MONETARY AND CAPITAL MARKETS

Digital Money Developments—A (Very Brief) Financial-Economics Perspective

JVI Webinar

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Disclaimer

The views expressed here are my own and do not necessarily represent those of the IMF, its Executive Board, or IMF management.

Content

1. Stablecoins—Selected Issues
2. Quick Perspective on the JVI Region
3. Analytical Work in IMF Technical Assistance

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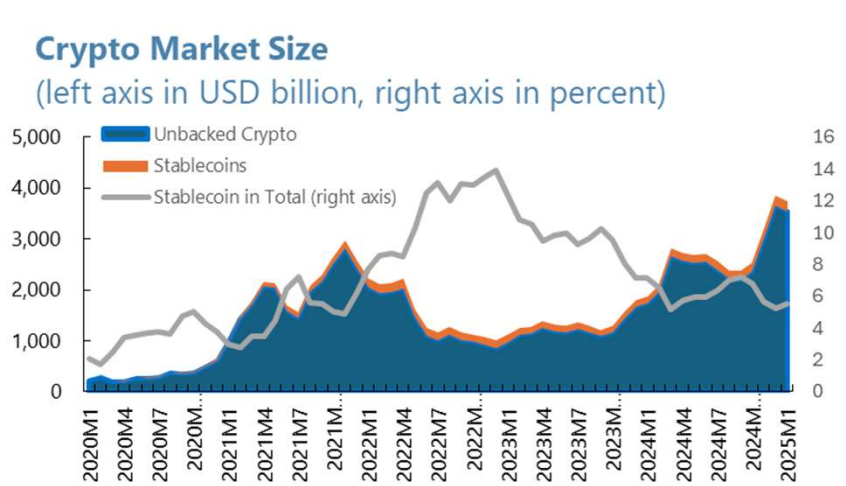
Stablecoins

Stablecoin market size remains small, in store-of-value terms….



…while stablecoin **flows are more sizeable—**mainly pertaining to crypto trading and cross-border payments

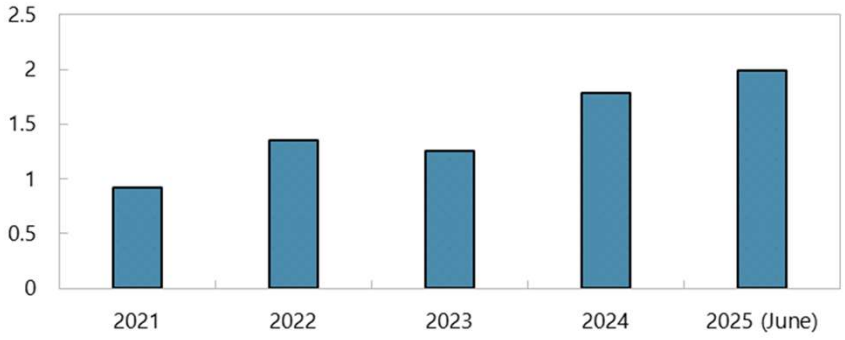
Source: CoinGecko, Chainalysis; part of Figure 1 of Gross and Senner (2026).

Stablecoins

Footprint in sovereign bond markets: growing; potential for two-way feedback with markets

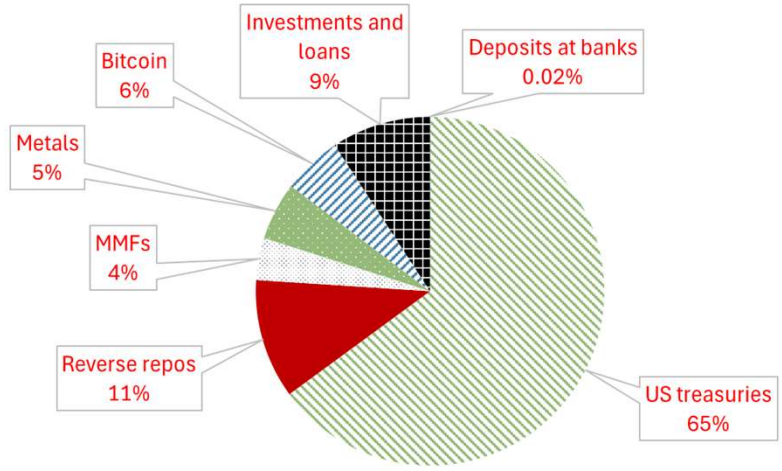
Regulation: under development; without regulation, incentives for SC issuers to be yield-seeking

Largest Stablecoins' Treasury Bill Holdings in Total Treasury Bills
(percent, end-of-period)



Source: Financial reporting of five largest USD stablecoins, FRB, and own calculations.

USDT's Asset Composition
(percent of total, end-June 2025)



Source: Tether.

Some Potential Benefits and Risks of Stablecoins

Potential Benefits

- Lower transaction costs and higher transaction speed for business and private remittances
- Benefits of (digital) currency substitution: more stable inflation, lower rates, more stable macro-financial environment
- Growing demand for sovereign debt of SC-dominant economy → lower interest rates, positive for fiscal finances
- FX appreciation for SC-dominant economy: support import purchasing power

Risks

- (Digital) currency substitution:
  - Loss of monetary sovereignty
  - Weaker monetary policy transmission
  - Loss of seigniorage income for CB/SOV
  - Higher capital flow and FX vola
  - FX appreciation for SC-dominant econ: burden exporters
- Risk of monopolistic rents for globally dominant systemic SCs
- Sovereign-stablecoin nexus:
  - Shortening of maturities, higher rollover risk & rate sensitivity for sovereign
  - Two-way feedback with sovereign bond markets
- Illicit activity and circumvention of capital controls

Note: The table summarizes some of the discussion in Gross and Senner (2026) and Adrian et al. (2025).

Current Global Developments

Central Banks & Governments

- **Some drive CBDC forward** (ECB, selected countries in the JVI region, China, Russia), many in active research mode, others pause
- **China**: recent notable move away from conventional CBDC
- **Stablecoin regulation** under development, US Genius Act, UK industry consultation, others
- **South Korea**: allow domestic FX bond issuance again, to counter capital outflow dynamic caused inter alia by SC purchases
- **Wyoming, US**: local governmental stablecoin, with reinvestment of seigniorage gain for public benefit (schooling)

Banks

- Aim to develop own SCs / tokenized deposits: JPM, Bank of America, Citi Bank, Lloyds, Standard Chartered, European bank consortium (Qivalis, 12 banks presently)

Payment Network Operators & Service Providers

- **Visa** allows USD-stablecoin-based settlement in the US
- **SWIFT** developing blockchain to improve cross-border transactions and partners with banks to allow transaction of tokenized products
- **PayPal** has its own SC already

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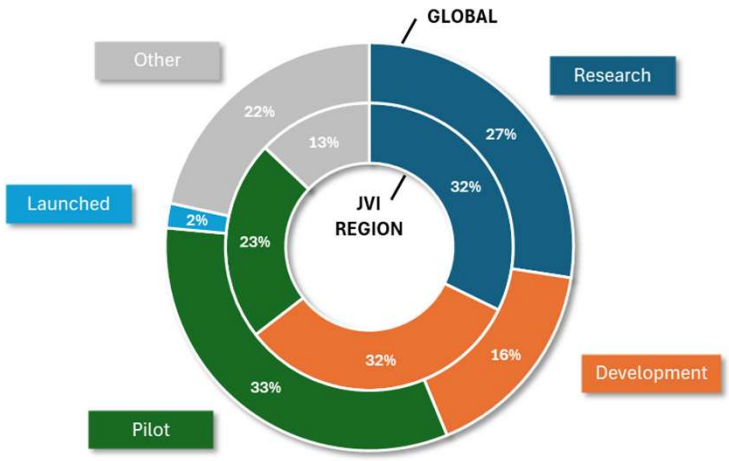
CBDC Developments in the JVI Region and the World



