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#### **Cambrian** Explosion



The Cambrian Explosion is an evolutionary event that started about 541 million years and lasted for about 20-25 million years. During this time, a few simple organisms were replaced by <u>a great variety of complex organisms</u> (with eyes and legs). It may represent the most important evolutionary event in the history of life on Earth. This was also a period in time when many organisms went extinct.

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#### A Cambrian Explosion of Crypto Assets

Investment in Crypto-Economy (\$MM, End of June 2018)



- First wave of investment from traditional venture firms in Bitcoin associated companies was between 2013 and 2016, with \$400-700 million annually
- Second wave of investment from corporates into enterprise blockchain was between 2015 and 2017, with \$250-400 million annually
- Third wave of public crowdfunding flowed into ICOs, with an unprecedented rise in prices for crypto currencies, with \$7 billion of investment going into the space, 4x greater than equity investment in crypto companies
- Many ICOs formed to take advantage of the "goldrush" and created questions of quality and regulation for tokens

Source: Autonomous NEXT, Various for ICO, Pitchbook for VC, EOS Scan

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#### Allow for a Variety of Complex Structures



Source: Autonomous NEXT

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#### Many of Which Went Extinct

Initial Coin Offerings by Date and Capital Raised



× Unlisted  $\circ$  Listed <= 60 Days  $\diamond$  Listed > 60 Days

Source: Benedetti and Kostovetsky (2018)

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#### Digital, Yet Scarce Assets, Scale Up with Moore's Law



Moore's Law (a variant of) - an <u>exponential</u> increase in the number of <u>computations</u> conducted by an <u>integrated circuit</u> at the <u>same cost</u>.

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#### Digital, Yet Scarce Assets, Scale Up with Moore's Law

Due to Moore's Law, sometime in the early 2000s computing power seems to have reached a critical threshold.

It became possible to solve complex cryptographic puzzles on standalone personal computers and then communicate these solutions to other computers via the open Internet for verification.

This gave rise to a decentralized self-sustaining computational ecosystem governed by a protocol that issued new crypto assets to those who provided computational resources – distributed ledger technology. And off it went...



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 $E(R) = \sum_{i=1}^{n} p_i R_i$  Expected return on an investment

The probabilities assigned to payoffs need not be known, rational or consistent with some true measure.

Because successful applications of crypto technology are so new, both outcomes and their probability weights are anyone's guess at this point.



#### But we do have equilibrium frameworks for these cases too.

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Security of a crypto asset reflects its *technological* vulnerability to risks of fraud, manipulation, abuse, and attack. E.g., use of a more advanced encryption renders an asset more secure.

Stability of a crypto asset reflects its vulnerability to risks related to its potentially faulty *governance*. E.g., regulated or self-regulated governance renders a crypto asset more secure.



Crypto assets differ by their <u>security</u> and <u>stability</u>.

Probability of adoption: a choice between security and stability.

Increasing Security

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Four main types of crypto assets:



Increading risk of not being adopted

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#### CBDCs

Central bank issued digital currencies are digitally-native bearer instruments that can be used to pay for any good, service or financial asset in one transaction.

Their technological advantage is being digitally-native, i.e. they are created and used in a technologically efficient and secure digital form.

Their economic advantage is access to a central bank-regulated payment system.

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#### CBDCs – A Definition from the BIS/FSB

"CBDC is not a well-defined term. It is envisioned by most to be a new form of central bank money.

That is, a central bank liability, denominated in an existing unit of account, which serves both as a medium of exchange and a store of value.

This would be an innovation for general purpose users but not for wholesale entities."



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#### CBDCs – A Definition from the BIS/FSB

"Central banks already provide digital money in the form of reserves or settlement account balances held by commercial banks and certain other financial institutions at the central bank.

It is easier to define a CBDC by highlighting what it is not:

a CBDC is a digital form of central bank money that is different from balances in traditional reserve or settlement accounts."

#### CBDCs



The probability of non-adoption for such an asset could be kept very low as a central bank can simply mandate its use within its regulated jurisdiction (high security and high stability).

Expected return could be negative as the convenience of access to an ultraliquid credible national payment system can be worth paying for.

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#### Where Does a CBDC Make Sense (or Not)?

CBDC really makes sense in an economic area where value added is expected to scale up with Moore's Law.

Issuance of a CBDC <u>does not</u> make sense in countries where value added is mostly associated with <u>physical transformations</u> <u>of natural resources</u> or provision of <u>non-digital services</u> such as

extraction and sale of commodities, construction of commercial or residential real estate, or traditional manufacturing and agriculture.

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#### Where Does a CBDC Make Sense?

CBDC really makes sense in an economic area where value added is expected to scale up with Moore's Law.

Economic activities that involve production and sale of <u>digital</u> <u>goods and services</u>, including software development and internet commerce would benefit from the ability to use

an ultraliquid, digitally-native asset with access to the payment system that's better suitable to their very scalable business processes.

