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Judge RESEARCH

CRYPTO ASSET MARKETS RIGHT NOW

STRATEGIES FOR THE CURRENT MARKET ERA

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Executive Summary

Crypto asset markets are evolving rapidly. **Important perceptions** formed two quarters ago simply no longer hold. For instance,

- In the current market era, Bitcoin has performed poorly relative to several reasonable alternatives
- Bitcoin no longer consistently leads the market, erasing one of the major reasons for weighting a portfolio in its favor during a down market
- Lagged, erratic relationships between assets have been replaced by a structure of high, steady correlations
- High daily correlations, in turn, have masked a wide divergence in asset performance over the current market era.

The market's **basic mechanics** shifted around the time of the massive spike in January, 2018. This has led many to treat the current market era as simply a post-bubble version of the earlier market: a lull before entrepreneurial success creates mass markets or, failing that, a lull before everyone goes home.

In fact, it is those changes that occurred contemporaneously with the bubble that are driving today's market. We list them. By defining the **current market era** this precisely - by the causal forces that began it - we are left with a framework both adaptive to a rapidly changing market and suggestive of **actionable market strategies**.

In this report, we suggest (**Pg. 11**) one strategy is currently dominant: As a value play, exchange tokens are an exceptional opportunity. We explain why they are capable of unusually high risk-adjusted returns, are relatively robust against unpredictable future developments; and why the timing is right.

Finally, we give several reasons **BNB, Binance's token**, is currently one of the best vehicles for this play.

About Judge Research

Judge Research is a research firm staffed by PhDs. We combine our experience as formal students of markets with our founder's years of experience in crypto markets as a CEO, partner at a San Francisco blockchain accelerator, investor, advisor, and friend to leaders in the crypto space.

About This Report

Judge Research recently published its inaugural report, *Understanding the New Paradigm of Liquid Venture Capital: the Correlation Structure of Crypto Asset Markets*. Part of a large research project, the report is the first in a series designed to help venture capitalists rework their investment model for a liquid market context. From a combination of that denser report and conversations with industry insiders, *Crypto Asset Markets Right Now* distils the most actionable points for traders.

CRYPTO ASSET MARKETS RIGHT NOW
by Nicholas Adams Judge, Ph.D. and Dennis Zhang, Ph.D.

1 Crypto Assets Move Less Uniformly Than You Think

Three empirical traits of crypto asset markets have converged to create an impression of tighter within-class relationships than really exists.

1.1 Historic Volatility

The spike at the beginning of the year makes even major recent movements look negligable. Notice that the numbers on the right-hand y-axis of *fig. 1* are multiples, not percentages.

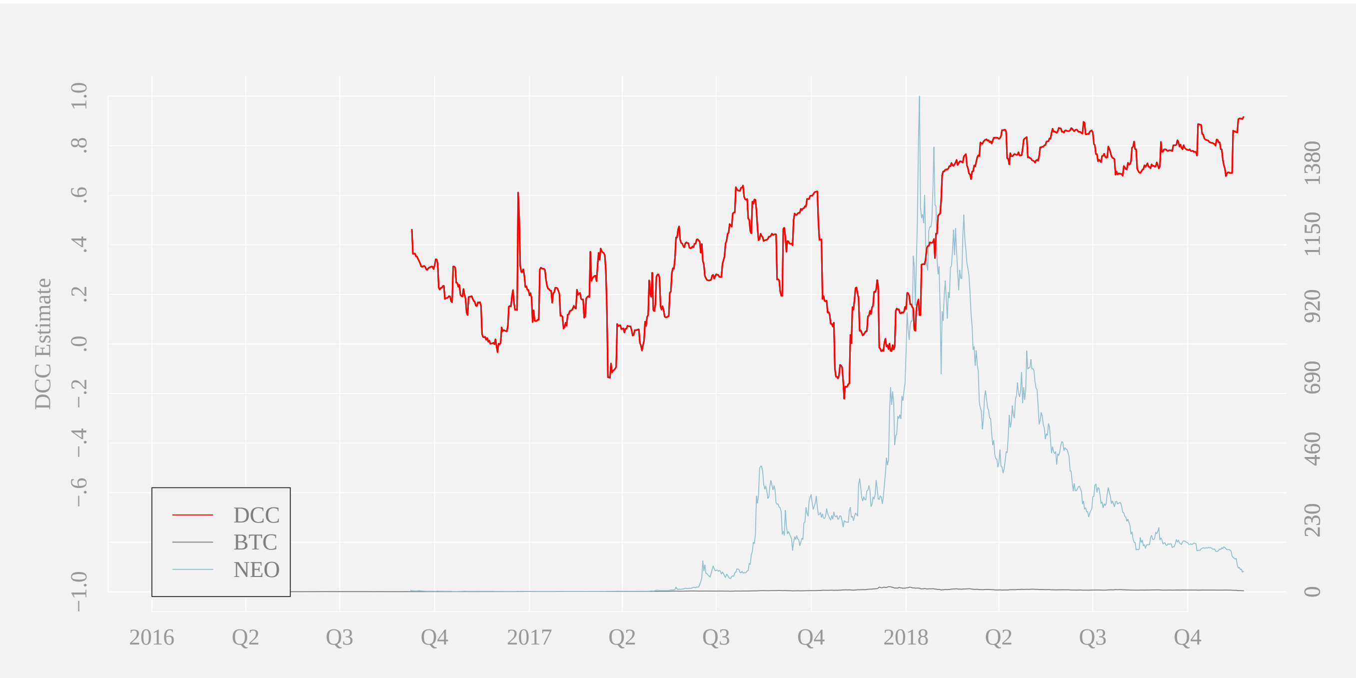

Figure 1: Neo, Bitcoin and their Correlations Over Time. March 1, 2017 Price = 1.

