BANK FOR INTERNATIONAL SETTLEMENTS

Central Bank Digital Currencies (CBDC): *an early contribution to the debate*

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WORKSHOP ON FINTECH, PAYMENTS, AND FINANCIAL INCLUSION

"*Unlocking the Potential of Financial Innovation for sub-Saharan Africa*"

Disclaimer

Structure of the discussion

1. Introduction
2. CBDC: definition & taxonomy
3. Payment aspects: general purpose vs. wholesale only CBDC
4. Monetary policy aspects
5. Financial intermediation, financial stability & cross border aspects

1. Introduction

1.1. Interest in CBDC: what's prompting it?

1.2. Other reasons?

1.3. Rationale for paper

1.4. Importance of CBDC debate: beyond technology

1.1. Interest in CBDC: what's prompting it?

i. Interest in technological innovations for the financial sector;

ii. Emergence of new entrants into payment services & intermediation;

iii. Declining use of cash in a few countries; and

iv. Increasing attention to so-called private digital tokens.

1.1. Interest in CBDC: what's prompting it? *(continued)*

"The Riksbank is one of the central banks that will need to take an active stance on whether or not to issue a digital currency first. We cannot wait any longer, and I shall now tell you what we intend to do in the coming years". (Skingsley 2016)

"In recent years, digital currencies have shown considerable promise. Research by the People's Bank of China suggests that the best way to take advantage of these innovations is for central banks to take the lead, both in supervising private digital currencies and in developing digital legal tender of their own. At the PBOC, this effort is underway. ... Since 2014, under the guidance of Governor Zhou Xiaochuan, the PBOC has attached high importance to the development of legal digital currency". (Yifei 2016)

"If a central bank were to issue a digital currency everyone, including businesses, households and financial institutions other than banks, could store value and make payments in electronic central bank money in addition to being able to pay with cash. While this may seem like a small change, it could have wide-ranging implications for monetary policy and financial stability". (Bank of England 2017)

"The ECB would in particular have to understand the impact – positive or negative – of DBM [Digital Base Money - OB] on our primary objective of price stability before considering introducing it. Moreover, any value judgement on DBM needs to be assessed against a number of high-level principles, namely (1) technological safety, (2) efficiency, (3) technological neutrality, and (4) freedom of choice for users of means of payments". (Mersch 2017)

"A digital currency could also be issued by the central bank and potentially substitute for bank deposits as the main form of money holding of households and businesses. This would challenge the present fractional reserve system at its core. Increased instability of monetary aggregates and credit supply would be a possible outcome, if market participants shifted liquidity pro-cyclically between digital money and bank deposits. Commercial banks would increasingly have to rely on other funding sources than deposits, so that this disruptive change to the fractional reserve system could finally pave the way for a more stable financial system". (Fiedler et al. 2017)

Source Bjerg: 2017

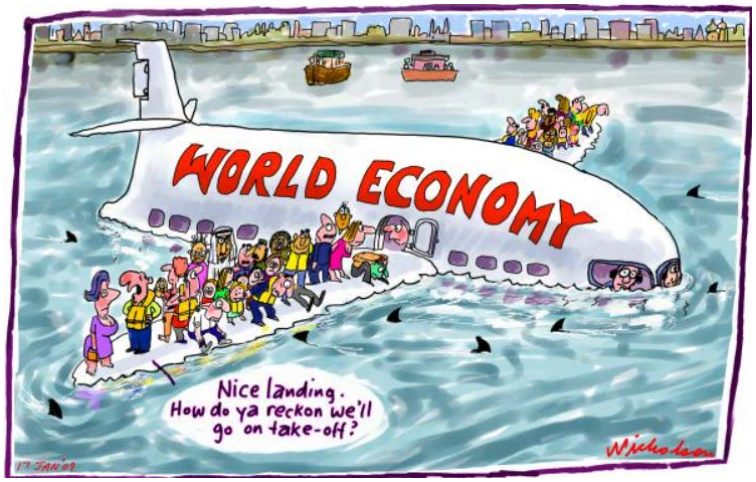
1.2. Interest in CBDC: other reasons?

