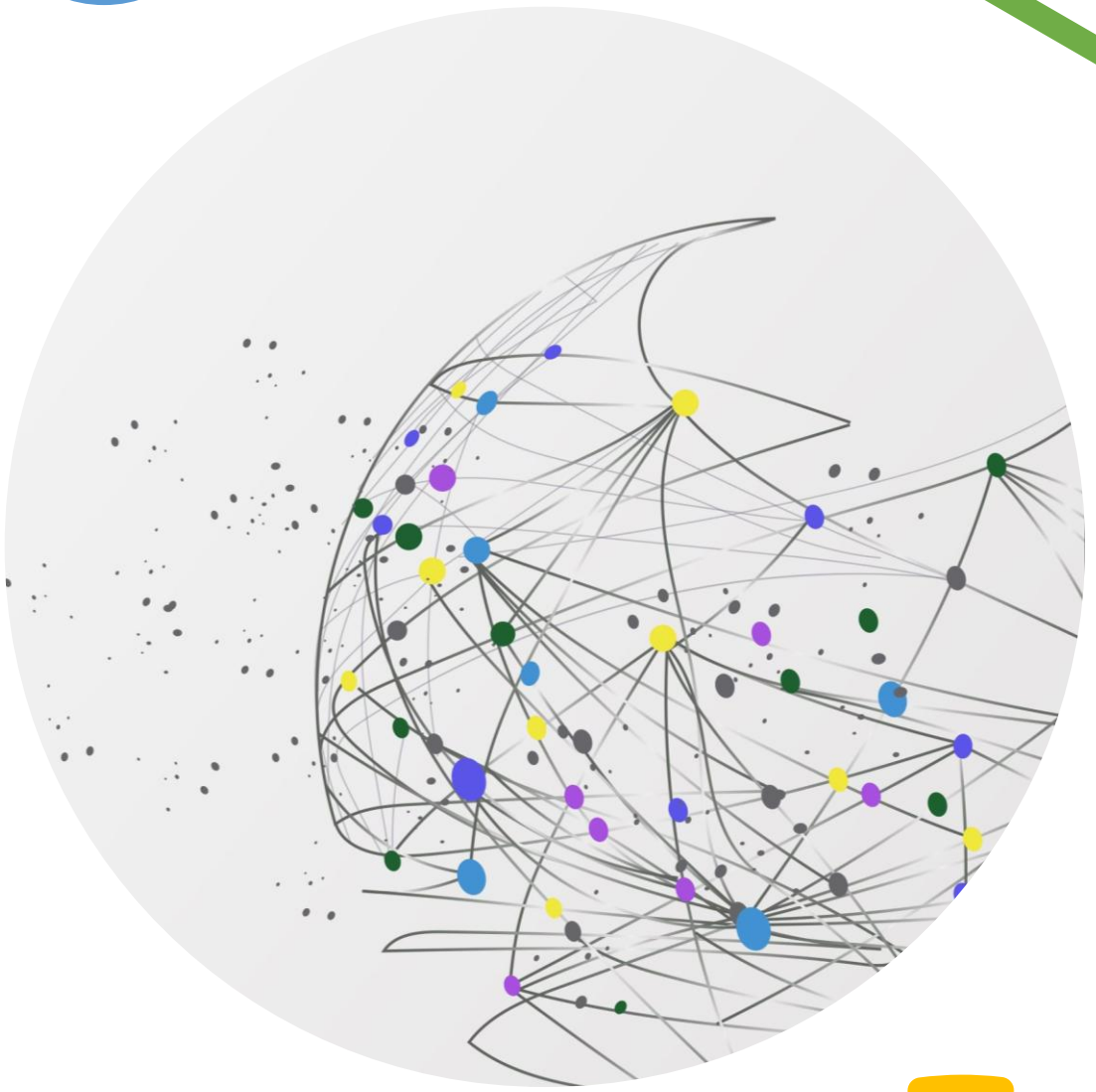

Digital Payment and Currency ~Cross-Border Perspectives~

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Outline of Presentation

Part 1

Retail Payment: QR and Fast Payment Systems

Part 2

Central Bank Digital Currency (CBDC)

Part 3

Fiat-Backed Stablecoins for Payments

Digital Economy and Productivity

- Payments are not just a financial service — they are a core infrastructure for productivity and digital trade.

