

Research Report

BNB Investment Thesis

This research report presents 21Shares' 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



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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 report¹, we'll adapt Multicoin Capital's definitions² 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.

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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)⁴ 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 exchanges⁵.

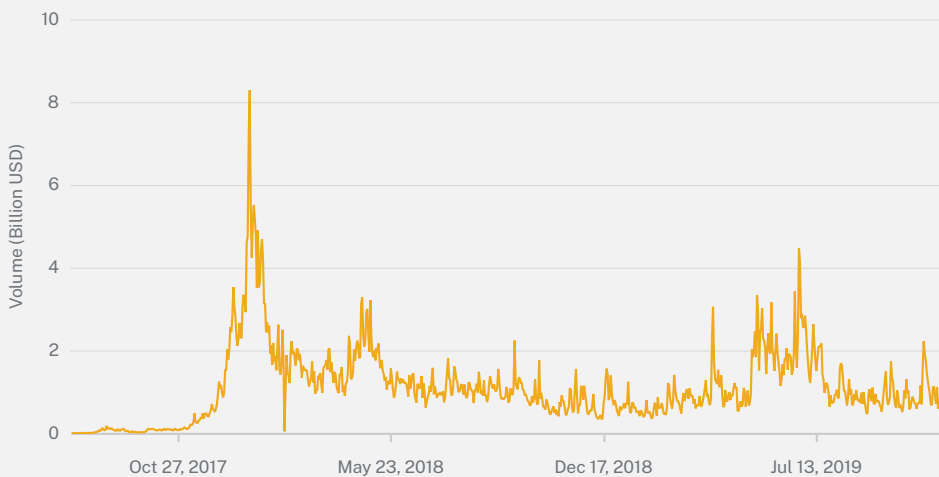


Figure 4: Binance Spot Trading Volume

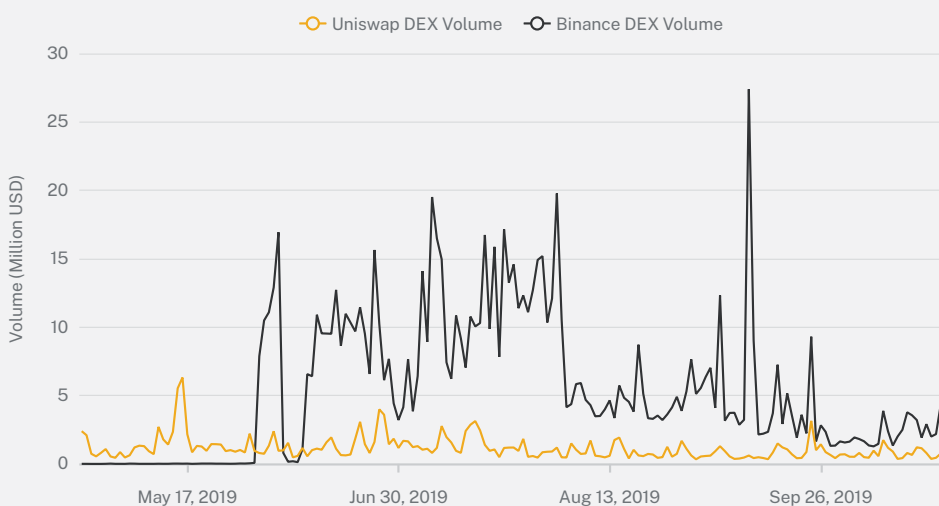


Figure 5: Binance DEX and Uniswap Volume

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)⁶.

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)⁷ 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 team⁸ 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.

