



Decentralised Society @ Strathy

Crypto-Assets & Portfolios 101

Dr Wassim Alsindi
Parallel Industries

[\(wassim@pllel.com\)](mailto:wassim@pllel.com)

[\(cryptoassets101.d-soc.net\)](http://cryptoassets101.d-soc.net)

pllel

A Question or Two for You.



IMPORTANT INFORMATION

Warning on the Risks Involved with Speculative Mania



parallel



Warning on the Risks Involved with Speculative Mania

IANYL/IANYFA

DO NOT RISK WHAT YOU CANNOT AFFORD TO LOSE
DO NOT GO INTO DEBT TO ACQUIRE CRYPTO-CURRENCIES
UNDER-REGULATED MARKETS = SCAMMER PARADISE
GOVERNMENTS MAY TAKE SUDDEN, STRINGENT MEASURES
PRICE ACTION IS EXTREMELY VOLATILE + UNPREDICTABLE
90% DRAWDOWNS ARE NOT UNCOMMON
DO NOT TRUST ANYONE & DYOR

How are crypto-assets different from traditional financial instruments?



(Equity-Debt / PMs / cryptos)

(NOT Fractional / Debt-Based. NO Counterparty Liability)

(Incompatible Value Proposition Models)

(Bearer assets like metals *sans specie* w/ programmability)

(Decentralised / Borderless)

(Culture)



Do traditional *asset* valuation metrics such as “Market Cap” make sense in crypto-finance?

Supply Without Demand is a Dangerous Game

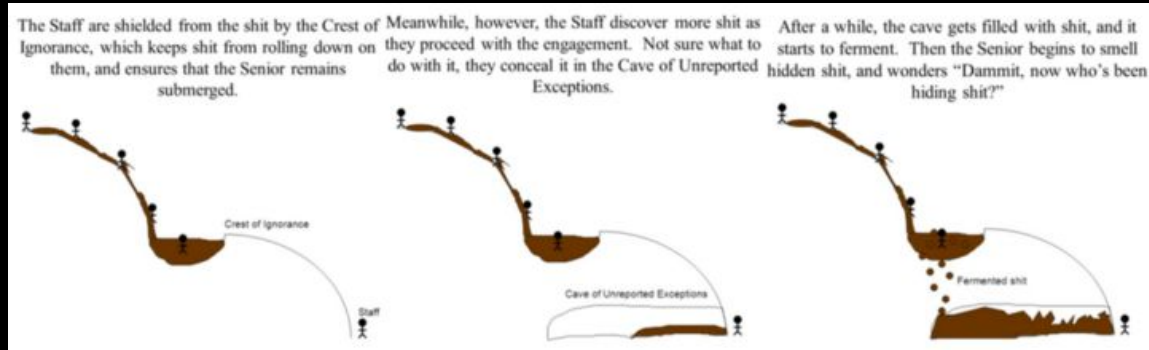
Everyone Overpays to "Squat" on Assets they Believe are Scarce

Infrastructure Capacity aka CAPEX Investments Constrains the Ability to get Supply to Market

Artificial Demand Can Only Last So Long

Production Costs Are Skyrocketing due to Demand

In the End, a Lack of Natural Demand Trumps Speculative Demand



Meltem Demirors [Follow](#)
I don't sleep, I wait. Investing, evolving, creating, teaching @MIT @UniofOxford, advising @WEF, founding team @df-co.
Mar 25 · 16 min read

Drowning in Tokens

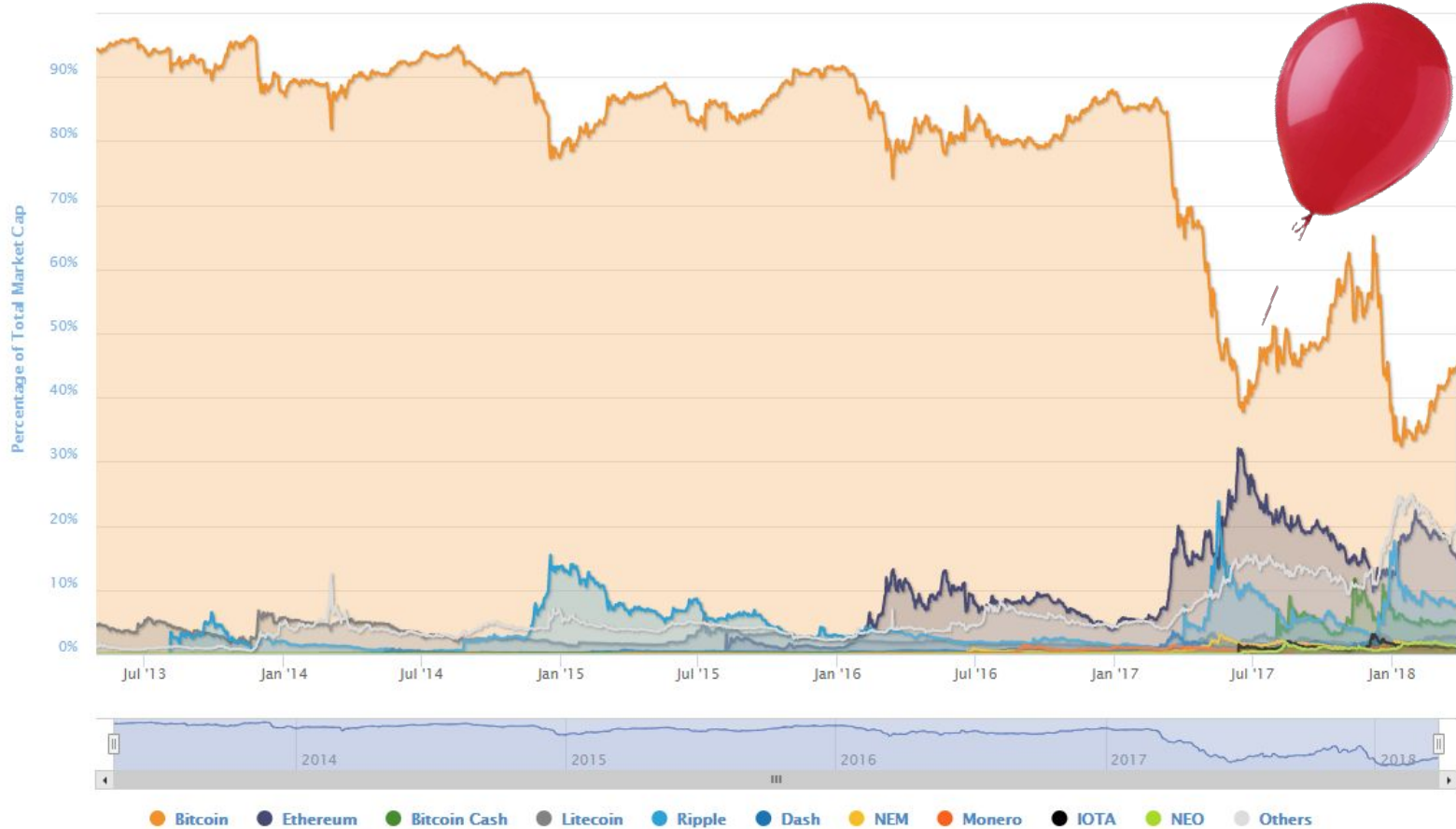
A pragmatist's take on perceived scarcity and artificial demand



Percentage of Total Market Capitalization (Dominance)

Zoom 1d 7d 1m 3m 1y YTD ALL

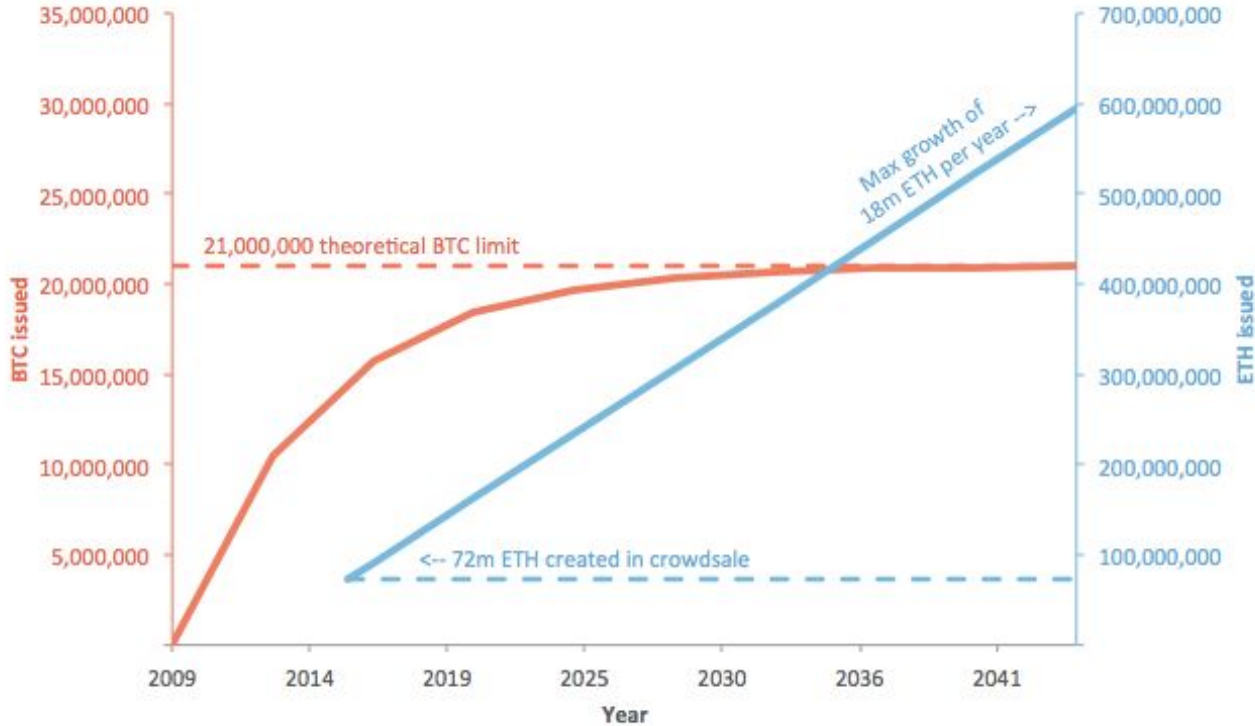
From Apr 28, 2013 To Mar 28, 2018





BTC vs ETH issuance models

www.bitsonblocks.net





Total Y2050 Marketcap: \$445,094,266,740

Total Current Marketcap: \$281,671,791,484

Bitcoin Dominance: 48.56%

Flagged Assets USD | BTC

You haven't flagged any assets yet...