	Abs.		Rel.	
	Global	JVI region	Global	JVI region
Research	42	10	27%	32%
Development	25	10	16%	32%
Pilot	50	7	33%	23%
Launched	3	0	2%	0%
Other (inactive or cancelled)	33	4	22%	13%
Total	153	31	100%	100%

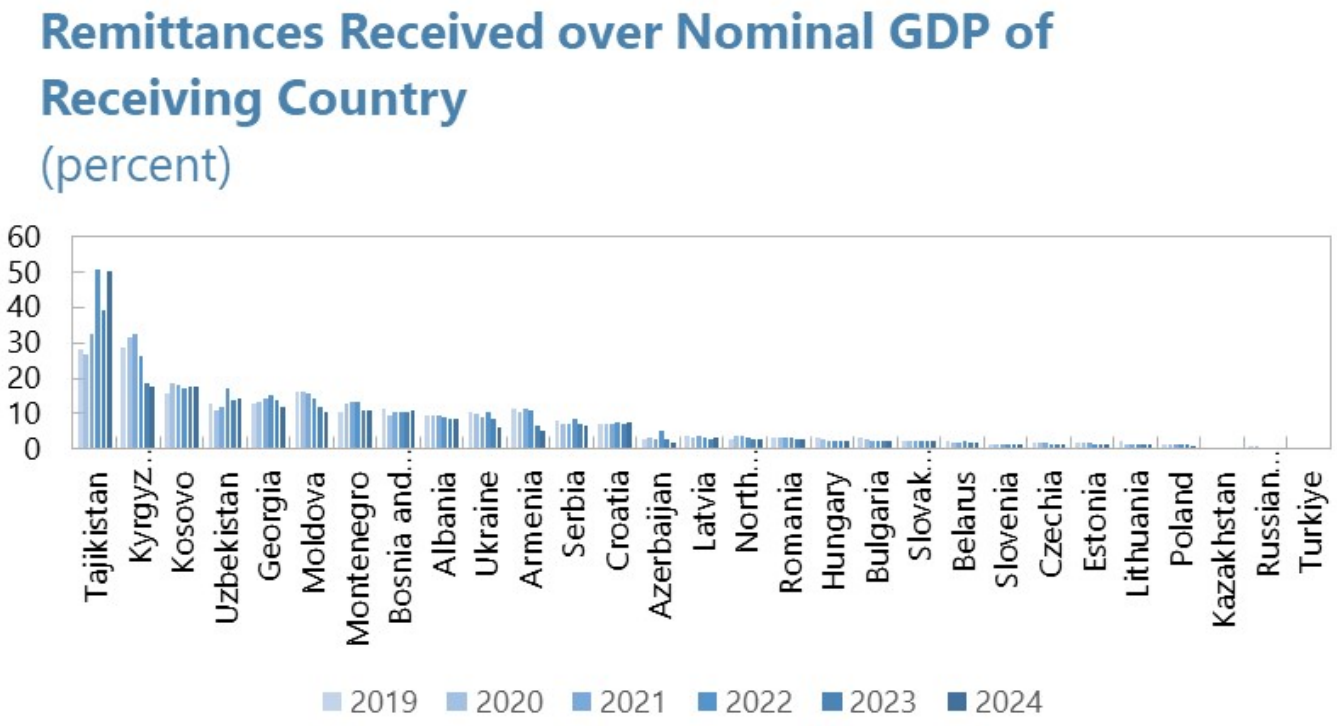
JVI region (31 countries) compared to global developments:

- More research and development
- Not that much piloting yet in comparison
- Yet overall, more active (less inactive)

Source: Atlantic Council (AC), CBDC Tracker, retrieved on 1 Jan 2026.

Note: Global counts based on initial counts from AC, augmented by 15 countries from JVI region that AC does not currently cover.

Remittance Flows for Countries in the JVI Region



Source: World Bank Group, and own calculations.

For high-remittance countries in the region, even small fee reductions can matter macroeconomically.

But high remittance intensity also raises sensitivity to FX substitution if stablecoin use shifts from medium of exchange to store of value.

Stablecoins vs. CBDC

Stablecoins may be more likely to take root where:

- High de facto foreign-currency use (EUR or USD)
- Remittance-heavy corridors
- Monetary policy already constrained
- CBDC perceived as lower marginal benefit

CBDCs may be more compelling where:

- Low euroization/dollarization
- Credible inflation targeting
- Strong desire to modernize payments without losing control
- Political sensitivity to foreign-currency dominance

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Analytical Tools and Models as Part of IMF Technical Assistance for Central Banks

1 Balance sheet-based take-up simulations

Understand take-up process, for CBDC and e-money.

2 Fee income impact analysis

For banks and non-bank payment service providers

3 Broader Financial Sector Impact Analysis

- Gross & Letizia (2023)
- Meller & Soons (2023)
- Liquidity risk analysis

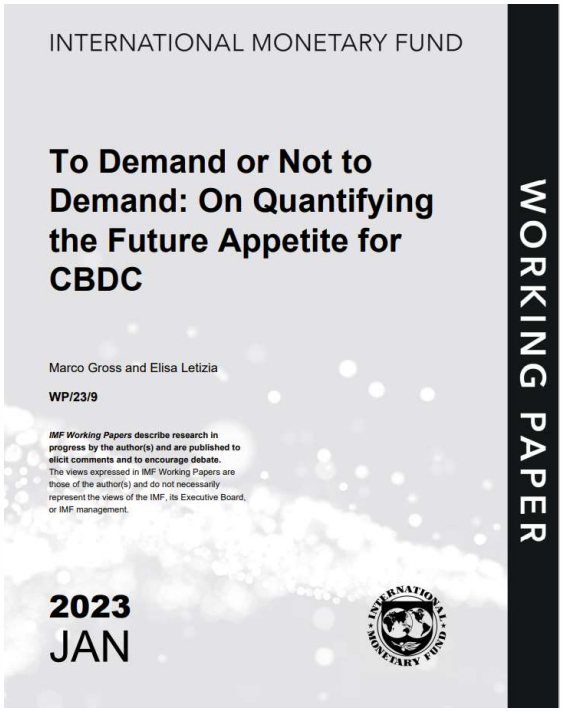
A Model to Quantify the Impact of CBDC and NBPMs

An example—The GL (2023) Model

- Gross and Letizia (2023)
- For conducting *ex ante* impact simulations
- Also useful to quantify effects of e-monies with 100 percent safeguarding at central bank

Questions the model can help answer

- What CBDC-in-total-money shares may emerge?
- How would deposit rates change?
- How will reserve volumes be affected?
- What impact on bank profits and central bank seigniorage?
- How much stronger may monetary policy pass-through become?



