



Cryptocurrency, CBDC and e-CNY: Status and Future

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Content

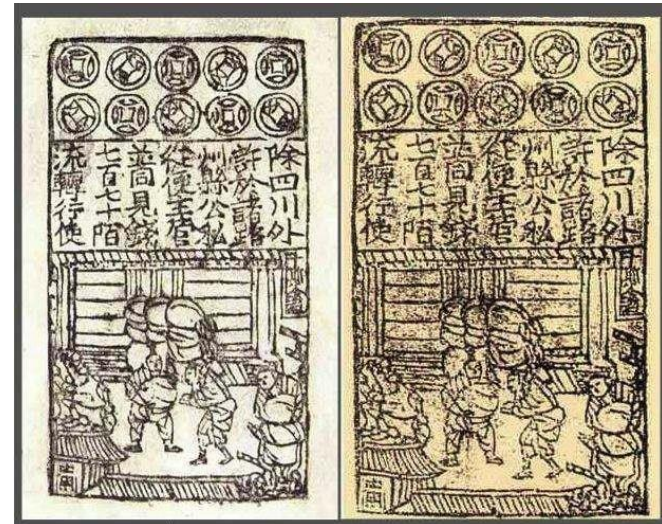
Background

- Cryptocurrency
- CBDC

e-CNY in China

- Pilot Stage
- Features
- Scenarios
- Prospects

What is money?







- Any noncash transaction requires a trusted third-party administrator—commonly a bank or financial service provider.
- The system forces participants to trust financial institutions. What happens if the financial institutions get trustless?

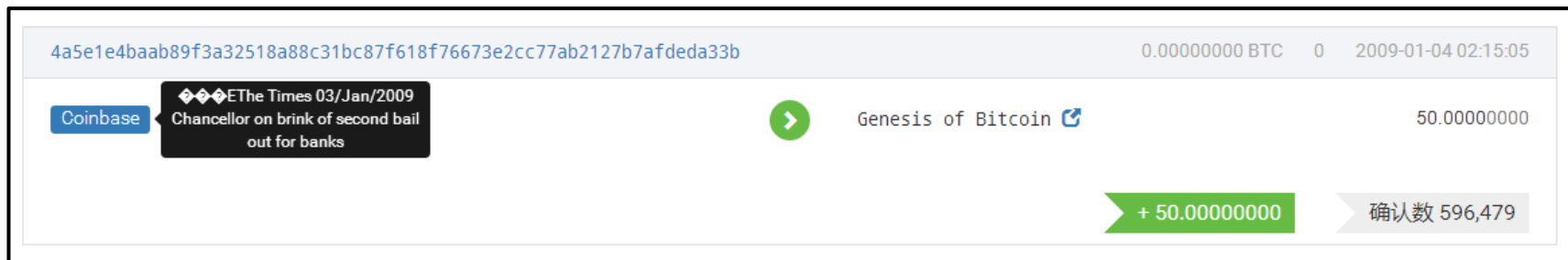
- It was the year 2008 when the giant bank Lehman Brothers crippled due to the financial crisis which exposed the flaws in the banking and financial system.
- After the financial meltdown, there was the emergence of **Bitcoin**.
- Motivation
 - Distrust of financial institutions
 - Transaction costs



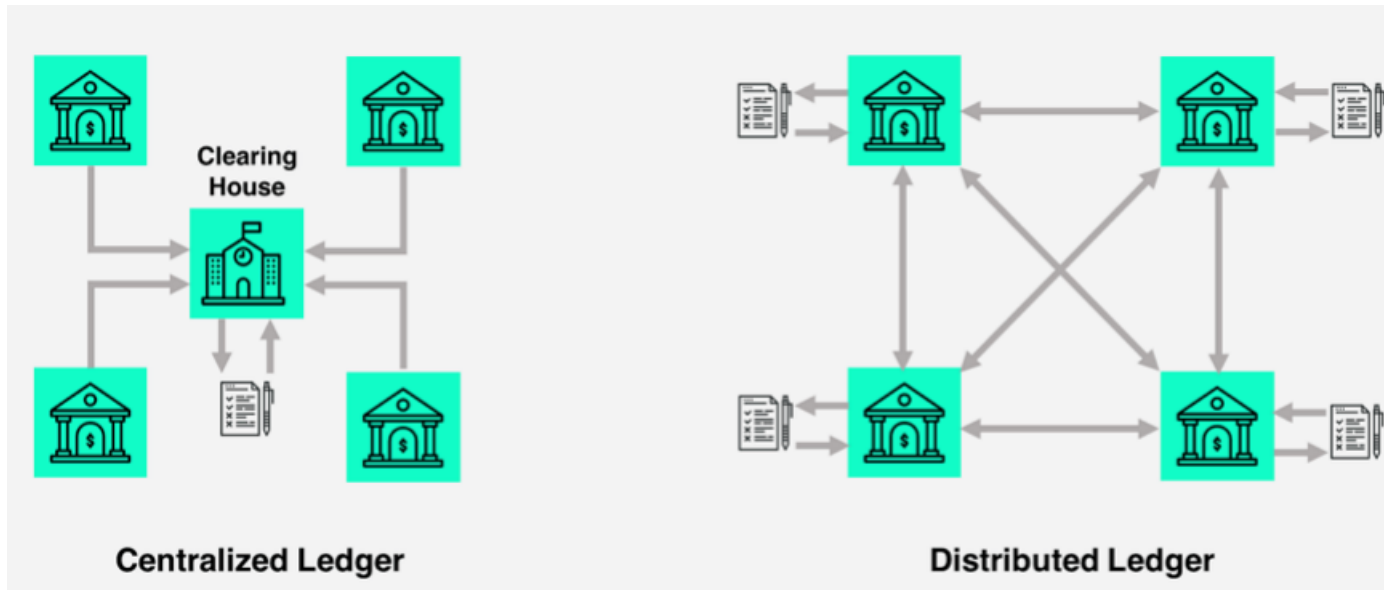
Bitcoin

- Satoshi Nakamoto
- In 2008 Satoshi published the Bitcoin white paper (“Bitcoin: A Peer-to-Peer Electronic Cash System”).
- The system allows decentralized transfers of value between individuals and businesses.

- On January 3, 2009, Bitcoin was born. With the creation of 'Genesis Block'—the first set of 50 BTC was mined into existence.
- **Wallet address:** `1A1zP1eP5QGefi2DMPTfTL5SLmv7DivfNa`
- <https://www.blockchain.com/btc/address/1A1zP1eP5QGefi2DMPTfTL5SLmv7DivfNa>



Distributed Ledger Technology (DLT)



Double-spending problem

- If the money is just digital codes, why not copy and paste to make more money?
 - Timestamps
 - Block chain

Timestamps

- Each transaction is packaged and publically recorded in the order it was carried out.
- So whenever a Bitcoin block is generated, there are two timestamps. One of them is in the block header, which is placed by the miner, and the other one is the actual time when the block is created.

Block Chain

- Transactions are recorded in a community-built record of all transactions that acts as a proof-of-work.
- Computers connected to the network accept the longest chain as accurate.

