

Paradigm Fund

## **INVESTMENT THESIS**

Moscow 2019

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# 1 Introduction

Technological advances have always impacted our world like nothing else. The advent of Homo Habilis and the creation of the Oldowan lithic industry made the Homo genus dominant on our precious planet. Since then, through evolution, Homo have devised new ways of dealing with constant surrounding threats. We, Homo Sapiens, another step of human evolution, have strained technological advances way beyond the limits of imagination of our predecessors. It took more than a million years for Homo to progress from primitive Oldowan industry to producing bronze by smelting copper and alloying it with tin, arsenic, or other metals, at the same time Homo Sapiens have gone from the Iron Age and Holy Crusades to space rocketry and Starbucks in just a millennium.

Every time a major technological breakthrough occurs, it changes the political, social, economic, and philosophical stance of our species. History is filled with endless examples of how tech influenced the whole world. The most obvious example would be the creation of weapons of mass destruction. Oppenheimer's most famous child changed the way global superpowers interacted with each other, thus bringing humanity into a new state of international relations. Manhattan project is the main reason why we have been mostly living in peace and had time to create smartphones, the Kardashians, and spinners.

Since technology impacts our species on a very large scale, it might not come as a surprise that the most valuable companies in the world are directly connected to technological evolution: Apple, Amazon, Alphabet, Microsoft, Facebook, Alibaba, etc. It also shouldn't be a surprise that the wealthiest people are also heavily involved with emerging technologies: Jeff Bezos, Bill Gates, Mark Zuckerberg, Charles, and David Koch, Larry Elision, etc. The people and companies listed above redefined our everyday existence. That is why, throughout all these years, so much value has concentrated in their hands. It is hard to imagine a modern world without social networks, mind-bending search engines, and goodwill-driven smartphones.

Considering everything mentioned above, we at Paradigm fund have formulated a strategy that would lead us to invest in emerging technologies that would change the world.

## 2 Underlying value of the Internet

Each technology is an ever-evolving process of invention, exploration, creation and saturation.

Passing through these cycles' technology proves itself in the real world becoming a fundamental layer by allowing other things to be built on top of it. In contrast, technology almost never evolves on its own.

Internet was born in 1969 as a DARPA project called ARPANET out of an idea of a network capable of surviving a nuclear strike.

In its lifetime it has gone through several cycles. The first cycle may be described as an infrastructure cycle. It was all about combined development of stack of protocols, which are the backbones of the Internet nowadays: TCP/IP, DNS, SMTP, WWW (software layer), together with development on physical infrastructure (hardware layer).

In terms of software developers this process can be described as patching, or a constant update of the current version of a product. Let's say original ARPANET is a version 0.1.0, then SMTP protocol which is a standard email protocol developed in 1971 is version 0.1.1, transition of ARPANET from NCP to TCP/IP in 1983 can be described as 0.2.1, adding Domain Name System (or DNS) is 0.3.1, and developing an Internet Relay Chat (or IRC) in 1988 which is a standard from online chat messaging is 0.3.2. And only after introducing a WWW protocol together with HTTP, HTML and first web browser Internet finally became a network of networks. We call it Internet 1.0 - the Internet of Information.

Originally complex things should become easy to be used by masses opening a vast field for creativity and value creation.

*Only after Mosaic browser hit the scene in 1993, the Internet turned from nerds' thing used by a small group of tech-savvy people into a global platform for sharing information.*

It allowed the level of creativity and complexion never seen before in the history of mankind. Mosaic was a singularity point of a Big Bang which created what is called a universe of FANGs - Facebook, Amazon, Netflix, and Google. It gave us a possibility to create a social network unimaginable in pre-information age and evolved from immobile and inconvenient PC to mobile Internet with phone as a platform in our pocket with millions of apps available. It changed everything - from how we communicate (WhatsApp, Telegram, WeChat) to how we interact with environment (Google maps, IOs app store, Uber taxi, AirBNB) and even to how we consume (Amazon).

Hugely impactful, those changes are still only the tip of an iceberg, because as we stated above, the Internet in its current version altered the way we interact with information, not with the value.

This is where comes the blockchain.

*With the creation of Bitcoin, we finally entered the era of the Internet- of value, or as we say Internet 2.0.*

Money, or Value, is also information. Scarcity is a unique feature.

Our usual pattern of dealing with information on the internet is merely copying the origin and sending either a direct copy (photo, video, screenshot) or altering it and sending the result (email or document). However, it's not the case when talking about money or valuable things. This doesn't work for obvious reasons - money and value must be scarce; otherwise, it cannot retain its value.

