different crypto assets which use the burn mechanism. In this case it helps to show that, relative to other tokens such as Huobi Token (HT) and Maker (MKR), BNB is an attractive investment when its value is considered as solely derived from its burn mechanism. The graph on the next page (Fig. 14) compares the PTB ratio of BNB to that of Huobi Token (HT), KuCoin Shares (KCS), FTX Token (FTT), and OKB Token (OKB).



BNB's PTB ratio generally trends lower than the majority of the other coins except for both Huobi Token and OKB Token. The mean values for the burn-mechanism crypto assets in 2019 including Maker (MKR) and UNUS SED LEO (LEO) are as follows: BNB (12.37), HT (7.12), KCS (71.55), MKR (889.26), FTT (47.79), LEO (221.54), and OKB (3.58). Based on the PTB ratio alone, BNB seems to be valued at a premium to that of its nearest competitor's tokens — OKB and HT — but at a steep discount to other exchange tokens, in particular KCS and LEO.

We imagine that the market has already priced in the majority of the value created by the token burns and if so, it is likely that further BNB appreciation in the future will either be driven by its increased demand in Binance's alternative verticals (i.e. Binance Chain, Lending, Stablecoins, etc.) or by large, unexpected increases in the USD value of BNB burned in future quarters.

## Future Growth Opportunities

Binance has a number of other extremely viable future verticals such as Binance DEX and their other Decentralized Finance (DeFi) products, such as margin trading, lending, on-ramp exchanges, and their stablecoin initiatives. The success of any of these verticals could positively affect the value of BNB, as each vertical may well find a way to integrate the crypto asset — likely through an exclusive access model.

## BNB Investment Thesis

# Portfolio Allocation

Similar to Bitcoin, an investment in BNB could permit an investor to diversify their portfolio and maximize risk-adjusted returns. Here we show the correlation of the returns of BNB compared to Bitcoin (BTC) and several exchange-traded products: SPDR S&P 500 ETF Trust (SPY), iShares 20+ Year Treasury Bond ETF (TLT), and SPDR Gold Trust (GLD). Fig. 15 shows the correlation of BNB's returns to the other assets and Fig. 16 overpage shows assets' cumulative returns since the start of 2019.

BNB's returns correlation with SPY, TLT, and GLD is even lower than BTC in 2019 — 0.04, -0.02, and 0.07 respectively for BNB compared to -0.15, 0.09, and 0.26 for BTC. This suggests that BNB could offer additional diversification benefits that BTC would not be able to. The primary driver for BNB's uncorrelated returns is undoubtedly the launch of Binance Chain (as well as its futures platform) and it is probable that its risk profile will fall more in line with the rest of the crypto asset market over time.

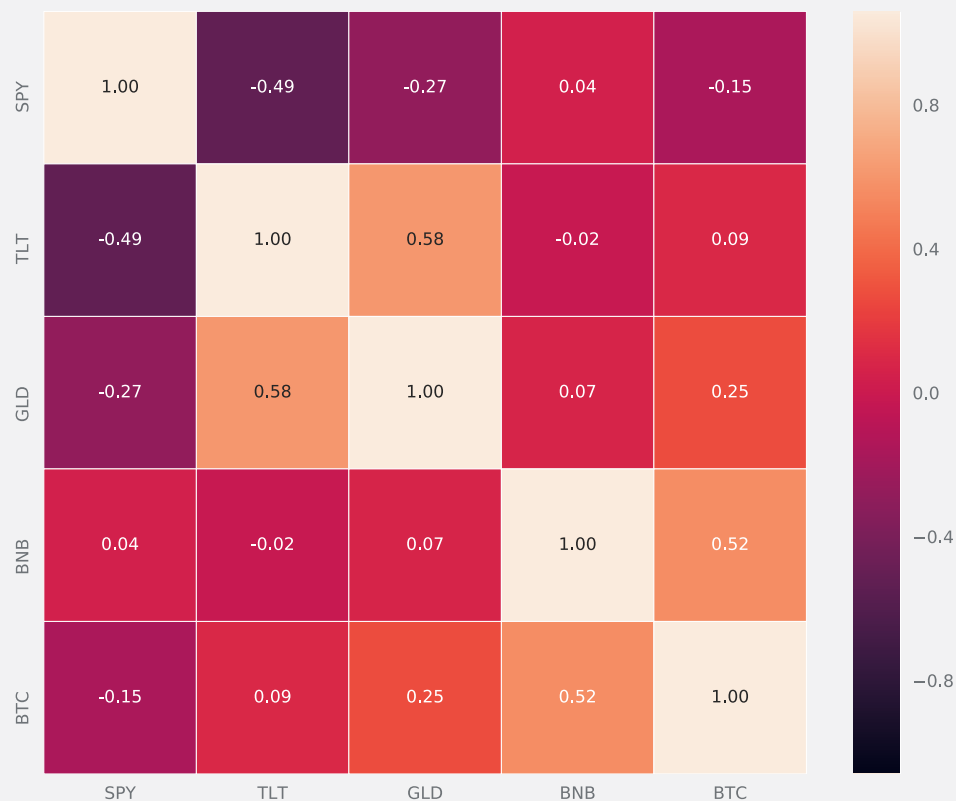




Fig. 16 below gives a further view of the effect of the launch of Binance Chain and its futures platform on BNB's performance. As of October 21 2019, BNB had returned 200.81% compared to BTC's 122.71%, SPY's 21.71%, TLT's 16.10%, and GLD's 15.29%. This analysis can be taken further by constructing several portfolios (Fig. 17) which contain varying amounts of BNB in order to better understand the asset's ability to diversify a portfolio<sup>13</sup>.

Portfolio A	SPY 60%	TLT 40%	
Portfolio B	SPY 58.5%	TLT 39%	GLD 2.5%
Portfolio C	SPY 58.5%	TLT 39%	BTC 2.5%
Portfolio D	SPY 58.5%	TLT 39%	BNB 2.5%
Portfolio E	SPY 57%	TLT 38%	BTC 5%
Portfolio F	SPY 57%	TLT 38%	BNB 5%

Figure 17: Portfolio Tearsheet

	Portfolio A	Portfolio B	Portfolio C	Portfolio D	Portfolio E	Portfolio F
Annualized Returns	22.88%	22.77%	25.45%	26.69%	28.01%	30.50%
Annualized Volatility	7.13%	6.98%	6.98%	7.38%	7.32%	8.23%
Sharpe Ratio	2.98	3.03	3.41	3.40	3.60	3.50

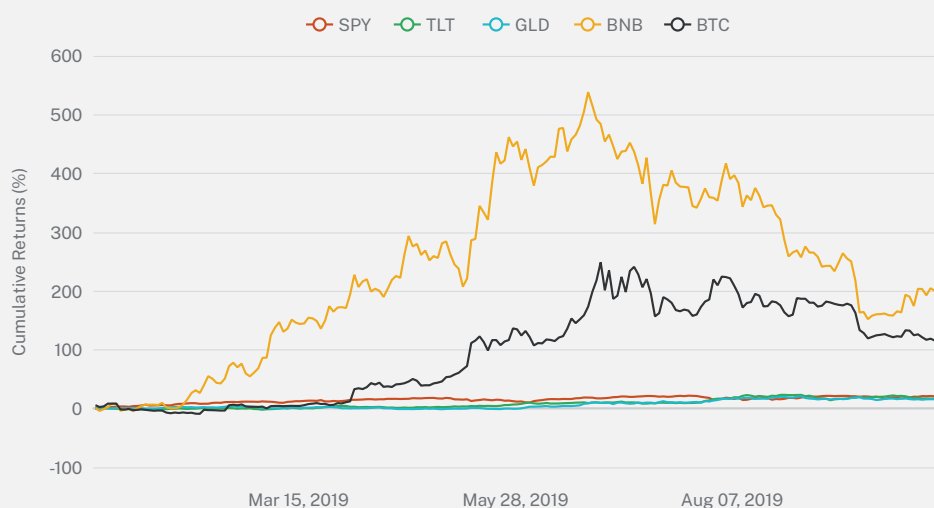


Figure 16: Asset Cumulative Returns

# BNB Investment Thesis

## Risks

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### Regulation

Despite the strides that Binance have made in recent months to ensure that their products are regulatorily compliant, such as Binance Jersey and Binance US, the regulatory status of BNB in the United States is still unclear. This is largely due to the fact that the token was launched following an initial coin offering (ICO) and the U.S. Securities and Exchange Commission (SEC) has generally had an unfavorable view of them. It is unclear how much of a problem this will be moving forward, especially given the fact that Binance is neither a US-based exchange nor are its products dominated by US clients.