Mining Bitcoins



- Miners solve complicated algorithms to find a solution called a hash.
- Finding a hash creates a block that is used to process transactions.
- Each new block is added to the block chain.
- After 21 million (maybe in year 2140) bitcoins are mined, miners will not charge transaction fees for creating a new block.

Is bitcoin a currency?

The answer is **NO**.

- It cannot play the role of currency.
- It is criticized because of the illegal use.
- It suffers severe energy consumption problem.

Bitcoin cannot play a role of currency.

Currency mainly serves as:

- A medium of exchange
- A standard of deferred payment
- A store of wealth
- A measure of value

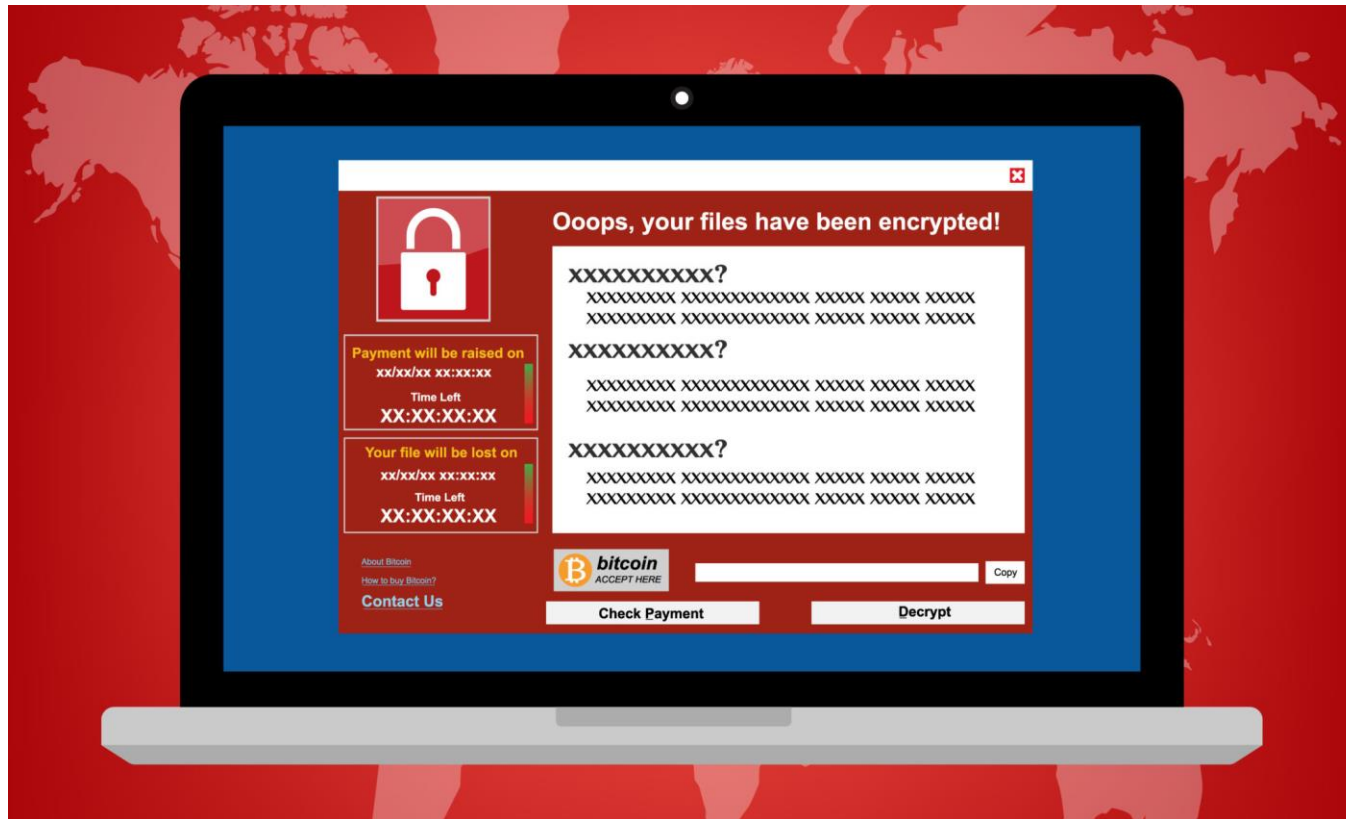
Bitcoin has intense price fluctuations.



Illegal Use.

- Bitcoin is linked to crime and illegal activity.

WannaCry attack in 2017





Sex, Drugs, and Bitcoin: How Much Illegal Activity Is Financed through Cryptocurrencies?

[Get access >](#)

[Sean Foley](#), [Jonathan R Karlsen](#), [Tālis J Putniņš](#) ✉

The Review of Financial Studies, Volume 32, Issue 5, May 2019, Pages 1798–1853, <https://doi.org/10.1093/rfs/hhz015>

Published: 04 April 2019

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Abstract

Cryptocurrencies are among the largest unregulated markets in the world. We find that approximately one-quarter of bitcoin users are involved in illegal activity. We estimate that around \$76 billion of illegal activity per year involve bitcoin (46% of bitcoin transactions), which is close to the scale of the U.S. and European markets for illegal drugs. The illegal

Energy Consumption Problem



Energy Consumption Problem

On March 18, 2021, the annual power consumption of the Bitcoin network was estimated to be **129 terawatt-hours (TWh)**. Here's how this number compares to a selection of countries, companies, and more.