Example applications: Bahrain, Tunisia, Georgia, Qatar

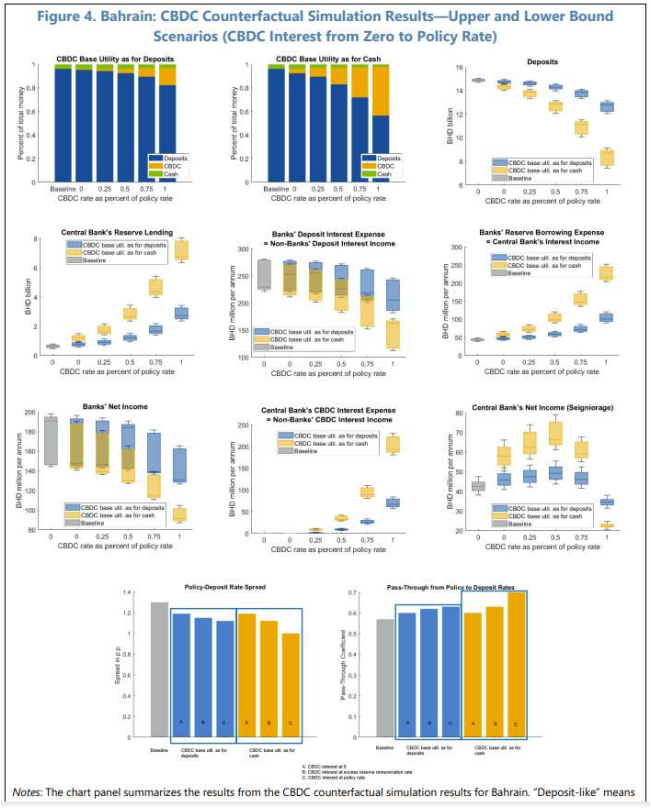
Tunisia, Georgia, Qatar: https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2024/04/26/Central-Bank-Digital-Currencies-in-the-Middle-East-and-Central-Asia-543566

Bahrain: https://www.imf.org/en/Publications/CR/Issues/2023/09/19/Kingdom-of-Bahrain-Selected-Issues-539282

Table 2. Bahrain: CBDC Counterfactual Simulation Results

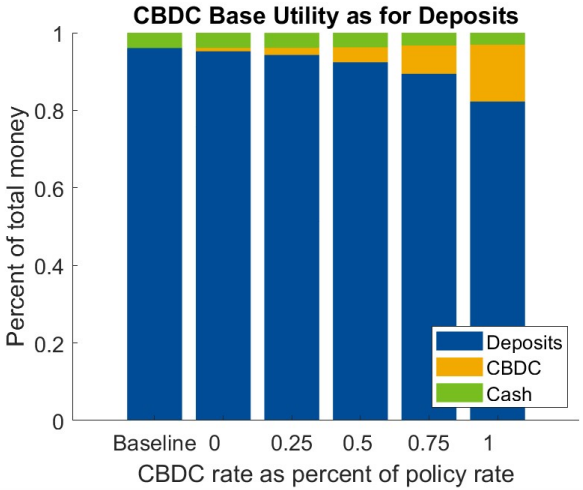
Base utility of CBDC →		CBDC's Base Utility = Deposit Money's Base Utility			CBDC's Base Utility = Cash's Base Utility		
CBDC Interest →		0%	Reserve rem. rate	Policy rate	0%	Reserve rem. rate	Policy rate
Money shares	**Deposits** (base = 96%)	95.5%	94.5%	83%	92.5%	88%	56%
	Cash (base = 4%)	3.5%	3.5%	3%	3.5%	3%	2%
	CBDC (base = 0%)	0.5%	2.0%	14%	4%	9%	42%
Deposit-policy rate spread (baseline = 1.3 p.p.)		1.2 p.p.	1.15 p.p.	1.12 p.p.	1.2 p.p.	1.1 p.p.	1 p.p.
Deposits (Δ to baseline)		-0.1 bn -0%	-0.25 bn -2%	-2 bn -13%	-0.5 bn -3%	-1.2 bn -8%	-6.2 bn -42%
Reserve borrowing (Δ to baseline)		+0.05 bn	+0.2 bn	+1.8 bn	+0.4 bn	+1.1 bn	+5.8 bn
Banks' deposit interest expense (Δ to baseline p.a.)		+16 mn +7%	+18 mn +7%	-7.6 mn -3%	+7.8 mn +3%	+5.4 mn +2%	-82.3 mn -34%
Banks' net res. borrowing expense = CB's net res. lending income (Δ to baseline p.a.)		1.5 mn +3%	7 mn +15%	55 mn +124%	13 mn +30%	34 mn +76%	173 mn +393%
Banks' net income (Δ to baseline p.a.)		-17.4 mn -10%	-24 mn -13%	-47 mn -26%	-21 mn -12%	-39 mn -21%	-91 mn -50%
Banks' Return on Assets (RoA, annual) (Δ to baseline p.a. in basis points)		-11 bps	-16 bps	-30 bps	-15 bps	-25 bps	-60 bps
CB's CBDC interest expense (Δ to baseline p.a.)		-	+3.5 mn	+65 mn	-	+14 mn	+195 mn
Central bank net seigniorage (Δ to baseline p.a.)		+1.5 mn +3%	+3.1 mn +7%	-10 mn -23%	+13 mn +30%	+20 mn +45%	-21 mn -50%
Monetary policy pass-through to bank deposit rates (baseline = 0.57)		0.6	0.62	0.63	0.6	0.63	0.7

Notes: All results are expressed as deviation from current (baseline); except for the money shares. "p.a." abbreviates per annum. Million and billion amounts are in BHD. The third and sixth column are considered an upper bound for illustrative purposes.

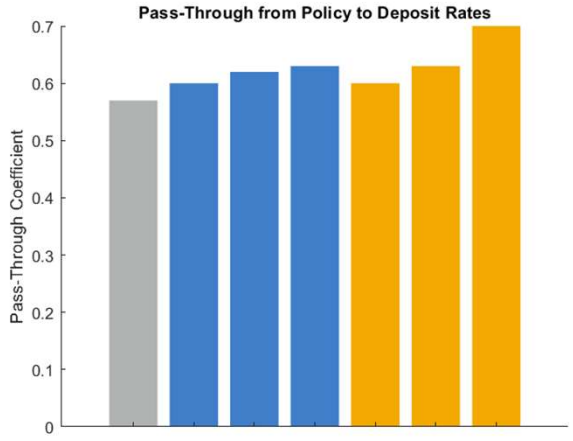


Example: Bahrain—Selected Indicators

CBDC demand
– estimated ranges

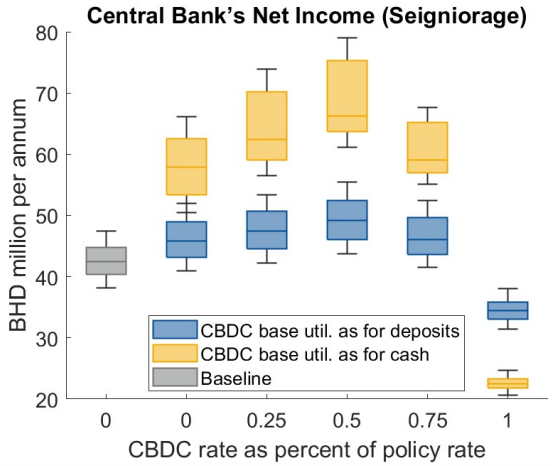


Monetary policy transmission
– may strengthen



A: CBDC interest at 0
B: CBDC interest at excess reserve remuneration rate
C: CBDC interest at policy rate

Central bank seigniorage
– possible positive effects



Source: https://www.imf.org/en/Publications/CR/Issues/2023/09/19/Kingdom-of-Bahrain-Selected-Issues-539282

Take-Aways

Stablecoin primer

- Benefits and risks → sovereign-bank nexus, feedback potential, risk of loss of monetary sovereignty, etc.
- Ongoing private sector response to counter competition and avoid loss in profit/market share

The JVI region

- Active research into CBDC and active experimentation with blockchain technology and stablecoins
- Numerous high remittance inflow countries, potential appeal for stablecoins

Analytical work for IMF technical assistance

- For CBDC, e-monies, and other new forms of digital monies
- Assess impact on financial system, incl. bank profitability and solvency, central bank seigniorage etc.

