Digital Fiat Currency for Everyone and Now
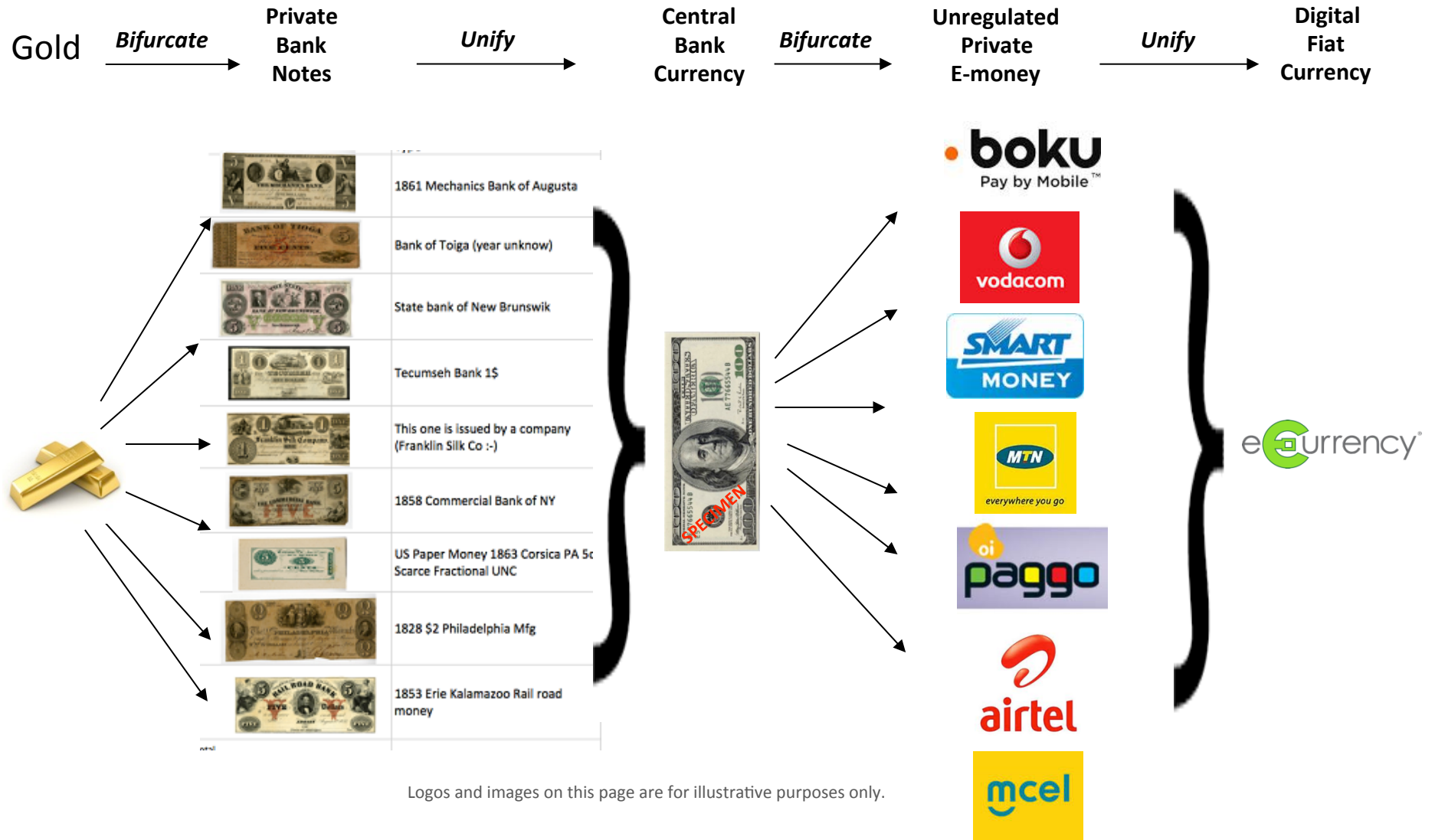
David Wen

Chief Scientist @ eCurrency

7/26/2016
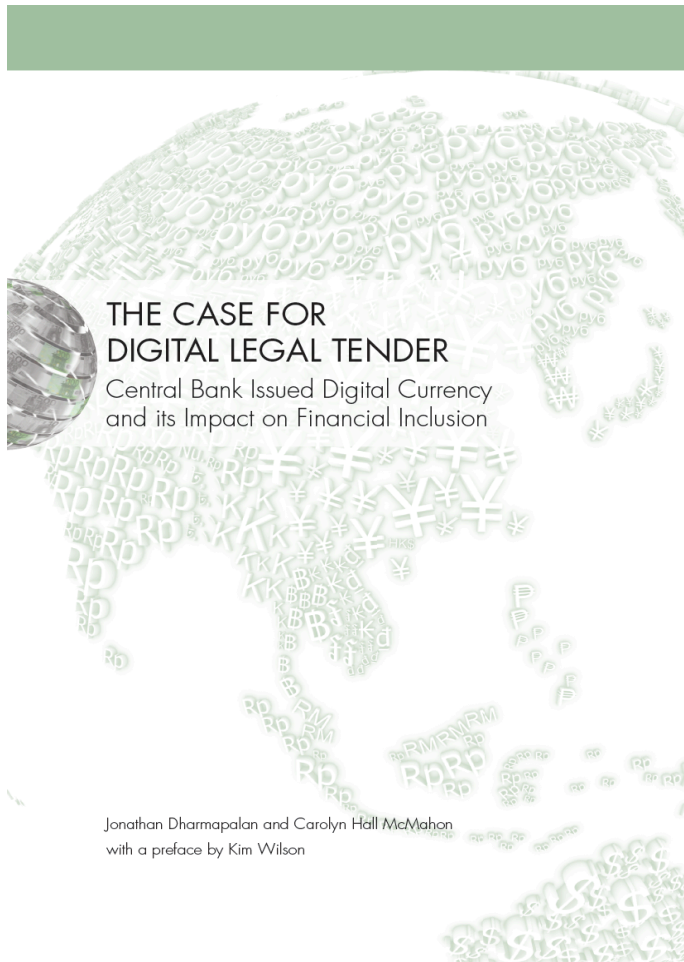
History Is Repeating Itself

Gold → *Bifurcate* → **Private Bank Notes** → *Unify* → **Central Bank Currency** → *Bifurcate* → **Unregulated Private E-money** → *Unify* → **Digital Fiat Currency**

Image	Description
	1861 Mechanics Bank of Augusta
	Bank of Toiga (year unknow)
	State bank of New Brunswik
	Tecumseh Bank 1$
	This one is issued by a company (Franklin Silk Co :-)
	1858 Commercial Bank of NY
	US Paper Money 1863 Corsica PA 5c Scarce Fractional UNC
	1828 $2 Philadelphia Mfg
	1853 Erie Kalamazoo Rail road money

boku — Pay by Mobile™

vodacom

SMART MONEY

MTN — everywhere you go

oi paggo

airtel

mcel

Logos and images on this page are for illustrative purposes only.

