

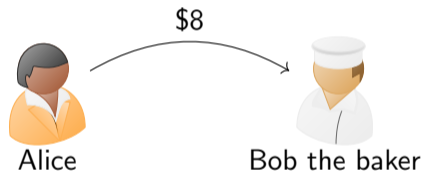
Policies for Digital Currency Innovation and Payment-System Disruption

Darrell Duffie
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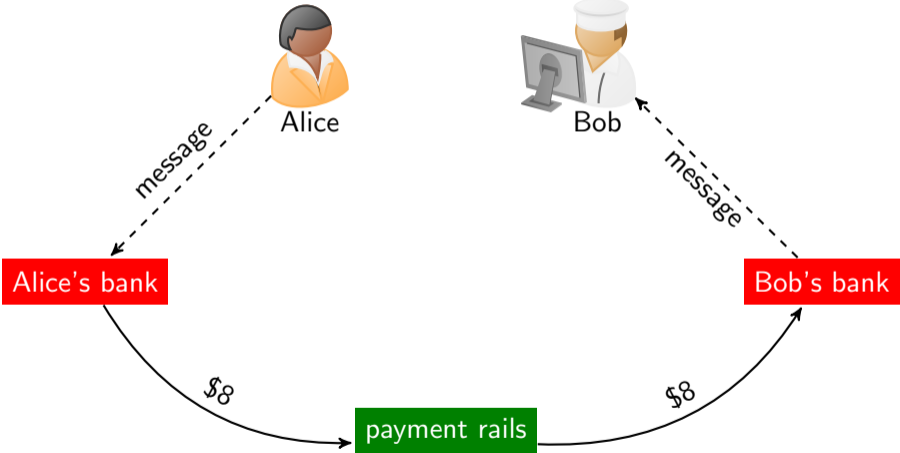
The Future.s of Money

June, 2022

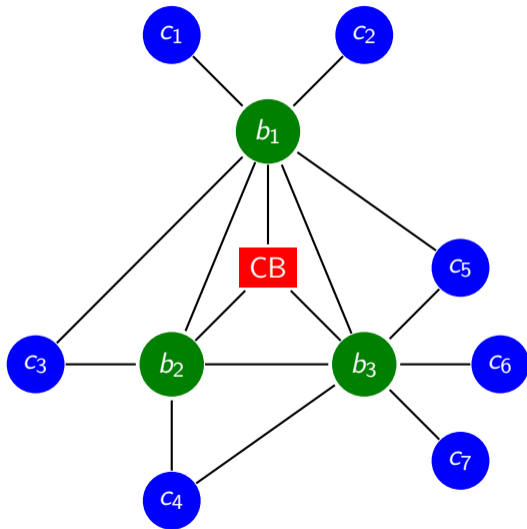
A payment



A bank-railed payment

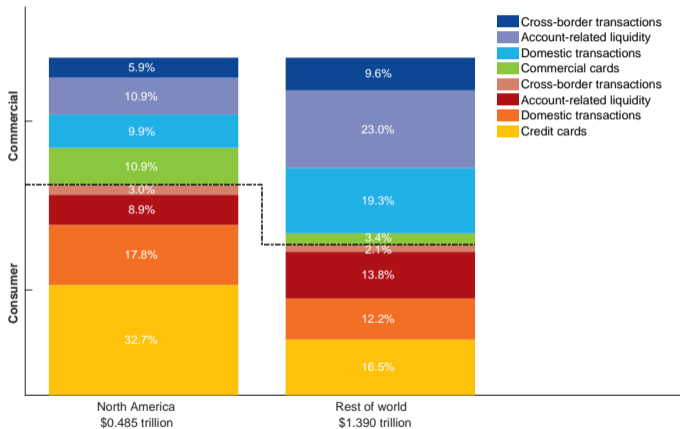


Bank payment rails



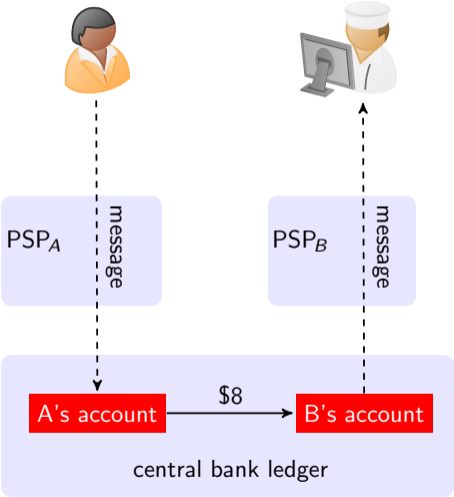
Disruptable bank-based payment system revenues

