



The Future of Money and Thoughts on Cryptocurrencies

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Overview

- **Role of Money:** What is it? Who supplies it? How is it supplied? How much is needed?
- **Long history** shows that what we call money has **evolved** over centuries, affected by technology, institutional and legal arrangements. Those have also evolved, having learned from a long history of failures.
- **Bitcoin** and would be digital currencies are still far from being money
- **Digital tokens and coins** could improve on our payment systems
- **DLT** (Distributed Ledger Technology) has technological features that could improve the existing financial system
- **ICOs** could bring about new investment models
- **Amara's Law** : “in the short run, we tend to overestimate the impact of technology and underestimate it in the long run”



Before the Crypto

- Money: 3 roles
 1. Unit of Account (though unit of accounts do not need to be money) .1 יחידה חשבונאית
 2. Means of Payment (though means of payment do not need to be money) .2 אמצעי תשלום
 3. Store of Value (there are lots of store of value that are not money) .3 כלי לשמירת ערך
- So to perform all of these functions, it has to be available, affordable, durable, portable and reliable.
- Forms of money have been varied throughout history
 - metal of various sorts (earliest coins date from about 600 BCE in Izmir), or other rare items such as certain seashells in the Americas
 - paper (banknotes originated in 7th century China),
 - and, yes, “ledgers” recording promises to pay as in the ancient clay tablets of Babylon (17th century BCE!).
- Those “monies” have been produced privately or publicly

Before the Crypto – Precious Metals

- When the Spanish Conquistadors crushed the Incas in Alta-Peru, their quest was for Gold and Silver which at the time were greatly used as money in Europe and in Asia
- They dug up so much silver that the value of the metal dramatically declined
- They failed to understand that the value of precious metal is not absolute: “money is worth only what someone else is willing to give you for it”
- An increase in its supply will not make a society richer (though it may enrich that who has a monopoly on its production), but will make prices higher.
- *“What the conquistadors failed to understand is that money is a matter of belief, of faith: belief in the person paying us, .. in the person issuing the money... Money is not metal, it is TRUST INSCRIBED”*

Nial Ferguson, “The Ascent of Money”

