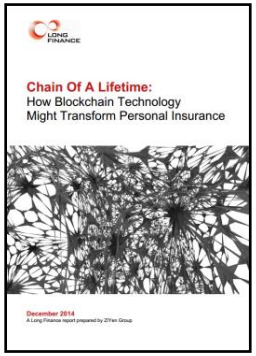
BarCampBankLondon Unconference



"When would we know our financial system is working?"

Chain Of A Lifetime:

How Blockchain Technology Might Transform Personal Insurance

Professor Michael Mainelli
Executive Chairman, Z/Yen Group
National Endowment for Science, Technology, and the Arts (NESTA)
9 February 2015

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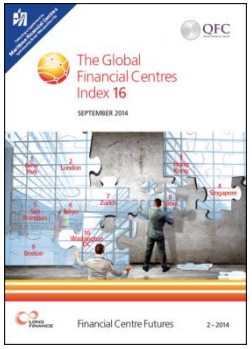
London Accord

LONG FINANCE

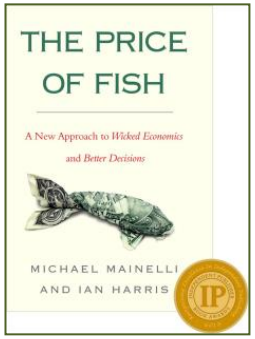
The Global Financial Centres Index

WINNER BCS IT PROFESSIONAL AWARDS 2004 ComputerWeekly



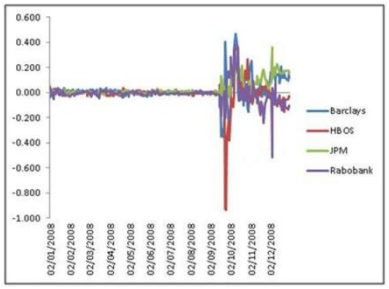
- Special – City of London's leading commercial think-tank
- Services – projects, strategy, expertise on demand, coaching, research, analytics, modern systems
- Sectors – technology, finance, voluntary, professional services, outsourcing

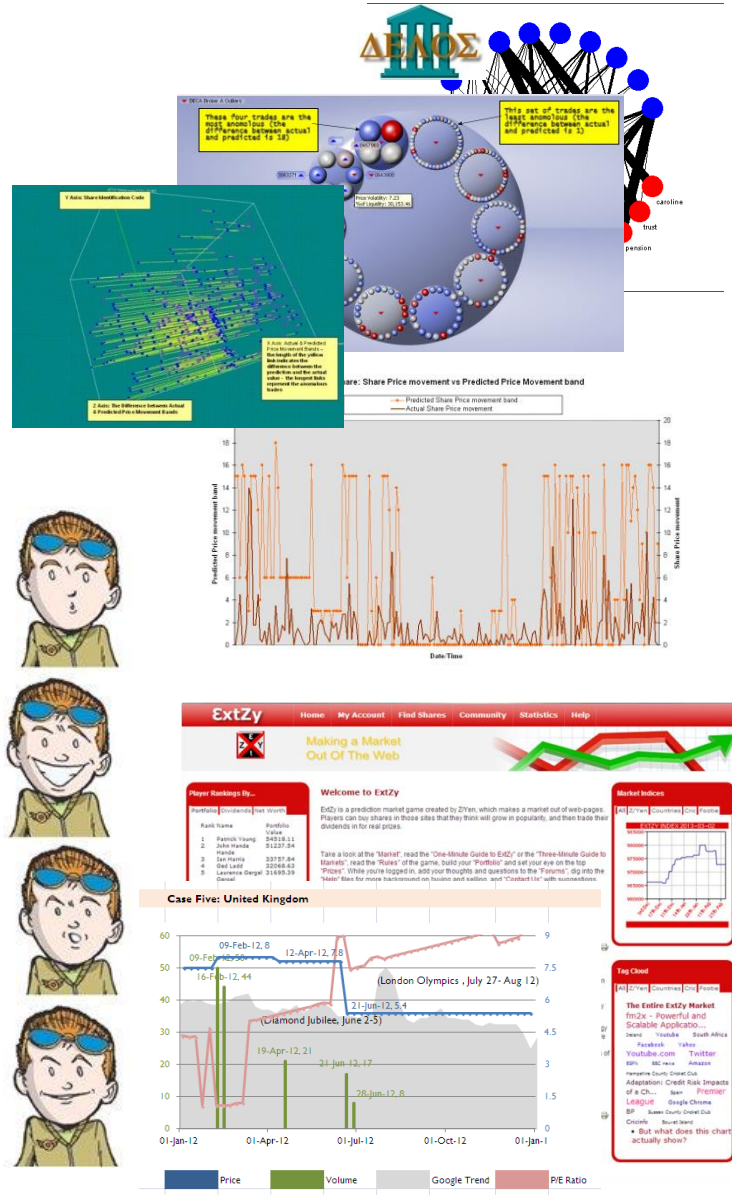
  - Independent Publisher Book Awards Finance, Investment & Economics Gold Prize 2012 for ***The Price of Fish***
  - British Computer Society **IT Director of the Year** 2004 for PropheZy and VizZy
  - DTI **Smart Award** 2003 for PropheZy
  - *Sunday Times* Book of the Week***, Clean Business Cuisine***
  - £1.9M **Foresight Challenge Award** for Financial £aboratory visualising financial risk 1997



