

COINMETRICS

FROM ORANGE GROVES TO ORANGE GOLD

CAN ON-CHAIN METRICS DETERMINE WHICH
CRYPTOCURRENCIES ARE SECURITIES?

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SUMMARY

How crypto assets are to be regulated in the United States is a contentious battleground with high stakes implications for the future of the crypto industry. However, participants in the industry contend that the current regulatory framework is ambiguous, unclear, and is not representative of the realities of how blockchains operate. This paper translates the existing regulatory guidance from the US Securities and Exchange Commission on how to classify crypto assets as securities using a set of measurable, reproducible, metric-driven assessments. We apply the Howey Test using on-chain data on several crypto assets to assess which of them exhibit characteristics of an investment security based on the SEC's criteria. Our findings suggest that applying the current securities framework requires a holistic analysis, with on-chain data telling part of, but not the entire story.

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1 INTRODUCTION

As a response to the excessive risk taking and fraud in capital markets of the 1920's followed by the subsequent crash of 1929, the United States Congress enacted laws to protect investors from information asymmetries and to promote transparent markets. These events defined the necessary disclosures for securities issued to the public, birthed the securities market enforcement agency (the Securities and Exchange Commission, or "SEC"), and raised the question of which assets are securities.

A hundred years later, crypto markets are mirroring the boom and bust of the 1920's, similarly inciting debate for how markets ought to be regulated. A central point of this debate revolves around defining which crypto assets are securities. Entities that issue securities must undergo a lengthy and expensive process to register with the SEC as well as subject themselves to increased scrutiny under the securities law. SEC enforcement actions against Coinbase and Binance, as well as statements made by past leadership hint at, but don't conclusively state, how crypto assets are classified as securities. The legal battle between the SEC and Ripple has further complicated this issue, with the court ruling that token sales can be packaged into securities offerings on a case by case basis. [10]

The crypto market is worth over \$1.1 trillion. Nearly \$600 billion (49%) of the market is Bitcoin, the only asset the SEC has claimed to not be a security. \$81 billion (7%) of the market consists of assets alleged as securities by the SEC, including XRP, BNB, and a handful of other multi-billion marketcap projects. More than \$500 billion (44%) of the market consists of assets with no clear classification. Defining a securities framework and path to compliance for digital assets are essential parts of promoting a healthy crypto market in the United States. With so much capital at stake, it becomes increasingly important that any determination for how a digital asset is to be regulated is made objectively and accurately.

This paper translates the existing guidance from the SEC and other organizations on how to classify crypto assets as securities using a set of measurable, reproducible, metric-driven assessments. Section 2 provides a background of the US securities framework and its application to crypto. In Section 3, we apply those assessments to a sample of widely traded crypto assets, some of which have been classified as securities by the SEC. We will stop short of explicitly classifying any asset as a security and leave that determination to outside parties.

Estimated Marketcap for Assets by SEC Security Allegation

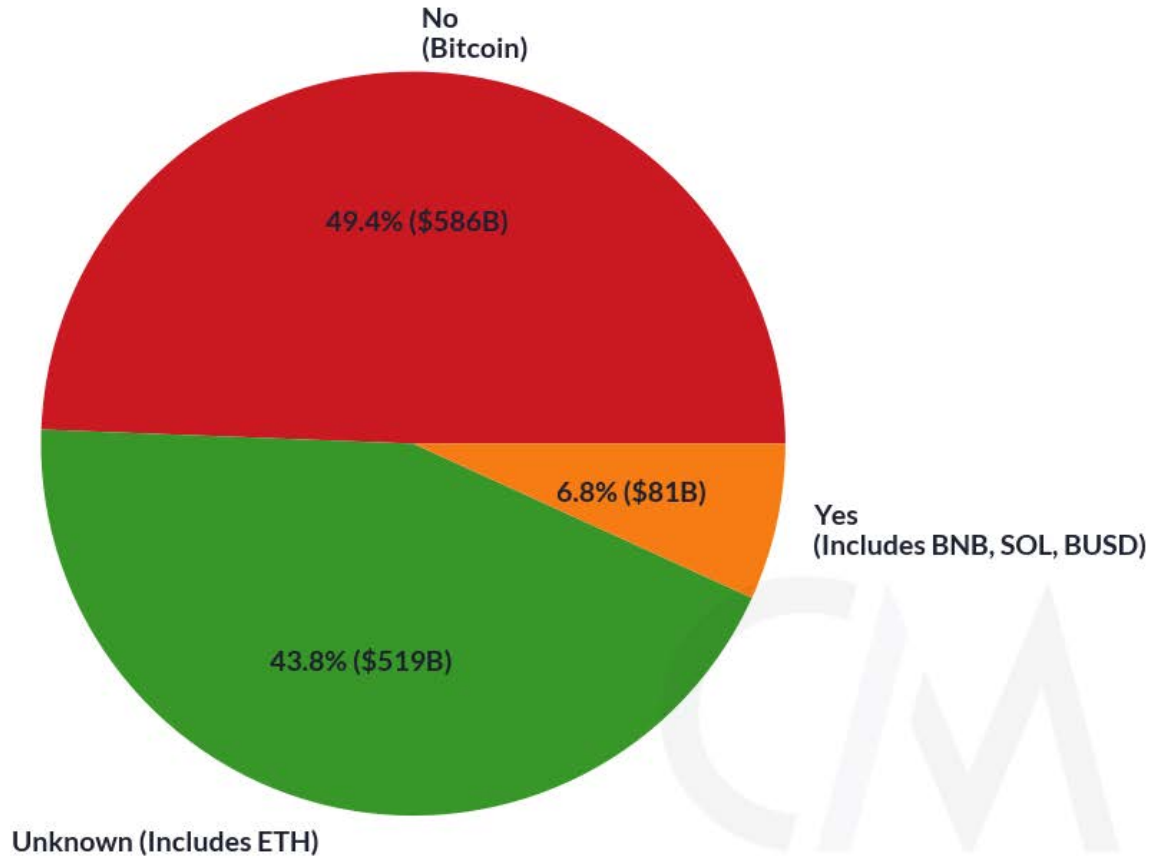


Figure 1 Estimated Marketcap of crypto assets by security status. Data as of July 17, 2023.

Source: Coin Metrics Network Data Pro

2 BACKGROUND

Origins of the US Securities Framework

Prior to federal securities laws being enacted by the United States in the 1930s, speculation based on fraud plagued the US stock market in the 1920s. Among the most notable examples were the original Ponzi schemes, one of which was devised by its namesake Charles Ponzi. Those original Ponzi schemes sought to raise capital by promising high returns of investments to investors with minimal risk, without disclosures being made by those making these promises. As these investment schemes collapsed, so too did the capital from these investors. The subsequent crashes led to the US enacting its first federal laws to regulate these markets.

Securities Act of 1933 and Securities Exchange Act of 1934

The Securities Act of 1933 was the first federal law to regulate the sale of securities in the United States. It requires the promoters or issuers of securities to disclose financial information to the public and prohibits fraud in the sales of securities. This information includes a description of the security, the business which promotes the security, its management, and financial statements. This act of disclosure is accomplished by registering with the SEC, hence the distinction between “registered” securities (which are legal) and “unregistered” securities (which are illegal).

The Securities Exchange Act of 1934 created the SEC, which acts as the enforcement agency for federal securities laws. The SEC’s mission is to “protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.” In addition to being the regulatory body responsible for overseeing the sales of securities, it regulates the venues with which securities are exchanged, such as the New York Stock Exchange, NASDAQ, and brokerage firms. [1]

SEC v W.J. Howey Co., 1946

SEC v W.J. Howey is a case which applied the Securities Act of 1933 to the sale of citrus grove cultivation in exchange for future proceeds to investors. W.J. Howey owned Howey-in-the-Hills Service Inc., which managed orange groves in Florida. The Howey Company offered half of its shares to the public to cultivate developments of their groves. The shares were packaged for sale as a real estate and service contract. The real estate contract conferred ownership of a parcel of the orange grove (though there was no separation between owned lots) while the service contract charges the investor in exchange for the Howey Company's labor, cost of materials, and efforts to promote and market the land. In particular, the shares that the company sold were often to unsophisticated investors who did not have the expertise to manage the real estate themselves, nor where they located remotely close to the property.

The court ruled that those contracts offered by the Howey company qualified as "investment contracts" that were unregistered securities. This case birthed the assessment by which an asset is deemed an investment security called "The Howey Test". [2]

The Howey Test consists of the requirement that an "investment contract" exists when there is the **investment of money** in a **common enterprise** with a reasonable **expectation of profits** to be derived from **the efforts of others**. Each of the points emphasized can be considered an independent "prong" of the Howey Test, and all need to be met to be classified as an investment security. Put differently, an asset that "fails" any of the prongs of the Howey Test is **not** considered an investment security.

US Securities Framework in the Crypto Era

The Hinman Speech: When Howey Met Gary (Plastic)

The "Hinman Speech", a 2018 speech given by former SEC Director of Corporate Finance William Hinman, shed light on how to apply the existing Howey Test guidance to the crypto market. Given a year after the Initial Coin Offering (ICO) craze of 2017, Hinman emphasized that the assets themselves may not be securities, but rather the method of packaging and selling the asset to investors could qualify as a securities offering. Hinman states:

[The token] – or coin or whatever the digital information packet is called – all by itself is not a security, just as the orange groves in Howey were not. Central to determining whether a security is being sold is how it is being sold and the reasonable expectations of purchasers. [3]

One of the key takeaways that the industry took from his speech was the idea that securities laws do not apply to protocols that were “sufficiently decentralized”. In an excerpt, Hinman states:

“If the network on which the token or coin is to function is sufficiently decentralized – where purchasers would no longer reasonably expect a person or group to carry out essential managerial or entrepreneurial efforts – the assets may not represent an investment contract.” [3]

We explore different ways to quantify “sufficient decentralization” in Section 3.

Framework for “Investment Contract” Analysis of Digital Assets

The “Framework for “Investment Contract” Analysis of Digital Assets” [5] is the SEC’s official framework on how to apply existing securities laws to crypto assets. It lays out criteria for whether a “digital asset”, the token itself or the manner in which it’s sold, can be classified as an investment contract security. The framework outlines each prong of the Howey Test and explains factors that would imply meeting each of the criteria.

Of note, it goes deep into the latter prongs of the Howey Test – whether an investment contract contains “Reasonable Expectation of Profits Derived from Efforts of Others”. We dig deeper into translating the criteria laid out in this document in Section 3.

Frameworks from Outside the SEC

In attempts to concretely define the existing securities framework to cryptocurrencies, the crypto community and lawmakers have put forth their legal interpretations of securities law as applied to crypto. The subsections below give a short overview of these frameworks and their distinguishing features.

Framework for Securities Regulation of Cryptocurrencies by Coin Center

Coin Center's framework [6] applies the Howey Test to the technical properties of a blockchain network. It focuses on the investor risk posed by token distribution mechanisms, commonality present in the ecosystem, the relative effects from the efforts of a third party, and the degree of trustlessness of the system such as their consensus mechanisms. The framework's goal is to delineate between the most innovative projects versus the likely scams that are harmful to the industry.

Crypto Rating Council's (CRC) Securities Law Framework

The CRC published a rubric [7] for classifying digital assets as securities based on the Howey Test. The rubric contains mostly qualitative measures for how assets are packaged for sale, the influence a project team has on the ecosystem, and the asset network's utility and decentralization. Measures are tallied up using a scoring system from 1 to 5, from least likely to most likely to be a security.

Market Structure Bill (Draft - 2023)

At the time of writing, Congress is proposing a new market structure bill [8] which amends the Securities Act to include sections for classifying digital assets as securities. It notably includes a path to compliance for digital assets, which may first be classified as securities, to eventually mature into a digital commodity. Under the digital commodity distinction, these digital assets will be regulated outside of the SEC's jurisdiction. We will cover the specific criteria proposed in this bill in the following section.