1.2 High Correlations

We studied 435 time series of correlations between crypto assets. Correlations[1,2] were wildly erratic until the middle of Q1 2018. They then climbed to levels reminiscent of non-dollar currencies during the euro crisis, and have largely stayed there.

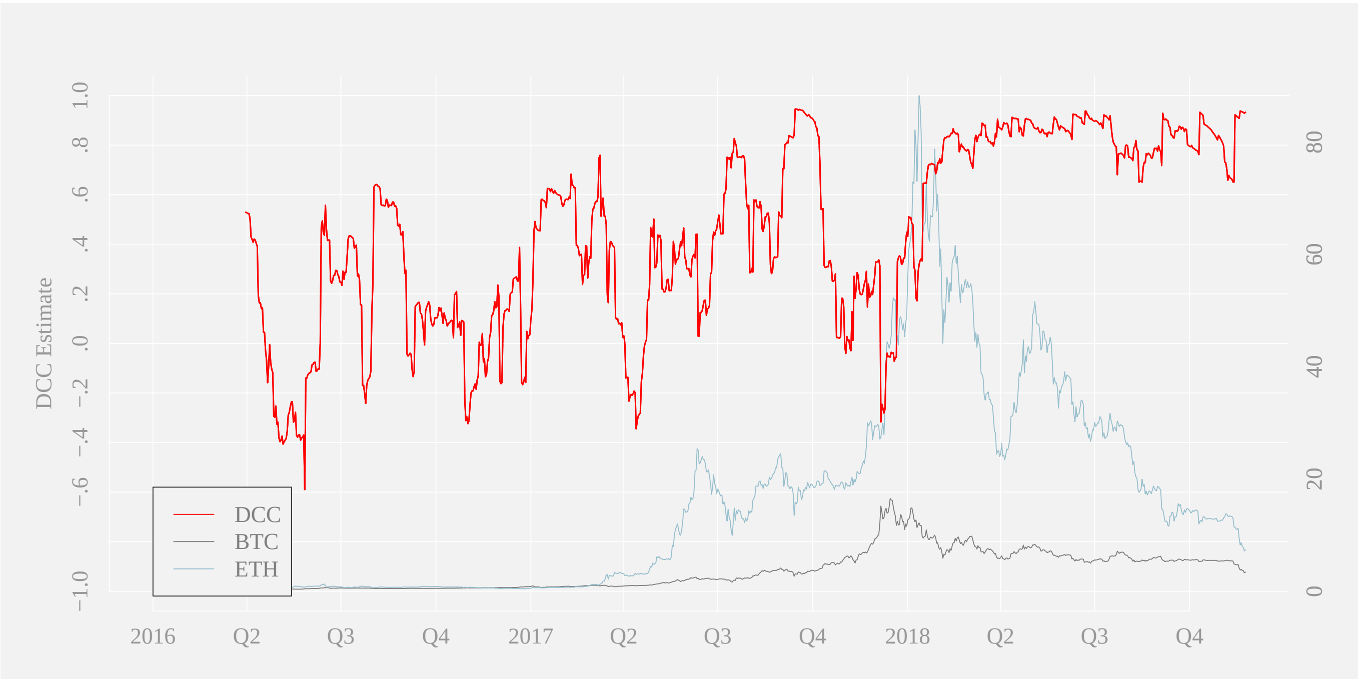

Figure 2: Bitcoin, Ether and their Correlations Over Time

[1] A DCC-GARCH(1,1) model was chosen to measure daily correlations. Unsurprisingly, nearly every one of the 435 time series of correlations were integrated. For more information on model specification, see *Understanding the New Paradigm of Liquid Venture Capital.*

[2] For an overview of estimating large samples and/or large matrices of time series of covariance, see the first author's dissertation, *From Predictive to Causal Inference: The Use of Multivariate Generalized Autoregressive Conditional Hetereoskedastic-Derived Time Series of Covariance in the Study of Political Economic Systems.*