Z/Yen in Finance Research

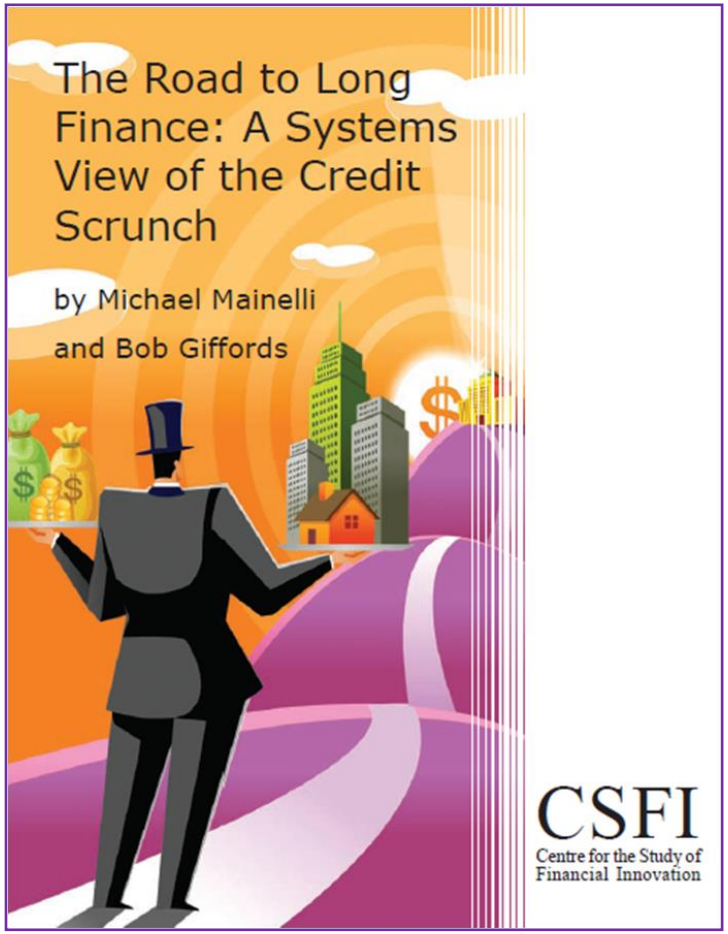
- Blockchains (current)
- Long Finance predicting bubbles (current)
- LIBOR and FX litigation (current)
- Prediction markets (1998-present) – www.extzy.com
- Market Intelligence – Ministry of Defence, e.g. Vision 2020 (1994-present)
- Avatars for Big Data (2010-2012)
- PropheZy and VizZy – Automation of Compliance monitoring (2003-2008)
- Financial £aboratory Club visualising risk (1997-1998)





Impertinent Questions

About LONG FINANCE



'When would we know our financial system is working?'

Objectives:

