



Digital Currencies and the Future of Monetary System

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1986 LL.B, Faculty of Laws, University of Tokyo

1990 LL.M, University of California at Berkeley, School of Laws

Attorney at Law in New York State

-2010 Alternate Executive Director for Japan in IMF

-2013 Member of the Basel Committee

**-2015 Director-General of Markets Department, Bank of Japan
Member of the Markets Committee, BIS**

**-2018 Director-General of Payment and Settlement Systems Department, Bank of Japan
Member of the Committee on Payments and Market Infrastructures, BIS**

(Articles published in English)

“Managing the Exit: Lessons from Japan’s Reversal of Unconventional Monetary Policy”, IMF (2010)

“The Legal Framework for Central Banking in a Crisis: Japan’s Experiences“, IMF (2013)

“The Future of Central Banking“, Accounting, Economics, and Law (2019)

“Digital Innovation, Data Revolution and Central Bank Digital Currency” BoJ Working Paper (2019)

(Co-authored with Noriyuki Yanagawa)

“Digital Currencies and the Future of Money” (2022)



How should we design the best-possible monetary system in the coming future?

- Various issues of digital currency should be considered in the context of overall design of future monetary system.
- **Applying advanced digital technologies to payments and settlements can be beneficial.**
- **Should digital currency be issued as central bank liabilities(, and if so, to what extent)?**

Modern Monetary System

- Established in the 19th century when modern nation states were almost completed.
- Each country has a central bank as a single issuer of sovereign currencies.
- Two-tiered system with a central bank and commercial banks.
 - The central bank issues (i) banknotes to general public and (ii) central bank deposits mainly to banks.
 - Commercial banks issue deposits (= commercial bank money) to general public.

Establishment of Modern Central Banks

Year	Nation	Events
1844	U.K.	Bank Charter Act 1844 (Peel Banking Act of 1844) (Bank of England became the single issuer of banknotes.)
1848	France	Banque de France became the single issuer of banknotes.
1874	Spain	Banco de España became the single issuer of banknotes.
1876	Germany	Reichsbank was founded.
1882	Japan	Bank of Japan was founded.
1893	Italy	Banca d'Italia was founded.
1897	Sweden	Riksbank became the single issuer of banknotes.
1913	U.S.	Federal Reserve was founded.

Advantages of Modern Monetary System

Single Unit: CB money and commercial bank money is exchangeable at parity.

- People do not have to worry about “exchange rates” among domestic currencies.
- The credibility of bank deposits are supported by banking regulation, deposit insurance and LLR.

Financial Intermediation: Banks can use the deposits for making loans and investments.

- Banks can perform financial intermediation functions and contribute to efficient resource allocation.

Innovation: Private initiatives facilitate innovation in payments and settlements.