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We view our financial system the same way we do the internet.

For ages, humanity used different monetary systems, starting from gold as a first universal ledger, which requires no middle man (or version 0.1), finally coming to banks, payment systems like VISA, custodians, and depositories (which can be in general described as version 1.0). With crypto entering the scene, we are on the brink of a significant update of our monetary, or value, the system to version 2.0.

For the last 500 years, humanity knew and valued five major asset classes: government-backed money, equity, debt, real estate, and commodities. Of course, there are subclasses such as public and private equity or government and corporate debt, all types of financial contracts such as futures, options, swaps, or derivatives, but all of them supplementary and sit on top of those magnificent 5. What is new about crypto - a child born on the Internet. At the same time, it managed to become the first new asset class for the last 500 years. What is even more fascinating - crypto is a digital asset, thus for the first time in history, it can represent or be any asset.

Just stop and think for a second - it's tough to imagine a gold bar with functions of a bond, or house as a public equity trading on NASDAQ. But it's straightforward if we are talking about crypto token. Actually, in our opinion, another leg of crypto adoption will be linked with a massive wave of STO's, or security token offerings, coming sometime in 2019-2020. To understand the value of technology and timing to invest, we use several methodologies that make our analysis as precise and objective as possible.

### 3 Gartner Hype Cycle

It was developed and still being used by Gartner, the American research, advisory, and information technology firm.

We can't state that the info provided by Gartner is always 100% correct, considering the number of randomizing factors that occur every single day, but the Hype Cycle (see figure 1) provides a very linear and profound presentation of the maturity of emerging technologies through five phases.

Gartner Hype Cycle (GHC) can be applied to many different aspects of our everyday life. But as our company concentrates on emerging technologies, let's have a closer look at a more definitive form of GHC.

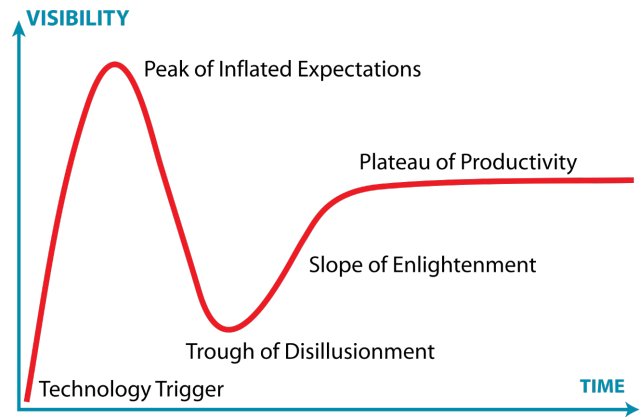


Figure 1. Hype Cycle graph ([source](#))