Before the Crypto- The Banknotes

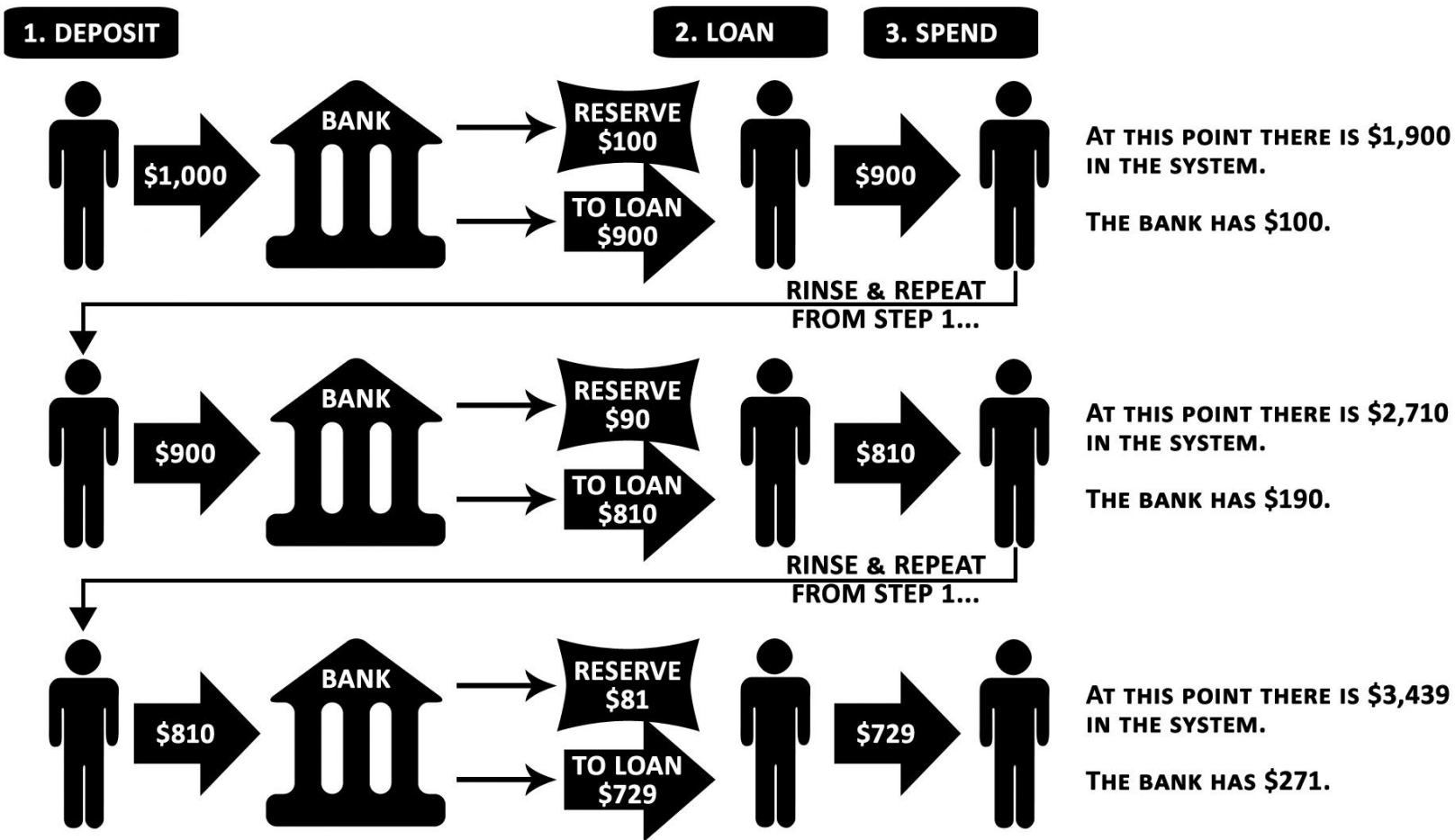
- Italian banks, and most famously that of the Medici Family in Florence (early 15th century), were really brokers **issuing “bills of exchange”** to finance trade – a creditor could draw a bill on the debtor (a promise that the debtor will be pay the creditor in cash at the end of the transaction) – but that piece of paper, the contract in effect, could be passed on and used as a means of exchange. There was no interest paid (it was forbidden) but the traders could make a profit by brokering these promises, most of the time given orally but the broker kept a very meticulous bookkeeping.
- These intermediaries saw an advantage in expanding which allowed them to **diversify their risk** and increase their profits. It was better than relying (as earlier banks had done) on large – apparently strong – borrowers...as did the earlier Florentine banks in the 14th century who financed King Edward III’s military campaigns and who eventually reneged on all of his loans, which wiped out the banks.
- **So banknotes origins, until today, are just “promises to pay” the bearer**

Before the Crypto- The Bank Exchange

- **The Amsterdam Exchange Bank (Wisselbank)** founded in 1609 solved a problem for merchants using multiple currencies : it pioneered the system of cheques and direct debits or transfers between merchant accounts denominated in a standardized currency
- It facilitated more commercial transactions just by debiting and crediting the merchants' accounts without having to actually move coins or notes – a **central ledger**
- **But the Exchange kept in its coffers almost the same amount in precious metals and coins → so there was no possibility of a bank run** (this made the bank very secure, but it did not allow for credit creation)
- **1657 Stockholm Banco** : pioneers fractional reserve banking
- **1694 Bank of England and in 1742 gets a partial monopoly on issuing bank notes** to facilitate payments without the need of both parties to have an account

