

Foundations of FinTech

Money, Cryptocurrencies & Initial Coin Offerings

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UCF

Government issued Money

Meaning of Money

- **Money** is anything that is generally accepted as payment for goods or services or in the repayment of debts and is considered as store of value [broad definition].
- Money means a medium of exchange in current use authorized or adopted by a domestic or foreign government as a part of its currency [Securities and Exchange Commission].
- Money (a stock concept) is different from:
 - *Wealth*: the total collection of pieces of property that serve to store value
 - *Income*: flow of earnings per unit of time (a flow concept)
- Money's primary function is it acts as a "medium of exchange"
 - Eliminates the trouble of finding a double coincidence of needs (i.e., buyer with goods) and reduces transaction costs
 - Promotes specialization

What are the features of a currency?

In your view...

Who am I?

Bitcoin/USD



USD/MXN



Aristotle's Good Money

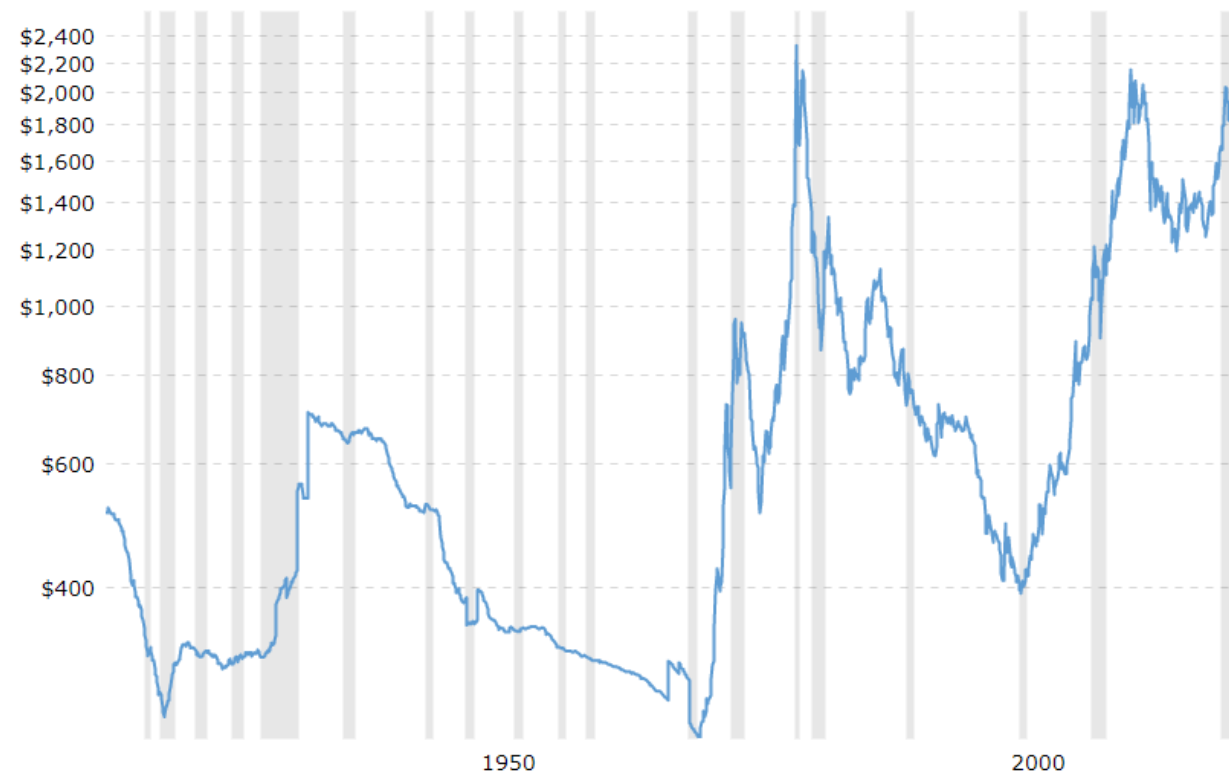
- Aristotle came up with 4 characteristics of “good money”.
 - Durable – [store of value] the medium of exchange must not weather, degrade, fall apart, or become otherwise unusable.
 - Portable - relative to its size, it must be easily moveable and hold a large amount of universal value relative to its size
 - Divisible - should be relatively easy to separate and put back together without ruining its basic characteristics
 - Scarcity - value of money should be independent of any other object; not easily obtained or counterfeited
- All of these are part of standard definition of today's money.

Properties of a currency

- A medium of exchange
 - Widely accepted
 - Easy to standardized
 - Easy to carry
 - Easy to divide
 - Durable
 - Not deteriorate quickly
-
- Good if it is stable (not a theoretical necessity)
 - Good if it is difficult to counterfeited (not a theoretical necessity)

Currencies can be volatile

- Price stability has never been a required feature of money but admittedly it helps.
- Gold's price is volatile.
 - Why has gold been used as currency for thousands of years?
 - *Scarcity*: price plunged every time a large reserve was identified



Source: Macrotrends

Functions of Money

- **Unit of Account:**

- Used to measure value in the economy
- Reduces transaction costs

- **Store of Value:**

- Used to save purchasing power over time.
- Other assets also serve this function.
- Money is the most liquid of all assets but loses value during inflation.

Measuring Money

- How do we measure money? Which particular assets can be called “money”?
- Construct **monetary aggregates** using the concept of liquidity:
 - **M1** (most liquid assets) = currency + traveler’s checks + demand deposits + other checkable deposits
 - **M2** (adds to M1 other assets that are not so liquid) = M1 + small denomination time deposits + savings deposits and money market deposit accounts + money market mutual fund shares

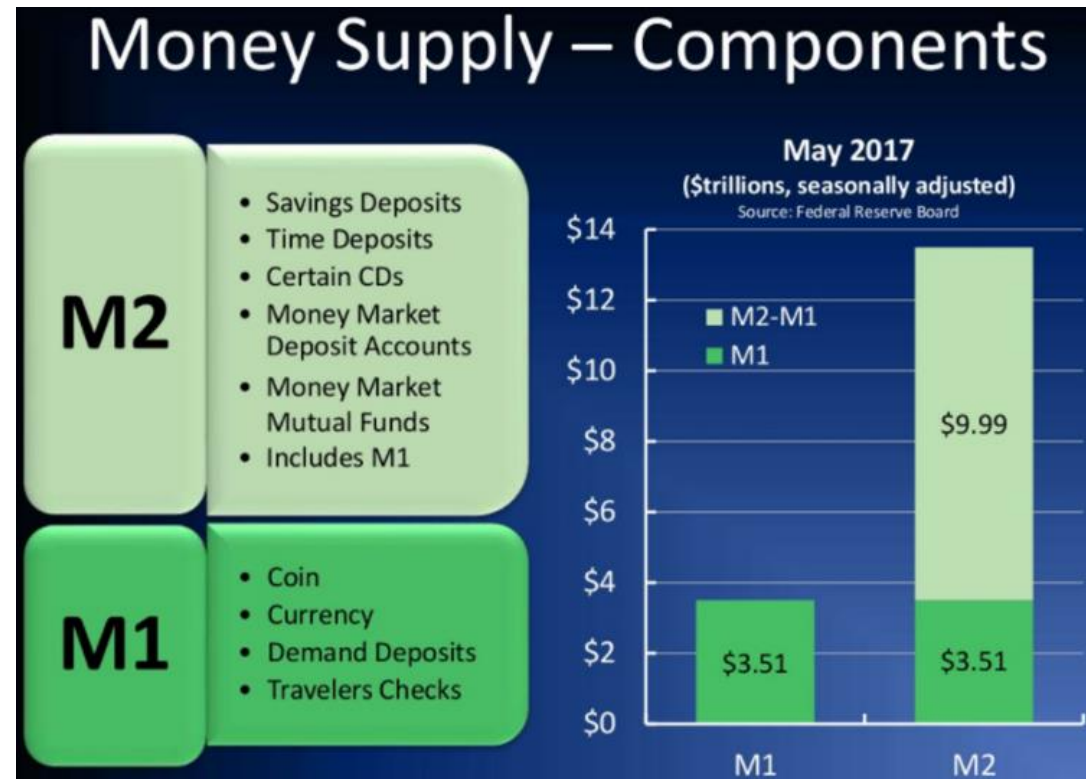
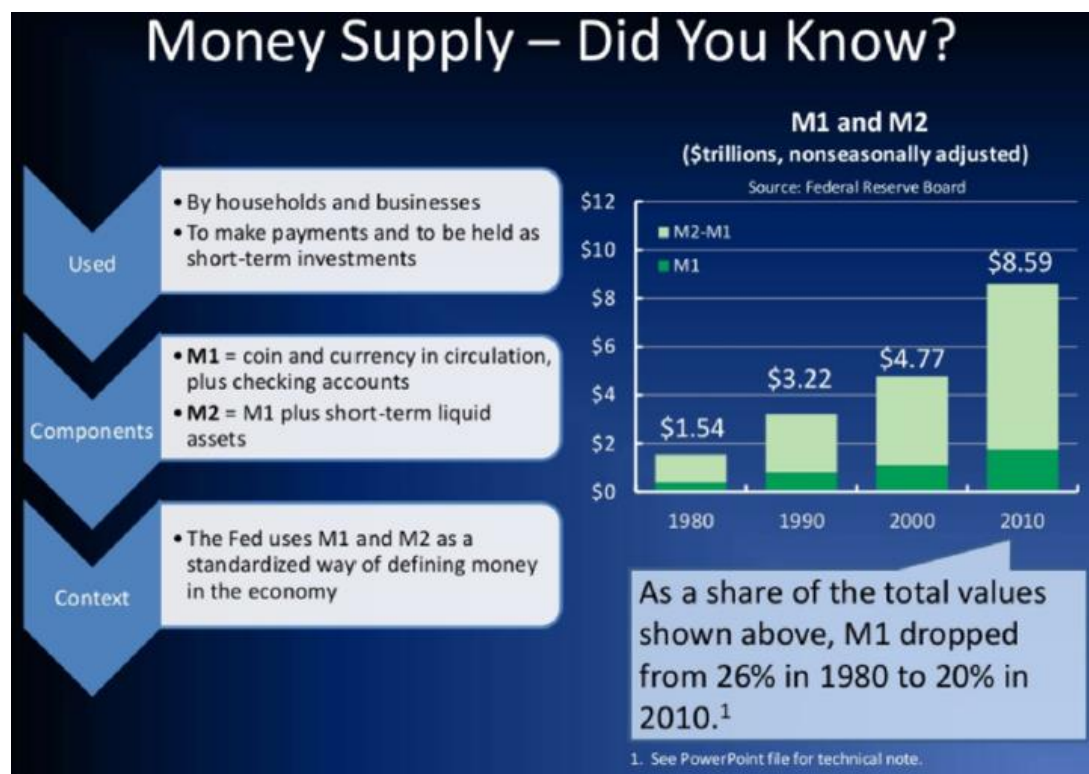
The Federal Reserve's Monetary Aggregates

