CPMI report on "Digital currencies"

Regional Payments Week 2015
December 2015

Introduction

2008
9-page proposal for a 'peer-to-peer electronic cash system' by Nakamoto

2009
Nakamoto mines the first 50 units of bitcoin and put them into circulation

2010
online exchange Mt. Gox begins trading bitcoins

2014
Mt. Gox goes to bankruptcy

2013
first bitcoin ATM starts to operate in Vancouver

2013
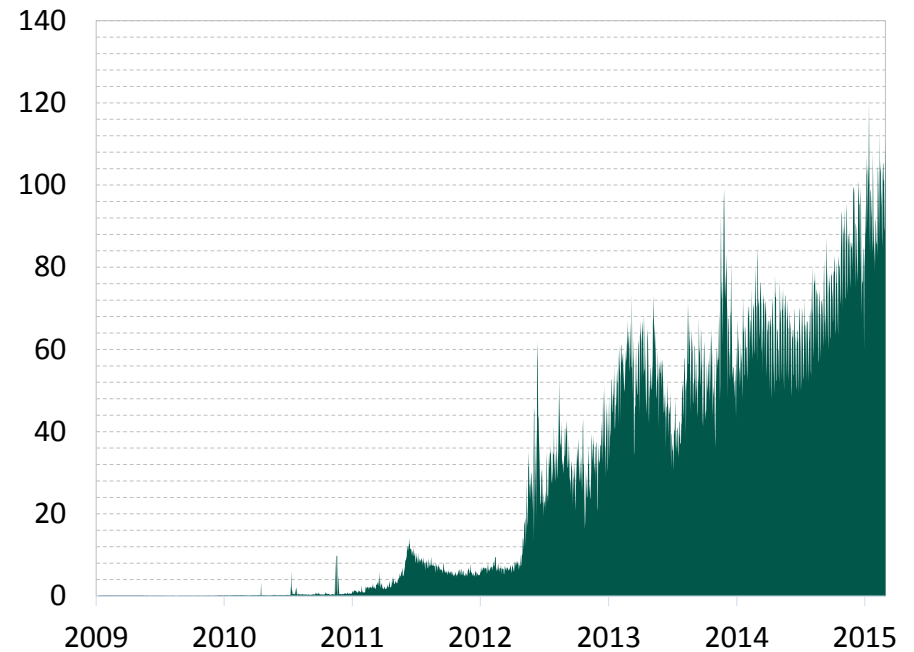Silk Road marketplace operator arrest: media attention

Introduction

Bitcoin/USD daily closing price
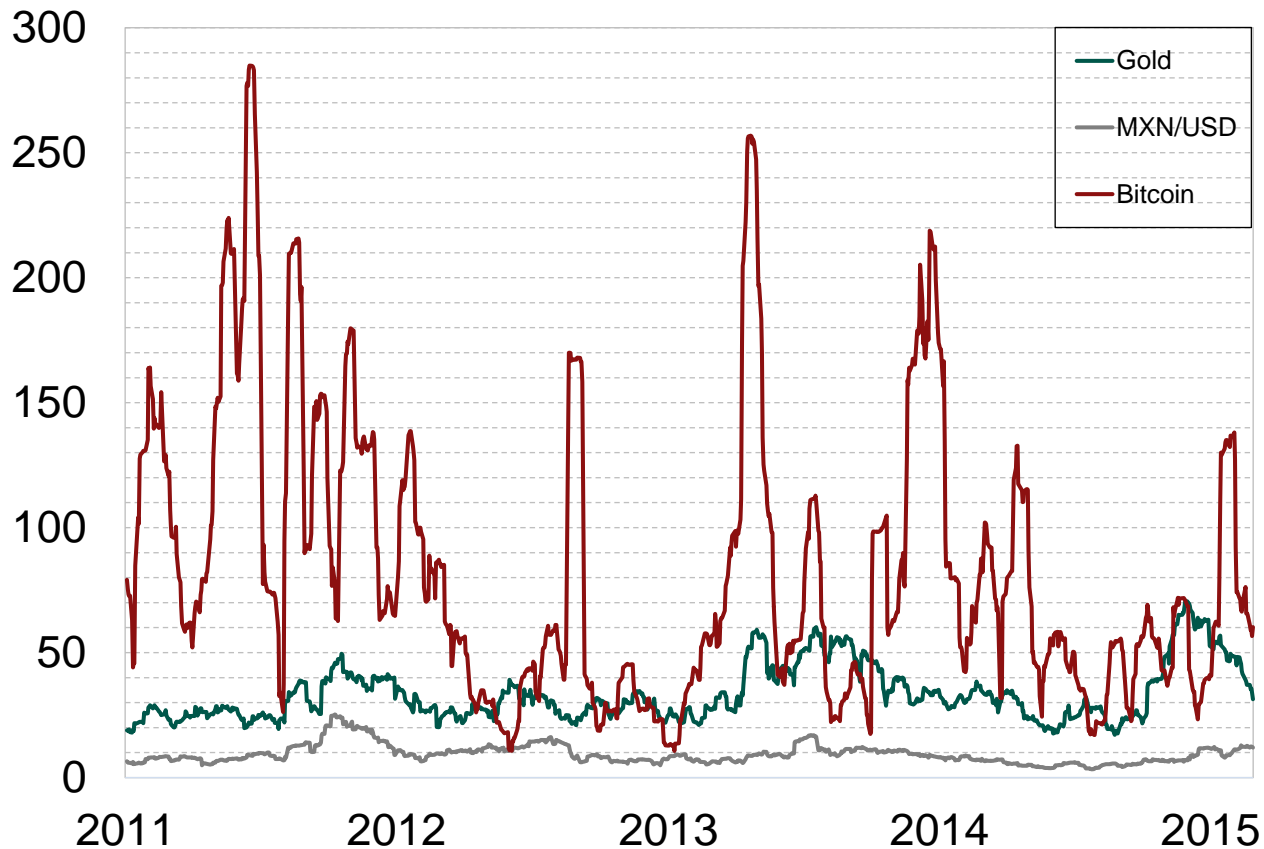Jan.2010 - Nov.2014