Before the Crypto- The private banks

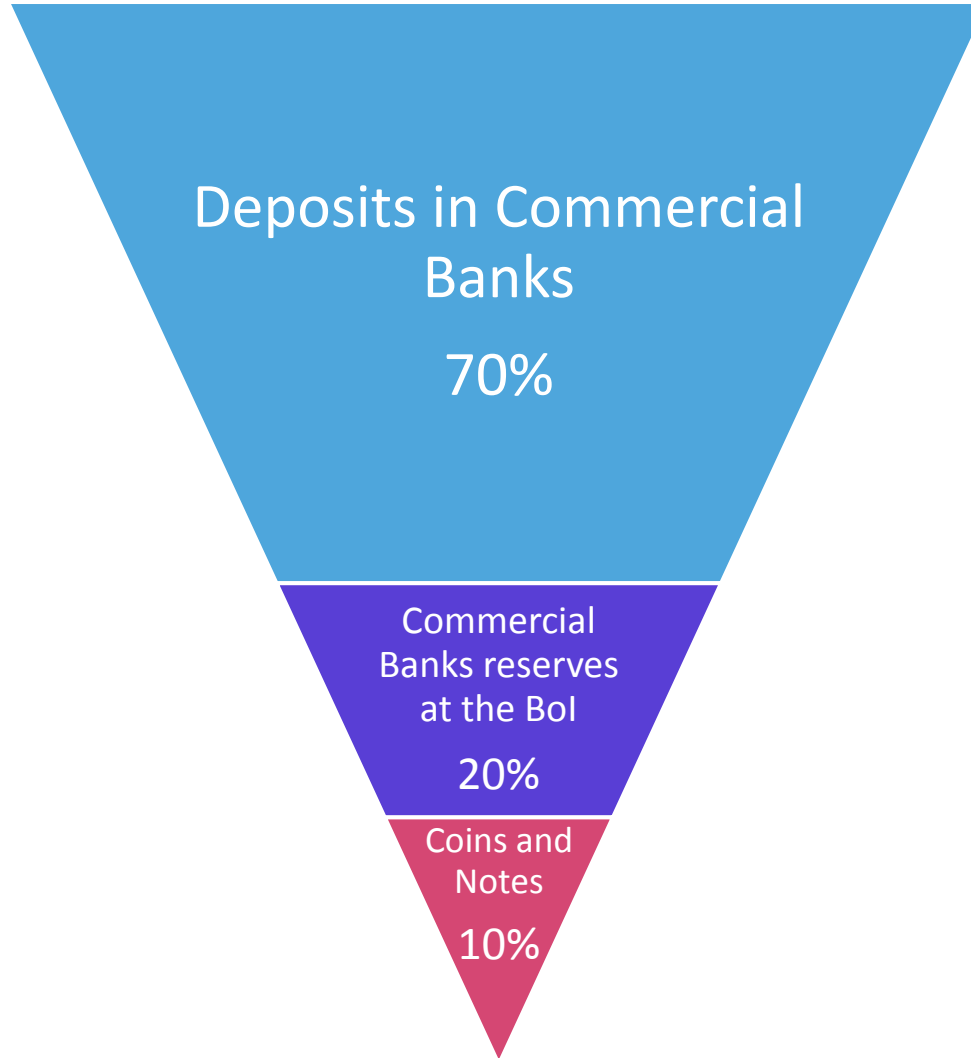
THE BASIC FRACTIONAL RESERVE BANKING CYCLE



Fractional reserve banking, cashless transactions, and Central Bank monopolies on issuing bank notes means that today's money is really the total sum of specific liabilities (deposits and reserves) incurred by banks

[HTTP://CYNIC.ME](http://cynic.me)

Before the Crypto – Money Supply



Most of our money today is already digital

But only cash allows for transactions to be immediately final with no need for an intermediary to “ensure” that payment has been made

All other forms of money require one or more intermediary to keep our money, to ensure that our partner in transactions has money and to finalize the transactions

Before the Crypto – Technology and Legal

- **The forms of Money** are affected by the **technology** available but also by the economic and particularly by the **legal institutions** in place to provide TRUST

“With the wisdom borne from such sad experience, most countries have now settled on centralised, public fiat money backed by robust institutions in order to provide the public with money that is both highly trusted and easy to use”.

Marc Carney, Governor of the Bank of England, March 2018

Before the Crypto – What makes you Trust?

- To make transactions, to save, to borrow – there is a great need for TRUST, the more so when those activities are undertaken with unknown counterparties, or at arms length such as in international trade
- Money:
 - **Government backing** as in Fiat money ensures enforcement (but if it varies widely in its value such as when hyperinflation...won't be used);
 - **Banks** : create money also – and **tight regulation and supervision** ensure stability (often reinforced by government insurance) and legitimacy of sources of economic activity
 - **Means of payments**: are varied in types (from cash to bank transfers to credit cards to MPESA) and have various degree of efficiency to use

Before the Crypto – Monetary System

1. Providers of Money:

- Government (through their central banks) enjoy seignorage
- Banks – in a regulated way, they must show resilience (capital), good governance (all the AML/CTF rules, Bank Directives and so on) and keep reserves (so there is a limit as to how much money they can create). Banks are not just intermediaries like stock markets, or Mutual Funds, or Pension Funds, they create money.

2. How Much Money needed?

- Enough to facilitate economic activity but not too much to fuel price increases

3. Monetary Policy:

- Is the tool that ensures that just the “right” amount of money is around in the economy to satisfy 2.



