Korea Capital Market Institute

Money in the Digital Age

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“Money is a score, and more”©

- “Money is an entry in a data base”, Elon Musk
- “Money is societal memory” *PLUS*

Scores in life	Medium of exchange	Interoperability
• Liquid wealth	✓	
• Illiquid wealth	✓ ?	
• Airline miles	somewhat	
• Game token (monopoly money)	No	
• Parking tickets	No	
• FICO score/Social score	No	
• Spouse brownies	No	

- Score = “wealth on a platform/data base” (unit of account + store of value)
- Money = score + medium of exchange + store of value (privacy)

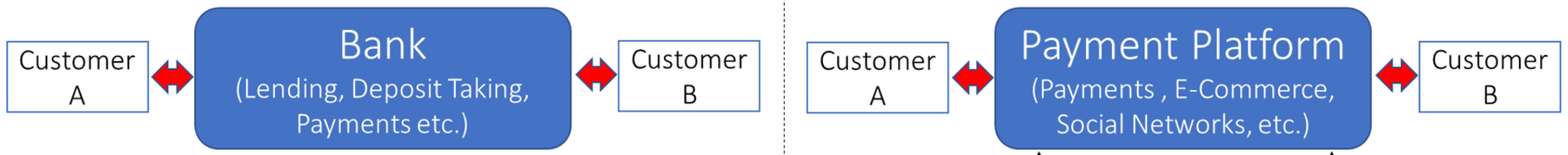
Roles of Money in a Digital World

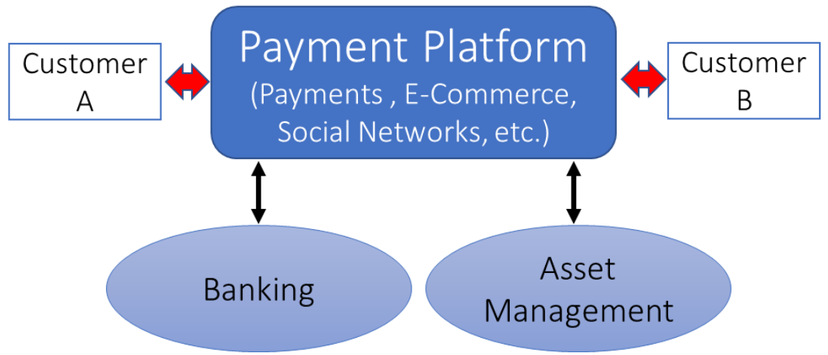
- **Record keeping device** "Money as societal memory"
- **Unit of account**
  - Behavioral: Language analogy, translation software, AR glasses
  - New Keynesian: Price Stickiness
  - MacroFin: Denomination of debt (market incompleteness)
- **Medium of exchange**
  - Network externalities due to switching costs decline
- **Store of value**

- With Fintech does money lose its specialness/essentiality (Hahn)?

Tech Trends that Impacts Money

- Smart phone — **M-Pesa**
- DLT (Blockchains) — **Bitcoin**
- Token (vs account-based)
- Big data, AI, deep learning, → inverse selection
- Digital platforms/ecosystems – **Alipay**, **WechatPay**





- Smart contracts and money
- Internet of things: payments from machine to machine
- Micropayments

Money and Payments

- Back-end plumbing
  - Record keeping
  - Verification (no double spending)
  - Netting
  - settlement
- Front-end component
  - Costumer interface
  - “smart contracts”
- Public good criterion
  - network’s cybersecurity infrastructure
  - network externalities
  - Data privacy
- Innovation criterion
  - functions that are less open for innovation

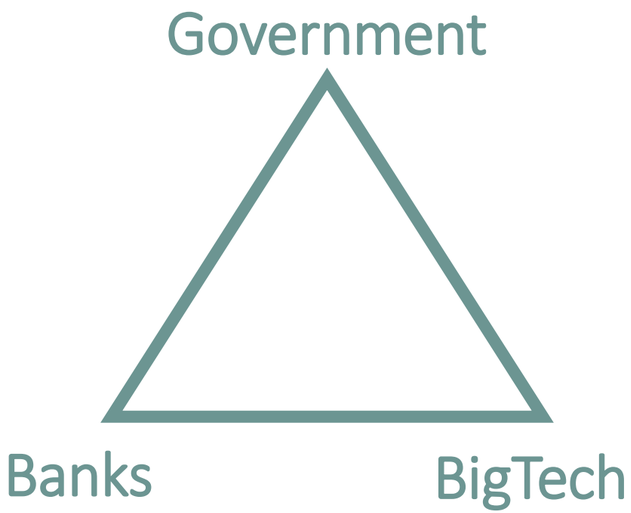
Public Private Partnership

- Current 2 tier system: ***multiple issuers, but one money***

  Government — outside-money/unit of account/settlement among banks

  Banks (private) — inside money

- Future 3-way arrangement:



- International Competition

Public Private Partnership

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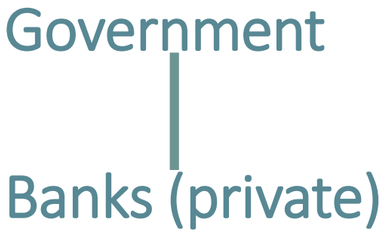
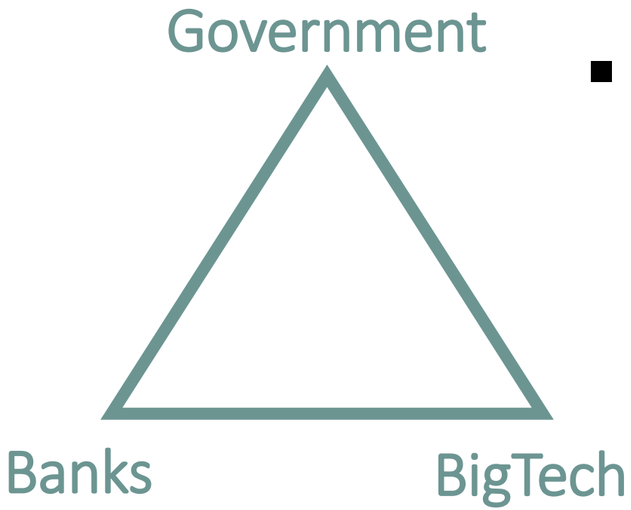


- Future 3-way:



- Why CBDC?
  - After cash:
    grant citizens access to public money
  - Preserve monetary sovereignty
    - Avoid “digital dollarization”…
  - Get around ZLB + cybersecurity
- Timing and Transition and financial stability

- International Competition

Uniformity/Singleness of Money

- "Many issuers, but one money"
  - Inside money (checking accounts, …)

- Why uniformity of money?
  - Eases price comparison – easier in digital world anyway
  - Eliminate exchange rate risk
  - Information insensitiveness – no lemon's problem

- Should we allow many forms of (digital) tokens?
  - New Digital Currency Areas
    - What is a separate currency?
      - Different unit of account OR no legal conversion claim (stable coin)

Monetary Sovereignty	Purview
▪ Monetary policy to manage business cycle Should Facebook's MoPo manage the macroeconomy? ▪ **Unit of account** role of money	*Central Bank*
▪ Seigniorage rents from money creation ▪ **Store of value** role of money ▪ Financial repression	*Central Bank* *& private banks*
▪ Power to bail out and to provide liquidity LOLR ▪ Connected to taxing power, fiscal space, governance	*Subsidy to private banks*
▪ Power to exclude from monetary system	*?*

with Harold James and Jean-Pierre Landau

“Digital Dollarization” – “Digital Colonialization?”

- Loss of “unit of account” role of money
  - Via medium of exchange (invoicing)
    vs. store of value (reserves)

  Sudden and highly non-linear (Chang&Velasco 2006)
- Vulnerable countries: small, socially open
  - Small, open economy, large informal sector
  - Inefficient electronic payment system

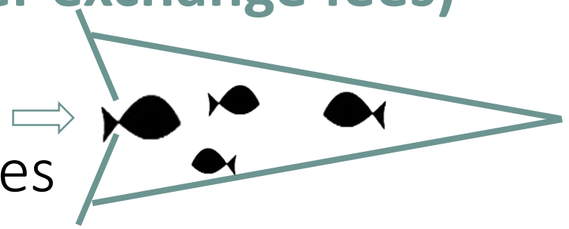
Nepal suspended AliPay and WeChat pay
May 2019

- Defense:
  - CBDC since, (Public) Cash is poor substitute for private digital money

    Private “stable coins” via 100% narrow bank (whole sale CBDC)
  - LOLR and taxing power + taxes in local currency
- Offense: Internationalization of the $/Remimbi/Euro

Platform and Tokens – with Jonathan Payne

Low interoperability (higher exchange fees)



1. Lock people in and large platform dominates
   - limits competitions across platforms/tokens

"lure you in, lock you in, and inflate value away" ("Hotel California")

Increased interoperability (lower exchange fees)

1. Platforms switches to a low volume, high markup business model
2. Financial instability: Run on tokens
3. Prevents platforms from using tokens to redistribute to improve platform matching efficiency
   - Matching efficiency depends on network thickness externalities
     - attracting large and small sellers to enhance competition on platform

- Increasing $-money growth, go for ₮ seigniorage (instead of markups)

… to sum up

- Money
  - Digitalization raises old questions in a new context
  - Key innovation: AI and platforms
- New currency/platform competition – digital dollarization
  - Interoperability, convertibility, limit product differentiation
- Non-geographic digital currency areas
- "Monetary Sovereignty" to manage macroeconomy
  - Private vs. Public Money – important role of CBDC/LOLR

Is Bitcoin/Libra is like Napster was for the music industry?

Based on Research with various Coauthors

- The Digitalization of Money
  - With Harold James and Jean-Pierre Landau
- On the Equivalence of Private and Public Money
  - With Dirk Niepelt
- Digital Tokens and Platforms
  - With Jonathan Payne
- Inverse Selection
  - With Rohit Lamba and Carlos Segura-Rodriguez