Ratio of payment revenues to GDP: North America 2.1% versus EMEA: 1.6%

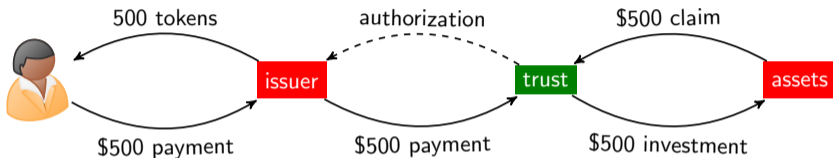


Data source for figure: McKinsey Global Payments Report, October, 2021.

A CBDC payment



Private stablecoins



President's Working Group Report on Stablecoins, November, 2021:

"... legislation should limit stablecoin issuance, and related activities of redemption and maintenance of reserve assets, to entities that are insured depository institutions. The legislation would prohibit other entities from issuing payment stablecoins. Legislation should also ensure that supervisors have authority to implement standards to promote interoperability among stablecoins."

Fast payment systems could increase competition

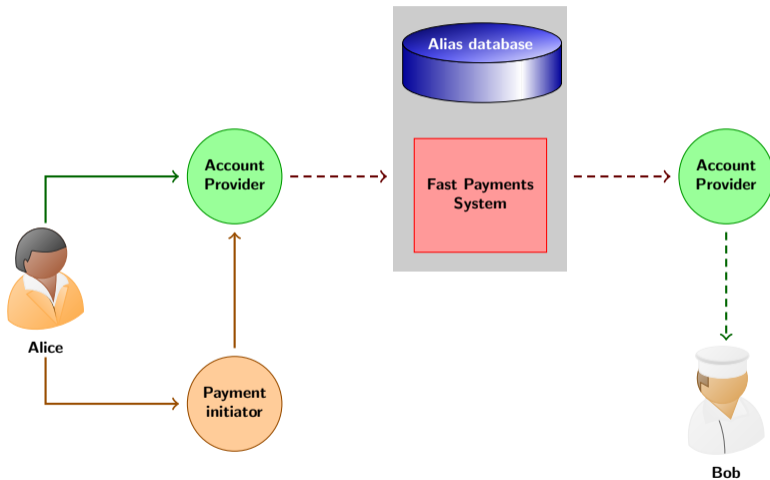
- ▶ Key defining properties:

1. $24 \times 7 \times 365$ availability.
2. Real time gross settlement (RTGS).

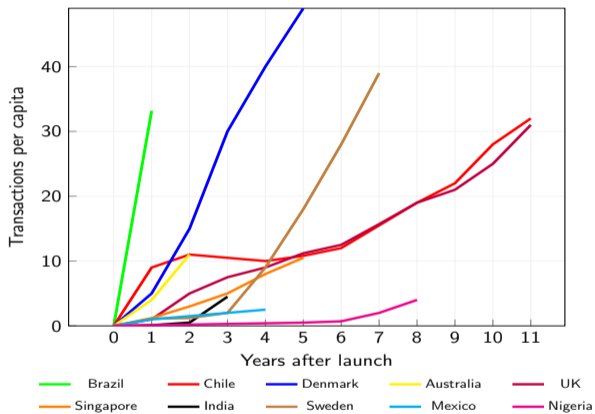
- ▶ Examples:

- ▶ Korean Electronic Banking System, established 2001.
- ▶ Bank of Mexico's Sistema de Pagos Electrónicos Interbancarios.
- ▶ Swish, a private mobile payment system available in Sweden.
- ▶ The United Kingdom's non-profit utility, Faster Payments.
- ▶ Singapore: Fast and Secure Transfers (FAST).
- ▶ The European Central Bank TARGET Instant Payment Settlement (TIPS), based on the SEPA Instant Credit Transfer platform.
- ▶ The US: Real-Time Payments System and Fed RTGS fast payment system, FedNow.
- ▶ Brazil's Pix.