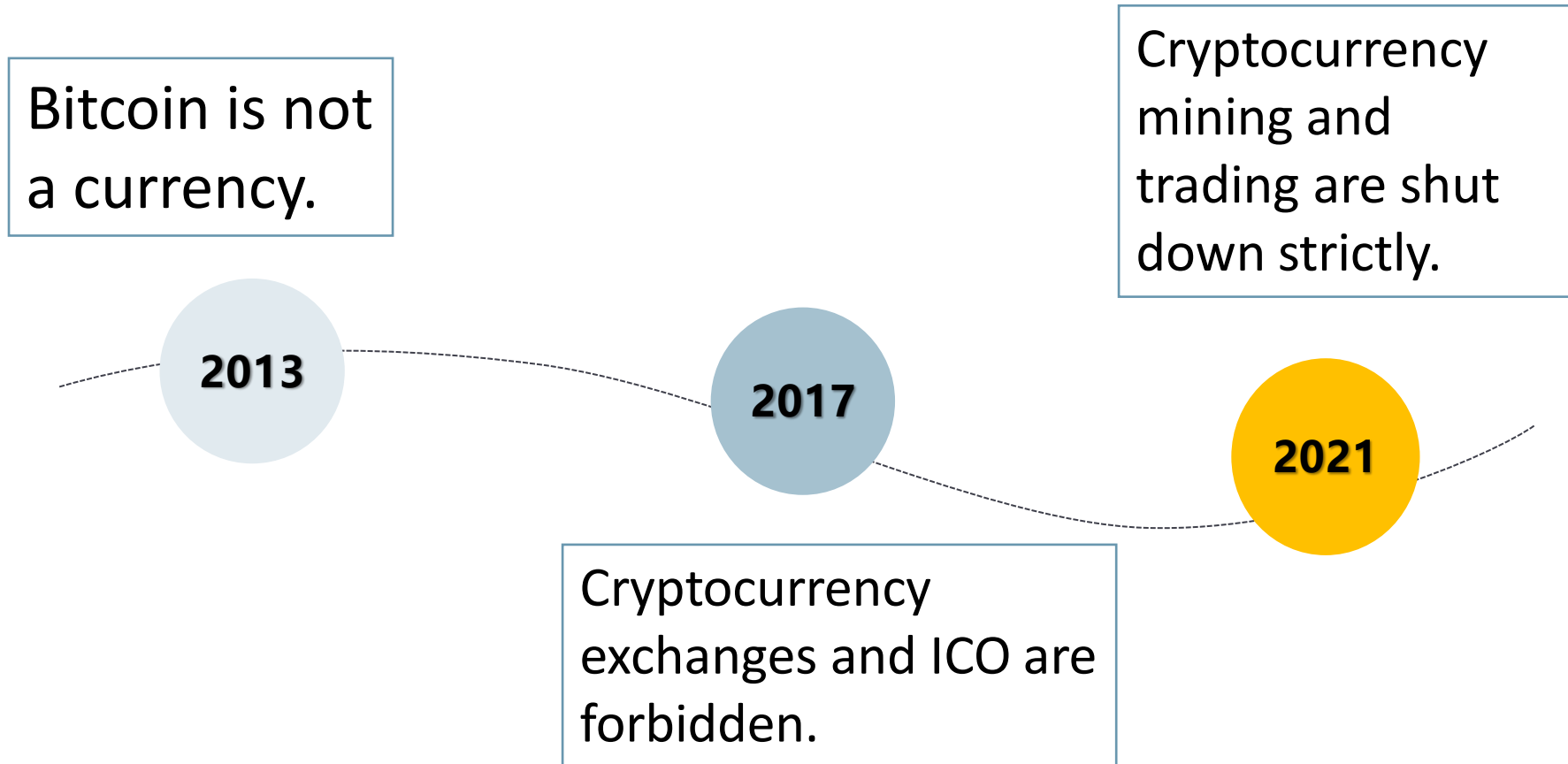
Name	Population	Annual Electricity Consumption (TWh)
China	1,443M	6,543
United States	330.2M	3,989
All of the world's data centers	-	205
State of New York	19.3M	161
Bitcoin network	-	129
Norway	5.4M	124
Bangladesh	165.7M	70
Google	-	12
Facebook	-	5
Walt Disney World Resort (Florida)	-	1

***Note:** A terawatt hour (TWh) is a measure of electricity that represents 1 trillion watts sustained for one hour.*

***Source:** Cambridge Centre for Alternative Finance, Science Mag, New York ISO, Forbes, Facebook, Reedy Creek Improvement District, Worldometer*

If Bitcoin were a country, it would rank **29th** out of a theoretical 196, narrowly exceeding Norway's consumption of 124 TWh. When compared to larger countries like the U.S. (3,989 TWh)

Timeline of Regulations in China



Notice on Risks of Bitcoin (2013)

- Bitcoin is not a currency and it carries substantial risks.
- China prohibited financial institutions from dealing in the digital currency.

Announcement on Preventing the Financing Risk of ICO (2017)

- The government banned initial coin offerings (ICOs).
- China also closed domestic cryptocurrency exchanges.

Notice on Regulating the "Mining" Activities of Virtual Currency (2021)

- In 2021, China was banning cryptocurrencies from mining to trading.
- Virtual currency-related business activities are illegal financial activities.
- Financial institutions and payment companies overseas cannot offer cryptocurrency service to Chinese clients.



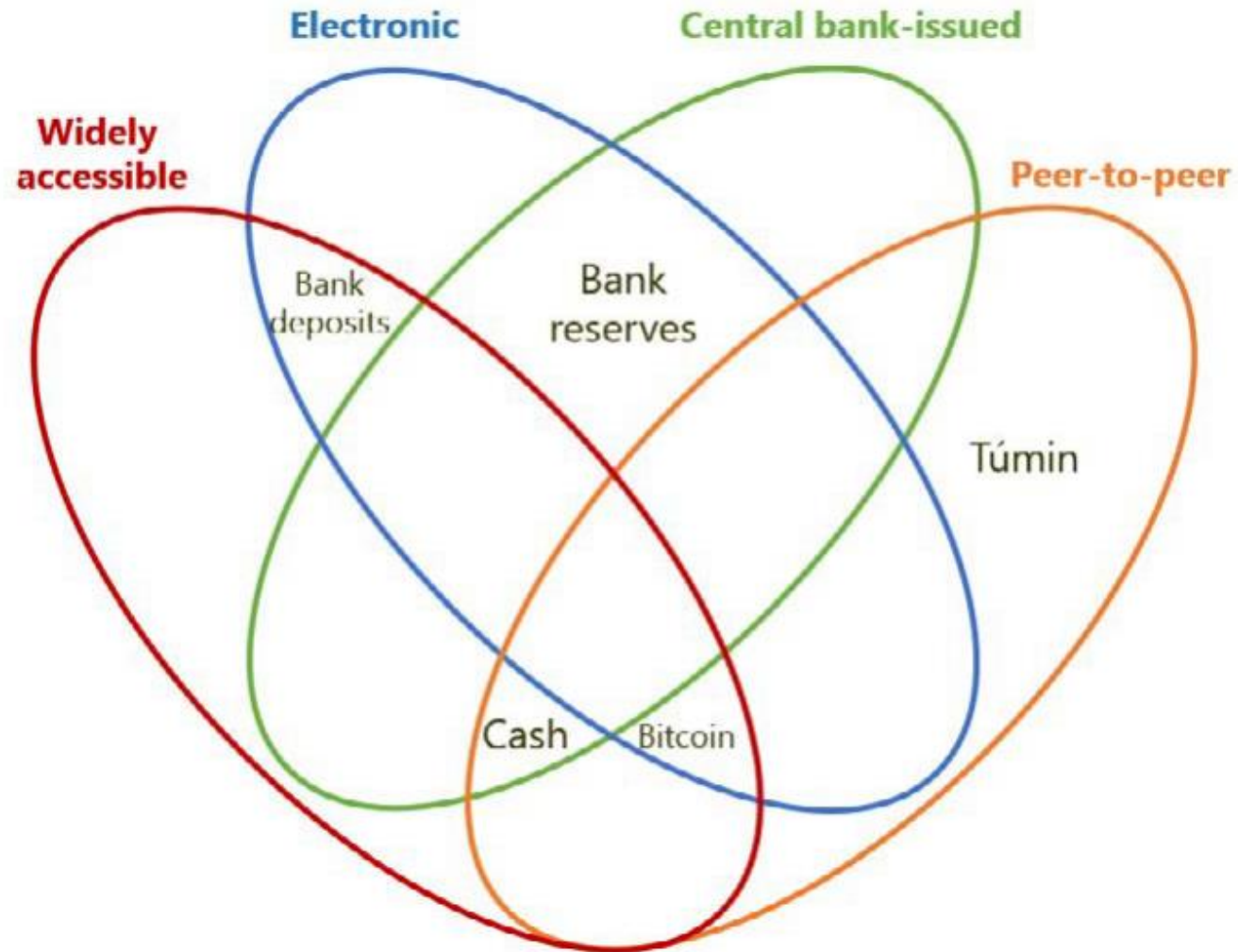
In conclusion, the following activities are forbidden in China:

- Cryptocurrency mining
- Cryptocurrency trading
- Changing cryptocurrency to legal currency
- Cryptocurrency exchange or other financial service
- ICO



Money Flower (BIS)

Figure 2





BRIEFING ROOM

Executive Order on Ensuring Responsible Development of Digital Assets

MARCH 09, 2022 • PRESIDENTIAL ACTIONS

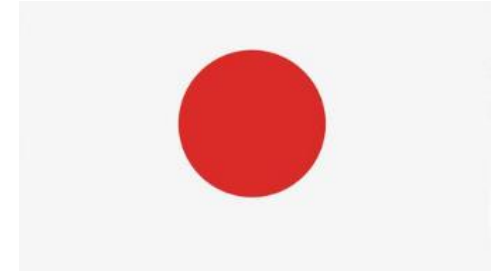
- The government...reduces negative climate impacts and environmental pollution, as may result from some cryptocurrency mining.