- Expand Frontiers
- Change Systems
- Deliver Services
- Build Communities

London Accord

Financial Centre Futures

Meta-Commerce

Eternal Coin

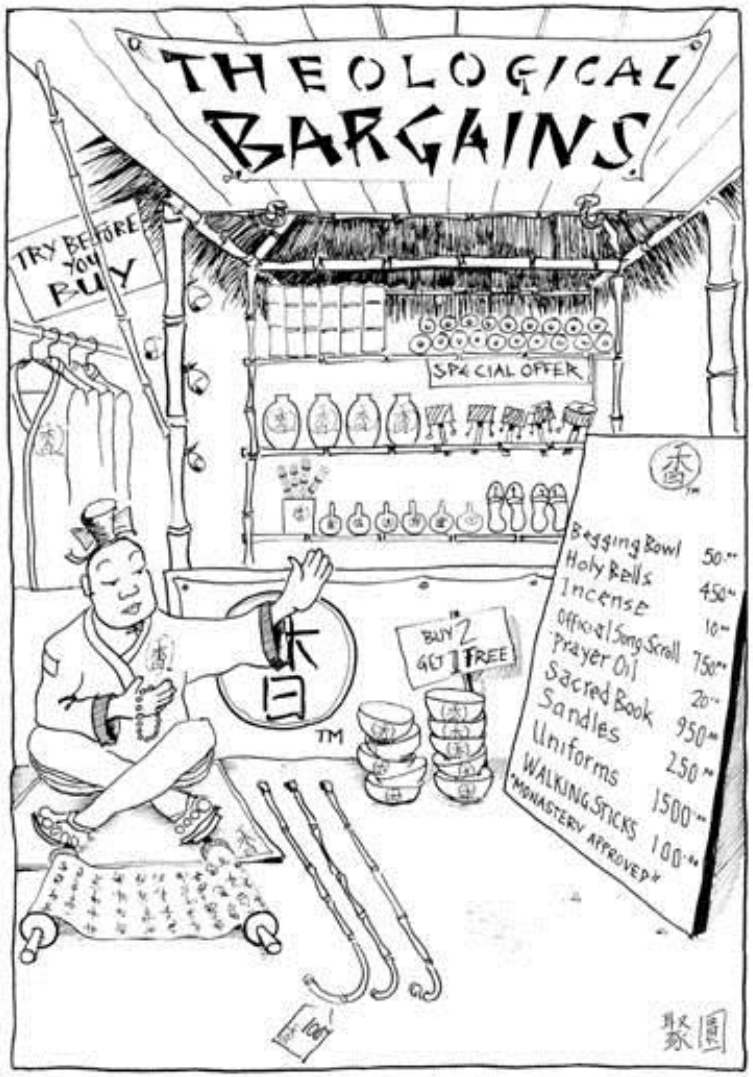
GRESHAM COLLEGE
Founded 1597

CITY OF LONDON

Lunacy, Heresy, Or Orthodoxy?

Measurement	▪ Confidence Accounting**
	▪ Long-Term Performance Measurement
	▪ Uses and Abuses of Discount Rates*
Financial System	▪ Insured Utility Banking*
	▪ Futures of Finance
	▪ Clustering*
	▪ Asset Management*
	▪ Global Financial Centres**
	▪ Emerging Markets*
	▪ Sell-Side Research
Monetary Systems	▪ Common Tenders*
	▪ Eternal Coin*
	▪ Cryptocurrencies (aka Alt Coins) and Blockchains*
Regulation	▪ Mortgages*
	▪ Voluntary Standards Markets*
	▪ Compliance Architectures
Governance	▪ Ethics
	▪ Ethical Banking*
Structure	▪ Pensions Indemnity Assurance and Internal Growth Rate Measures for Pensions**
	▪ Cyber Reinsurance*
Behaviour	▪ Concepts of "Fairness"
Sustainability	▪ London Accord 2007** (24 integrated reports) & London Accord*
	▪ Burn it all?!
	▪ Policy Performance Bonds (Index-Linked Carbon Bonds & Index-Linked Forestry Bonds)*

(*) indicates research at an active stage (**) indicates research at an advanced stage

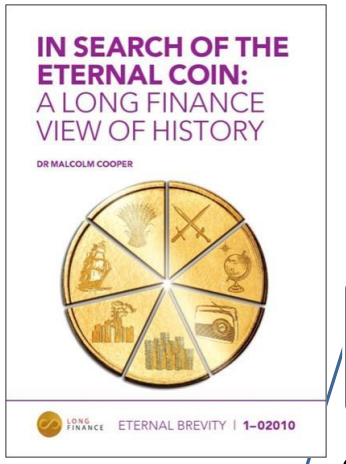


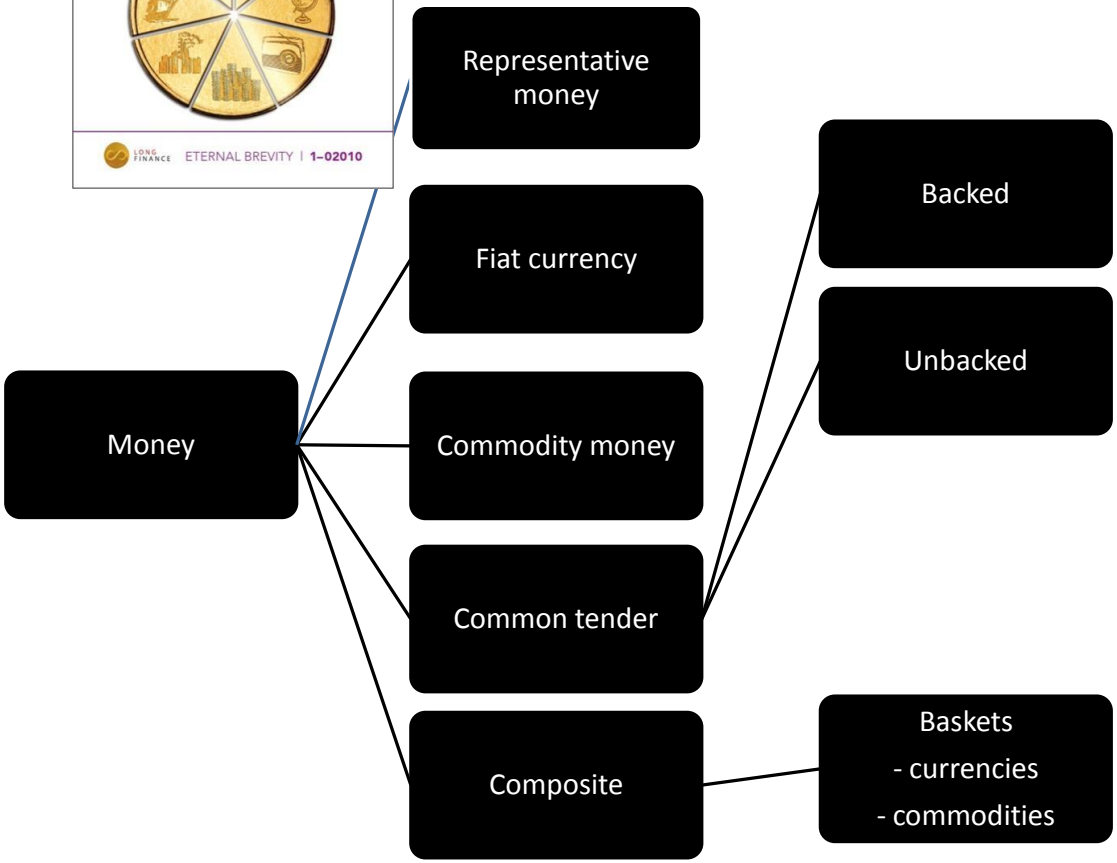
"Get a detailed grip on the big picture."
Chao Kli Ning