In addition, the listing of BNB on Binance's US-facing exchange is a positive sign that the exchange has received legal guidance that the crypto asset is compliant with U.S. securities law. Nevertheless, regulatory compliance specifically for BNB — as well as other tokens listed on Binance Chain or launched through Binance Launchpad — is likely to be an ongoing issue for Binance, with the primary question being just how much of an issue. However, the recent news of Block.one's reasonable settlement<sup>14</sup> with the SEC over the EOS token sale is perhaps a positive sign for other well-capitalized firms such as Binance which have been involved in past token sales.

### Token Distribution and Centralization Risk

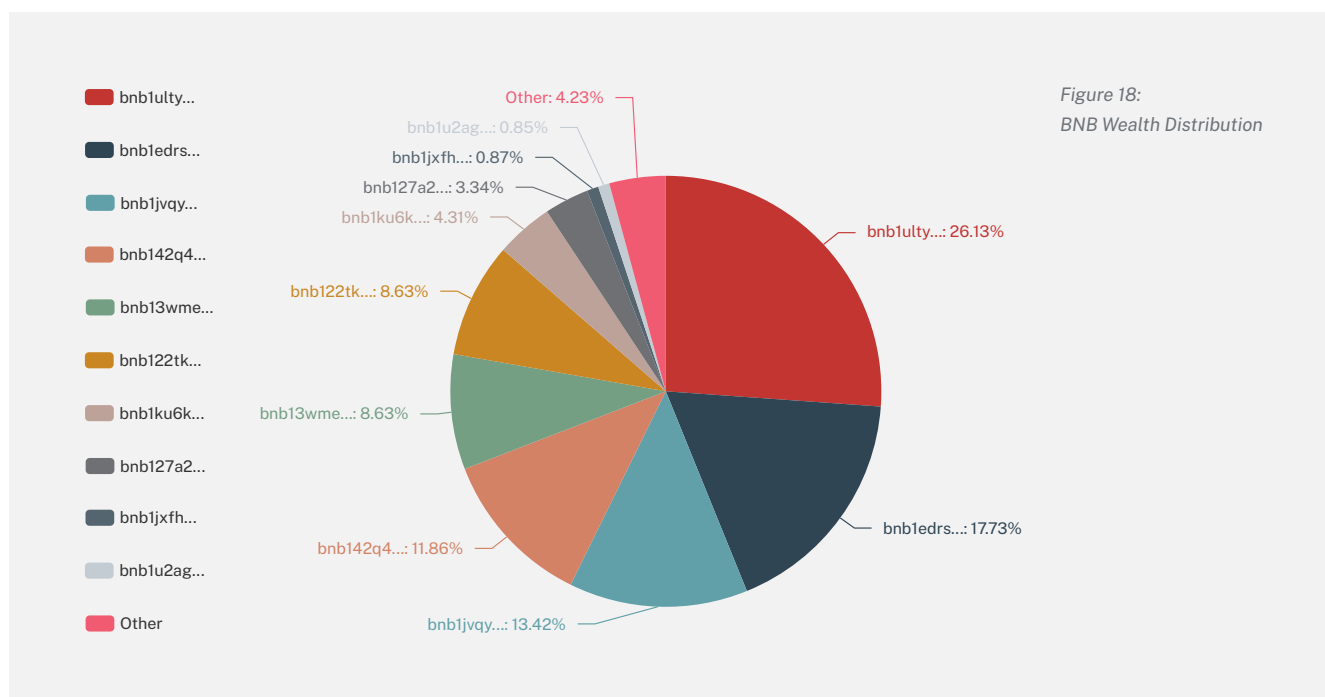
Unlike a crypto asset like Bitcoin, BNB has strong ties to Binance, a centralized entity. As a result, there is an increased centralization risk for the crypto asset because an event which negatively affects Binance (such as regulatory or management issues) will undoubtedly affect the value proposition of BNB which is derived from the financial success of the exchange and the popularity of Binance Chain. This fact is reflected in the token distribution as of October 20, 2019 where 95.77% of BNB's token supply is controlled by the top 10 addresses<sup>15</sup> (Fig. 18). For BNB, to a much larger extent than crypto assets of a similar fully-diluted market capitalization, its value is tied to a very obvious risk factor — in this case Binance.

## Burning Valuation Model

Finally, there have been questions<sup>16</sup> raised about why BNB's token burn mechanism should be intrinsically value accretive. Superficially, the mechanism seems similar to a share repurchase as a burn mechanism works by acquiring an asset from its circulating supply — either through direct purchases or from another source — and then permanently removing it from supply.

In the case of a share repurchase, the reason why it can be said to be value accretive is that this means that the outstanding float of shares, on a per share basis, has a larger claim on the net present value of the given company's free cash flow.

However, in the case of a token burn model, the token does not act as a claim on an entity's cashflow in the first place. One could perhaps argue that the funds used to burn tokens are the cashflow in question but this simply leads to a circularity as, in this case, the tokens have no claim on cashflow outside of the burn mechanism — unlike in the share repurchase example. For this reason, it could be argued, as some have done, that tokens which use a burn mechanism have no intrinsic valuation. Given, the proliferation of the burn mechanism within the crypto asset space, however it is likely that an alternative theoretical explanation will eventually be provided for the value accretive effect of the mechanism.



## BNB Investment Thesis

# Conclusion

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This research report has discussed an investment thesis for BNB by carefully outlining its core value propositions — the burn mechanism, the various discounts its holders are entitled to, and its role as the native crypto asset in Binance Chain and integral place in the wider Binance ecosystem. As each of the verticals around these value propositions continue to grow, BNB is perfectly situated to see value accrue to it. We believe that Binance Chain and the exchange's stablecoin initiatives are likely to be the main catalysts for the continued growth in value of BNB over the next year. When we analyze the burn mechanism more closely, we see that BNB's relative valuation under the PTB ratio is more attractive than all but two of the other crypto assets which use a similar mechanism. Moreover, the amount of assets burned under Binance's burn mechanism vastly outstrips its competitors in absolute terms. While it is difficult to understand exactly how BNB's role as a discount token and as the native crypto asset on Binance Chain affect its price, these two factors are undeniably positive drivers of the crypto asset in the long term.

Despite the multitude of positive developments in BNB's history as well as its optimistic future, the crypto asset is subject to some risks, namely regulation, centralization risk, and the theoretical underpinnings of its valuation model. However, we believe that all of these risks can potentially be mitigated going forward as Binance continues to launch products within regulated frameworks and with greater regulatory clarity, whilst valuation frameworks around crypto assets continue to improve. Since the initial coin offering of 2017 Binance has seen tremendous growth and there is no reason to doubt that this won't continue. This means that BNB is in a prime position to be one of the best performing large cap crypto assets of the next twelve months.

## Endnotes

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1) All data is sourced from Coin Metrics unless stated otherwise – 2) As defined in Binance Coin (\$BNB) Analysis and Valuation — <https://bit.ly/32rQwml> – 3) <https://tcn.ch/2NhRrRE> – 4) Cryptocompare – 5) Alethio, where we only count trades where BNB is either the quote or base asset – 6) <https://dex.watch> – 7) <https://github.com/tendermint/tendermint> – 8) <https://docs.binance.org/blockchain.html> – 9) Cryptocompare – 10) CCXT and Binance – 11) CCXT – 12) <https://bit.ly/35M0FMz> – 13) Risk-free rate is taken to be the 3 month Treasury bill rate as of October 18 2019 — 1.63% – 14) <https://www.sec.gov/news/press-release/2019-202> – 15) <https://explorer.binance.org/asset/BNB> – 16) <https://bit.ly/2E1fu0T>

## Research Report

# Tezos Investment Thesis

This research report presents Amun's investment thesis for the Tezos (XTZ) crypto asset. In this analysis, we begin with an overview of the crypto asset and its parent exchange before discussing the market opportunity of Tezos. Next, we delve into the key value proposition of Tezos and outline the crypto asset's primary value drivers. Finally, we touch on the impact of various allocations of Tezos on an institutional investor's portfolio and highlight the asset's main risks.

DATA AS OF DECEMBER 2019



## Tezos Investment Thesis

# Introduction

Tezos is a blockchain for smart contracts which aims to improve on other competing smart contract platforms by utilising a consensus mechanism called Liquid Proof of Stake in order for nodes within the Tezos network to come to agreement. It also validates blocks and uses on-chain governance where holders of the Tezos (XTZ) crypto asset are able to vote of key development decisions for the blockchain. In order to understand the Tezos blockchain and the XTZ crypto asset, it is crucial that one first has a good understanding of certain foundational concepts which we define below.