STRENGTHENING AMERICAN LEADERSHIP IN DIGITAL FINANCIAL TECHNOLOGY

EXECUTIVE ORDER

January 23, 2025

Sec. 3. Revocation of Executive Order 14067 and Department of the Treasury Framework of July 7, 2022. (a) Executive Order 14067 of March 9, 2022 (Ensuring Responsible Development of Digital Assets) is hereby revoked.



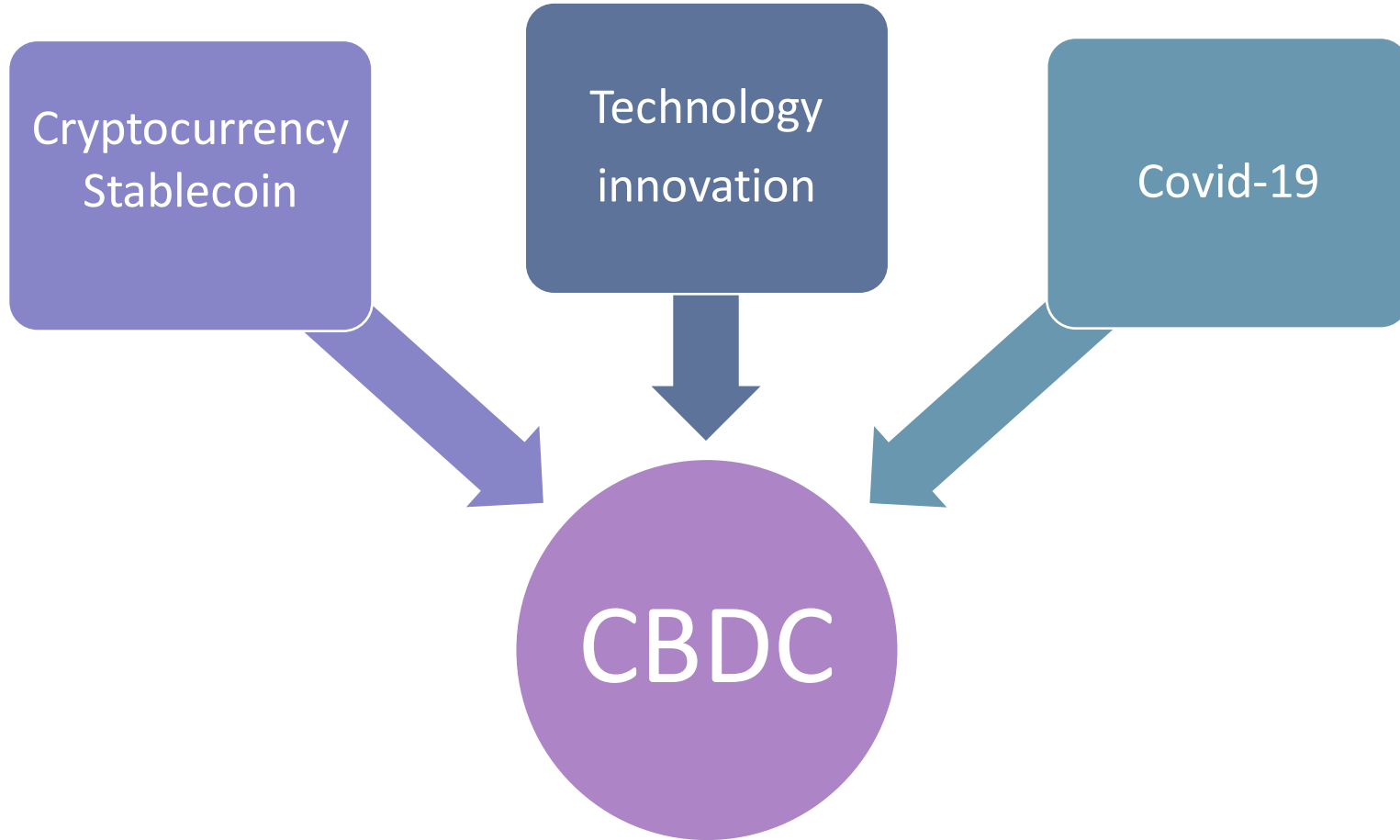
- Payment Services Act (2016) : Virtual currencies were defined and recognized as a means of payment. They are regarded as a property value.
- The Japanese Financial Services Agency (FSA) is responsible for regulating cryptocurrency in Japan.
- Cryptocurrency exchanges must be registered and comply with traditional AML/CFT and other regulations.
- Only banks, fund transfer service providers, and trust companies are entitled to issue stablecoins.

Stablecoin

- Stablecoin refers to a subcategory of cryptocurrencies with mechanisms that are aimed at maintaining a stable value, such as by pegging the value of the coin to a specific currency, asset, or pool of assets or by algorithmically controlling supply in response to changes in demand in order to stabilize value.