Table 1 Measures of the Monetary Aggregates

	Value as of July 3, 2017 (\$ billions)
M1 = Currency	1,481.5
+ Traveler's checks	2.0
+ Demand deposits	1,501.5
+ Other checkable deposits	574.8
Total M1	3,559.8
M2 = M1	
+ Small-denomination time deposits	357.7
+ Savings deposits and money market deposit accounts	8,923.9
+ Money market mutual fund shares (retail)	673.7
Total M2	13,515.1

Source: Federal Reserve Statistical Release, H.6, Money Stock Measures:
<https://www.federalreserve.gov/releases/H6/current>.

The Federal Reserve's Monetary Aggregates



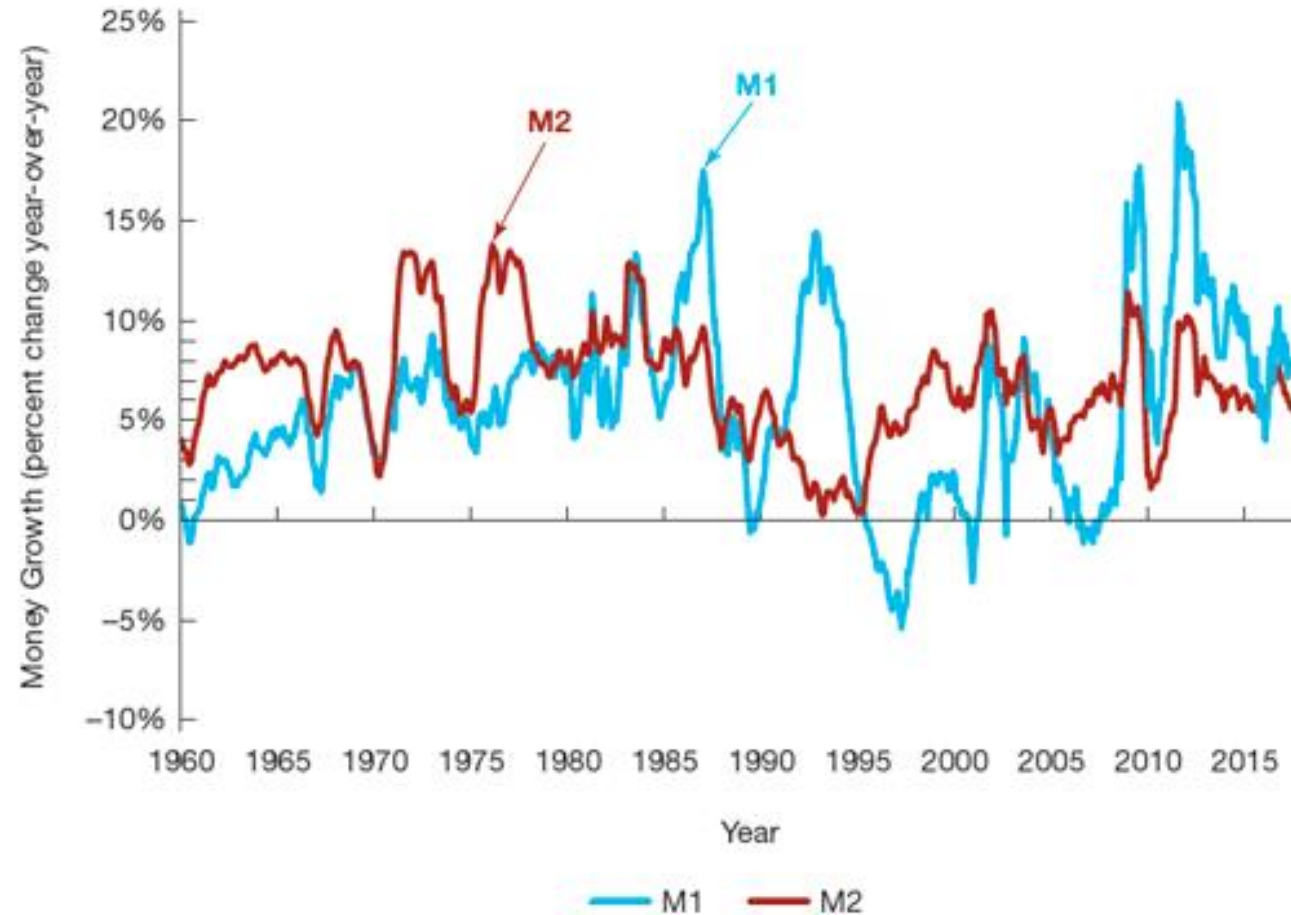
Source: Federal Reserve Bank of San Francisco

The Federal Reserve's Monetary Aggregates

- M1 versus M2: Does it matter which measure of money is considered?
- M1 and M2 can move in different directions in the short run.
- Conclusion: the choice of monetary aggregate is important for policymakers.

Growth Rates of the M1 and M2 Aggregates, 1960–2017

Source: Federal Reserve Bank of St. Louis, FRED database: <http://research.stlouisfed.org/fred2>



Where Are All the U.S. Dollars?

- More than \$4,500 of U.S. currency held per person in the United States is in circulation: a surprisingly large number!

Evolution of the Payments System

- **Commodity Money:** valuable, easily standardized, and divisible commodities (e.g. precious metals, cigarettes)
 - Spain's eight-sided silver coins and Dutch "Leeuwendaaler" or "lion dollar" was circulated in the US till the Coinage Act of 1857.
- **Fiat Money:** paper money decreed by governments as legal tender
 - Value is based on faith in the currency and the country that backs it
 - Temples in Rome, Egypt, China and India issued IOUs/fiat money when patrons deposited their precious metals (origin of the banking system)
 - The first bank in the world was created by the Knights Templar, and it was active for almost 200 years until the full collapse of the Order of the Temple in 1314.

Evolution of the Payments System

- **Checks:** an instruction to your bank to transfer money from your account
- **Electronic Payment** (e.g. online bill pay)
- **E-Money** (electronic money):
 - **Debit card**
 - **Stored-value card (smart card)**
 - **E-cash**

Are We Headed for a Cashless Society?

- Predictions of a cashless society have been around for decades, but they have not come to fruition.
- Although e-money might be more convenient and efficient than a payments system based on paper, several factors work against the disappearance of the paper system.
- However, the use of e-money will likely still increase in the future.