1.3 The Bloodbath

Table 1: YTD and Current Era Returns

Ticker	Symbol	YTD	Mar. 1
BTC	Bitcoin	-72%	-61%
ETH	Etheruem	-85%	-86%
XRP	Ripple	-84%	-59%
BCH	Bit. Cash	-93%	-85%
LTC	Litecoin	-87%	-85%
XEM	NEM	-93%	-83%
DASH	Dash	-91%	-84%
ETC	Eth. Clas.	-83%	-86%
IOTA	IOTA	-92%	-85%
XMR	Monero	-83%	-80%
NEO	NEO	-90%	-94%
STRAT	Stratis	-95%	-91%
ZEC	Zcash	-86%	-82%
OMG	OmiseGO	-92%	-92%
QTUM	QTUM	-97%	-92%
WAVES	Waves	-92%	-83%
LSK	Lisk	-93%	-92%
BTS	Bitshare	-93%	-78%
BCN	Bytecoin	-86%	-82%
STEEM	Steemit	-88%	-89%
XLM	Stellar	-56%	-52%
GNT	Gnosis	-90%	-77%
REP	Augur	-89%	-83%
EOS	EOS	-62%	-60%
SC	SiaCoin	-91%	-85%
ICX	ICON	-95%	-93%
STORM	Storm	-94%	-88%
ARDR	Ardor	-97%	-85%
ADA	Cardano	-95%	-88%
BNB	Binance	-40%	-50%

Third, most crypto assets have fallen so far that looking at the YTD charts feels a bit like surveying the losing side of a battlefield. Bitcoin, for instance, fell by more than half this year, with the vast majority of those losses occurring since March 1, in what we define as the current market era.[3]

High Differentiation

Despite this mix of high daily correlations, extreme losses and past volatility, the standard deviation of YTD returns was a full 20.3%, and a similar 19.9% since March.[4]

[3] From March 1, 2018 to the present, measured on Nov. 25, 2018 in *table 1*. See the following section

[4] We chose the top 25 crypto assets by market cap, defined by mean market cap during a month in the middle of our time window. We also added five smaller cap tokens, Storm, Binance and Icon, Ardor and Cardano.

Focus on The Current Era

Our interest is in the current market, not financial history. With a market changing this quickly, the choice of time windows to study - and train algorithms upon - is critical. Our charts and larger study look back as far as the start of 2016 because important trends began around then. But analytically we prefer to leave off the spike at the beginning of 2018 and its immediate aftermath, defining the "current market era" as March 1, 2018 onward to the present.[5]