Digital Fiat Currency Is A Legal Doctrine

Physical Representations of Money	Fiat Currency (Paper and Coins)
• Created as a medium of exchange within a circle of acceptance	• Central Bank issued
• Privately issued	• Legal tender
• Non-reliable source to store value	• Sovereign denomination
• Accepted within a circle of users	• Unit of account, medium of exchange, store of value

Electronic Representations of Money (E-Money)	Digital Fiat Currency
• Issued (electronically) in exchange for currency	• Central Bank issued
• Privately-sanctioned	• Legal tender (in electronic form)
• Non-reliable electronic store of value	• Sovereign denomination
• Operates in closed systems	• Unit of account, medium of exchange, store of value

The Case for Digital Fiat Currency

eCurrency

THE CASE FOR
DIGITAL LEGAL TENDER

Central Bank Issued Digital Currency
and its Impact on Financial Inclusion

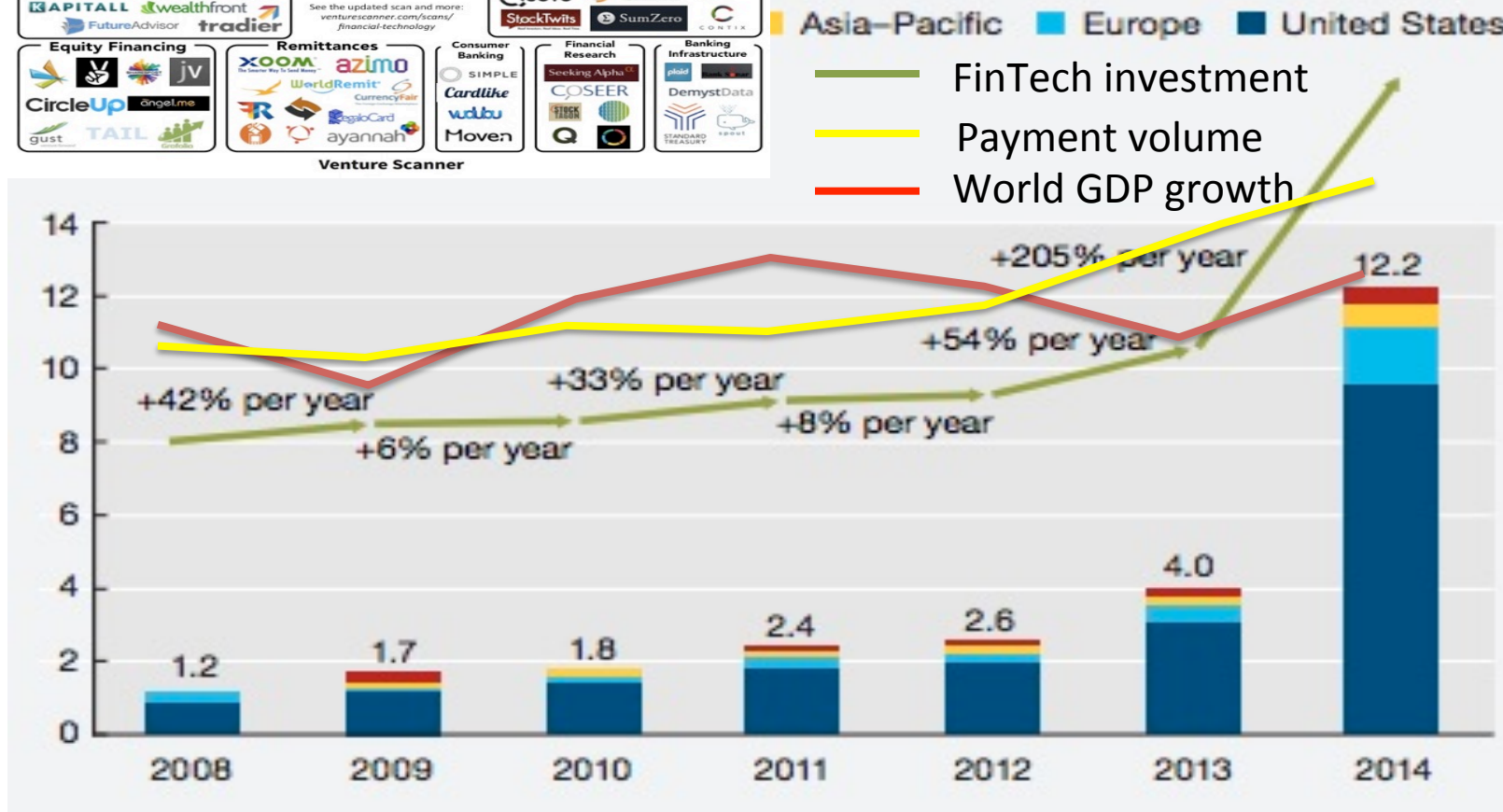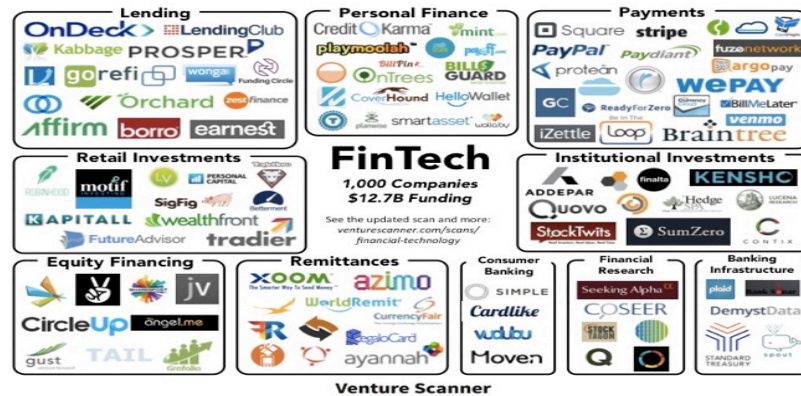Jonathan Dharmapalan and Carolyn Hall McMahon
with a preface by Kim Wilson

BANK OF ENGLAND

Staff Working Paper No. 605
The macroeconomics of central bank
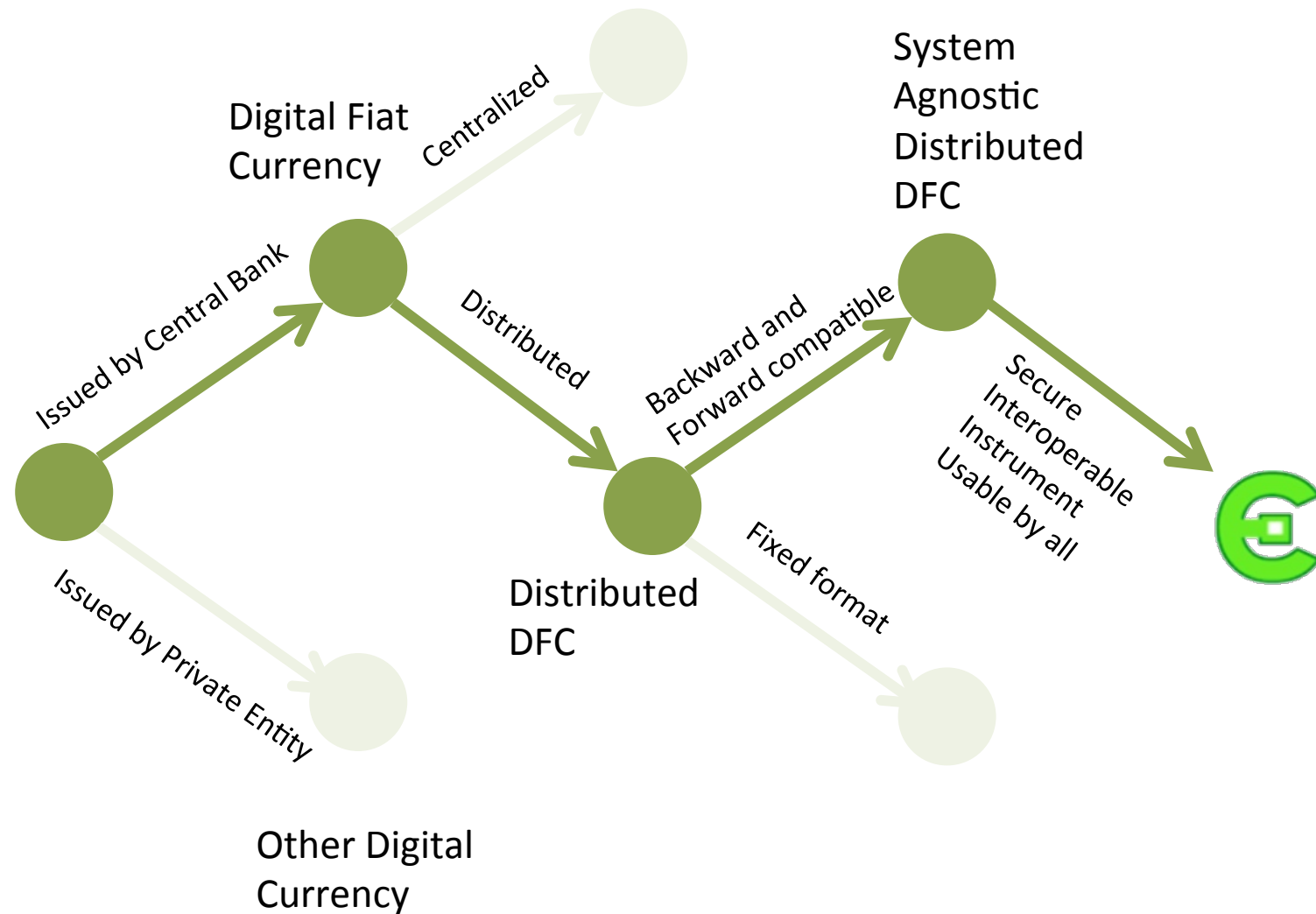issued digital currencies
John Barrdear and Michael Kumhof