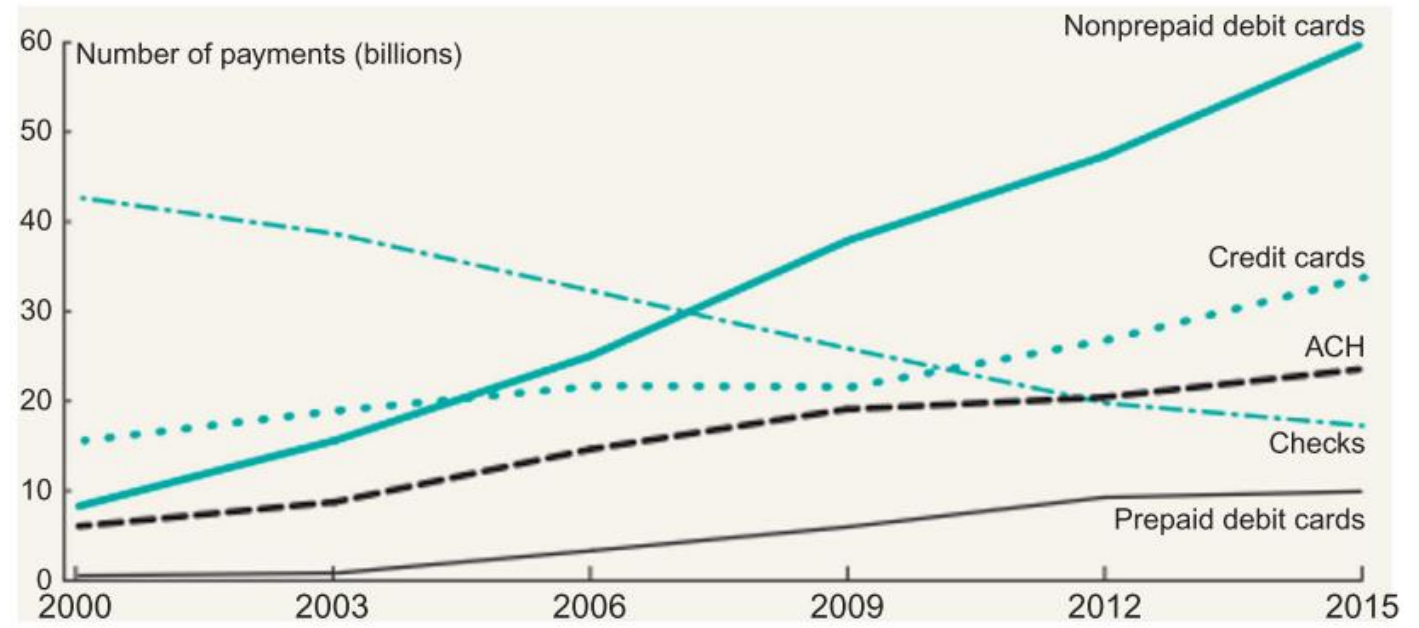


Figure 3.4 Trends in noncash payments 2000–2015, by number. *Source: FRB. Note: Prepaid debit card includes general purpose, private label, and electronic benefit transfer.*

U.S. Dollar (USD): World's Reserve Currency

- Till WWI, British pound was considered as the reserve currency
- The U.S. supplied the Allies in WWII and got paid in gold.
- U.S. currency was linked to gold since 1840s
- Bretton Woods Agreement cemented US Dollar as the reserve currency.
 - Other countries linked their currencies to the USD.
- The USD was fully decoupled from gold in 1976 and became fiat money.
 - Value no longer depends on gold.



Source: Balance

Cryptocurrencies 101

Bitcoin, Ether, Ripple and countless more to come...

Electronic, Digital/Crypto- currency

- Electronic currency is USD in electronic form.
 - Both physical and electronic.
 - This is what we have now.
- Digital currency exists only in electronic form.
 - Most Central banks are looking into this [more later].
- *Cryptocurrency is a type of digital currency.*
- Electronic currencies can do almost everything that cryptocurrencies offer!
- If this is true, then:
 - What is a cryptocurrency?
 - Why do we need it?
 - What is new about them?



Source: Getty images

What is a cryptocurrency?

What is a Cryptocurrency?

My definition:

- A *digital asset* that has some value either because of the asset it represents or because of the trust a body of individuals have placed on it.
- It typically has some form of *built-in cryptography* to anonymize identity and transactions are irrevocable.
- Not a legal government tender.

What is a Cryptocurrency?

- IRS definition of a virtual currency:

- “Virtual currency is a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value.
- In some environments, it operates like ‘real’ currency . . . but it does not have legal tender status [in the U.S.].
- Virtual currency that has an equivalent value in real currency, or that acts as a substitute for real currency, is referred to as ‘convertible’ virtual currency. Bitcoin is one example of a convertible virtual currency.
- Bitcoin can be digitally traded between users and can be purchased for, or exchanged into, U.S. dollars, Euros, and other real or virtual currencies.”

Why was Cryptocurrency [Bitcoin] invented?

The problem

Creators of cryptocurrencies wanted to:

- Reduce financial system centralization
 - “Practically all of these machines have architectures that were designed to be controlled by a single person or a hierarchy of people who know and trust each other...” – *Nick Szabo*
- Remove reliance on third parties
 - “Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments.” – *Satoshi Nakamoto (2009)*
- Tame the political economy and bad actors
 - Dilute the control governments and financial institutions have on commoners.
 - Provide a method to avoid and trace fraud.



The Solution: Cryptocurrency

- A currency that is NOT controlled by a single government.
- Monetary policy NOT set by elected officials/governments with agenda.
 - Supply is pre-determined.
- A decentralized financial system that does NOT require a trusted third-party to verify transactions (double spend problem).
- First successful solution: Bitcoin (January 2009)
- Bitcoin is defined as a **digital, disintermediated, decentralized trust-based cryptocurrency.**

The Solution: Cryptocurrency

- **Layers in the technology stack of a Cryptocurrency:**
 - **Currency** (e.g., Bitcoin (BTC), Litecoin, Dogecoin)
 - **Protocol and client:** Software programs that conduct transactions
 - **Blockchain/Distributed Ledger:** Underlying decentralized ledger
- Each coin is both a currency and a protocol, and it may have its own blockchain or may run on borrowed blockchain.
 - For example, the Litecoin currency runs on the Litecoin protocol, which runs on the Litecoin blockchain. (Litecoin is very slightly adapted from Bitcoin to improve on a few features.)
 - A separate blockchain means that the coin has its own decentralized ledger.
 - Protocols, such as Counterparty, have their own currency (XCP) and run on the Bitcoin blockchain (i.e., their transactions are registered in the Bitcoin blockchain ledger).

Cryptocurrency

- It is generally in dematerialized form (i.e. electronic form)
- Usually follows a set of rules participants have agreed to (monetary policy)
 - e.g., creation process, rewards and fixed supply of 21M bitcoins
- Protected using cryptography
- Considered to be transparent and immutable
- Usually no single individual/entity has decision making power
 - 51% agreement for changing rules (Ethereum)
- Must be resistant to manipulation (good luck here!)

Cryptocurrency

- So far, governments do not have monopoly over any cryptocurrency
- Contrast cryptocurrency features with any country's currency!
- Do you see why cryptocurrencies are seen as a revolt against authority?
- Non-government issued digital currencies have existed before
 - Mobile airtime
 - Loyalty points (credit cards, Macys, etc.)
 - World of Warcrafts (online game tokens)
 - Many adult entertainment sites
 - Monopoly money (non-digital)
 - Chips in casinos (non-digital)

Digital Currencies: commodity backed

- We discussed early digital currencies such as ecash and e-gold in the previous chapter.
- **The earliest digital currencies were backed by gold!**
- E-gold was founded in 1996 by Gold & Silver Reserve, Inc.
 - The system was operating with precious metals—silver, gold, platinum, and palladium—which were stored in Gold & Silver Reserve vaults.
 - The users could create accounts by buying one of the precious metals at its market price.
 - This feature made e-gold very convenient and popular for processing international payments because user accounts were not tied to any national currency.
 - In May 2007 a federal grand jury indicted e-gold, accusing the company of money laundering, conspiracy, and operating an unlicensed money-transmitting business.