Structure of a Pix payment

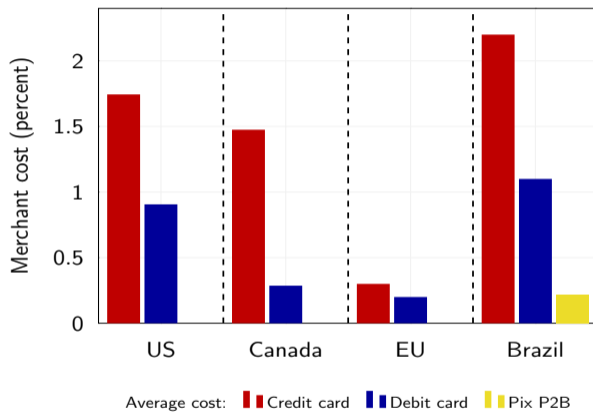


Pix adoption has been rapid



Source: Duarte, Jon Frost, Gambacorta, Koo Wilkens and Shin, Bank for International Settlements, 2022.

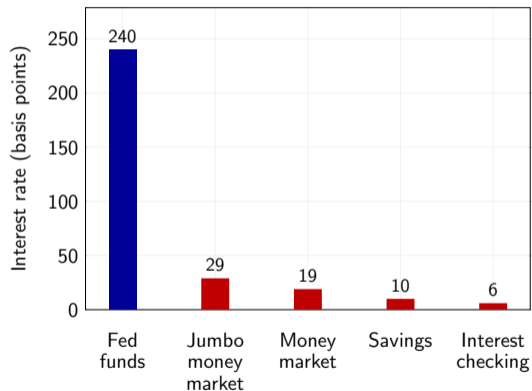
Merchant costs for cards and Pix



Source: Duarte, Jon Frost, Gambacorta, Koo Wilkens and Shin, Bank for International Settlements, 2022.

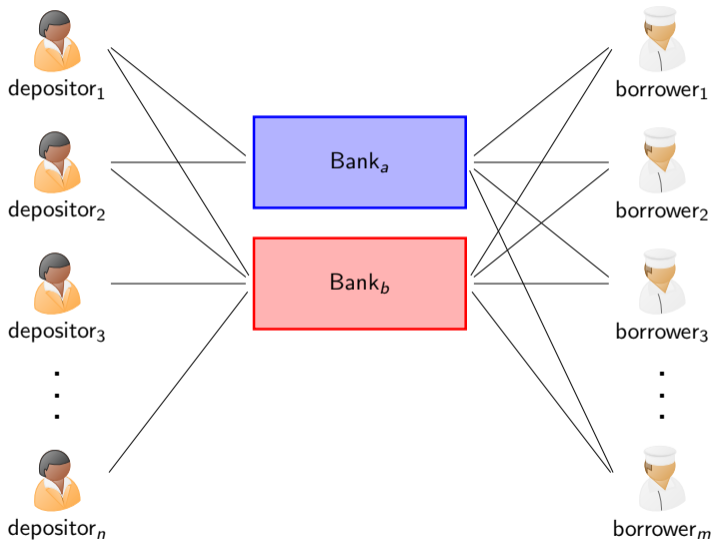
Weak competition for deposits reduces bank funding costs

When wholesale rates last peaked in April 2019



Data sources: FRED and FDIC.