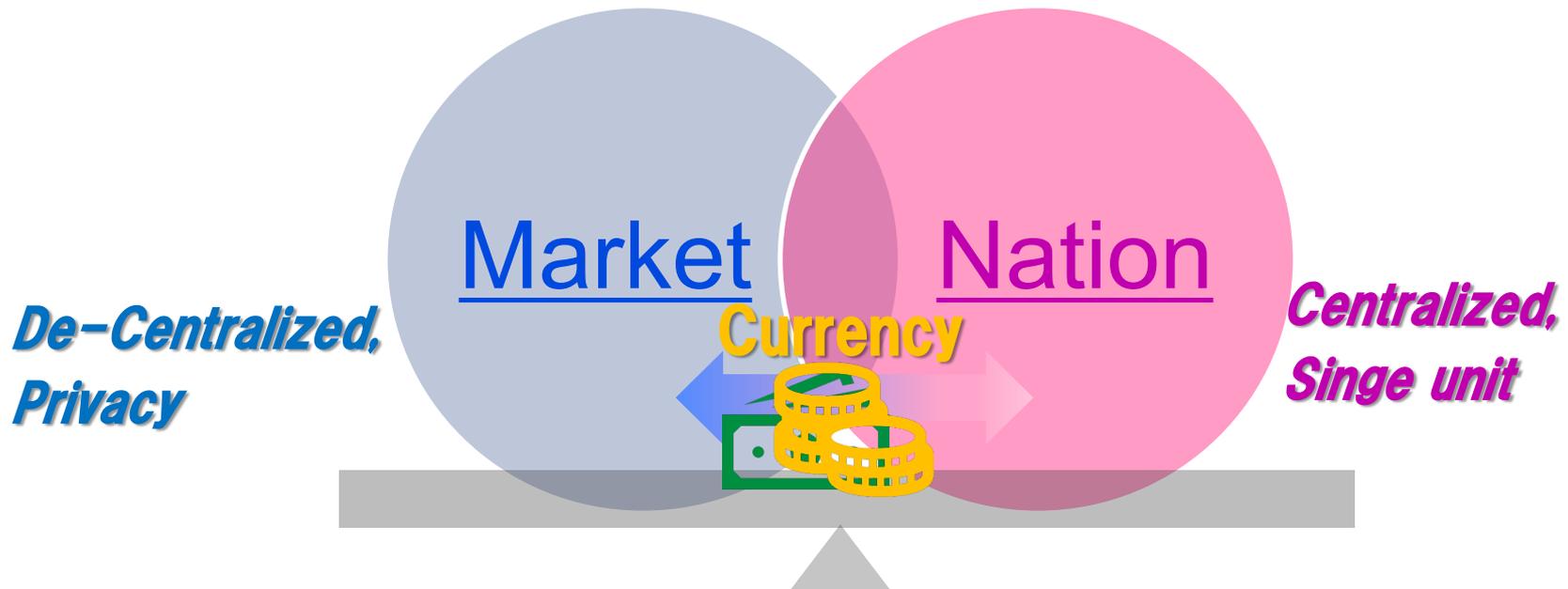
- Many innovative services such as ATMs, debit cards and mobile payments have been developed by private entities.

Information and Data: CB does not monopolize information and data attached to payments.

- Banknotes carry only the information of value. The issuer CB does not know each holder of them.
- CB refrains from occupying the information and data about people's daily transactions.

Modern Monetary System

– Delicate Balance of the Nation and the Market –



- Currency, issued by the nation, has been the driving force of the market economy.
- The stability and the credibility of the currency are supported by institutional framework of the nation state.
- The authorities and the central bank refrain from intervening in the contents of people's daily transactions.

Issues in CBDC

- **Impact on deposits and financial intermediation?**
 - Will CBDCs replace not only cash but also bank deposits?
 - Why are bank regulation and deposit insurance needed?
- **Digital bank-run?**
 - Will CBDCs accelerate liquidity crisis in a market stress?
- **Impact on private-led innovation?**
- **Impact on data and privacy?**

Moreover, in Japan

- Financial inclusion is not a problem.
- Japanese people are sensitive to privacy.
- Interest rate is very low.

Digital Innovation, Data Revolution and
Central Bank Digital Currency*

Noriyuki Yanagawa[†], Hiromi Yamaoka[‡]

