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DIGITAL CURRENCIES AS INFRASTRUCTURES

Introduction to “Gaming Money” workshop
May 18th, 2015

Gianluca Miscione
University College Dublin
Centre for Innovation Technology and Organisation (CITO)
Overview

Some basic concepts and early ideas for discussion

1. Information goods ➔ platforms and 2 sided-markets
2. Digital money as new seignoirage?

Runaway money
3. (Native) digital monies
4. Scarcity and authentication

5. Open issues ➔ “Gaming money”
Common definition

Currencies can function as
- Storage of value
- Means of exchange
- Unit of account

(Coggan, P. 2011. Paper Promises: Money, Debt and the New World Order)

USEFUL HERE?
A different starting point...

Currencies are information infrastructures at least because they:

• classify goods (through pricing);

• communicate prices across markets; and

• establish, maintain and transform social and power relations
Possibly, **information goods** have always existed

New waves of **information technologies** (alphabet, paper, printing press, TV, computers) have **emphasized** those goods **peculiarities**

Walter Benjamin wrote about “The Work of Art in the Age of Mechanical Reproduction” already in 1936

BUT the **distinction** between **information** and **support** has never been so evident since **Napster**
1. Information goods

- Information has high production costs
- Negligible replication costs
- Negligible distribution costs
  (⇒ Zero marginal cost)
- Information is not the carrier

- Most costs are sunk
- No natural capacity limits
- Not consumed by use
- Experience goods

- Timeliness (ex: if material goods price rises tomorrow you buy today. If newspaper price is higher tomorrow, you don’t)
Information Economics

• **Value in scarcity:**
  - The value of a good is a function of its limited availability

• **Value in plentitude:**
  - The value of a network is a function of the number of connected nodes

Source: Gabriele Piccoli
What markets?

- newspapers join subscribers and advertisers
- operating systems connect users to software developers
- credit cards link consumers and merchants
- ...

2-sided markets have two types of members:
- Users
- Suppliers
  plus gatekeepers (Adobe PDF, Gmail...)

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Two-Sided Networks

• value of the network to one type of member depends on the number of members from the other side

• Products and services that bring together groups of users in two-sided networks are **platforms**

• Now, hold on...
Money out of barter economy?!

No archaeological nor anthropological evidence of a developed barter economy before the emergence of money

Origin of money as debt to authorities (political, religious...)

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Authorities / States

States can issue money to pay troops, facilitate tax collection...

→ by making money

states become part of all relations mediated by money
A platform creates its gatekeeper

In 2015 Uber, the world’s largest taxi company owns no vehicles, Facebook the world’s most popular media owner creates no content, Alibaba, the most valuable retailer has no inventory and Airbnb the world’s largest accommodation provider owns no real estate.

A similarity to states can be noted: they don’t sell products and services (mostly)
States finance themselves by exacting a percent on all economic transactions
Platforms / Currencies

2-sided network platforms have a role comparable to currencies

An overstretched analogy or a “new seigniorage”?
Not all bucks are green...

Appear the same...

1. State money (fiat)
2. Credit money (central banks guaranty)
3. Post-credit money (based on interbank loans)

Credit tools are the perfect example of being money AND a 2-sided network/platform.
Banks gained gatekeeping role by “printing” money while everyone acted as it was fiat money. It may have learned from them.
2. A new seigniorage?

- Currency, including cash, is not free, banknotes and coins have **production costs**
- Seigniorage is the difference between the facevalue of money and its production cost
- Is it a tax?

Also, **using cash costs money** (private companies argue): 1k $ p.a. to live without bank account; risks of lost, stolen… money

➔ A fee on money usage (opposite of demurrage)

In 2-sided markets, the tax/fee on the everyday use of money is paid to infomediaries (Paypal, ApplePay, MPesa, …)
Platform? Money!

States and infomediaries as gatekeepers of massive general purpose multiple-sided networks

Their platform is currency

➡️ Currency as technology
What derivatives?

Banks create financial products out of borrowed money

Infomediares will derive information goods (information about money is money!)
Why bother?

What’s the point in looking at currencies as platforms?

- No one thinks that platforms are neutral,
- That they have intrinsic values (vs. common sense about money),
- They’re partly fungible

AND: zero interest rates ➔ back-office innovation
Pervasive *general purpose* technologies

If our main infomediare (Google) fails, we have problems in maintaining all relations that its 2-sided networks support.

As much as if banks fail, we have problems to maintain all relations that credit money supports.