- **Smart Contracts:** A piece of code which exists on a distributed blockchain network and enforces the business logic of an arrangement between different users or addresses on the network.
- **Proof of Work:** A consensus mechanism within a blockchain network which deters unwanted behaviour on the network by requiring nodes or miners, who wish to create new blocks in the blockchain, to execute an algorithm which is computationally expensive to solve in order to ensure the economic security of the blockchain. Miners are rewarded with newly created units of the crypto asset native to the blockchain.
- **Proof of Stake:** An alternative consensus mechanism to Proof of Work where instead of a miner being required to expend computational power in order to solve the required algorithm to create a new block, validators/miners must place down a deposit of the blockchain's native crypto asset which could be slashed (where funds are forfeited due to a violation of the protocol's role) if the validator breaks the rules of the network. Miners are rewarded with newly created units of the crypto asset native to the blockchain.
- **Liquid Proof of Stake:** A variant of Proof of Stake where users are able to delegate their own holdings of their crypto asset to validators who, in turn, are involved in the process to validate blocks. This ensures that all users do not see the real value of their holdings reduce over time due to inflation.
- **Consensus Mechanism:** The means by which nodes within a given blockchain network come to agreement on the current state of the blockchain and its blocks.
- **On-chain Governance:** A system wherein decisions about the future of development for a given blockchain network are made by those who hold the crypto asset.

Figure 1: XTZ Key Metrics

Tezos Key Metrics		As of December 10, 2019
Ticker	XTZ	
Price (USD)	\$1.44	
Circulating Supply (XTZ)	660,373,612 XTZ	
Market Capitalization (USD)	\$952,043,633	
Nominal Staking Yield (%)	6.77%	



This report presents Amun's investment thesis for the Tezos crypto asset<sup>1</sup>. The Tezos blockchain and XTZ were created to solve some of the major issues its founders, Arthur and Kathleen Breitman, had with existing crypto assets — namely Bitcoin and Ethereum. The key issues, as pointed out in the 2014 Tezos white paper<sup>2</sup>, were the problem of forks due to governance disagreements, the various shortcomings of Proof of Work, and security concerns about smart contracts. Tezos was marketed as a solution to these problems and managed to raise \$232 million during a token sale in the summer of 2017. In Fig. 2 we show the most prominent token sales<sup>3</sup> and highlight the amount raised by Tezos in comparison — which is the third largest token sale to date.

In order to properly understand the value of Tezos and the XTZ crypto asset, one must first understand the value of Tezos' unique selling points when contrasted with that of its largest competitor, Ethereum. The crypto asset's ability to accrue value and capture an increasingly large segment of the smart contract market will be determined by the market's judgement of the importance of on-chain governance, (Liquid) Proof of Stake, and formal verification — the process of proving that a given algorithm or smart contract runs exactly as it has been specified to run. The latter factor should help reduce the prevalence of bugs in smart contract code.

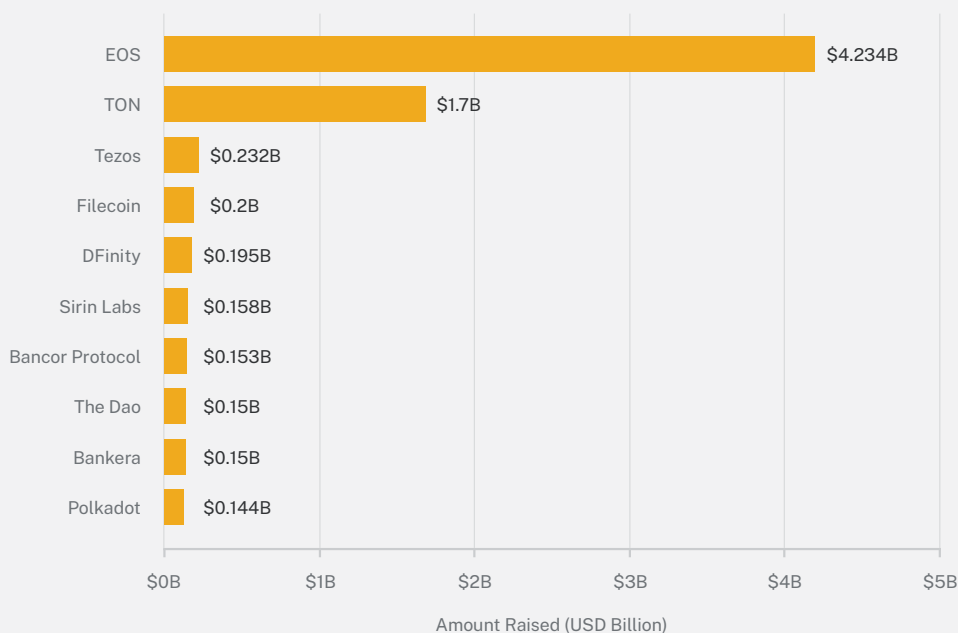


Figure 2: List of Prominent Token Sales by Amount Raised (USD)

The smart contract market is extremely competitive, with a slew of crypto assets and blockchain networks constantly being launched to compete with Ethereum’s market share. The chart<sup>4</sup> below (Fig. 3) compares the market share of Ethereum (ETH) and Tezos (XTZ) to the rest of the smart contract market as of December 10, 2019.

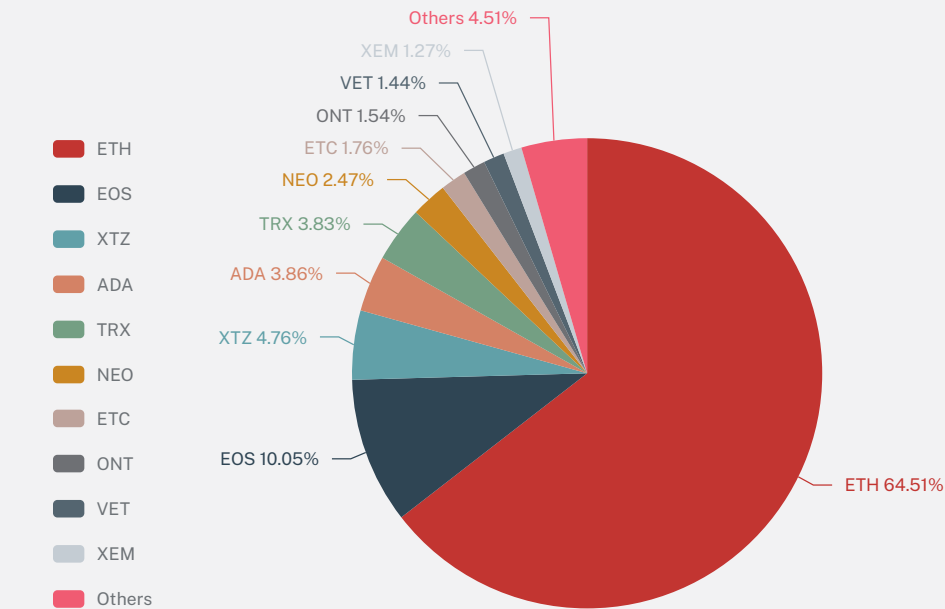


Figure 3: Breakdown of Smart Contract Platforms' Market Share

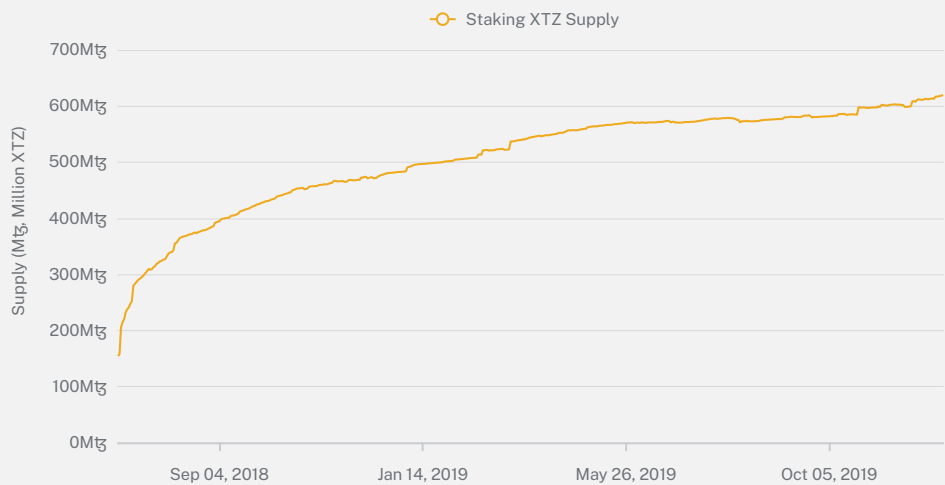


Figure 4: XTZ Supply Over Time

# Tezos Investment Thesis

## Background

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### Baking

Baking (typically called 'staking') is the process on Tezos which is analogous to mining on the Bitcoin network where new blocks are published and validated by entities in the Tezos network before being appended to the blockchain. The key difference is that instead of miners using computational power to solve Proofs of Work to mine blocks, here validators of blocks are chosen pseudo-randomly based on the size of the XTZ deposit. There are three important types of users involved in the baking process in Tezos:

- **Bakers:** Entities that are chosen randomly every 4,096 blocks ( $\approx$  3 days) to publish blocks. Bakers earn a block reward of 16 XTZ per block and also, if they hold at least 8,000 XTZ (called a 'roll'), can qualify as a 'delegate' wherein other users are able to delegate their XTZ to be baked on their behalf by the baker — allowing the baker to take a fee at their discretion. Bakers who receive the delegated XTZ of other users must place down an additional bond to ensure that 8.25% of total circulating XTZ is slashable at all times.
- **Endorsers:** Every block, 32 bakers are randomly selected to verify the last block which was published by a baker. Priority 1 endorsers receive 2 XTZ for each block they endorse and priority 2 endorsers receive 1 XTZ for each block they endorse.
- **Delegators:** Refers to an XTZ holder who created a delegation of their XTZ and appointed a given baker's address. The delegator maintains custody of their funds, yet their funds are counted towards the baker's staking balance.

Under common circumstances, the delegator expects to receive a slice of the baking and endorsing block rewards that the baker produces. The baker, on the other hand, normally charges a service fee, a percentage of the rewards, in return. What the actual service terms are (i.e. fees charged, reward payout schedule, etc) varies from baker to baker. Both bakers and endorsers are rewarded through monetary inflation in XTZ where the inflation rate is set such that the monetary base of XTZ tokens grows at a fixed rate of around 5.51% every year. This means that if 100% of XTZ tokens are staked then annual yield for bakers would be around 5.51%; conversely, if only 50% of circulating XTZ tokens were staked then the yield would be around 11%. The chart (Fig. 4) to the left shows XTZ circulating supply over time since its Genesis block, the percentage of said supply which is staked, and the percentage of said supply which is delegated.

## Governance

As previously mentioned, a key feature of Tezos is its on-chain governance wherein XTZ holders are able to make decisions on the future of protocol development on Tezos. On May 29 2019, Tezos carried the first amendment process of its protocol based on its on-chain governance feature; in this case, one of the amendments led to the size of a 'roll' being reduced from 10,000 XTZ to 8,000 XTZ<sup>5</sup>. The governance or amendment process can be broken down into four discrete stages<sup>6</sup> which each last eight baking cycles (i.e. 32,768 or 22 days, 18 hours), meaning the entire governance process lasts around three months (Fig. 5 shows the voter turnout on Tezos over the year):

- Proposal Period:** Bakers submit amendment proposals on-chain and each baker is allowed to submit 20 proposals in each period. Other bakers can then vote on existing proposals and also have the chance to vote on 20 unique proposals. At the end of the period, the network counts the number of votes for each proposal and the ones with the most votes move to the next stage. A baker's vote is weighted by the amount of rolls in its staking balance at the start of the period.
- Exploration Period:** Bakers vote on the smaller set of the top-ranked proposals from the previous round. In a similar fashion to the proposal period voting, a baker's vote is weighted by the number of rolls in its staking balance at the start of the exploration period. At the end of the period, the network counts the number of votes and if it passes the quorum<sup>7</sup> and an 80% supermajority of non-abstaining bakers vote for a given proposal, it moves to the next period.
- Testing Period:** If a proposal receives a supermajority in the Exploration Period then the Testing Period initiates a fork on the Tezos testnet chain for 48 hours. The idea behind the Testing Period is to ensure that the proposed upgrade does not lead to unintended consequences in the Tezos network.
- Promotion Vote Period:** In this period, the network decides whether to implement the governance decision. Bakers submit their votes and their votes are once again weighted proportionally to the number of rolls they had in their staking balance at the beginning of the Promotion Vote period. Each baker can only send one ballot operation during this period. If the participation rate hits the quorum and an 80% supermajority of non-abstaining bakers vote positively then the proposal is activated on the Tezos mainnet.

## Major Stakeholders

In addition to Tezos' on-chain governance process, there are a number of other stakeholders who are involved in the development and maintenance of Tezos projects. These include entities such as the **Tezos Foundation**, **Dynamic Ledger Solutions (DLS)**, **Nomadic Labs**, the **Tezos Commons Foundation**, and **Cryptium Labs**. There are several notable individuals who could be argued to have played a significant role in the development of Tezos since its inception:

### Arthur Breitman

Co-founder of Tezos and CTO of Dynamic Ledger Solutions

### Kathleen Breitman

Co-founder of Tezos and CEO of Dynamic Ledger Solutions

### Ryan Jespersen

President of Tezos Foundation

Tezos was first conceived of by Kathleen and Arthur Breitman in August 2014 through a paper which outlined the vision behind the project<sup>8</sup>, with a more detailed white paper in September 2014. Following the release of these papers, the Breitmans came together with a early-stage developers to help build the first version of the Tezos protocol. In August 2015, the Breitmans founded Dynamic Ledger Solutions (DLS) to lead the development of the Tezos project and, 13 months later, in September 2016, the source code for the Tezos project was published on GitHub. In addition, the Tezos Foundation was chartered in Zug, Switzerland in April 2017 and was allocated the 65,000 BTC and 360,000 ETH contributed to the Tezos Foundation. DLS owns all intellectual property associated with Tezos but has pledged to transfer these rights to the Tezos foundation; in addition, 10% of the 763,306,930 XTZ issued at launch were allocated to both the Tezos foundation and DLS. Moreover, 8.5% of the funds raised in the token sale were allocated to DLS with the rest allocated to the Tezos Foundation.

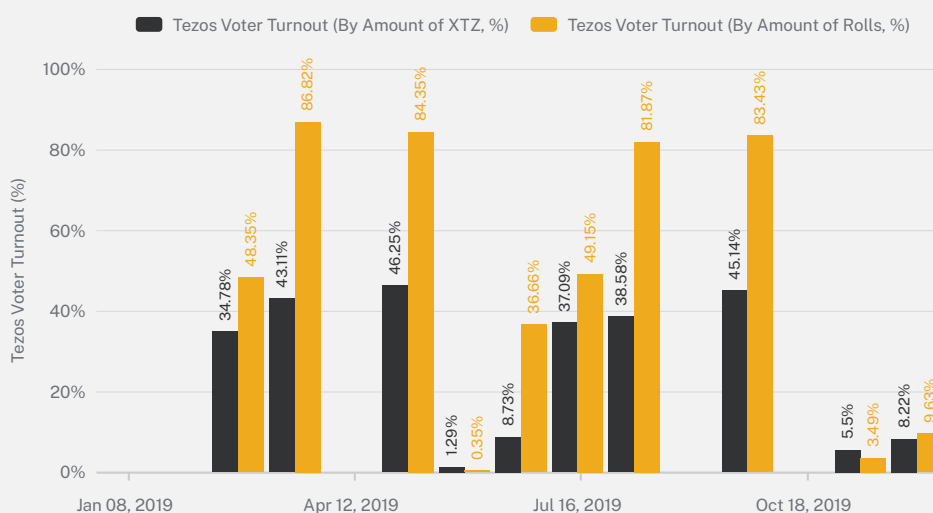


Figure 5:  
Tezos Voter Turnout

## Smart Contracts

In a similar fashion to Ethereum, Tezos' core use case is as a facilitator of decentralized smart contracts and transactions (see Fig. 6). Therefore, in order to develop an investment thesis for Tezos it is important to understand the current state of the blockchain's smart contract ecosystem. Whilst still in its nascent stages, the Tezos ecosystem for smart contracts is undoubtedly growing. For example, the chart (Fig. 7) shows the deployed smart contracts on the Tezos network since its launch in 2018 — one can see the steady growth especially since the start of 2019.

As expected, the ecosystem for decentralized applications (which use smart contracts to power the backend business logic of web applications) is in its nascent stages and barebones when compared to smart contract platforms like Ethereum or EOS. However, there are a handful of notable decentralized applications being built on the Tezos network:

- **tZERO** and the Tezos Foundation partnered on a project to tokenize \$643 million in planned real estate development<sup>9</sup>.
- **Clause** was issued a grant by the Tezos Foundation to develop a smart legal contract layer on top of the Tezos blockchain.