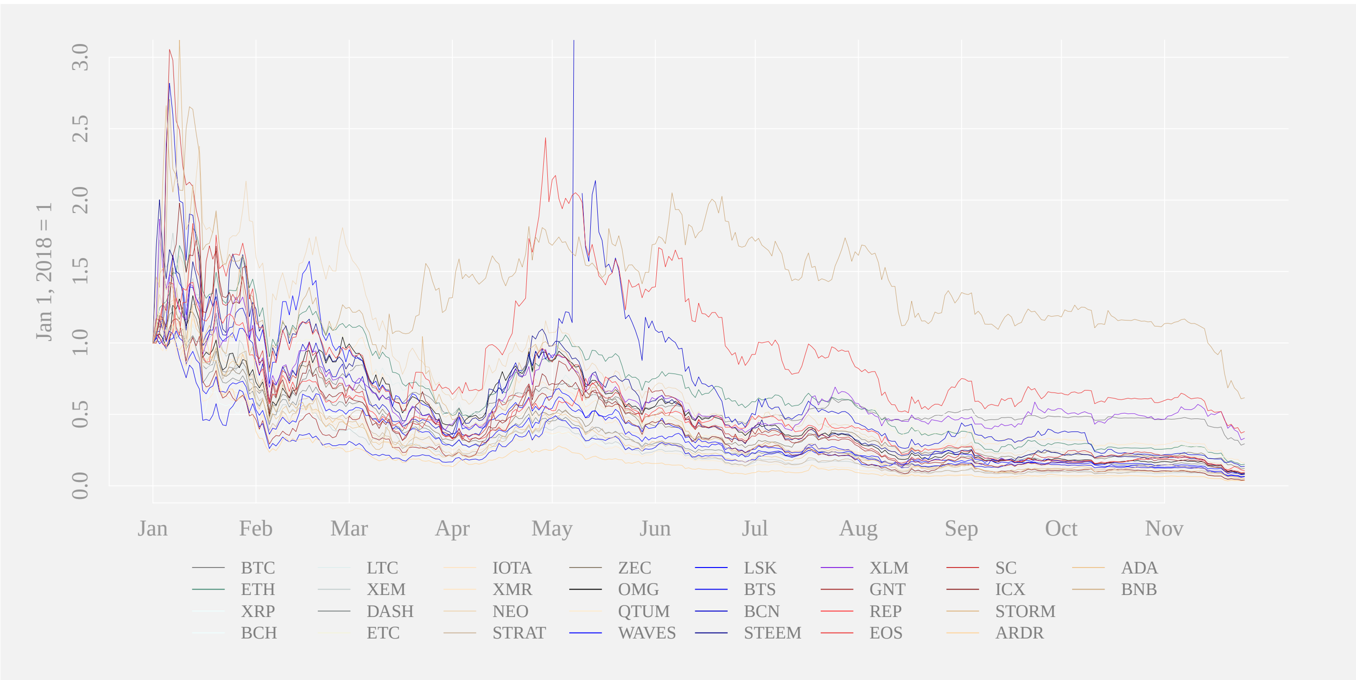

Figure 3: YTD Performance of the 30 Crypto Assets Under Study

[5] Unless otherwise stated, price data is taken from coinmarketcap.com

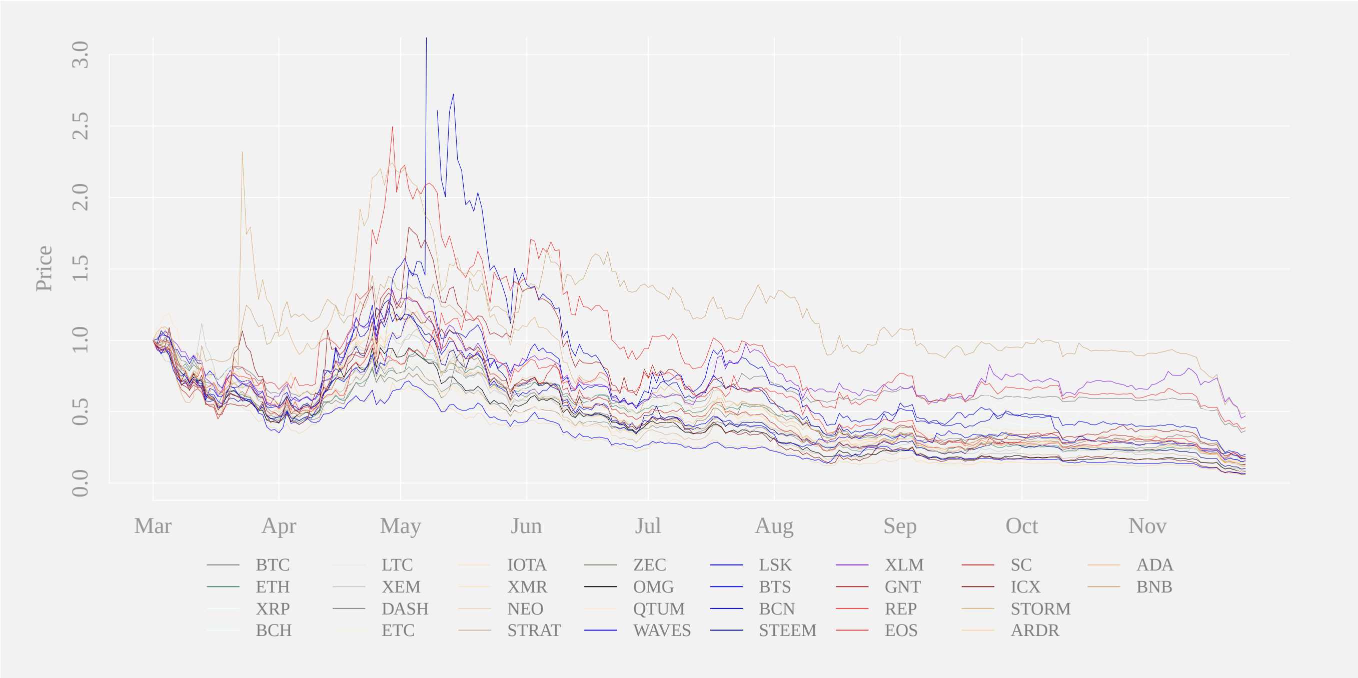

Figure 4: The Current Regime: Prices from March 1, 2018; day one closing price = 1