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Market Opportunity

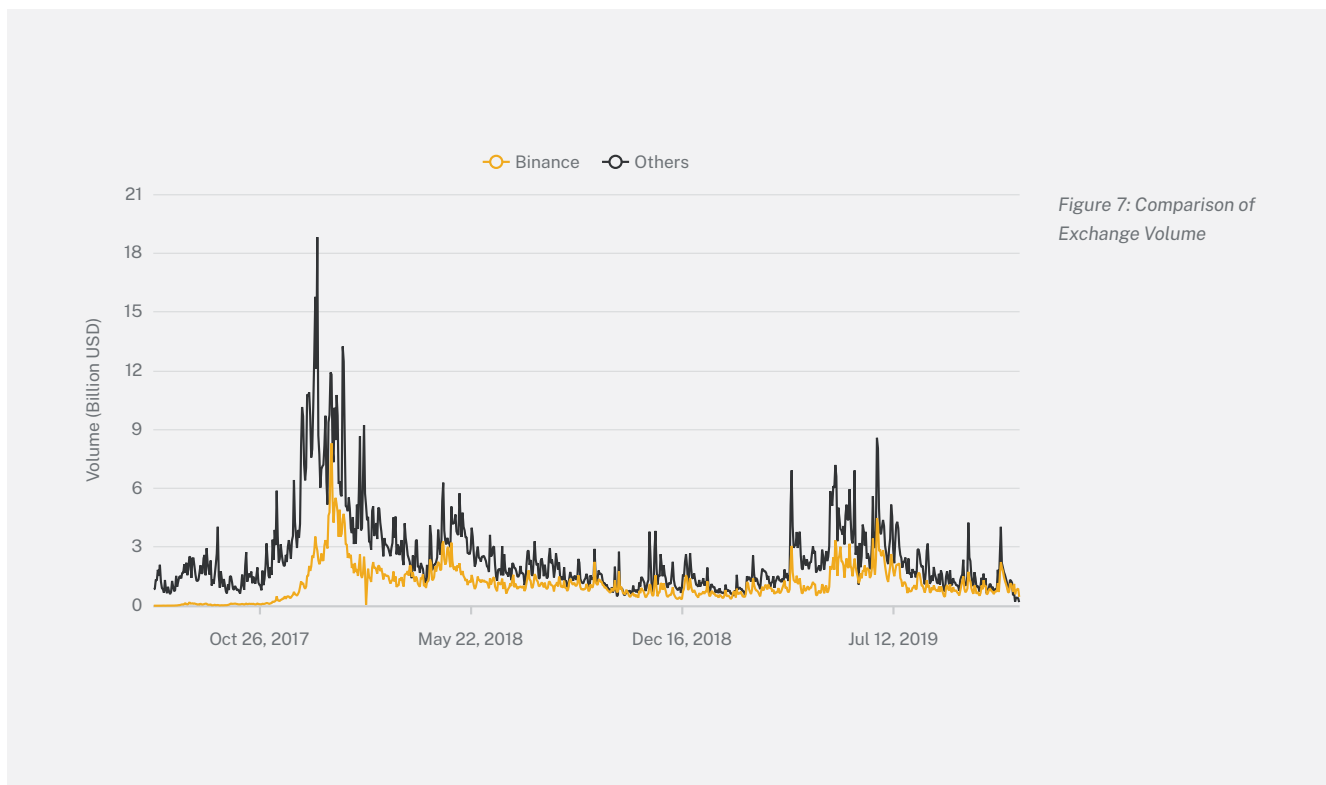
The Exchange Landscape

The chart⁹ 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 chart¹⁰ (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.



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 Binance¹¹ 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.