USDT

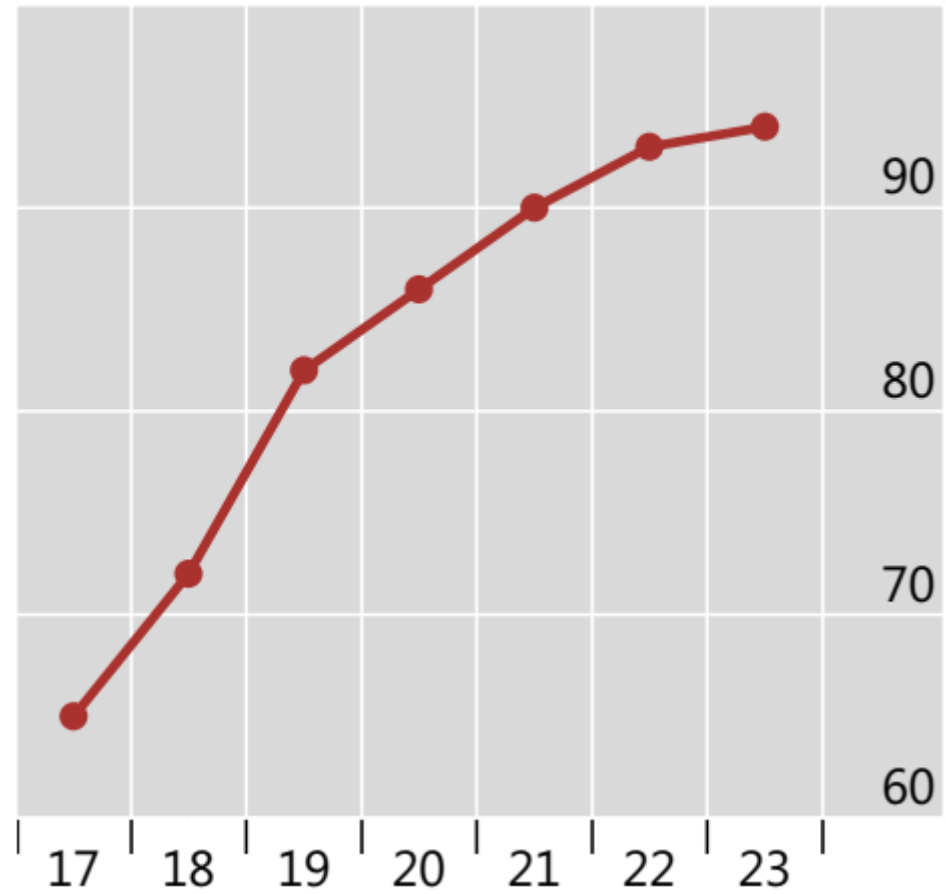
- USDT (Tether) is a cryptocurrency stablecoin pegged to the U.S. dollar and backed "100% by Tether's reserves," according its website.
- USDT is the third-largest cryptocurrency after Bitcoin (BTC) and Ethereum (ETH), and the largest stablecoin with a market capitalization.
- USDT is criticized by the transparency.



Central Bank Digital Currency (CBDC)

- CBDC is defined as central bank money in a digital format, denominated in the national unit of account, that is a direct liability of the central bank and can be used for retail payments and/or wholesale settlement.

A. Engagement in CBDC work

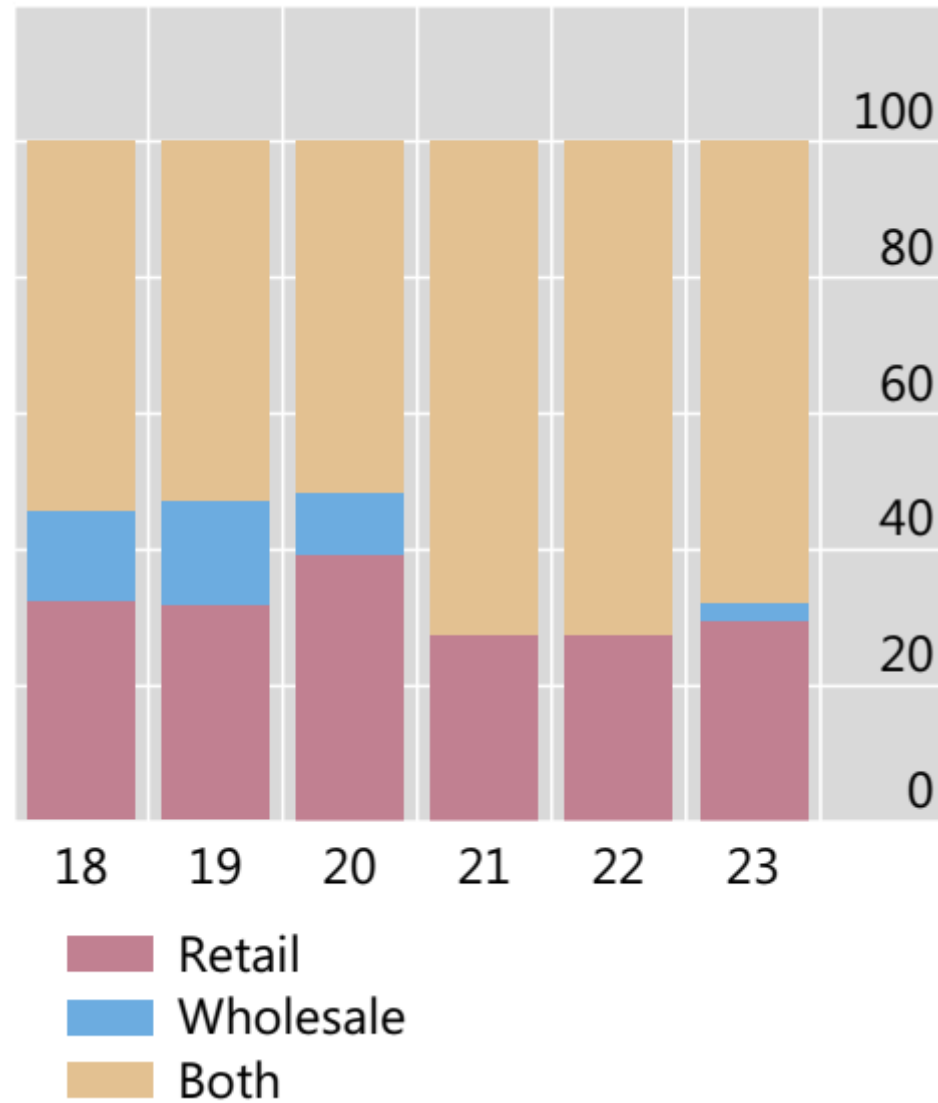


Bank for International Settlements (2023)