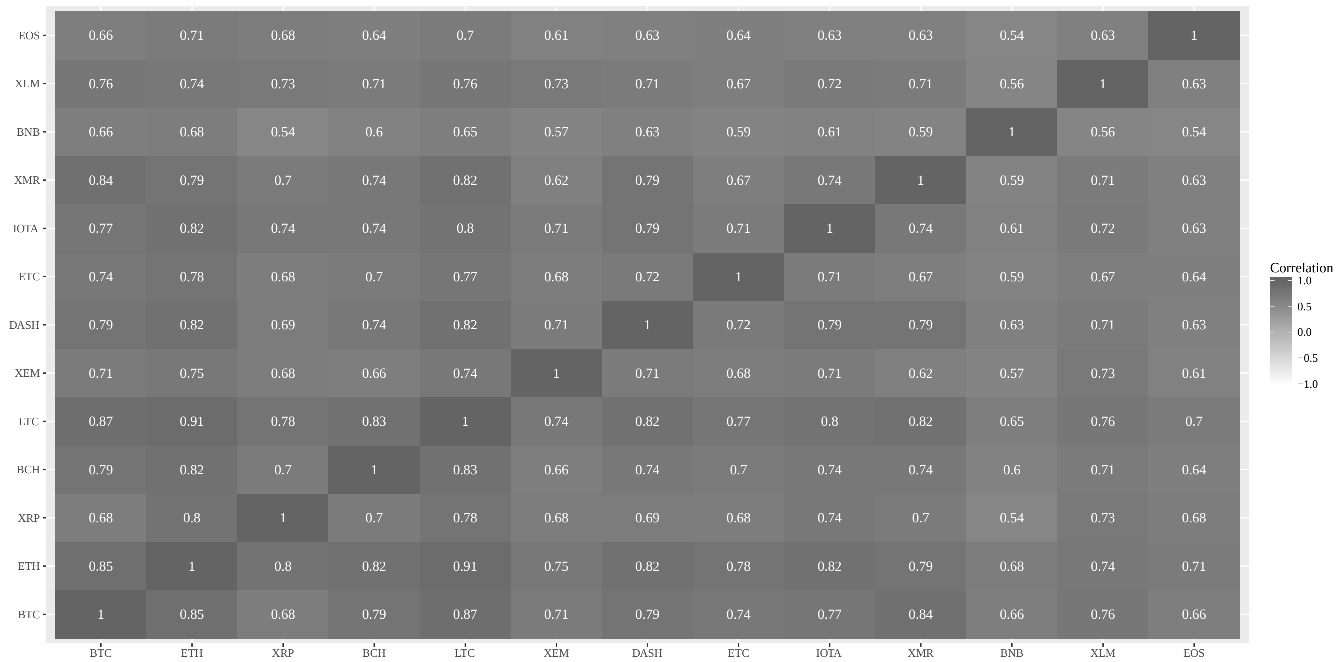

Figure 5: Correlations among 13 Crypo Assets from March 1 - November 25, 2018

2 From Whence We Came

The previous era, ending in Q1 2018, had several main features,

1. **high volatility**
2. **lagged and unstable relationships** between assets
3. highly profitable **market momentum** strategies
4. **Bitcoin as a leading indicator**: Capital came into the market primarily via BTC, followed by holders diversifying profits into alt coins and ICOs - a pattern referred to at the time as "cycling."

All of the above have changed dramatically. Volatility has of course reduced. Lagged relationships - which imply an inefficient market - were replaced by higher, more stable correlations[6]. This can be seen as a growing sophistication of the basic mechanics of the market. Momentum strategies have also become much less useful.[7]

Far more than just a bubble popping, Q1 2018 saw a market whose most basic mechanics had been reworked.

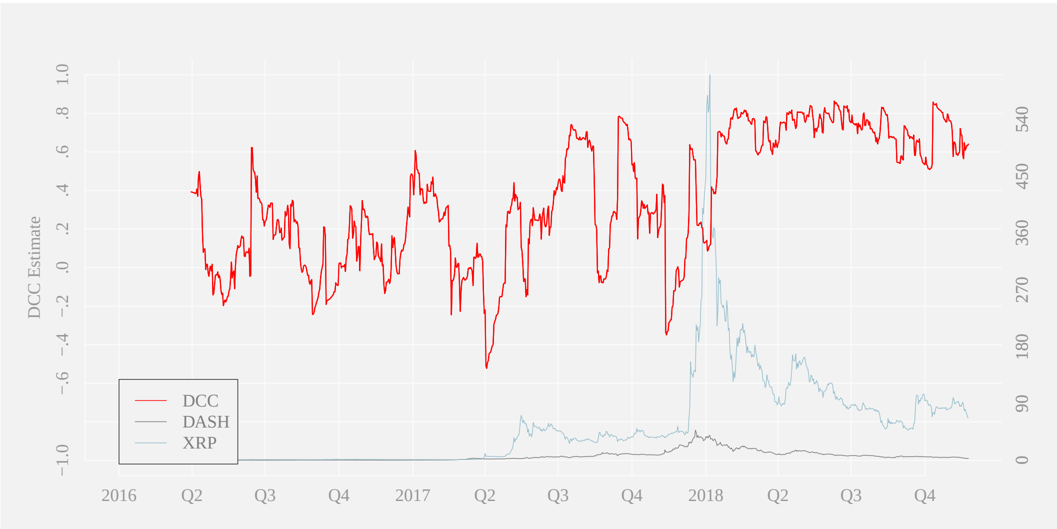

Figure 6: Ripple and Dash's Correlation Over Time

[6] That is, larger lags became $lag = 0$

[7] In *Understanding the New Paradigm of Liquid Venture Capital* we replicate a recent working paper out of the Yale Department of Economics which touts large momentum effects. We find that if one excludes the two weeks of early January, 2018 the lion's share of momentum effects disappear.

3 So, What Happened?

Our larger study[8] explored the changes that ushered in two different market eras in more depth. They roughly coincided with the massive spike in the market. Briefly, they are:

1. The cracking of **trader homogeneity**: As crypto-focused funds run by mainstream finance professionals came online, the market no longer was dominated by those that held similar views and had self-selected themselves into a niche market

2. The evaporation of the **wealth effect** that had dominated the market: Previously, when capital entered the market, it was entering an almost-closed feedback loop. Those who were holding BTC, ETH and XRP "diversified" into alt coins and ICOs. Now, gains made by professional traders are more likely to be taken off the table, leaving the asset class.