NAME	BORN	DIED	USERS	CURRENCY
e-gold	1996	2008	2,500,000	1 g of gold
e-Bullion	2001	2008	1,000,000	e-currency
1mdc	2001	2007	N/A	e-gold
Pecunix	2002	N/A	N/A	GAU – Gram of <i>Aurum (lat. Gold)</i>

Digital Currencies

- In 1993 Chaum invented the digital payment system ecash.
 - The ecash payer was anonymous but “under exceptional circumstances” could reveal her or his identity, for example, in order to provide proof of payment. The anonymity of the payer was achieved by blinded signatures using the RSA (Rivest, Shamir, Adleman) encryption algorithm
- In 1998 Charles Cohen launched Beenz, which attempted to create a “native” Internet currency.
 - Users earned “beenz” for sharing their personal information and visiting e-commerce websites, where they can also spend their beenz. (Brave- BAT?)
- PayPal, Amazon Payments, and many other online payment processors dominate the market of Internet payments.
 - Such online payment processors are simply extensions, or superstructures, of the banking and credit card systems, which after all, use fiat money as a medium of exchange.
 - They cannot be classified as digital money.

Digital Currencies/Payment Systems

- Digital gold currencies such as e-gold and e-Bullion were the first successful online payment systems that were backed by real gold.
- Ecash was the first electronic payment system based on cryptography
- There are two major groups of electronic payment systems: **centralized and decentralized**.
 - E-gold, ecash, Liberty Reserve, PayPal, and Amazon Payments are all examples of centralized payment systems. e-gold and Liberty Reserve have been operated independently from traditional financial institutions.
 - Bitcoin is the first decentralized payment system that also does not depend directly on banks, clearinghouses, or credit card networks.

Digital currencies after 2008

- Birth of Bitcoin: which solved double-spending issue
- Bitcoin is defined as a **digital, disintermediated, decentralized trust based cryptocurrency.**
- 2017 was the year of cryptocurrency

- Most cryptos: Decentralized, Instantaneous (not really!), low cost (not really!), borderless (partially true) and have fixed monetary policy (till the majority feels otherwise)
- Although Bitcoin functions as a medium of exchange, it is unlikely to become the money of the future because it performs less well as a unit of account and a store of value.

Comparison of cryptocurrencies

Feature	Ripple	Ethereum	NXT	Counterparty	Colored Coins
Started On	2012-12-22	2015-07-30	2013-11-24	2014-01-02?	
Network speed	2-5 second ledgers	1 minute blocks	1 minute blocks	10 minute Bitcoin blocks	10 minute Bitcoin blocks
Own blockchain	Own ledger	Own blockchain	Own blockchain	Bitcoin blockchain?	Bitcoin blockchain
Coin distribution	All distributed by creators	Some pre-purchase, infinite mining afterwards	Pre-purchase only	Proof-of-burn*	NA
Block creation	Consensus	Proof-of-knowledge / PoS-PoW hybrid / To be decided	Proof-of-stake	Consensus	NA
Decentralization	Distributed	Decentralized	Decentralized	Decentralized	Decentralized
Fees	Fixed (30XRP) fees for activating new addresses and (5XRP) granting trust. Minimal fees for transactions. Custom fees (usually around 0.2%) set by Gateways for using IOUs	Fixed fee per operation with each different operation having a different base fee		0.5 XCP flat free for asset creation. No fees for fundraisers, decentralized exchange, or betting	Standard Bitcoin fees?

* Proof-of-burn: Miners show proof that they burned some coins (i.e., sent them to a verifiably unspendable address). This is expensive from their individual point of view, just like proof of work; but it consumes no resources other than the burned underlying asset. To date, all proof of burn cryptocurrencies work by burning proof-of-work-mined cryptocurrencies, so the ultimate source of scarcity remains the proof-of-work-mined "fuel".

- For a full comparison of cryptocurrencies see:



Microsoft Excel
Worksheet

Cryptocurrencies: Disadvantages

- Its difficult to buy and sell even now.
 - Need special apps and need to setup a backing bank account.
- If you forget your private key, the money is lost forever.
 - Changed your hard disk without copying the key: you lose! (<https://www.cnbc.com/2017/12/20/man-lost-127-million-worth-of-bitcoins-and-city-wont-let-him-look.html>)
- A practical currency needs to have stability
 - Think about what is happened with Venezuelan currency: bolívar soberano and the currencies it has replaced in the past.
 - Venezuela's Petro coin.
- Volatility is not a good thing for any type of currency
 - It correlates with inflation and eats away purchasing power.

What is new about Cryptocurrencies?

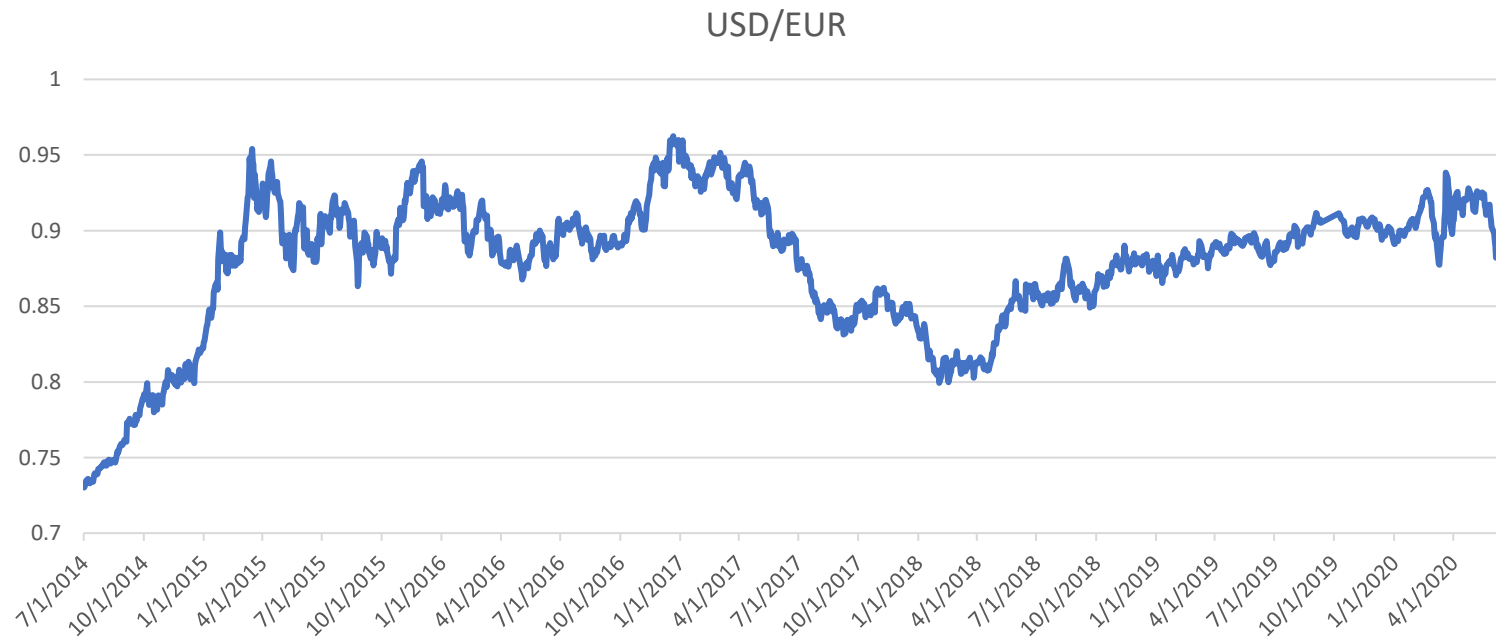
What is new about Cryptocurrencies?

- Electronic currencies can do almost everything that cryptocurrencies offer!
- But:
 - Not controlled by governments
 - Transactions are transparent/auditable
 - Identity is anonymized
 - Transactions are irrevocable/immutable

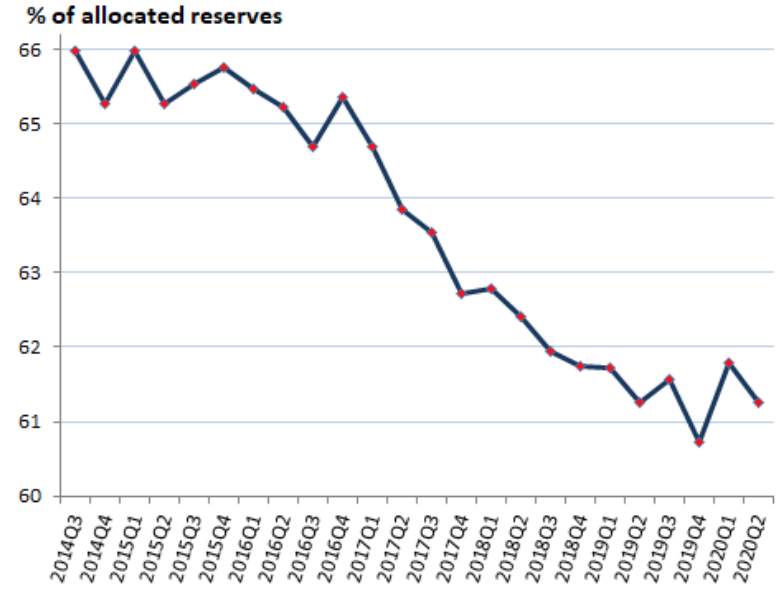


What gives value to a currency? (USD)

- Demand!