Categories of CBDC

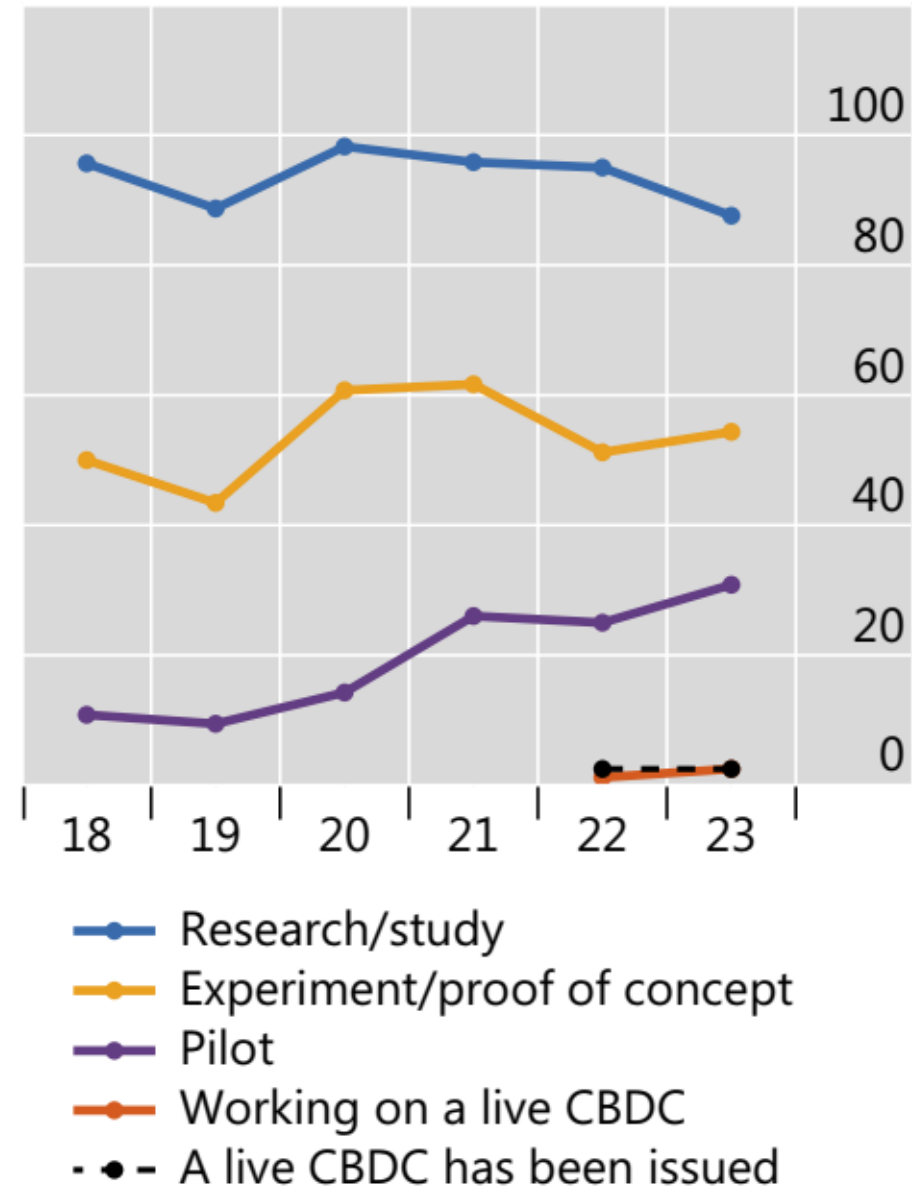
- Retail CBDCs are meant to be held and used by individuals and firms for day-to-day transactions, including purchases of goods and services.
- Wholesale CBDCs are held by eligible financial institutions only and used for financial market payments (eg interbank payments and the settlement of securities and currency transactions).

B. Focus of work²

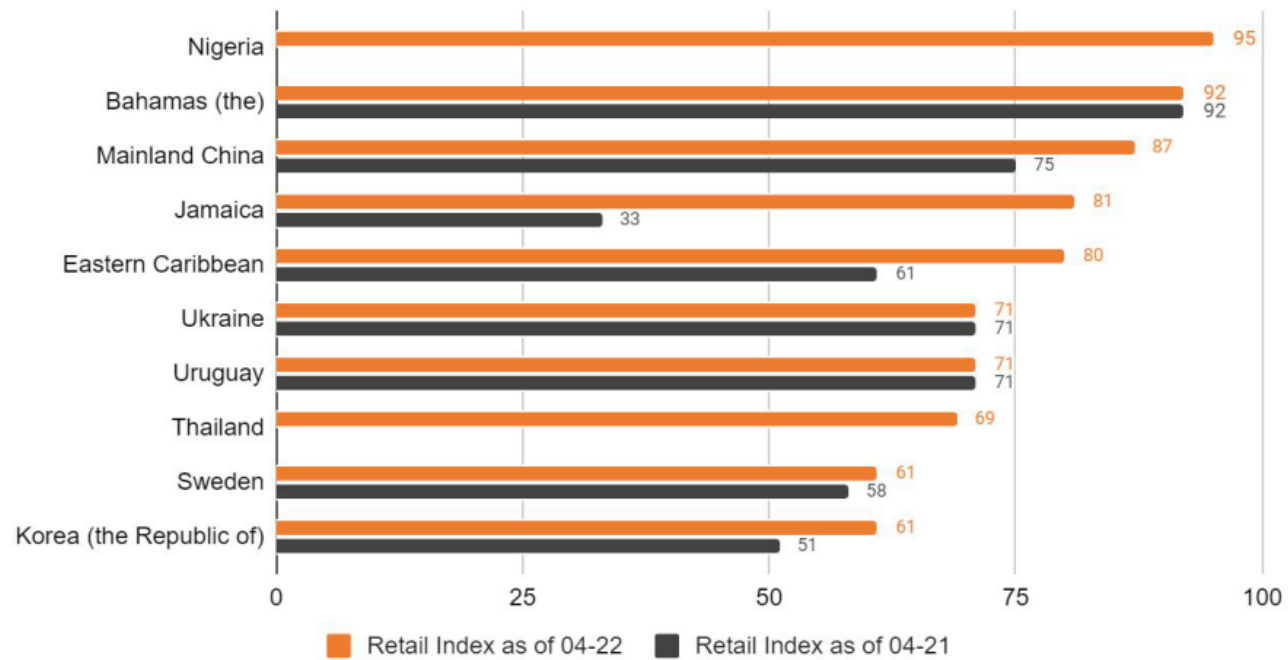


Bank for International Settlements (2023)

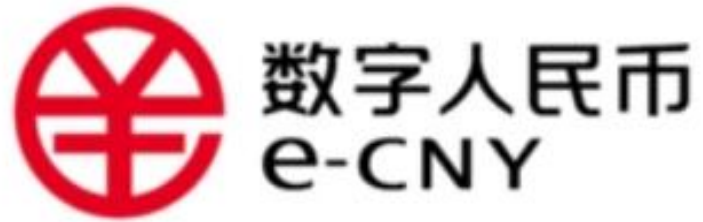
C. Type of work²



Index status – Top 10: **Retail** CBDC projects



From: Pricewaterhouse Coopers (2022)



- China is likely to be the first major economy to issue CBDC.
- e-CNY is the digital version of fiat currency issued by the People's Bank of China (PBOC) and operated by authorized operators.

Objectives and Vision

- To diversify the forms of cash, satisfy the public's demand for digital cash and support financial inclusion
- To support fair competition, efficiency and safety of retail payment service
- To echo the international initiative and explore the improvement of cross-border payment

R&D Stage

e-CNY was also previously known as the Digital Currency/Electronic Payment (DC/EP or DCEP).

Development of DC/EP started in 2014 with the establishment of a Digital Currency Institute.

Pilot Areas

- PBOC has launched e-CNY pilots in some cities, e.g. Shanghai, Shenzhen, Suzhou, Chengdu and Xiamen and etc. since 2019.
- By the end of July 2024, the cumulative transaction amount in the pilot areas had reached **7.3** trillion yuan.

Features

- E-CNY adopts **two-tier operation** whereby the PBOC is responsible for issuance and disposal, inter-institution connect and wallet ecosystem management.
- CBDC selects 10 commercial banks with certain strengths in capital and technology as authorized operators to take the lead in providing e-CNY exchange services.

Features -continued

- E-CNY is account-based and **quasi-account-based**.
- It could be loosely coupled with bank accounts, and thus payments through e-CNY wallets are settled upon payment.

Features -continued

“**Controllable Anonymity**” means anonymity for small value and traceable for high value.

The e-CNY gives its users the option to hide their identity from counterparties, while allowing law enforcement (rather than individual government units) to have the ability to trace illegal transactions.