Background Slides

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CBDC in China: The Revised e-CNY Scheme

e-CNY as a bank liability

- For banks, e-CNY will now be an on-balance sheet liability, with reserve requirements as for regular deposits
- Banks are allowed to pay interest on e-CNY balances, as on their regular deposits
- NBFIs can still provide e-CNY too, with a 100% reserve requirement at the PBoC

Other aspects

- Continue working on mBridge to develop cross-border functionality, with China, Hong Kong, Thailand, UAE, and others
- e-CNY wallet application was updated

CBDC in China: The Revised e-CNY Scheme

Implication of e-CNY as a bank liability

- The e-CNY would not be a CBDC anymore in the conventional sense, from the bank perspective; just regular deposits
- NBFIs providing e-CNY, with a 100% reserve requirement at the PBoC, means that this part is economically equivalent to a CBDC (though still with differences from other perspectives, e.g., legal, operational risks, and others)
- **Whether it is a quasi-CBDC from an economic perspective will depend on the extent to which user take-up in store-of-value terms will be via banks or NBFIs**
- Meanwhile, strictly speaking from a conventional definitional point of view (liability of the central bank), it is not a CBDC anymore

Wyoming, US: A Local Governmental Stablecoin

- **State-issued USD stable token:** Wyoming launched **public, state-issued stablecoin** (Frontier Stable Token, FRNT), **not a CBDC** and legally separated from the Federal Reserve.
- **Statutory public-utility model:** Issued and governed by **Wyoming Stable Token Commission**, with public oversight, transparency requirements, and policy objectives; no profit maximization.
- **Reserve design: 102% over-collateralization**, backed by cash, short-term U.S. Treasuries (<1y), and short-term repos; investment income accrues to the **state school fund**.
- **Payments and public-sector use cases:** Designed for **instant, 24/7, fee-free payments**, disaster relief, government disbursements, and transparency-enhancing public payments, using public blockchains.
- **Strategic positioning:** Wyoming bans CBDCs at the state level while using the stablecoin to **benchmark private issuers**, promote auditability, and test whether a public issuer can shape market standards without federal monetary authority.

Tokenized Deposits (TDs): Banks' Strategic Response to Stablecoins

- **What they are: Bank-issued digital representations of commercial bank deposits** on DLT, fully on-balance-sheet, redeemable at par, and integrated into existing banking and payment infrastructures
- **Who is moving: JPMorgan (JPM Coin), Bank of America, Citigroup, Lloyds Banking Group, Standard Chartered**, and **Qivalis** (a European bank consortium, 11 banks) are developing TDs to defend payments, liquidity franchises, and corporate cash management
- **Difference to stablecoins: TDs are Interest-bearing**, covered by **bank regulation and resolution**, AML/KYC-native, and directly interoperable with RTGS and core banking systems—appealing especially for **wholesale and corporate use cases**.

Tokenized Deposits (TDs): Banks' Strategic Response to Stablecoins

- **Primary use cases:** 24/7 wholesale payments, cross-border treasury management, on-chain FX and securities settlement, smart-contract-enabled cash legs—without breaking the singleness of bank money
- **How they differ from stablecoins: Economically similar instruments, but institutionally different**—*tokenized deposits are issued by banks and are deposits*; *stablecoins are typically issued by non-banks and are not deposits* (often non-interest-bearing, segregated-reserve structures)
- **Policy relevance:** Seen by regulators as a **lower-risk private alternative** to stablecoins—preserving monetary transmission and bank lending business while capturing DLT efficiency gains.

Developments in South Korea

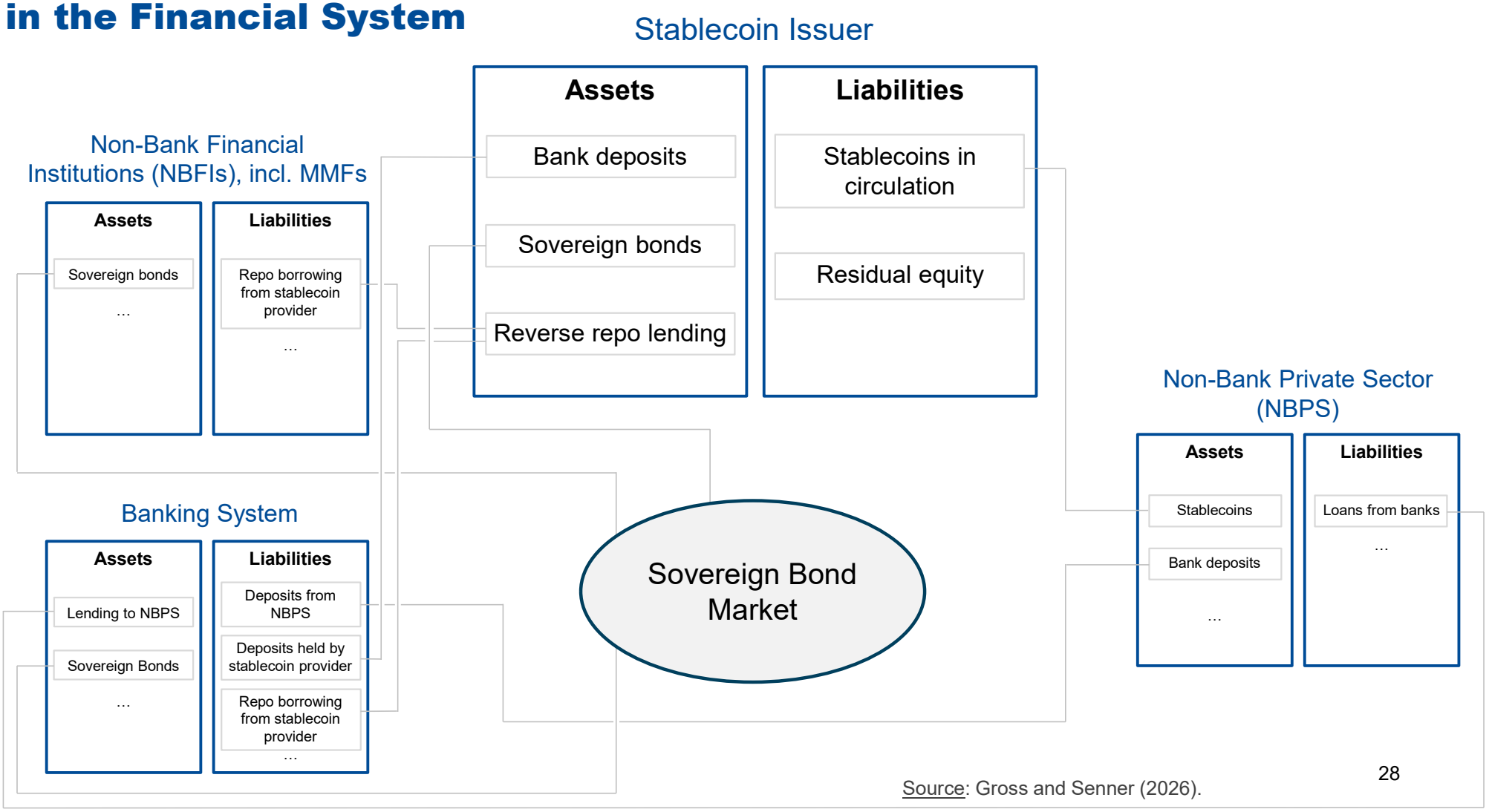
THE BANK OF KOREA

- **Central bank resistance:** Bank of Korea openly concerned that widespread stablecoin issuance could trigger **capital outflows**, drawing explicit parallels to vulnerabilities exposed during Asian Financial Crisis
- **Political–regulatory conflict:** Lawmakers have proposed allowing **non-bank firms to issue stablecoins**, while BoK argues issuance should be **restricted to banks** (or bank-controlled entities) under tight supervision
- **Crypto-driven demand pressures:** Stablecoin use in Korea is already significant, largely for **crypto trading on offshore exchanges**, where regulatory frictions and price differentials incentivize capital leakage
- **Macro-financial countermeasures:** Authorities have responded by **liberalizing FX regulations** (e.g., lifting the ban on onshore FX bond purchases, expanding FX hedging limits) to offset outflows linked to crypto and stablecoins
- **CBDC deprioritized:** Amid these tensions, BoK **suspended its retail CBDC plans**, citing cost, limited bank incentives, and concerns that private stablecoins could complicate monetary control.