Banks fund borrowers with deposits and other funding

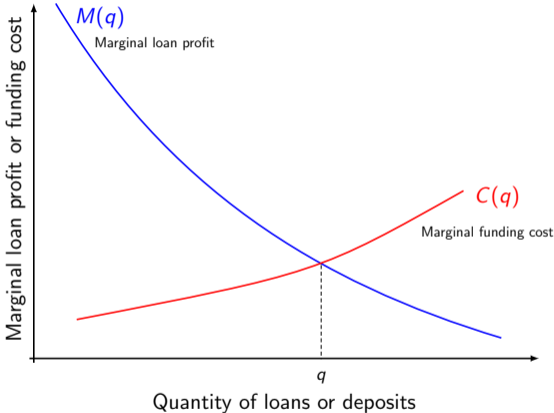


Central banks are worried about credit provision

“A widely available CBDC [...] could reduce the aggregate amount of deposits in the banking system, which could in turn increase bank funding expenses, and reduce credit availability or raise credit costs for households and businesses.” *Money and Payments: The U.S. Dollar in the Age of Digital Transformation*, Federal Reserve, 2022.

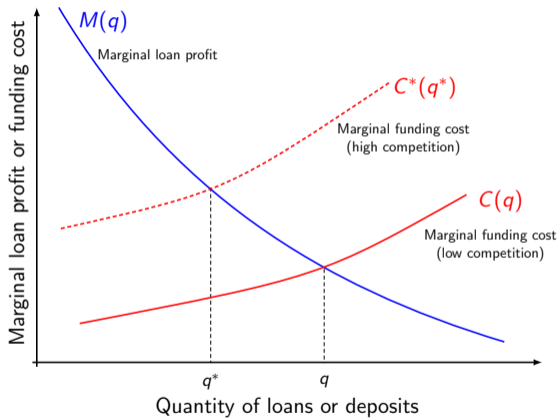
The BIS and G7 central banks, including the Fed, suggest that “if banks begin to lose deposits to CBDC over time they may come to rely more on wholesale funding, and possibly restrict credit supply in the economy with potential impacts on economic growth.” *Central Bank Digital Currencies: Foundational Principles and Core Features*, BIS, 2020.

A monopolistic bank that funds all loans with deposits

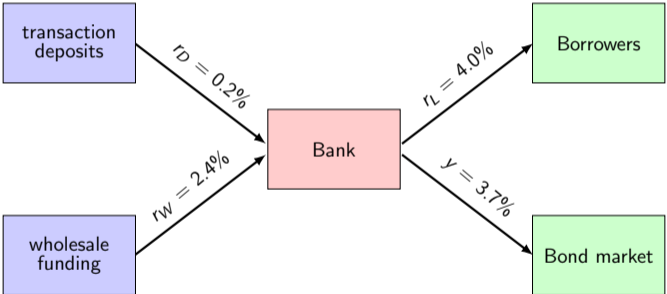


For small monopolistic banks:

Loan provision declines as deposit-market competition rises



CBDC-induced deposit-market competition is unlikely to lower credit provision much for large banks



References: Andalfatto (2020); Piazzesi and Schneider (2020); Chiu, Davoodalhosseini, Jiang, and Zhu (2021); Keister and Sanchez (2021); Whited, Wu, and Xiao (2022).

US calibrated impact of a CBDC (Whited, Wu, Xiao, 2022)

		Small Banks	Big Banks
Panel A: Subsample Parameter Estimates			
μ	Average loan maturity	3.76	3.35
ξ	Firesale discount	0.27	0.19
W_0	Relative size of the deposit market	0.211	0.272
ϕ^d	Bank's cost of taking deposits	0.008	0.009
ϕ^l	Bank's cost of servicing loans	0.011	0.006
χ	Net operating cost	0.112	0.046
Panel B: Impact of Introducing CBDC			
Total deposits		-5.76%	-6.42%
Marginal funding cost		+0.13%	+0.06%
Loans		-4.59%	-1.51%