Money As Technology

"Money is a technology communities use to trade debts across space and time."

"Tokens of indebtedness are social desires frozen at a point in time – tokens depend on the future persistence of the community and its values."





Possible 'Blockchainable' Items

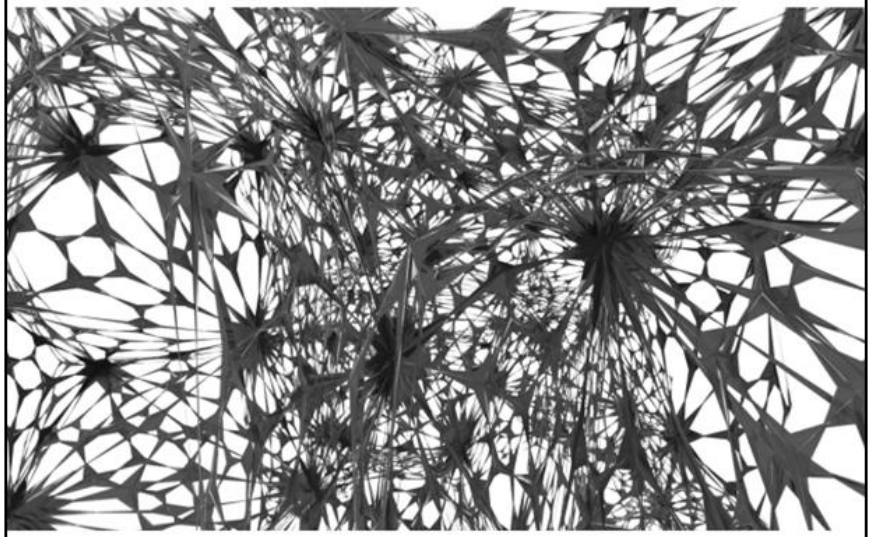
Financial instruments, records, models	Currency, private and public equities, bonds, derivatives, voting rights associated with financial instruments, commodities, derivatives, transaction records (e.g. trading), mortgage or loan records, crowd-funding, P2P lending, microfinance, (micro)charity donations ,etc.
Public records	Land and property titles, vehicle registries, business license, business ownership/ incorporation/ dissolution records, regulatory records, criminal records, passport and ID, birth or death certificates, voting ID, registration and rights, health and safety inspections, tax returns, building and other types of permits, court records, government/ listed companies / civil society - accounts and annual reports etc.
Private records	Contracts, ID, signature, will, trust, escrow, any other type of classifiable personal data (e.g. physical details, date of birth, taste) etc.
Semi-private/semi-public records	High school/university degrees and professional qualifications, grades, certifications, human resources records, medical records, accounting records, business transaction records, locational data, delivery records, genome and DNA, arbitration, genealogy trees etc.
Physical asset keys (e.g. in relation with Internet of Things)	Key to home, office, car, locker, safety deposit box, mail box, hotel rooms etc.
Intellectual property	Copyrights, licenses, patents, proof of authenticity or authorship etc.
Other records	Cultural, historical events, documentary (e.g. video, photos, audio), (big)data (weather, temperatures, traffic), sim cards etc.

What Might Blockchain Technology Mean For Traditional Financial Services?

- Registries – ships, aircraft, artworks, tax, …
- Trade reporting, consolidated tapes
- Personal insurance blockchains and smart insurance contracts
- Identity blockchains for anti-fraud protection or anti-money laundering
- Multi-entity contracting and virtual contract companies
- Corporate voting
- Accounting registries

LONG FINANCE

Chain Of A Lifetime:
How Blockchain Technology Might Transform Personal Insurance



December 2014
A Long Finance report prepared by Z/Yen Group

http://www.longfinance.net/publications.html?id=903/

Exploring?