Features -continued

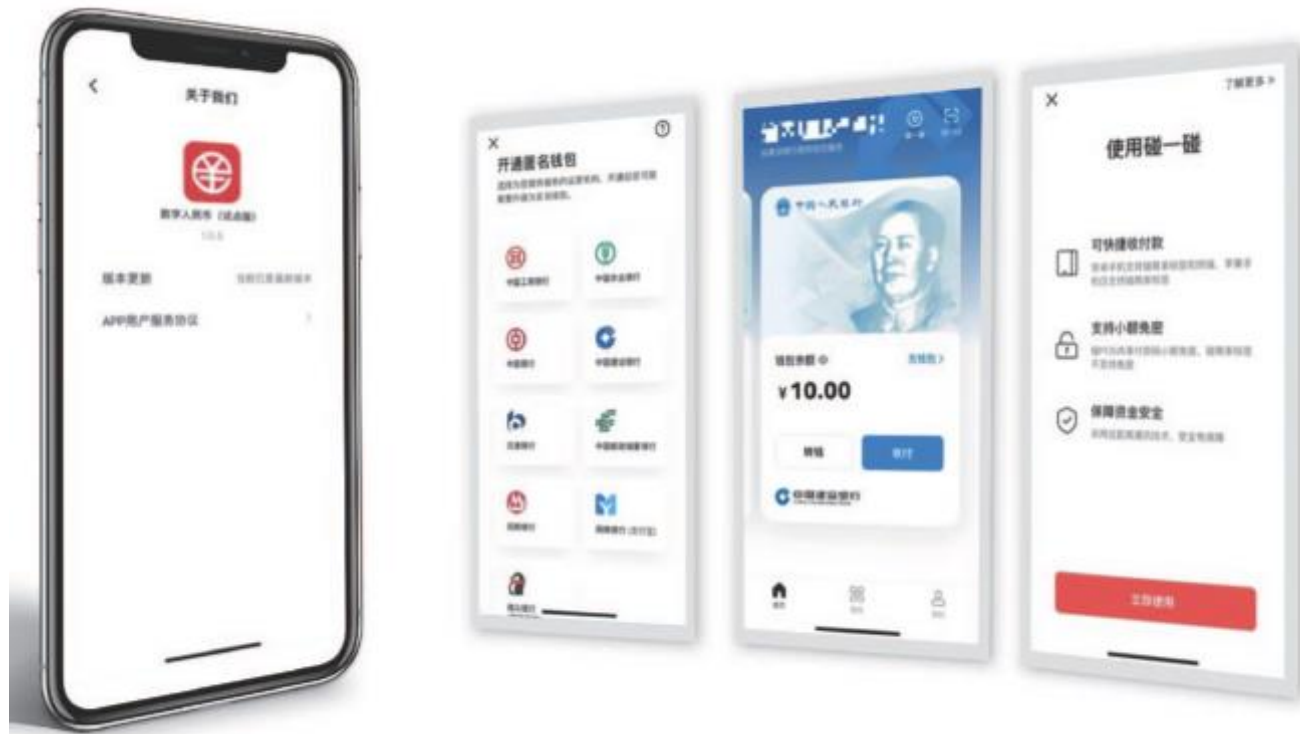
- PBC study [dual offline payment](#) and other innovations on mobile devices.

Digital wallet

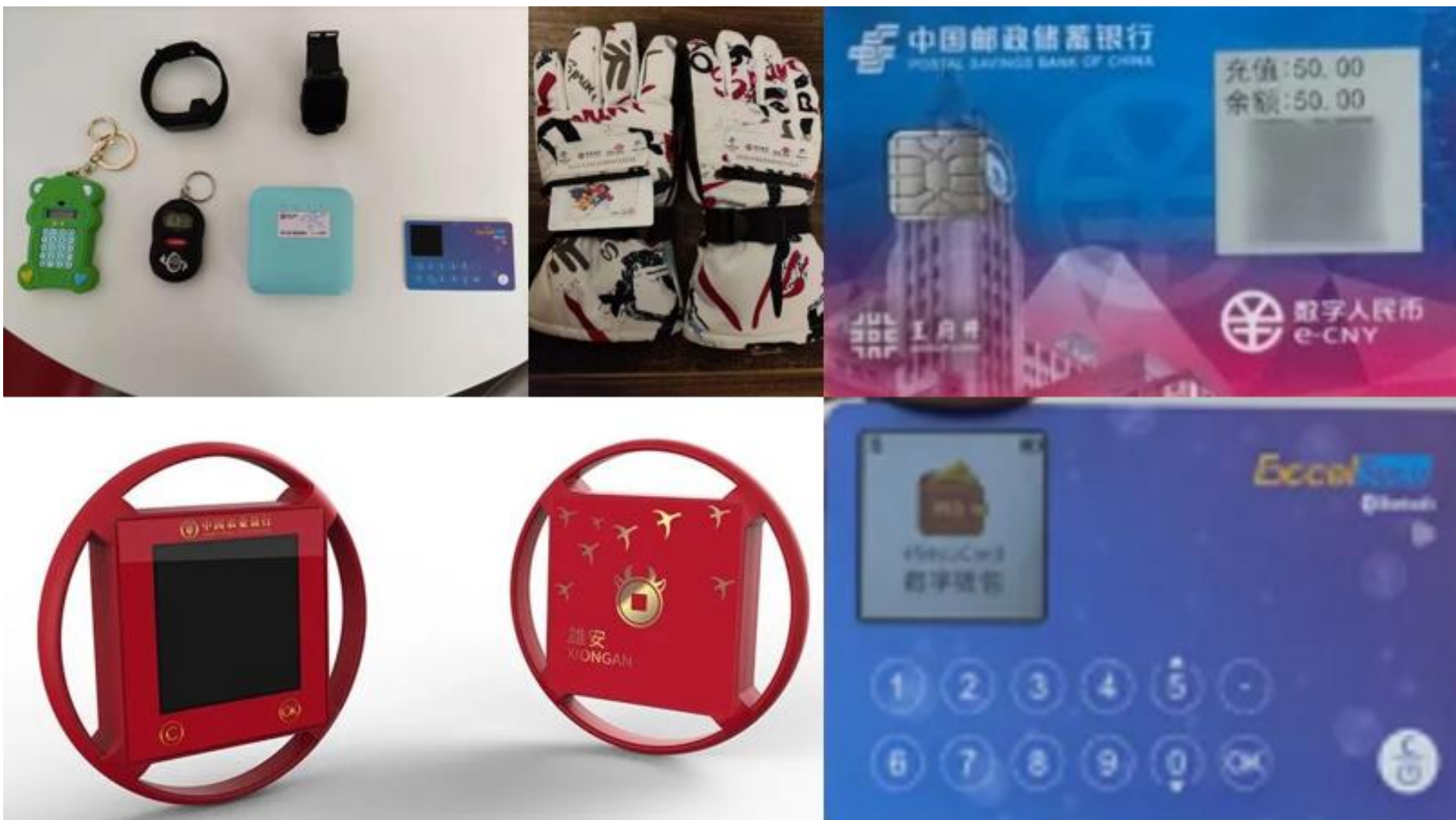
- The digital wallet offered by the bank is an interface to allow users to access their e-CNY.
- The pilot programs so far require only a mobile phone number to have a e-CNY wallet.