**Difference**: email, web, etc. are open source → someone can create substitutes

(with money, QE? or...?)
Currencies as elephant in the room

1\textsuperscript{st} grand change: banks taking money from public bodies

2\textsuperscript{nd}: IT companies aiming at banks

Bankers in smart pants can handle hundreds of thousands of wealthy individuals (glossy brochures, dinners, travels,...)

IT MNEs can handle billions of small transactions (FB posts, profiling, SNA, no need to sample price index, “\textit{pulse of a nation}”...
3. (Native) digital monies

We can’t eat information

Since there’s no established digital currency...

Credit money (no fiat)
or Free

(both very common in “Digital Society”)
Digital currencies

• Beenz 1998
• Linden dollar
• ...

• Whuffle currency
  (https://en.wikipedia.org/wiki/Whuffie)
• ...

Shambolic vs. authentic?

Original internet architecture: unlimited redundancy proved future proof, opened possibilities beyond foreseeable (generative)

→ No scarcity

BUT: infinite money is not money

→ design the impossible to allow what no-scarcity does not allow

(i.e. define the impossible for new possibilities)
Satoshi Nakamot

*folk hero of the information society* (not an established R&D centre)

Who is he/them?
Background?
Motives?

Very performative paper
NO double spending...

The main feature of any currency

This centralized public record of transactions maintained by decentralized resource is

Nakamoto’s design of the impossible:
• Impossible to spend money twice
• Impossible for a single central authority to emerge (51% pool?)
Computing power scarcity converted into authentication capacity (hashing)
4. Scarcity → authentication

Blockchain introduces *native authentication*

Allowing interactions between trustless parties at scale (≠ no trust)
51% vs. authority

Trust *ex nihilo* (out of thin air)

Publicity of all transactions to enforce scarcity without any guardian

51% to avoid the infinite regress of controlling controllers with more controllers

Proof-of-work:

Heterotopian Money

BTC cuts loose from institutions (i.e. social models):

• “Gold standard without gold
• Fiat money without a state
• Credit money without debt” (Bjerg)

Built around scarcity/absence → Digital currency rules

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A real-politik

All spectrum of views, from frictionless trades to doing to Wall Street what Napster did to music industry up to replacing fiat currencies altogether

• “Emerging economy”

• Irreversible (individual transaction AND the whole thing)

Reality check
• No full control of states/MNE
No global stealth action
“Participation of the fittest?”

Does Bitcoin openness bring democratization?
Or “participation of the fittest”?

- **Gender**: Male (96.29%)
- **Sexual orientation**: Heterosexual (92.42%)
- **Income**: 44.71% above own national average + 27.40% around own national average

More:

https://bitcointalk.org/index.php?topic=486149.msg5354626#msg5354626
> ¼ BTC for < 50!

N. Dodd at OpenHere
5. What’s next?

• What innovation processes and from where? (hackers vs. FP7)
  - Micropayments for content,
  - remittances,
  - computing power...

• Many blockchains?

• How do they co-exist and co-evolve?
Blockchains not for currency?

Different possible uses demonstrate a general purpose I.I.:
- trans-jurisdictional record keeping (accountancy),
- Any authentication (IF this THEN that. examples: doors, accounts,...) → automation of data management

• How embedded in societies?
• If no BTC reward, what rewards?
• Impossible to design → experiment, time will tell
• Would it be possible to pay taxes with non-state money?!
PROGRAM - morning

9:30 – 10:30 Professor Ole Bjerg, CBS “How is Bitcoin money?”

10:30 – 11:00 Q&A

11:00 – 12:30 parallel groups:
Scenario Planning (Donncha Kavanagh)
Scalability and hard limits of the blockchain (Séan McGarraghy)
Science, Technology, and Society Perspectives (Kalpana Shankar)
States, jurisdictions and Post-Westphalian order (John Flood)

12:30 – 13:30 Lunch break
Afternoon

13:30 – 14:30 Professor Nigel Dodd, LSE “Origins and Utopias of Money”

14:30 – 15:00 Q&A

15:00 – 16:30 parallel groups:
Follow the money, ethnography of algorithms (Séamas Kelly)
Programmable money, smart contracts and Common-Based-Peer-Production (Rachel O’Dwyer)
A Game of Coins (Kevin Scally)
Accounting, Auditing and the Distributed Ledger (John McCallig)

16:30 – 17:30 Final round table discussion

Aperitif at the Common Room