- How blockchain technology could be applied in finance
- How blockchain technology and related applications could be relevant to the insurance industry, with a focus on personal insurance
- What the likely implications of applying blockchain technology in insurance might be, e.g. relationships between insurers and consumers over time, perception of risk, identity, and personal data management

Approach

- Engaged blockchain technology experts, insurance industry professionals, regulators, consumer bodies, futurists, researchers and academics
- in Europe, North America, Australia and Asia
- through
  - desk research
  - semi-structured interviews (30)
  - events
    - London-based workshop on 11 September
    - Webinar on 1 October
    - 5 open discussions on the topic with several hundred

Look Beneath The Coins

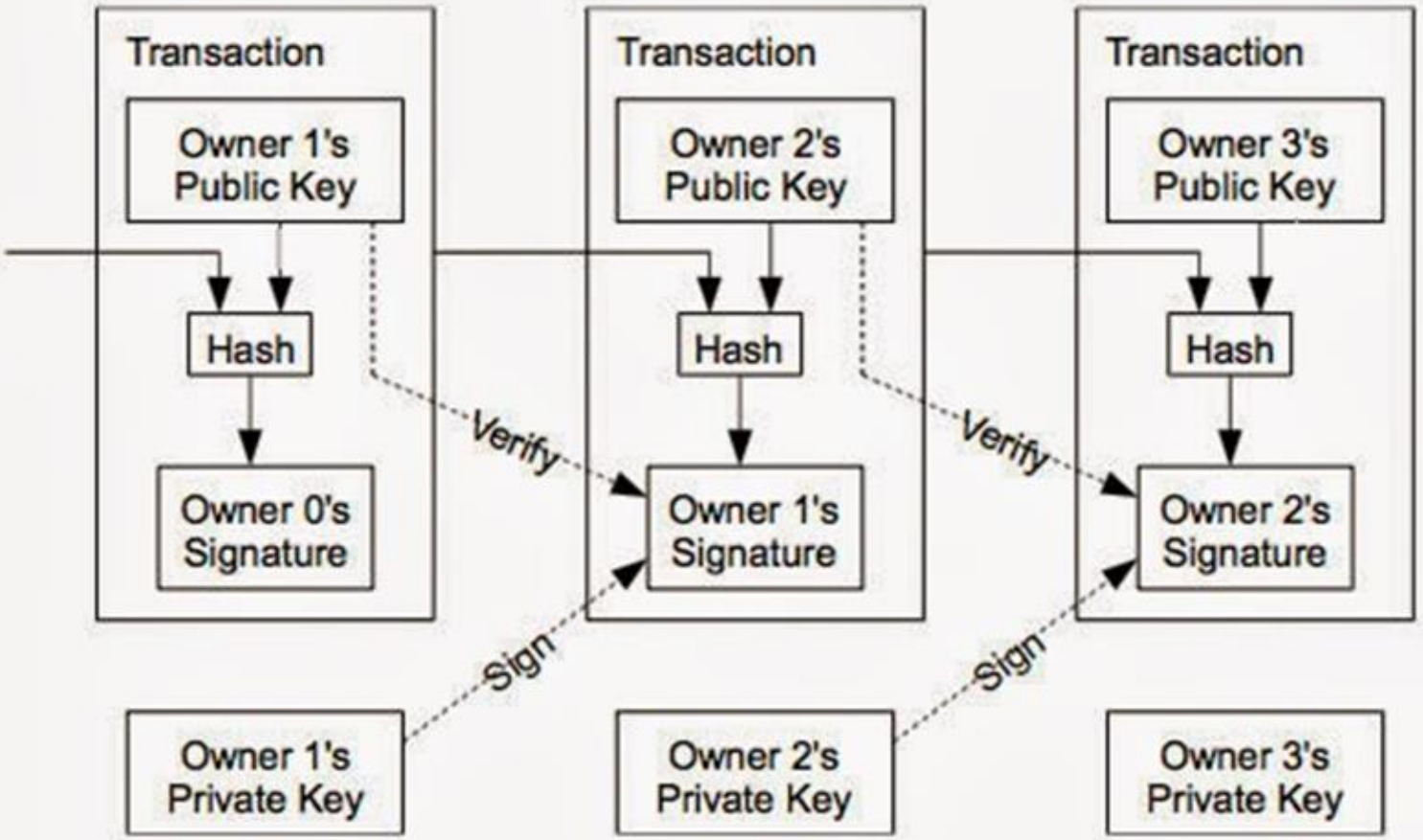
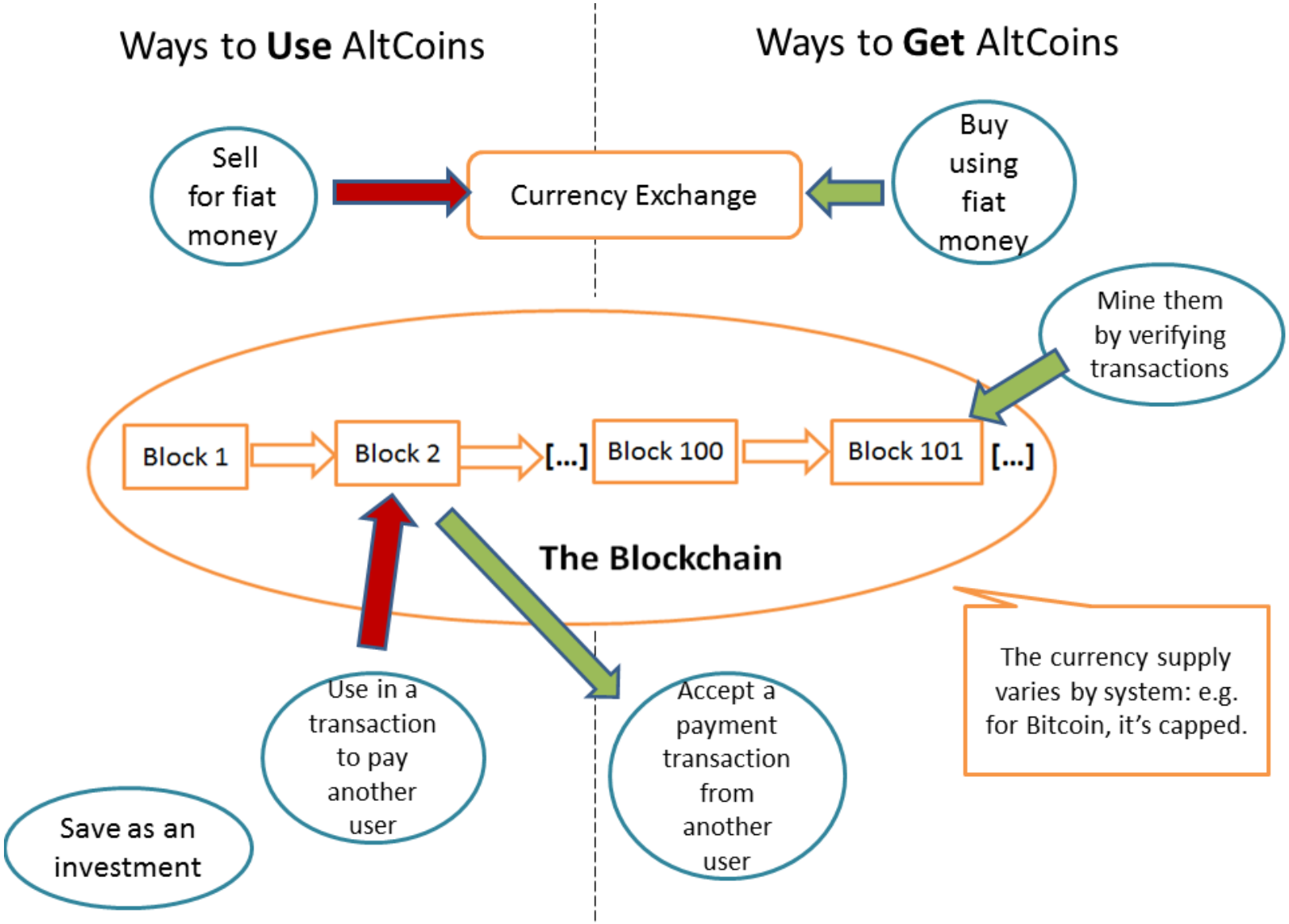