3 TESTING THE SECURITIES CRITERIA

In this section, we illustrate how we can translate the legal language of existing frameworks into objective, measurable criteria. We use a combination of Coin Metrics network data metrics, market data metrics, and block explorer ATLAS to verify on-chain activity.

Methodology

Applicability of the Howey Test On Tokens

There is a distinction between how a token is sold being a securities offering and a token itself being a security [2] [3]. The Howey Test applies for “investment contracts”, the legal definition of which is a point of contention for the ongoing battles between the SEC and the industry, such as SEC v. Ripple and the SEC’s enforcement actions against Coinbase, Binance, and others.

Coinbase’s response to the SEC’s complaint[4] and the Southern District of New York’s (SDNY) ruling in the SEC v Ripple Case [10] argues that secondary market sales are not investment contracts and exempt from being securities offerings. The SDNY court ruled that: “*Whether a secondary market sale constitutes an offer or sale of an investment contract would depend on the totality of circumstances and the economic reality of that specific contract, transaction, or scheme.*”[10]. Disqualifying secondary market sales and thus its basis as an investment contract would nullify the application of the Howey Test on crypto assets. Rather, the focus becomes the nature of certain transactions being securities offerings. Using the Howey comparison, the tokens are the orange groves while the securities are the contracts for Howey’s management services.

The SEC’s enforcement actions imply that crypto assets “embody” the manner in which they are sold. A token and its associated transactions are inherently investment contracts, meaning any market participant who buys a token is participating in an investment contract with the “issuer” of the token. This allows the SEC to apply the Howey Test directly to the tokens, leading to their allegations that some are unregistered securities. Using the Howey comparison, the SEC implies buying a token from an exchange is akin to buying a real-estate contract to Howey’s orange groves.

Regardless of its accuracy, the SEC’s stance of counting token secondary market sales is the status quo for how to classify digital assets as securities. We assume that a token sold in the secondary market may still qualify as a securities offering and a token itself may be a security. We will loosely refer to “assets being securities” in the SEC’s stance.

Asset Sampling

We chose a sample of assets to assess which met the following asset characteristics:

- Is sold on the secondary market,
- Has a high degree of reliability and verifiability of on-chain data,
- Is alleged to be a security or
- If no allegation has been made by the SEC, has a significant marketcap, and
- Is not an on-chain derivative (stablecoin, staked tokens)

Howey Test

The Investment of Money

This prong defines an “investment” as any sale in exchange for a token. According to the SEC’s framework, any transfer of value (sale) of a token automatically meets the *Investment of Money* prong of the Howey Test.

The focus of the Howey analysis is not only on the form and terms of the instrument itself (in this case, the digital asset) but also on the circumstances surrounding the digital asset and the manner in which it is offered, sold, or resold (which includes secondary market sales).

It’s assumed that the SEC thinks all assets listed on a secondary market meet this prong.

Different token distribution schemes may pass this prong more than others depending on the permissioned nature of this scheme. “Pre-Mines”, Initial Coin Offerings (ICOs), and other

permissioned token distribution schemes offer investors more of a chance to realize a profit depending on the managerial efforts of others. Token distribution from mining and airdrops, where recipients are more likely to be the users of the network that are degrees removed from the profitability of the network, are less likely to be considered as investments of money. The immutable nature of blockchains make this prong difficult to unwind once its tokens are initially issued.

Historically, the SEC has scrutinized tokens which were initially sold as tokens or on private sales more so than tokens distributed from mining. Virtually every asset the SEC has alleged to be a security were ICOs. Despite the SEC's historical behavior, it's unclear whether mining or proof of work consensus makes a token less likely to be subject to securities law.

Common Enterprise

The next prong concerns the presence of a *common enterprise* for a project. In equities, this often refers to the company that issues a stock. In crypto, the shared ownership and participation of every token holder within a network raises the question of what it means to be a *common enterprise*.

Vertical and Horizontal Commonality

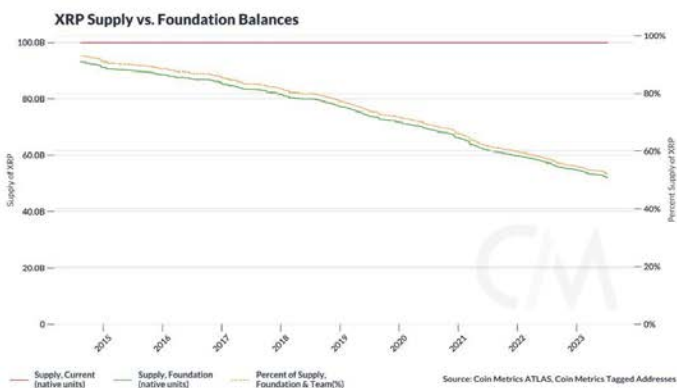
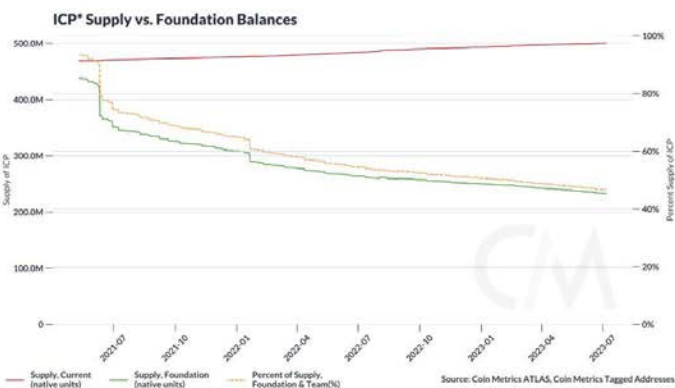
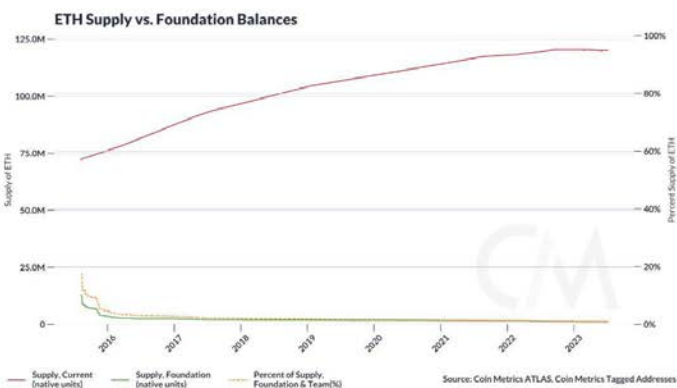
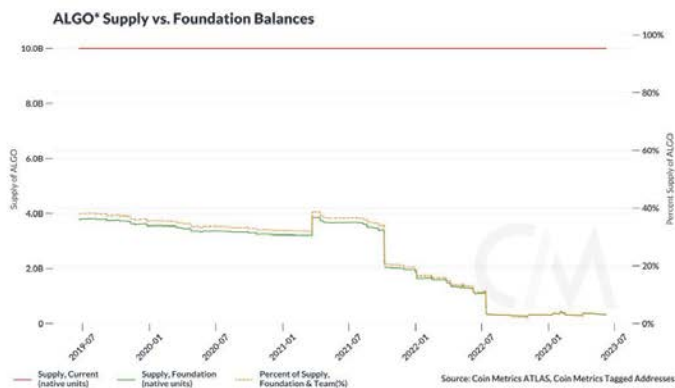
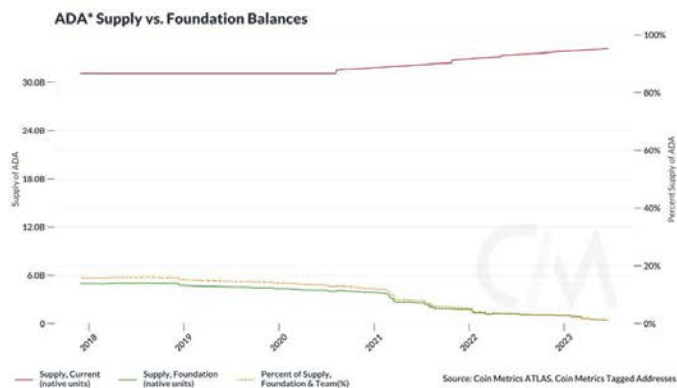
The presence and definition of a common enterprise is subject to debate within the context of a decentralized network. Strictly speaking, the vast majority of projects have some common enterprise – be it a team, foundation, mining or staking pool, a group of investors, or something else – that influences the success of a protocol. In a legal sense, there is a distinction to the degree where the labor of a common enterprise is distributed across a set of participants of the network. This concept is called Vertical and Horizontal commonality.

This excerpt from Coin Center's Framework for Securities Regulation of Cryptocurrencies [6] explains this concept well:

Briefly, horizontal commonality can be defined as the pooling of investor funds such that the fates of all investors rise or fall together, often—though not always—through a pro-rata sharing of profits. Vertical commonality requires that the “fortunes of the investor are interwoven with and dependent upon the efforts and success of those seeking the investment of third parties.

“Horizontal commonality” tends to not be a distinguishing characteristic for blockchain networks because it’s generally met by all tokens to some degree. We’ll focus on “vertical commonality” because a network with established vertical commonality poses higher investor risk and is more in line with the “common enterprise”. For this analysis, we will assume that the primary common enterprise in question involves a combination of a “foundation” and affiliated developer teams.