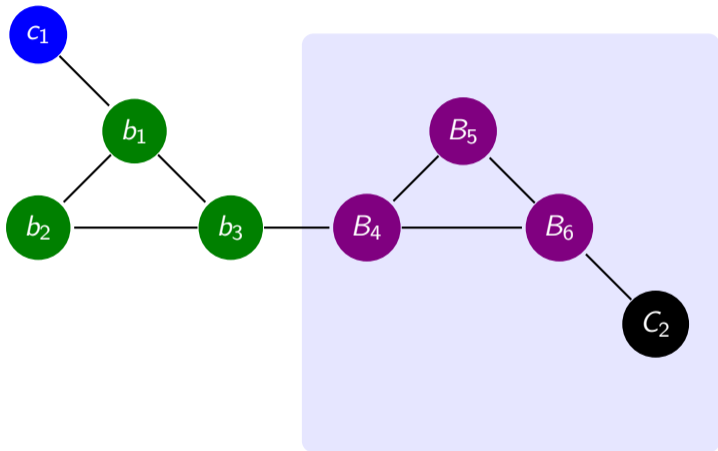
Source: Whited, Wu, and Xiao (2022).

Policies

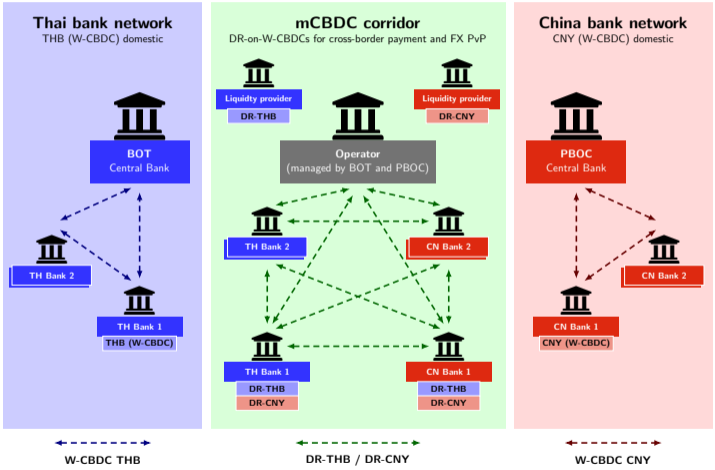
1. Use regulations and fast-payment infrastructure to promote a more open, efficient, and competitive bank-railed payment system.
2. Allow entry by private stablecoins and fintech banks, subject to compliance and interoperability standards.
3. Continue developing CBDC technology. Deploy a CBDC when the key technology gaps are closed and the economics warrant a CBDC.
4. Support wholesale CBDCs for settlement systems and cross-border payments.
5. Analyze dollar-dominance risks and benefits carefully.

Appendix exhibits

What about cross-border payments?



A multi-CBDC exchange corridor



Adapted from: Project Ithanon, Bank of Thailand, 2021.

The U.S. government is concerned

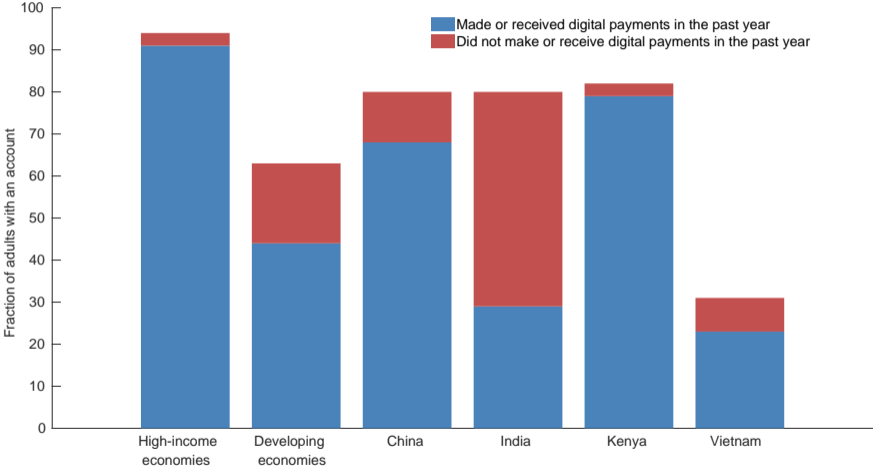
In addition, technological innovations such as digital currencies, alternative payment platforms, and new ways of hiding cross-border transactions all potentially reduce the efficacy of American sanctions. These technologies offer malign actors opportunities to hold and transfer funds outside the traditional dollar-based financial system. They also empower our adversaries seeking to build new financial and payments systems intended to diminish the dollar's global role. We are mindful of the risk that, if left unchecked, these digital assets and payments systems could harm the efficacy of our sanctions.