Recent Quotes USD | BTC

You haven't viewed any assets yet...

Daily Movers USD | BTC

Top Gainers

SYS	\$0.39	+21.93%
BCN	0.2719 cents	+12.65%
SALT	\$2.79	+7.92%
EOS	\$6.33	+6.63%
GNT	\$0.25	+6.35%

Top Losers

XVG	\$0.04	-8.00%
BAT	\$0.23	-4.72%
MTL	\$4.60	-3.33%
LTC	\$137.78	-2.79%
SC	\$0.01	-2.74%

Cryptoasset Indexes

Bletchley 10	1010.44	+0.59%
Bletchley 20	1542.07	+2.73%
Bletchley 40	223.92	+1.65%

Sector Watch USD | BTC

Daily Winners

Scams	+12.10%
Distributed Computation	+6.35%
Lending Platform	+5.74%

Daily Losers

Advertising	-4.72%
Distributed Storage	-1.83%

#	Flag	Name	Price USD	24hr Change vs USD	Y2050 Marketcap (implied)	Current Marketcap	24hr Vol	Supply % Issued
1	🇺🇸	Bitcoin (BTC)	\$8,072.00	+0.70%	\$169,378,774,856	\$136,773,679,264	\$5,177,530,000	80.75%
2	🇺🇸	Ethereum (ETH)	\$460.19	+0.29%	\$67,637,111,606	\$45,313,993,036	\$1,523,910,000	67.00%
3	🇺🇸	Ripple (XRP)	\$0.58	0.00%	\$58,460,900,000	\$22,854,837,127	\$295,947,000	39.09%
4	🇺🇸	Stellar Lumens (XLM)	\$0.22	+2.56%	\$31,820,474,479	\$4,138,284,687	\$30,620,800	13.01%
5	🇺🇸	Bitcoin Cash (BCH)	\$887.05	-1.91%	\$18,613,313,409	\$15,117,349,662	\$331,574,000	81.22%
6	🇺🇸	Litecoin (LTC)	\$137.78	-2.79%	\$11,557,549,509	\$7,692,050,757	\$344,828,000	66.55%
7	🇺🇸	EOS (EOS)	\$6.33	+6.63%	\$9,241,779,577	\$4,787,414,587	\$942,840,000	51.80%
8	🇺🇸	Cardano (ADA)	\$0.16	+2.35%	\$7,268,715,000	\$4,187,921,923	\$80,154,200	57.62%
9	🇺🇸	Dash (DASH)	\$364.34	-2.07%	\$6,886,044,900	\$2,904,608,429	\$90,695,100	42.18%
10	🇺🇸	NEO (NEO)	\$58.21	+3.55%	\$5,821,010,000	\$3,783,656,500	\$115,921,000	65.00%
11	🇺🇸	Tron (TRX)	\$0.05	+2.83%	\$4,527,150,000	\$2,976,519,296	\$248,687,000	65.75%
12	🇺🇸	ZCash (ZEC)	\$217.56	+1.03%	\$4,526,336,244	\$778,373,162	\$49,409,400	17.20%
13	🇺🇸	Monero (XMR)	\$195.79	+4.48%	\$4,401,949,916	\$3,107,823,855	\$60,159,500	70.60%
14	🇺🇸	Ethereum Classic (ETC)	\$16.33	+2.15%	\$3,756,222,000	\$1,646,312,858	\$172,012,000	43.83%
15	🇺🇸	Iota (IOT)	\$1.22	+3.48%	\$3,403,451,446	\$3,403,451,446	\$28,509,000	100.00%
16	🇺🇸	VeChain (VEN)	\$2.98	-0.78%	\$2,586,598,720	\$1,551,113,413	\$54,366,700	59.97%
17	🇺🇸	Lisk (LSK)	\$10.04	-1.92%	\$2,351,987,436	\$1,036,382,153	\$17,461,600	44.06%
18	🇺🇸	Icon (ICX)	\$2.91	-0.52%	\$2,332,252,274	\$1,166,126,137	\$94,827,700	50.00%
19	🇺🇸	New Economy Movement (XEM)	\$0.26	+0.70%	\$2,312,154,000	\$2,312,154,000	\$21,161,600	100.00%

What are these columns?

Search

Choose Columns

Standard

- Flag
- Logo
- Price USD
- Price BTC
- 24hr Change vs USD (%)
- 24hr Change vs BTC (%)
- Y2050 Marketcap (implied)
- Current Marketcap
- 24hr Trade Vol
- Age

Supply

- Y2050 Supply
- Available Supply
- Supply % Issued

All Time High

- ATH (USD)
- Days since ATH
- % down from ATH

On-chain Data

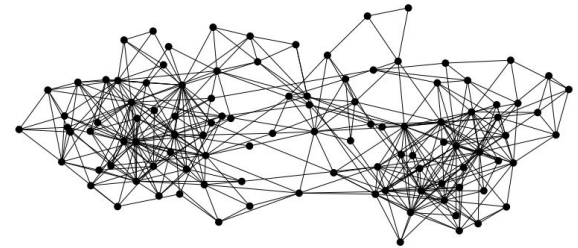
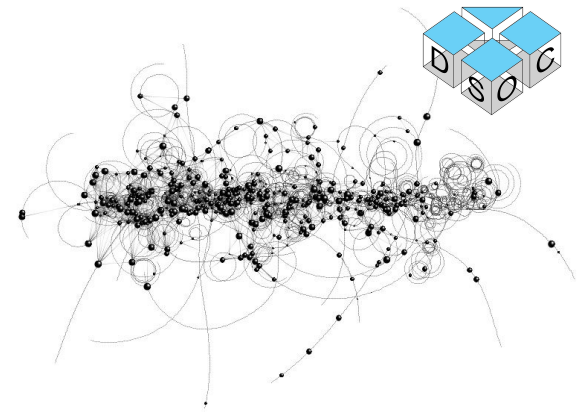
- TX Vol (24hr, USD)
- NVT Ratio

Bitcoin: A Protocol and a Currency

- **B**itcoin: protocol, software, and community
- **b**itcoins: units of the currency

bitcoins are sent using Bitcoin

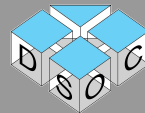
- bitcoins are the first powerful Bitcoin protocol application: a native digital asset created inside the protocol



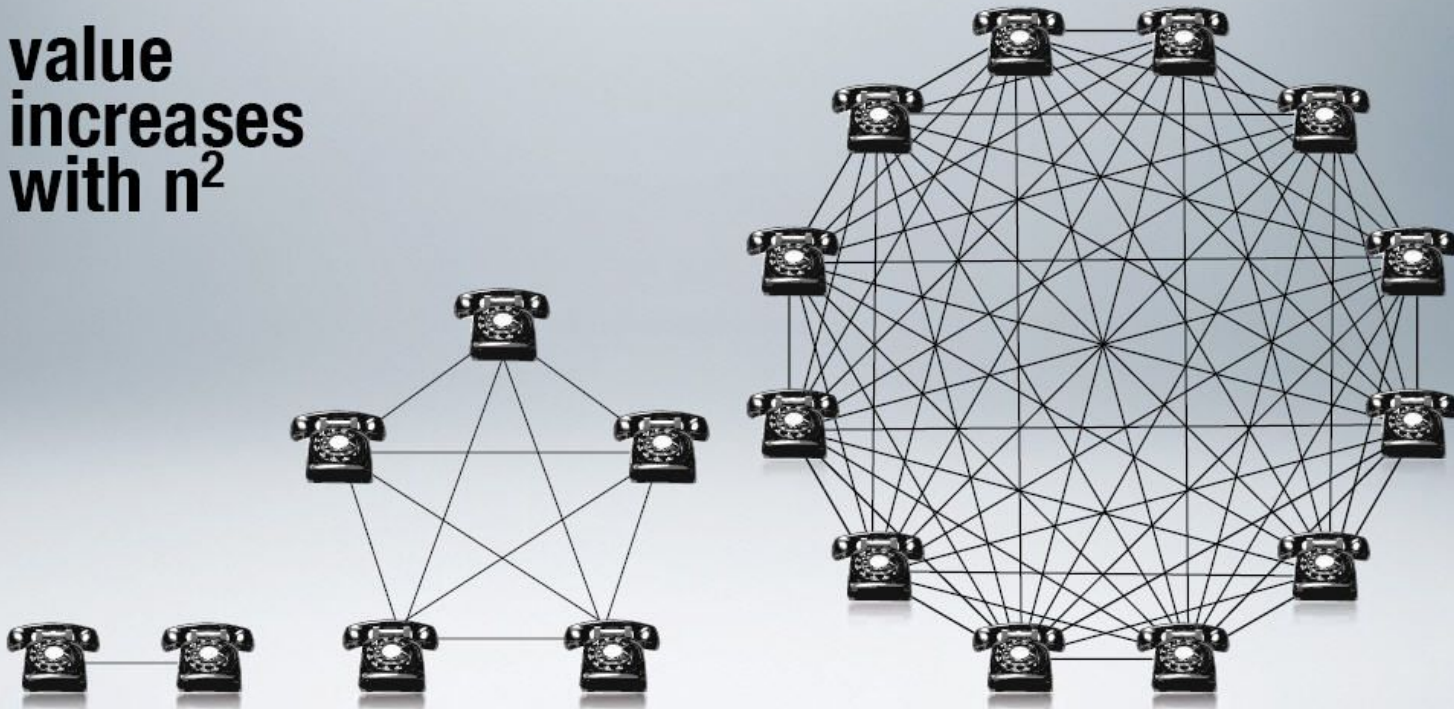


How can *networks* be valued?