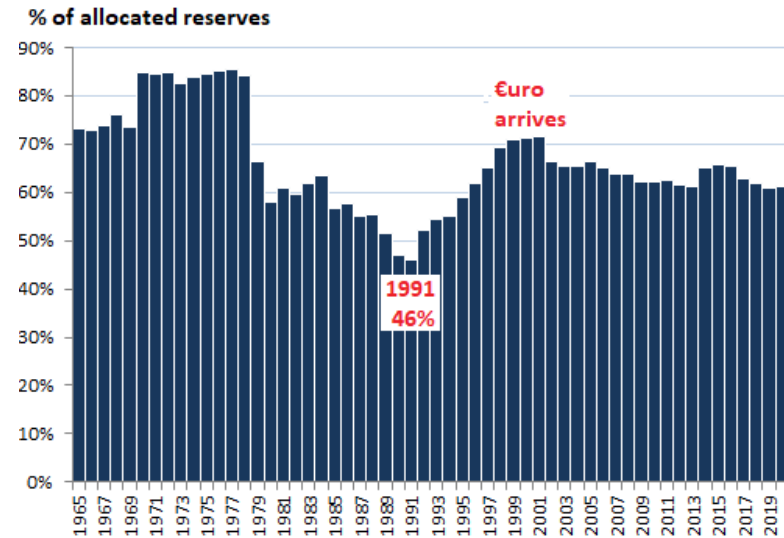
US Dollar Share of Global Reserve Currencies



Source: IMF

WOLFSTREET.com

USD Share of Global Official Reserves



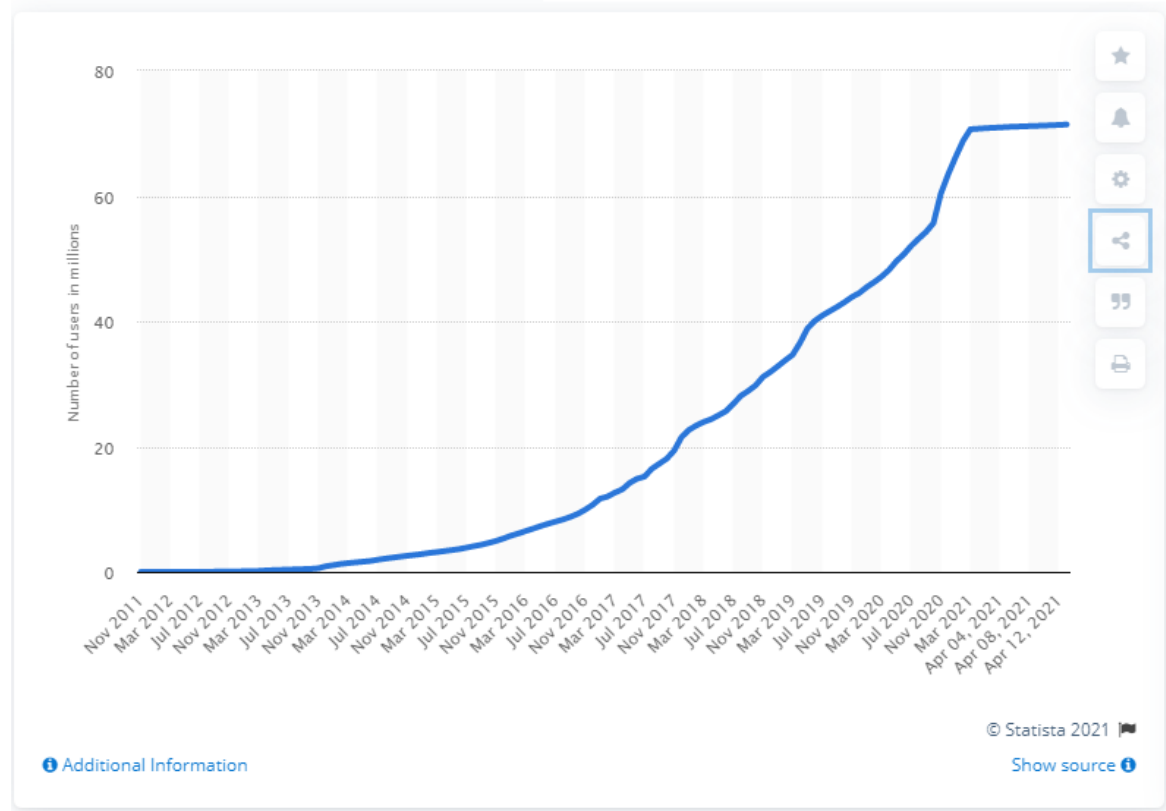
Source: IMF

WOLFSTREET.com

What gives value to a currency? (Bitcoin)

- Demand!

Number of Blockchain wallet users worldwide from
(in millions) November 2011 to April 13, 2021



Central Bank Digital Currency (CBDC)

Central Bank Digital Currency (CBDC)

- More than 80% of central banks are investigating digital versions of their currency (PwC, 2021).
 - China's digital yuan in pilot since 2014.
 - Bitcoin from Bank of England (effort announced in 2021).
 - E-krona from Sweden by 2023.
 - Bahama's Sand dollar project.
- U.S. Federal reserve & MIT: Project Hamilton
 - Fed Chair, Jerome Powell: Digital dollar is a remote possibility for now.



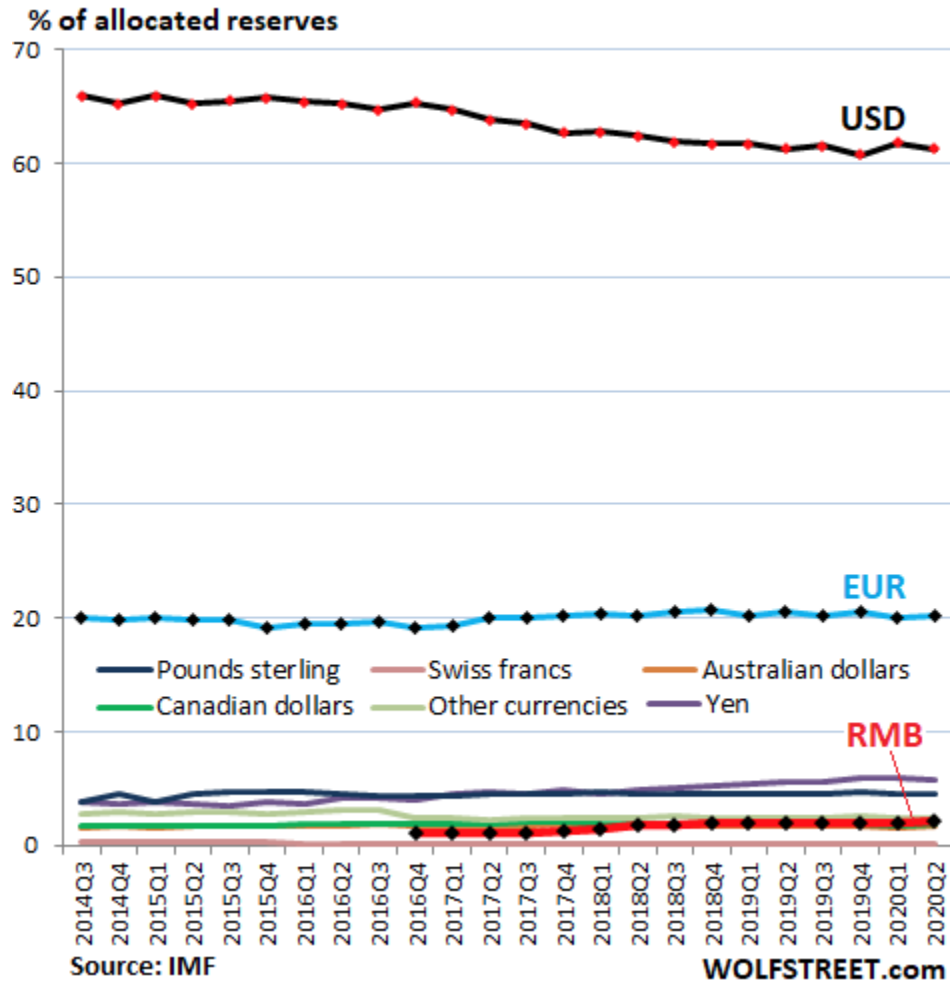
digital
currency
initiative

But, why a CBDC?