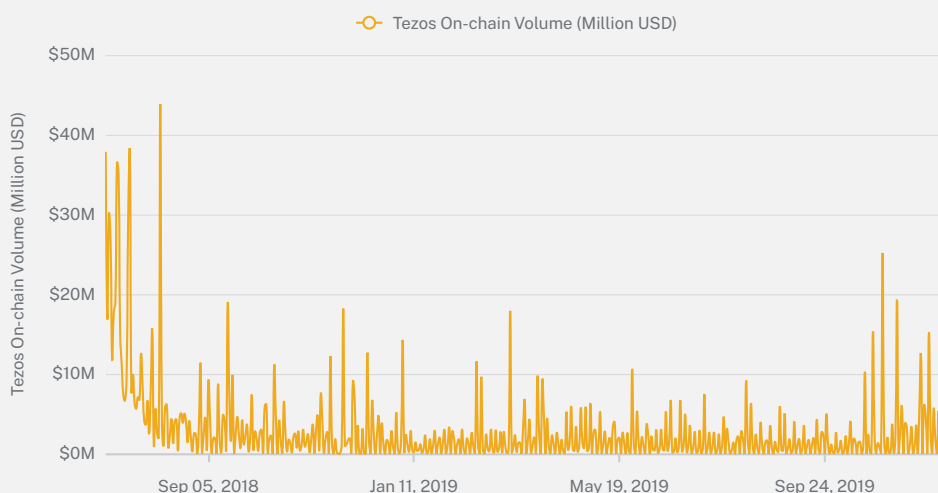
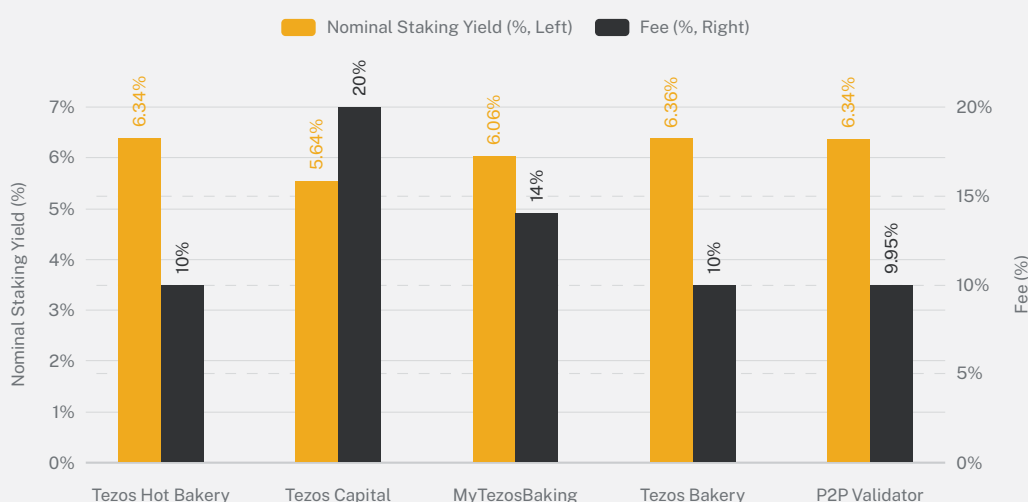
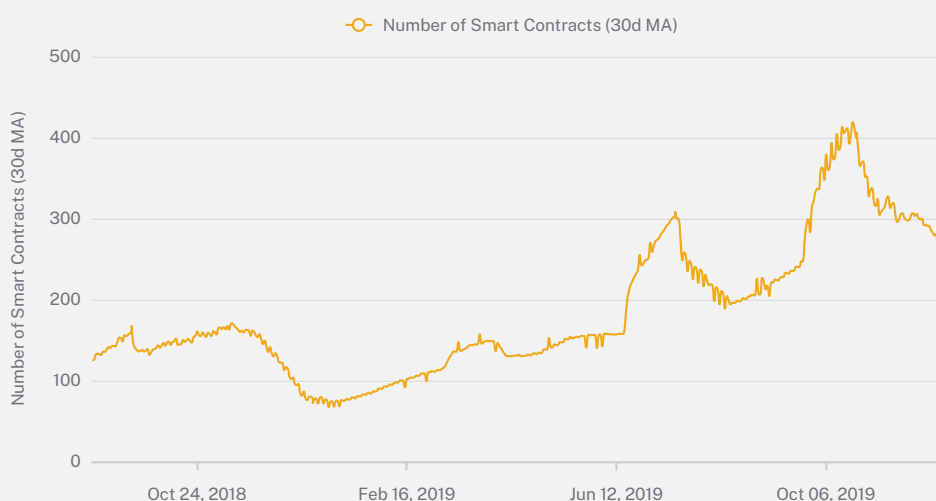


Figure 6: Tezos  
On-chain Transaction  
Volume (Million USD)

## Tezos Baking Services

This report has already stressed how important a role bakers and delegators play within the Tezos ecosystem, naturally therefore there have been various baking services which have arisen in the last couple of years which compete for XTZ delegation. Figure 8 below shows the nominal staking yield and fees for the top baking service providers for Tezos as ordered by efficiency as measured by Mytezosbaker.com<sup>10</sup>.



## Tezos Investment Thesis

# Market Opportunity

## On-Chain Governance

Tezos' key value proposition comes from the ability it gives to XTZ holders — in the form of bakers submitting governance proposals — to issue amendments to its blockchain. Therefore, in order to appreciate Tezos' value proposition from an investment perspective, it is important to understand the added value of on-chain governance. Tezos, through the launch of its white paper in 2017, rose to prominence in the midst of the fork of Bitcoin Cash from Bitcoin due to disagreements within the community over a push to increase Bitcoin's block-size limit<sup>11</sup>.

Some have argued that having a formal procedure built into a given blockchain protocol for initiating backwards-incompatible changes, like the push for an increase in Bitcoin's block-size limit, could help solve governance issues for crypto assets. The graphic below from Bitcoin Magazine<sup>12</sup> shows the variety of crypto assets which have hardforked from Bitcoin, several being the result of governance disputes.

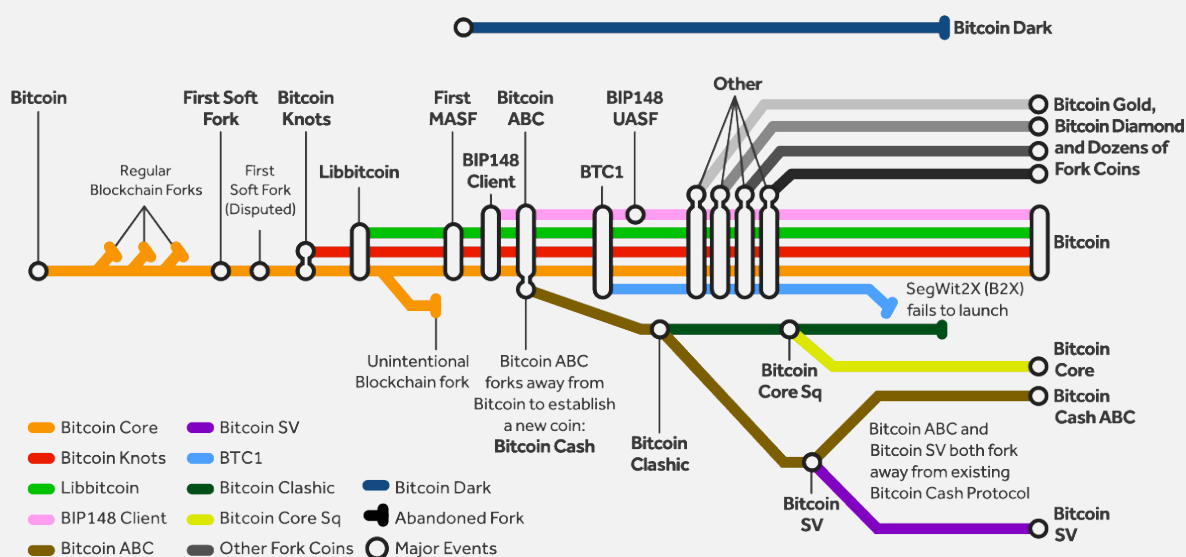


Figure 9: A Map of Bitcoin Forks



Having a formal governance procedure for proposed amendments to a blockchain could theoretically reduce the amount of hard forks which occur, thus ensuring that such governance disputes do not lead to a split in the crypto asset's community. As mentioned, a roll of XTZ (8,000 XTZ) is the basic unit which allows one to engage in the various voting procedures which make up Tezos' on-chain governance process. A number of commentators have argued that crypto assets which give their holders a right to govern the network are valuable solely for that reason alone<sup>13</sup>. Governance rights entitle a crypto asset's holder to decide how the various resources within the network are provisioned — such as by influencing how much XTZ is required in a roll, for example.