METCALFE'S LAW



value
increases
with n^2



Velocity:

Money's Second Dimension *By Bryon Higgins*

"Money has a 'second dimension, namely, velocity" Arthur F. Burns in Congressional Testimony.

Understanding the effects of monetary

economic theories were inadequate to deal with the problems resulting from the Great Depression.

In the crisis atmosphere surrounding policy discussions at the depth of the Great

Appraising network value



NV : T ?

$$M * V = P * Q$$

Money Supply
Circulation per year

Price per Unit
Quantity Produced

DEMAND SIDE

SUPPLY SIDE

VALUE OF MONEY

• Irving Fischer
• $PT = MV + M_1V_1$

Quantity Theory of Money



• Cambridge Economists: Keynes, Marshall
• $M = KPy$

Cash Balance Approach to Money

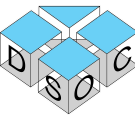


• Milton Friedman
• $M_d = f(Y_p)$

Modern Theory of value of money



Is Bitcoin In A Bubble? Check The NVT Ratio



Willy Woo, CONTRIBUTOR

I do data-centric investment research on cryptocurrency markets. [FULL BIO](#)

Opinions expressed by Forbes Contributors are their own.



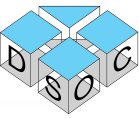
Shutterstock

The Idea Behind NVT Ratio

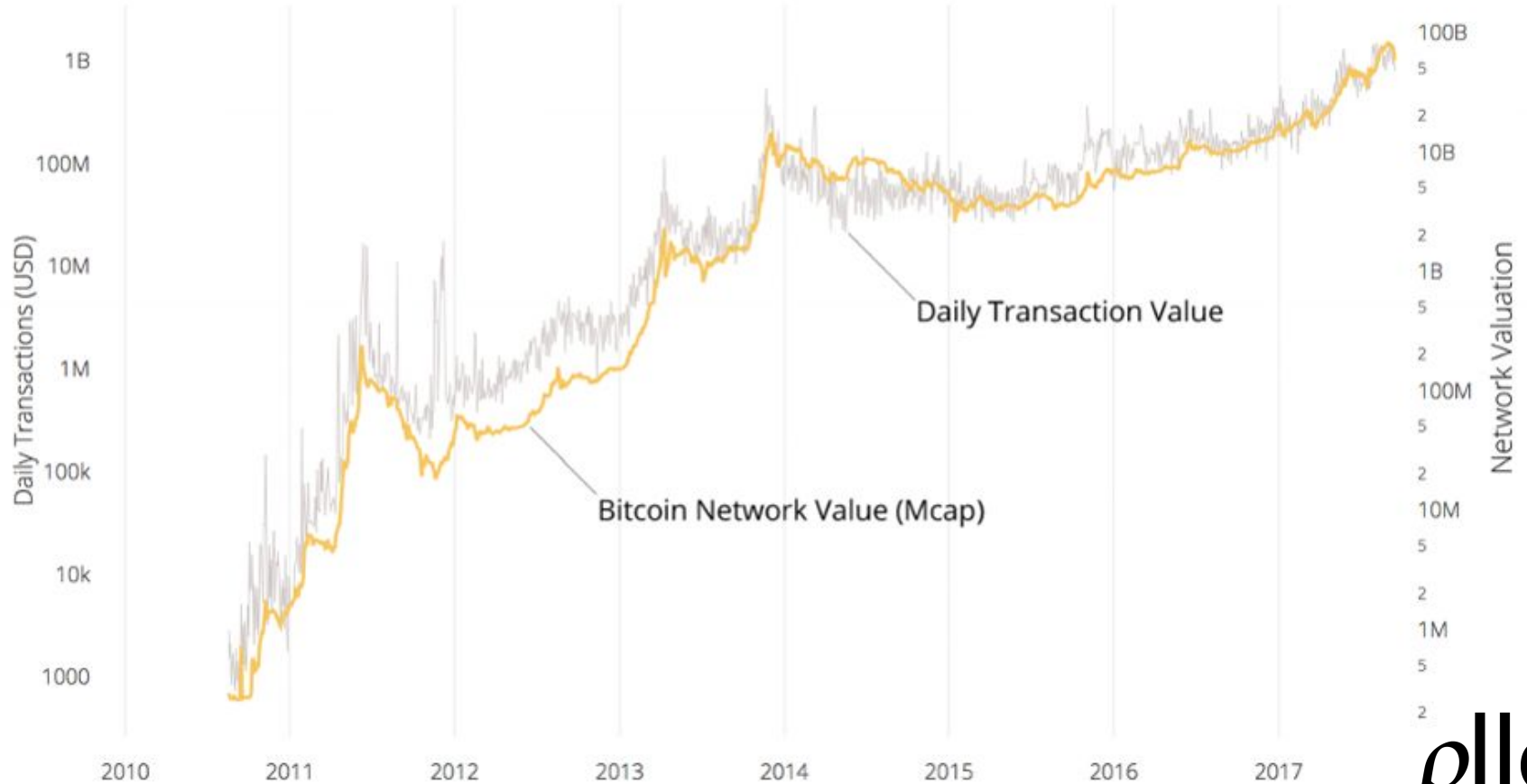
February of this year, I [tweeted](#) a chart that presented the idea of a PE ratio for Bitcoin, something I temporarily called MTV Ratio before my buddy [Chris Burniske](#) suggested the less confusing term of **NVT Ratio** (Network Value to Transactions Ratio). Later in May, Chris was the first to present NVT Ratio at [Token Summit 2017](#). Subsequently, this ratio has been mentioned in blog and media articles across the web. In my original tweet, I promised an article; it lay unwritten until now.

pllel

Network Value and Transaction Value

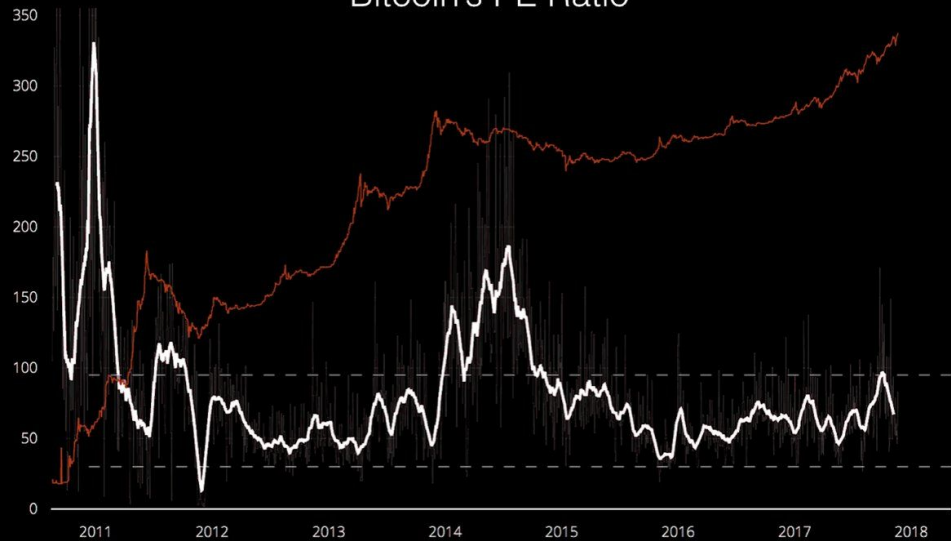


Source: Woobull.com

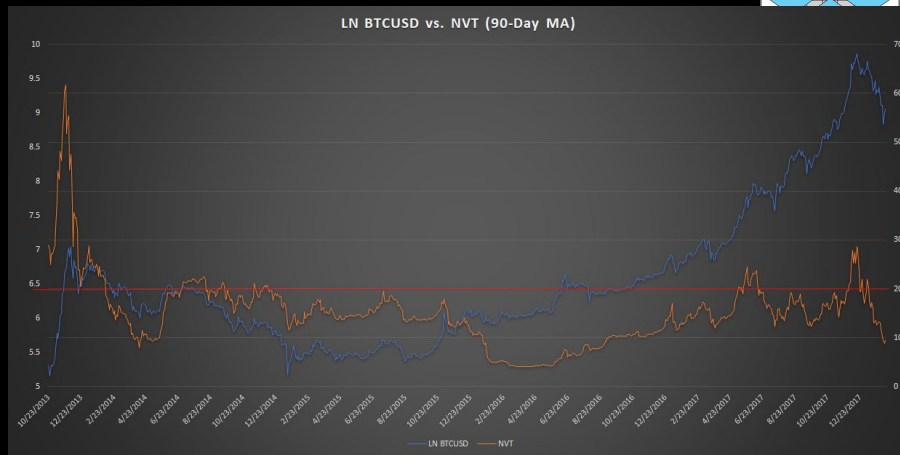


NVT Ratio

“Bitcoin’s PE Ratio”