July 2016

What Is Needed: A Zero To One Solution

Requirement for a Digital Fiat Currency

Digital Fiat Currency

Centralized

System Agnostic Distributed DFC

Issued by Central Bank

Distributed

Backward and Forward compatible

Secure Interoperable Instrument Usable by all

Issued by Private Entity

Distributed DFC

Fixed format

Other Digital Currency

Containerization is an zero to one innovation without creating a new means of transportation
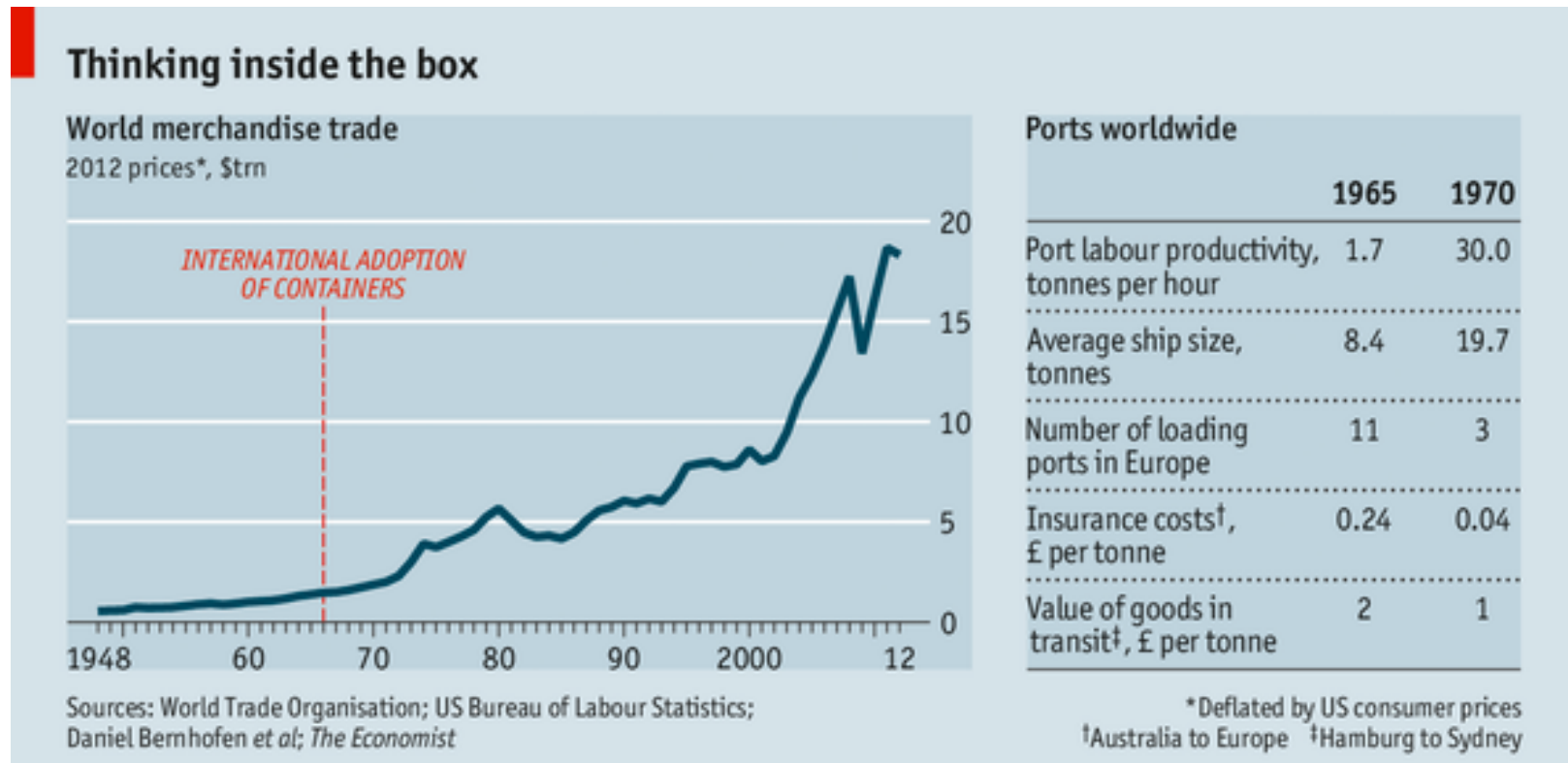

Governance Technology

- Standardization
- Enhance Security
- Interoperability
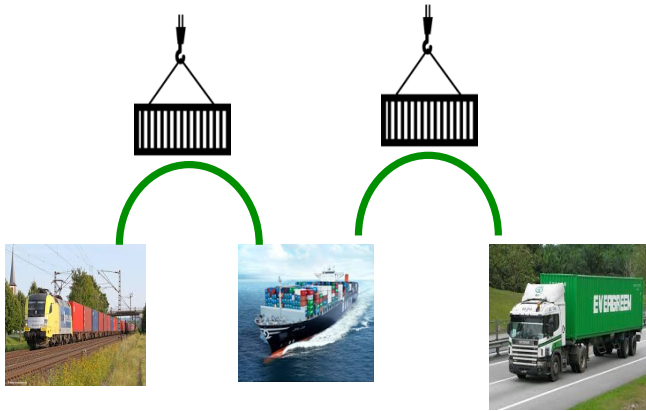- Reduce theft
- Efficiency
- Shorten time

Benefit of Containerization in 5 years

- 17 times productivity increase
- 6 times of cost reduction
- Better security and shorter transit

Thinking inside the box

World merchandise trade
2012 prices*, $trn

INTERNATIONAL ADOPTION OF CONTAINERS

1948 60 70 80 90 2000 12

(y-axis: 0, 5, 10, 15, 20)