Software Wallet

- e-CNY wallet app



Hardware Wallet



Scenarios

- Now the e-CNY has been widely used at plenty of scenarios in catering, entertainment, shopping, and etc., to stimulate consumption, fight the pandemic and to promote low-carbon daily-life.

The commercial banks issue a lot of the “red packet” for promotion of e-CNY.



- Example A

A person from Taiwan uses e-CNY app without the mainland bank account in Xiamen city.




- Example B

People use e-CNY for prepaying the training fees taking the advantage of smart contact of e-CNY.

- e-CNY is a challenge to third-party payment platform.



微信支付

  微信支付	 数字人民币 e-CNY
Online payment provider	Money and payment
Firm credit backed	Government backed
Transaction cost	No transaction cost
Internet needed	Sometimes done without internet

Cross-border payments

- Whether e-CNY will be used in cross-border payments and to promote RMB internationalization draws much attention. The internationalization of CNY involves various complicated issues.
- Though technically ready for cross-border use, e-CNY is still designed mainly for domestic retail payments at present.

With your mobile phone in hand, you can experience the convenience of digital payment in Hong Kong and across pilot regions in the mainland. Simply register for CCB e-CNY Wallet to enjoy the convenience of “Instant Top-up” and smoother payment experience!

From now until June 30, 2024, the first 3,000 bank or credit card customers of CCB (Asia) who successfully register for the e-CNY promotion with their Hong Kong mobile number via CCB (Asia) Mobile Banking and open CCB e-CNY Wallet can receive **Red Packets with a total value of ¥100**, which can be spent at selected merchants in Shenzhen!

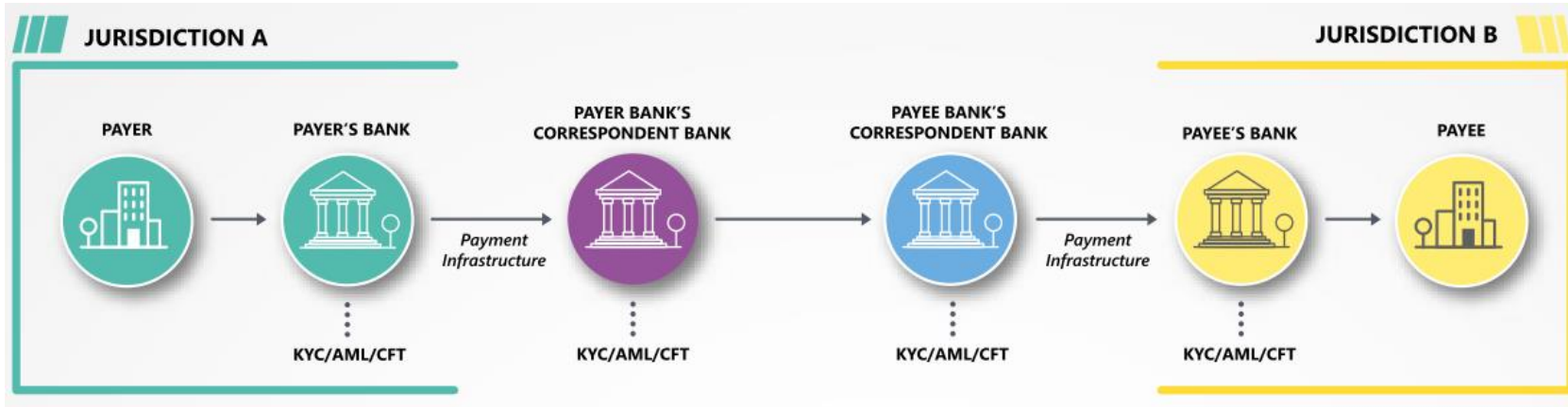
	Single transaction	Daily	Annual
Payment	¥ 2000	¥ 5000	¥ 50000
Top-up	¥ 2000	¥ 5000	¥ 50000

Project mBridge

Project mBridge experiments with a multiple-central bank digital currency (multi-CBDC) common platform for wholesale cross-border payments.

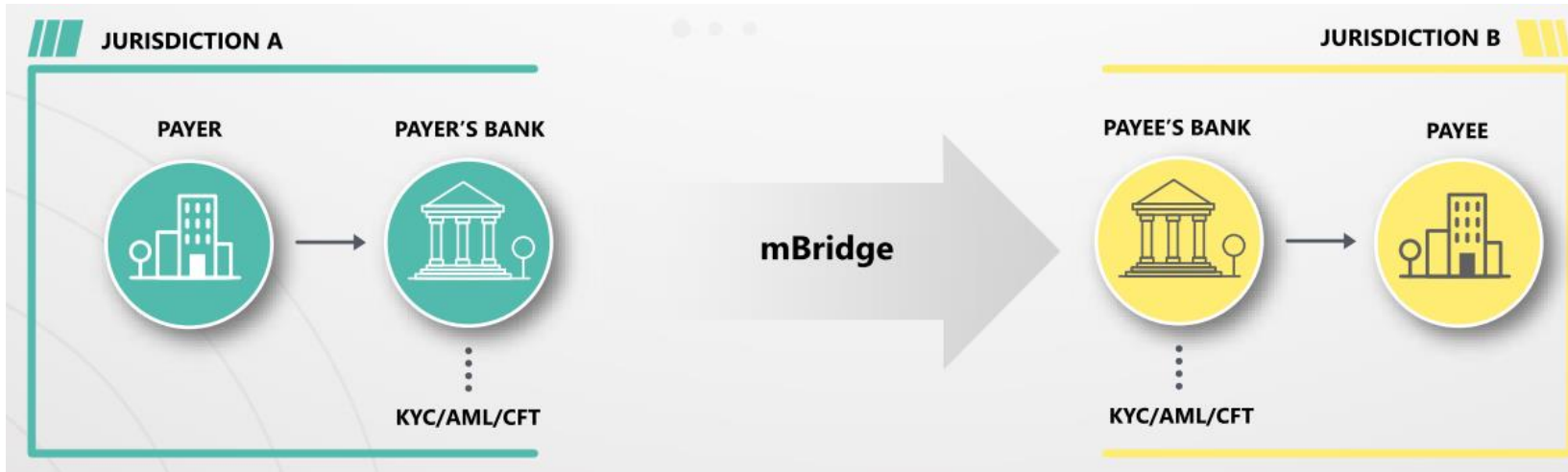
- BIS Innovation Hub Hong Kong Centre
- Digital Currency Institute of the People's Bank of China
- Hong Kong Monetary Authority
- Bank of Thailand
- Central Bank of the United Arab Emirates.

traditional



High costs
Settlement risks
Low speed
Operational complexities

Project
mBridge



Faster
Safer
More accessible
Cheaper
Compliant
Settled with finality

- In January 2024, the United Arab Emirates (UAE) has settled its first cross-border payment (Dhs 50 million) to China using CBDC on the mBridge platform.
- In June 2024, Project mBridge continues its development and has reached the minimum viable product (MVP) stage.

Conclusion

- Cryptocurrencies, backed by blockchain are facing regulatory issues due to volatility and illegal use risks.
- Many countries are exploring CBDCs, which blend digital payment benefits with fiat currency stability and regulatory control.
- China's e - CNY has made great strides in pilots, and it is changing China's payment scene.

The end.