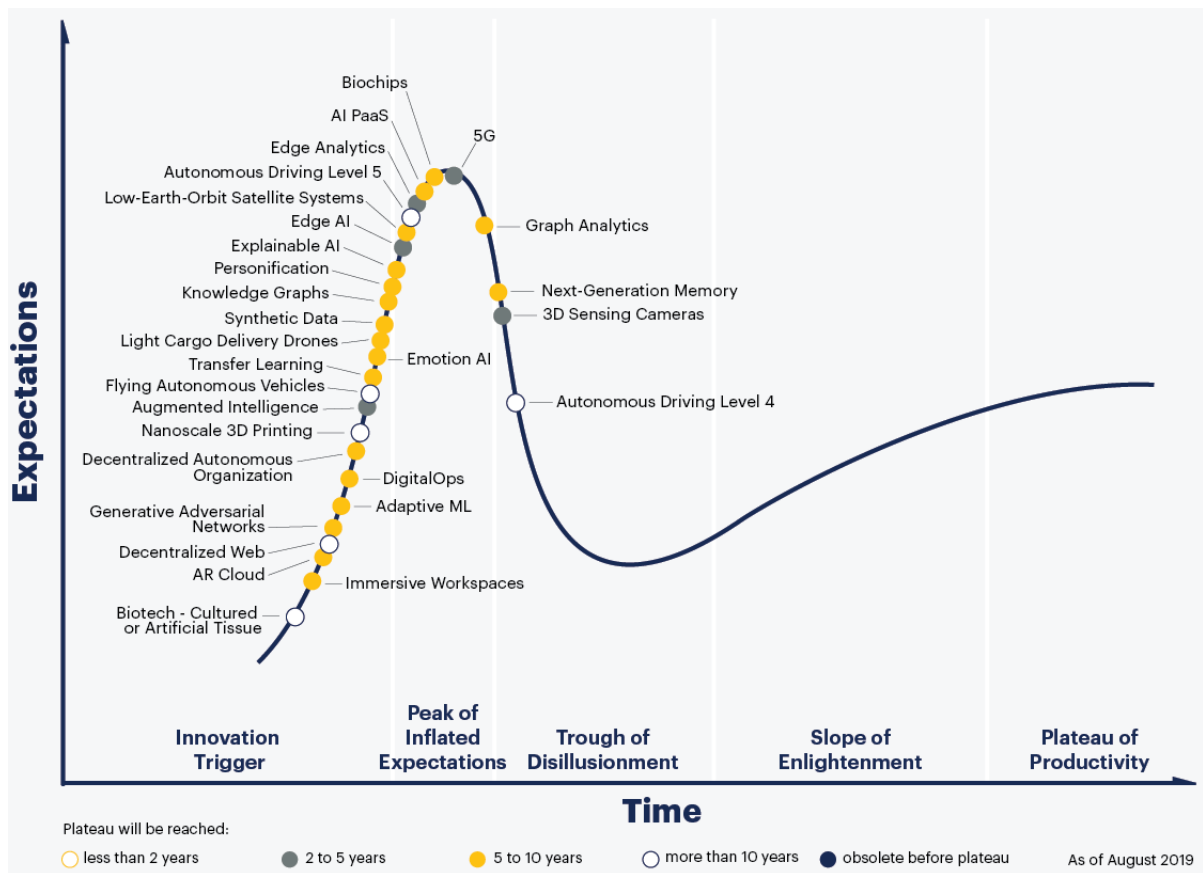


Figure 2. Gartner Hype Cycle for Emerging Technologies, 2019 ([source](#))

	Phase	Description
1	Technology trigger	Media sees potential breakthroughs in emerging technology. First, MVPs are being constructed. Often no usable products exist, and commercial viability is unproven. First investment rounds are gathered.
2	Peak of Inflated Expectations	Few developers produce several insignificant success stories, many others fail. Some companies act; most don't.
3	Trough of Disillusionment	Public interest declines as MVPs fail to deliver. Developers are being shaken out by the market. Second investment rounds are being gathered on the bottom, this time only if the surviving developers improve their products to the satisfaction of early adopters.
4	Slope of Enlightenment	New technological optimization and innovation enter the market. The technology itself becomes more evident and widely understood. Second - and third-generation products appear from developers. Investment Funds become more interested, and enterprise investment surge.
5	Plateau of Productivity	Mass adoption stage. Users can appropriately assess the competitive characteristics of different technology providers. Mass adoption on the broad market brings massive income and growth of the underlying asset.

Table 1. Phase of the Gartner cycle

## 4 Aggregation theory and cryptonetworks

The value chain for any given consumer market is divided into three parts: suppliers, distributors, and consumers, or users. The best way to make outside profits in any of these markets is to either gain a horizontal monopoly in one of the three parts or to integrate two of the elements such that you have a competitive advantage in delivering a vertical solution. In the pre-Internet era, the latter depended on controlling distribution.

The distributors in all of the industries integrated backward into supply: there have always been far more consumers than suppliers, which means that in a world where transactions are costly, owning the supplier relationship provides significantly more leverage.

Instead, with the help of the Internet, suppliers can be commoditized, leaving consumers as a first-order priority. By extension, this means that the most important factor determining success is the user experience: the best distributors/aggregators/market-makers win by providing the best experience, which earns them the most consumers,

which attracts the most suppliers, which enhances the user experience in a virtuous cycle.

Suppliers who become fully dependent on aggregators cannot influence market rules and have to agree to all his decisions. This position obtained by aggregators opens the door to market inefficiency, as aggregators start to extract from both suppliers and users on demand side, claiming additional value created by them, which results in monopolist's network value growth.

This can be seen as a monopolistic loss in production, further change from market-efficient supply curve. Full ownership of the network can show us signs of monopoly.

«Deadweight loss is the lost welfare because of a market failure or intervention. In this case, it is caused because the monopolist will set a price higher than the marginal cost. This means there will be people willing to pay more than the cost of production, which will not be able to purchase the good because the monopolist is maximizing profit.»