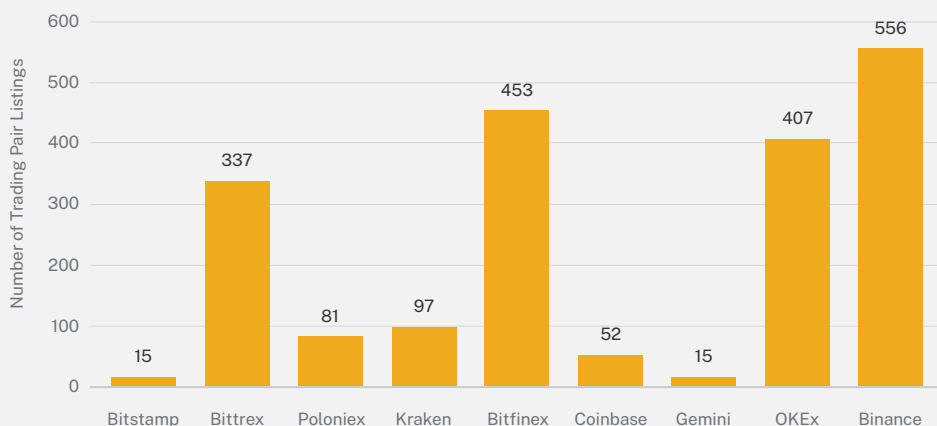


Figure 8: Comparison of Exchange Trading Pairs

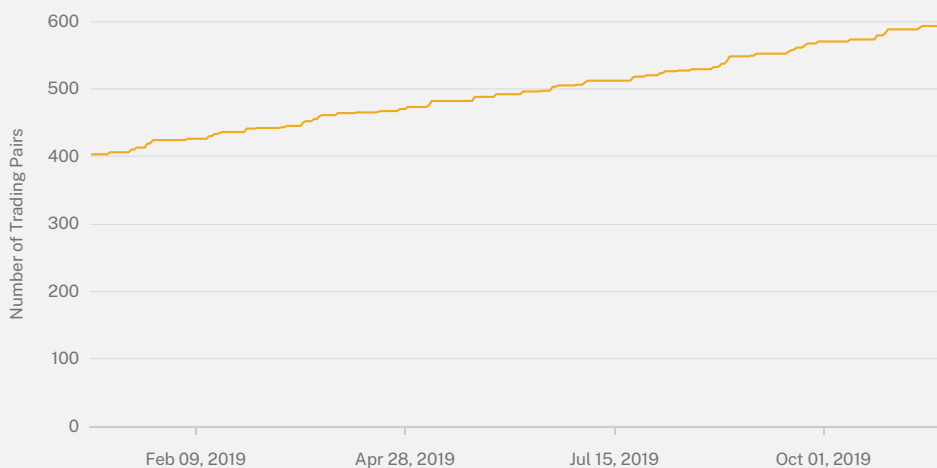


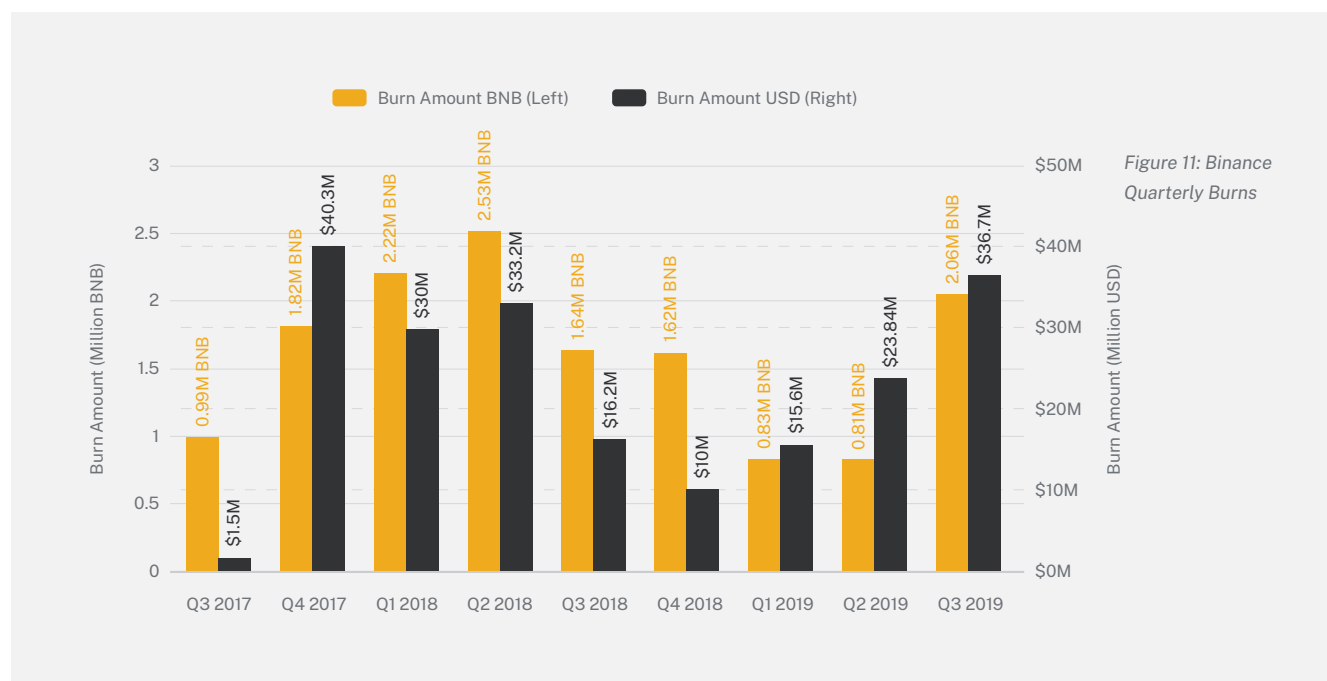
Figure 9: Growth in Binance's Trading Pairs