Ports worldwide

	1965	1970
Port labour productivity, tonnes per hour	1.7	30.0
Average ship size, tonnes	8.4	19.7
Number of loading ports in Europe	11	3
Insurance costs†, £ per tonne	0.24	0.04
Value of goods in transit‡, £ per tonne	2	1

Sources: World Trade Organisation; US Bureau of Labour Statistics; Daniel Bernhofen et al; The Economist

*Deflated by US consumer prices †Australia to Europe ‡Hamburg to Sydney

Containerization: transport agnostic interoperable instrument

eCurrency: system agnostic secure interoperable instrument

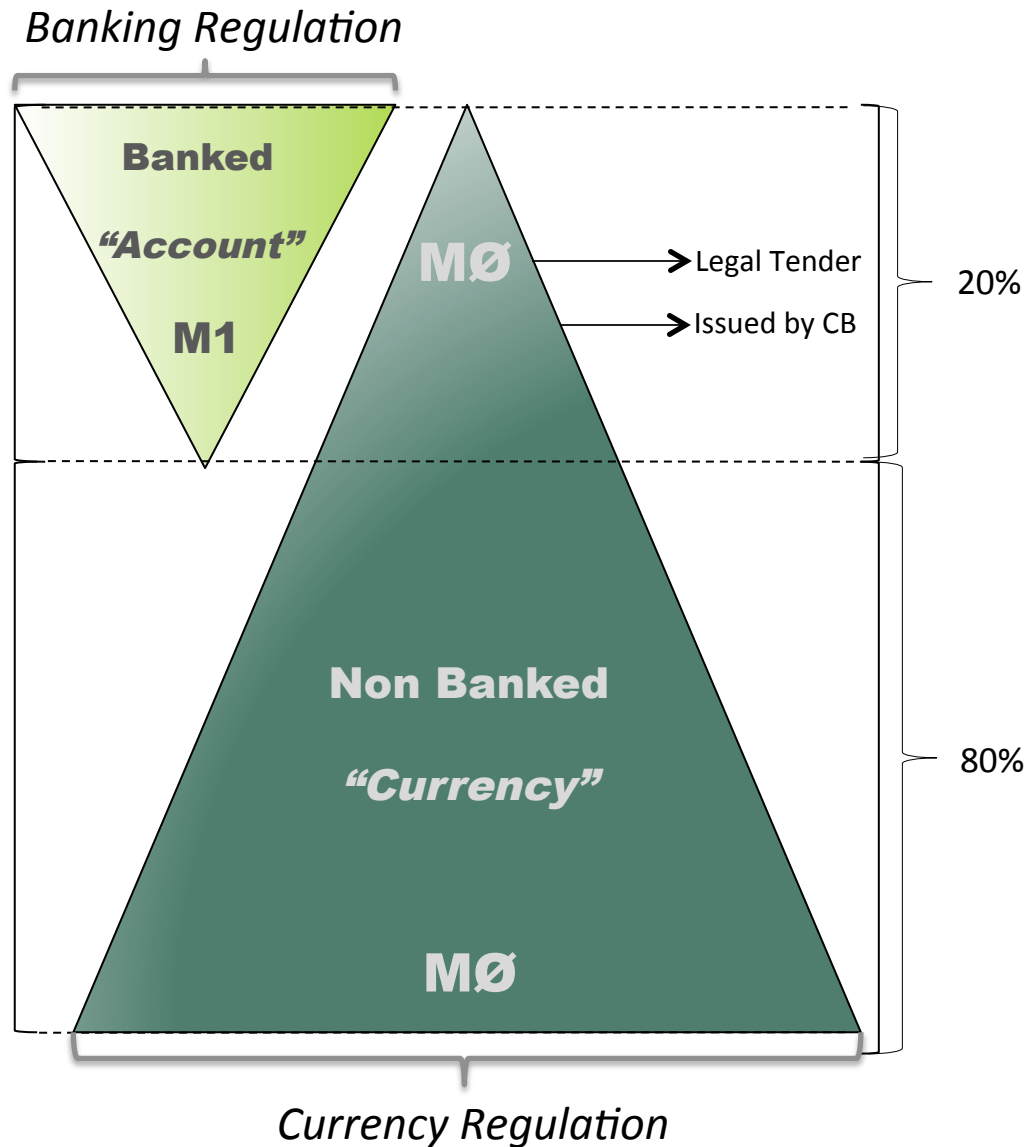eCurrency API and Appliance eCurrency API and Appliance eCurrency API and Appliance eCurrency API and Appliance
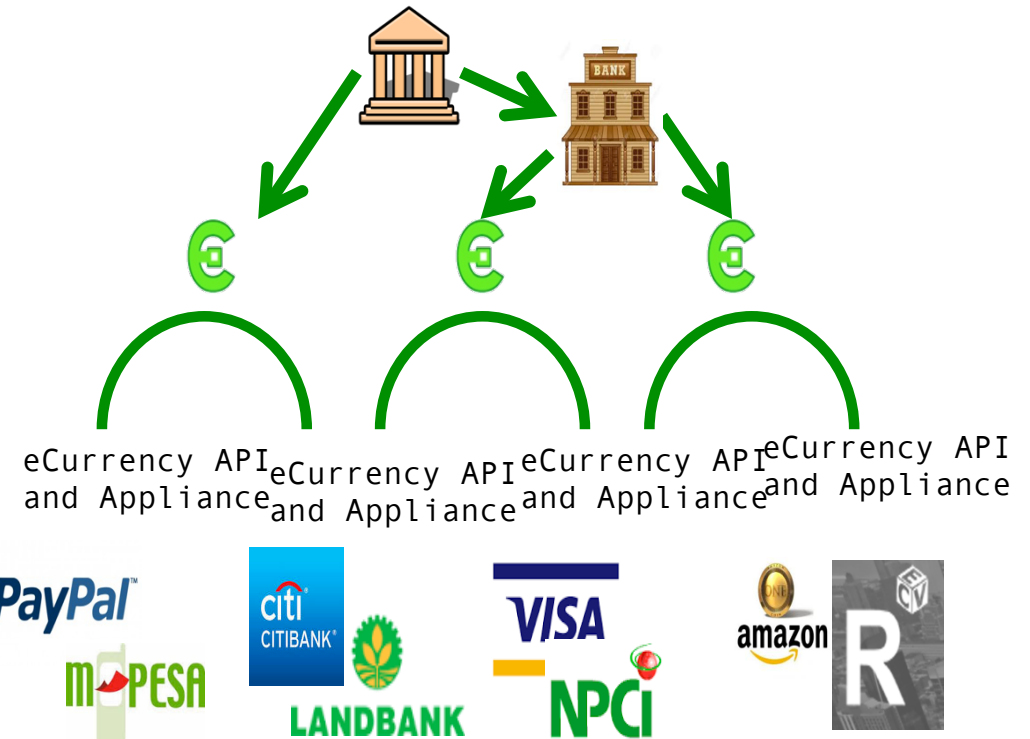
Logos for illustration only