Balances by Team and Foundation vs. Supply



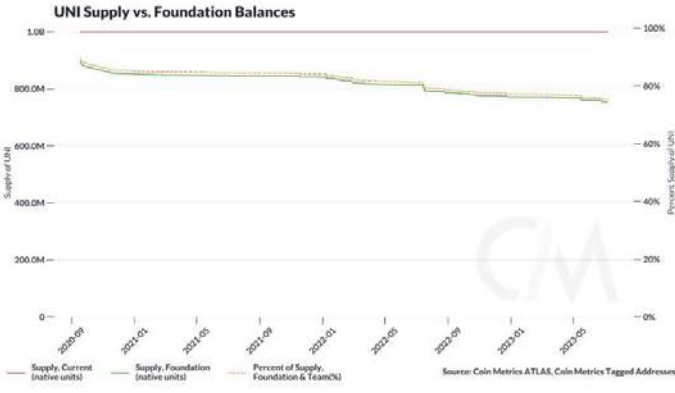
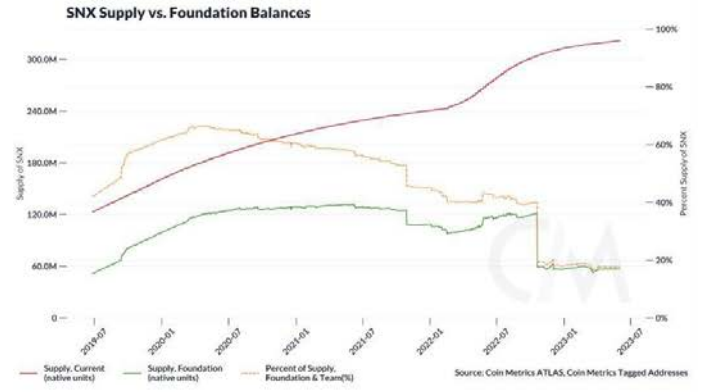
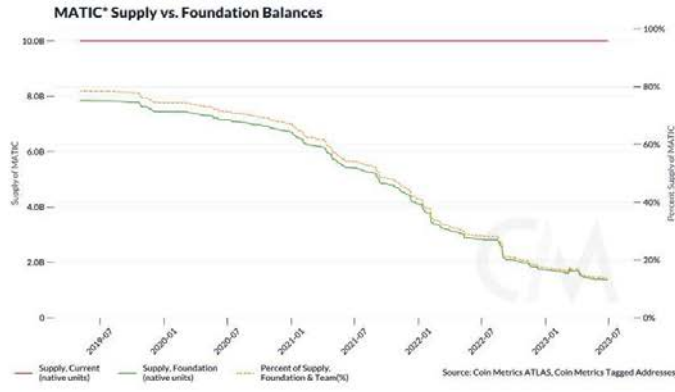
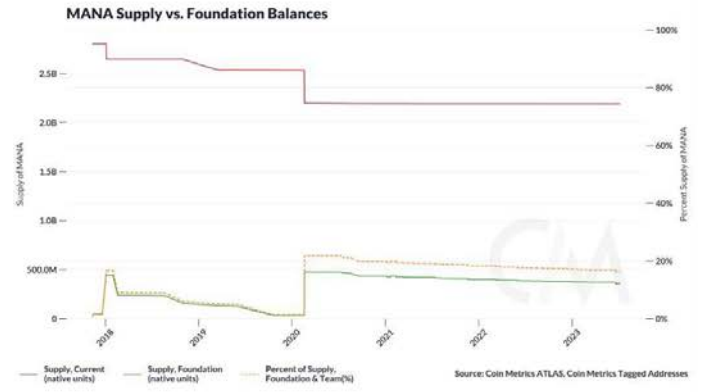
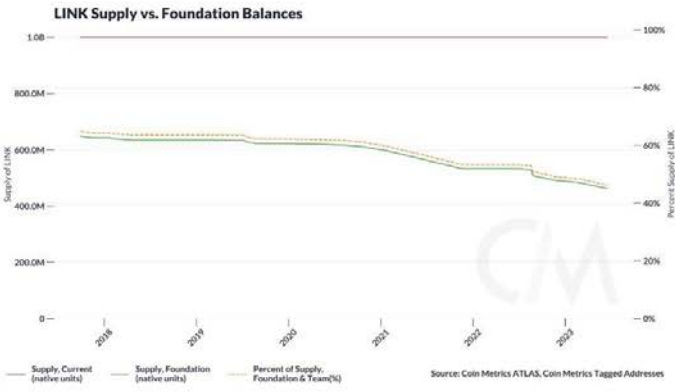
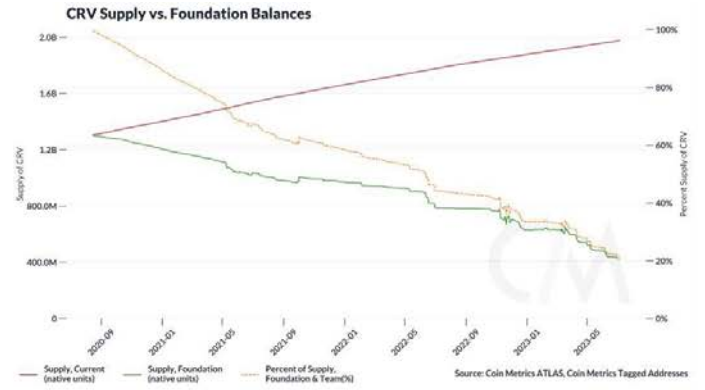
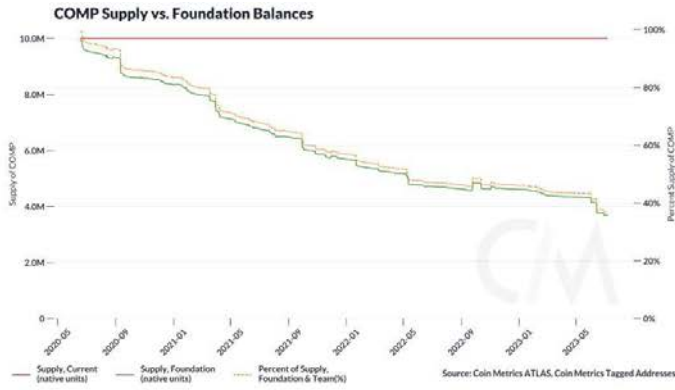


Figure 2 Balances of Foundation and Team Over Time. Foundation and Team addresses were directly sourced from public data using our [free float methodology](#). Sources for addresses include but are not limited to: project disclosures, on-chain analysis, and social media posts. As a result, the set of addresses used are deterministic rather than probabilistic, and aggregates represent a lower bound. Source: Coin Metrics Network Data Pro

Figure 2 shows the varying degrees of token ownership by common enterprises. UNI, ICP, MANA, and CRV have the highest share of its supply owned by their founding team*. This data point could increase the likelihood that the SEC considers those assets securities. Notably, each of those assets had different initial token distribution schemes. Uniswap famously [airdropped](#) its UNI token to users, Curve Finance “stake dropped” its CRV token to early users who had provided initial liquidity to its protocol, while Dfinity’s ICP and Decentraland’s MANA raised and \$195M and \$24.4M respectively with their ICOs.

Regardless of initial token distribution schemes, networks tend to get decentralized over time as more tokens get distributed from insiders to the rest of the network. The fluid nature of supply distribution suggests a path to which projects may lessen the influence of any one common enterprise and become sufficiently decentralized, thus lowering their chances of being labeled as a security.

*Uniswap’s large Foundation balance is largely due to a [time-locked contract](#) that automatically vests. Although not actively managed in the same sense as a typical account owner being able to transfer tokens at will, it may be accessed by admins from the Uniswap Foundation to protect the protocol in the event of a security breach. It’s unclear at this time whether the SEC considers this level of “managerial effort” to map to being an “active participant” [5] that directly affects the eligibility of an asset being deemed a security. An active participant, among other things, “has a lead or central role in the direction of the ongoing development of the network or the digital asset, [...] plays a lead or central role in deciding governance issues, code updates, or how third parties participate in the validation of transactions that occur with respect to the digital asset. An AP has a continuing managerial role in making decisions about or exercising judgment concerning the network or the characteristics or rights the digital asset represents.” However, the US District Court of the Southern District of New York ruled that compensating employees via token does not apply to the Howey test.

The form of admin access that the Uniswap Foundation has over the foundation's balance and its risks are covered in our report on the risks of admin keys: [Monitoring Defi’s Biggest Risk](#). Uniswap Labs’ token disclosure can be found on its website [here](#).

Reasonable Expectation of Profit Derived From The Efforts Of Others

This prong relates to whether the expectation of profit is specifically derived from the managerial and/or entrepreneurial efforts of others.

To quote the SEC's framework:

A purchaser may expect to realize a return through participating in distributions or through other methods of realizing appreciation on the asset, such as selling at a gain in a secondary market. When a promoter, sponsor, or other third party provides essential managerial efforts that affect the success of the enterprise, and investors reasonably expect to derive profit from those efforts, then this prong of the test is met.

The qualifier for depending on the efforts of others is crucially linked. One may purchase an asset with the expectation of profit but not derived from the efforts of others. Such was the case in *Noa v. Key Features* involving the sale of silver bars. The courts found no expectations from the efforts of others because once the purchase of silver bars were made, the profits to the investors were primarily based on the fluctuations of the silver market. [2]

The degree to which any incremental improvement impacts the network's valuation plays a key role in interpreting the applicability of reliance on the efforts of others. A minor upgrade on Bitcoin from an open source developer has less of an effect on its network valuation than a major functionality implementation made to a smaller network by an employed developer. Therefore, the relative impact that any common enterprise (if one exists) has on a network may greatly influence the degree of importance our measures have.

Below, we'll compare how assets score in metrics that gauge the likelihood of there being a reasonable expectation of profits from the managerial efforts of others.

Correlation Between Free Float Supply Change and Price Change

The relationship between the supply held by insiders (“active participants”) and the change in price is of particular interest when measuring the reliance of others when expecting profits.

From the SEC’s framework:

The more the following characteristics are present, the more likely it is that there is a reasonable expectation of profit:

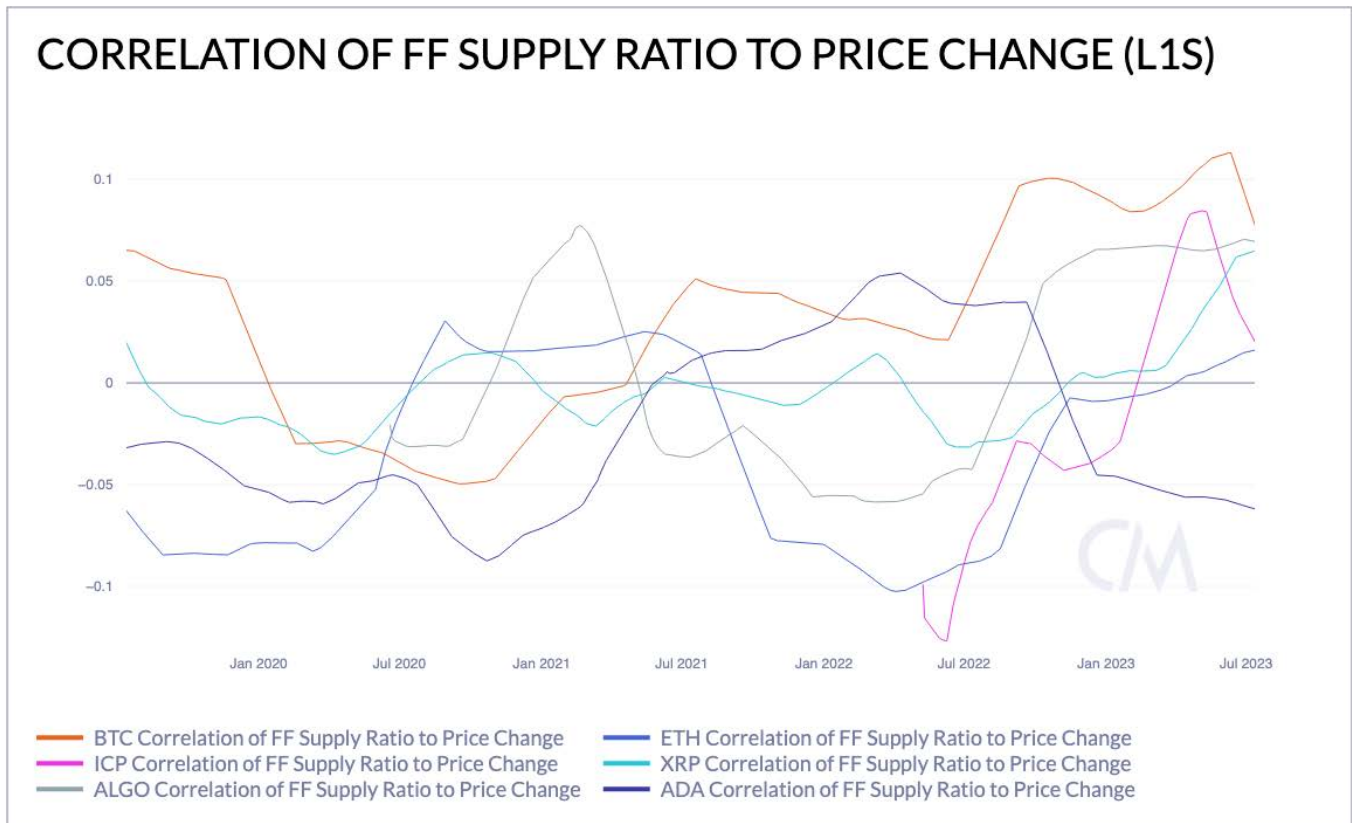
- *The digital asset gives the holder rights to share in the enterprise's income or profits or to **realize gain from capital appreciation** of the digital asset.*
- *The opportunity may result from appreciation in the value of the digital asset that comes, at least in part, from the operation, promotion, improvement, or other positive developments in the network, **particularly if there is a secondary trading market that enables digital asset holders to resell their digital assets and realize gains.***
- *The [active participant] is able to **benefit from its efforts as a result of holding** the same class of digital assets as those being distributed to the public.*
- *The [active participant] continues to **expend funds** from proceeds or operations to **enhance the functionality or value** of the network or digital asset.*

For simplicity, we can measure the relative effects of changes in [free float](#) supply ratio to changes in price. Free float supply measures the supply of a token available to the market. It excludes foundations, teams, supply inactive for >5 years, among others. Note that free float supply has more exemptions than the foundation and team supply from the data in Figure 2.