Digital Technology (Platforms, AI, Cloud)

- Lower transaction costs and faster transaction pace

Payments Infrastructure

- Faster payment execution and lower payment risk

Cross-border digital trade and services

- E-commerce and platform-based digital services

How Digitalization Raises Productivity

Lower transaction costs

- search, contracting, payments

Improved firm management

- inventory control, cash-flow management

Expanded access to finance

- data-based credit, SME finance

Part 1. Retail Payment: QR Payment and Fast Payment Systems

Key Global Trends in Retail Digital Payments

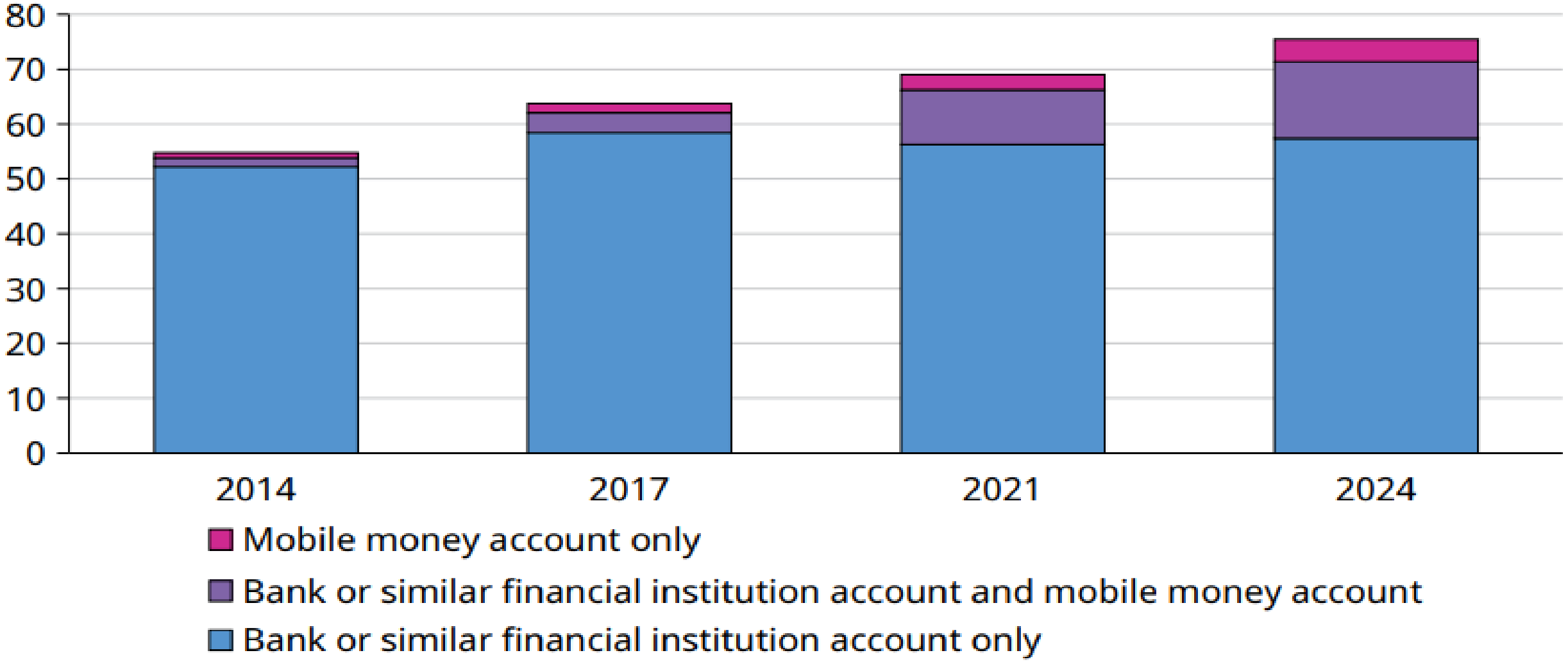
Key Points:

- Digital payments adoption has grown rapidly, both in developed and developing economies.
- Retail digital payments now underpin consumer spending, remittances, and formal economic participation.

Data (OECD 2025):