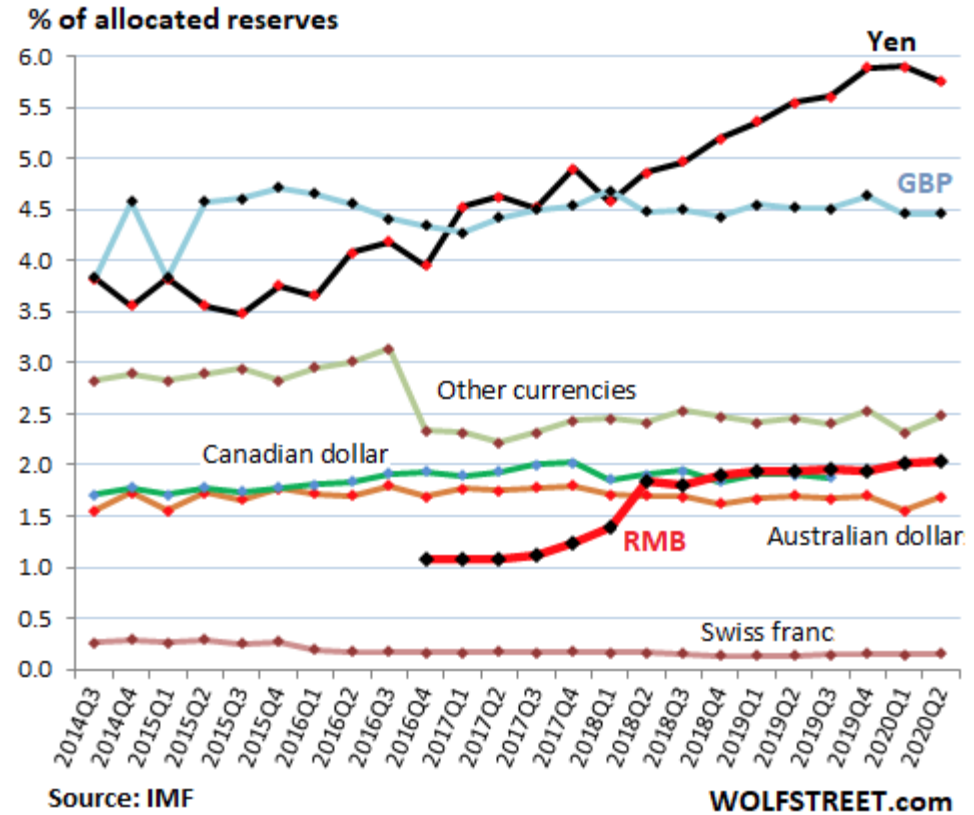
- Today: a bank transfer is just a promise that money is coming.
 - Money does not move between banks immediately.
 - 60 days to contest an ACH transaction.
- Benefits of a CBDC:
 - Transfers can be instant and irrevocable.
 - Potentially more efficient transfers and lower fees
 - Direct implementation of monetary policy
 - Promote spending by directly depreciating currency!

But, why a CBDC? – Geopolitical

US Dollar's Declining Hegemony



Reserve Currencies except USD and EUR



U.S. CBDC is more likely to be adopted and further strengthen its reserve currency status!

Wrap

	U.S. Dollar	Cryptocurrency
Who prints it?	Bureau of Engraving & Printing; U.S. Mint	Mining nodes
Form	Physical/digital	Digital
Backed by	U.S. Government	Network of users
Where is the value coming from?	Trust by users	Trust by users
Who sets the rules/ is the deciding authority?	Federal Reserve (monetary policy)	Core group of developers (+ 51% users in Ethereum)
Possibility of manipulation?	Yes	Yes
Can you Counterfeit?	Yes	Difficult. But yes.
Can you observe all money flow?	No	Yes. Blockchain keeps track of everything.
Can users be anonymous?	Yes, with cash.	Yes.
Who is responsible for digital Security?	Financial institutions and users	Blockchain, platforms, and users

Initial Coin Offering

Venture Capital Industry

- Entrepreneurs need funds to build their products/services
 - Most entrepreneurs start by bootstrapping
 - Then, look for funding from Angels and Venture Capitalists
- The term Venture Capital was **coined by Arthur Rock**
 - He helped Intel raise \$2.5 million in 1968 through convertible debentures
 - **Recouped his investment and that of others in 1970 when Intel went public**

Venture Capital Industry

- In 1999, a median technology company took 4 years to IPO
 - In 2014, it is 11 years
- This means that investors are locked in longer
- The regulatory burden for IPO is also higher

- Entrepreneurs find it extremely difficult to attract investors
- Network connections play a vital role in gaining funding

- This is a very risky industry
 - The market is dominated by institutional investors with extensive connections

- Initial Coin Offerings are aiming to disrupt this market

What is an Initial Coin Offering (ICO)?

- ICOs allow companies to raise funds from investors by offering them the right to buy digital tokens to fund a project.
 - It sounds similar to an IPO
 - But, it is more similar to crowdfunding campaigns in terms of fund raising process
 - Investors get access to services the company hopes to provide one day.
 - **Most ICO do not offer any controlling rights on the company**
 - Many investors hope to earn returns by trading the tokens at a higher price
- ICOs are intended to promote specific projects and become currencies for transactions, when the project is deployed
 - Ethereum's raised \$18 million in 2014 and "Ether" tokens are required for building apps on the platform
- What is an ICO? (in 5 mins) <https://www.youtube.com/watch?v=VcEi2HO9whM>

Steps involved in an ICO

1. **Announcement:** made via Reddit, Twitter, Bitcointalk, or a conference
2. **Whitepaper:** Founders publish a white paper that contains:
 - Team information with contact details
 - Product details
 - Technology details
 - Roadmap/milestones
 - Dates and structure of token sales
3. **Structure ICOs:** limited to a fixed time period
 - Typical ICOs also include a 10 to 20% bonus for investors buying tokens early
 - Minimum and maximum target amount are also mentioned beforehand to avoid speculation (e.g., DAO ICO)
 - Allocation of tokens between founders and investors are made public

Steps involved in an ICO

4. Token sale:

- Investors buy tokens using bitcoins or ether or other means specified by founders
- Some ICOs allow reservations
- Investors are given cryptocurrencies, cryptocommodity or tokens in exchange
- These are deposited to a wallet or moved to an exchange on behalf of the investor

5. Secondary sales:

- Depending on the token type, rules and demand, some token may get traded on exchanges

ICO Landscape: Geographies and Platforms

Top countries by the number of ICOs	
#1 USA	734
#2 Singapore	533
#3 UK	473
#4 Russia	325
#5 Estonia	264

Top countries by raised funds	
#1 USA	\$7.4B
#2 British Virgin Islands	\$2.3B
#3 Singapore	\$2.2B
#4 Switzerland	\$1.8B
#5 UK	\$1.3B