Network value to money transmitted through the blockchain



Mayer Multiple @TIPMayerMultiple · 4h

The current Mayer Multiple is 0.87 with a \$BTC price of \$USD 8,093.07 and a 200 day moving average of \$9,327.81 USD. The @TIPMayerMultiple has historically been higher 82.22% of the time with an average of 1.58. Learn more about how to use this tool at:



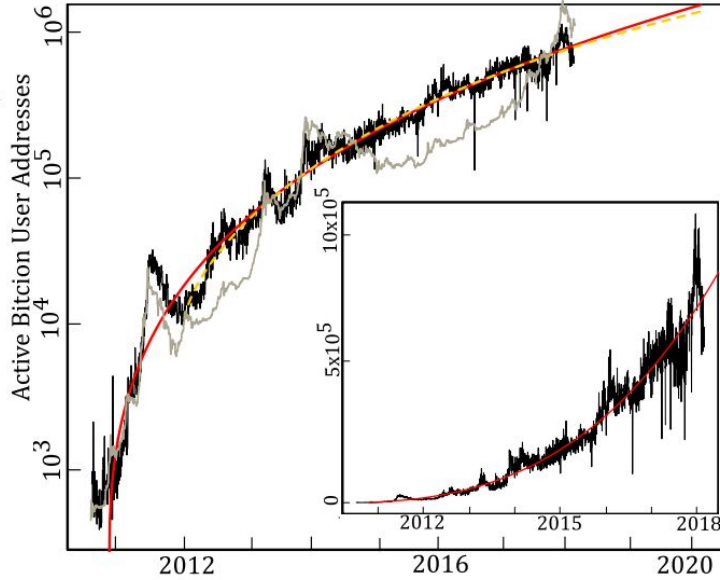
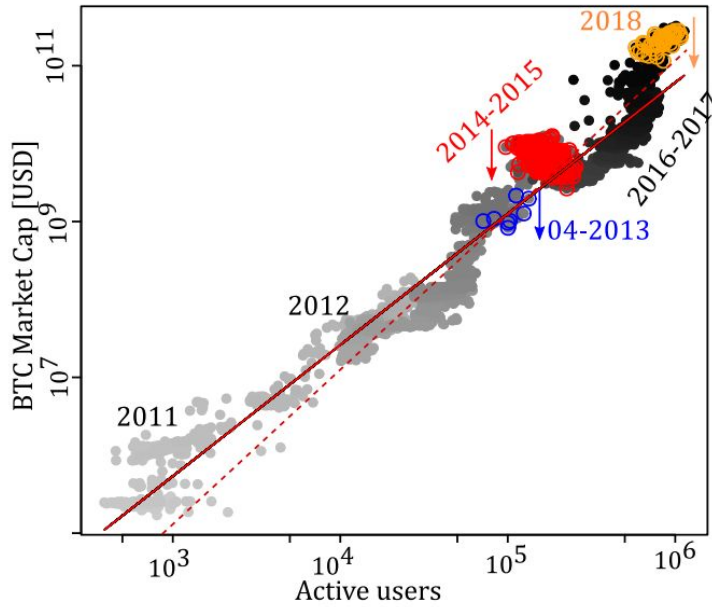
Mayer Multiple

MAYER MULTIPLE Below is a distribution chart of the multiple of the bitcoin price over the 200-day moving average. If a person decides to allocate a s...
theinvestorspodcast.com

<https://twitter.com/tipmayermultiple>

2017 Bottoms





Are Bitcoin Bubbles Predictable?

Combining a Generalized Metcalfe's Law and the LPPLS Model

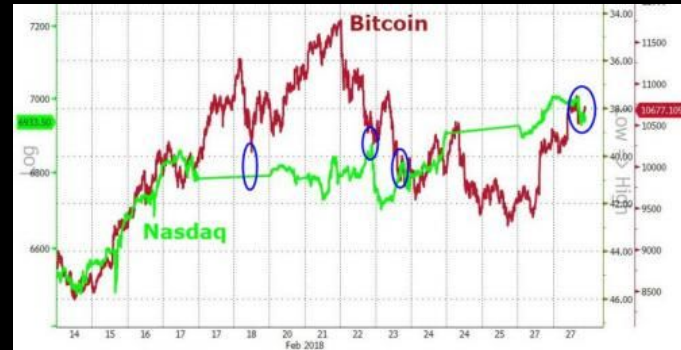
Spencer Wheatley^{1*}, Didier Sornette^{1,2*}, Tobias Huber¹, Max Reppen³, and Robert N. Gantner

Is Bitcoin Really A Leading Indicator For The Entire Market?



by Tyler Durden
Wed, 02/28/2018 - 12:51

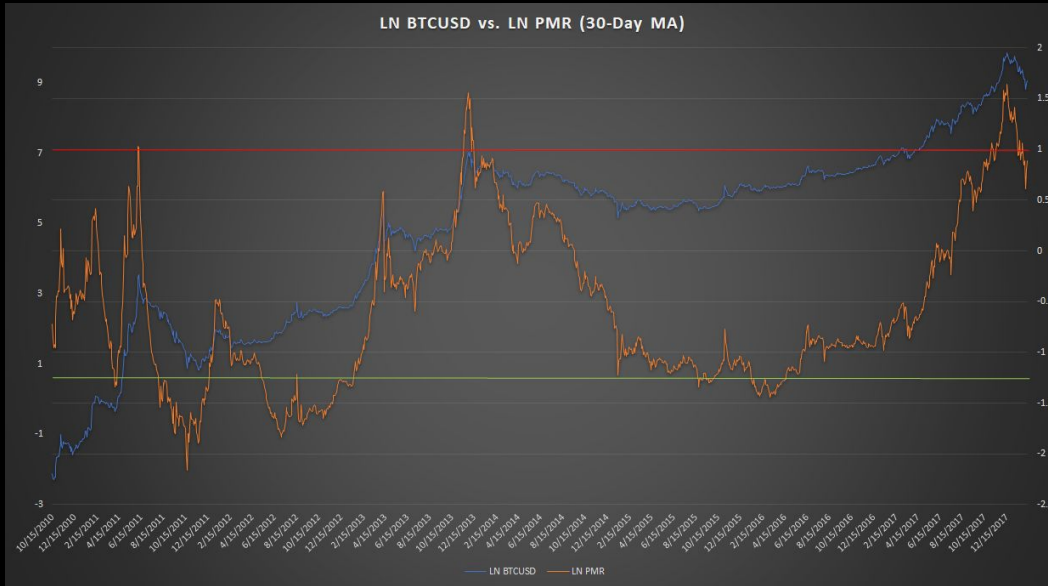
40 SHARES





$$PMR = \ln \frac{\text{Daily USD Price}}{30\text{-Day MA of } M2}$$

PMR?



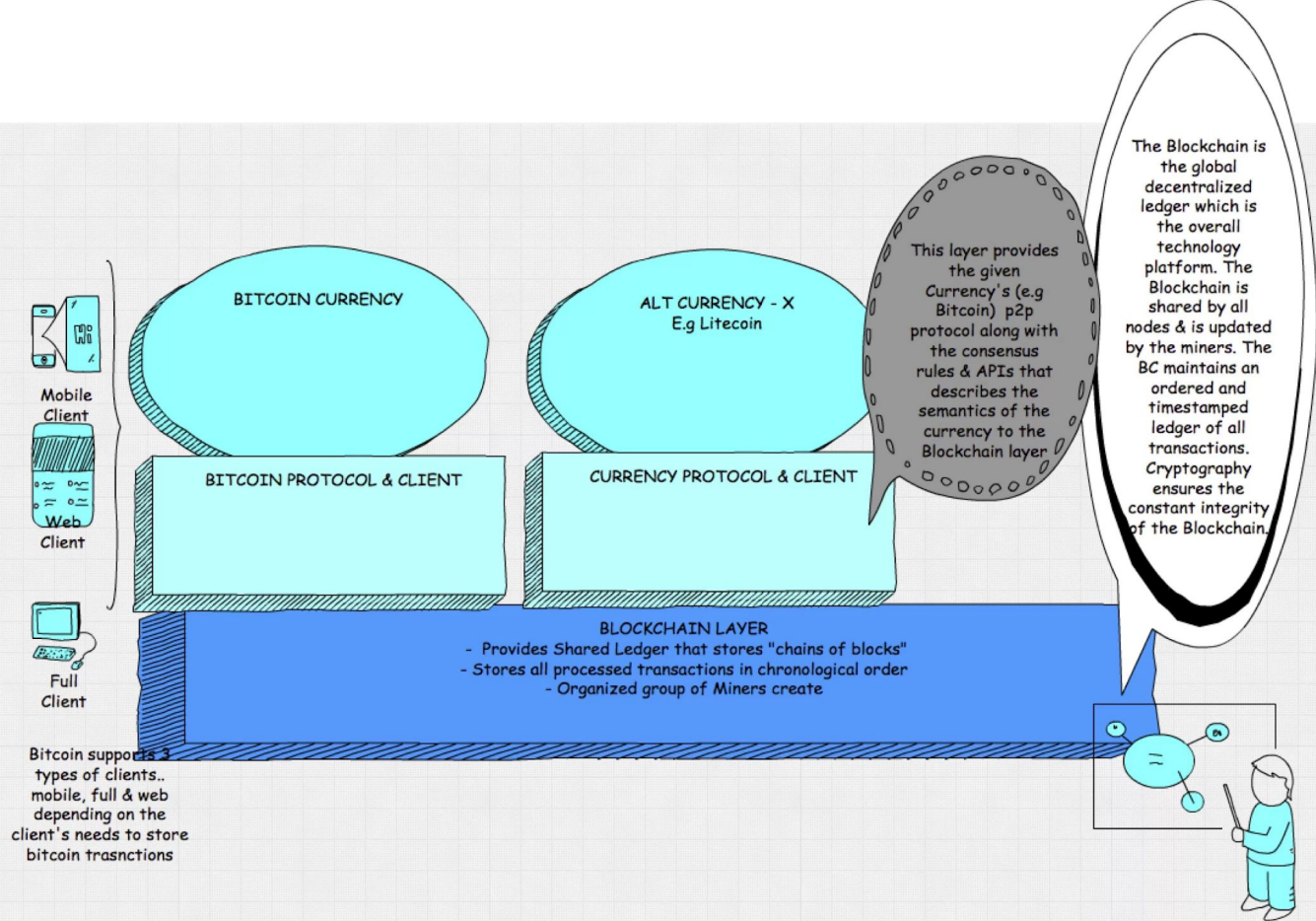
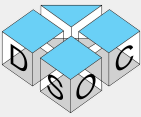
A model for the value of the network in relation to the number of unique addresses participating in the network utilizing an exponential function was also derived and compared with Metcalfe's Law. The new model has the following form:

$$V(N) = Ce^{\lambda N^m} \quad (5)$$

The values of C , λ , and m are determined by the fit to the equation. The filter applied to N is a 30-day average filter which takes the form:

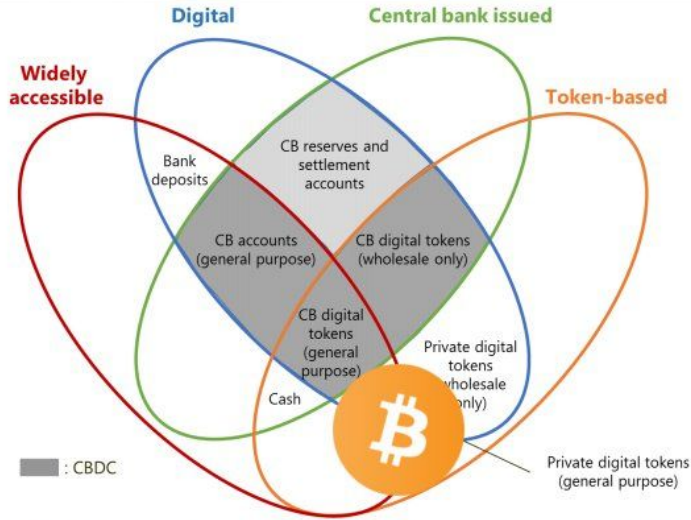
$$\bar{N}_t = \frac{1}{30} \sum_{i=30+h+1}^{i+h} N_i \quad (6)$$

Note that $h=0$ is the 30 day backward moving average and results in a lagging N in relation to the value function. h was chosen to weight the filter evenly about the point at i for the exponential function, with its effect shown in the close fit between the filtered and actual quantity in Fig. 1.



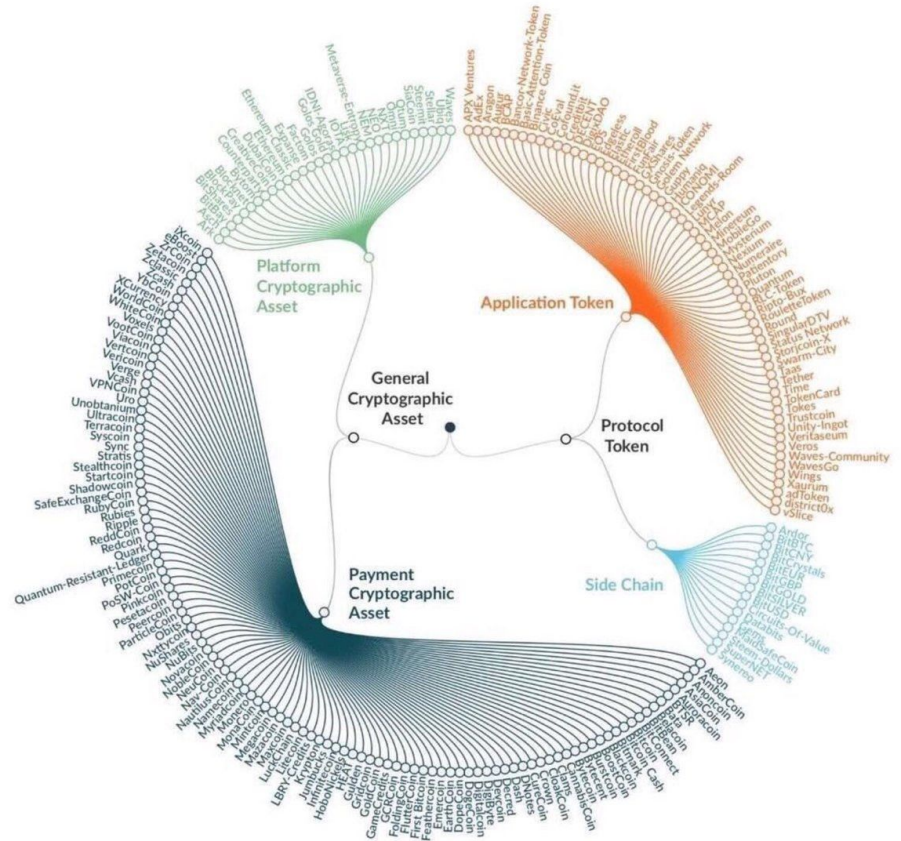
Bitcoin supports 3 types of clients.. mobile, full & web depending on the client's needs to store bitcoin transactions

The Blockchain explorer and other tools provide a way to explore the contents of different blocks and to query & search them



Notes: The Venn-diagram illustrates the four key properties of money: *issuer* (central bank or not); *form* (digital or physical); *accessibility* (widely or restricted) and *technology* (account-based or token-based). *CB* = central bank, *CBDC* = central bank digital currency (excluding digital central bank money already available to monetary counterparties and some non-monetary counterparties). *Private digital tokens (general purpose)* include crypto-assets and currencies, such as bitcoin and ethereum. *Bank deposits* are not widely accessible in all jurisdictions. For examples of how other forms of money may fit in the diagram, please refer to the source.

Source: Based on Bech and Garratt (2017).



Moving Closer

Bitcoin's correlation to valuations has been getting more positive

■ Correlation(XBTUSD Curncy,PR005,120,0) (SPX) 0.2178



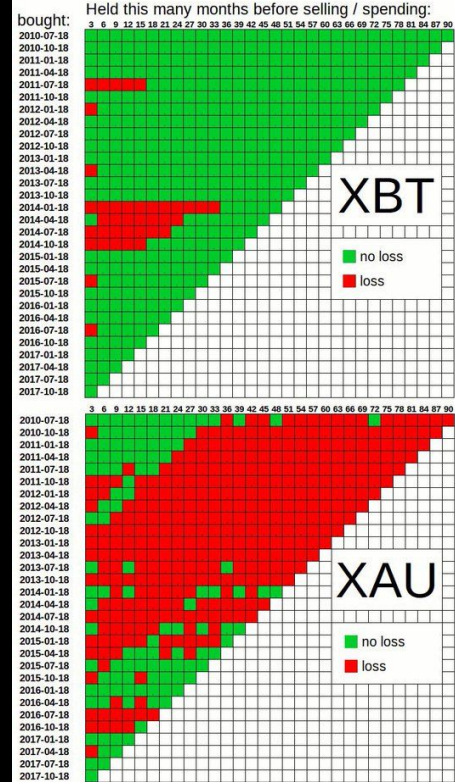
Source: Bloomberg

Bloomberg

Bitcoin vs. Gold

Which one is better as a store of value?

If you sell it after holding for 3, 6, ... 90 months, which one is more likely to cause you a loss?



Sources of data: <https://data.bloomberglp.com/govt-logic/calc>, <https://www.condeek.com/pric/>, https://www.perthinvest.com/investment_mest_in_gold_prices_metal_prices.aspx (the price from the closest previous working day was used if exchanges were closed at this day)
Note: Losses were calculated using prices in 2010 US dollars.

© TheStreet.com, 2017. This image was released into the Public Domain - you can use it for any purposes (commercial or), without asking the author.