## The Value Proposition of Baking

Assuming that not all XTZ is being used to be staked within the network, baking (or staking) has been shown to be an integral part of Tezos' value proposition as a way for investors to generate yields. As the chart below (Fig. 10) shows, as of December 10 Tezos offers yields (in real terms) which are less than that of many other crypto assets which offer staking rewards. However, when compared to crypto assets with a similar market cap such as TRX, ATOM, or NEO, Tezos' real staking yield is comparable to the aforementioned assets' mean real staking yield — 1.15% compared to 1.26%.

As Placeholder Capital<sup>13</sup> has argued, as the value of a crypto asset network's underlying resource increases — in this case the resource of censorship-resistant computation in the form of smart contracts — then the value of the asset which grants access to and governs said resource also increases. There has been research<sup>14</sup> which has valued governance-based crypto assets as a function of the cost incurred by a network fork. Thus, the usefulness of Tezos as a smart contracting platform increases then one can expect a similar increase in its valuation (on a cost-to-fork basis) to increase as well.

It is important to note that, from a valuation perspective, staking is not necessarily a value accretive mechanism in of itself if there is not an independent and exogenous source of demand for the crypto asset in question. At its core, the function of staking is to help properly incentivize the various actors within a given crypto asset network to properly fulfil their function — in Tezos' case, this means using staking as a means to ensure the blockchain maintains resistance to censorship or subversion.

Interestingly, it is easy to see — from the perspective of an individual investor who stakes — what the benefit of staking will be: It helps prevent them from losing the value of their investment in real terms to inflation. Moreover, in cases where not all users are staking their assets then staking can still provide yields in real terms — as is the case currently for the Tezos network. The chart below (Fig. 11) shows how the real staking yield of Tezos has evolved over time. It is expected that real staking yields will tend to zero as more of the total XTZ in the network is staked.

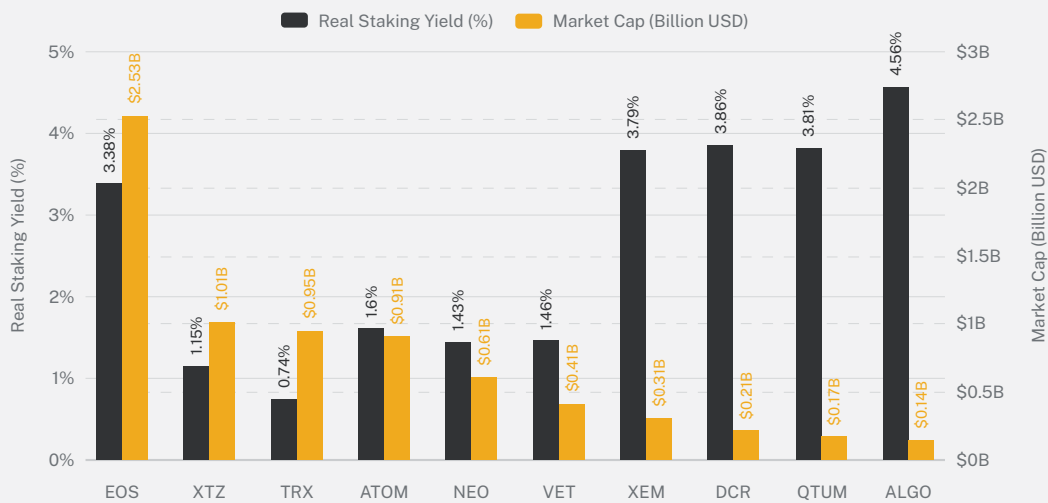


Figure 10: A Comparison of Crypto Staking Yields and Market Cap (as of Dec. 10, 2019)

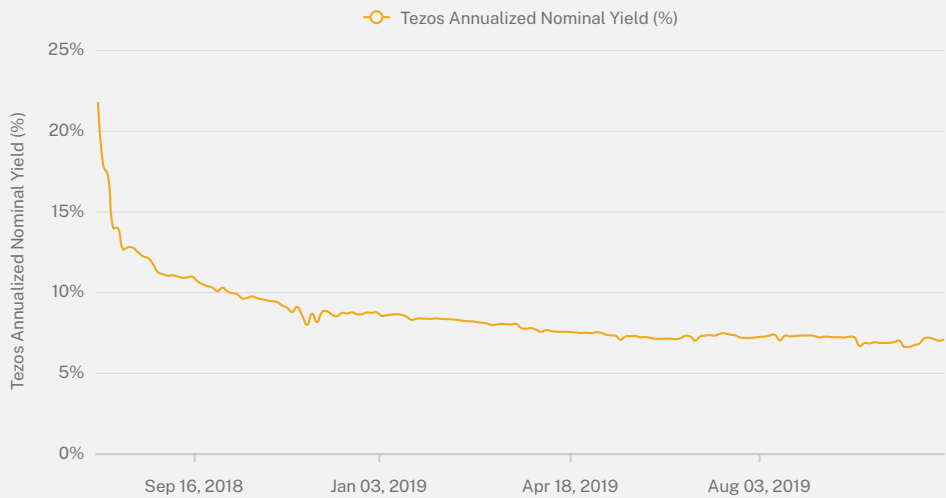


Figure 11: Tezos Nominal Staking Yield Over Time

## Formal Verification

Smart contracts offer a way for financial instruments to be represented as pieces of code and, furthermore, create the opportunity for the internal logic of institutions and businesses to be defined as a set of smart contracts. However, with this comes a great number of security risks where millions of dollars of value and capital can be represented, owned, or managed by programs which could contain vulnerabilities or bugs. This issue has been prevalent on Ethereum, the most popular of the smart contract platforms. As shown by the graph below (Fig. 12), there have been numerous examples of occasions where millions of dollars worth of crypto assets have been lost or stolen due to vulnerabilities in smart contracts — for example, ETH worth \$60M was initially stolen during the DAO hack in 2016.

Another unique feature of Tezos is its explicit focus on what is called formal verification — methods to prove or disprove that an algorithm or piece of code runs as expected with respect to a given formal specification. Michelson, the primary programming language used to develop smart contracts on Tezos<sup>15</sup>, is a language aimed at facilitating formal verification.

It should be noted that formal verification does not necessarily ensure that a piece of code is error free, rather than the code will simply adhere to its formal specification. If the formal specification for a code does not offer an exhaustive account of its behaviour then there is still the possibility of errant behaviour. In any case, the fact that Tezos' smart contracting language is being optimized for formal verification is a positive signal for the network's potential future use in applications which require guarantees of a smart contract's security — such as financial applications. The formal verification ecosystem around Tezos is continuing to grow and the Tezos Foundation has been actively promoting efforts<sup>16</sup> by researchers within the space.

It should also be noted that Tezos is not the only project where efforts into formal verification by smart contract researchers are thriving; there has been some promising work on Ethereum in this field as well. It can be expected in the long-term that synergies will be found between various projects which are making inroads into smart contract formal verification — something that both Tezos and Ethereum will benefit from.

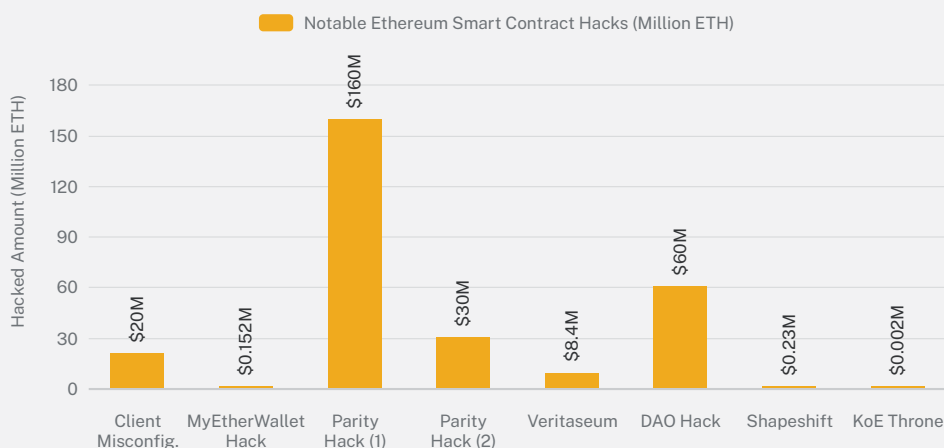


Figure 12: Notable Ethereum-based Smart Contract Hacks

## Tezos Investment Thesis

# Portfolio Allocation

Similar to Bitcoin, an investment in XTZ could permit an investor to diversify their portfolio and maximize risk-adjusted returns. In the tables below, we show the correlation of the returns of XTZ compared to Bitcoin (BTC) and several exchange-traded products: SPDR S&P 500 ETF Trust (SPY), iShares 20+ Year Treasury Bond ETF (TLT), and SPDR Gold Trust (GLD)<sup>18</sup>. Figure 13 shows the correlation of XTZ's returns to the other assets and Figure 14 shows the cumulative returns of assets since the start of 2019. As shown by Fig. 13, XTZ generally exhibits an extremely low level of correlation with

traditional financial assets like SPY, TLT, and GLD — 0.08, 0.07, and 0.04. XTZ's correlation with the aforementioned assets has even been lower than BTC in 2019 — -0.12, 0.06, and 0.23 for SPY, TLT, and GLD respectively. While this fact does not necessarily mean that XTZ is likely to maintain these same low levels of correlation with the assets in the long-term, it does demonstrate that XTZ's valuation drivers over 2019 have been extremely decoupled from the traditional finance sector and even Bitcoin (correlation -0.42).