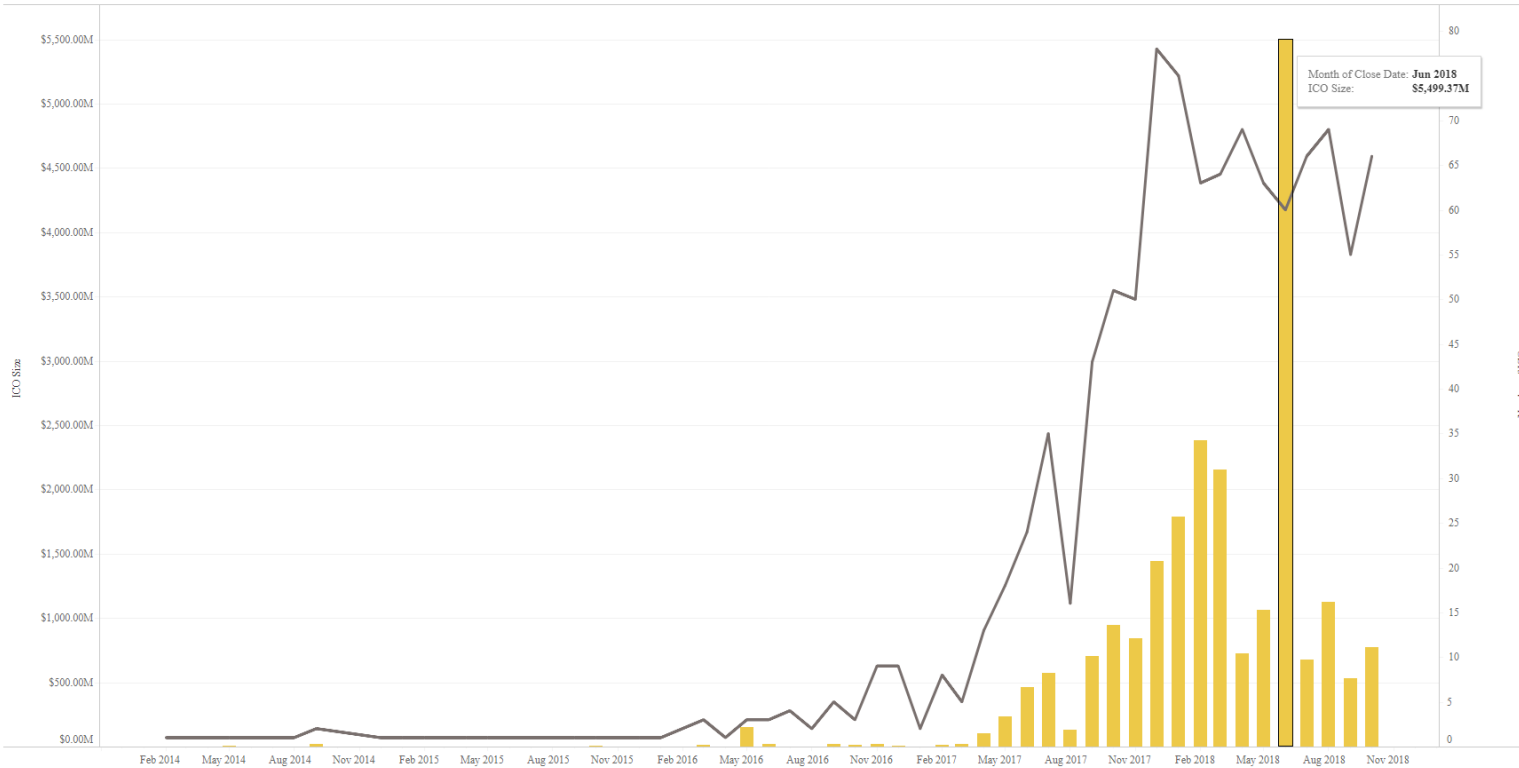
Top ICOs by the value of sold tokens	
#1 EOS	\$4,197,956,135
#2 Telegram Open Network	\$1,700,000,000
#3 TaTaTu	\$575,000,000
#4 Dragon	\$320,000,000
#5 HDAC	\$258,000,000



Source: <https://icobench.com/stats> (February 11, 2019)

ICO Landscape

Monthly New ICO Funding

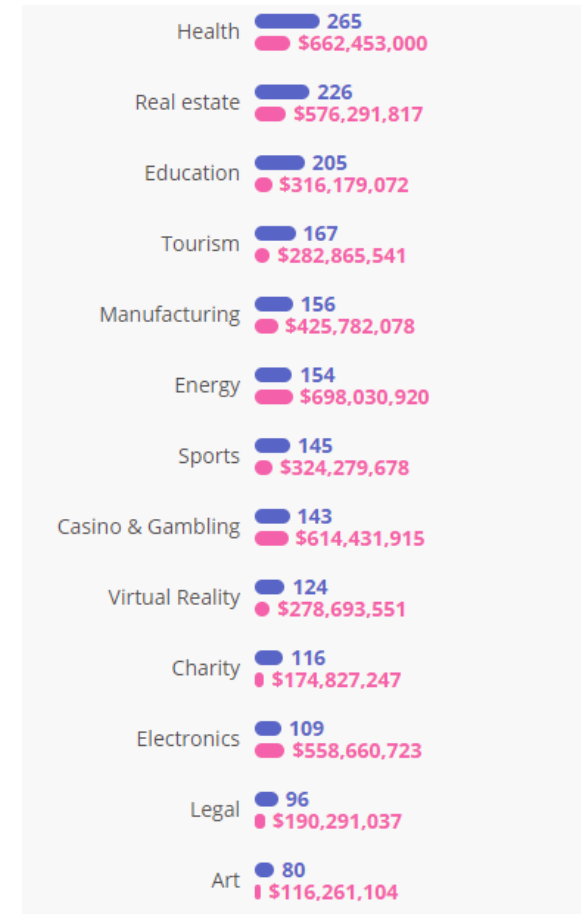
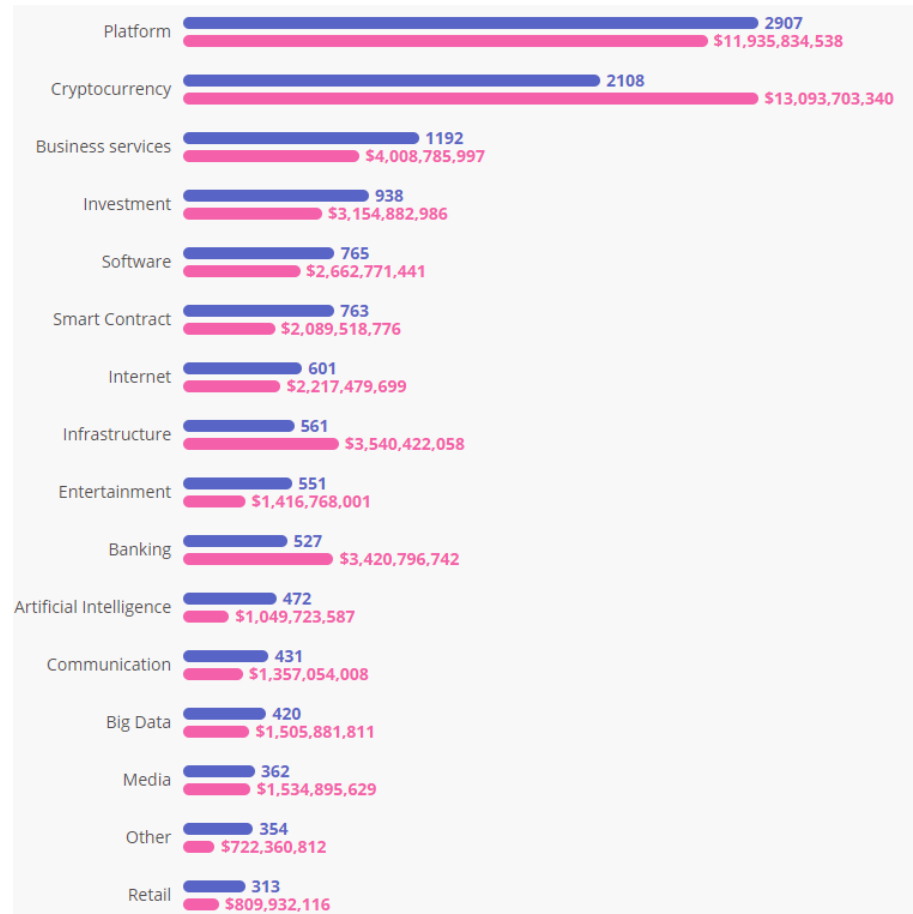


Summary Stats

	Year of Close Date				
	2014	2015	2016	2017	2018
ICO Size (\$mn)	30	9	256	5,482	16,718
Average	4	1	6	16	26
Median	2	1	1	8	10
Max	18	5	152	262	4,200
Min	0	0	0	0	0
Std. Dev.	7	2	23	28	173
Number of ICOs	7	7	43	343	650

Source: <https://www.coindesk.com/ico-tracker> (February 11, 2019)