Before the Crypto – Role of the Bank of Israel

- It is the sole provider of fiat money
- It provides a wholesale payment system RTGS as clearing house for interbank transactions
- It is preparing to ensure a faster payment system for retail transactions
- As supervisor of the commercial banks,
 - It ensures that those are properly governed with proper risk management to make sure that our citizen's money is safe
 - It urges banks to make the **use** of our money as **efficient** as possible,
 - It enforces that banks comply with the highest level of AML-CFT rules. This introduces friction in the system, it takes time and resources, but it is a friction that certifies that we have a law abiding network.
- Perhaps most importantly, its Monetary Policy Committee ensure that our money keeps its value, by targeting a low and stable price environment.
 - The MPC made up of 6 people, including 3 members of the Public sit weekly to discuss the economic and financial environment in order to achieve the target set by the government.
 - They answer the question “**how much money is needed**”: enough to facilitate economic activity but not too much to fuel price increases – monetary policy is the tool that ensures that just the “right amount” of money is around to satisfy that condition.

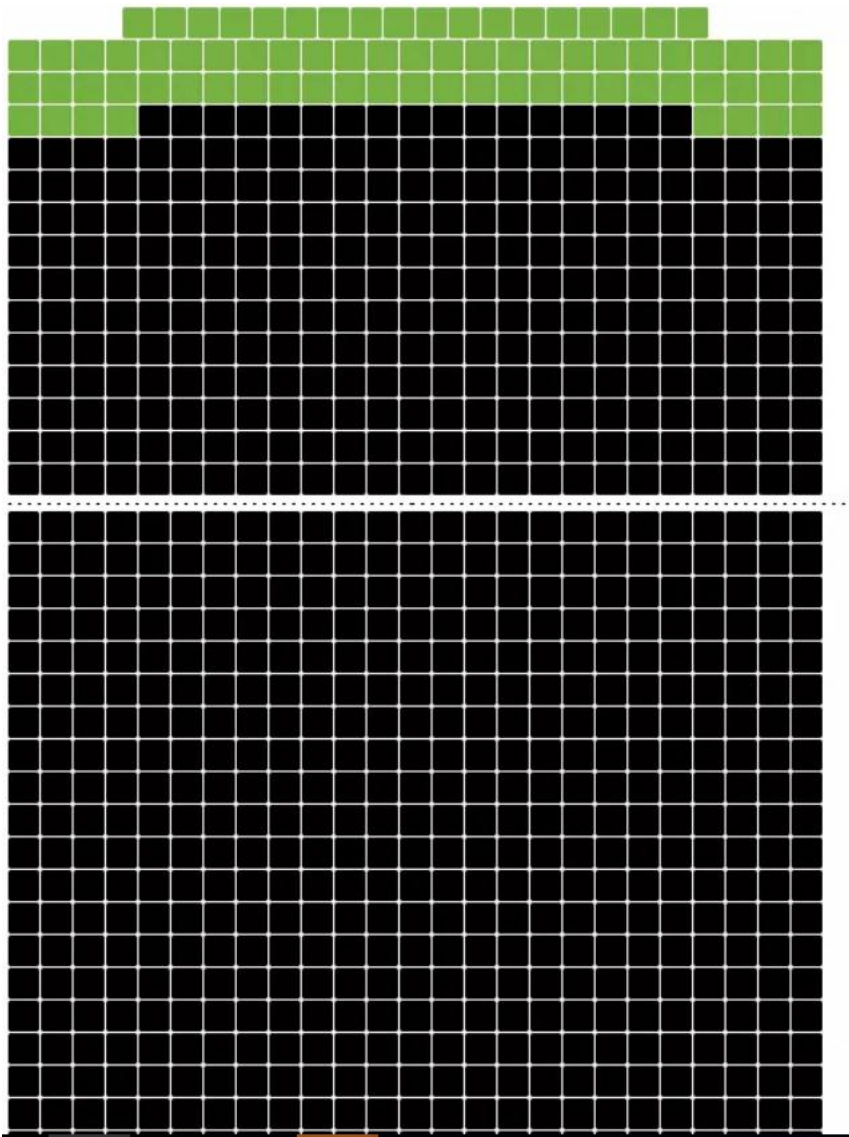
CryptoCurrencies – not much of a Store of Value

Percentage of Total Market Capitalization (Dominance)



Not much as a Means of Exchange

Global Money Supply



Narrow Money

The total value of the world's easily accessible money is **\$36.8 trillion**. This includes the world's coins, banknotes, and checking deposits.