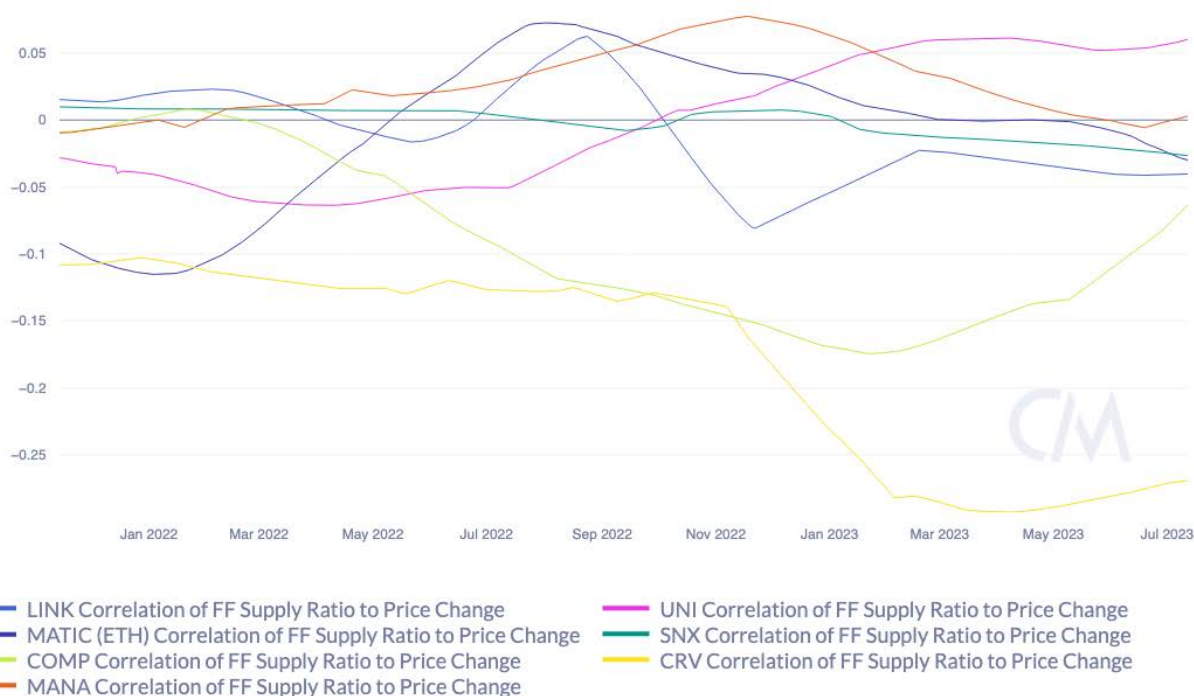
To measure the relationships between *the reliance of others* with the *expectation of profit*, we can calculate the correlation between the relative amount of supply available to the market to the appreciation of a token’s price. In equation form, this reads:

$$\text{Corr}(\Delta(\text{SplyFF}/\text{SplyCur}, 1 \text{ day}), \text{PctChange}(\text{PriceUSD}, 1 \text{ day}), 365 \text{ days})$$

When a foundation *sells* their assets, the proportion of free float supply to current supply *increases*. Inversely, a foundation which *increases* their share of the token supply means the proportion of free float supply to current supply *decreases*. Coupled with price change, this correlation measures the relationship between a foundation's buys and sells with the token's price. A large correlation implies a strong relationship between a foundation's transactions on the price of a token.



CORRELATION OF FF SUPPLY RATIO TO PRICE CHANGE



Figures 3 and 4, Correlation between the change in Free Float Supply Ratio and Price.

For Bitcoin, Free Float Supply excludes bitcoin untouched for >5 years.

Source: Coin Metrics Network Data Pro.

Chart for L1s: <https://charts.coinmetrics.io/formulas?id=7817>.

Chart for Application tokens: <https://charts.coinmetrics.io/formulas/?id=7818>

Based on our findings, we see little correlation between a foundation's transactions and price for most assets, with the exception of CRV. As crypto markets become more liquid, the impact of any foundation's transactions gets smaller. These findings suggest market forces tend to dominate any reliance on one central entity's supply holdings on the expectation of profits. This corroborates our previous research where we've found that changes in a token's free float supply generally [has little impact on its price](#).

As it applies to the Howey Test, the key assumption here is that holders share in the enterprise's income or profits when price appreciates. The validity of this assumption is up to debate.

Network Utility and Other Relevant Considerations

The SEC's framework includes additional characteristics outside of the Howey Test that relate to the economic realities of a given network. The presence of which could "lower the likelihood" that an asset could be security, although the exact likelihood per criteria is unclear.

Economic consumption is a key characteristic because it allows assets to be viewed more like "utilities" rather than securities. In other words, network participants may reasonably claim that asset purchases are primarily to consume resources to use the network rather than for financial gain. Rather, any financial gain would be merely incidental to market forces.

Below, we'll make inferences on what's meant as this economic consumption criteria by using network activity metrics across several assets.

Trading Activity Corresponding to Demand

Another criteria to measure the expectation of profits relative to a network's utility is how volume is correlated with demand. From the SEC's framework [5]:

[...there would be ... considerations as they relate to the "reasonable expectation of profits," including but not limited to...]

- *The trading volume for the digital asset corresponds to the level of demand for the good or service for which it may be exchanged or redeemed.*

Assets whose trading volume is correlated to its demand are less likely to be securities. Demand to use a blockchain network can be thought of in terms of how much a user is willing to pay in order to make it to the next block, or a blockchain's fee rate. We can thus apply a correlation between fee rates and centralized exchange trading volume to measure this criteria.

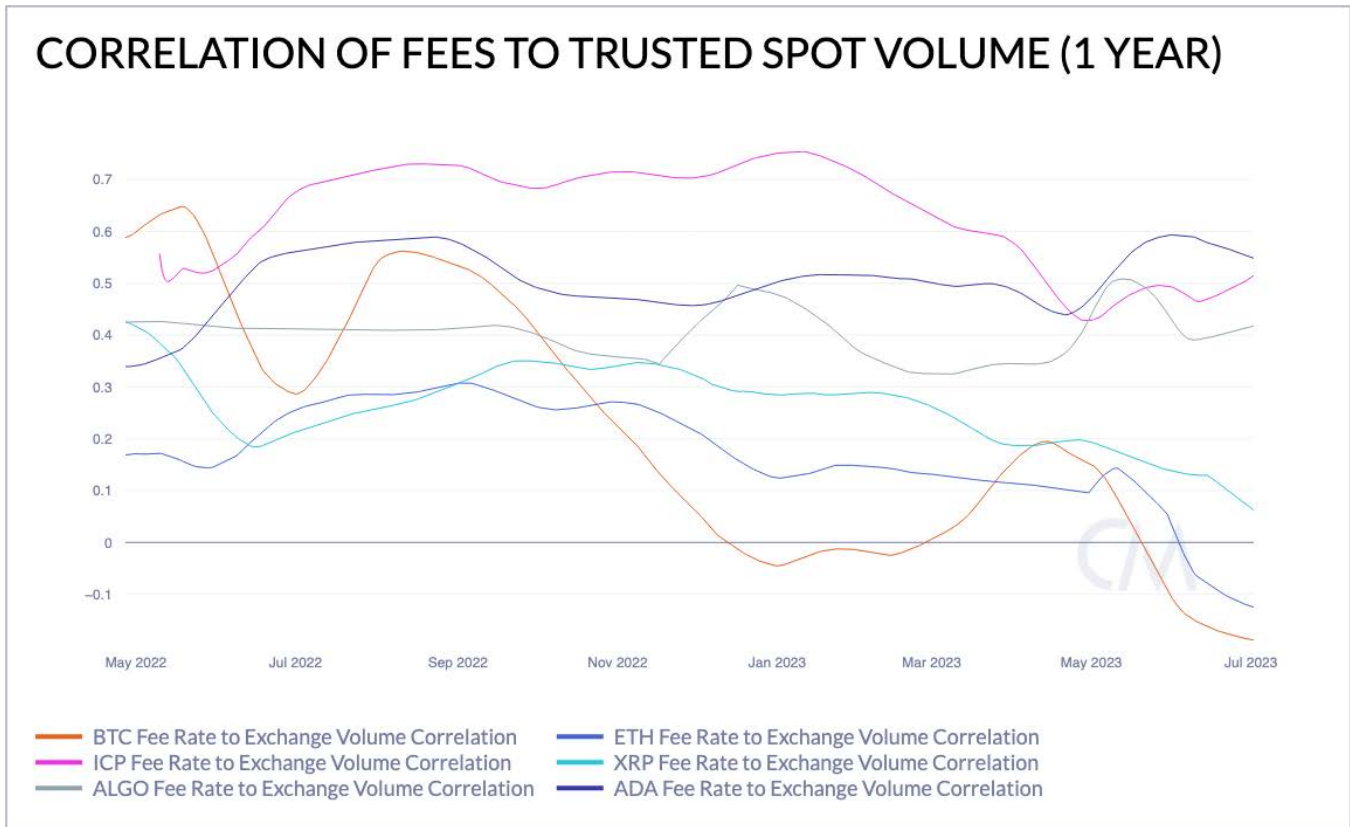


Figure 5, Correlation of Fees to Volume.
 Chart from <https://charts.coinmetrics.io/formulas?id=7784>.
 Source: Coin Metrics Network Data Pro and Market Data Feed

According to Figure 5, BTC and ETH exhibit the lowest correlations between fees and centralized exchange volume. ICP and ADA, which are alleged as securities, exhibit the highest correlations. This is contrary to the expectation for BTC and ETH being more commodity-like. Given these findings, we may come to several conclusions based on whether we accept or reject the following assumptions:

1. The SEC’s directional guidance on the correspondence between demand and activity as a security-determining characteristic is absolute.
2. Bitcoin and Ether are directionally the least security-like of all non-stablecoin digital assets.
3. Digital assets in general are to be framed within the traditional definition of a “security”, as opposed to utilities, commodities, or something else.

Accepting all assumptions represents an “SEC-maximalist” view, implying that virtually *all assets* (perhaps even bitcoin) are securities. Loosening assumption 1 while accepting assumptions 2 and 3 suggests some minimal threshold set by bitcoin and ether, above which assets are not securities and therefore allowing for fewer assets to be securities in general. Outright rejecting assumption 1 while accepting assumptions 2 and 3 would imply that we should be *inverting* the interpretation of this metric – the lower the value, the less security-like an asset is.

Loosening assumption 3 in general accepts how digital assets may differ from securities. If we were to stretch the analogy of the relationship between demand and volume onto utilities, we can see how high fees could correlate with low trading volumes. When energy prices are high, energy consumption tends to trend down. Likewise for blockchains, when fees are high, users may tend to match their consumption habits of the network accordingly.