Diagram of a Bitcoin

from *Bitcoin: A Peer-to-Peer Electronic Cash System*, published in 2008 by "Satoshi Nakamoto".

The Blockchain 'Ecosystem'



What Is Blockchain?

- Blockchain = transaction database based on a distributed cryptographic ledger shared amongst all nodes participating in a system
  - Aka ‘chain of blocks of transactions’
  - A publicly accessible ledger of all transactions that have ever occurred in a protocol
  - Fully decentralized and accessible to every node of the system (protocol)
- Bitcoin experiment begins January 2009
- Hundreds of AltCoin experiments

What's Interesting About Blockchain?

- Displaces two roles of trusted third parties:
  - Can't do the same transaction twice* - no double spending or transaction repudiation
  - Public history of transactions* - one unified unalterable state of the ledger at all times shared by all nodes
  - Trustful – initial entry requires high degrees of trust but then system operates on a trustless basis
- Decentralised - robust, no central control or authority required to coordinate behaviour or interaction
- 'Proof of work' and block validation - lower transaction costs, but speed sometimes an issue

Distributed Applications

- Smart contracts (aka scripts) enforced when certain pre-defined conditions are met, e.g.:
  - Oracles, e.g. crop insurance smart contract coupled with ‘trusted’ weather data feed
  - Arbitrators, e.g. appointed ‘experts’ e.g. software development smart contract appointing software experts to test the product
- Decentralised autonomous organisations (DAO) – sophisticated, conceptual, types of ‘smart contracts’ creating autonomous entities involving both a governance system and a way for the DAO to fund and manage resources, e.g. through the sale of a service or endowment

Long Finance koan – **“If you have trust I shall give you trust; if you have no trust I shall take it away.”**

Experimentation Continues

Crypto-Tech Platforms, Programs and Protocols

Non-Bitcoin Blockchain Bitcoin Currency

Blockstream
Truthcoin

Non-Bitcoin Blockchain Non-Bitcoin Currency

Ethereum: *Ether*
BitShares: *BTS*
Truthcoin: *CashCoin*
Litecoin: *LTC*
PayCoin: *XPY*

Non-Blockchain Consensus

Ripple: *XRP*
Stellar: *STR*
NXT: *NXT*
Hyperledger
Tendermint
Pebble
Open Transactions