Broad Money

The total value of the world's money is **\$90.4 trillion**. This includes coins, banknotes, money market accounts, as well as saving, checking, and time deposits.



Crypto Assets



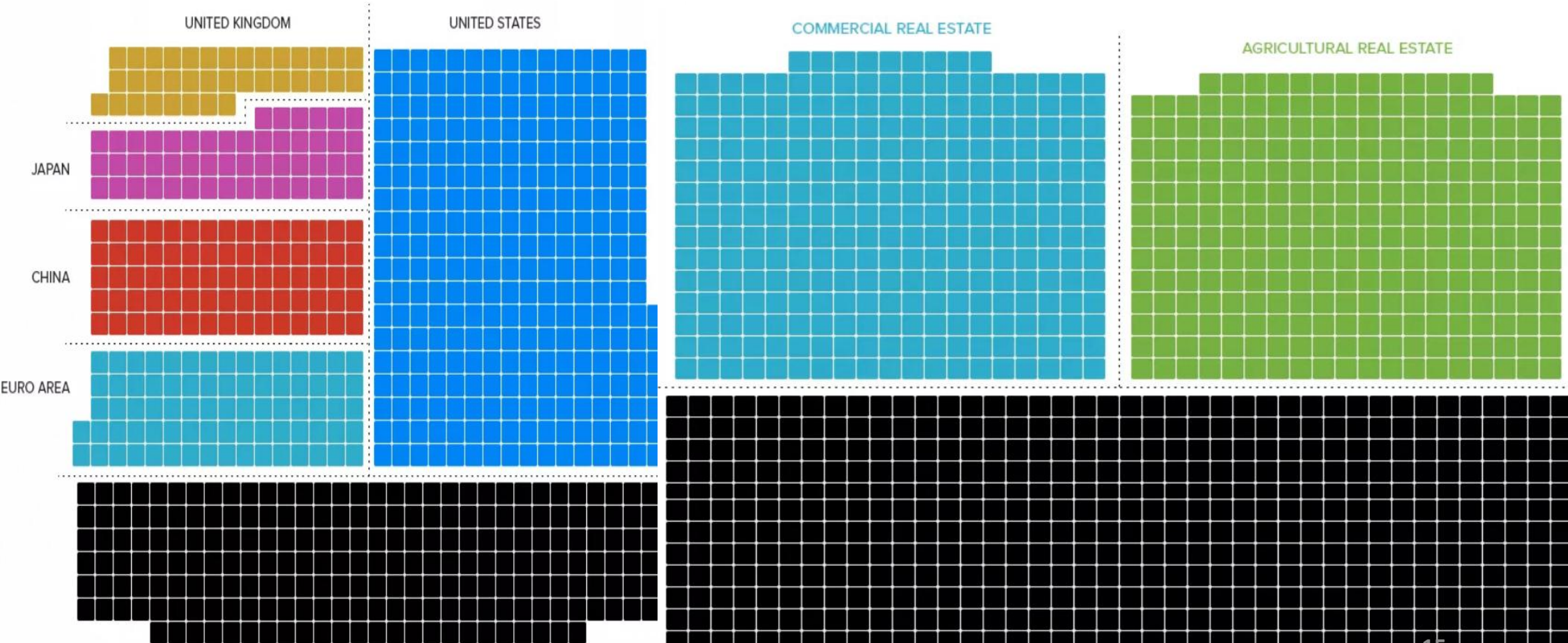
\$ 0.3 trillion



Still a very small part of All Assets

World Stock Markets
 \cong \$77 trillion

Global Real Estate
 \cong \$220 trillion



Bitcoin follows a 20 year search for digital cash

TABLE 0.1. NOTABLE ELECTRONIC PAYMENT SYSTEMS AND PROPOSALS

ACC	CyberCents	IKP	MPTP	Proton
Agora	CyberCoin	IMB-MP	Net900	Redi-Charge
AIMP	CyberGold	InterCoin	NetBill	S/PAY
Allopass	DigiGold	Ipin	NetCard	Sandia Lab E-Cash
b-money	Digital Silk Road	Javien	NetCash	Secure Courier
BankNet	e-Comm	Karma	NetCheque	Semopo
Bitbit	E-Gold	LotteryTickets	NetFare	SET
Bitgold	Ecash	Lucre	No3rd	SET2Go
Bitpass	eCharge	MagicMoney	One Click Charge	SubScrip
C-SET	eCoin	Mandate	PayMe	Trivnet
CAFÉ	Edd	MicroMint	PayNet	TUB
Checkfree	eVend	Micromoney	PayPal	Twitpay
ClickandBuy	First Virtual	MilliCent	PaySafeCard	VeriFone
ClickShare	FSTC Electronic Check	Mini-Pay	PayTrust	VisaCash
CommerceNet	Geldkarte	Minitix	PayWord	Wallie
CommercePOINT	Globe Left	MobileMoney	Peppercoin	Way2Pay
CommerceSTAGE	Hashcash	Mojo	PhoneTicks	WorldPay
Cybank	HINDE	Mollie	Playspan	X-Pay
CyberCash	iBill	Mondex	Polling	

- Bitcoin has several notable innovations including the blockchain and a decentralized model that supports user-to-user transactions.
- It provides a practically useful but less-than-perfect level of anonymity for users.

Technological revolution behind the Cryptos: DLT

- Transactions are stored and recorded simultaneously not in a central data base, but in a distributed data base. In addition, Blockchain has strong cryptographic security built into it- “natively digital”