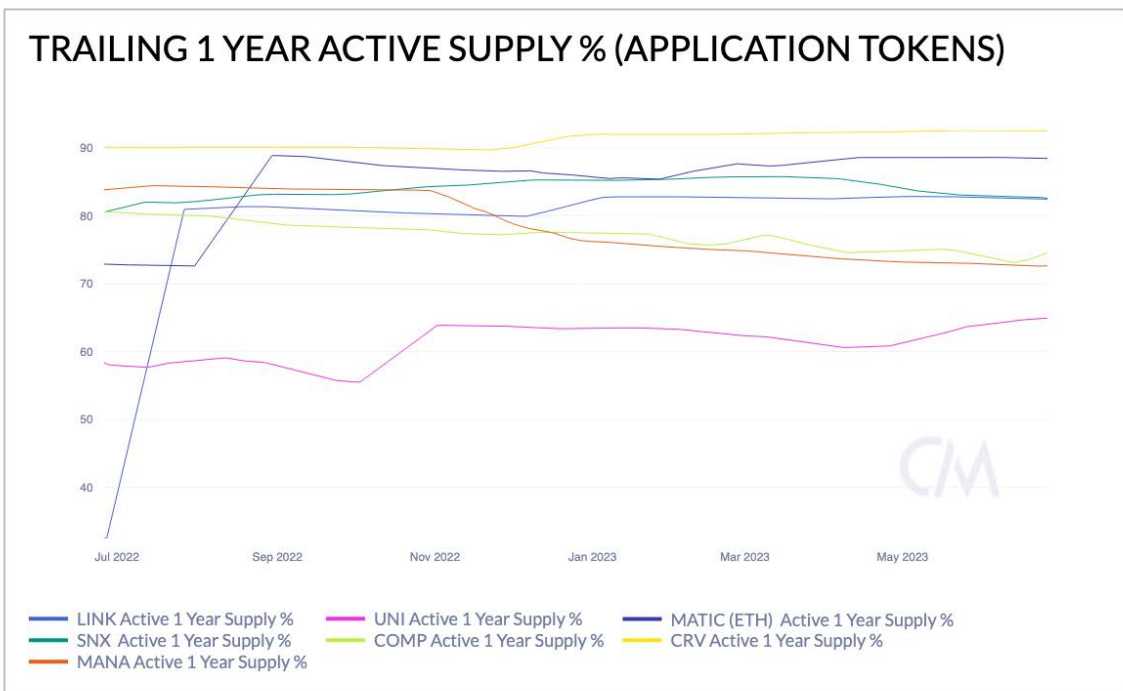
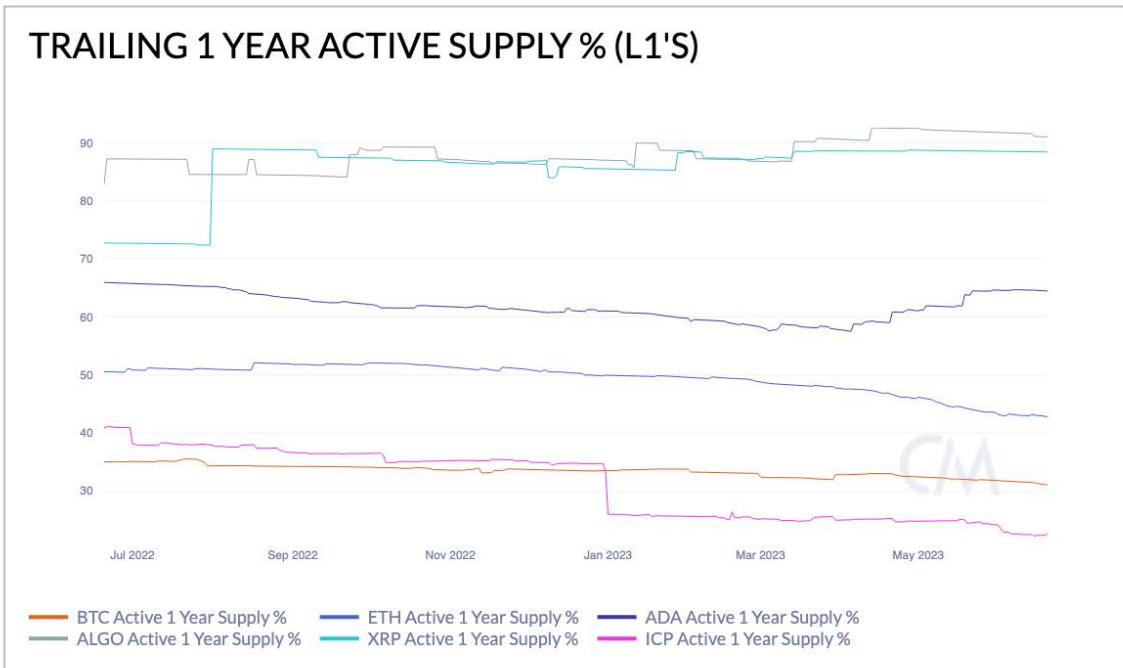
Assets Held for Expectation of Profit (Active Supply)

The incentives for network participants to consume an asset versus hold (presumably for profit) is an economic reality that the SEC examines. From the SEC’s framework:

- *Prospects for appreciation in the value of the digital asset are limited. For example, the design of the digital asset provides that its value will remain constant or even degrade over time, and, therefore, a reasonable purchaser would not be expected to hold the digital asset for extended periods as an investment.*

Although we can’t know the intent of every asset holder of the network, we can measure the token supply being actively exchanged in the network. This is roughly in line with the assumption that, if an asset is not a security, a rational holder of the asset will want to actively exchange that asset for the services provisioned by the network.

Percent of Active Supply



Figures 6 and 7, Percent of Supply Active in a Network Trailing 1 Year.

Chart for L1's: <https://charts.coinmetrics.io/formulas?id=7773>.

Chart for Application Tokens: <https://charts.coinmetrics.io/formulas/?id=7774>.

Source: Coin Metrics Network Data Pro

It's important to note that holding period as a measure for speculation naively assumes that holders are only holding for an expectation of profit. Those who hold tokens may have several reasons outside of speculation for holding a token, some of which may not be intentional (such as losing their private keys). Additionally, markets may speculate on anything regardless of if it is a security, such as commodities or physical art.

Supply Spent for Consumption

Although it's impossible to know the intent behind each transaction, we can infer that *some* portion of a given network's supply is used to facilitate its primary function. Blockchains have a cost to operating their primary function, whether it's to transfer value (digital currencies) or compute (smart contract platforms). These costs manifest themselves in fees. Thus, we can approximate how much of the token's supply is spent on its primary function by looking at the fees the network generates.

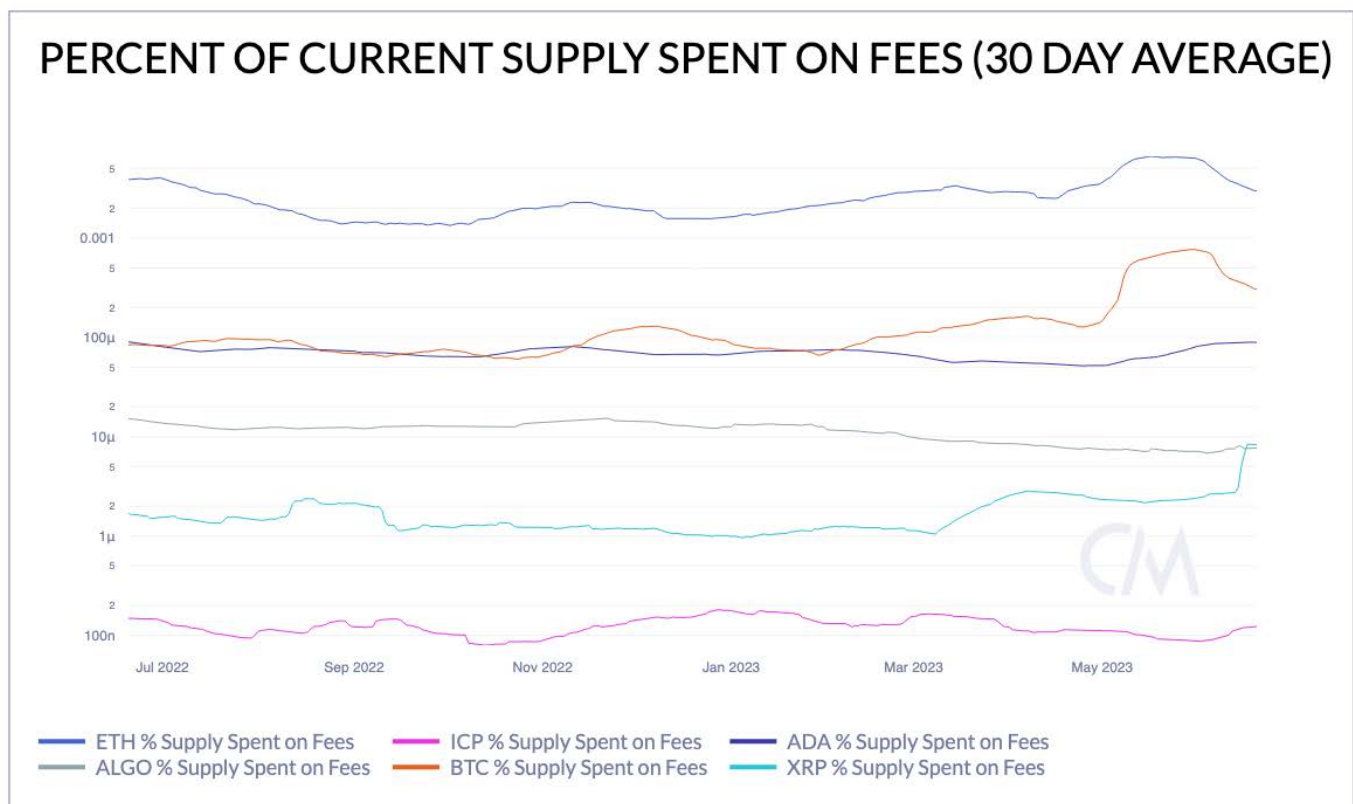


Figure 8. Percent of Current Supply Spent on Fees.
 Chart: [<https://charts.coinmetrics.io/formulas?id=7762>].
 Source: Coin Metrics Network Data Pro

Based on Figure 8, ADA, BTC, and ETH stand out among its Layer 1 peers, with a higher degree to which fees make up the active supply. This suggests more of the network’s supply is being used to perform its primary function. Inversely, XRP and ICP score low on this metric. It’s worth noting that the order of magnitudes of these metric values skew below 1%, but this is largely due to fees generally not making up a large portion of a transaction value to begin with.

Market Structure Bill

The market structure bill proposes new measures to assess whether a digital asset is a security [8]. Before diving into the assessments, the bill lays out some important definitions:

A “digital asset issuer” can be thought of like a “common enterprise” in the Howey Test, and explicitly includes foundations and founding developers.

A “digital commodity” is a digital asset issued on a “functioning decentralized network”, excluding stablecoins. A digital commodity is to be regulated separately (by the CFTC) from that of a security.

A “functioning decentralized network” is defined as having key characteristics that relate to the relative influence a digital asset issuer has on the network – the lower the influence, the more decentralized.

Balances By a Digital Asset Issuer

The Market Structure Bill states that a digital asset where a digital asset issuer has held 20% or more of a network’s supply within the past 12 months can be labeled a security. Below is an excerpt from the bill:

“(28) DIGITAL ASSET MATURITY DATE.—The term ‘digital asset maturity date’ means, with respect to any units of a digital asset, the first date on which 20 percent or more of the total units of such digital asset that are then outstanding as of such date are—

“(A) digital commodities; or

“(B) digital assets that have been registered with the Commission and issued and sold by a digital asset issuer.”

From the data used to generate Figure 2, we can plot the percentage of the supply held by its foundation and team per asset below.