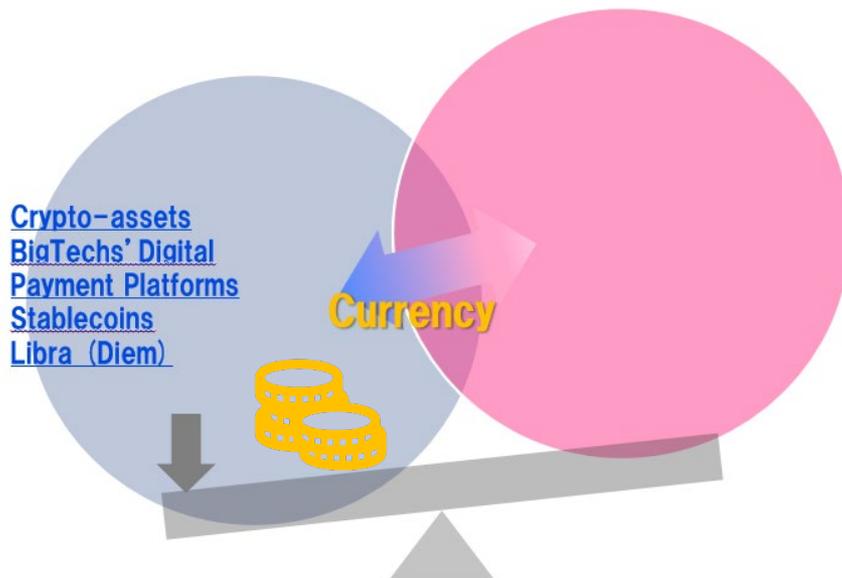
February 2019

Abstract

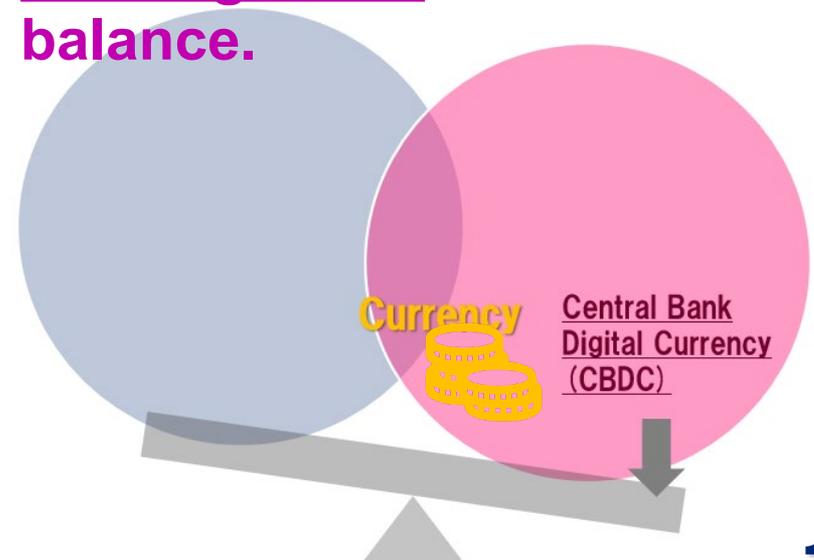
Under the developments of digital innovation, global expansion of cashless payments and the emergence of crypto-assets, some argue that central banks should issue digital currencies that can be used by ordinary people instead of paper-based banknotes. The debates on central bank digital currencies are now gathering great attention from worldwide. Although many of major central banks, including the Bank of Japan, do not have an immediate plan to issue digital currencies that can replace banknotes, some central banks are seriously considering whether they should issue digital currencies in the near future or

Impacts of Digitization on Monetary System

- **Crypto-assets, BigTech, and stablecoins may affect the balance and change the two-tiered structure.**



- **Central Bank Digital Currency can be regarded as the authorities' efforts to maintain their controllability of monetary system.**
- **But CBDC may also change the two-tiered structure into the single-tier and affect the balance.**



Issues on Monetary Policy and Financial Intermediation

- **Positive interest rates on CBDC will accelerate fund shift from bank deposits to CBDC.**
 - Since the CB is not good at making loans directly to firms and individuals, efficient resource allocation will be affected.
 - **Negative interest rates on CBDC will make people prefer banknotes rather than CBDC.**
 - As long as banknotes remain, ZLB will continue to exist.
 - Negative rate on CBDC will reduce its usage.
 - It is not certain whether negative rate on CBDC (=reduction in nominal value of CBDC) will stimulate or discourage spendings.
- ⇒ **It is not easy to use CBDC as a monetary policy tool.**



University of Tokyo – Bank of Japan Conference on “FinTech and Monetary System in Future”

(Its summary is published only in Japanese.)

<https://www.boj.or.jp/research/conf/data/rel161201a8.pdf>

(Main arguments)

- As long as digital payment instruments are denominated by the nation's sovereign currency unit, the effectiveness of the nation's macro policies will be maintained.
- Digital technologies may intensify the competition among currencies, and each nation is required to enhance the utility of its currency if the nation hopes its currency to remain widely used.
- With digital technologies, payment instruments are expected to function as the infrastructure for information and data.

Issues on Financial Stability

➤ It is difficult for the authorities to argue that CBDC is safer than bank deposit.

- In order to make bank deposit safe and monetary system stable, **banking regulation**, **deposits insurance** and **LLR** have been formed.
- If the authorities emphasize the safety of CBDC, “**digital bank-run**” will be accelerated in case of market stress.

⇒ **Financial stability will not be a strong reason to issue CBDC.**

➤ “Indirect” issuance of CBDC will put banks in a complicated situation.

- Banks will offer (1) **their own liabilities** (deposit) and (2) **CB liabilities** (CBDC) simultaneously. (Banks will not want to argue that their own liabilities are riskier than CBDC.)

