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Foundational Framework for Analyzing Crypto Assets

Seven factors for evaluating long-term potential

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Important Disclosure

The primary analyst responsible for this note has a financial interest in the sector and is an investor in Ethereum (Ticker: ETH) through his/her personal trading account. The analyst's investment has been made as a long-term buy and hold strategy.

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Introduction

2017 was a breakout year for the crypto asset class, with retail and institutional investors alike trying to take part in the potentially transformative technology. With the stampede of investors entering the space and massive price swings, virtually everyone is trying to be the short-to-medium term price guru, but few people are delivering deep, long-term value research.

Given the predominant narrative that bitcoin and crypto assets in general are the "greatest bubble of all time," with many going as far as to call them Ponzi schemes, it may seem odd to look for long-term value opportunities; however, we do see value in the underlying technology and believe that, if developed and implemented successfully, it can dramatically reduce transaction costs, create transparency, enhance security, and remove costly intermediaries across an array of industries. Furthermore, crypto assets and blockchain technology will impact the traditional venture capital ecosystem, with many VCs already altering their limited partnership agreements (LPAs) to allow for investments in crypto assets.

Due to this wide-ranging potential, we find it necessary to explore a framework to assess the long-term value of a blockchain protocol and its impact on the investment ecosystem. Below, we outline the primary variables and inputs that together comprise the framework for evaluating crypto assets. Feel free to reach out with any questions, comments or suggestions.

Note: *This analysis is focused on the business implications and market opportunities for a protocol, as opposed to the underlying code/programming.*

Crypto Assets: Cutting through the opacity and unknown

Many market participants assess crypto assets as if they were traditional stocks or ETFs due to the ability to trade on open markets; however, the underlying business models are early-stage projects barely out of the proof-of-concept phase, and the uncertainty associated with products in that stage of development inherently results in extreme price volatility. To that end, we view the risk profile as most similar to early-stage venture investments and, as such, we will analyze these investments in a similar manner.

Note: For the purpose of this framework, crypto assets refers specifically to utility tokens. The tokenization of more traditional securities will remain in the realm of traditional asset classes and require separate frameworks.

Much like the venture return distribution, the return distribution for cryptos will likely be extremely fat-tailed and skewed to the right. Many crypto assets are likely to end worthless, others will provide mediocre returns relative to the given level of risk taken, and a small proportion will deliver outsized returns. It is this asymmetric return distribution that creates the potential for massive returns.

This analysis does not produce an exact price target; rather, it serves to help investors understand the potential development of the blockchain ecosystem and how it can impact the landscape in which investors operate in today.

Primary framework considerations

Analyzing seed-stage investments is more art than science. However, by considering the factors below we believe we can develop a greater understanding of a given protocol's long-term potential:

- Incentive Structure
- Token Analysis
- Market Opportunity
- Founding Development Team
- Milestones
- Legal and Regulatory
- Network Ecosystem (if applicable)

Incentive Structure

The analysis begins with an understanding of how an individual protocol incentivizes participants to interact with the network. Due to the lack of support by real-world assets or authorities, the protocol must be designed with an inherent incentive structure that promotes positive contribution to the network by thousands and possibly millions of unknown participants. Due to this nature, we view the incentive structures as the most important factor underlying a protocol.

General understanding of network participants

- Nodes/Miners
  - The names can vary but they all perform the same function, which is to maintain the network by processing transactions and keeping track of the blockchain's history.
- End-users
  - Those who use the product or service offered by the protocol.
- Developers
  - Those committed to developing and supporting the software that underpins the network. This entails everything from identifying and rectifying bugs, to developing scaling solutions.

How does each participant interact on the network?

- Is there a clear purpose to these interactions?

Economics and Safeguards

- Property of token economics
  - Initial analyses of crypto assets have predominantly centered on the medium of exchange equation (mv=pq) where m= network value, p= cost of computing resources, q= the quantity of computing resources consumed, and v= velocity of the token. While we understand that most models are based on best-guess assumptions, we view the lack of historical data and high uncertainty as particularly concerning when attempting to estimate inputs for the above equation. As such, we believe the medium of exchange equation has limited usefulness.

    That said, under the assumption that m=pq/v is indeed an accurate model for a digital economy, the equation is useful in analyzing where value is likely to accrue in a network. As an example, the fact that bitcoin's network cost (pq) increases as adoption increases, combined with its use-case as a store of value (SoV), means velocity (v) is low, thereby driving network value (m) upward. In this scenario (i.e., high pq, but low v), the greatest amount of value accrues to token investors; on the other hand, a low pq and high v translates to a low network value because value accrues to the nodes that are processing a high volume of transactions. These do not account for additional value accrued due to speculation.

- **Protocol Security**

  — It does not require a computer science degree to understand the different consensus mechanisms used to create network trust without a central authority enforcing rules and agreements. Regardless of technical skill, these organizational structures are new and untested. Until more use cases are available to analyze, much of the discussion will continue to center on game theory and other theoretical incentive models. Though there is a steep learning curve to this section, we will identify and answer a few simple questions to give a non-technical investor an idea of how the protocol facilitates mutually beneficial usage for every participant.