ICO Landscape: Industries



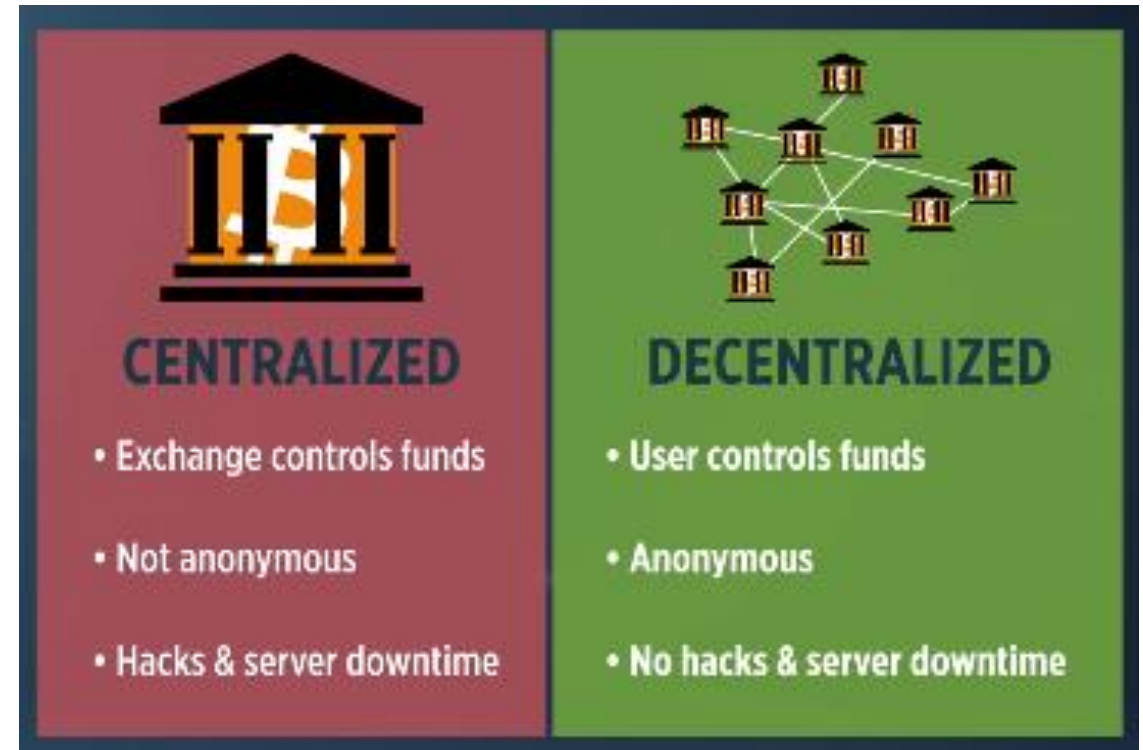
Source: <https://icobench.com/stats> (February 11, 2019)

Cryptocurrency Exchanges

- What are crypto exchanges?
 - A place where cryptocurrency is exchanged
- So, what the rules?
 - It is **unclear and varies depending on the exchange**
 - The level of verification and disclosure is very lax, at the moment, and there are no unifying standards
- Digital assets such as Bitcoin, Ethereum, Dogecoin, Litecoin are exchanged in secondary market where trading happens.

Cryptocurrency Exchanges: Types

- **Centralized**: you typically get your money into crypto ecosystem through this type of exchange (Fiat to Crypto conversion: USD to Bitcoin Satoshi)
- **Decentralized**: Most crypto-to-crypto transactions happen here (e.g. Bitcoin to Ethereum)



Conventional Exchanges Vs. Digital Asset Exchange

Parts required for an exchange: Custody, Clearing & Trading-outs

Conventional exchange:

- The exchange acts as an “executor” for custody and settlement.
- Record keeping (custody) and clearing is done by a set of partners who hold the assets on your behalf.
- Trading-out in a conventional exchange is on trading days and happens on a T+1/T+3 cycle.

Digital Asset exchange:

- Everything is done by the exchange
- It is basically a market place for traders
- Trading-out is 24 hours on a Digital exchange

Cryptocurrency exchanges: Types of tokens

- **Payment tokens:** Cryptocurrencies that are vying to replace traditional currencies. They are not attached to one project. They are considered to have inherent value based on the perception of the users.
- **Security tokens:** These are like shares and are claims to ownership or underlying asset. Subject to taxes.
- **Utility tokens:** Pre-payment for services to be rendered in the future. Holder typically does not have to pay taxes. The company may pay taxes on revenue generated/services rendered.



Cryptocurrency Exchanges

- There are two types of crypto exchanges:
 - Those that have been hacked
 - Those yet to be hacked
- Which one is a good exchange?
 - Does the exchange have good security infrastructure?
 - Do they provide fair prices? Amount of fees? (Think how much you pay for FX when you travel)
 - Ability to quickly withdraw your money and convert it to fiat
 - Is the currency exchange liquid

ICO & SEC

- ICOs have all the hallmarks of an Initial Public Offerings but with less regulations.
 - In July 2017, SEC ruled that some tokens are in fact securities under the Securities Act of 1993
 - SEC is actively developing a framework: <https://www.sec.gov/ICO>

Howey test

- Howey Test is the result of 1946 U.S. Supreme Court case, SEC v Howey Co.
 - It investigated whether a convoluted scheme to sell and then lease tracts of land qualified as an “investment contract” (i.e., security)
- It can be used to figure if an ICO is a security.
- If an asset meets the following criteria, it will likely be considered as a security:
 - It is an investment of money.
 - The investment of money is in a common enterprise.
 - There is an expectation of profits from the investment.

VC investments Vs. ICO companies

VC Investments

- Difficult to attract investments from VCs and angels
- Startups typically have at least a prototype before approaching investors
- Investments are closely monitored and staged

ICO Companies

- Relatively less effort to setup a fundraising campaign
- Most companies have an idea and a whitepaper only. Many companies do not even reach prototyping stage
- Rules regarding monitoring and investor protection are murky at best.

ICO scams

- Many ICOs are a little more than sophisticated scams
- Ethereum has become the platform of choice for scam artists (<https://cointelegraph.com/news/from-ponzi-schemes-to-ico-exits-ethereums-blockchain-has-been-the-platform-of-choice-for-scammers>)
- ICO enforcement actions have become a top priority for SEC
 - There was no mention of digital currency scams in its annual reports until 2016
 - AriseBank's recently settled with SEC (<https://www.sec.gov/news/press-release/2018-280>)

Questions to ask before investing in an ICO

- Is there a published white paper?
- Is there a detailed development road map that includes a breakdown of all appropriate financials along the way?
- Does it use an open, public blockchain, and is the code published?
- Is there clear, logical, and fair pricing in the token sale?
- Is it clear how much of the token has been assigned for the development team and how those tokens will be released? Releasing them over time keeps the developers engaged and protects against centralized control of the token.
- Does the token sale tout itself as an investment? It should instead be promoted for its functionality and use case and include appropriate disclaimers that identify it as a product, not an investment.

Virtual Currency Risks outlined by CFTC

- While virtual currencies have potential benefits, this emerging space also involves various risks, including:
 - Operational Risks
 - Cybersecurity Risks
 - Speculative Risks
 - Fraud and Manipulation Risks

Virtual Currency: Operational Risk

- Conduct extensive research before giving any money or personal information to a virtual currency platform.
 - The virtual currency marketplace is comprised of many different platforms where you can convert one type of virtual currency into another or into real currency, if offered.
 - *Many of these platforms are not subject to the supervision which applies to regulated exchanges.* For example, if they engage in only certain spot or cash market transactions and do not utilize margin, leverage, or financing, they may be subject to federal and state money transmission and anti-money laundering laws, but they do not have to follow all the rules that regulated exchanges operate under.
 - Some virtual currency platforms may be missing critical system safeguards and customer protection related systems; without adequate safeguards, customers may lose some or all of their virtual assets.

Virtual Currency: Cybersecurity Risk

- Keep your property in safe accounts and carefully verify digital wallet addresses.
 - Some platforms may “commingle” (mix) customer assets in shared accounts (at a bank for real currency or a digital wallet for virtual currency). This may affect whether or how you can withdraw your currency.
 - Depending on the structure and security of the digital wallet, some may be vulnerable to hacks, resulting in the theft of virtual currency or loss of customer assets.
 - If a bad actor gains access to your private key, it can take your virtual currency with limited or no recourse
 - When transferring virtual currency, be sure to confirm the destination wallet address, even when using “copy and paste.” It is possible for hackers to change digital wallet addresses on your computer.

Virtual Currency: Speculative Risk

- Only invest what you are willing and able to lose.
 - The virtual currency marketplace has been subject to substantial volatility and price swings.
 - An individual or coordinated group trading a large amount of virtual currency at once could affect the price, depending on the overall amount of trading in the marketplace.
 - Periods of high volatility with inadequate trade volume may create adverse market conditions, leading to harmful effects such as customer orders being filled at undesirable prices.
 - Some advertisements promise guaranteed returns – this can be a common tactic with fraudulent schemes.

Virtual Currency: Fraud & Manipulation Risk

- Carefully research the platform you want to use, and pay close attention to the fee structure and systems safeguards.
 - Unregistered virtual currency platforms may not be able to adequately protect against market abuses by other traders.
 - For example, recent news articles discuss potential “spoofing” activity and other manipulative behavior that can negatively affect prices
 - Some virtual currency platforms may be selling you virtual currency directly from their own account – these types of transactions may give the platform unfair advantages and sometimes resemble fraudulent “bucket shop” schemes.
 - There is also a risk of Ponzi schemers and fraudsters seeking to capitalize on the current attention focused on virtual currencies.