Developments in South Korea (ctd)

- **Kimschi Bonds:** FX bonds (usually USD) issued **onshore in Korea** by foreign firms or financial institutions, sold in the Korean market
- **Why they matter:** Issuers typically **swap proceeds into KRW**, bringing **foreign currency inflows** into Korea
- **Why banned (2011–2024):** Authorities feared **currency mismatches** and volatile capital flows after the GFC.
- **Why re-allowed (2024/25):** To **counter capital outflows**, including those linked to overseas crypto investment and stablecoin use.
- **Policy link to stablecoins:** Part of a broader **defensive FX-management toolkit** by Korean authorities as USD stablecoins increase retail demand for foreign currency.

A Stablecoin's Position in the Financial System



Source: Gross and Senner (2026).

Risks Facing (Systemic) Stablecoins

Credit Risk

Reverse repo counterparts such as banks and NBFIs, and sovereign, may default (even though that risk is meant to be minimal)

Market Risk

Mark-to-market valuation of bond holdings, reflecting credit risk (and other risks) of asset-side counterparts + risk aversion in markets (the “market price of risk”)

Liquidity (Redemption) Risk

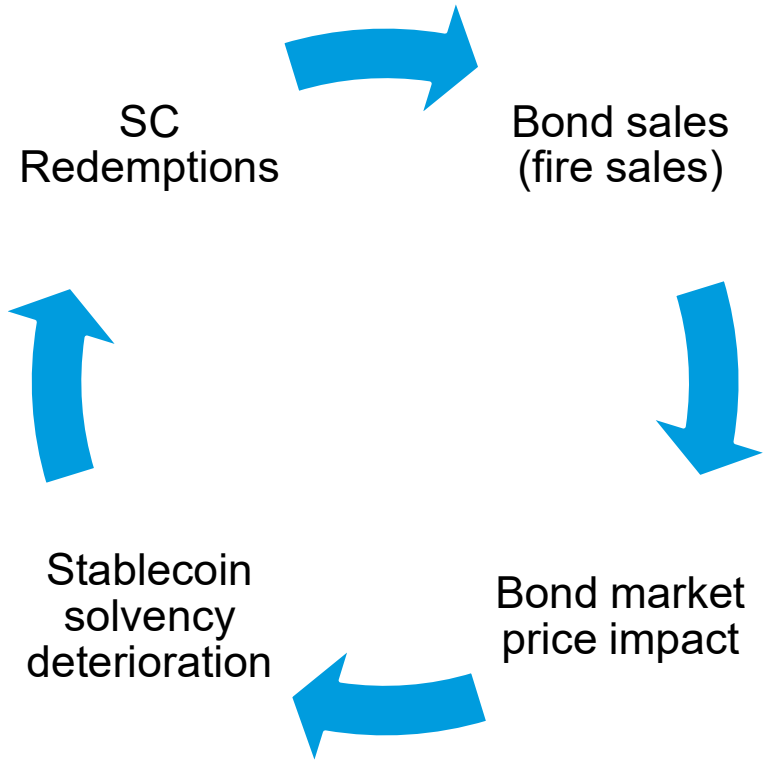
SC issuer assets subject to market risk and degree of illiquidity (reverse repos, 24/7/365 redemptions), retail clients with no direct access to SC issuer, thus secondary market dependence; growing wholesale funding dependence for banks

Interconnectedness

Contagion risk due to interconnectedness; sovereign-stablecoin nexus and potential negative feedback to sovereign’s financial stance; feedback loop with markets

Source: Gross and Senner (2026). “From Par to Pressure: Liquidity, Redemptions, and Fire Sales with a Systemic Stablecoin.” IMF Working Paper No. 26/5.

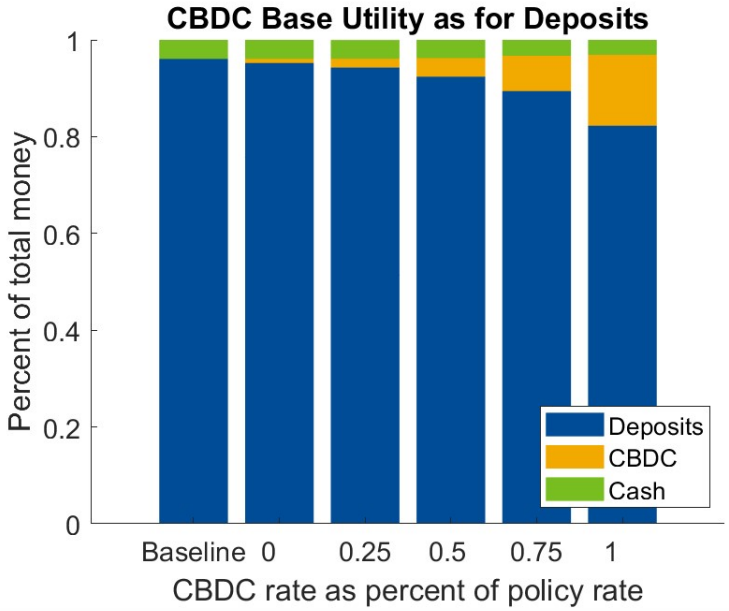
The Redemptions—Fire-Sale—Bond Price—Solvency Feedback Loop

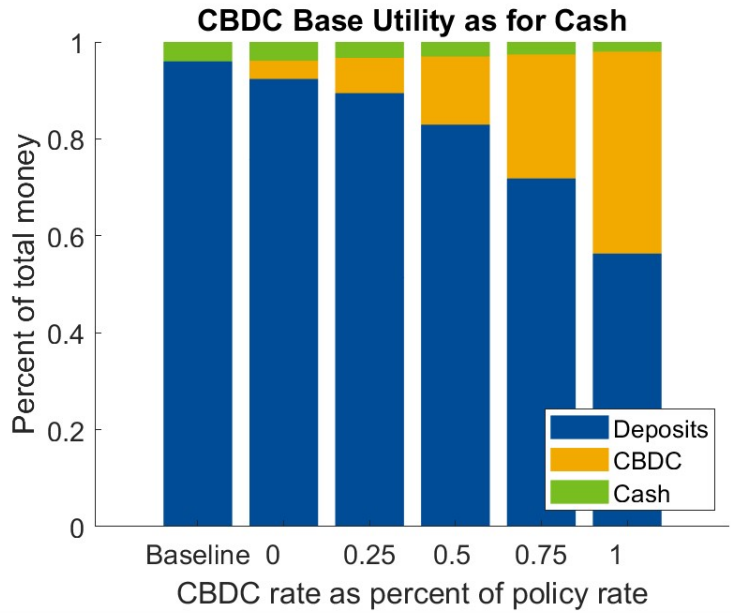


Source: Gross and Senner (2026). "From Par to Pressure: Liquidity, Redemptions, and Fire Sales with a Systemic Stablecoin." IMF Working Paper No. 26/5.