“Narrow Banking” Debates

- The issues on CBDC largely overlaps those on **“narrow banking”**.
- The common issues are whether
 - the banking system will be sustainable without the **“economies of scope”** of (i) payment and settlement services and (ii) financial intermediation services
 - the **“two-tiered”** structure of monetary systems should be maintained or not

Issues on Quantitative limits on CBDC

- for the volume of amount outstanding and/or each transaction -

- **CB liabilities tend to be used likely for extremely large-value settlements such as RTGS (, since it is hard for a private entity to bear the risks associated with such settlements).**
 - In Japan, the interbank-settlements of below 100mil. JPY are processed through netting in ZENGIN, while the settlements of 100mil. JPY or above are processed through RTGS.
 - Especially in retail payments, private entities have been competing for innovation (e.g., e-money, credit cards, mobile payment).
- **Any quantitative limit will reduce the utility of digital currencies. (If it is introduced, there should be reasons such as to avoid bank-run.)**
 - Any quantitative limits will make users hold two or more accounts, and such activities will increase the burden for administration.

Possible Needs for CBDC

- **Providing “lifeline” retail payment services.**
 - Like cash, some people may need digital payment instruments for basic transactions even though they do not have bank accounts.
 - How should we share the costs for building and maintaining such infrastructure?
- **Enhancing the efficiency of wholesale settlements (including cross-border ones)**
 - How will CBDC in this sense be different from CB RTGS systems?

Cross-border Issues

- As long as each CBDC is denominated by each sovereign currency unit cross-border remittances will continue to need **conversion between different currencies**, even if such CBDCs are issued.
 - What are the sources of the problems in the current cross-border remittances? (e.g. deficiency in private arrangement or in global standards?)
 - Will the issuance of **CBDC** solve those problems? (If so, how?)
 - How can **private initiatives** (e.g., SWIFT GPI) contribute to solve those problems?

Digital Currency Forum and “DCJPY”

- Digital Currency Forum, which consists of around 100 leading firms (including 3 mega banks), tries to introduce two-tiered digital currency platform named “DCJPY”.

November 2021

November 2021

(Benefits of DCJPY)

- JPY-denominated, and issued by private entities such as banks
 - ⇒ Fostering private-led resource allocation and innovation
 - ⇒ Avoiding digital bank run
- Two-tiered structure of common area and “programable” business process area
 - ⇒ Maintaining the benefits of the modern monetary system
 - ⇒ Facilitating utilization of data by private entities
 - ⇒ Applying smart contracts to sophisticated transactions

The Digital Currency Forum Members

Chairperson

Hiromi Yamaoka, Director, Future Corporation

(Former Head of the Payment and Settlement Systems Department, Bank of Japan)

Observers

- Financial Services Agency, Japan
- Ministry of Internal Affairs and Communications, Japan
- Ministry of Finance, Japan
- Ministry of Economy, Trade and Industry, Japan
- Bank of Japan

- Aioi Nissay Dowa Insurance Co., Ltd.
- Aizuwakamatsu City
- Accenture Japan Ltd.
- Asukoe Partners, Inc.
- AEON Co., Ltd.
- AEON Financial Service Co., Ltd.
- Internet Initiative Japan Inc.
- Industry One, Inc.
- INTEC Inc.
- Intelligent Wave Inc.
- ANA Group (ACD Inc.)
- SBI Holdings, Inc.
- ENERES Co., Ltd.
- NTT Group
- Future Innovation Group, Inc.
- au Kabucom Securities Co., Ltd.
- au Jibun Bank Corporation
- au Financial Holdings Corporation
- Osaka Digital Exchange Co., Ltd.
- Kao Group Customer Marketing Co., Ltd
- KATAOKA & KOBAYASHI LPC.
- The Kansai Electric Power Company, Incorporated
- Keychain GK
- Payments Japan Association, Incorporated
- Kyushu Financial Group, Inc.
- KYOCERA Corporation
- Kumamoto Prefectural Government
- xID Inc.
- KDDI CORPORATION
- Kesenuma city
- CYBERLINKS CO., LTD.
- SATUDORA HOLDINGS CO., LTD.
- JCB Co., Ltd.
- JPX Market Innovation & Research, Inc.