–The Treasury Sanctions Review, U.S Department of the Treasury, October, 2021.

Bank of England: CBDC Objectives

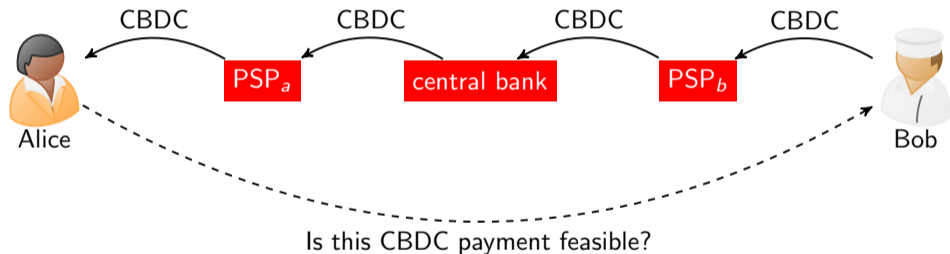
1. Supporting a resilient payments landscape.
2. Avoiding the risks of new forms of private money creation.
3. Supporting competition, efficiency and innovation in payments.
4. Meeting future payment needs in a digital economy.
5. Improving the availability and usability of central bank money.
6. Addressing the consequences of a decline in cash.
7. An enabler for better cross-border payments.

Financial inclusion and digital payments



Data source: World Bank Global Findex Database.

Interoperability for hybrid CBDC is crucial



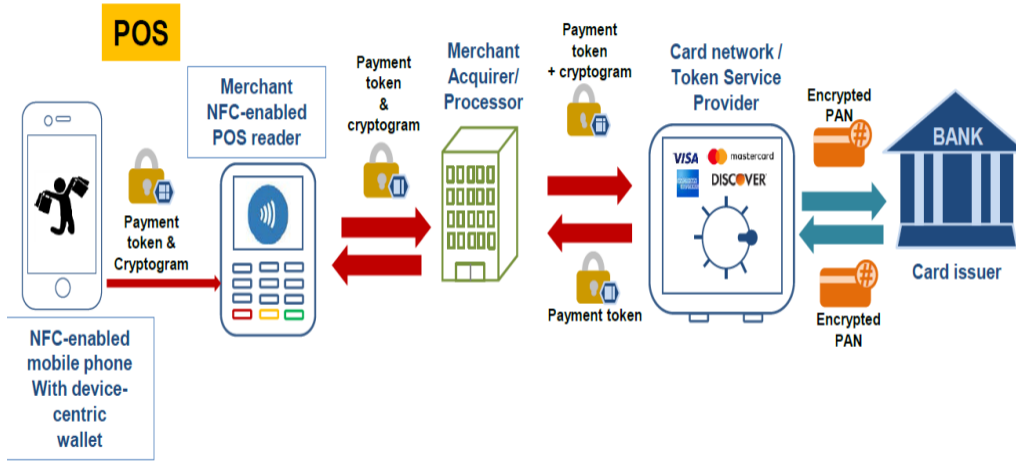
Major CBDC developers

Major CBDC developers include:

- ▶ Peoples Bank of China.
- ▶ Sveriges Riksbank.
- ▶ Bank of Korea.
- ▶ Nigeria.
- ▶ European Central Bank.

Recommended reading: Adrian and Mancini-Grifoli (2019), Bindseil (2019), Group of Thirty (2020), Auer and Böhme (2020), Bank of Canada, Bank of England, Bank of Japan, European Central Bank, Federal Reserve, Sveriges Riksbank, Swiss National Bank and BIS (2021), Federal Reserve Board (2022), The White House (2022).

Illustrative cryptographic payment authorization flow



Source: Federal Reserve Bank of Boston, U.S. Payments Forum.

Two-ledger payment system