  - Does the consensus mechanism force nodes on the network to put capital to work, or lockup capital?
    - E.g., bitcoin mining requires a large initial investment in specialized hardware that only has value if the network is maintained. If a network participant were to damage the network, it would also compromise their investment.
  - Does the nature of the consensus mechanism erode the value of the token if bad actors are successful?
    - E.g., if someone successfully overrode the bitcoin network, the price would plummet as holders lose trust in its consensus mechanisms, making the value of the theft a fraction of its prior worth.
  - Is there any scenario where a bad actor can succeed in cheating the network without facing ramifications?

Note: Consensus mechanisms are the algorithms of a protocol that ensures varying participants reach agreement on the correct state of the ledger and prevent bad actors from manipulating the network.

Token Analysis

Crypto assets lack the regulatory oversight of traditional asset classes. Even as governments introduce new laws and regulations, crypto assets' global nature makes it difficult for regulators to reign in bad actors, especially as decentralized exchanges hit mainstream adoption. Due to this lack of oversight, many forms of trading activity that are illegal in traditional assets frequently occur in the crypto asset class, which makes understanding a protocol's token release schedule important to avoiding pump-and-dumps, cornered markets, insider trading, and other activity that could compromise an otherwise promising project.

Token Classification

- Currency
  - — A token that acts solely as a medium of exchange, a store of value, and/or a unit of account.
- Utility
  - — A token that facilitates the use of a product or service within a blockchain ecosystem
- Asset-Backed
  - — A token whose value is intended to be pegged to a real-world asset.
- Security-Equity
  - — A token that represents ownership over future cash flows and/or profits from a service or product.
- Security-Debt
  - — A token that facilities the issuance of credit from one party to another with an expectation of interest and the payback of principal.
- Hybrid
  - — A token that combines any number of the above types of digital assets.
- Unknown
  - — A digital asset that does not fall into the above classifications or is too difficult to classify due to limited information.

Token Distribution Schedule

- What percent of tokens were released at ICO?
  - — How do the remaining tokens get released?
    - – E.g., mined by nodes to incentivize early adoption, airdropped to random people for a "fairer" distribution, etc.
- Percent of tokens held by founding team
- Lock-up periods for founder/pre-sale investors
  - — A growing number of development teams are locking up their tokens/capital for predefined periods to better align their personal incentives with token investors.

- Token-holder concentration
  - Regardless of the ICO route, any scenario where a few individuals control a significant portion of tokens poses a risk of concentrated selloffs, which could impede future adoption and jeopardize even the most promising projects.

Purpose for the token

- The initial coin offering (ICO) phenomena has led to thousands of tokenized projects; however, decentralization is only necessary for a small percentage of these projects, and an even smaller percentage of projects require their own token. Should the above interactions not require their own token to facilitate and incentivize the use of the protocol, we view it as unnecessary.

Market Opportunity

While many blockchain protocols are decentralized and lack the typical corporate structure, they still offer a product or service in some form. Evaluating and understanding the value proposition along with the total addressable market allows for a greater understanding of how the protocol fits in with the current business environment. This includes identifying and quantifying the total addressable market, competitive advantages over both centralized and decentralized competitors, and establishing a valuation model.

Total addressable market (TAM)

- Identifying this requires accurately identifying the end-user, which can be difficult
- Taking for example Ethereum or other infrastructure protocols, a potential TAM can be derived through some percentage of the current demand for cloud computing services. If a platform protocol is successful in scaling the technology, there is certainly a scenario where some products hosted on Amazon Web Services, or other cloud services, are moved to a decentralized platform.

Competitive advantages over centralized business models:

- Crypto assets (i.e., decentralized) are generally analyzed or discussed in isolation from the traditional business world (i.e., centralized). This is a mistake, as neither world vision (centralized/decentralized) is likely to be the only structure moving forward. When considering whether a decentralized business model is necessary, we assess the following:
  - Does the protocol reduce transaction costs for the end-user?
  - Does the protocol increase privacy?
  - Does the protocol increase market efficiency by removing costly intermediaries or increasing transparency?
  - Does the protocol create an entirely new market not possible without decentralization?

Competitive advantages over similar decentralized protocols:

- Ecosystem development
  - This is an important factor that creates a moat around a protocol. In the case of bitcoin, there are 100s of teams creating products/solutions for bitcoin uses that extend from software development to real-world mining facilities, and each is invested in the future of token.
- **Network capacity**
  - Everyone hears ad nauseam how slow the networks are and how they'll never compete with faster centralized counterparts due to the inability to handle the current volume of transactions. Besides the fact that there are distinct advantages to decentralization versus centralization depending on the end-users' needs, this ignores the fact that new technology is always slow and clunky and, moreover, a myriad of solutions are being developed. This is akin to dismissing the internet out of hand in the late 1990s because AOL dial-up was slow. That said, the networks working to implement greater capacity without sacrificing the benefits of decentralization have strong competitive advantages.