- SIGMAXYZ Inc.
- Super City AiCT Consortium
- SUMITOMO CORPORATION
- SUMITOMO LIFE INSURANCE COMPANY
- Securitize Japan K.K.
- SECOM CO., LTD.
- Seven Bank, Ltd. (Seven & i Holdings Co., Ltd.)
- SOHGO SECURITY SERVICES CO., LTD.(ALSOK)
- SocioFuture, Ltd.
- Sony Bank Incorporated
- Sony Payment Services Inc.
- SoftBank Corp.
- Sampo Holdings, Inc.
- DAIICHIKOSHO CO., LTD.
- DAIDO LIFE INSURANCE COMPANY
- Dai Nippon Printing Co., Ltd.
- Daiwa Securities Group Inc.
- Daiwa Institute of Research Ltd.
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- Tokyo Kiraboshi Financial Group, Inc.
- Tokyo Financial Exchange Inc.
- TOKYO METROPOLITAN GOVERNMENT
- Toppan Inc.
- TOPPAN FORMS CO., LTD.
- THE NISHI-NIPPON CITY BANK, LTD.
- West Japan Railway Company
- NS Solutions Corporation
- The Mortgage Corporation of Japan, Limited
- Japan Securities Clearing Corporation
- NEC Corporation

Senior Advisor

- Toshihide Endo
(Former Commissioner of Financial Services Agency)

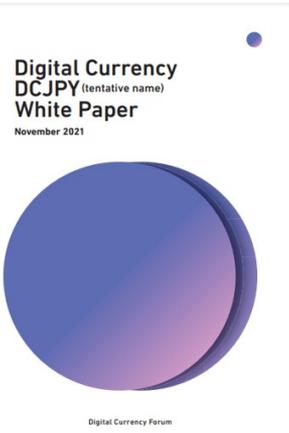
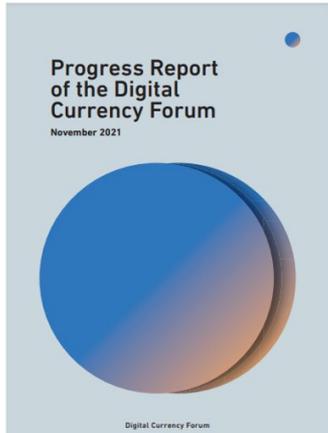
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- PwC Consulting LLC
- East Japan Railway Company
- Hitachi, Ltd.
- BIPROGY Inc.
- The Hiroshima Bank, Ltd.
- FamilyMart Co., Ltd.
- Fintertech Co. Ltd.
- BOOSTRY Co., Ltd.
- Future Architect, Inc.
- Payroll Inc.
- Mizuho Bank, Ltd.
- Mitsui Sumitomo Insurance Co., Ltd.
- Sumitomo Mitsui Banking Corporation
- Sumitomo Mitsui Trust Bank, Limited
- Mitsubishi Corporation
- MUFG Bank, Ltd.
- Mitsubishi UFJ NICOS Co., Ltd.
- Mitsubishi UFJ Research and Consulting Co., Ltd
- MIRAI Inc.
- Meiji Yasuda Life Insurance Company
- Mori Hamada & Matsumoto
- YAMATO HOLDINGS CO., LTD.
- JAPAN POST BANK Co., Ltd.
- Rakuten Edy, Inc.
- Resona Holdings, Inc.
- Lawson, Inc.
- Laurel Bank Machines Co., Ltd.

(100 companies, municipalities, and organizations)