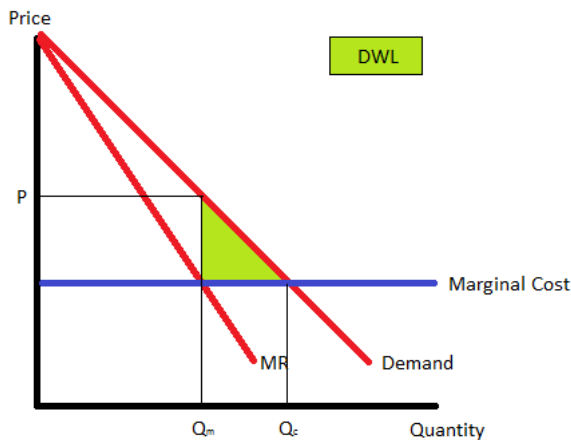


Figure 4. Deadweight loss - DWL (source)

Demand will win a lot in this case, as well. Crypto network assets can be described by code in any reasonable way. Why do crypto networks allow new startups to compete with FANG and break Aggregation Theory and machine-learned user experience supremacy? Because blockchains diminish the two aspects of defensibility held by FANG:

- **UX/Network Effects** - Cryptonetworks allow for a new monetary incentive structure to give early adopters greater upside the earlier they join the network as they become its owners. That can even outperform aggregators' advantages

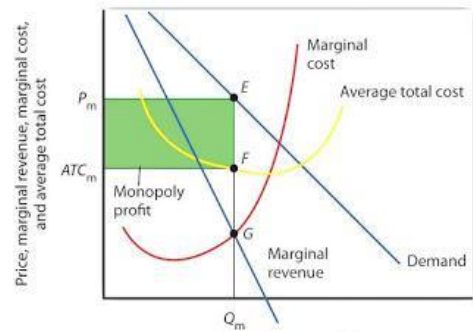


Figure 3. Monopolist profit, demand losses in monopolistic stuff

In the short term, to become a monopoly, one has to keep prices lower than the market. However, when aggregator matures, he starts to extract from other participants, integrating suppliers into a monopoly, controlling market prices by increasing fee, or making more expensive advertisements with the help of collected user information.

Cryptonetworks offers a solution to deadweight inefficiencies by creating new assets instead of ruining market equilibrium extracting fees from network participants.



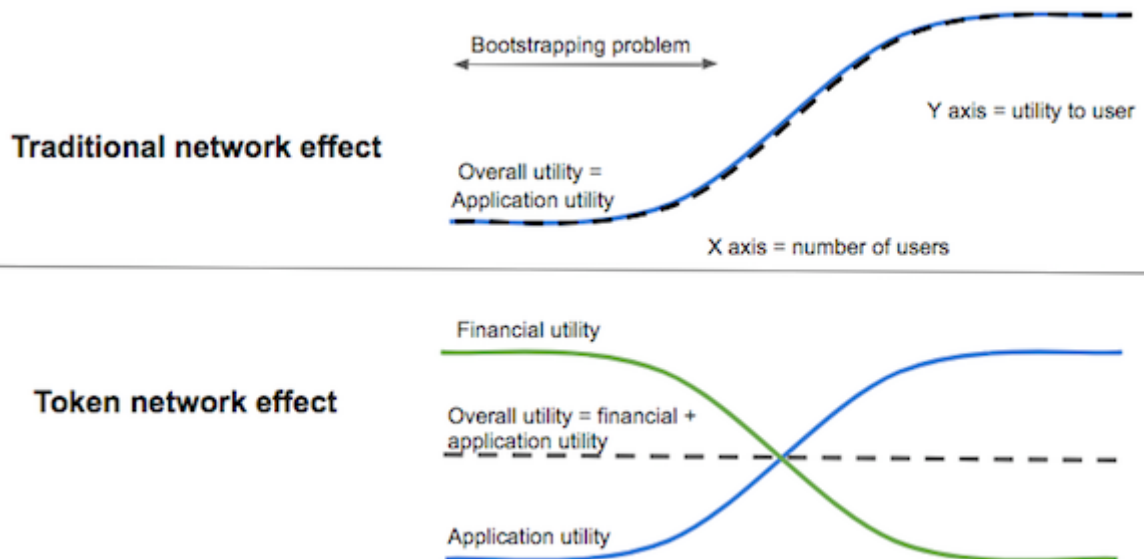


Figure 5. Tokens help overcome the bootstrap problem by adding financial utility when application utility is low ([source](#))

of the existing network effect.