CBDC Demand (Estimates for Bahrain using GL model)

- CBDC take-up primarily depends on its perceived utility to the population
- At higher levels of take-up, a CBDC increasingly competes with deposits.

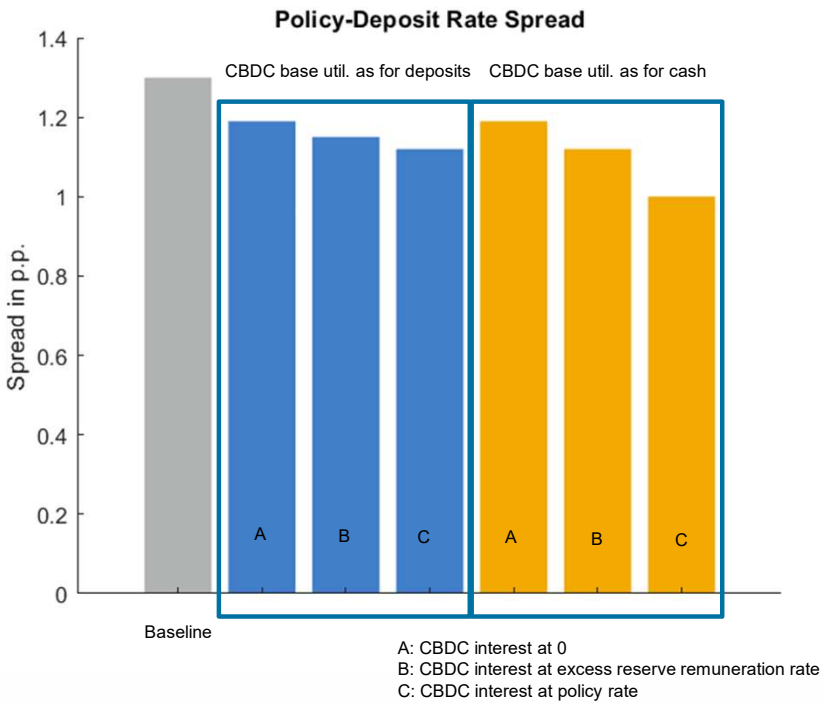


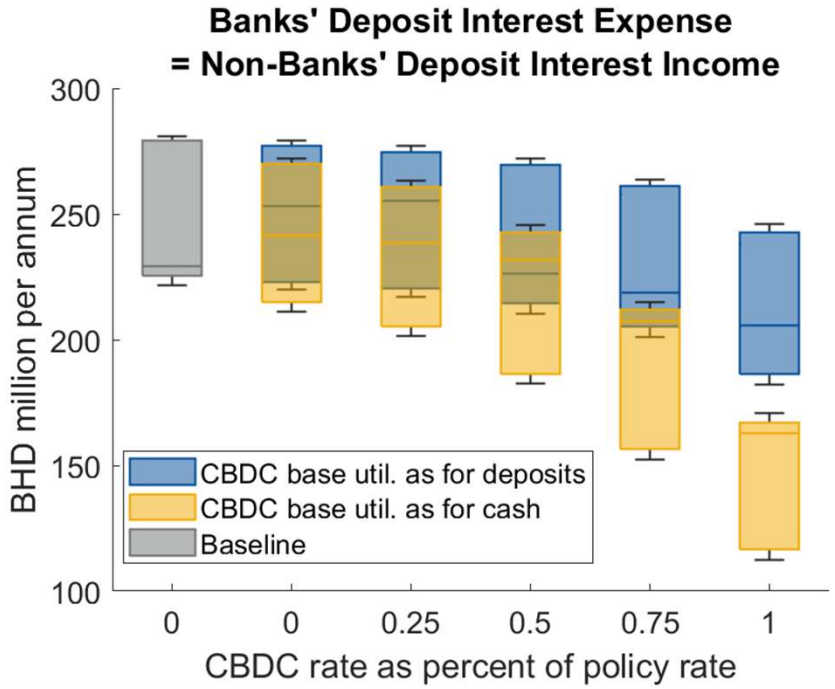


Source: IMF AIV 2023 "Financial System Effects of Introducing a CBDC in Bahrain—A Counterfactual Analysis."

Bank Deposit Balances and Deposit Expenses

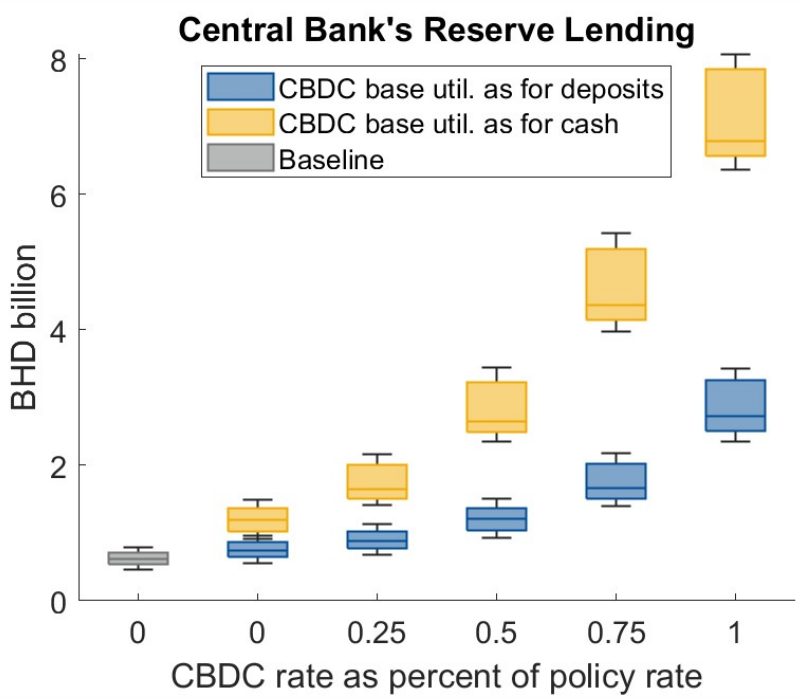
- Banks would raise their deposit rates to compete with a CBDC and more so if it were to be remunerated.
- Banks could incur higher deposit interest expenses, despite the decline in the volume of deposits.

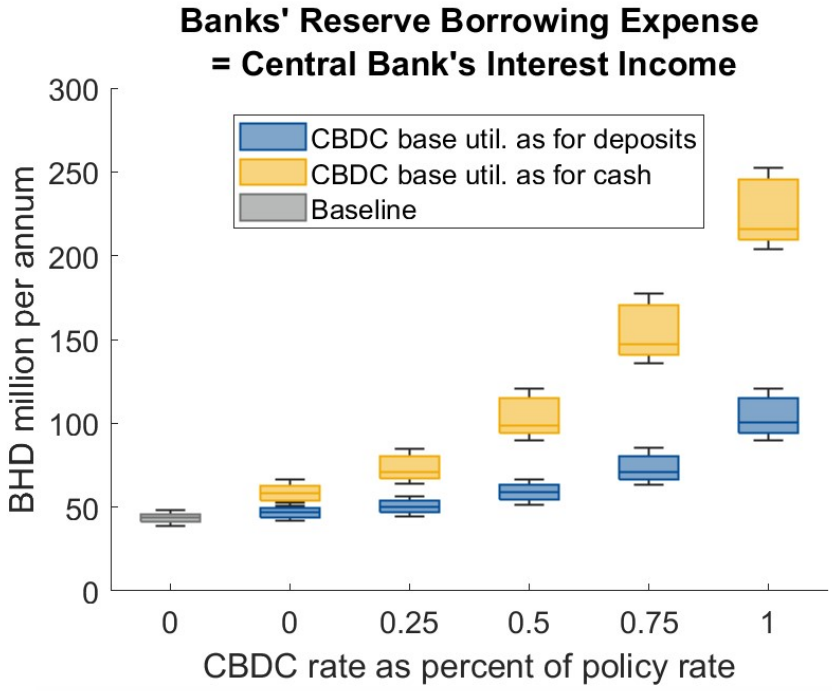




Central Bank Reserves

- Central bank reserves replace deposit liabilities
- Banks incur additional interest expenses (or less interest income on excess reserve holdings)