DCJPY - Two-tiered digital currency platform -



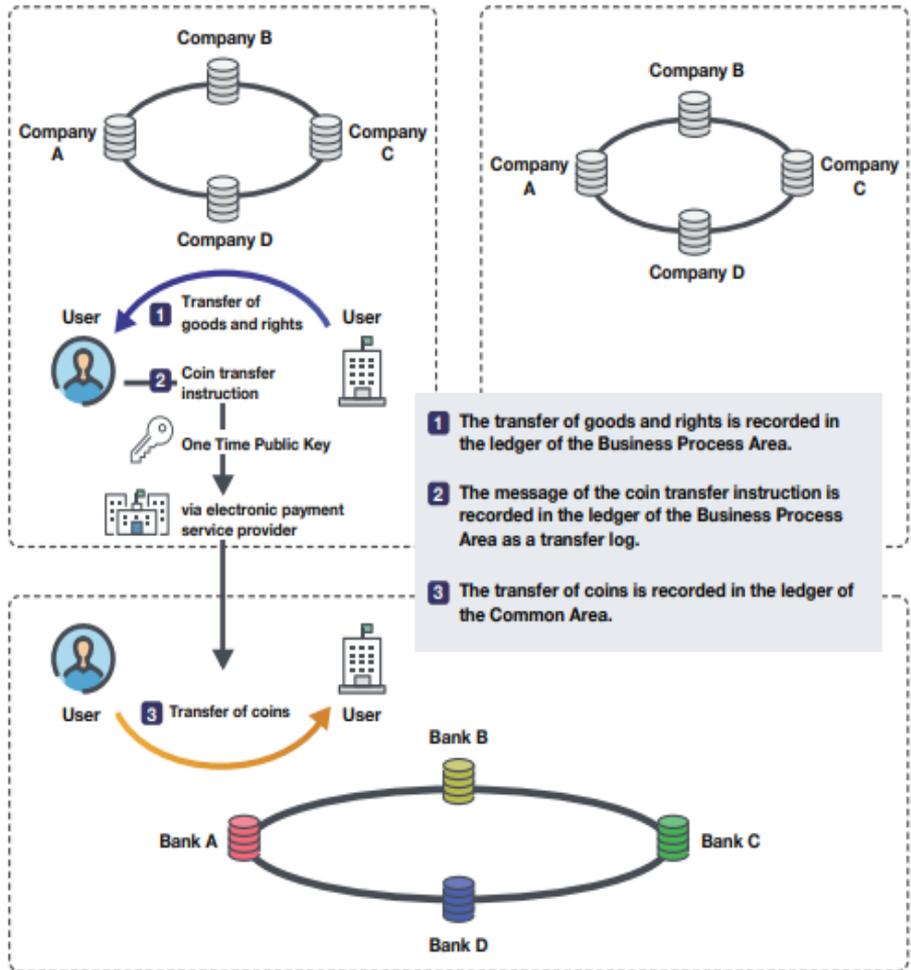
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Today, the world is facing a variety of challenges. There are strong needs to promote sound developments of digital economy and innovative markets including those of digital assets. Moreover, the world is required to achieve carbon-neutrality, to promote the development of regional economy, and to take effective measures against cyber-attacks. Now, more than 70 leading companies, financial institutions and experts in Japan have gathered at the Digital Currency Forum to work on solving a wide range of issues through applying digital technology to monetary infrastructure. I believe that such initiatives are very meaningful and encouraging, reflecting strong intentions of the industries in Japan to promote digital transformation ("DX").

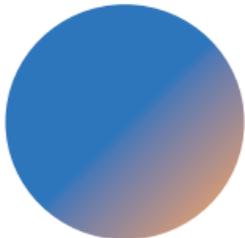
The Digital Currency Forum will continue to make every effort to overcome various challenges and contribute to the economy through utilizing digital technology for monetary infrastructure.