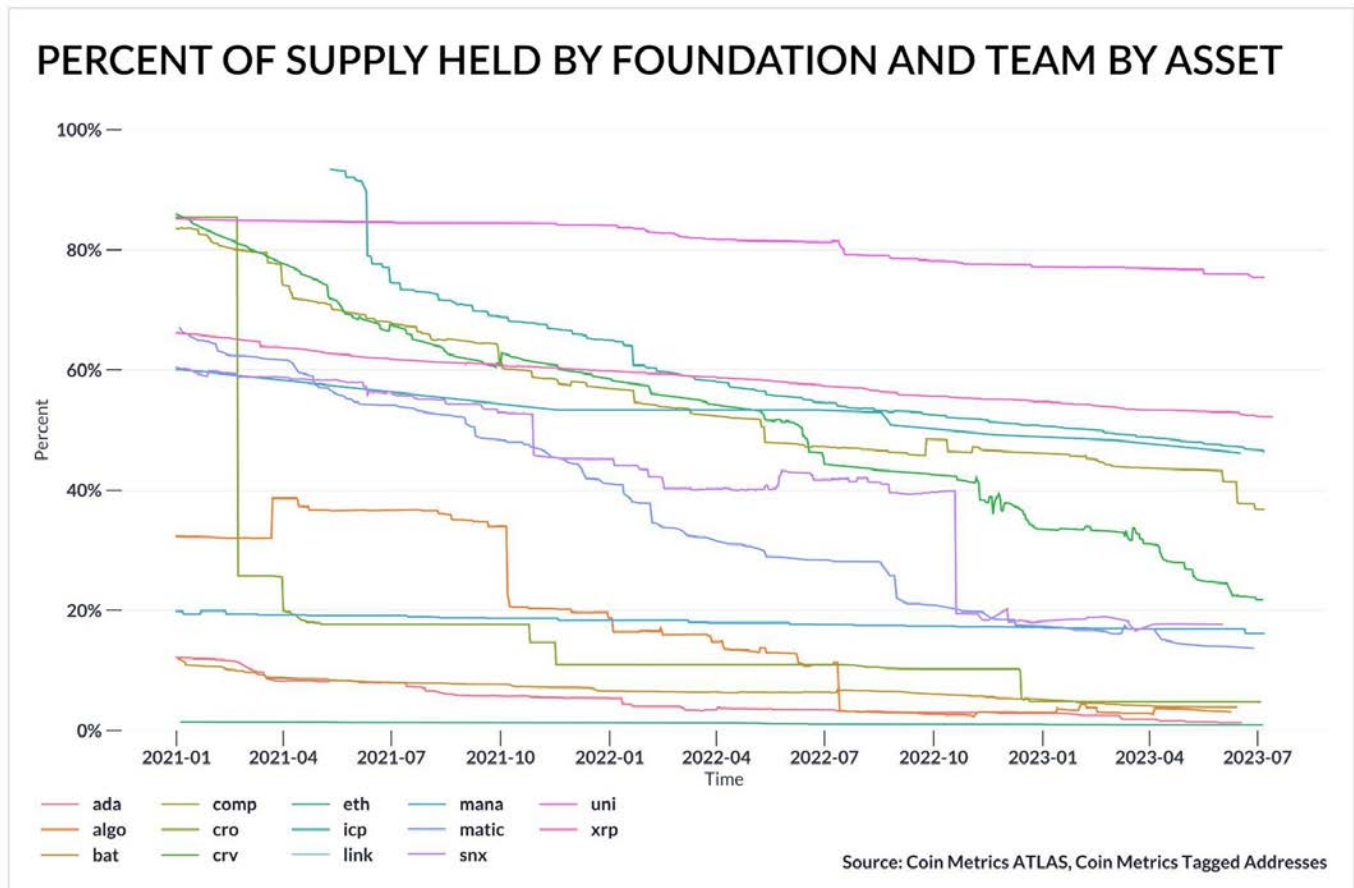


Figure 9. Percent of an asset’s supply held by a foundation and team. Source: Coin Metrics ATLAS.

Using the definition of a digital asset maturity date, the following assets have not reached, or are less than 12 months from, their maturity date:

Asset	Latest Date Where Supply Held by Digital Asset Issuer Exceeded 20% (As of 2023-07-07)
COMP	2023-07-06
CRV	2023-07-06
ICP	2023-06-13
LINK	2023-07-06
MATIC	2022-10-21
SNX	2022-12-02
UNI	2023-06-13
XRP	2023-07-06

Table 1. Assets Where Digital Asset Issuers Hold \geq 20% of Supply. Source: Coin Metrics ATLAS.

It's unclear whether the market structure bill includes time-locked contracts such as the one incorporated by Uniswap Labs. We include the supply locked in those contracts here, so any supply estimates from which includes those contracts represent an upper bound.

Generally, these supply balances are estimates from public sources and may contain some error. Address disclosures are voluntary and vary across projects and people affiliated with projects. The Market Structure Bill would put the onus on projects to disclose affiliated persons and addresses. This new clause will allow anyone with access to blockchain data to more precisely track supply held by insiders by simply tracking flows from publicly known insider addresses.

Transactions By a Digital Asset Issuer

The bill also sets conditions on transactions which can delay the Digital Asset Maturity Date:

“(8) transactions involving the offer or sale of units of a digital asset by a digital asset issuer, if—

“(A) the aggregate amount of units of the digital asset sold by the digital asset issuer, including any amount sold in reliance on the exemption provided under this paragraph,

during the 12-month period preceding the date of such transaction, including the amount sold in such transaction, is not more than \$75,000,000;

[...]

(C) after the completion of the transaction, the purchaser does not own more than 10 percent of the total amount of the units of the digital asset

In layman’s terms a digital asset is a security if at least one of these is true:

- There was a sale from a “Digital Asset Issuer” of more than \$75M in the last 12 months
- There was a purchase from a “Digital Asset Issuer” that led to the digital asset issuer holding more than 10% of the supply

Sales from a Digital Asset Issuer Exceeding \$75M within 12 Months

The table below shows sales from foundation or team accounts which exceed \$75M.

Asset	Date	Change (native)	Price	Change (USD)	Tx ID
ICP	2022-01-21	4.0M	\$23.91	\$95.6M	77b5459861c247b4a8c642f40c9a2e7b76d84364e1e7da51b0fd94b5a7966ef6
ICP	2022-01-21	4.0M	\$23.91	\$95.6M	51144a118a4358e3183d1ed7b3e36df391aa11e1dac45e2c917c029d70182ac1
ICP	2022-01-21	5.0M	\$23.91	\$119.5M	dce103422a836e3ad84faa1f485385e9d722e28750be368b4ef5a750130b3720
ICP	2021-05-11	0.3M	\$367.37	\$103.7M	7af27a49b58c0257ed16a506ef74f224466d75a43b7d7ff8e9e0def380c33e92
SNX	2021-10-29	13.1M	\$10.30	\$134.8M	56b49568431c7e3c41505fb3840e406763e465ba51dedce0969f3296fdfe980c

Table 2. Sales above \$75M at the time of transaction from a foundation, 2021 and onward. Source: Coin Metrics ATLAS.

Table 2 shows the most recent asset sales above \$75M from project foundations. As of July 2023, none of these transactions meet the criteria within the previous 12 months.

Purchases That Exceed 10% of Network Supply

Asset	Date	New Balance	Change	Current Supply	New Founder Balance (% of Current Supply)	Tx ID
CRV	2023-04-10	109.8K	0.0K	1,930.2K	5.69%	1de44500bb05ce9a0a9f2833ddcd3e3ebbb537f38a2702...
MANA	2020-02-19	222.0K	222.0K	2,199.4K	10.09%	ced74a3ee5034d8cff89a794cfe8cc61bc1131160f22ed...
SNX	2023-04-05	19.9K	3.3K	318.8K	6.23%	8fe911a79d19267ab583a7edd6598494aade7816c56fcf...

Table 3. Purchases from a foundation which led to a high percent of founder controlled supply.
Source: Coin Metrics ATLAS

In Table 3, only MANA recorded a purchase which let the founding team hold more than 10% of the supply, albeit more than 3 years ago. CRV and SNX have a relatively high percentage of founder controlled supply but fall below this threshold. As of July 2023, no transactions within our asset universe qualify for this criteria.

Summary

Below, we summarize how our sample of assets perform under the Howey Test metrics outlined in earlier sections.

Howey Test Metrics

Digital Currencies and Smart Contract Platforms

Asset	<u>SEC alleged as security</u>	Investment in Money	Common Enterprise, Efforts of Others	Expectation of Profits, Efforts of Others	Expectation of Profits	Expectation of Profits, Network Utility	Expectation of Profits, Network Utility
		Initial Token Distribution (Raised in \$)	Balance Held By Foundation	FF Supply and Price Change Correlation	Fee-Volume Correlation	Active Supply	Percent of Supply Used for Fees
BTC	No	N/A	N/A	-0.1<x<0.1	-0.05	31%	2.9 * 10 ⁽⁻⁴⁾
ETH	No?	ICO (\$16M)	<1%	-0.1<x<0.1	0	43%	2.7 * 10 ⁽⁻³⁾
XRP	Yes	Private Funding Rounds, (\$1.3M)*	10.60%	-0.1<x<0.1	0.13	88%	8.3 * 10 ⁽⁻⁶⁾
ADA	Yes	ICO (\$62M)	52.2%	-0.1<x<0.1	0.54	65%	8.8 * 10 ⁽⁻⁵⁾
ALGO	Yes	ICO (\$122M)	3.10%	-0.1<x<0.1	0.43	91%	1.1 * 10 ⁽⁻⁴⁾
ICP	Yes	ICO (\$195M)	46.43%	-0.1<x<0.1	0.48	22%	1.2 * 10 ⁽⁻⁷⁾

Table 4. Howey Test summary for Digital Currencies and Smart Contract Platform tokens.

Application and Utility Tokens

Asset	SEC alleged as security	Investment in Money	Common Enterprise/Efforts of Others	Expectation of Profits, Efforts of Others	Expectation of Profits/Network Utility
		Initial Token Distribution (Raised in \$)	Balance Held By Foundation	FF Supply and Price Change Correlation	Active Supply
LINK	?	ICO (\$32M)	46.10%	-0.1<x<0.1	82%
UNI	?	Airdrop, \$1.0B**	75.40%	-0.1<x<0.1	65%
MATIC	Yes	ICO (\$5.6M)	13.70%	-0.1<x<0.1	89%
SNX	?	ICO (\$50M)	17.70%	-0.1<x<0.1	83%
COMP	?	Liquidity Mining Program, n/a	36.80%	-0.1<x<0.1	74%
CRV	?	Stakedrop, (\$7b)***	21.70%	-0.27	93%
MANA	Yes	ICO (\$24M)	16.20%	-0.1<x<0.1	73%

Table 5. Howey Test summary for Application Tokens. Data as of July 14, 2023.

Based on the enforcement actions from the SEC, the following characteristics stand out as defining securities:

- Large initial token funding rounds, or offering private sales
- Large balances held by foundations

Additionally, the following characteristics were outlined in the SEC's framework as increasing the likelihood that a token is a security, but empirically was found to be inconclusive:

- Low correlation between supply held by insiders and price changes

Bitcoin, a non-security, exhibits some characteristics that make it less security-like, such as:

- High proportion of current supply being used for fees.

And characteristics that would make it more security-like, such as:

- Low correlation between fees and trading volume (L1s)
- Low active supply (L1s)

**The SEC alleges that Ripple has raised \$600M in unregistered securities total in its charge as of December 2020*

***150M Uniswap was distributed with a market price being set at \$6.99 at 2020-09-18 using Coin Metrics Reference Rates*

****The initial supply of around 1.3b (~43%) is distributed as such:*

- 5% to pre-CRV liquidity providers with 1 year vesting
- 30% to shareholders (team and investors) with 2-4 years vesting
- 3% to employees with 2 years vesting
- 5% to the community reserve
- <https://resources.curve.fi/crv-token/understanding-tokenomics>
- Initial market price was set at \$7.04 at 2020-08-15 using Coin Metrics Reference Rates."

Market Structure Bill

Table 6 shows which securities criteria digital assets meet under the proposed market structure bill.

The limiting criteria in which assets may be classified as securities is whether insiders control $\geq 20\%$ of its supply within the previous 12 months. This criteria alone would incentivize projects to decentralize in order to remain compliant and not subject to securities laws.

Asset	Issuer Exceeds $\geq 20\%$ Supply	Sales Exceeding \$75M	Purchases Exceeded 10% of Network Supply
BTC			
ETH			
XRP	y		
ADA			
ALGO			
ICP	y		
LINK	y		
UNI	y		
MATIC	y		
SNX	y		
COMP			
CRV			
MANA			

Table 6. Market Structure Bill summary for digital assets.
Each criteria is based on a window of 12 months from July 2023.

The latter two criteria involving transactions from digital asset issuers are less applicable for our asset sample primarily because these are relatively mature ecosystems. Earlier stage projects are more prone to meeting this criteria. In a sense, this criteria is still spiritually similar to Howey. Networks with high centralized control are more likely to rely on the efforts of others for asset holders to realize a profit.

Under the Market Structure Bill, digital asset issuers have more agency over their compliance with securities laws. Digital asset issuers which currently own more than 20% of the supply can choose to distribute their balances so long as it meets the requirements under this bill.

Discussion

Under the SEC's framework, assessing which assets are securities requires a holistic analysis of the data. Many of these measurable criteria, while quantitative, require some unavoidable subjective interpretation and assumptions to arrive at a numeric value. And as with metrics measured over a rolling window, these values fluctuate.