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



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 Launchpad¹², 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

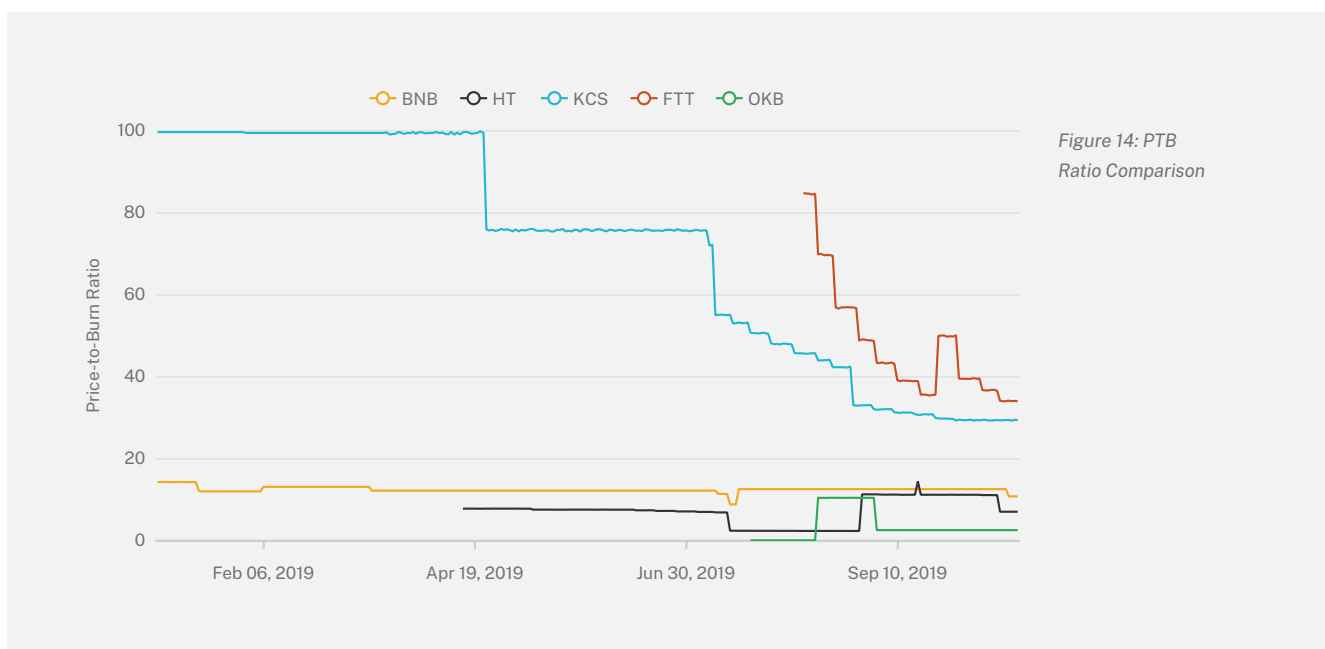
Price-to-Burn Ratio

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.