- The tokens/coins used in an exchange can embed all of the elements of a smart contract

➤ Our vulnerability to cyber breaches increases as we become more digital

While our existing systems require layers upon layers of cyber protection, DLT has built in security features.

- Blockchain technology improves resilience and secures our data by eliminating central targets altogether making it far more difficult for theft, fraud and manipulation of data to occur.
- In addition, encryption that requires the full public verifiability and immutability also adds considerably to the security of the information.
- This by the way comes with a cost, and the validation system is often slow compared to existing clearing and settlement systems



DLT and new business models?

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- **Decentralized data management of individual data** would impede on the rise of “data giants” that can exploit their quasi monopoly and network power over individuals.
 - **Financial institutions** have often been suspected of having an unfair advantage of holding asymmetric information, making it more difficult for smaller entrants to compete with them.
 - **“FANG” and other internet giants** who monetize the information and data of individual users, without it being very clear as to the extent to which the users have really consented to that use.
 - **We do not yet know** if this technology can deliver on that promise – one that was similarly made with the birth of the internet and which turned out to have been completely wrong – particularly given that the governance of these networks is still heavily centralized. Quoting from R3,

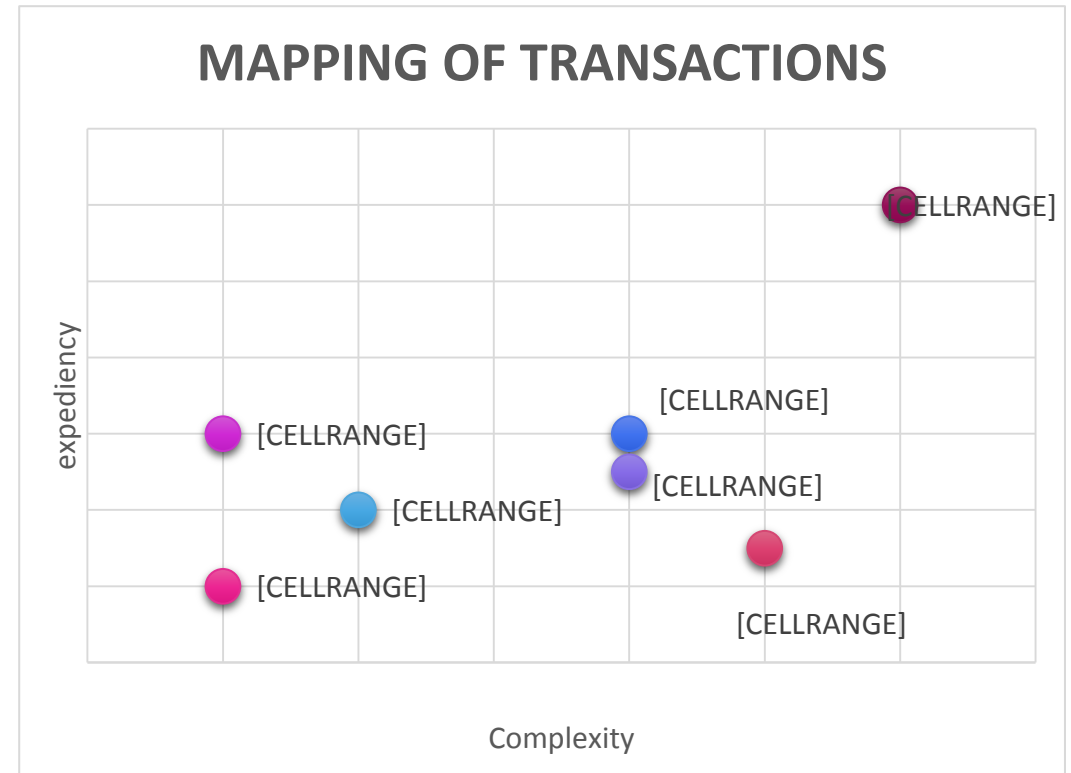
“The truth is that all these networks operate according to a defined set of rules, and that “who makes the rules matters at least as much as who enforces them”