Source: CoinDesk

Bitcoin daily number of transactions
Jan.2009 - Nov.2015

Source: CoinDesk

Introduction

Price Volatility
Jan.2010 - Nov.2014

Source: Bank of Mexico, CoinDesk, Yahoo! Finance
1/ 21-day annualized standard deviation over daily closing prices.

Outline

Introduction

- Digital currency schemes:
  - Not widely used or accepted
  - Face challenges that could limit their future growth

- Influence on financial services and the economy is negligible today and probably in the long term.

- Distributed ledgers may be used when a central party is not cost-effective.

- In most jurisdictions they typically do not satisfy the legal definition of e-money.
  - Digital currencies may meet the broad conceptual definition of e-money,
  - In many jurisdictions, the value stored and transferred must be denominated in a sovereign currency to be considered e-money.

Outline

1 Introduction

2 Key features and uses of digital currencies

3 Factors influencing the development of digital currencies
  a) Supply side factors
  b) Demand side factors
  c) Role of regulation

4 Implications for central banks
  a) Consumer protection
  b) Financial stability and monetary policy
  c) Potential issuance of digital currency by central banks

5 Conclusions

Key features and uses of digital currencies

Assets :

- Value determined by supply and demand

- Not a liability of any individual or institution; not backed by any authority

- Value relies only on the belief that they might be exchanged for other goods or services

- Issuance is typically determined by a computer protocol → no single entity manages the supply

Key features and uses of digital currencies

Distributed ledgers :

- Mechanism settles electronic value in the absence of trust between the parties and without no intermediaries

- Typically, a payer has cryptographic keys that give access to the value

- The payer uses these keys to initiate a transaction that transfers a specific amount of value to the payee

- The confirmation process for digital currency schemes can vary in terms of speed, efficiency and security

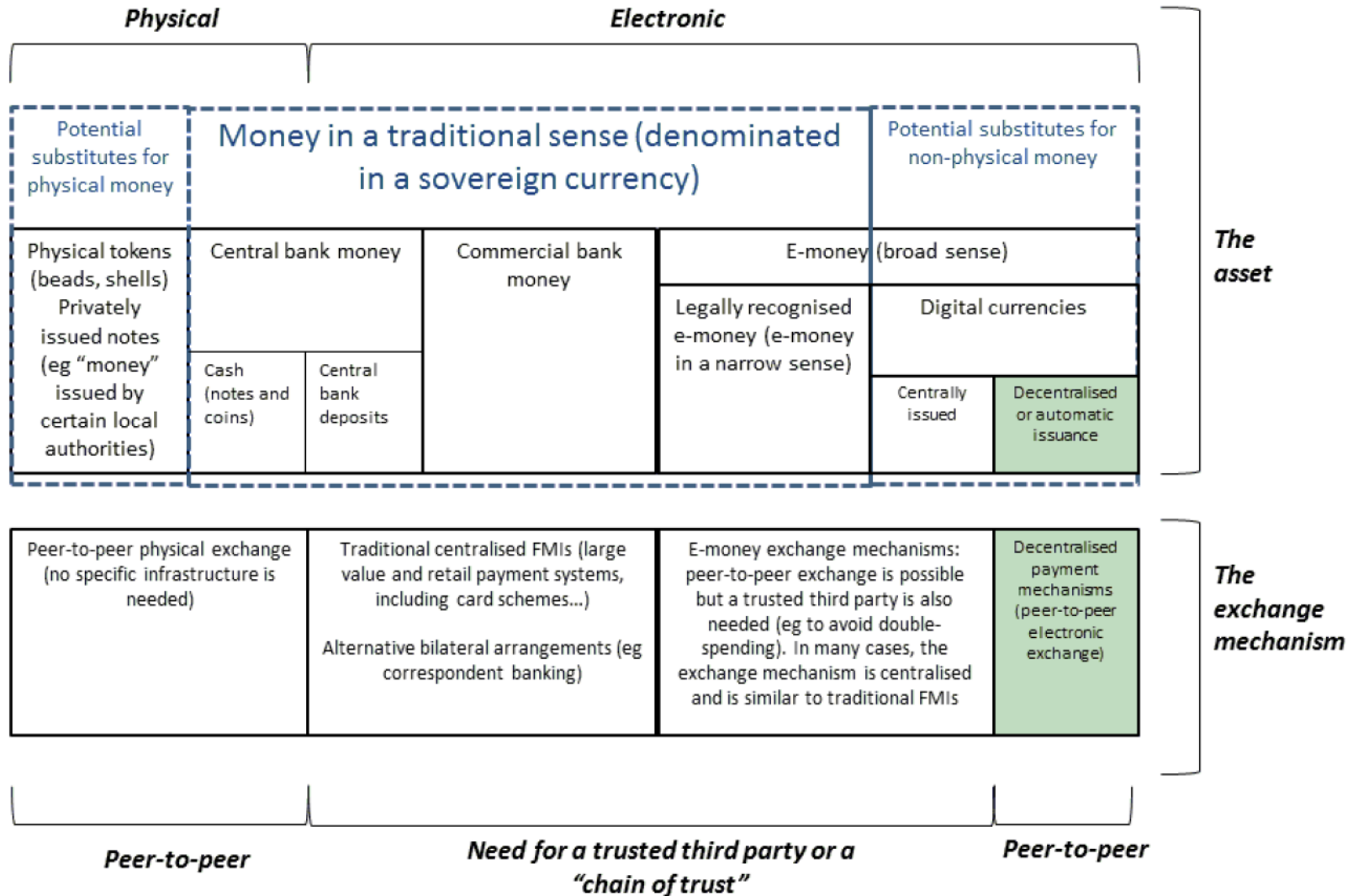# Key features and uses of digital currencies