- **Governance structure**

  — As the technology and landscape continues to rapidly change, the ability for a decentralized network to be able to adapt will be paramount. On one end of the spectrum, there is no governance built into the protocol and this can, and has, led to multiple forks of a single blockchain, essentially spawning near-identical competitors. While this is not always bad for an investor, enough forks will erode the value of a protocol by decreasing the number of nodes and splitting end-users (not necessarily token investors) across different protocols.

  On the other end of the spectrum, is a built-in governance system that allows for token investors to vote on the development of the protocol. Some protocols are experimenting with ecosystem funds paid for by a portion of transaction fees to be used to pay developers and other contributors to the development of the network.

  While certainly subject to a lot of debate, our analyses moving forward will treat some form of built-in governance as a better route for token investors.

Plan to differentiate

— This is often overlooked in the current investing discussions surrounding crypto assets; however, many teams are creating projects that are attempting to address the same underlying issue. We will look to determine which team have the ability to differentiate themselves to engage and attract end-users and nodes.

Budget capacity and restraints

— What prior financing does the team have, and are they able to raise more to complete the protocol if needed? (ICO, venture capital, angel)

Founding Development Team

Blockchain protocols are in very early-stage development, and much like investing in traditional startups, understanding the strengths and weaknesses of the development team leading a project is vitally important to delivering on a project's vision. As increasing amounts of capital are thrown at blockchain projects, development teams must outshine not just their fellow decentralized competitors but also traditional incumbents in the current market. Fortunately, there are a variety of avenues that allow for thorough analysis of most founders, such as social media, criminal background checks and primary outreach.

Founder background

- This is mostly a common-sense check and is largely a qualitative exercise, but a quick analysis on founding developers can give insights into the project.
    - — Founder history
        - – Schooling, career etc.
    - — Founder accomplishments
        - – Start-ups built and sold, technical projects completed, etc.
    - — Founding team incentives
        - – Founding teams with capital/tokens locked up provide some security to the investor that the team will follow through on vision. The longer the lock-up period the better due to the longer-term incentives it creates for the founding development team to remain continually focused on the development of the protocol. This establishes greater trust between development teams and early participants to the network.

Development team's roadmap:

- Key technical issues
- Development team's potential solutions
- Historical timeline and development team's progress on these tasks
- Future timeline and projected milestones

Milestones

Projects must demonstrate progress towards meeting the long-term goals they've laid out in their whitepapers. After an initial whitepaper, projects often release additional technical papers going deeper into proposed solutions. While the initial coin offering occurs early in the projects lifecycle, stronger projects will have already demonstrated the ability to ship live code. No project is perfect at the time of ICO, even Bitcoin had several major updates. A project should list a set of dates with proposed milestones and should be held accountable by its community. These dates should also be reasonable given the size of the team. If these seem like stretch goals, hiring additional talent needs to be a demonstrated priority. Developer activity on Github can be used as an indicator of progress in lieu of or to bolster team announcements.

Financial milestones

Development timeline

Key technical hurdles

Development roadmap

Legal and regulatory concerns

Legal issues have been at the forefront of the public discussion around ICOs. In the US, the SEC's initial guidance from summer 2017 categorized certain offerings that failed to pass the Howey Test as unregistered securities. The opinion left the door open for tokens that confer access to a working platform such as the Bitcoin payment network or Ethereum Virtual Machine. It should go without saying, but projects should avoid structuring their token sales as securities. It is important to note steps that have been taken to mitigate regulatory risk such as registering tokens under an exemption from the Securities Act by offering only to accredited investors, or offering only to investors in certain countries. Regulators have also signaled that enforcement would prioritize those projects which target retail investors. Thus, investors should be wary of overt retail marketing tactics such as celebrity endorsements or guaranteed profits.

Potential legal and regulatory implications for the developing team and investors.

Note: The Howey Test stems from the 1946 US Supreme Court case SEC vs. W.J. Howey Co., which defined a security as "a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party." Source: SEC v. W. J. Howey Co., 328 U.S. 293 (1946)

Network Ecosystem

If a protocol is running a live network, it is important to analyze the strength of the network, which we define as the ability to survive through various regulatory regimes and prevent collusion among nodes. Unfortunately, the infrastructure and lack of common metrics and standards can make this analysis difficult but the trajectory of three groups (developers, nodes/miners, and end-users) over time provide some insights into the ability of a protocol to achieve the stated goals and reach a certain level of adoption.

Outside developer commitments over time

- This is an important metric to establish since a non-technical investor can safely assume that technologists generally don't commit considerable time to a project unless they believe a payout is likely at the end. In essence, strong developer commitments signal that the key technical issues are indeed solvable.

Miner/Node Analysis

- The growth of such participants over time indicates strength in the underlying network and the potential for future value creation since the miners/nodes maintain the network and the blockchain.
    - — Geographic dispersion
        - – The benefits of decentralization can only be realized if a single legal authority cannot destroy or seriously harm the network. A wide dispersion of nodes across legal boundaries ensures no one legal entity will be able to harm the development of the network.
    - — Concentration of nodes
        - – Second to threats from governmental authorities are threats from a centralization of the nodes on a network. The greater the concentration a node or group of nodes has on the network, the greater possibility they can cooperate to cheat or manipulate the network for their own benefit.

Account Analysis

- Growth of account addresses over time and transactions over time.