Hiromi Yamaoka
Chairperson,
Digital Currency Forum

Business Process Area

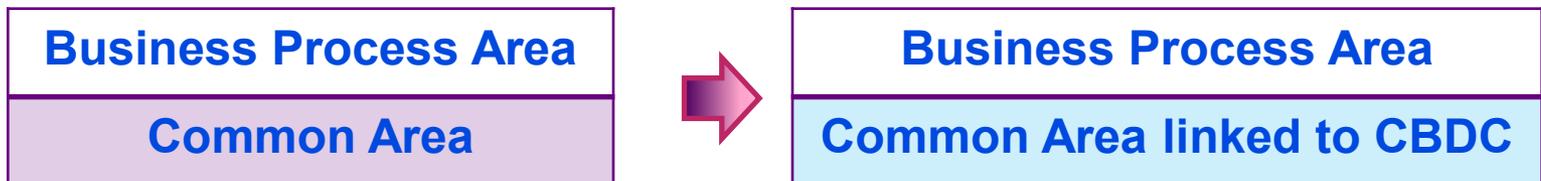


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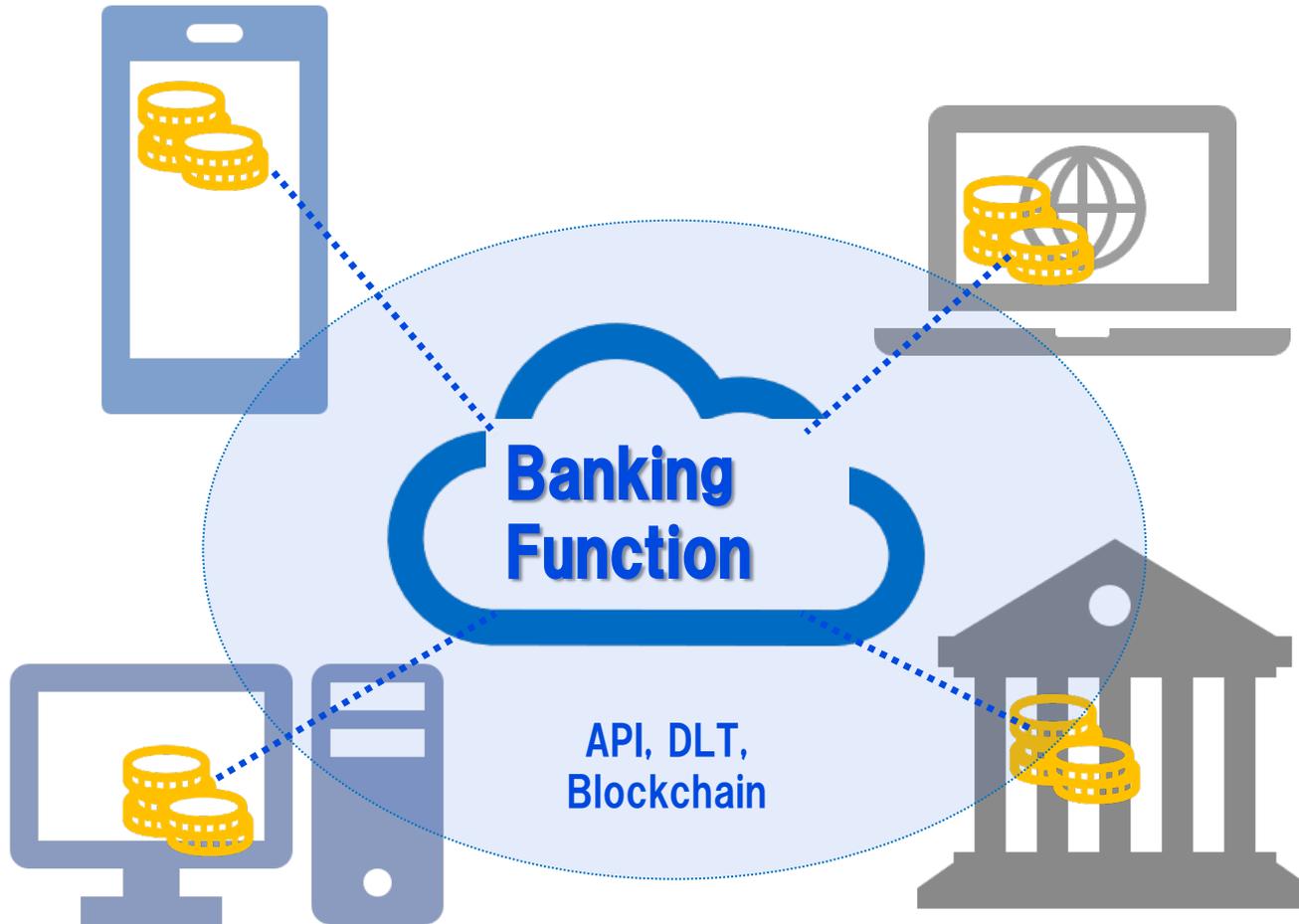


DCJPY and CBDC

- **DCJPY can co-exist with CBDC through its two-tiered structure.**
 - DCJPY can co-exist with CBDC through connecting its “common area” with CBDC infrastructure.
- **DCJPY has the potential to maximize the benefits of CBDC, if issued.**
 - DCJPY can keep “two-tiered structure” and make full use of private sector initiatives toward innovation and data utilization.



Payments and Settlements as a Service



Issues for Future Monetary System

- Impacts on Financial Intermediation and Resource Allocation, Function of Banks
- Roles of Banking Regulation and Deposit Insurance
- Data Governance, ideal Balance between Data Utilization and Privacy
- Legal and Institutional Framework for Asset Tokenization and New Digital Assets
- Future of Central Banking, ideal roles of CB money in payments and settlements
- Ideal Balance between Nation and Market

Thank you for your attention!