Amount of stored information :

- Vary from a bare minimum to a wealth of information.

- Most digital currency schemes require very little information to be kept in the ledger.

Institutional arrangements:

- Decentralized: Not operated by any specific individual or institution, as opposed to the operation of an e-money scheme.

- A number of intermediaries supply various technical services:
  - Wallet services
  - Exchange services

Key features and uses of digital currencies

Outline

Factors influencing the development of digital currencies

Supply side :

- Development mainly driven by private sector non-banks

- Factors that could have an influence :
  - Fragmentation: 600+ competing digital currencies (critical mass)
  - Scalability: share of transactions is almost negligible today
  - Efficiency: apparently resource-intensive in computational power → energy
  - Pseudonimity: AML/CFT requirements
  - Technical and security concerns
  - Business model sustainability: profit from seigniorage sometimes capped or decrease over time & high operating costs

Factors influencing the development of digital currencies

Demand side :

- Security: scheme & intermediaries
- Cost: lower transaction fees
- Ease of use
- Volatility and risk of loss
- Irrevocability: lack dispute resolution
- Faster processing speed
- Cross-border reach
- Data privacy/pseudonimity
- Marketing and reputational effects: innovative and interesting payment methods → merchants adoption

Factors influencing the development of digital currencies

Role of regulation :

- Novelty of digital currencies → do not fit easily in regulation
  - Borderless online nature
  - Absence of an identifiable "issuer" of the instrument

- Illegal activities

- Compliance with AML/CFT obligations

Outline

Implications for central banks

Consumer protection :

- Volatility of digital currencies value

- Risk of fraud: irrevocability of payments favors the payee

- Operational risks: ledger could be compromised

- Legal risk: no legal structure or clarity of rights

- Liquidity or credit risks

- Money laundering or criminal activities: high anonymity

Implications for central banks

Financial stability and monetary policy :

- Financial market infrastructures:
  - Distributed ledger technology
    - Pledging of collateral
    - Registration of financial assets

- Broader financial intermediaries and markets: disintermediation of traditional service providers

- Decline in central bank seigniorage revenue

- Monetary policy: effect in implementation of monetary policy
  - Change in demand for bank reserves
  - Financial interconnection between sovereign currency and digital currency

Implications for central banks

Potential issuance by central banks :

- Distributed ledger currencies could be issued by the central bank

- Raises a wide range of questions:
    - Impact on the payments system
    - Privacy of transactions
    - Impact on private sector innovation
    - Impact on deposits held at commercial banks
    - Impact on financial stability
    - Impact on the transmission of monetary policy
    - Technology employed and degree of decentralization
    - Type of entities that would exist in such a system and their regulation

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Conclusions

- Impact on payment systems and services:
  - Disruption of existing business models and systems
  - Emergence of new financial, economic and social interactions

- Widespread adoption → potential effects on monetary policy or financial stability

- Digital currency users → price and liquidity risks

- Genuinely innovative element: the distributed ledger
  - Peer-to-peer payments without a central party

- Central banks: investigate the potential uses of distributed ledgers in payment systems or other types of FMIs

- AML/CFT: consensus among jurisdictions to treat similar products and services consistently is essential

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