The token distribution scheme of an asset and supply held by insiders are likely to be the strongest determining factors for an asset's security classification. Despite the importance of "the expectation of profit from the efforts of others", quantifying that prong is challenging. Metrics such as the correlation between insider supply and price changes, and the correlation between fees and volume in theory should produce strong signals, but the data shows those metrics are inconclusive.

Ultimately, the SEC caveats that "these factors are not intended to be exhaustive in evaluating whether a digital asset is an investment contract or any other type of security, and no single factor is determinative". Empirical data does not reveal a smoking gun, and even the clues laid by the SEC are prone to yielding inconclusive results. The SEC and the industry differ on their respective interpretations of the securities laws. Until a legal consensus is reached, the onus will be on the industry to assess their own risks on how to proceed.

4 CONCLUSION

Digital assets and the networks they're hosted in come in a diverse range of designs, origins, and structures that behave differently than traditional assets. These differences present unique regulatory challenges stretching the linguistic boundaries of the US securities laws and raise countless debates on how to apply these laws to crypto.

Public and permissionless blockchains allow for unprecedented transparency that create tools for regulation. Rich datasets can be derived from public blockchains to allow for real-time and publicly auditable disclosures. This unique property is something good faith project teams can leverage to show compliance and regulators to make informed enforcement decisions.

Although on-chain metrics can equalize information asymmetries, they are not a panacea for legally defining which assets are securities. Our findings suggest that the Howey Test requires rough translations between legal language and technical language in order to create a rigorous, measurable, and data-driven assessment for classifying which crypto assets for securities. Metrics may also be gamified to appear more active than reality, no different than a loophole around a regulation. Even if certain metrics are applicable, it's unclear what the thresholds for compliance is for a given criteria, which may only manifest itself in the form of regulatory actions. A holistic approach where several factors are considered can lead to a more accurate conclusion.

This leaves the industry with some open questions: How is the SEC deciding which projects to enforce? What metrics do they use, and if so what values must be met and for how long? Can the Howey Test even be applied to tokens? How can crypto projects operate in good faith and become compliant?

New securities frameworks which accurately reflect the realities of blockchain technology have the opportunity to allow for clear measurements of compliance. Forging a path to compliance for protocol projects will allow the industry to operate in the US with more clarity. Regardless of the path that US lawmakers take, the crypto industry remains a globally distributed community regulated across several jurisdictions. Ultimately, the intent of US law is to protect American investors, maintain fair, orderly, and efficient markets, and facilitate capital formation – whether this is consistent with the proliferation of the crypto markets in the US remains to be seen.

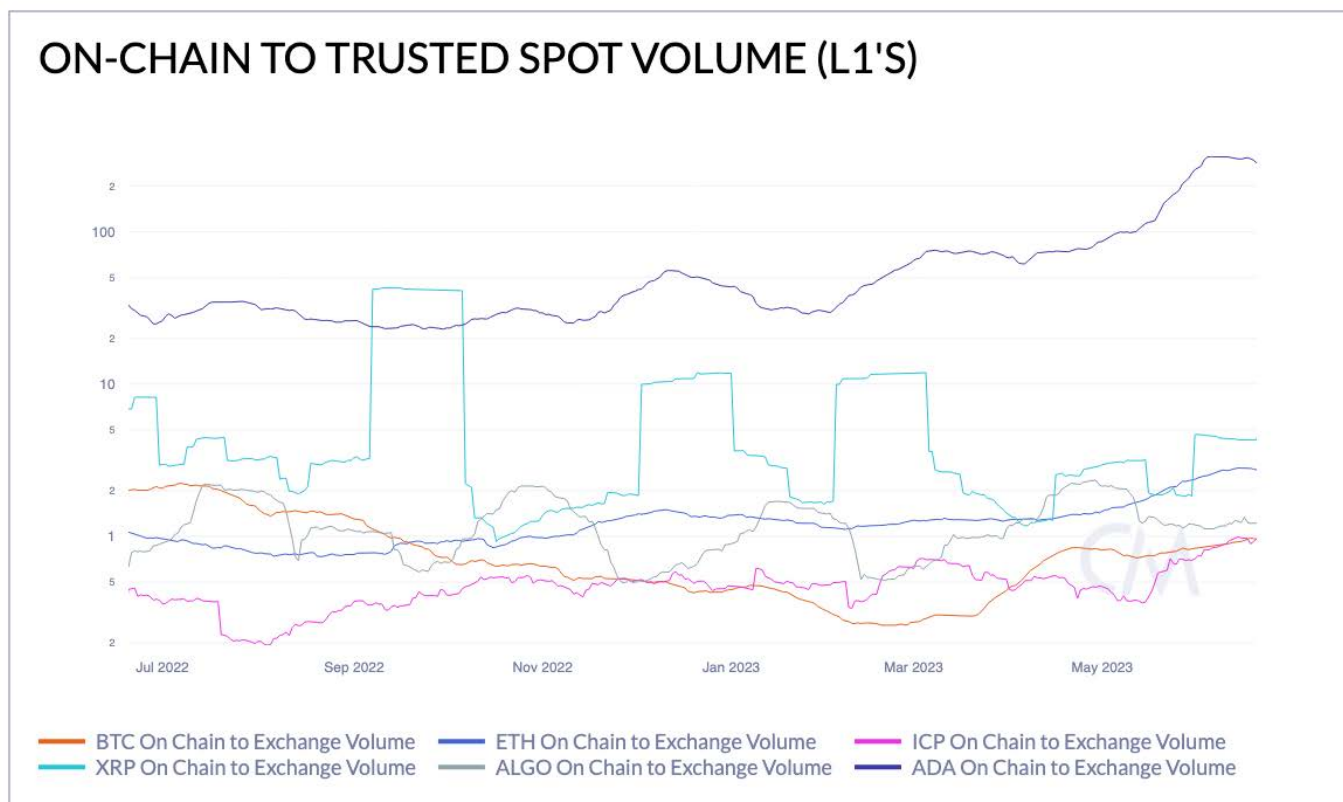
5 APPENDIX

Miscellaneous Metrics For Securities Assessments

The following metrics may also be used when assessing overall “security-like” characteristics for a digital asset network. These metrics attempt to measure the expectation of profit across the network and market activity as a whole rather than from the efforts of a central entity.

On-Chain Volume vs. Trusted Spot Volume Ratio

Another possible way to measure the expectation of profit across holders is an asset’s on-chain volume relative to its volume on centralized exchanges. A high on-chain volume relative to its centralized exchange volume may suggest that more of its value is transferred to use the network rather than for “expectation of profit” from trading.



ON-CHAIN TO TRUSTED SPOT VOLUME (APPLICATION TOKENS)



Figures 10 and 11. On-Chain Volume to Centralized Exchange Spot Volume.

Chart for L1's: <https://charts.coinmetrics.io/formulas?id=7730>.

Chart for Application Tokens: <https://charts.coinmetrics.io/formulas/?id=7764>.

Source: Coin Metrics Network Data Pro and Market Data Feed

Strikingly, these metrics show that Ripple and Cardano, two networks whose tokens are allegedly deemed as securities by the SEC, show the highest on-chain activity relative to centralized exchange activity. On the other hand, Bitcoin shows a relatively low value ranking similarly to ICP.

This highlights the importance of cross referencing multiple metrics, as opposed to a single data point, when making determinations of digital assets. Blockchains implement different solutions to similar problems, and may even try to address different problems entirely. The users of these networks influence the metrics as well: in the case of Cardano (ADA) the token has relatively low exchange volume as a share of market cap compared to other assets. So it's not surprising it has a high On Chain:Trusted Spot Volume ratio, however it may still be classified as a security based on its asset distribution or the control wielded by the issuer, for example.

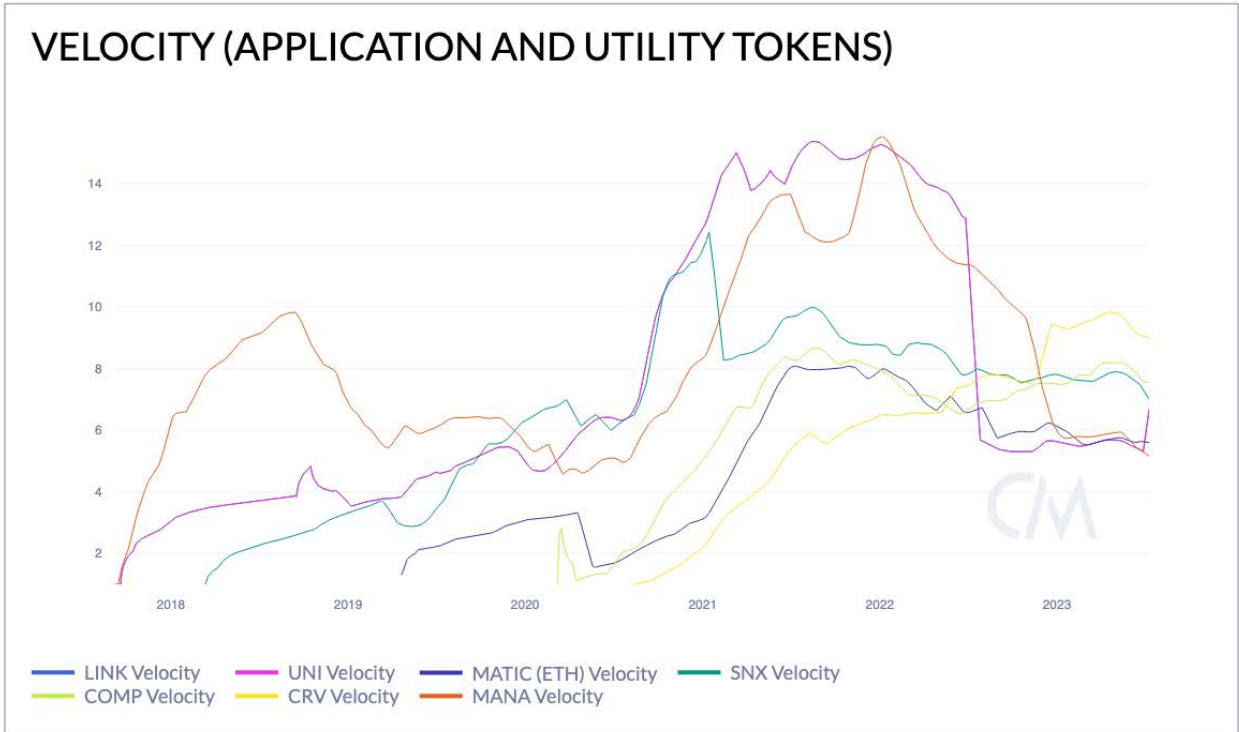
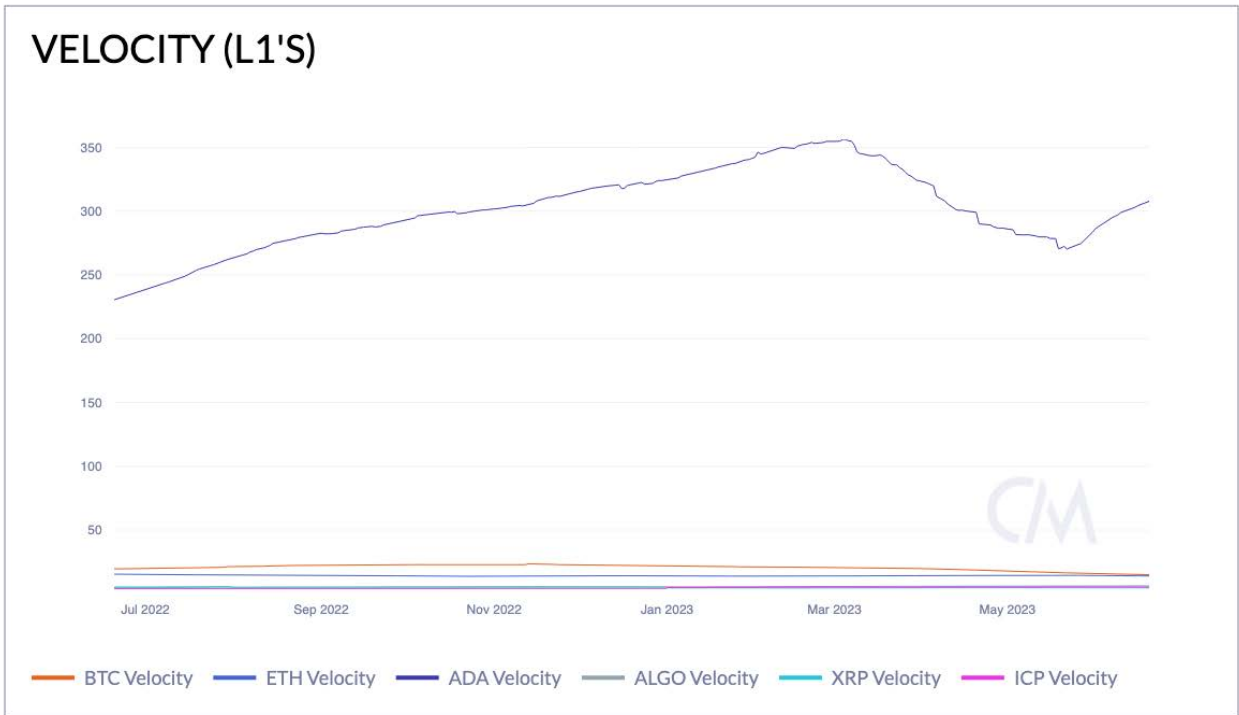
The use cases and implementations of assets can also lead them to have a high on-chain volume. Ripple for example claims institutional cross-border transactions are a primary function of its token. This could show up as larger on-chain volume, without invalidating the possibility that a significant share of the trading is done with "an expectation of profits".