- ML Data Advantage** - Blockchains allow for a DLT (distributed ledger technology) architecture where data is shared and open, rather than a client-server architecture where information is closed and siloed. This data, anonymized, helps you to improve UI at the very beginning if you have enough sources of it. An application will be able to learn on data from different sources, collected and anonymized in a shared database, and everyone can trust thanks to a distributed consensus regarding data security.

Before blockchains and the digital scarcity of tokens, it was challenging to attract early users to a new network. But now, a company can “pay” early adopters in a native token, and those early adopters will be incentivized to increase the value of their tokens<sup>1</sup>. Not by convincing to buy a token, but to participate in it as a user.

“So how do you get people to join a brand new network? You give people partial ownership of the network. Just like equity in a startup, it is more valuable to join the network early because you get more ownership.” This is where financial utility pays you off losses in UX, especially for early-stage projects who lack the quantity and relevance of obtained data. Sometimes, the network asks for a user to purchase a token to become a service provider, to increase the chance of successful long-term cooperation, and fight speculative short-termism<sup>2</sup>.

<sup>1</sup>Macro Blockchain 1: The End of Aggregation Theory, [Rhys Lindmark](#), June 2017

<sup>2</sup>Short-termism: Shareholders demand returns on their investments. Managers, whose compensation is tied to the company quarterly results, focus on optimizing their key indicators, often sacrificing long-term prospects. The lack of alignment between the different parties of an organization is the root of the problem. – Aragon One Official Blog, [Jorge Izquierdo and Ramón Recuero](#).

## 5 Firm, market, and cryptonetworks

Cryptonetworks are a continuation of Coases' markets and firms and new institutional economics. In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.

All these are transaction costs:

- Search and information costs
- Bargaining and decision costs
- Policing and enforcement costs

But these costs are significantly lower within the firm.

- As information flows more freely within the firm, the entrepreneur can more easily find a suitable employee to execute specific tasks.
- With no or little informal negotiation, the entrepreneur orders the employee.
- The entrepreneur punishes underperformers by demoting or firing them.

Cryptonetworks have the potential to bridge the gap between the market and the firm. It complements the firm by bringing the incentives of the market. It complements the market by offering the transaction cost benefits of the firm (see figure 6).

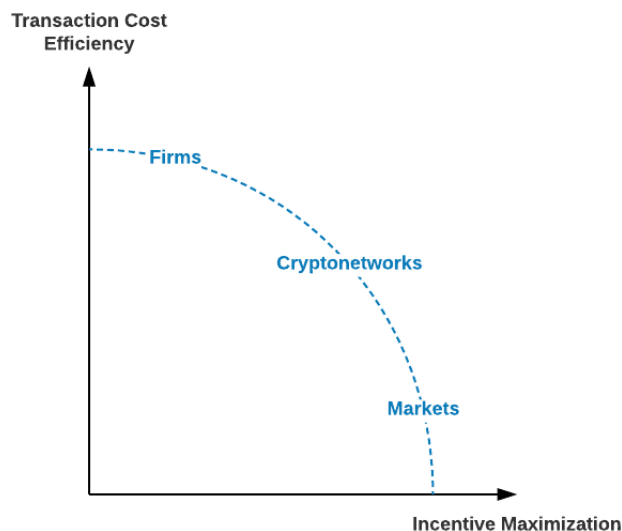


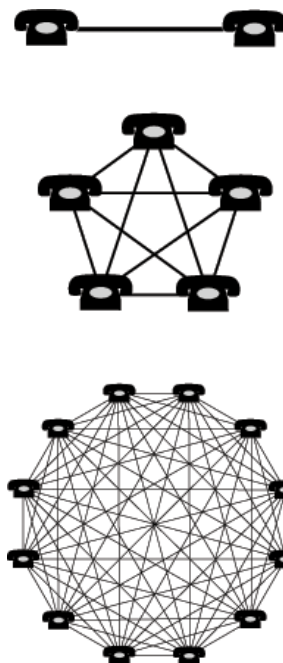
Figure 6. Source: [Qiao Wang](#) - Cryptonetworks and the theory of the firm

## 6 Network effects are stronger in cryptonetworks

“A network effect (also called network externality or demand-side economies of scale) is the positive effect described in economics and business that an additional user of a good or service has on the value of that product to others. When a network effect is present, the value of a product or service increases according to the number of others using it”.