Technological revolution behind the Cryptos: DLT

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- The tokens/coins used in an exchange can embed all of the elements of a smart contract
 - The “tokens” can merge functions that were until now split and thus could greatly improve the **more complex transactions** we undertake – and there are many of those, from buying a house to buying a financial derivatives in a foreign market, and undertaking import/export transactions.
 - In all of those the multiplication of intermediaries – who today bring value added due to the lack of information available – increases the cost and the need for credit. Indeed when there is a gap in time between the execution of the transaction and its final settlement, credit must be provided.

Technological revolution behind the Cryptos: DLT

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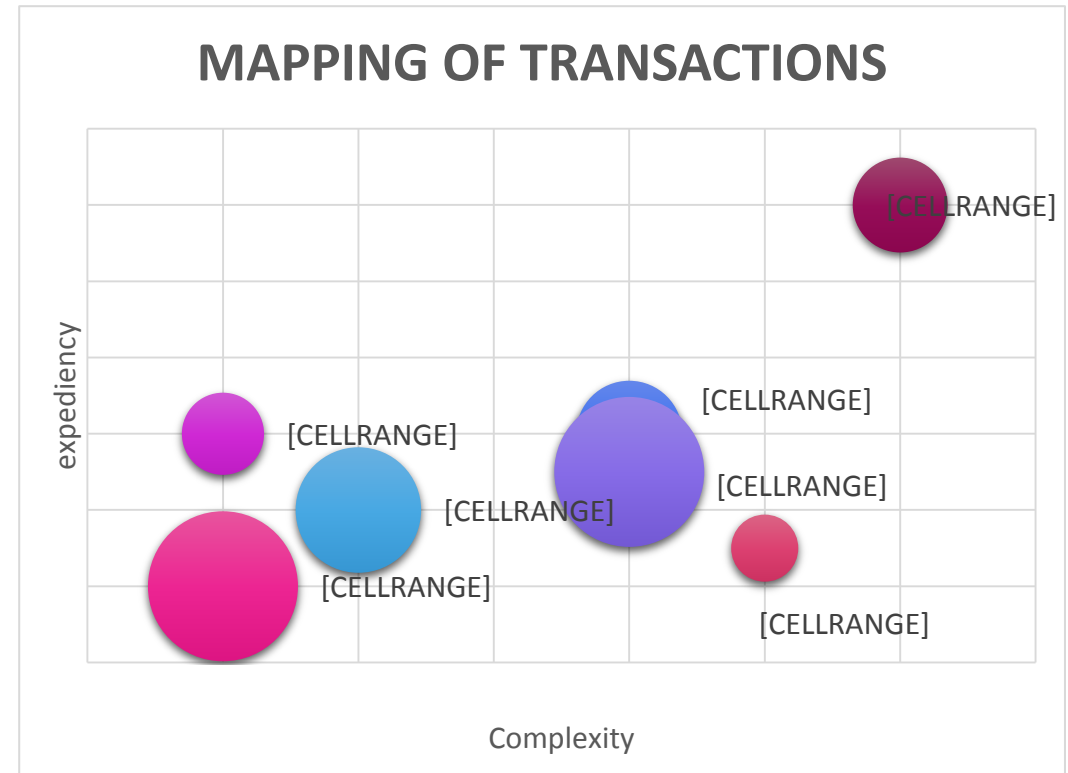


- So its biggest immediate potential is in complex transaction that take a long time to settle – not to replace cash or instant payments



Speed, Scalability, Security – SSS of DLT?