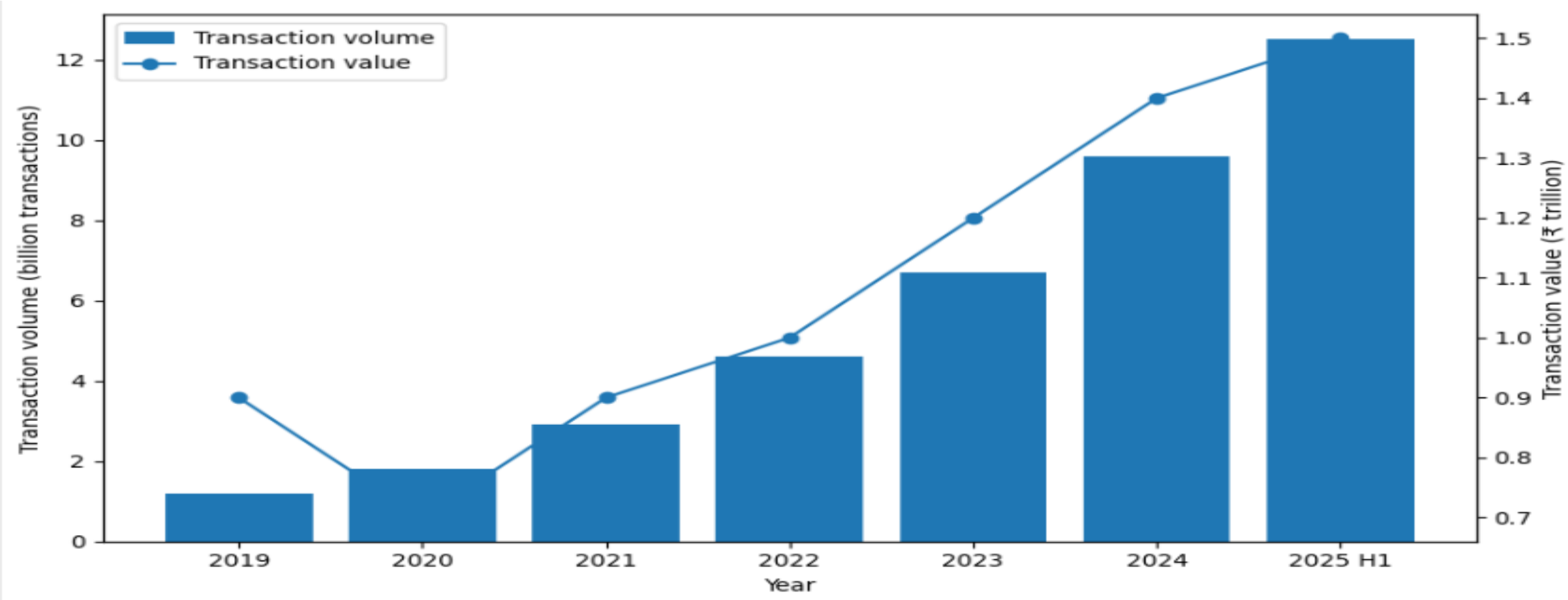
- In OECD countries, digital payment adoption had already reached a very high level, at **about 96%** of adults in 2024.
- Share of adults making/receiving digital payments increased from **55%** in 2021 to **62% in 2024** in developing economies.

Global Trends in Account Ownership by Type (%)



Source: World Bank

India’s Growth of Retail Digital Payments (UPI)



- Near-complete digitalization by transaction volume (UPI)

Source: RBI

Improving Retail Payments: Implications for SME Trade and Productivity

- Faster and cheaper retail payments ease cash-flow constraints for SMEs.
- Lower transaction/entry costs enable greater SME participation in domestic and cross-border trade.
- Digital transaction data improves access to credit and cash management, supporting productivity and growth.