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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.

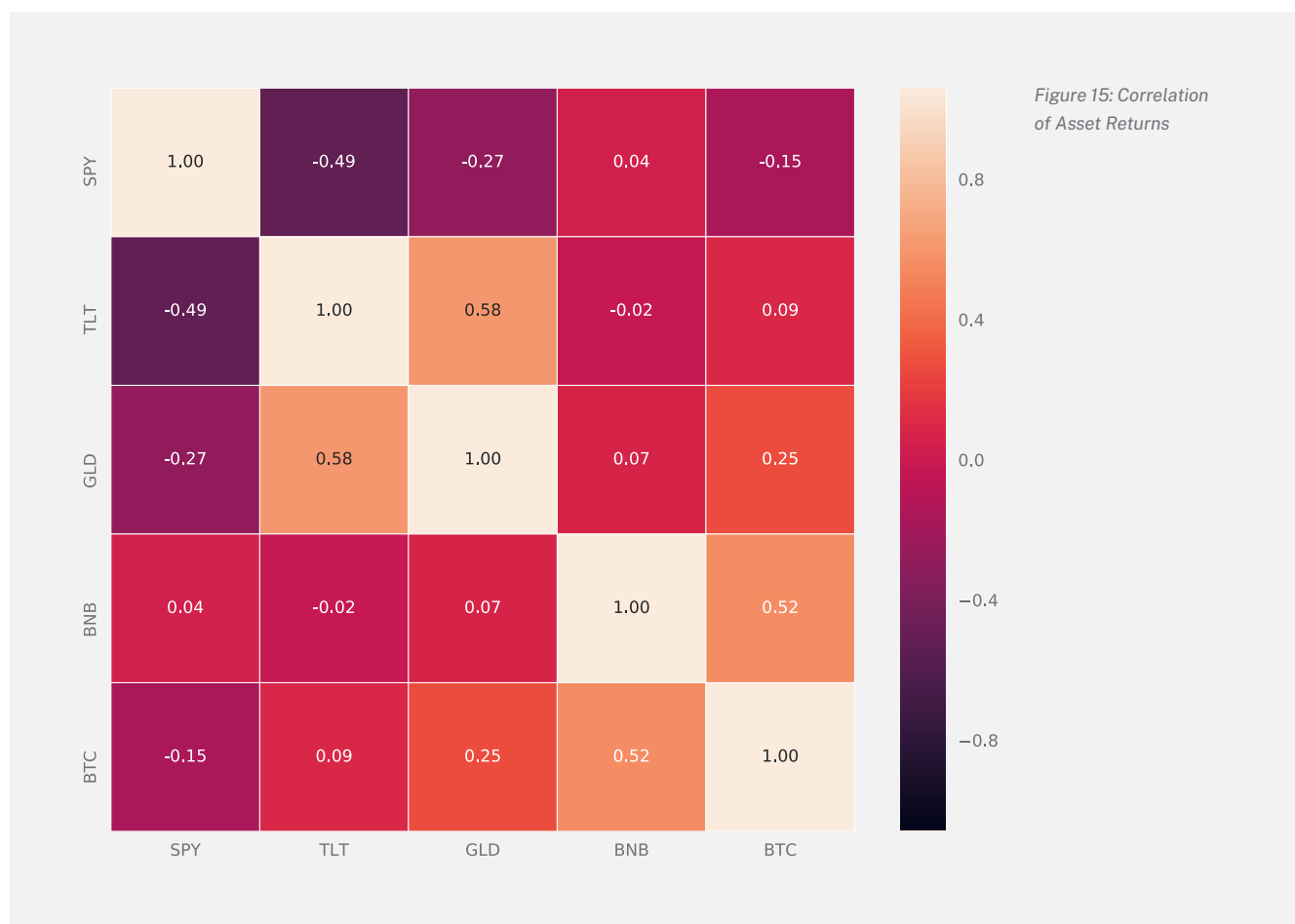


Fig. 16 below gives a further view of the effect of the launch of Binance Chain and its futures platform on BNB's performance. As of October 21 2019, BNB had returned 200.81% compared to BTC's 122.71%, SPY's 21.71%, TLT's 16.10%, and GLD's 15.29%. This analysis can be taken further by constructing several