We took the idea to Central Banks around the world
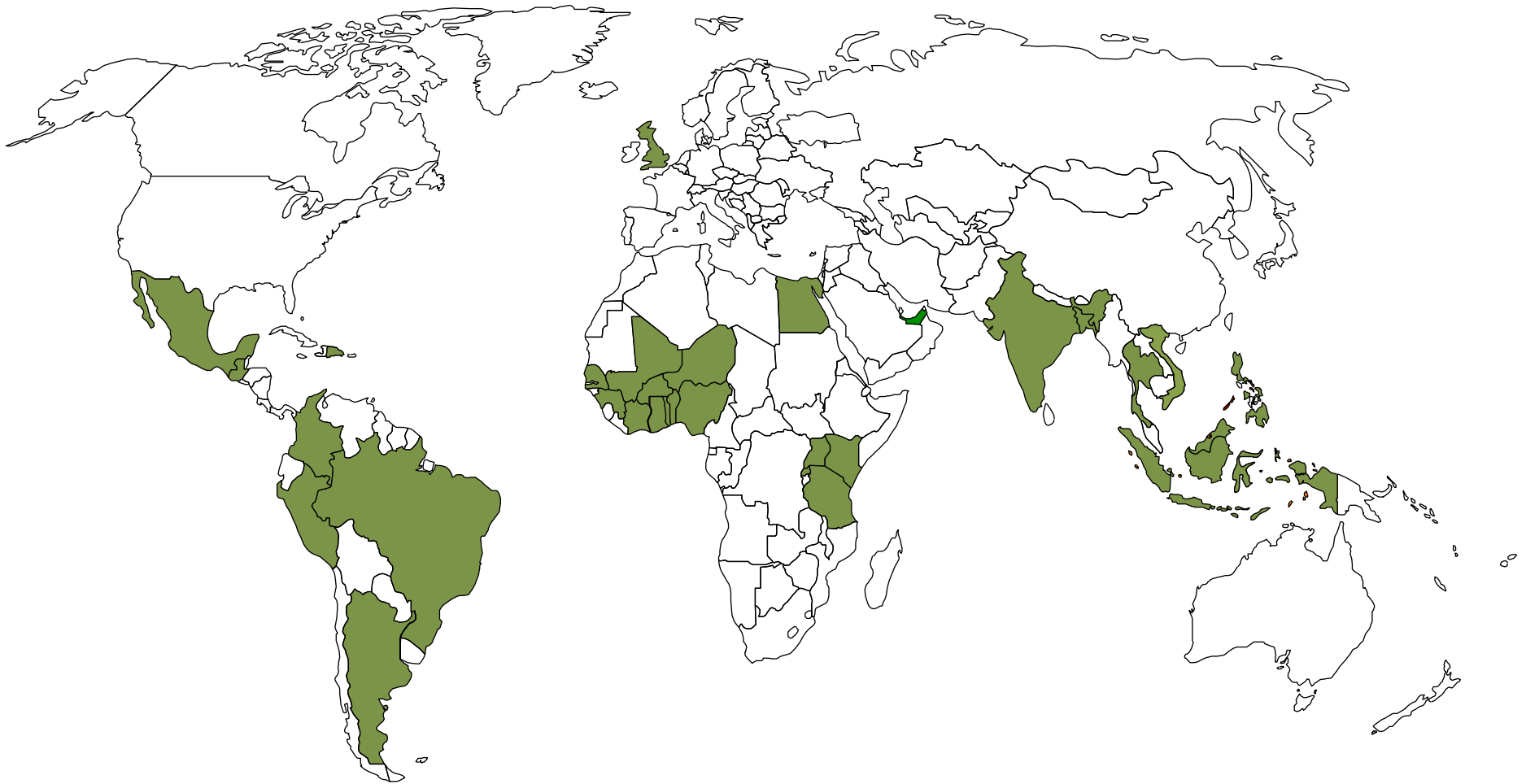
The Case for Digital Fiat Currency for Financial Inclusion

Banking Regulation

Banked

"Account"

M1

MØ → Legal Tender

→ Issued by CB

20%

Non Banked

"Currency"

MØ

80%

Currency Regulation

Logos for illustration only

Problem Use Case: Mobile Money Challenge

eCurrency

Much effort in FinTech were devoted to reaching customers with new eMoney systems (wallet, pre-paid, mobile money)

Initial success created more fragmentation of eMoney eco-system, and lack of interoperability forced consumer to perform interoperability by themselves: cashing out

Banks and the Central Bank didn't benefit much from proliferation of eMoney but has to bear the cost of handling more cash, and the regulatory risk

Solution: eCurrency (secure interoperable instrument)   e**C**urrency

Exchange money unit in eMoney system with eCurrency secure instrument and simple API for securitization

eCurrency allows the designated issuer (can be the Central Bank or designated bank(s) that is managing the reserve for the eMoney providers), to mange the supply, provide liquidity and observe eCurrency flow

Benefit for banks: Ability to manage liquidity, perform instant reconciliation, compliance, less cash use due to interoperability
Benefit for eMoney providers: less cash outlets, compliance better user experience and security against insider attack
FinTech companies: any new innovation FinTech eMoney solution can be added to the eco-system

eCurrency: Governance Technology

Legal

Governance Technology

FinTech

Central Bank

Issued by Central Bank and can be distributed by all Financial Institutions abide by existing rules and regulations

Past ← Wire - ACH — Debit Card – Mobile - BC/Blockchain → Future

Comparison Between Roles and Responsibilities

Central Bank	Dept of Transport
- Regulation, legal tender status	- Regulation
	- Crash test etc
X9/ISO	**ISO**
- Standard on protocol, API and security	- Standard on size, lock, strength etc
Commercial Bank	**Container port**
- Distribution	- Transshipment
- Liquidity/risk	- Inventory management
Payment Network	**Freight company**
- Lookup, routing	- Scheduling
- Messaging	- Routing
Mobile/Card/Web payment	**Truck/Train/Ship route**
- Customer acquisition	- Bill of lading
- KYC/AML	- Security of goods
Consumer	**Consumer/Business**
- Conduct transaction	- Conduct transaction