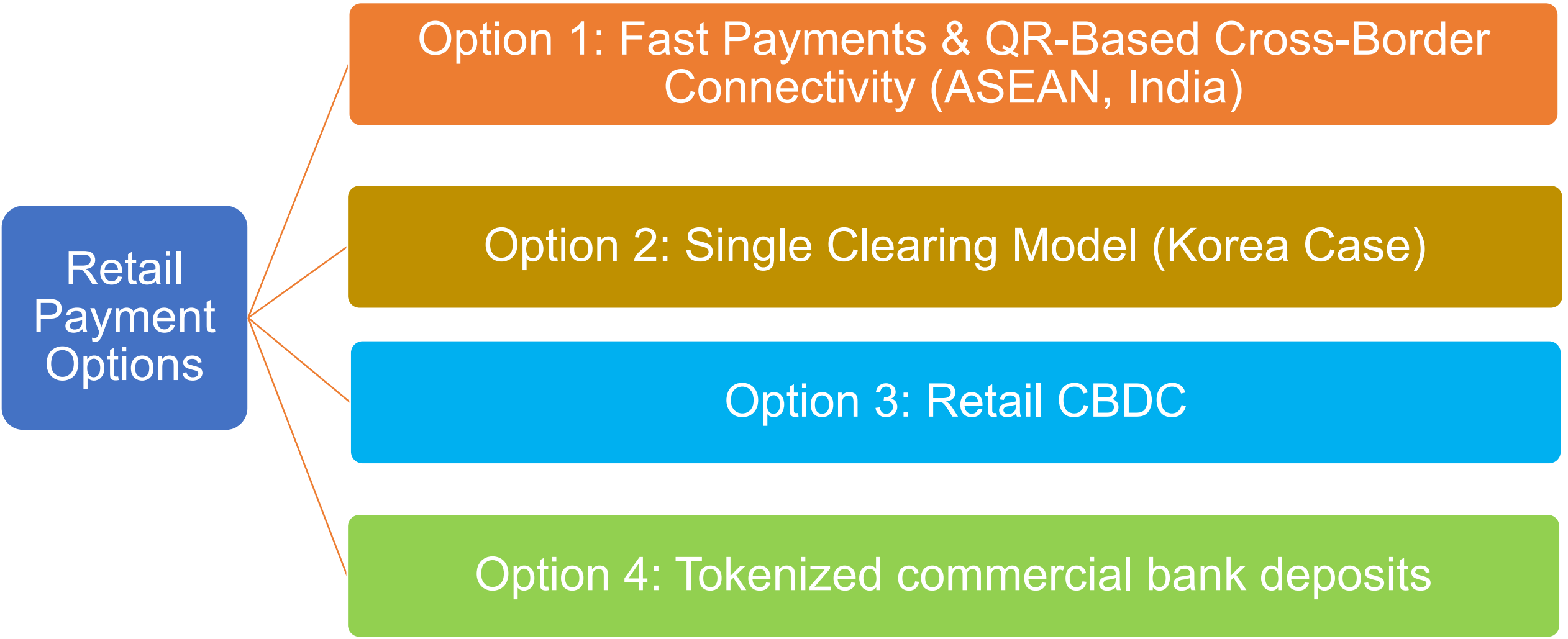
Benefits of Adapting Digital Payments

Digital payments enable scale, speed, and formal economic participation.

Selected Empirical Evidence

Frost et al. (2024) 101 countries	101 countries: A 1 percentage-point increase in digital payment use is associated with about 0.1 pp higher annual GDP per capita growth and a statistically significant reduction in the informal sector.
BIS Paper (2024)	Advanced and emerging economies: Faster and cheaper digital payments improve working capital management, support SME participation in trade, and strengthen monetary policy transmission.
Kahveci & Gurgur (2025)	Turkey: A 1% increase in digital payment transactions is associated with about 0.12 pp higher annual GDP per capita growth and a 1.5% increase in the private credit-to-GDP ratio.