Design of Tokenized ecosystem ≈ Design of EAs (Evolutionary Algorithms)

What	Tokenized ecosystem	Evolutionary Algorithm
Goals	Block reward function E.g. "Maximize hash rate"	Objective function E.g. "Minimize error"
Measurement & test	Proof E.g. "Proof of Work"	Evaluate fitness E.g. "Simulate circuit"
System agents	Miners & token holders (humans) In a network	Individuals (computer agents) In a population
System clock	Block reward interval	Generation
Incentives & Disincentives	You can't control human, Just reward: give tokens And punish: slash stake	You can't control individual, Just reward: reproduce And punish: kill



Trent McConaghy [Follow](#)

AI*blockchain. Founder @OceanProtocol | @BigchainDB www.trent.st
Mar 1 · 20 min read

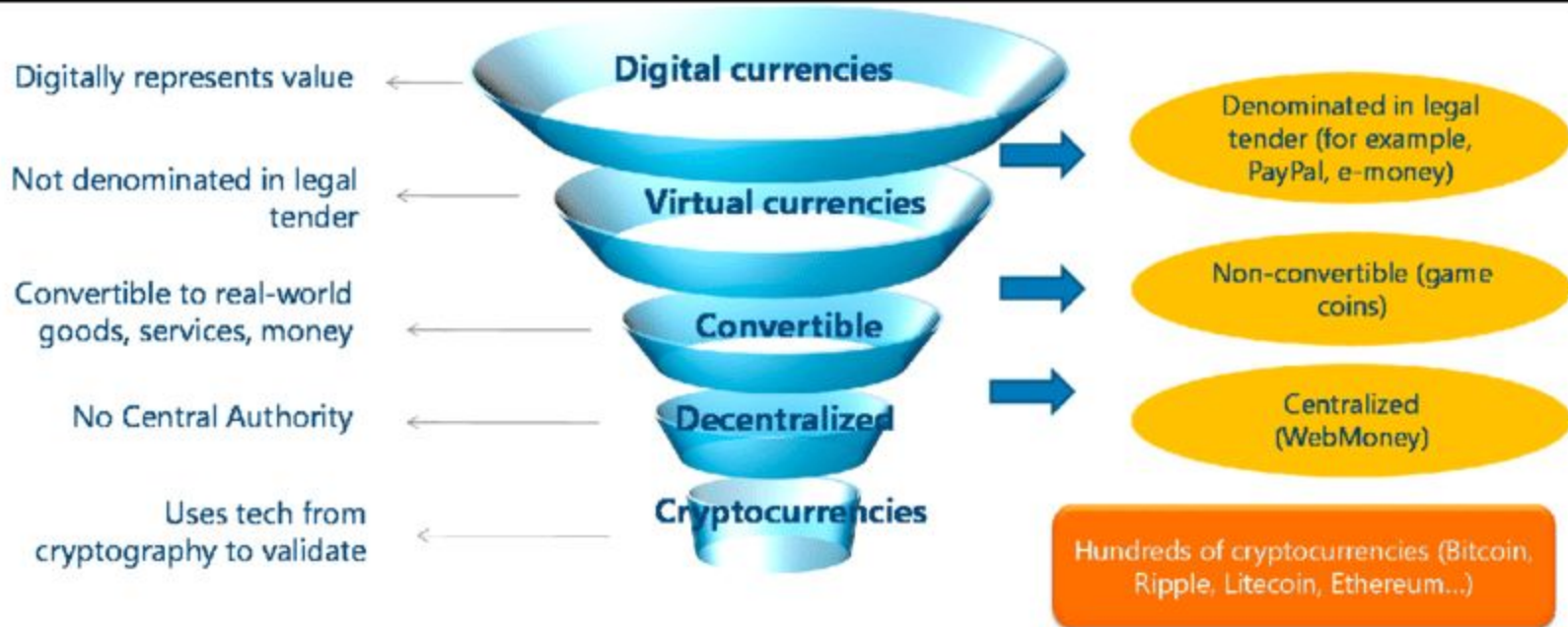
Towards a Practice of Token Engineering

Methodology, Patterns & Tools. TE Series Part II.

The algorithm's aim is formulated as a constrained multi-objective optimization problem

$$\begin{aligned}
 &\text{minimize} && f_i(\phi) && i = 1 \dots N_f \\
 &\text{s.t.} && g_j(\phi) \leq 0 && j = 1 \dots N_g \\
 &&& h_k(\phi) = 0 && k = 1 \dots N_h \\
 &&& \phi \in \Phi &&
 \end{aligned} \tag{1}$$

where Φ is the "general" space of possible topologies and sizings. The algorithm traverses Φ to return a Pareto-optimal



Source: IMF staff

Linux distro timeline

Version 7.2 by NPU (nonplus@gmail.com)

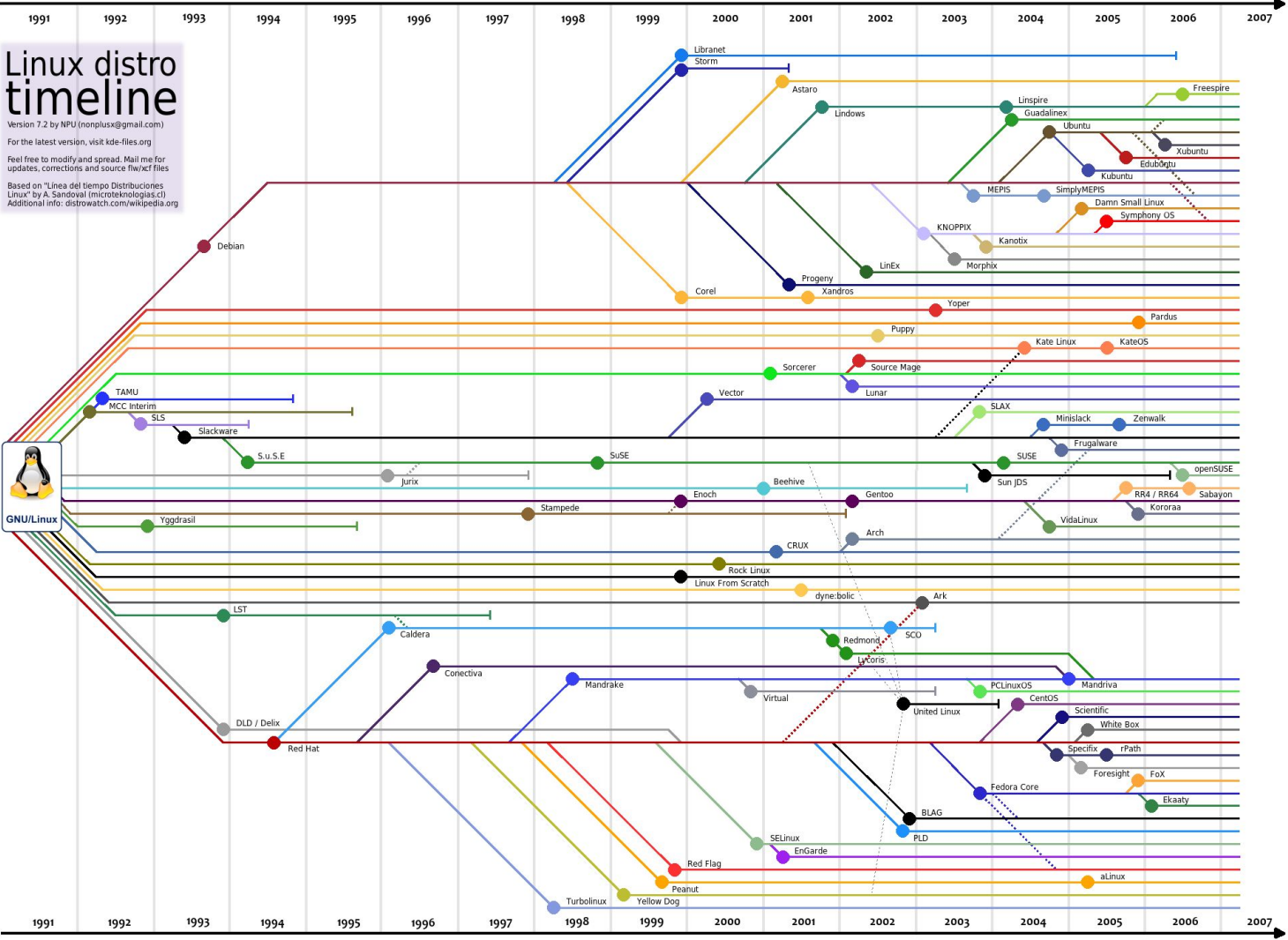
For the latest version, visit kde-files.org

Feel free to modify and spread. Mail me for updates, corrections and source flw/xf files

Based on "Línea del tiempo Distribuciones Linux" by A. Sandoval (microtecnologias.cl)
Additional info: distrowatch.com/wikipedia.org



GNU/Linux



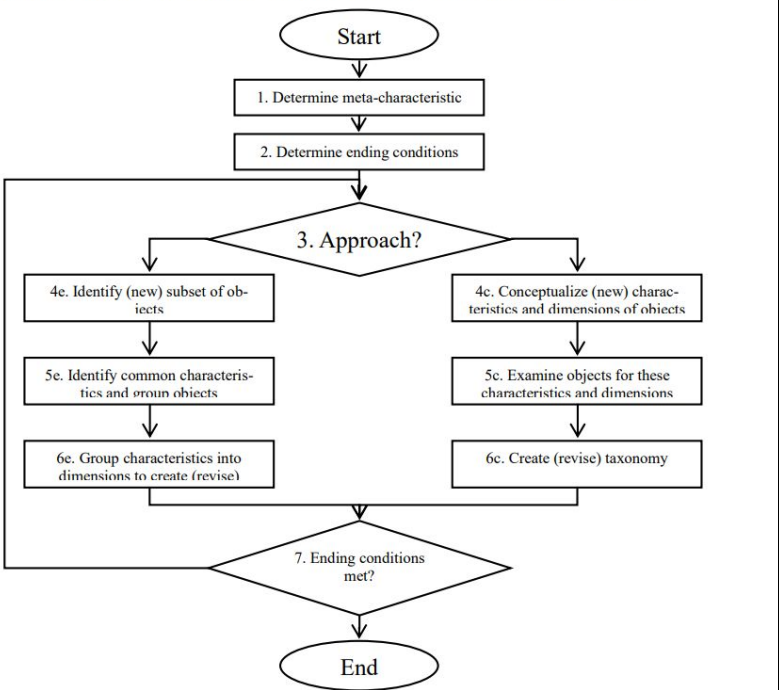


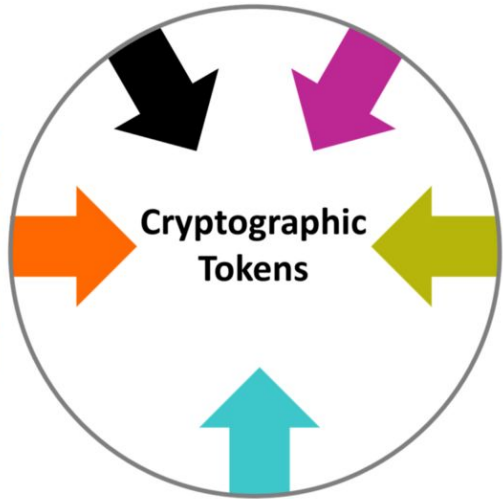
Figure 2. The taxonomy development method proposed by Nickerson et al. (2013).