In contrast, application and utility tokens are lower in magnitude to digital currency and smart contract platform tokens. This doesn't necessarily mean that these tokens are more "security-like". Utility tokens tend to have more specific use-cases than network tokens that aren't captured by broadly aggregating all transfers of tokens. A more instructive example would be to quantify the transactions in which a protocol's primary function is being executed, akin to how different sources of revenue are reported by companies in their financial statements. However, data to that granularity for most crypto protocols does not exist.

It's important to caveat that this metric naively assumes that *all* of on-chain volume is just for using the network, while *all* centralized exchange volume is for investment. In reality, different usage patterns consist of different intents. Applications such as decentralized exchanges may also muddy the distinction of on-chain versus market volumes. Nonetheless, this illustrates an objective, measurable criteria that could be given a pass/fail score when applied to a potential security. These findings suggest that quantifying the intent to invest or speculate requires more nuance than simply looking at the values of on-chain metrics.

Token Velocity

Similar to how network activity is measured to approximate utility versus speculation based usage, we can proxy the usage of the network by looking at the rate of turnover of assets over the course of some time period. This is referred to as the **Velocity** of its supply. The higher the velocity of a token, the more actively it's being traded among users, signaling high utility-driven usage. It's important to caveat here that different blockchains implement different data and accounting models, and this can impact the comparability across networks. For example, Cardano uses an "eUTXO" model that is a contributing cause to its higher velocity.



Figures 12, 13. Token Velocity. L1's: <https://charts.coinmetrics.io/formulas/?id=7727>.
 Application and Utility Tokens: <https://charts.coinmetrics.io/formulas/?id=7728>.
 Source: Coin Metrics Network Data Pro

Trade Volume Relationship to Prices

Several of the points in the SEC framework imply that market activity due to speculation is relevant when considering the likelihood that an asset is traded with an expectation of profit.

- *There is little apparent correlation between quantities the digital asset typically trades in (or the amounts that purchasers typically purchase) and the amount of the underlying goods or services a typical consumer would purchase for use or consumption.*
- *The digital asset is offered and purchased in quantities indicative of investment intent instead of quantities indicative of a user of the network. For example, it is offered and purchased in quantities significantly greater than any likely user would reasonably need, or so small as to make actual use of the asset in the network impractical*

We can illuminate this relationship by looking at how an asset's trade volume fluctuates with changes in price. Generally, market activity increases when the price changes and asset holders reevaluate their position. On its own, sensitivity to price does not necessarily make something a security. But a high price sensitivity in the absence of real usage suggests an asset mainly used for speculation. A lack of correlation between these values may also be a signal the supply has been manipulated.

For each asset on each day, we calculated the volume on trusted exchanges as a percentage of the 1-year active supply. We then calculated the absolute value of the daily percent change in price. These two numbers are represented as a heatmap in Figure 13.

The heatmaps contain linear quantile regressions for quantiles [5%, 50%, and 95%] of the data points, colored [red, green, and orange] respectively to help see the trends, and calculate representative metrics in the future.

Two interesting metrics can be summarized from this data: The slope of median regression (green line), and the spread between the 5% and 95% quantiles (red and orange lines). The former tells us how much the trade volume tends to increase with price, while the latter tells us the reliability of this relationship.

Price % Daily Change vs Trade Volume %

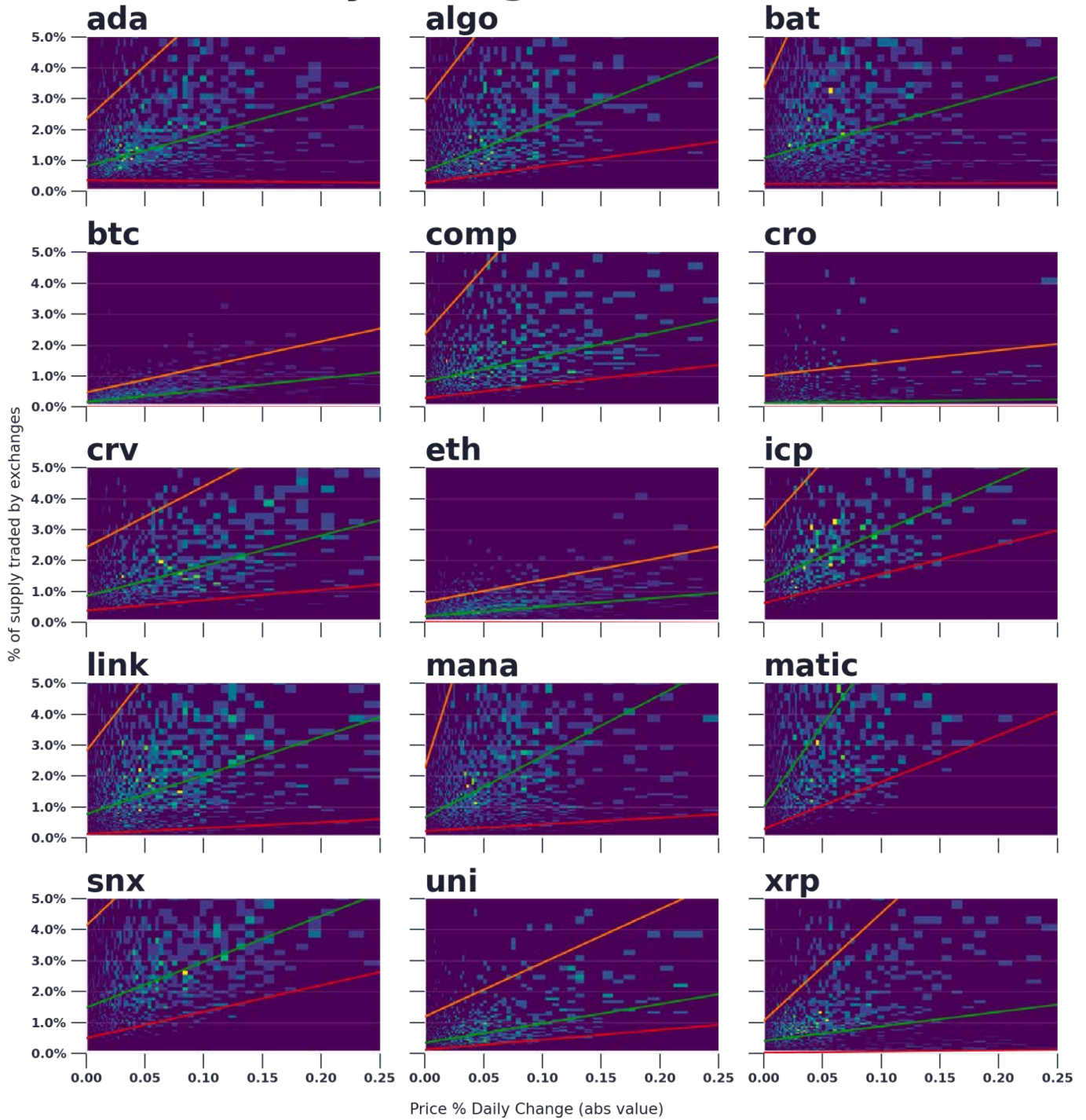


Figure 14. Active Supply % vs. Daily Price Change %

Assets with shallow slopes like BTC and ETH experience a relatively small increase in the amount traded when the price fluctuates significantly. In contrast, a steep overall slope can indicate that the market is unable to price the asset on its fundamentals and more of the trading is due to speculation.

Some assets show stronger correlations than others. A large spread in the distribution (which can be calculated as the angle between the red and orange lines) indicates less predictive power between volume and price. One interpretation of this is that stable demand based on usage is mixing with more speculative demand from short-term traders. It may also indicate manipulation in the market: if a significant supply is held by an entity they can create a supply shock where low volume of available assets (ie. liquidity) leads to a spike in price, but that spike in turn prompts retail investors to flood into the market. This produces situations where price changes accompany both high- and low-volume days.

6 REFERENCES

[1] “The Laws That Govern the Securities Industry.” *SEC.gov*, 1 October 2013

<https://www.sec.gov/about/about-securities-laws>. Accessed 7 July 2023.

[2] Guseva, Yuliya, and Carol Goforth. *Regulation of Cryptoassets*. West Academic Publishing, 2022.

[3] “Digital Asset Transactions: When Howey Met Gary (Plastic).” *SEC.gov*, 14 June 2018,

<https://www.sec.gov/news/speech/speech-hinman-061418>. Accessed 7 July 2023.

[4] Case 1:23-cv-04738. SEC Complaint Against Coinbase.

[5] “Framework for “Investment Contract” Analysis of Digital Assets.” *SEC.gov*, 3 April 2019,

<https://www.sec.gov/corpfm/framework-investment-contract-analysis-digital-assets>.

Accessed 7 July 2023.

[6] Van Valkenburgh, Peter. “Report Framework for Securities Regulation of Cryptocurrencies.” *Coin Center*, 10 August 2018,

<https://www.coincenter.org/framework-for-securities-regulation-of-cryptocurrencies/>.

Accessed 7 July 2023.

[7] *CRC Securities Law Framework*, 10 May 2021, https://www.cryptoratingcouncil.com/_files/ugd/c2a593_840c9e226e6d4f1bbb22ef2112e64f3e.pdf. Accessed 10 July 2023.

[8] *Digital Asset Market Structure Discussion Draft*. June 2023. *Digital Asset Market Structure Discussion Draft*, https://financialservices.house.gov/uploadedfiles/digital_002_xml.pdf.

[9] Nuzzi, Lucas, Ricci, Saulo, Kaleem, Muddabir. "Monitoring DeFi's Biggest Risk." *Coin Metrics*, 30 January 2023, <https://coinmetrics.io/special-insights/monitoring-defis-biggest-risk/>. Accessed 10 July 2023.

[10] *Securities and Exchange Commission v. Ripple Labs Inc.*, 1:20-cv-10832, (S.D.N.Y. Jul 13, 2023) ECF No. 874

FROM ORANGE GROVES TO ORANGE GOLD



CAN ON-CHAIN METRICS DETERMINE WHICH
CRYPTOCURRENCIES ARE SECURITIES?

By Victor Ramirez, Uriel Morone, Kevin Lu,
and the Coin Metrics Team



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