Policy Options to Enhance Cross-Border Retail Payments



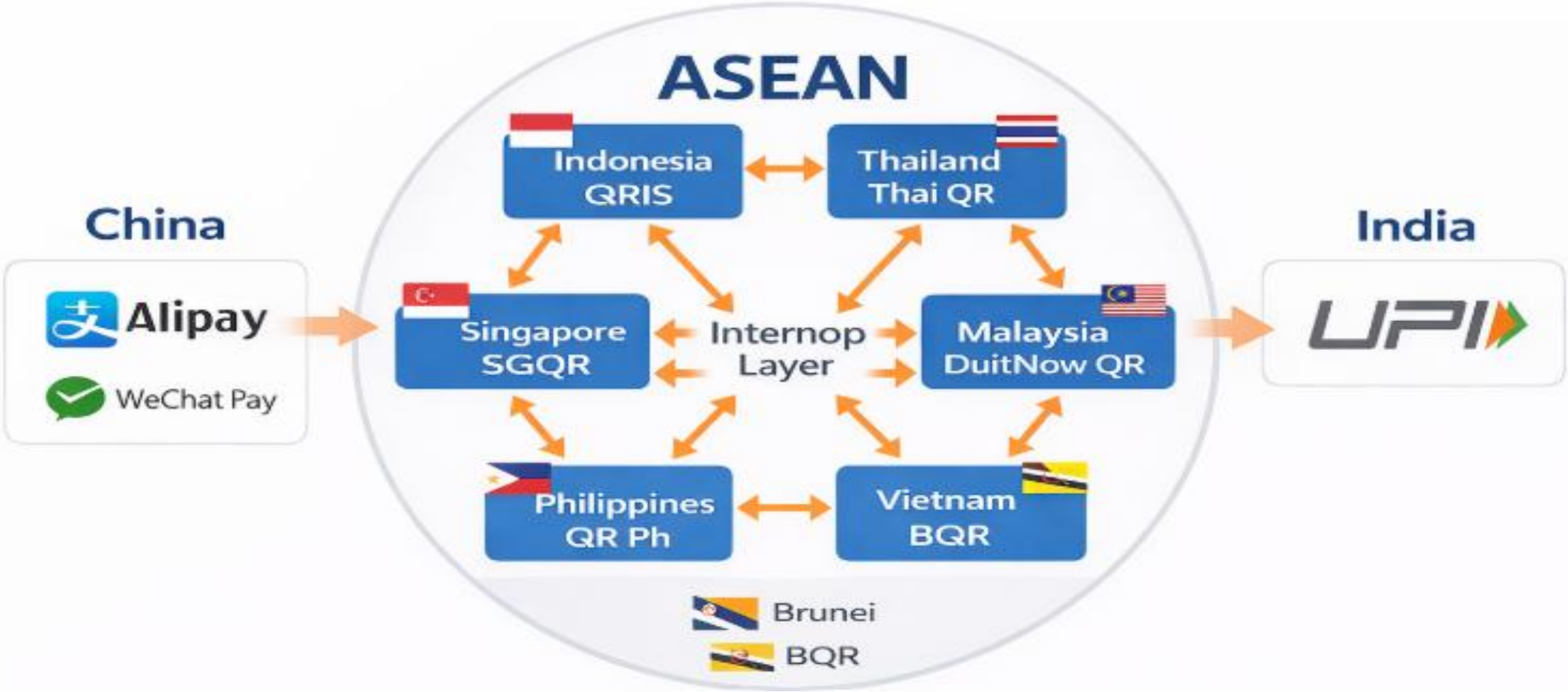
ASEAN QR Payment Connectivity

- ASEAN is building a region-wide Cross-Border QR Payment Linkage, jointly advanced by ASEAN central banks.
- The system enables consumers to pay abroad by scanning merchants' QR codes using their home-country mobile banking apps or e-wallets.
- Supports instant, low-cost cross-border payments for tourism, SMEs, and remittances.
- Uses real-time payment systems and increasingly supports local-currency settlement and thus reduces dependence on credit card networks and USD-based settlement.
- Current Coverage: Indonesia, Thailand, Singapore, Malaysia are already fully linked

Implications:

- Expands financial inclusion
- Strengthens ASEAN's digital and monetary integration
- Lays the foundation for future tokenized and programmable cross-border settlements

ASEAN Digital Payment Connectivity (Linking National QR Systems)



ASEAN–India-UAE QR Connectivity

India's UPI is being linked with ASEAN fast-payment and QR systems:

- India–Singapore (UPI–PayNow): live, enabling instant low-cost transfers
- India–UAE: QR payment acceptance and UPI enablement
- Ongoing discussions with Indonesia, Malaysia, Thailand on interoperability between UPI QR and ASEAN QR standards

Benefits:

- Enables cross-border retail payments for tourists and SMEs
- Reduces remittance costs across the India–ASEAN corridor
- Supports local-currency use and digital commerce integration

China–ASEAN and China–Global QR Linkages

China–ASEAN Integration: Alipay+ enables QR payments for users from Singapore, Malaysia, Philippines, Thailand, and Indonesia across Chinese merchants.

e.g., China–Singapore: Alipay–NETS Pay; WeChat Pay–NETS Pay interoperability.

e.g., China–Thailand: WeChat Pay and Alipay acceptance across Thai tourism sectors.

e.g., China–Indonesia & Malaysia: QR standards linked with local e-wallet ecosystems

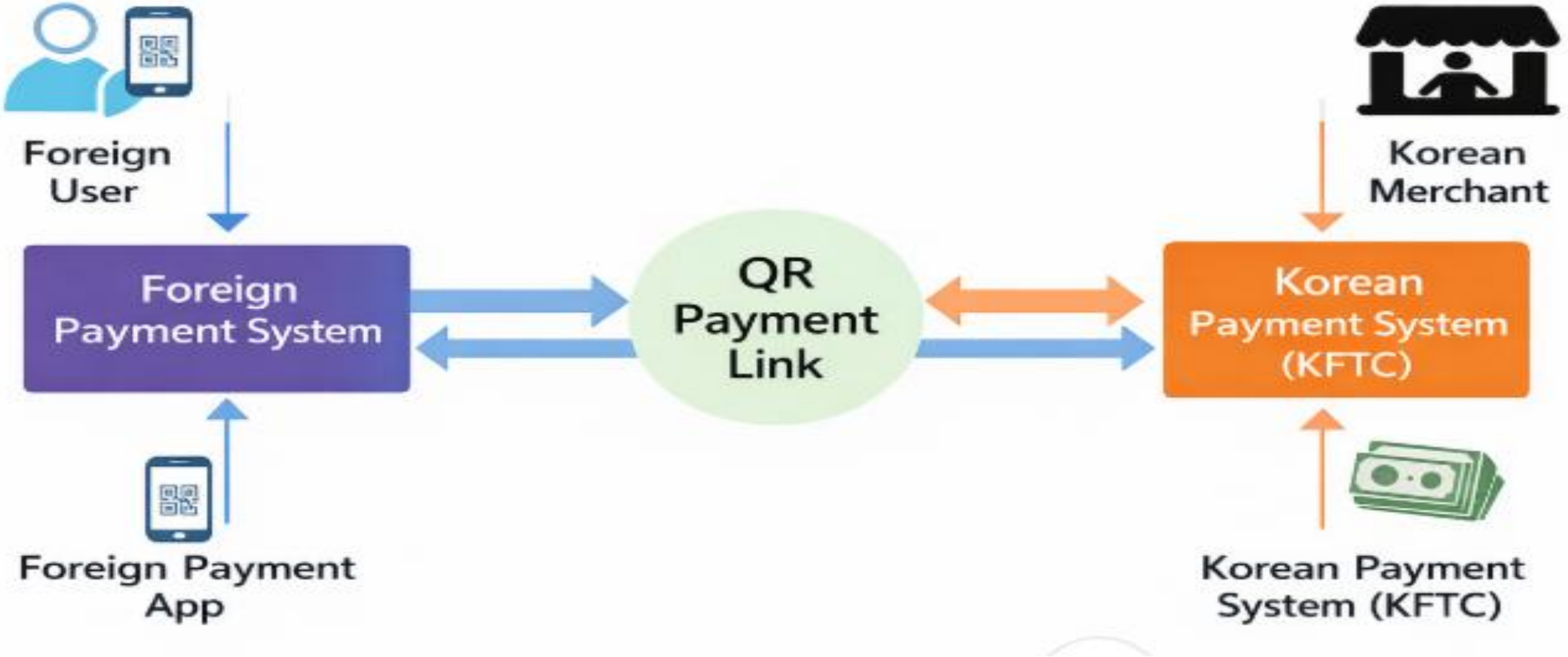
China–Global Integration:

- Alipay+ supported in Japan, Korea, UAE, and Europe.
- UnionPay QR expanding to Middle East, Africa, and East Asia.

Strategic Significance

- Reinforces China's influence in regional retail payment infrastructure.
- Provides a parallel network to credit card schemes and SWIFT for small-value cross-border flows.
- Enhances China–ASEAN economic integration and global QR acceptance.

Korea's Cross Border QR Payment Link (Centralized domestic switch connected to foreign payment systems)



BIS Innovation Hub: Project Nexus

1. **Connects domestic instant payment systems (IPS):** Nexus links national fast-payment systems so money can move across borders instantly, securely, and 24H/7D.
2. **Simple "single connection" model:** Payment providers integrate once with Nexus and gain access to all other connected countries—no need for bilateral development with each jurisdiction.
3. **Supports G20 goals for faster, cheaper, transparent payments:** Designed to reduce costs, improve speed and transparency, and expand accessibility for individuals and businesses globally.
4. **Scalable multilateral model:** Built as a global, interoperable network that can expand country by country, creating a shared international infrastructure for real-time cross-border payments.

Member Central Banks: India, Indonesia, Malaysia, Singapore, Thailand

Part 2. Central Bank Digital Currency (CBDC)

- Definition: A CBDC is a digital form of central bank money issued to the general public (retail) or financial institutions (wholesale)

- Two Types of CBDC:

(1) Wholesale CBDC: Used for interbank and cross-border settlement, foreign exchange payment-versus-payment (PvP), delivery-versus-payment (DvP), and liquidity management.

(2) Retail CBDC: Digital cash for the general public, supporting low-cost efficient retail payments.

Benefits of Wholesale CBDC

Real-time and low cost	Real-time cross-border settlement with PvP or DvP (FX, securities, collateral operations)
Direct Payment	Reduced reliance on correspondent banking networks
Programmability	Programmable settlement (PvP or DvP)
Digital Infrastructure	Infrastructure for tokenized financial markets and wholesale digital assets

Case of Wholesale CBDC: mBridge (2022~)

1. Real-time cross-border wholesale settlement
2. Central banks in China, Hong Kong, Thailand, and UAE, and now joined by Saudi Arabia
3. Supporting PvP for FX and DvP for tokenized assets
4. BIS Innovation Hub supported mBridge until 2024 through its transition to the minimum viable product stage

Other BIS Wholesale CBDC Projects

Project Mariana: France, Singapore, Switzerland (2022~)

- FX trading and PvP settlement using wholesale CBDCs combined with automated market makers (AMMs)
- Demonstrates the application of DeFi mechanisms to central bank money

Project Agorá: BIS + G7 central banks + major global banks (2024~)

- Interoperability between tokenized deposits and wholesale CBDCs, improving settlement efficiency

Project Ensemble: Bank of France + private sector (2023~)

- Wholesale CBDC settlement for tokenized financial assets within European market infrastructures

UAE–India CBDC Corridor (2023~)

- Cross-border wholesale CBDC pilots with commercial banks.
- Real-time FX and cross-border payments using the Digital Dirham and Digital Rupee

Benefits of Retail CBDC

Financial Inclusion	Accessibility with a mobile phone without a bank account
Safe money	Direct access to central-bank money in a cashless economy)
Low-Cost	Instant, low-cost payments and remittances
Offline Functionality	Payment availability during network outages or in low-connectivity areas

Retail CBDC Issuance and Limited Adoption

Retail CBDCs Already Issued or Piloted:

- Bahamas – Sand Dollar (2020)
- Jamaica – JAM-DEX (2022)
- Eastern Caribbean Currency Union – DCash (2021)
- Nigeria – eNaira (2021)
- China – e-CNY (pilot) – large-scale pilot; not yet nationwide
- India – Digital Rupee (pilot) – limited controlled rollout
- Kazakhstan – Digital Tenge – technically launched, but still in a pilot-like limited rollout

Cases of Retail CBDC Pilot Projects

China (e-CNY)

- Accessible via smartphone apps and QR-code payments
- Supports offline payments and programmable features
- Account-based (a hybrid model incorporating some token-like elements)
- Distributed through commercial banks and authorized payment service providers