		Decentralized Consensus Systems						
Dimension	Characteristic	Dccy	Altcoin	Sidechain	Metacoin	DAO	DAC	DApp
Underlying	Consensus	x						
	Dccy		x					
	Altcoin			x				
	Metacoin				x			
Valuation	External	x	x		x	x	x	x
	Pegged			x				
Community	Flat							x
	Tiered	x	x	x	x	x		
	Centralized						x	
Service Focus	Token	x	x	x				
	Protocol				x			
Code Base	Application					x	x	x
	Scratch	x						
Token Usage	Derived		x	x	x			x
	Transaction	x	x	x		x	x	
	Verification				x			x

Table 4. Taxonomy of Decentralized Consensus Systems.

Purpose	
What is the token's main purpose?	
Cryptocurrencies	
Network Tokens	
Investment Tokens	

Utility	
What utility does the token provide?	
Usage Tokens	
Work Tokens	
Hybrid Tokens	



Technical Layer	
On which system layer is the token implemented?	
Blockchain-Native Tokens	
Non-native Protocol Tokens	
(d)App Tokens	

Legal Status	
What is the token's legal status?	
Utility Tokens	
Security Tokens	
Cryptocurrencies	

Underlying Value	
Where does the token derive its value from?	
Asset-backed Tokens	
Network Value Tokens	
Share-like Tokens	

MAIN TOKEN TYPES PER DIMENSION



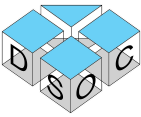
Technical Layer	Purpose	Underlying Value	Utility	Legal Status
Blockchain-Native Tokens Description: A token that is implemented on the protocol-level of a blockchain Characteristics: <ul style="list-style-type: none"> Critical to operate the blockchain Integral component of the blockchain's consensus mechanism Part of the blockchain's incentive mechanism for block validators/other nodes Examples: BTC (Bitcoin), ETH (Ether, Ethereum), STEEM (Steem, Sbeam)	Cryptocurrencies Description: A token that is intended to be a "pure" cryptocurrency Characteristics: <ul style="list-style-type: none"> Intended as a global medium of exchange Functions as a store of value Examples: BTC (Bitcoin), ZEC (Zcash), KIN (Kin, Kin)	Asset-backed Tokens Description: A token that functions as a claim on an underlying asset Characteristics: <ul style="list-style-type: none"> Allows trading via IOUs without actually having to move the underlying asset The issuer is responsible to hold the underlying asset Introduces counterparty risk Examples: USDT (Tether USD, Tether), GOLD (GOLD, GoldMine), Ripple IOUs (Ripple)	Usage Tokens Description: A token that provides access to a digital service, similar to a paid app key Characteristics: <ul style="list-style-type: none"> Grants holders access to exclusive functionality of the service Examples: BTC (Bitcoin), STX (Stacks, Blockstack)	Utility Tokens Description: A token offering owners clearly defined utility within a network or (de)centralized application Characteristics: <ul style="list-style-type: none"> Closely tied to the functionality of the issuing network or application Internal network/app currency but not necessarily attempting to be a currency Grants owners the right to actively contribute to the system vs. passive investor role Avoids security-like features Examples: GNO (Gnosis), STEEM (Steem)
Non-native Protocol Tokens Description: A token that is implemented in a cryptoeconomic protocol on top of a blockchain Characteristics: <ul style="list-style-type: none"> Integral component of the protocol's consensus mechanism Part of the protocol's incentive mechanism for nodes Tracked on an underlying blockchain to which it is not integral (e.g. ERC20 Tokens on Ethereum) Examples: REP (Decentralized Oracle Protocol, Augur)	Network Tokens Description: A token that is primarily intended to be used within a specific system (e.g. network, application) Characteristics: <ul style="list-style-type: none"> Token has functionality within the issuers system Not intended as a general cryptocurrency Examples: GNO (Gnosis), STX (Stacks, Blockstack)	Network Value Tokens Description: A token that is tied to the value and development of a network Characteristics: <ul style="list-style-type: none"> Tied to the value generated and exchanged on the network (e.g. transaction fee volume) Closely intertwined with key interactions of network participants Examples: ETH (Ether, Ethereum) STEEM (Steem)	Work Tokens Description: A token that provides the right to contribute to a system Characteristics: <ul style="list-style-type: none"> Owning Tokens is the precondition for contributing to the system Contributions are either incentivized with a rewards system or holders get utility from the system/(de)centralized organization Examples: REP (Resurrection, Augur), MKR (Maker, Maker DAO)	Security Tokens Description: A token that behaves like a security Characteristics: <ul style="list-style-type: none"> Shows security-like features, e.g. voting on decisions regarding the issuing entity, dividends, or profit shares Holders are regarded as owners Little or insufficient utility Examples: SPICE (SPICE VCI), Bitwala (bit)
(d)App Tokens Description: A token that is implemented on the application-level on top of a blockchain (and potentially protocol) Characteristics: <ul style="list-style-type: none"> Integrated within the application Part of the app's incentive mechanism for nodes and/or users Tracked on an underlying blockchain to which it is not integral (e.g. ERC20 Tokens on Ethereum) Examples: WIZ (Wisdom, Gnosis), SAFE (Safecon, SAFE Network)	Investment Tokens Description: A token that is primarily intended as a way to passively invest in the issuing entity or underlying asset Characteristics: <ul style="list-style-type: none"> The issuer promises token owners a share in (the future) success of the issuing entity No or little significant functionality Examples: Neufund Equity Tokens (Neufund), DGX (Digix Gold, DigixDAO)	Share-like Tokens Description: A token with share-like properties Characteristics: <ul style="list-style-type: none"> The issuer promises token owners a share in the success of the issuing entity (e.g. dividends, profit-shares) May or may not come with voting rights Mostly on no/weak legal basis Examples: DGD (DigixDAO), LKK (Lykke) <p><i>Likely to be classified as a security token</i></p>	Hybrid Tokens Description: A token featuring traits of both usage and work tokens Characteristics: <ul style="list-style-type: none"> Grants access to system functionalities Allows owners to contribute to the system Examples: ETH (Ether, Ethereum, after Casper), DASH (Dash)	Cryptocurrencies Description: A token that is a pure cryptocurrency Characteristics: <ul style="list-style-type: none"> Acts as a store of value and medium of exchange Not emitted by a central authority against which owners have claims in Germany (according to BaFin) currently not regarded as lawful functional currency not regulated by e-money laws Examples: BTC (Bitcoin), ZEC (Zcash), LTC (Litecoin)

*Details dependent on respective jurisdiction

Untitled INC

General Types	Purpose	Underlying Value	Utility	Legal Status*
Blockchain-Native Token	Cryptocurrency	Asset-backed Token	Usage Token aka: Access Token	Utility Token
Non-native Protocol Tokens	Network Token	Network Value Token	Work Token	Security Token aka: Equity token
(d)App Token	Investment Token	Share-like Token aka: Participation Token	Hybrid Token	Cryptocurrency

Uses tokens to incentivize "Oracles", a critical component of its decentralized prediction market.
 Owners have to report events and receive a share of all network fees.