#### Crypto Tokens – A High Risk Opportunity

Outright Fraud	Failure to Raise Target Capital	Operating Failure	Instrument Performance	Cyber security
<ul> <li>Prior to looking at the merits of investment, filter out all scams, frauds, phishing attempts, and suspicious projects</li> <li>Symptoms include false founder photos, duplicate language in white papers from other projects, and hijacked URLs</li> </ul>	<ul> <li>Like many Kickstarter projects and start-ups trying to raise Angel / Seed funding, some ICOs will fail to reach their fundraising goal</li> <li>This is not operating failure necessarily, but a lack of financing for an idea</li> </ul>	<ul> <li>In venture, the next stage after Seed funding is Series A and growth capital, which require operating progress</li> <li>Then, a company accesses the public market through an IPO or exits via M&amp;A</li> <li>Being listed on an exchange, or shutting down are relevant comps for ICOs</li> </ul>	<ul> <li>If a token makes its way to an exchange, it will experience price change, which can be measured relative to ICO price, and other coins</li> <li>Unlike equity returns, which display something like a Student distribution, token returns look a lot more like a lottery ticket, or an out-of the money option</li> </ul>	<ul> <li>Even if the investor selects a high- performing token, there is a cyber security risk embedded in holding capital on crypto exchanges, and a phishing risk during money movement processes</li> </ul>
<ul> <li>20% of projects are scams, the WSJ reports</li> </ul>	<ul> <li>65% of Kickstarter projects fail to raise their goal</li> </ul>	<ul> <li>50-70% of companies fail to progress from Seed to Series A</li> </ul>	<ul> <li>85% of DotCom tech IPOs were gone within 10 years</li> </ul>	<ul> <li>15% of all crypto assets have been hacked</li> </ul>

Source: Autonomous NEXT, WSJ, Kickstarter, CB Insights, McKinsey

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#### ICO Failure Rate is On Par with Early Stage Alt's



- When looking at failure of an ICO to raise a target, the correct comparison is the failure rate on Kickstarter, which
  is approximately 60-70%
- Looking at venture: for Seed stage startups, 55-70% are no longer operating by Series A either due to exit or failure to raise; for later stage, 70-80% do not make it to Series C due to either exit or failure

Source: Autonomous NEXT, Kickstarter, CB Insights, Mattermark, Bitcoin.com, Token Data

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## Crypto Token Returns Exceed Crypto Currencies



Source: Autonomous NEXT, <u>BITA</u> (coin market data, BITA top 50 Index)

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BTC and the magenta represents the BITA top

represents the BITA top 50 coin Index, which immediately highlight the correlation waves between BTC and the other crypto assets

The black bar represents

Discussion

Price performance of the

top 200 liquid coins over

the last 1.5 years looks like a Monte Carlo

simulation, except the scale for outcomes is an unbelievable 10% -

1,000,000%, graphed here on a log scale

Such continued

digital assets

performance would suggest exponential software-like growth for

## Crypto Token Adoption is Driven by Many Aspects

Splitting the functions of tokens into separate instruments can sometimes separate speculators from users of a platform (e.g., NEO vs GAS)

Many token projects are industry specific\*, and require knowledge and operating experience within a particular industry, like banking & payments, media, virtual reality, or retail. Even blue ocean projects, like decentralized exchanges and prediction markets, are now mature enough to have a rich set of competitors and customer acquisition dynamics

Without functional, fair and transparent governance and ongoing community engagement, no network can succeed (e.g., EOS, Tezos)



Tokens may have explicit economic functions to drive user participation, and careful thought should be put in to structuring those functions, and whether they aggregate up into a security offering

> Projects may have various levels of centralization (e.g., Bitcoin vs EOS vs Ripple vs Hyperledger), and associated technical choices may require network participants to run nodes, perform computational work, stake tokens or capital, get licenses, or perform other activities for the technical infrastructure to function

> > The global environment – economic, legal and crypto – is a major driver for fundraising and user growth

Source: Autonomous NEXT

\*Note: As an example, Brave New Coin uses the NAICS industry codes for classification

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## Crypto Tokens



The probability of non-adoption for crypto tokens is very high due to both low security and low stability.

Expected return must be highly positive to attract investors.

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#### Where Does a Crypto Token Make Sense?

Crypto tokens really makes sense as investment/participation vehicles for risky digital projects where value added is expected to scale up with Moore's Law.

Economic activities that involve production and sale of <u>digital</u> <u>goods and services</u>, including software development and internet commerce would benefit from the ability to use crypto tokens.

# **Regulation of Crypto Assets**

- What do you regulate?: Cryptography/encryption (AML/KYC), P2P (payments/intermediaries), consensus (governance), blockchain (entities/reporting)?
- Why regulate?: Market failure, asymmetric information/rent seeking, financial bubbles/systemic risk?
- Under which regulatory mandate?: monetary policy, financial stability, payments, consumer protection, fair and orderly markets?

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# **Regulation of Crypto Assets**

- Ideally, you would not want to regulate an asset.
- You would define broad attributes of an asset a commodity, security, index futures contract, CDS, etc.
- And regulate (principled) activity issuance, brokerage, custody,...
- Many crypto assets follow a zero trust achitecture "never trust, always verify any node or activity on the <u>inside</u> or outside the network" – so aspects of regulation need to be adapted to that by following a much lighter touch.

#### Implications of Crypto Assets

Implications of an asset that scales up with Moore's Law:

Role of central banks

Role of financial institutions

Role of market intermediaries and market regulators

Role of global technology platforms

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