eCurrency Distribution Framework

Central Bank

Secure Instrument — Root Plate

Issuance

Governance & Monitoring — Dashboard

Commercial Bank

Digital Fiat Currency Distributors

eCurrency Plates
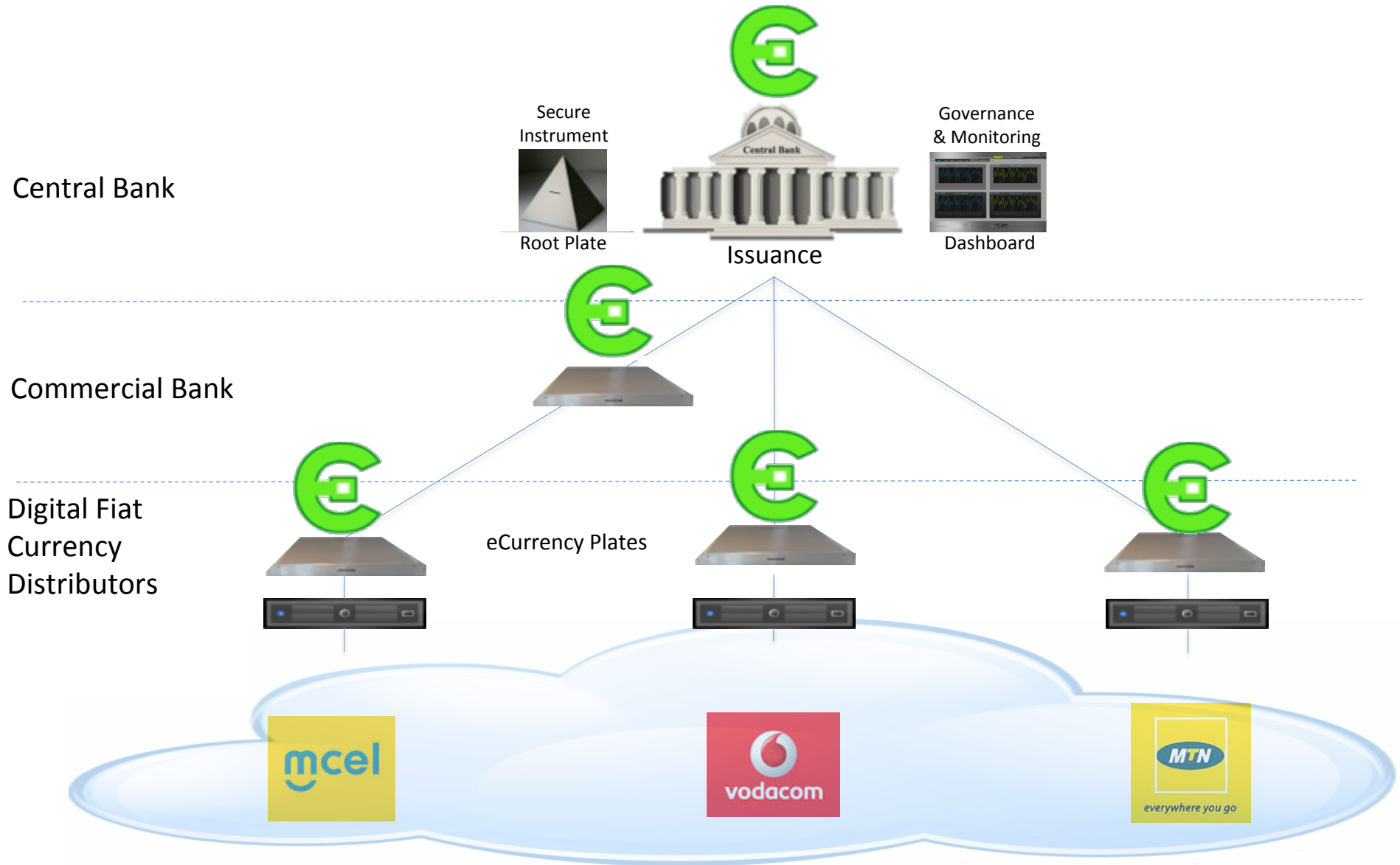
Logos for illustration only

Product deployed in the field in multiple countries
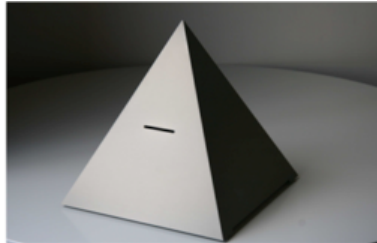
Secure Issuance

Secure Distribution

Secure Monitoring

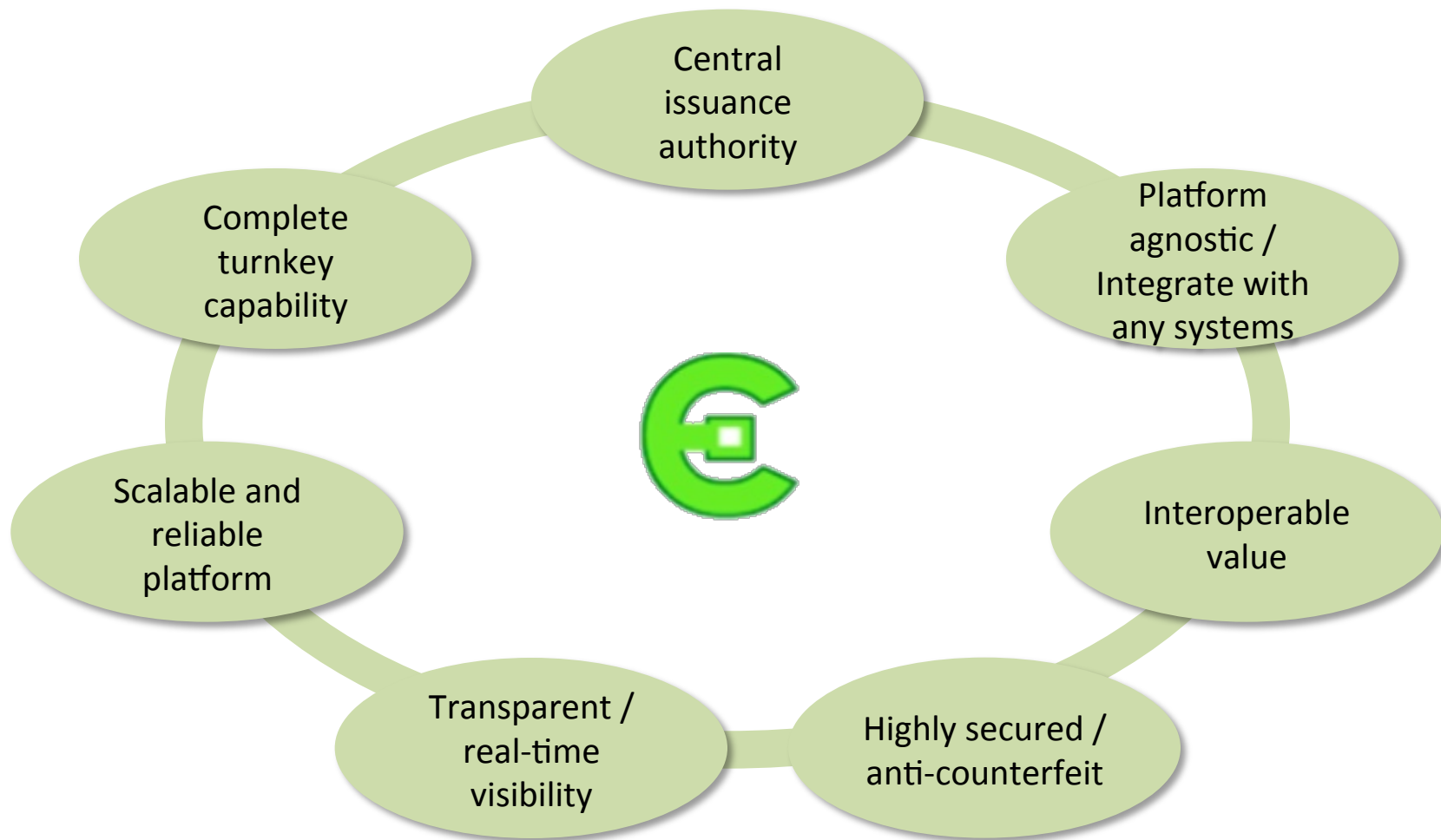|	
Mature	• Refined through careful design, continuous testing and successful deployments • 3 years in the making • Version 3.3 operating flawlessly since deployment
Secure	• Security built-in at the core of the system • Clearly defined boundary between currency and IT • Clearly defined boundary between online and offline systems • Best in class, audited processes for key creation and distribution
Scalable	• Tested to support multiple large operators at hundreds of transactions per second each • Scalable further on multiple axes
Reliable	• Highly redundant with hot failover • Extensively soak and load tested • De-centralized with high degree of autonomy per operator • Supports Disaster Recovery per customer policies
Supportable	• Engineered with operations and support in mind • Instrumented and IT monitored 24x7