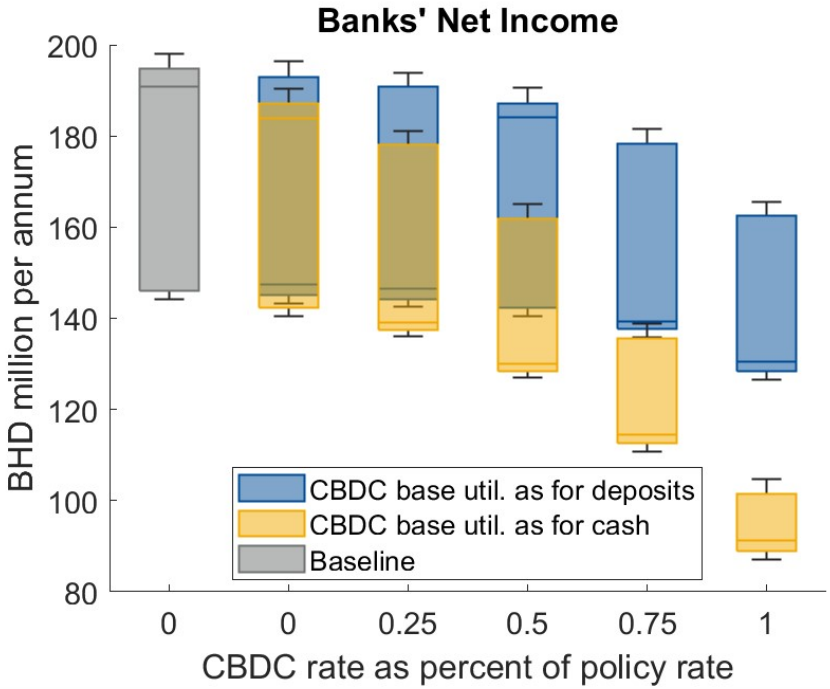




Source: IMF AIV 2023 "Financial System Effects of Introducing a CBDC in Bahrain—A Counterfactual Analysis."

Bank Profitability

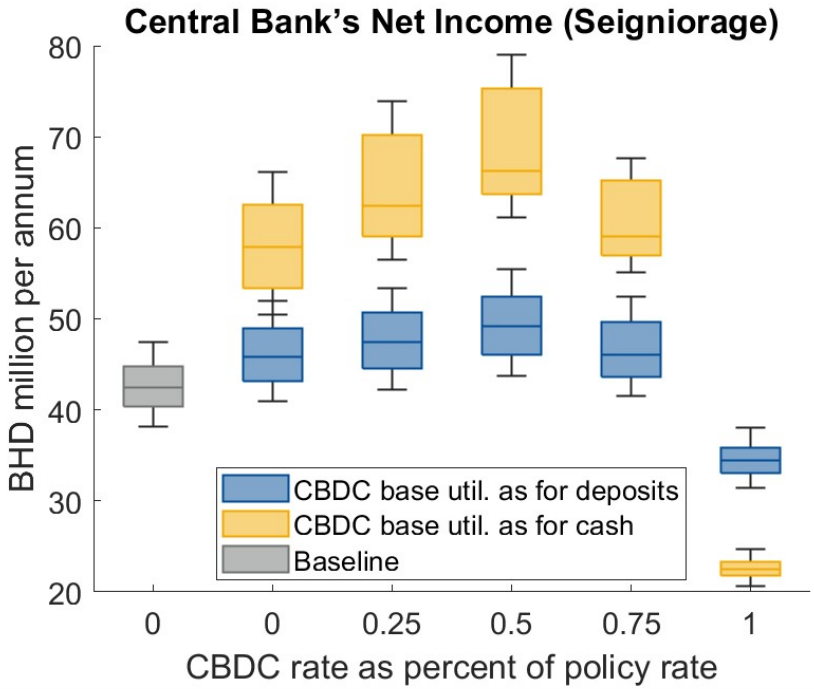
- Drag on profitability resulting from higher interest expenses can be notable, particularly in the remunerated case.
- Expressed in RoA terms, the impact on profitability ranges from -11 to -15 basis points in the unremunerated scenario and rises to -25 basis points with remuneration and high base utility.
- Impacts may be material for some banks in light of prevailing RoA levels in Bahrain (1.2 percent aggregate 5-year average).

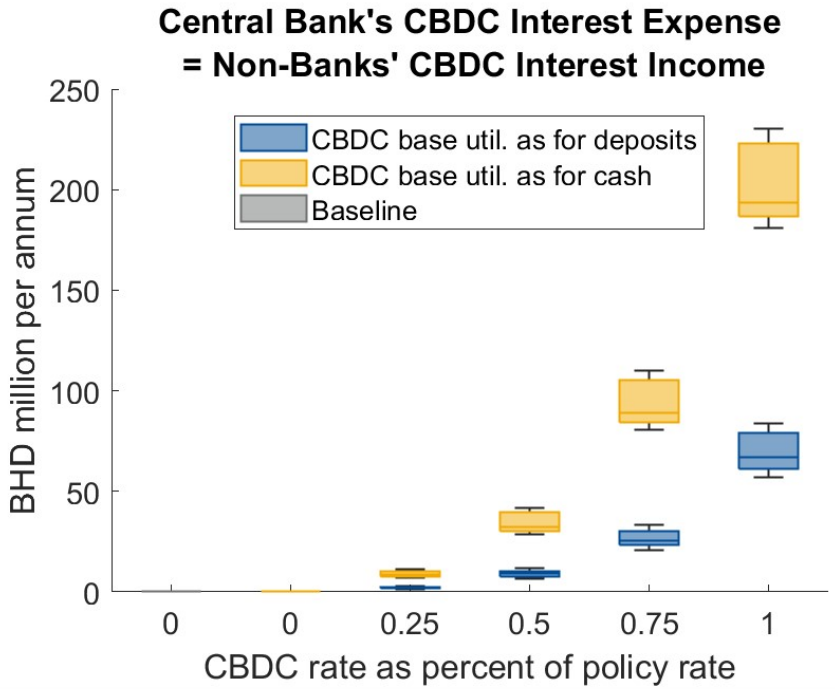


Source: IMF AIV 2023 "Financial System Effects of Introducing a CBDC in Bahrain—A Counterfactual Analysis."

Central Bank Revenue

- Central bank's net income grows due to higher interest income from reserve lending, which would be offset by any interest paid on CBDC balances.