Bitcoin Blockchain Bitcoin Currency

Bitcoin: *BTC*

Bitcoin Blockchain Non-Bitcoin Currency

Factom: *Factoids*
Mastercoin: *MSC*
Counterparty: *XCP*
Namecoin: *NMC*

Blockchain Neutral Smart Services

Eris Industries
PeerNova
Codius
SmartContract
SAE
Tezos
Tillit

[Source: http://radar.oreilly.com/2015/01/the-3ps-of-the-blockchain-platforms-programs-and-protocols.html]

Identity

What if …
you had a portable, secure, globally available store of personal data in a blockchain? You could have all of your health records or driving history available instantly to hand on to trusted third parties. You might hand over your health record to a new doctor or to obtain a life insurance quote, or your driving history at an airport counter for a car rental insurance discount. Your personal data store might also have your biometric data, thus giving you the ability to prove at any time it is you before someone, and that data contained in the blockchain is yours.

Finding #1 - Identity

- Blockchain could transform the way people manage identities and personal information
  - e.g. blockchain-based identity schemes coupled with
    - security e.g. distributed storage
    - data management & access e.g. automated permission frameworks for access by third parties
  - people would no longer need to trust centralised third parties to store and manage personal information
  - could reduce identity and claim fraud, increase confidence in products, lower rates, increase coverage

Space & Time

What if …
the importance of regulatory boundaries diminished? With blockchain applications, insurance products could reach scale at both local and global levels. Further, insurance coverage could be adjusted across space almost instantaneously while catering to ‘local’ needs.

What if …
there were no more disputes about the ‘last’ will and testament? When someone dies and the coroner verifies death and cause of death to their blockchain, then their last will and testament is released publicly, their health records are donated to medical research charities, their life insurance policy pays out automatically.

Findings #2 & #3 - Space & Time

- Blur global and local
  - Influence consumer perceptions of time
  - Link local spaces with global reinsurance markets
- Time-specific insurance, e.g. buying ‘spot’ insurance related to ‘collaborative’ or ‘sharing’ economy for temporary use of private home or vehicle - enabling nearly instantaneous adjustments of insurance coverage and price across space and time

Mutuality

What if …
any group of people could elect to create their own pooling system on the spot? These could be instant mini-insurers or mini-mutuals, a shared economy approach to insurance. An extensive Indian family might provide mutual health insurance to each other, backing it up with a combination of reciprocal arrangements with uncorrelated UK village health schemes and a standard international reinsurance product that a global reinsurer had developed for such family schemes. What if insurers never needed to fund risks? For example, people could have adjustable payments pooled to reflect rising and falling risk levels. Unemployment insurance could be merged with educational loans and deals struck over a lifetime so that young people could be funded in education, insured against unemployment, yet simultaneously be extending part of their employment income to provide others with risk cover.

Finding #4

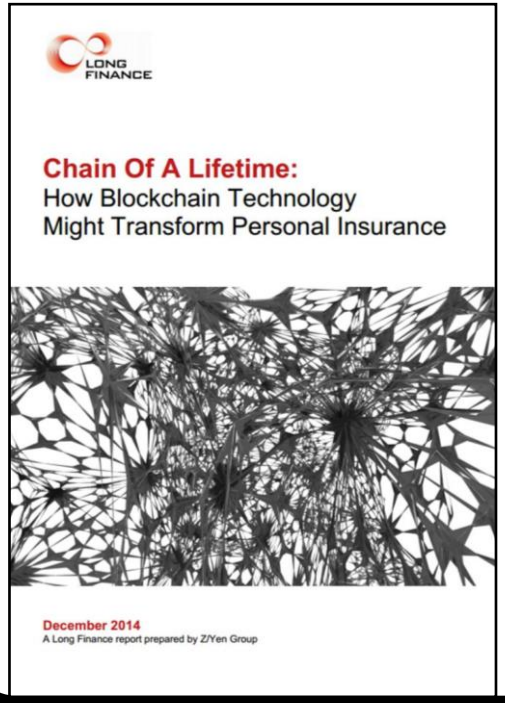
- Blockchain technology could influence perceptions of risk that could change the way insurers support mutualisation
  - empower people to manage risk more directly e.g. P2P or mutual insurance platforms based on blockchains (fully or partially funded)
  - if successful at scale, insurers' roles could shift over time towards expert advice and management of mutual pooling mechanisms (instead of directly absorbing risk)

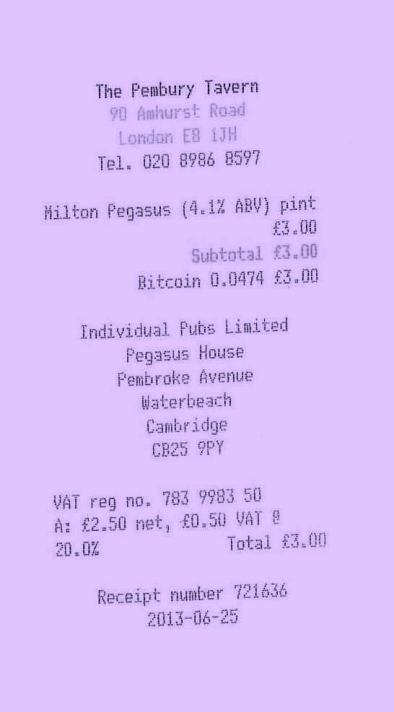
Issues

- Security and user/asset protection, e.g. exchanges (collapse, fraud), how users manage their information and accounts - balance between privacy and accountability
- Proof of validity - mining centralisation (51%) - though new blockchain protocols try to address that - how to incentivise block validation if not currency-based protocol?
- Content capacity
- Interfacing digital and physical worlds - compatibility with, and enforceability within, existing legal frameworks, e.g. distributed apps
- Performance parameters?