Govern, Supervise and Monitor

eCurrency

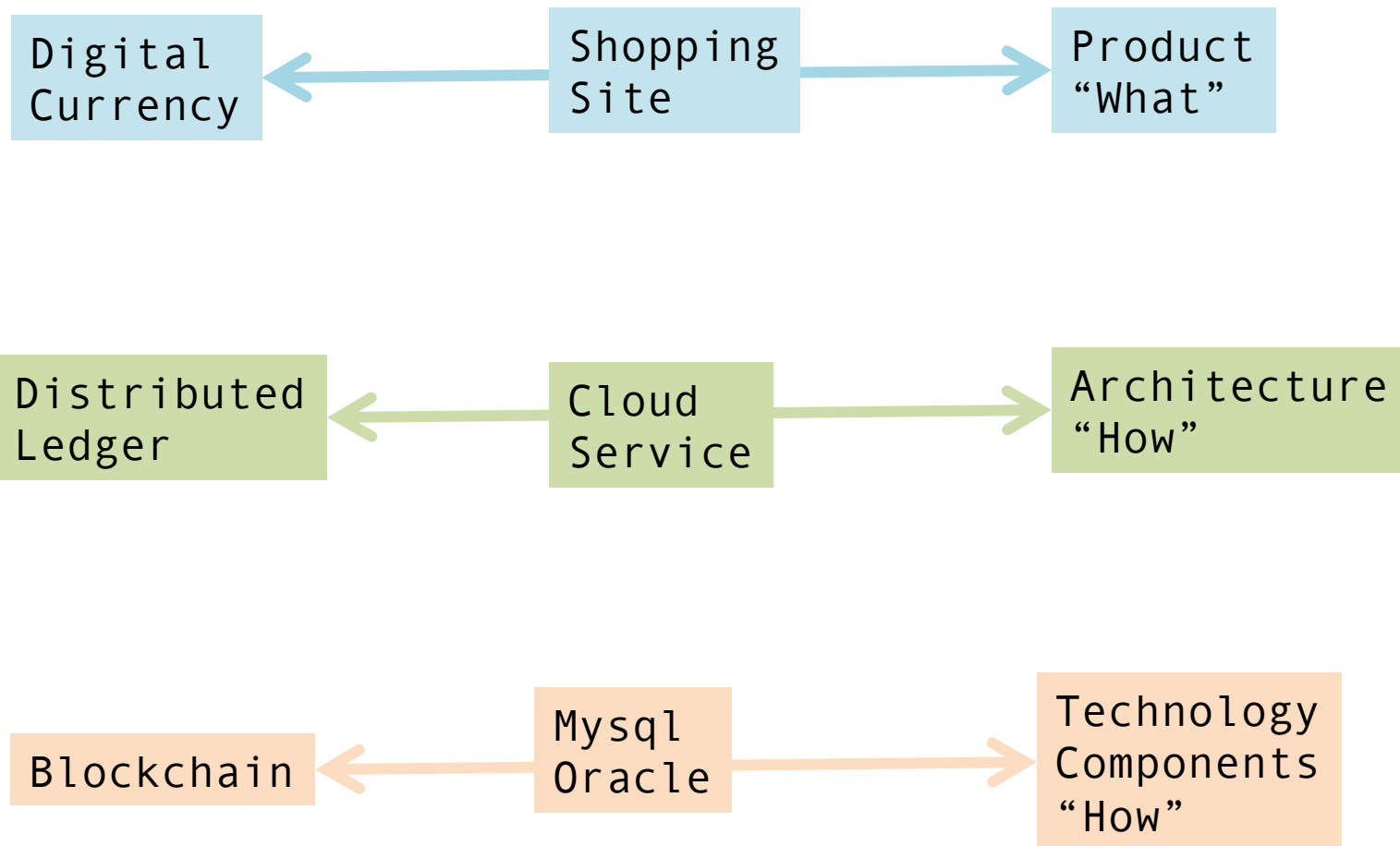Governance, Supervision and Control

I

Central Bank

Issuer

Real-time Data

Securely Monitored Transactions

mcel

vodacom

MTN
everywhere you go
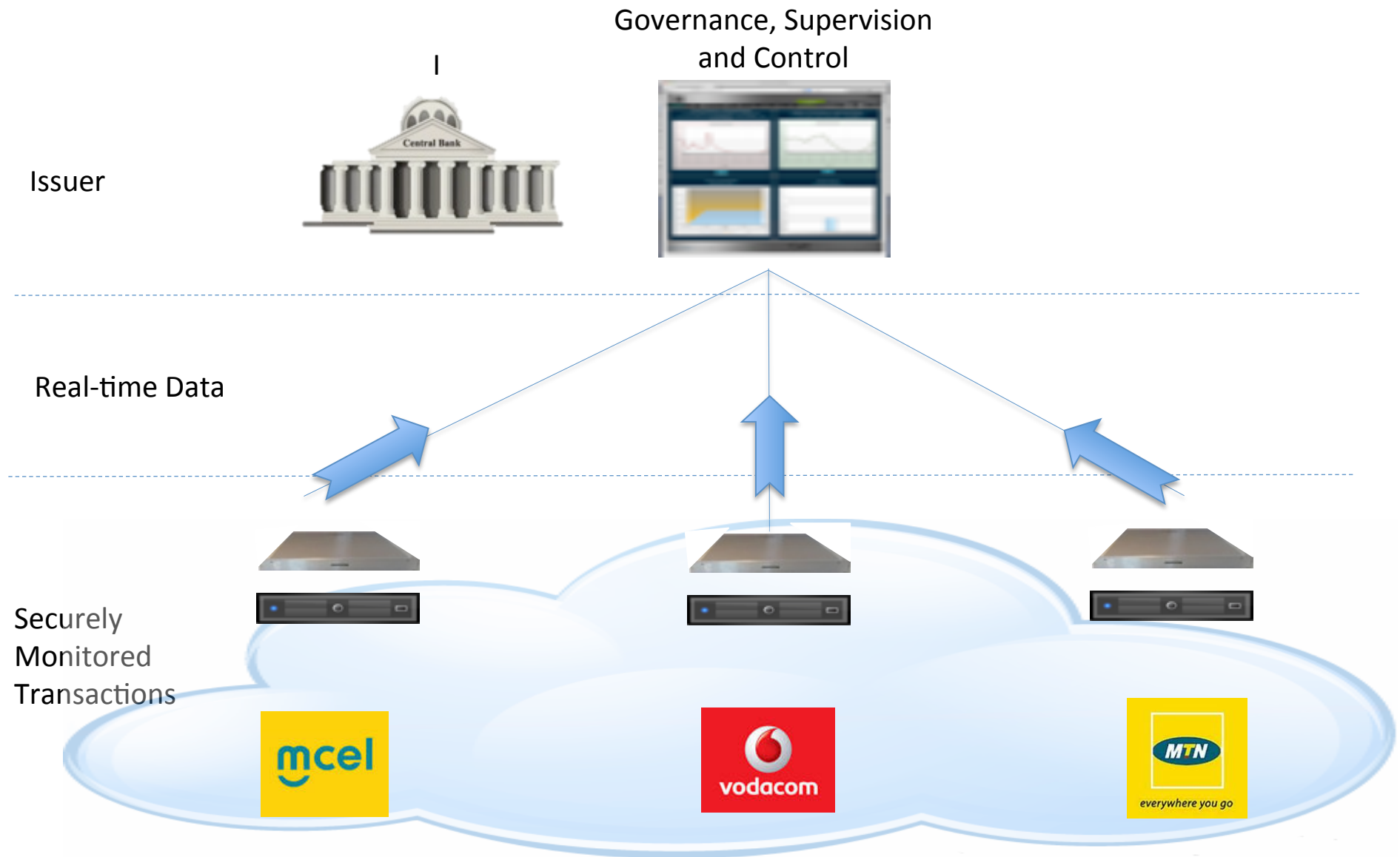
Logos for illustration only