$$M \times V = P \times Q$$

$$M: M2 + C + I - L - S$$

$$P: P(\text{BTCe}) + P(\text{Ee})$$

$$Q: Q(\text{BTCe}) + P(\text{Ee})$$

$$V: PQ/M$$

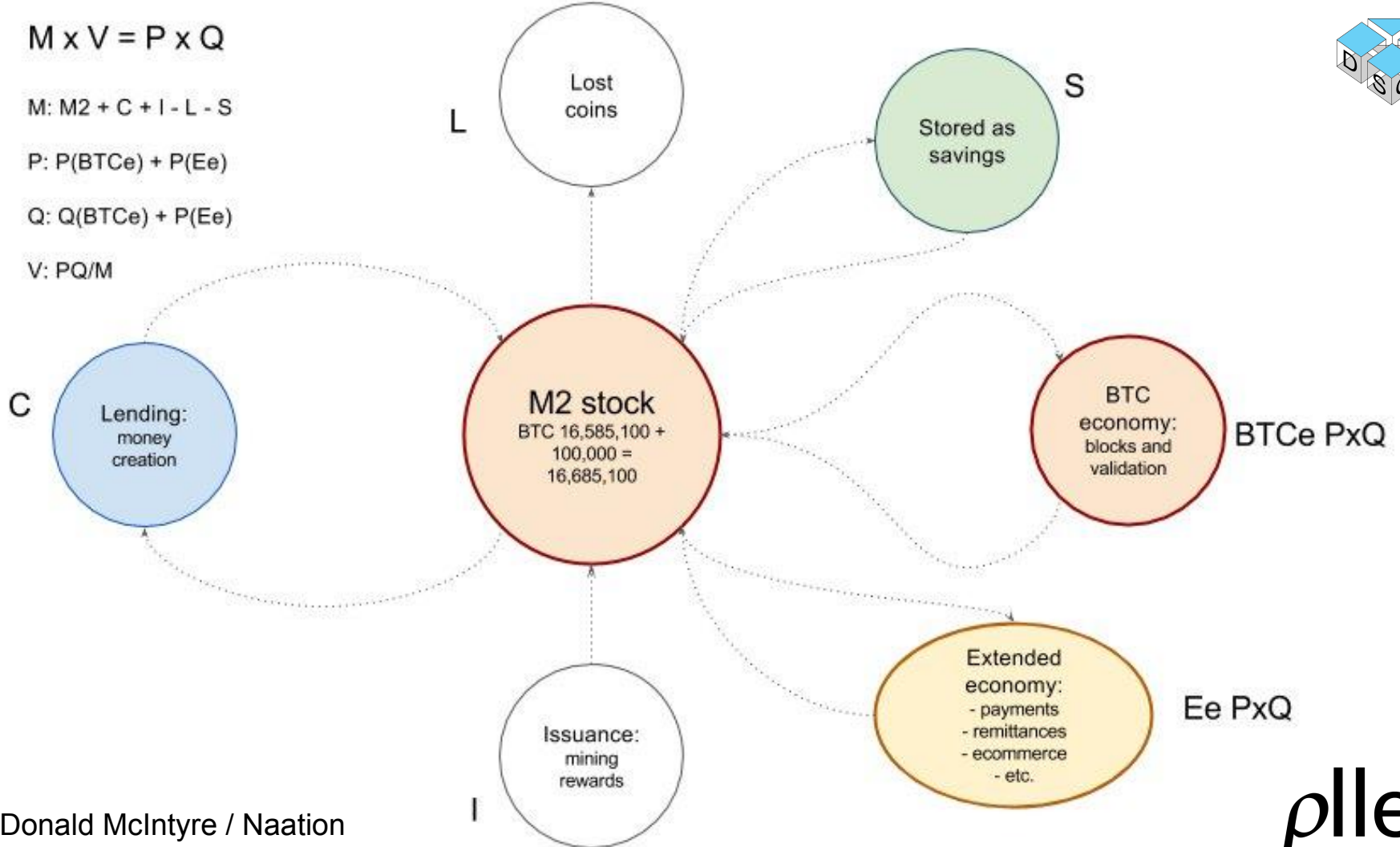
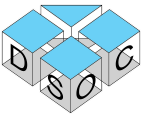


Fig: Donald McIntyre / Naation

Individual Performance

(Top 125 coins)





What creates that value?

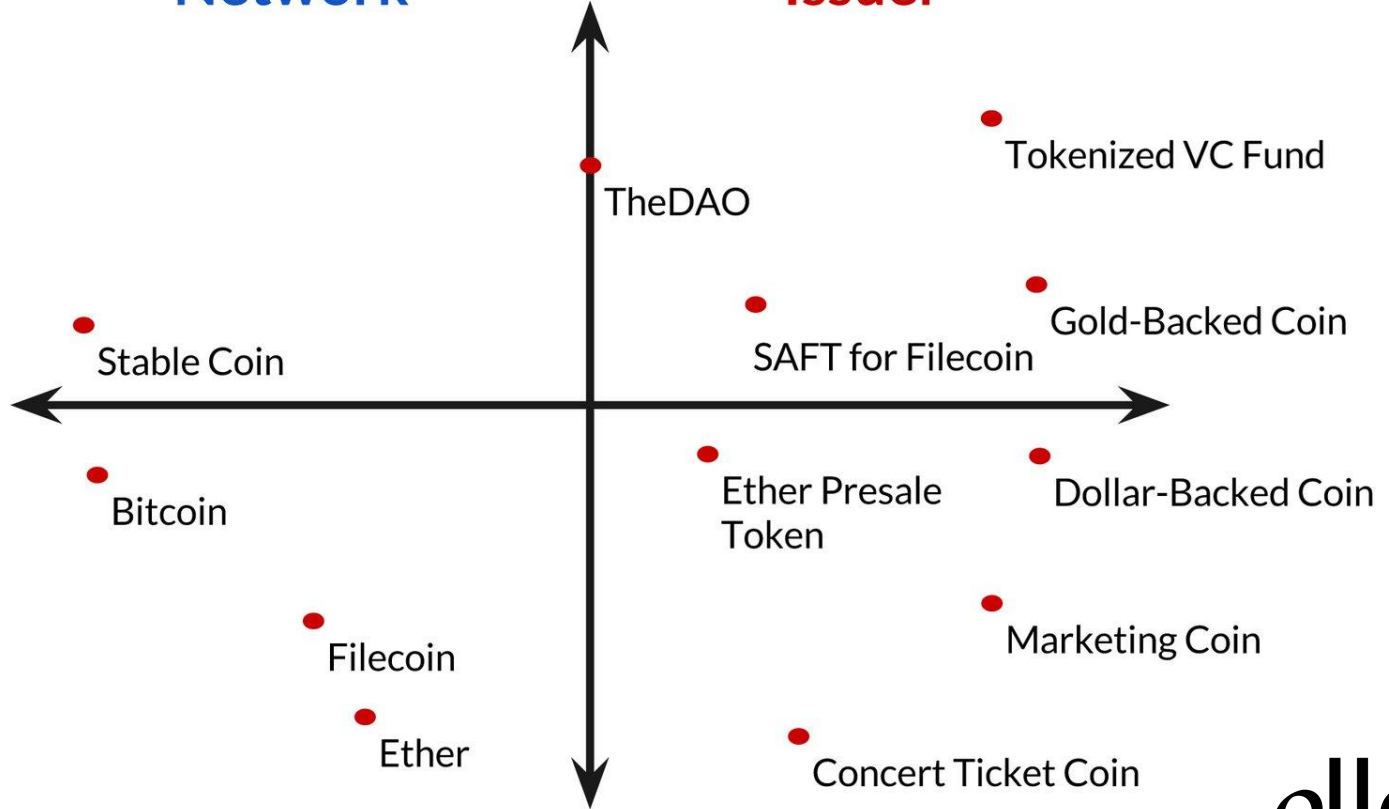
Why is the token valuable?

Investment

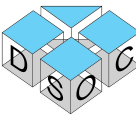
Utility

Network

Issuer



A Guide to Crypto Tokens Usage and Value



ROLE

PURPOSE

FEATURES

RIGHT



Bootstrapping engagement

Product usage
Governance
Contribution
Voting
Product Access
Ownership

VALUE EXCHANGE



Economy creation

Work rewards
Buying
Spending
Selling something
Active/Passive work
Creating a product

TOLL



Skin in the game

Running smart contracts
Security deposit
Usage fees

FUNCTION



Enriching user experience

Joining a network
Connecting with users
Incentive for usage

CURRENCY



Frictionless transactions

Payment unit
Transaction unit

EARNINGS



Distributing benefits

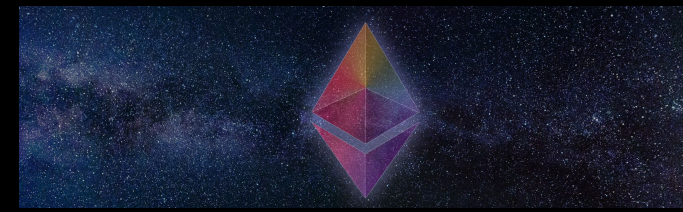
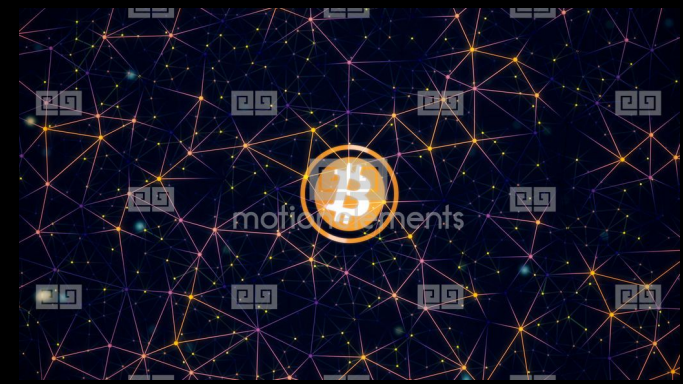
Profit sharing
Benefits sharing
Inflation benefits

CRYPTOCURRENCY UNIVERSE

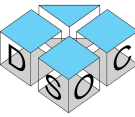


Coin	Forks
BTC Bitcoin	660 forks
BCN Bytecoin	17 forks
NXT Nxtcoin	13 forks
XRP Ripple	4 forks

pllel



Bitcoin 60-Day Volatility 14.85%



Source: Woobull.com

Bitcoin historical price (grey), daily volume (circles) and USDEUR volatility (blue) included for reference



Thankyou!

Questions?

these slides: cryptoassets101.d-soc.net

Dr Wassim Alsindi, Parallel Industries.

Parallel Industries is an applied cryptographic advisory specialising in ethical portfolio construction, autopoetic compliance frameworks and humanitarian applications of radically decentralised technologies.

Web: www.pllel.com

Twitter: @parallelind

No written or spoken remarks constitute investment advice.



D-Soc Crypto Portfolio Contest is **LIVE**

Investment theses:

<https://docs.google.com/document/d/11IMBR1W2a196MCwz5hit7go8ITVroKzCy7CpCPQGDzM>

Team 1 (Dundee ChainKings)

<https://www.cryptocompare.com/portfolio-public/?id=356588>

Team 2 (Strath Fintech)

<https://www.cryptocompare.com/portfolio-public/?id=356584>

Team 3 (Strath D-Soc)

<https://www.cryptocompare.com/portfolio-public/?id=356582>

Team 4 (UoG Fintech)

<https://www.cryptocompare.com/portfolio-public/?id=356586>