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- How many of these transactions can DLT handle without affecting expediency ?
- Bitcoin and Ethereum can add a maximum of seven and 20 transactions per second to their respective ledgers, while the credit card company Visa process 56,000 transactions per second



From Bitcoin to ICOs – New Business Models?

- Beyond matching borrowers with investors in the most efficient way, ICO's want to match consumers of a service/product directly with investors of that product/service.
- Example: financing the building of a new stadium by issuing “rights to purchase tickets in the future”. Crowdsourcing where the customers of the product – the sports fan – will gain/lose depending on the future value of the sport franchise into which they are buying.





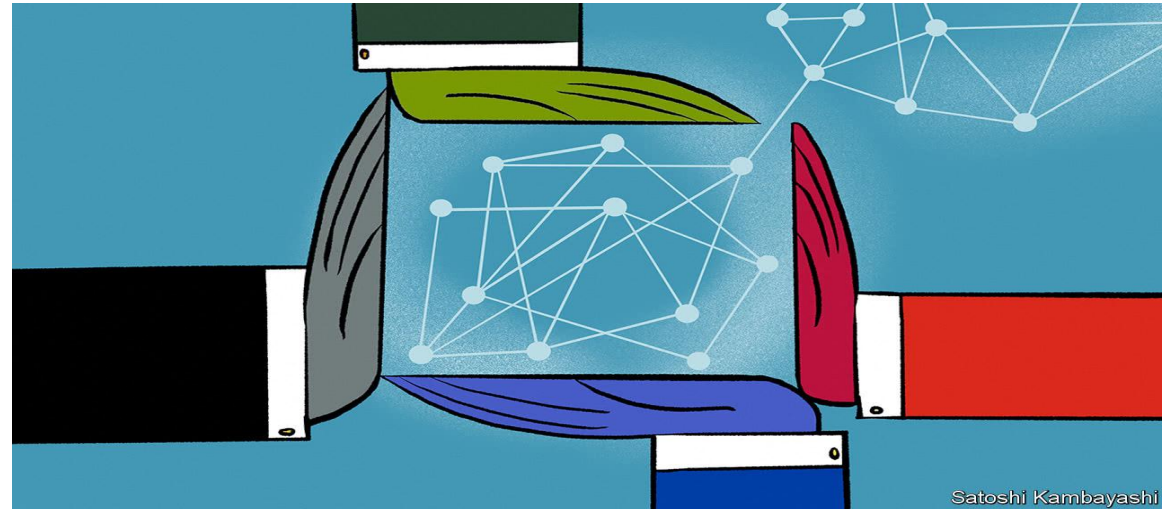
From Bitcoin to ICO's – New Business Models?

➤ Are these ICO's viable?

According to recent research by Prof David Yermack of NYU, less than 25% of ICO survive more than 90 days!

➤ Are these ICO legitimate?

Apparently a large proportion of ICOs are just fraudulent investment schemes. See “*The Big ICO Swindle*”, Wired, April 2018



“... someone—it is almost impossible to figure out who—is using a crowd sale to peddle Jesus Coins, which promise to forgive sins and fight corruption in “the church,” among other things.”

“...I’m not saying all ICOs are sketchy. Some have legitimate uses, such as Filecoin, which aims to allow a token holder access to storage online and rewards people for hosting files.”

Joi Ito, Director of MIT Media lab

Amara's law

“We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.”

Some of the promises behind the DLT will come true, others probably won't, and it is very early in the game to pick the winners.

“The largest and most successful companies on the internet were built after the first bubble, when the protocols and the technologies became mature.”

Joi Ito – Director of the MIT Media Lab

Roy
Amara

American researcher



Roy Charles Amara was an American researcher, scientist, futurist and president of the Institute for the Future best known for coining Amara's law on the effect of technology. [Wikipedia](#)

Sort of a conclusion

- Cryptos are unlikely to fulfill the 3 functions of money, mostly because private money makers are not geared to maintain a stable value of the currency – which is a crucial Public Good
- In order for Cryptos to connect to the existing banking system, they will need to implement KYC and meet existing AML-CFT rules
- Cryptos may become a more efficient means of payment, by cutting intermediaries, particularly for complex transactions
- Crypto tokens may raise efficiency in the many industries that require smart contracts
- DLT has the potential to have business models where individuals retain ownership of their data, and avoid the concentration of power by “data giants”
- ICOs – viable and legitimate ones- bring a new business model of financing projects where the “consumers” and the “investors” are one and the same.



THANK YOU
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