portfolios (Fig. 17) which contain varying amounts of BNB in order to better understand the asset's ability to diversify a portfolio¹³.

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

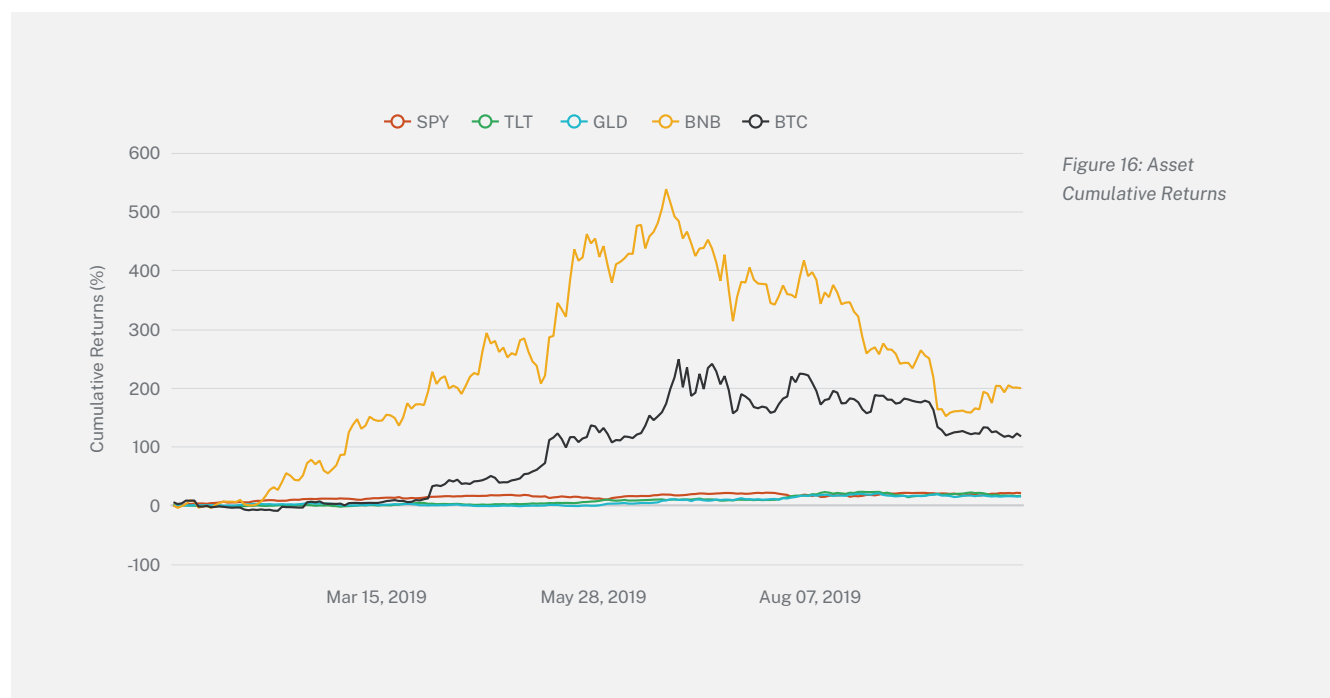


Figure 16: Asset Cumulative Returns

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Risks

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 settlement¹⁴ 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