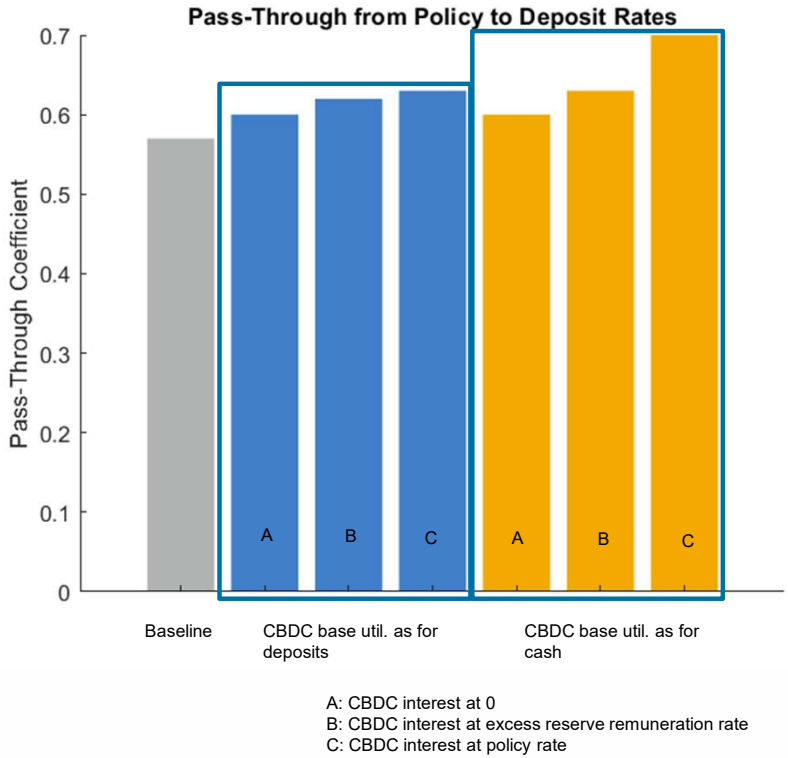




Source: IMF AIV 2023 "Financial System Effects of Introducing a CBDC in Bahrain—A Counterfactual Analysis."

Deposit Rates & Monetary Policy Pass-Through

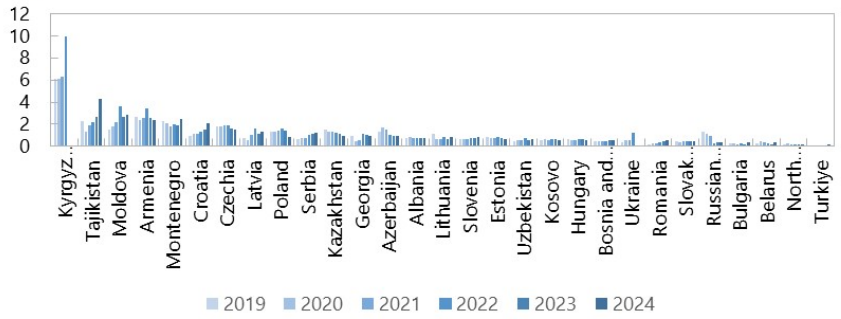
- CBDC introduction strengthens monetary policy pass-through and more so if it were remunerated through:
  - The closer alignment of deposit rates with policy rates
  - Increased role of central bank reserves in bank funding
- Pass-though strengthens materially if the CBDC had a high base utility CBDC and was remunerated at the policy rate.



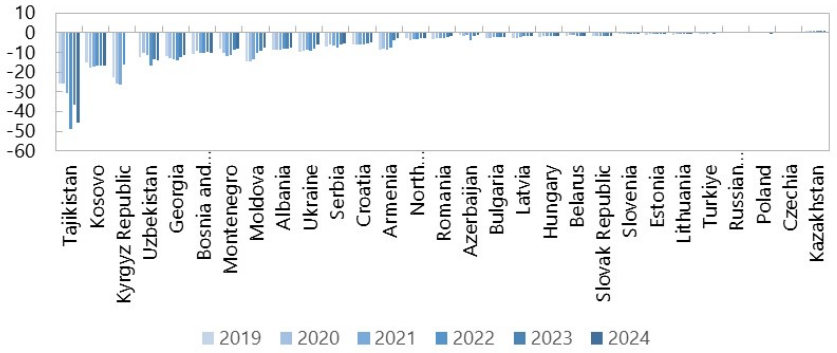
Source: IMF AIV 2023 "Financial System Effects of Introducing a CBDC in Bahrain—A Counterfactual Analysis."

Remittance Flows

Remittances Sent over Nominal GDP of Sending Country
(percent)

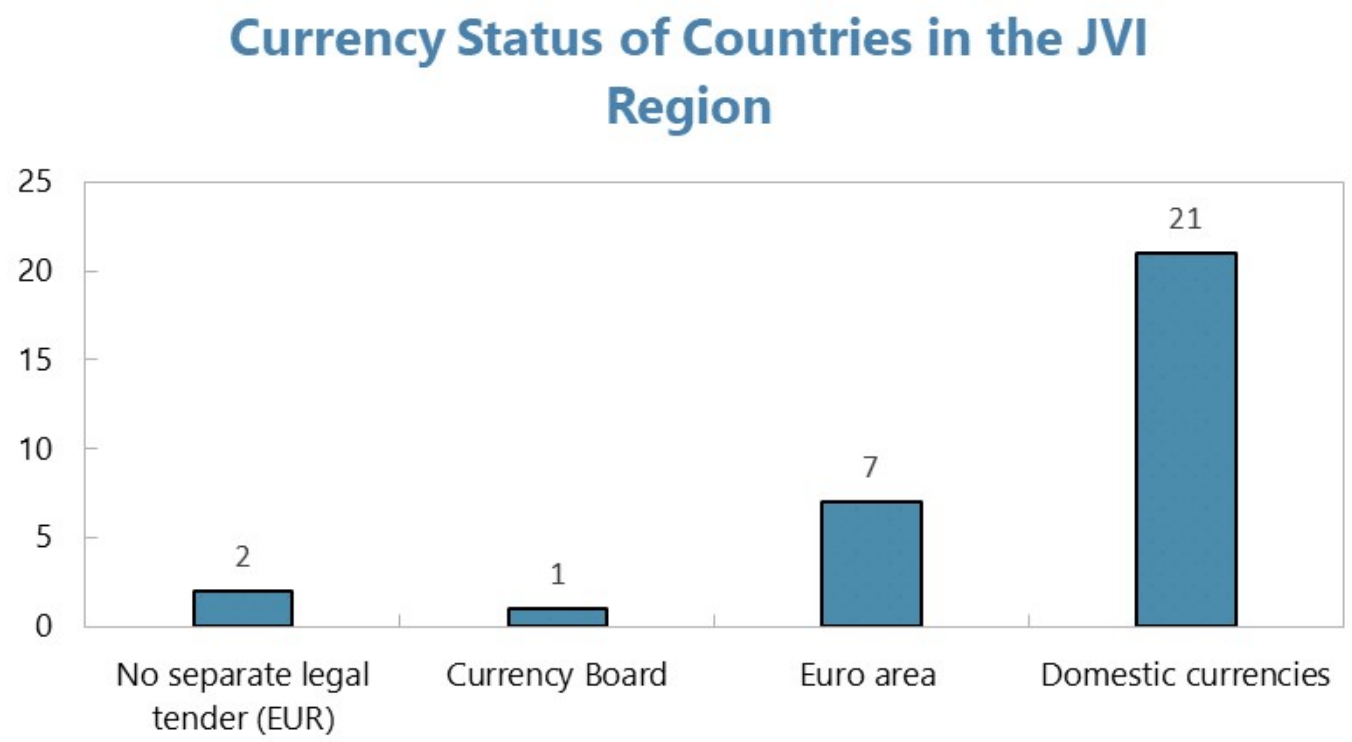


Net Remittances over Nominal GDP
(percent, negative means net receiver)



Source: World Bank Group and own calculations.

Currency Status in the JVI Region



Monetary Policy Regimes in the JVI Region