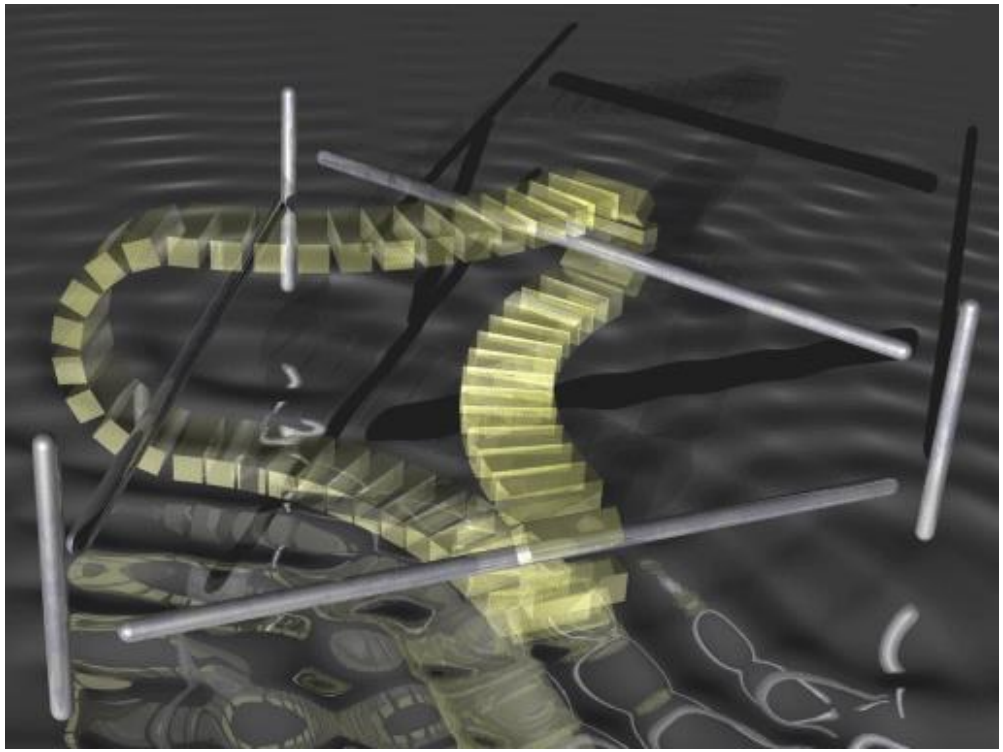
The Long-Term?

Theme	Service	Question
Trust	Identities	authentication
Space	Transactions	services
Time	Debts	value-added
Mutuality	Communities	common-wealth



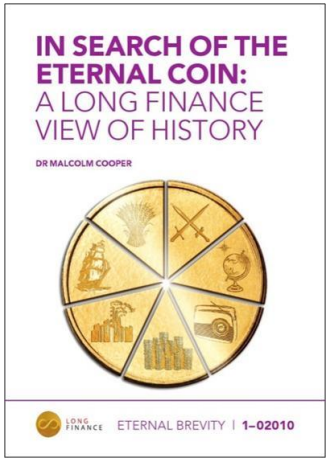


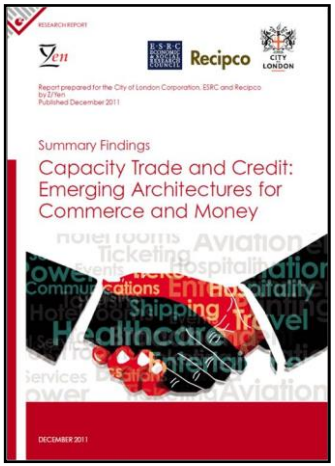
Trust – Space – Time – Mutuality



Money is the self-referential system upon which all our financial analysis is based:

- community values
- economic activity over space
- debts over time

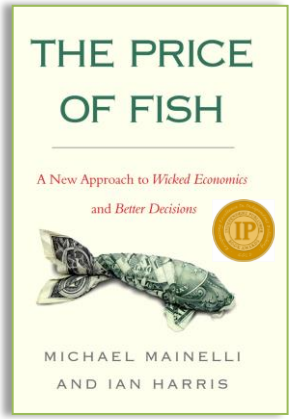




[Source: http://illusionsetc.blogspot.com/2005/08/moving-mobius-strip.html]

When Would We Know Our Commerce Is Working?

"Get a big picture grip on the details."
Chao Kli Ning



Welcome to Knightian Ignorance

"Are You Not Thinking What I'm Not Thinking?"

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