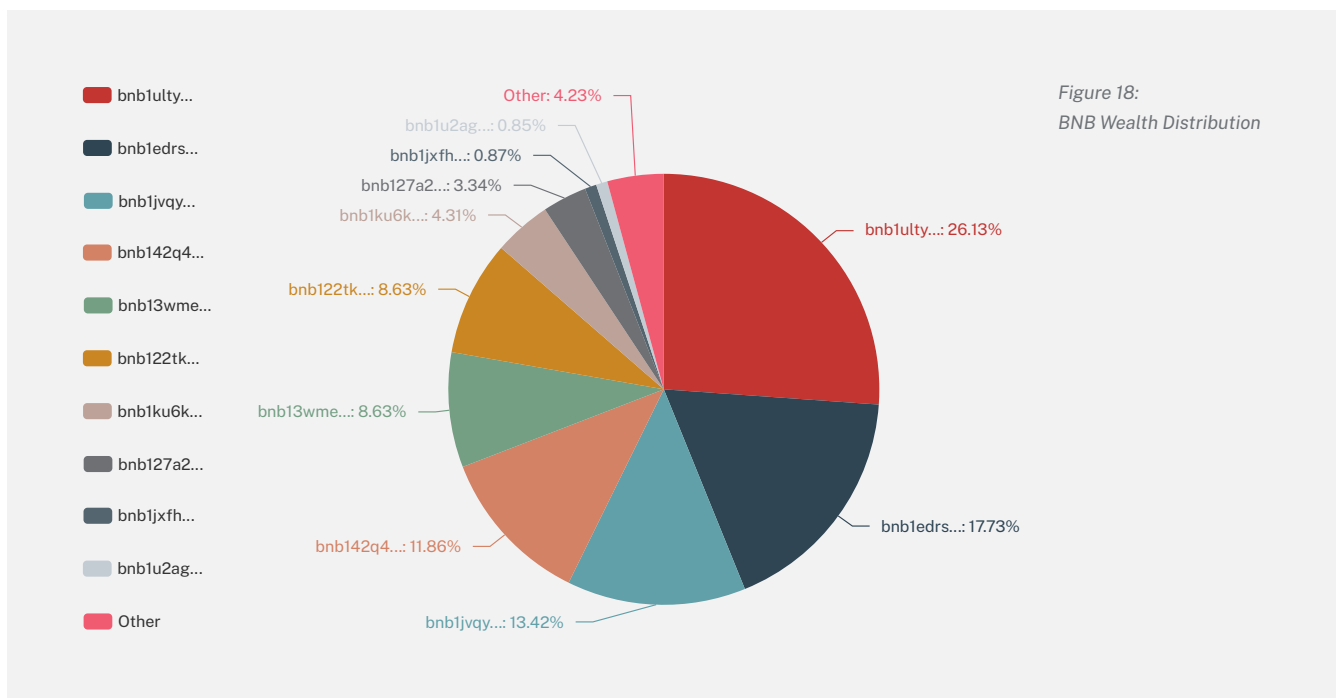
Unlike a crypto asset like Bitcoin, BNB has strong ties to Binance, a centralized entity. As a result, there is an increased centralization risk for the crypto asset because an event which negatively affects Binance (such as regulatory or management issues) will undoubtedly affect the value proposition 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 addresses¹⁵ (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 questions¹⁶ 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.



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Conclusion

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

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>

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Currently, there is relatively small use of crypto assets in the retail and commercial marketplace in comparison to relatively large use by speculators, thus contributing to price volatility that could adversely affect an investment in crypto assets. In order to participate in the trading of crypto assets, you should be capable of evaluating the merits and risks of the investment and be able to bear the economic risk of losing your entire investment.

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