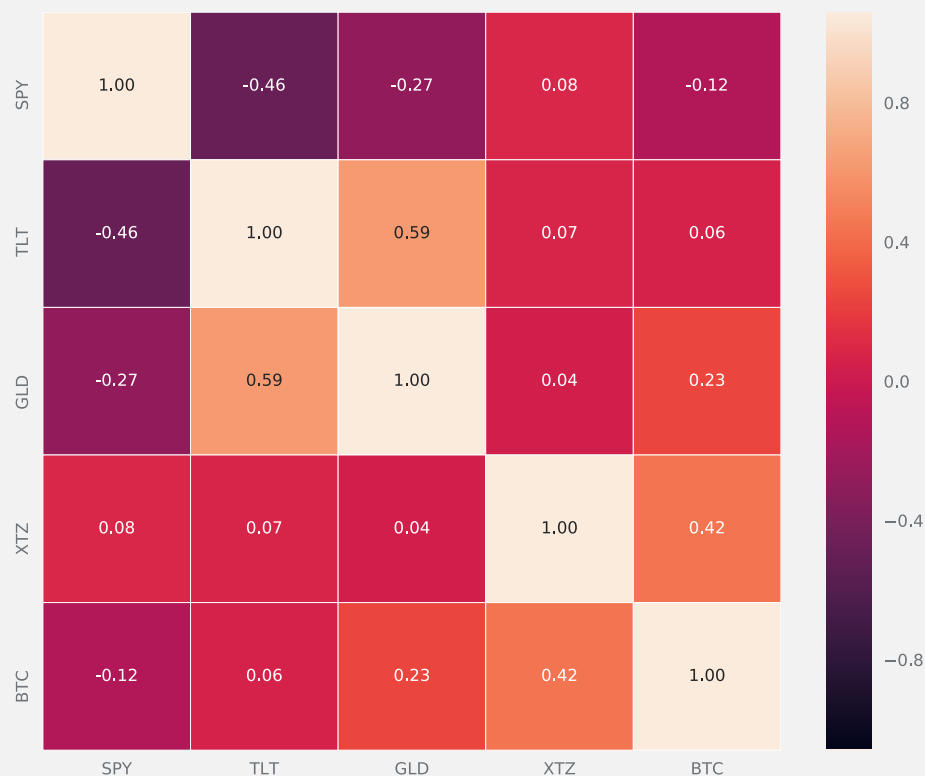


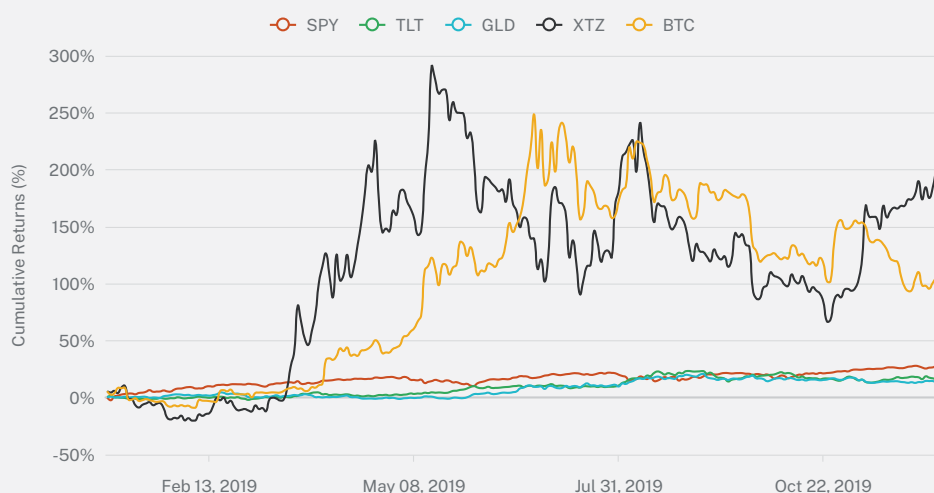
Figure 13: Correlation of Asset Returns

In addition, XTZ's cumulative returns (as shown by Fig. 14) from the start of the year to December 10, 2019 have been 242.97% compared to 99.07% for BTC, 27.34% for SPY, 16.60% for TLT, and just 13.47% for GLD — making XTZ perhaps the best performing large cap crypto asset this year. However, due to the additional volatility that a small allocation of XTZ adds to an investor's portfolio, small allocations of BTC still provide better risk-adjusted returns than that of XTZ as shown by Figure 15.

Portfolio A	SPY 60%	TLT 40%	
Portfolio B	SPY 58.5%	TLT 39%	GLD 2.5%
Portfolio C	SPY 58.5%	TLT 39%	BTC 2.5%
Portfolio D	SPY 58.5%	TLT 39%	XTZ 2.5%
Portfolio E	SPY 57%	TLT 38%	BTC 5%
Portfolio F	SPY 57%	TLT 38%	XTZ 5%

Figure 15: Portfolio Tearsheet

	Portfolio A	Portfolio B	Portfolio C	Portfolio D	Portfolio E	Portfolio F
Annualized Returns	22.74%	22.53%	24.64%	26.85%	26.53%	30.96%
Annualized Volatility	6.93%	6.80%	6.83%	7.62%	7.20%	9.07%
Sharpe Ratio	3.06	3.09	3.38	3.32	3.47	3.24

Figure 14:  
Asset Cumulative Returns

# Tezos Investment Thesis

## Risks

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### Regulation and Governance

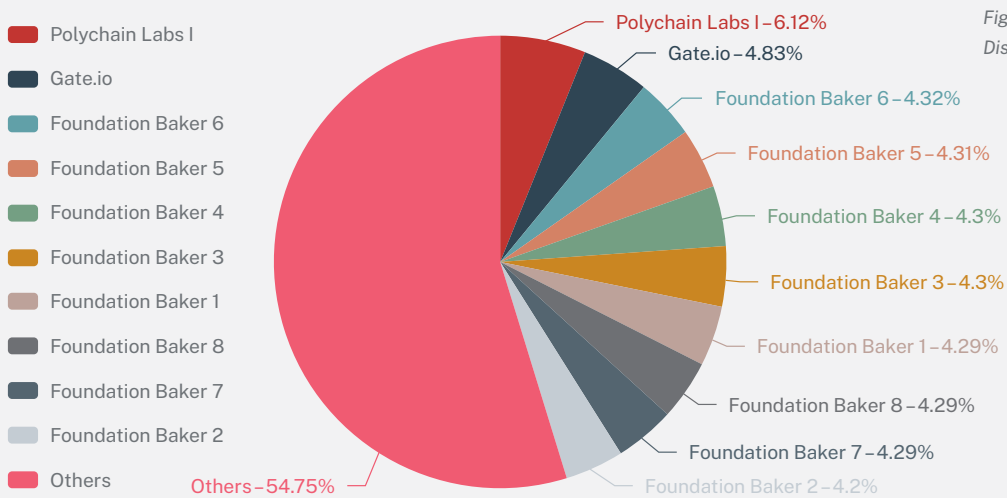
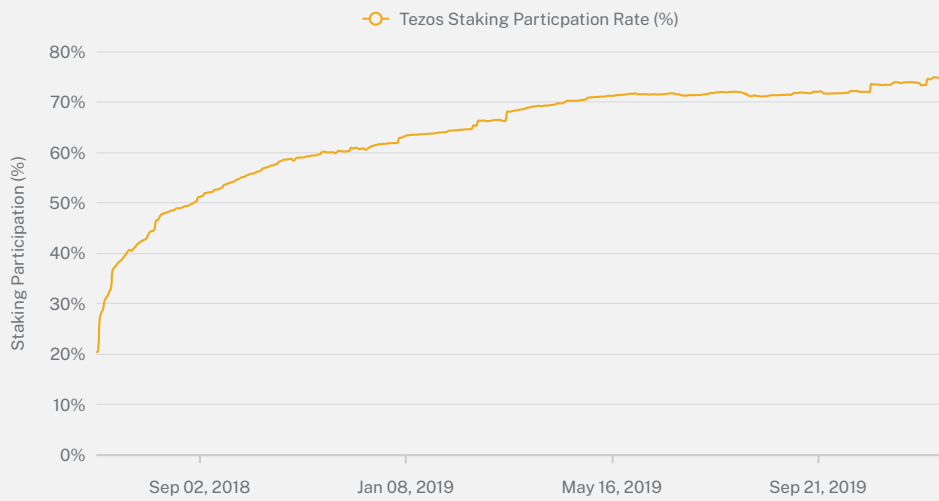
Since Tezos' fundraiser in the summer of 2017, the Tezos project has been hit with several governance and regulatory-related issues, the most prominent of these being the governance dispute<sup>19</sup> with the former President of the Tezos Foundation, Johann Gevers. Gevers had battled with Tezos founders Arthur and Kathleen Breitman over a contract dispute regarding his compensation, which left the funds raised during the Tezos fundraiser inaccessible to the foundation and the Tezos development team. While Gevers eventually reached a resolution<sup>20</sup> with the Breitmans and stepped