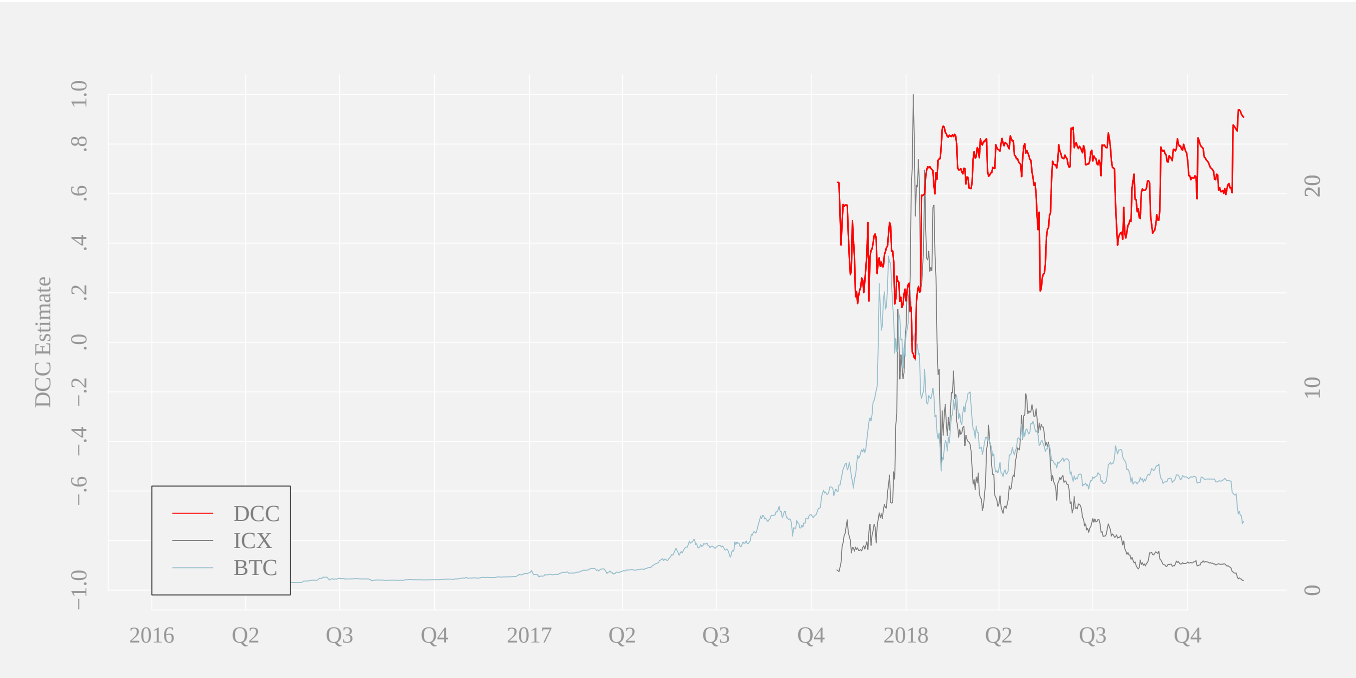

Figure 7: Wealth Effect - As Investors Travelled to Seoul in January 2018 for Icon's Conference, $100,000 Put Into their ICO Had Become $10,000,000. From Discussions at the Conference, the Vast Majority of that New Wealth Was Kept In Crypto Assets.

[8] Understanding the New Paradigm of Liquid Venture Capital

3. In a dynamic unique to crypto, this wealth effect applied to **miners** as well as traders

4. The build-out of **shorting mechanisms**: The absence of convenient ways to short crypto assets allowed speculative bubbles to fester

5. Increased exchange on-boarding capacity: Exchanges in 2017 were overwhelmed by demand for new accounts, creating a lag between latent demand for crypto assets and actual asset purchases

6. The **construction and capitalization of basic algorithmic trading strategies**: Strategies that typically would take advantage of lagged relationships were previously under-built and undercapitalized

What some have misread as simply a post-bubble market is actually a market whose basic mechanics have evolved rapidly. After these changes, we find ourselves in a definable market circumstance. Market mechanics have developed significantly, while entrepreneurial mechanics of the market have changed much more slowly. Most importantly, norms that link tokens to some reasonable risk adjusted value appear to have not yet formed.

4 Strategies For The Current Era

Markets are about context. Finding the right question for the **current** market era is the crucial task. Given the above sections, we propose: What firms are **actually making money**? The simple answer right now: **exchanges and OTC desks**. **Binance**, for instance, sees a daily trade volume of between $500m - $1b. Their token, BNB, in comparison, enjoys a market cap of roughly $1.2b.