Compliance and regulatory technology at work

eCurrency Property and Value Proposition

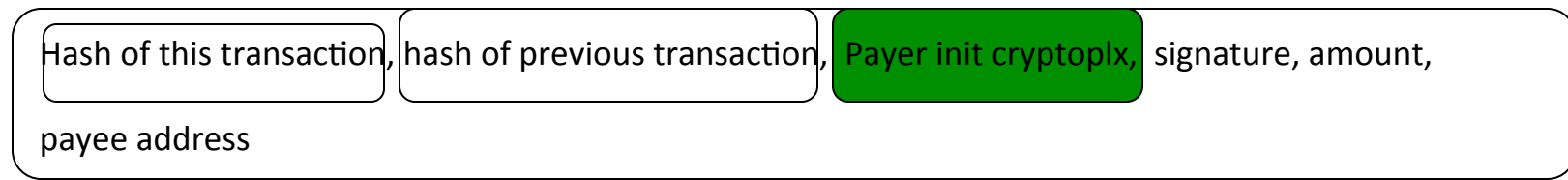- Central issuance authority
- Platform agnostic / Integrate with any systems
- Interoperable value
- Highly secured / anti-counterfeit
- Transparent / real-time visibility
- Scalable and reliable platform
- Complete turnkey capability

Clarification of Some Important Terms

eCurrency

Digital Currency	← Shopping Site →	Product "What"
Distributed Ledger	← Cloud Service →	Architecture "How"
Blockchain	← Mysql Oracle →	Technology Components "How"

eCurrency: A Inclusive Governance Technology

Centralized Ledger

Distributed Ledger(DL)

eCurrency enables:
- instant settlement
- wholesale and retail distribution
- interoperability

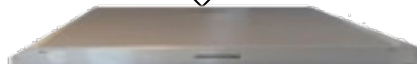eCurrency enables:
- Interledger settlement
- interoperability with non-DL

Digital Fiat Currency for all: Example for Permissioned Blockchain Interface
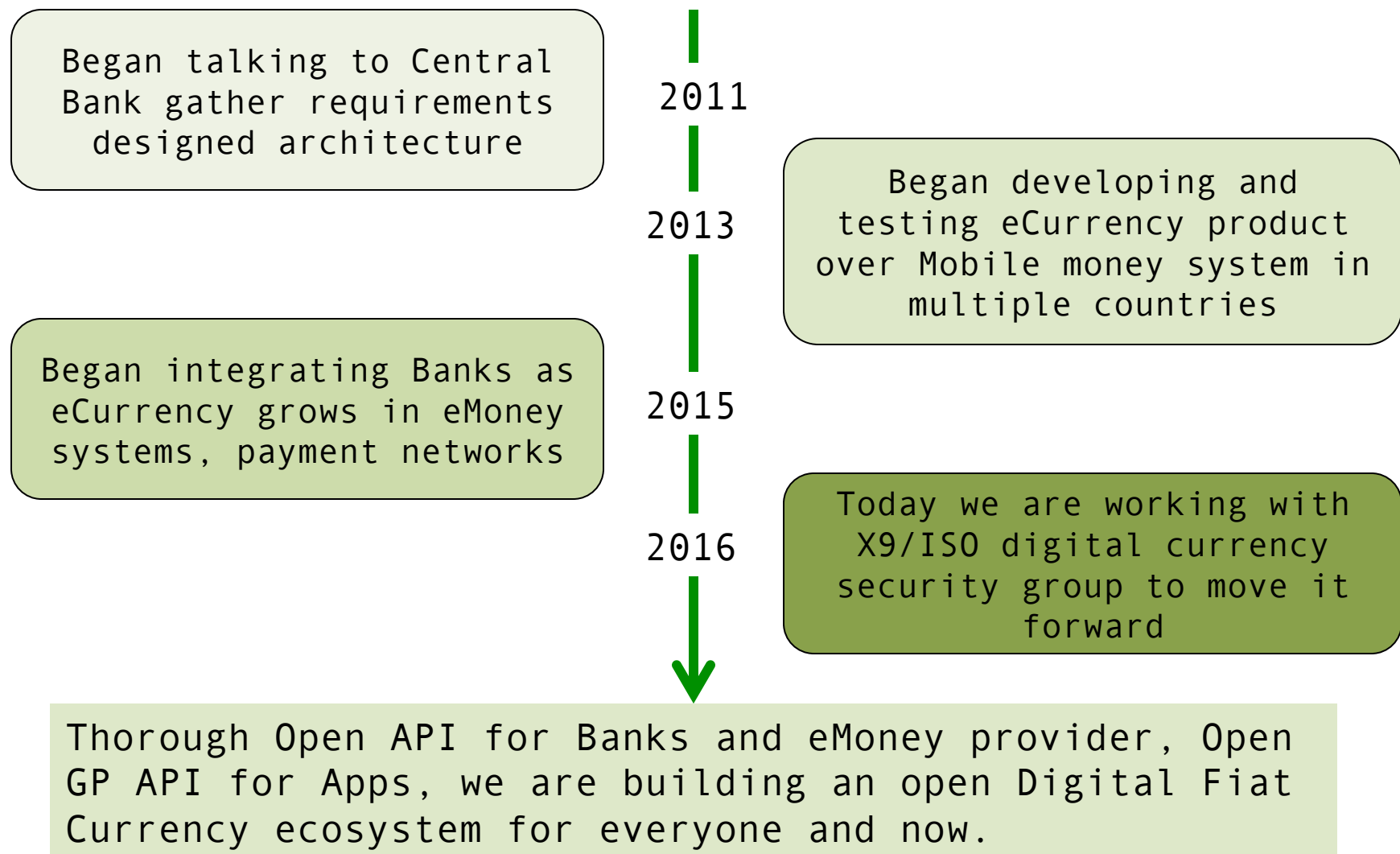
Fresh transaction submitted to consensus engine

Hash of this transaction, hash of previous transaction, Payer init cryptoplx, signature, amount, payee address

⬇ Submitted via API to eCurrency plate

⬇ Returned to consensus engine

Hash of this transaction, hash of previous transaction, Payer final cryptoplx , signature, amount, payee address, payee cryptoplx
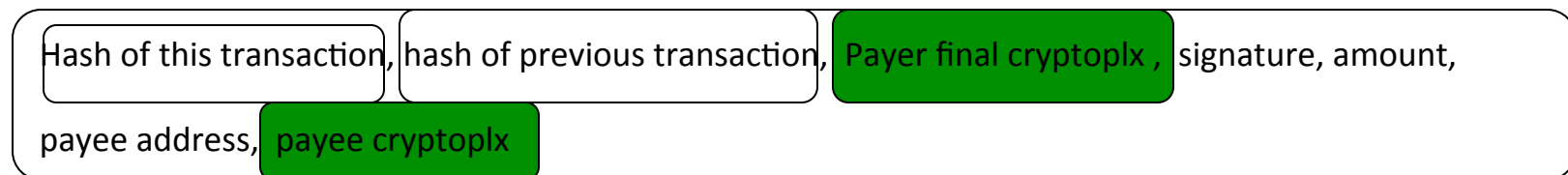
Consensus engine to include into next block

Https://www.ecurrency.net
david.w@ecurrency.net

Https://x9.org

THE CASE FOR
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Jonathan Dharmapalan and Carolyn Hall McMahon
with a preface by Kim Wilson

THE
BOX
How the Shipping Container
Made the World Smaller and the
World Economy Bigger

Marc Levinson

Https://www.ecurrency.net/whitepaper.ps

https://www.amazon.com/Box-Shipping-
Container-Smaller-Economy/dp/
0691136408