India (e-Rupee)

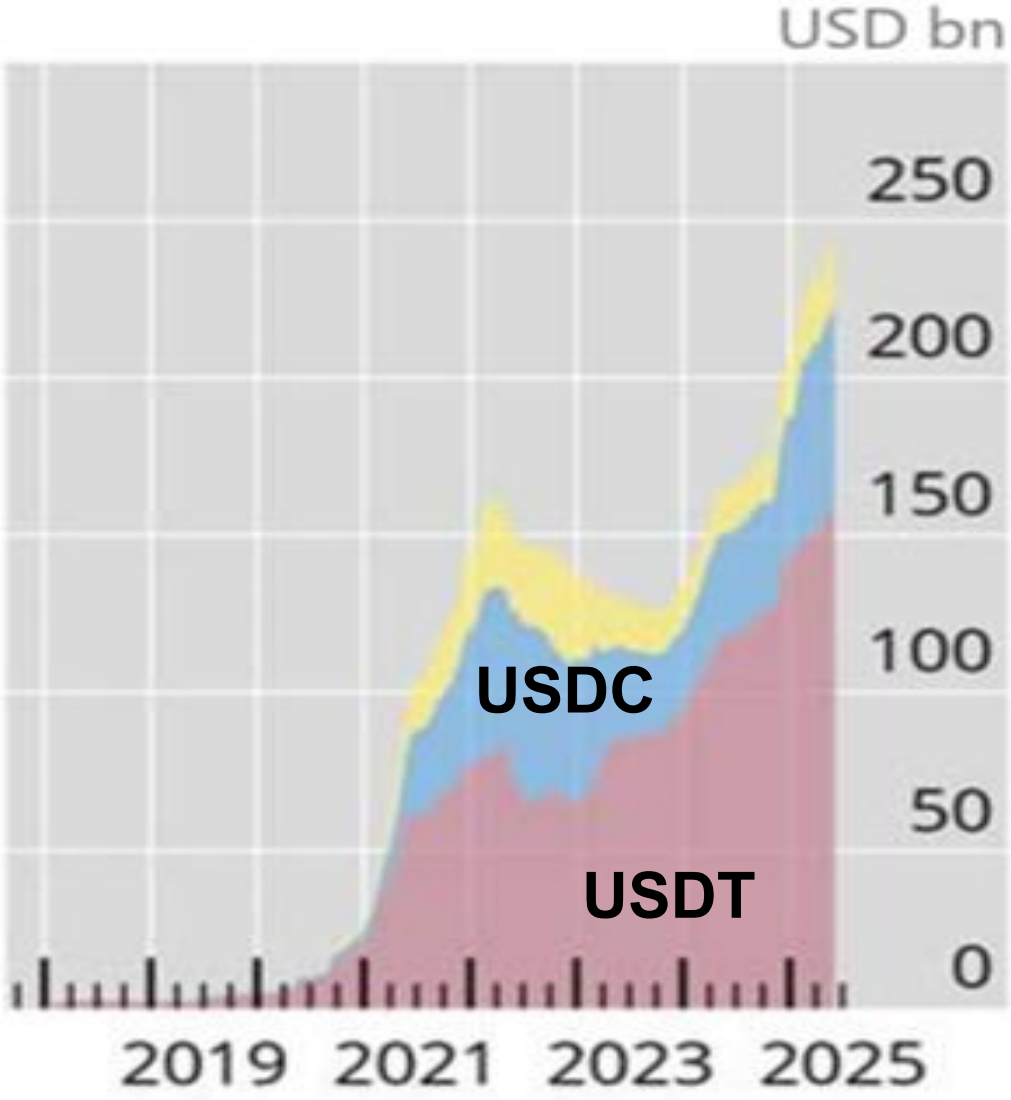
- Primarily token-based aimed at enabling privacy in small-value transactions
- Distributed through commercial banks
- Designed to complement India's UPI instant-payment infrastructure
- Initially piloted for both retail and wholesale use cases in select regions

Adoption Remained Limited

1. **Strong competition from existing private payment systems:**
   - Mobile wallets and bank apps already offer fast, easy, low-cost digital payments.
   - No pricing benefits or convenience superior to current solutions.
   - Merchants face onboarding and compliance burdens.
2. **Limited interoperability with existing platforms**
   - In many cases, CBDC apps are stand-alone, not integrated into dominant QR or instant-payment ecosystems.
3. **Concerns about privacy and state monitoring**
   - Fear of government visibility of spending reduces willingness to adopt.
4. **Technical and usability challenges**
   - Early System Outages as a Major Barrier to Adoption (e.g, Dcash, eNaira)
   - User experience often inferior to commercial fintech apps.