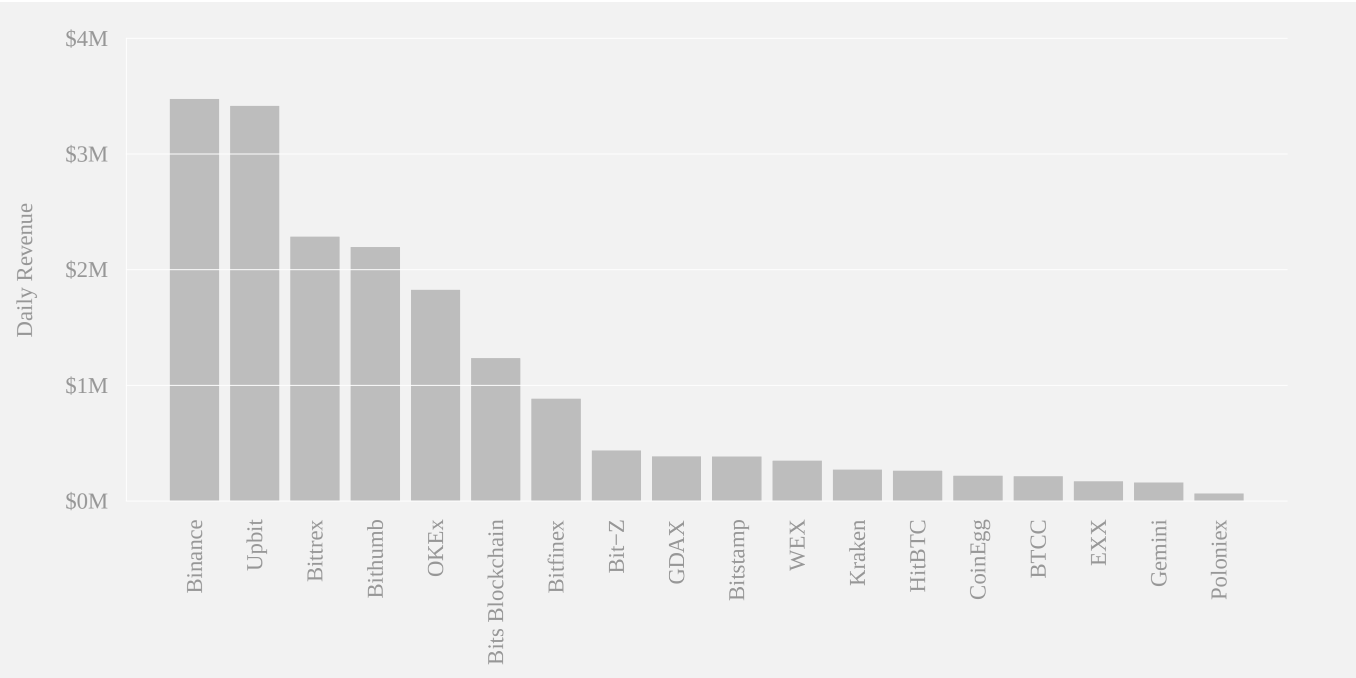

Figure 8: Exchange Daily Revenue. Source: Bloomberg

The answer to that simple question is reinforced in some powerful ways. And it these more nuanced points that leads to our strong endorsement of Binance's token.

1. Exchanges in many markets are a good investment. In crypto, they are not just the large money-makers, they are **early movers** with exceptional social capital and industry knowledge.

2. The **rules governing their own token** were written when they were in a less well-established market position, and are therefore needlessly investor-friendly.

3. Those rules include **large scale purchase and burn** of their own token

4. Timing, part 1: While far-and-away **the best performer in the current market era** among the thirty tokens we studied, the fall in the larger market has left it down sharply% since March

1, down roughly 40% YTD. It has clearly differentiated its performance from other tokens, but sits currently at only 22% of its peak value.

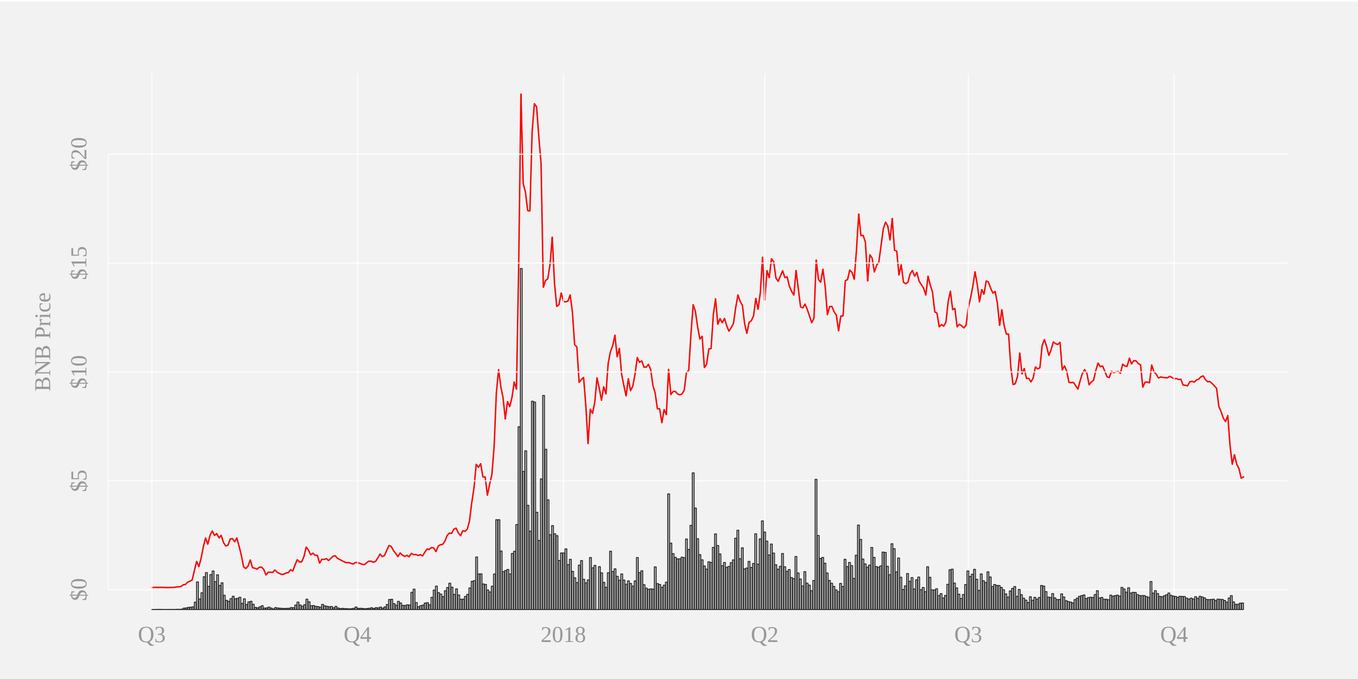

Figure 9: Binance's Daily Volume and its Token Price

1. Timing, part 2: The New York Attorney General's recent report[9], while questionable many respects, reveals ongoing, basic bad practices that among less professional exchanges. However,