Due to the ability to capture both supply and demand side, network effects start earlier for an application as “you can both charge and compensate your early adopters through tokens.” This draws near the critical point in the number of participants to obtain long-lasting network-effect. Thus, the crypto network needs less direct investments before becoming big enough. We can compare Ethereum developed by 17 million dollars of direct investment and Google’s 500 million dollars of investment on the road to becoming profitable or stable as a system (not talking about Uber). The price of starting a network is low, and barriers become lower. Five years later, Ethereum now has more 1000 developers as a network as it could derive value from network growth, together with its participants. They shared value all the time. One did not extract it from others, thus leading to a network effect increase.

Such a structure leverages the psychological effects of loss-aversity hard-wired into every person. Why would one leave the network if he already contributed<sup>3</sup> to and invested<sup>4</sup> into it?



## 7 A need for a new business model

The economics of large scale consumer apps is broken. They are not able to generate revenue as it is embedded in stock prices. One has to wait for a hundred years for dividends to cover the stock’s price. Advertising is the primary source of revenue for consumer applications. For instance, messengers, penetrating the market of human communication, cannot figure out the way to monetize their user base. The problem with advertising is that a person’s information becomes more valuable than the service itself. Business logic changes and closes the door to substantial revenue streams from ads.

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<sup>3</sup>The “IKEA Effect”: When Labor Leads to Love, Michael I. Norton, Daniel Mochon, Dan Ariely, 2011, Harvard business school

<sup>4</sup>Kahneman, D. Tversky, A. (1979). "Prospect Theory: An Analysis of Decision under Risk". *Econometrica*. 47 (4): 263–291. [doi:10.2307/1914185](https://doi.org/10.2307/1914185).

Crypto industry has the answer for these companies: turning into a crypto network with its own tokenized micro-economy, deriving value not from people themselves, or their attention, but from participants of the system, different agents incentivized to act according to network's rules and needs. It's of no surprise that significant messengers are embracing this opportunity: Japanese Line, Korean Kakao, Telegram, and Facebook are integrating crypto into their products in 2019.

It's of no surprise that banks that monetize on transactional cost will enter the field in the first quarter of 2019. Financial institutions, as Fidelity see both opportunity and competition from a new asset class<sup>5</sup>.

## 8 Our approach to investing. Fundamentals

**Paradigm** is a full-stack fund, investing in cryptonetworks: base protocols and tokenized consumer dApps with built-in micro-economies, as well as infrastructure, connecting the flow from traditional finance. Funds and investors have a role to play in operating decentralized value networks. Together, we become network-builders, helping both to secure the network and govern it, as we do with Tezocracy<sup>6</sup>, spread awareness, and provide it with resources as a network agent.

### 8.1 Proof-of-stake cryptonetworks

We invest in cryptonetworks getting ready to acquire the most valuable apps, and therefore, generate solid transaction flow. Learning from venture capital, we invest in early stages, both in private sales and purchasing from the market, before the company becomes widely known by fundamentally inexperienced market participants, but already has strong business and tech developers, a network of partners strongly involved into contributing to the network.

Being engaged as delegators, validators, and service providers of these networks, we are able to collect fees and earn a yearly dividend of approximately 8% on Proof-of-stake networks.

### 8.2 Financial infrastructure

Equity-structured or tokenized companies building key financial infrastructure will bridge the gap between crypto and the current financial system. Centralized cryptocurrency exchanges, for example, are the most profitable businesses in the industry. BitMex generated 1 billion in net revenue in 2018, surpassing NASDAQ by one third.

We believe security tokens to be the next huge market, companies that help issue and trade security tokens are prone to succeed.

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<sup>5</sup>Why 72% of institutional investors believe that the value of crypto assets will rise during a recession – Paradigm Fund

<sup>6</sup>Tezos delegation and transaction verification [service](#)

Derivative applications or protocols able to capture part of transaction flow are of high value as well; the term nowadays defined decentralized finance.

All of the above have to be powered by smart private contracts and computation networks.

### **8.3 Applications and services with built-in micro-economies**

The dominance of the decentralized service or network rules instead of company rules sometimes leads to direct economic advantage due to the technological excellence of the protocol.

They will be able to compete in streaming, storage, cloud computing, and other IT sectors.

### **8.4 Financial interoperability networks**

Interoperability cryptonetworks, which, via bridges or key sharding, connect all asset types, even from traditional finance via oracles, and provide a platform for user applications, both business and consumer.