Part 3. Fiat-Backed Stablecoins for Payments

Market Capitalization



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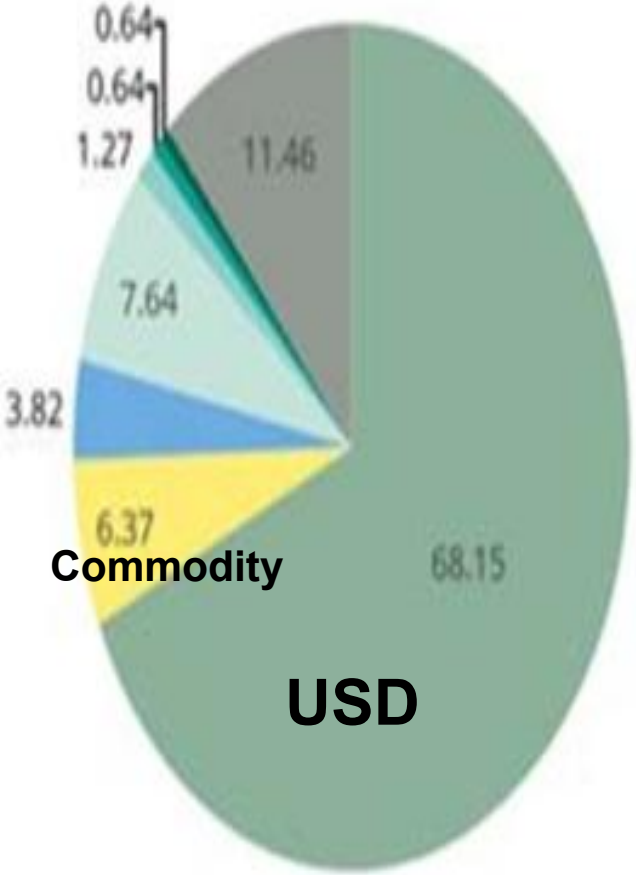

Currency

Source: BIS

- Definition: Stablecoins are crypto-tokens designed to maintain stable value on blockchain networks, typically pegged to fiat currencies such as the U.S. dollar

Features (Retail Use):

(1) **Full value stability**: Fully backed by sovereign fiat currency at a 1:1 ratio, with redemption at par value

(2) **Growing regulatory oversight**: Reserves increasingly consist of central bank money, regulated deposits, or short-term government bonds, with new rules requiring transparency and reporting.

(3) **Efficient digital payments**: Enables instant, low-cost transfers and connect to the traditional financial system through on-/off-ramps (convert between stablecoins and fiat currency).

(4) **Programmability (Optional)**: Smart-contract based, enabling conditional payments (e.g., automatic payment, support for PvP or DvP and other advanced financial operations)

Features (Wholesale Use):

1. **Instant settlement for FX, securities, and collateral transactions**
   – Improved liquidity and reduced counterparty risk.
2. **PvP-based FX settlement and DvP-based settlement for tokenized securities**
   – Lower settlement risk.
3. **24/7 cross-border settlement without correspondent banking networks (e.g., pilot wholesale CBDC between Hong Kong & Thailand)**
   – Reduced delays and lower operational costs.
4. **Settlement asset for tokenized financial markets**
   – Applicable to bond tokenization, repo markets, and digital collateral, enabling automated and programmable settlement workflows.
5. **Interoperability with banks, custodians, CSDs, and institutional blockchain platforms**
   – Connectivity through on/off-ramps to networks such as JPM Coin, Onyx, and MAS Project Guardian.

U.S. GENIUS Act (July 2025)

- The federal framework for payment stablecoins to ensure consumer protection, financial stability, and the integrity of USD-pegged stablecoins.
- Only approved payment stablecoin issuers may issue USD-pegged stablecoins and must maintain 1:1 backing with high-quality liquid assets (USD cash, bank deposits, U.S. Treasury bills).
- Mandatory monthly attestations and independent audits of reserve assets.
- Foreign issuers offering stablecoins to U.S. users must comply with equivalent standards and submit to U.S. oversight.

<u>Implications</u>

- Enhances the global role of the U.S. dollar in digital asset markets.

Stablecoin Regulations: Hong Kong and Singapore

Hong Kong (Aug. 2025)

- Only licensed entities may issue or market fiat-referenced stablecoins in Hong Kong
- Applies to stablecoins referencing the HKD and to other fiat currencies designated by the HKMA (e.g, USD)
- World's strictest frameworks, covering primary/secondary offers (including P2P transactions), high-quality 1:1 reserves, segregation and custody of assets, detailed disclosures, and ongoing reporting

Singapore (2023)

- Applies to stablecoins referencing SGD or any G10 currency and issued in Singapore
- MAS-regulated stablecoins require fulfilment of MAS requirements while non-regulated ones may still circulate
- Strict conditions on the regulated stablecoins: 1:1 high-quality backing, segregation of reserves, monthly attestations, daily monitoring, and T+5 redemption guarantees.