2. Early, large exchanges **knew they were where the regulatory hammer would fall the hardest**. The resulting professionalism and caution of these players is common knowledge among industry insiders but under-appreciated beyond crypto circles.

3. Timing, part 3: Early this year, Binance weathered the bad regulatory news out of Japan well, and now is on safer footing in **Malta, whose recent regulatory changes have made it a global crypto capital, particularly for exchanges**.

4. They have turned their early advantages into **diversified institutional strength.** Binance, for

[9] https//ag.ny.govvmii...report.pdf

instance has launched large investment programs and just in November launched a research desk.

5. Likewise, they have begun to **professionalize key processes**, such as token listing.

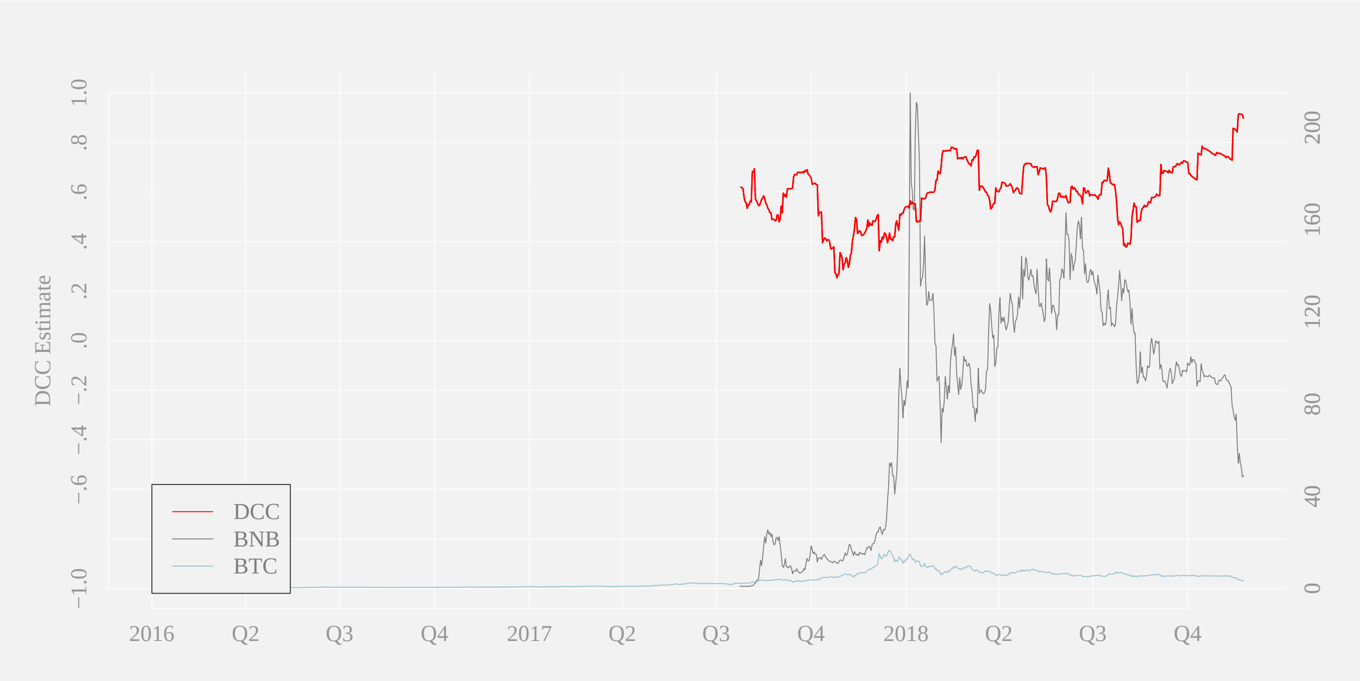

Figure 10: BNB's Correlation to Bitcoin and Other Major Crypto Assets has Remained Relatively Low and Steady, Extremely Rare Among the 435 Time Series of Correlation Studied

5 Conclusion

Long-term investors have bought into protocol-focused crypto assets, despite the relatively low barriers to entry for a protocol play, and therefore little clear reason to equate early-moving with eventual market dominance. Exchanges, on the other hand, have been forced to professionalize rapidly; their early mover status has been translated into real, reliable profits; they are pouring those profits into further build-out of their institutional capabilities; and recent regulatory clarity has "given them a home."

A subsequent report will dive further into the exchange token space, comparing reliable actors as well as their token models in more depth.