down from his position, the fallout from the lawsuit exposed the project to several further class-action lawsuits<sup>21</sup>. As of the summer 2019, there was at least one ongoing lawsuit against Dynamic Ledger Solutions regarding the Tezos fundraiser. While the outcome of the case is uncertain and may not necessarily have significant consequences, it does highlight the fact that the means through which Tezos was launched and its fundraiser — as well as its past issues with governance of the Tezos Foundation — exposes the project to regulatory risk in the long term.

### Proof of Stake Security

Tezos is notable for being one of highest profile Proof of Stake-based crypto assets. There have been some concerns over whether Proof of Stake can provide the necessary level of economic security due to potential issues with centralization risk, low participation rates<sup>22</sup>, novel attack vectors<sup>23</sup>, and bribery<sup>24</sup>, to name a few. Tezos has been built with its own ways to mitigate these types of issues — for example, the ability that XTZ holders have to delegate their holdings to baking services massively helps to improve Tezos' staking participation rate. For example, the chart (Fig. 16) to the right shows Tezos' staking participation rate over time since its launch; the protocol is designed to incentivize a high level of staking, which explains the upwards trend in staking, one that we can expect to continue. It has been argued that Proof of Stake systems — especially the kind of model

which Tezos employs — may be subject to some amount of centralization risk, greater than that of Proof of Work systems. This is because the system is such that those who have the largest holdings of a given crypto asset are the ones who benefit the most from their staking reward. The pie chart (Fig. 17) compares the distribution in rewards for staking thus far; as we can see, almost half of all rewards have been distributed to either Polychain Labs (an initiative set up by Polychain Capital, a Tezos investor), Gate.io (a popular crypto asset exchange), or the Tezos Foundation. Given that the staking rewards system seems to consolidate XTZ tokens in the hands of a few entities who already have a strong vested interest in the crypto asset, this could lead to Tezos' governance becoming increasingly plutocratic over time.



## Second-Mover Disadvantage

As we've argued the biggest competitor at present for Tezos is Ethereum which has a large first-mover advantage within the smart contracts space, as we've argued. The smart contracts ecosystem is likely to be a winner-takes-all where the top smart contract blockchain vastly outweighs its competitors in overall market capitalization and value — given that smart contracts and decentralized applications will likely exhibit strong network effects due to their high degree of composability. Given this fact, the delta in potential value between Tezos overtaking Ethereum in usage (or not) is significant and Tezos currently faces an uphill battle — due to the vibrant ecosystem already developed on Ethereum especially in the decentralized finance ("DeFi") segment.

However, it is important to note that Ethereum — the oldest smart contract platform — is only five years old and the battle for the dominant smart contracts platform is likely to be waged well into the next decade. The key deciding points likely to influence which smart contract platform dominates in the long term will be regulation and economic security trade-offs between different Proof of Stake algorithms. Developments in the range of smart contract platforms — such as Ethereum, Tezos, EOS, Dfinity, and others — continue to progress and need to be monitored in order to understand Tezos' viability as the dominant smart contracts platform in the long term.



## Tezos Investment Thesis

# Conclusion

In this analysis of the investment thesis for Tezos, we have argued that Tezos' key features are its on-chain governance, Proof of Stake 'baking' model, and its emphasis on formal verification for smart contracts. These features introduce a number of dynamics into the crypto asset industry which have not been tested thus far. From an investor's perspective, the addition of staking rewards creates an interesting value proposition for XTZ but it is important to note that the staking rewards can only be argued to be value accretive if there is an exogenous reason for market demand for XTZ. In addition, on-chain governance creates the potential for holders of the XTZ token to be much more closely involved in governance of Tezos' protocol development, a process that seems to have worked well to date. As we have shown, these features — on-chain governance and Proof of Stake — also create the potential of wealth distribution centralization.

The greatest risk factors to Tezos are potential issues related to regulation and governance, given the crypto asset's soured history of issues associated with the Tezos Foundation. Moreover, the crypto asset faces an uphill battle to compete with the dominant smart contract platform, Ethereum. Nevertheless, Tezos represents a novel take on developing its on-chain governance and its a censorship-resistant smart contract platform due to its lack of reliance on an energy-intensive Proof of Work. The crypto asset currently presents an extremely viable investment option for those who understand and believe in the value of on-chain governance and alternatives to Proof of Work mining.

### Endnotes

1) All data is sourced from Coin Metrics unless stated otherwise and all Tezos blockchain data is sourced from TzStats – 2) [https://tezos.com/static/position\\_paper-841a0a56b573afb28da16f6650152fb4.pdf](https://tezos.com/static/position_paper-841a0a56b573afb28da16f6650152fb4.pdf) – 3) <https://www.tokendata.io> – 4) <https://Messari.io> – 5) <https://www.coindesk.com/welcome-to-athens-tezos-complete-historic-first-blockchain-vote> – 6) <https://medium.com/tezos/amending-tezos-b77949d97e1e> – 7) <http://tezos.gitlab.io/whitedoc/voting.html#super-majority-and-quorum> – 8) <https://tezos.foundation/history> – 9) <https://www.coindesk.com/tzero-tezos-foundation-to-tokenize-500-million-in-uk-real-estate> – 10) <https://mytezosbaker.com> – 11) <https://bit.ly/37uGtQ9> – 12) <https://bitcoinmagazine.com/articles/infographic-map-bitcoin-forks#1554736128> – 13) <https://www.placeholder.vc> – 14) <https://hackernoon.com/a-framework-for-valuing-governance-tokens-0x-49d2cf2ef5bc> – 15) <https://tezos.gitlab.io/whitedoc/michelson.html> – 16) <https://tezos.foundation/news/tezos-foundation-issues-grants-for-tezos-smart-contract-projects> – 17) [https://github.com/leonardoalt/ethereum\\_formal\\_verification\\_overview](https://github.com/leonardoalt/ethereum_formal_verification_overview) – 18) Yahoo Finance and Coin Metrics – 19) <https://www.wired.com/story/tezos-blockchain-love-story-horror-story> – 20) <https://www.coindesk.com/tezos-board-reshuffled-johann-gevers-steps> – 21) <https://www.coindesk.com/new-class-action-suit-filed-tezos-founders> – 22) <https://medium.com/@petkanics/inflation-and-participation-in-stake-based-token-protocols-1593688612bf> – 23) <https://www.coindesk.com/validators-create-new-attack-vectors-for-decentralized-systems> – 24) <https://en.longhash.com/news/how-centralized-are-proof-of-work-and-proof-of-stake-cryptocurrencies> – 25) <https://bit.ly/2LbrzFd>

# State of Crypto

## Contacts

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**Amun AG**

Dammstrasse 19  
6300 Zug, Switzerland

**Sales**

+41-44-260-8660  
sales@amun.com

**Research**

research@amun.com

**Subscription**

quarterly@amun.com

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This report provides an in-depth overview of the state of crypto in the fourth quarter of 2019, from 1 October to 31 December — offering Amun's own view on the industry, a recap of the most important news items of the quarter, a look at the key data points of the most important crypto assets, and an overview of our current products. In addition, we have included two of our research reports: our investment theses for both BNB and Tezos.

It almost goes without saying that the fourth quarter of this year has been a uniquely eventful one for the industry and we hope this report will help you understand it better.



Quarterly Report by  
Amun Research Team

[research@amun.com](mailto:research@amun.com)  
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