i. Lowered trust in financial system (after the crisis)

ii. Too-big-to-fail concerns (e.g. Stiglitz)

iii. Proposed safer, transparent & more efficient system

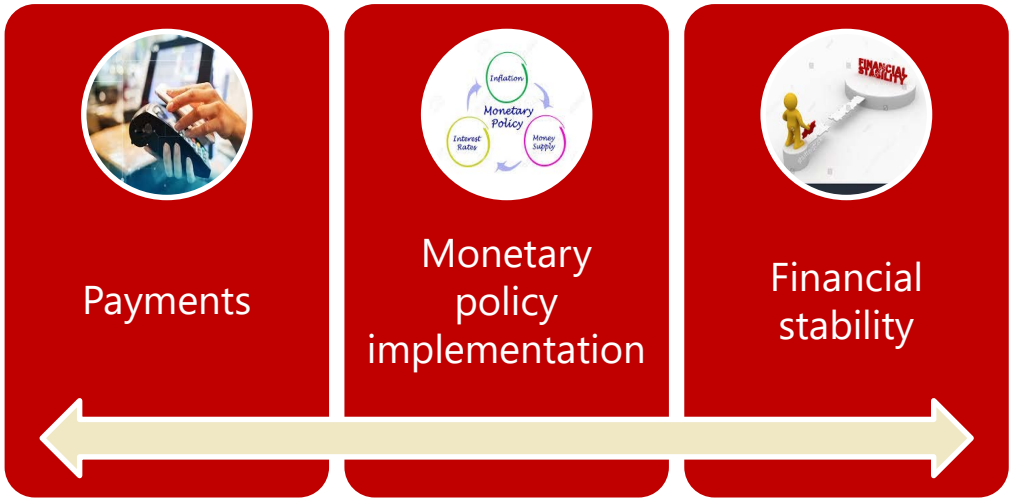
iv. Safe digital money for the internet era



Note: Presenters perspective

1.3. Rationale for paper

- Early contribution to debate. Conceptual analysis in 3 core central banking areas



- Builds on previous CPMI work:

role of central bank money

fast payments

digital currencies

access to central bank services & monetary policy implementation

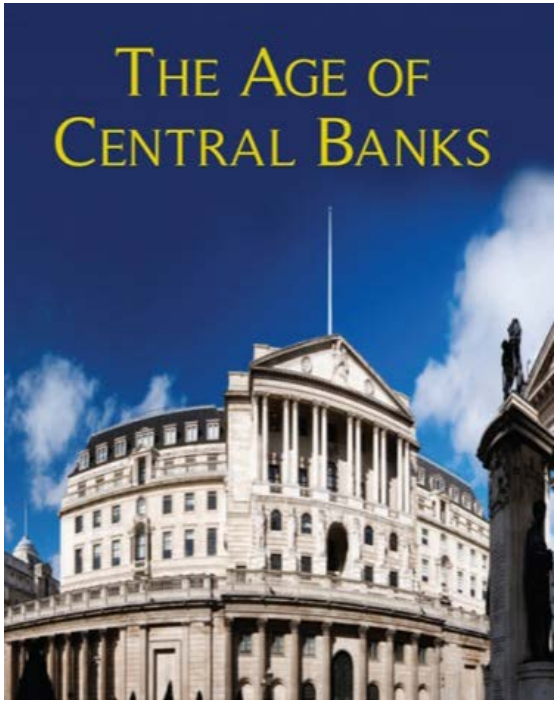
1.4. Importance of the CBDC debate: beyond technology

Raises fundamental questions about:

i. The role of central bank money

ii. Direct access to central bank liabilities &

iii. The structure of financial intermediation



2. Definition & Taxonomy

2.1. What is it?

2.2. What it's not…

2.3. Two taxonomies

2.4. Key design features

2.1. CBDC definition: what is it?

- Not a well-defined term. Used to refer to a number of concepts.

- Envisioned by most to be a new form of central bank money:
  (i) a central bank liability
  (ii) denominated in an existing unit of account
  (iii) which serves both as a medium of exchange and a store of value

- Would be an innovation for general purpose users but not for wholesale entities.

- Mix of new and already existing forms of central bank money makes it challenging to precisely define what a CBDC is.

2.2. CBDC definition: what is it?

Easier to define a CBDC by highlighting what it is not:

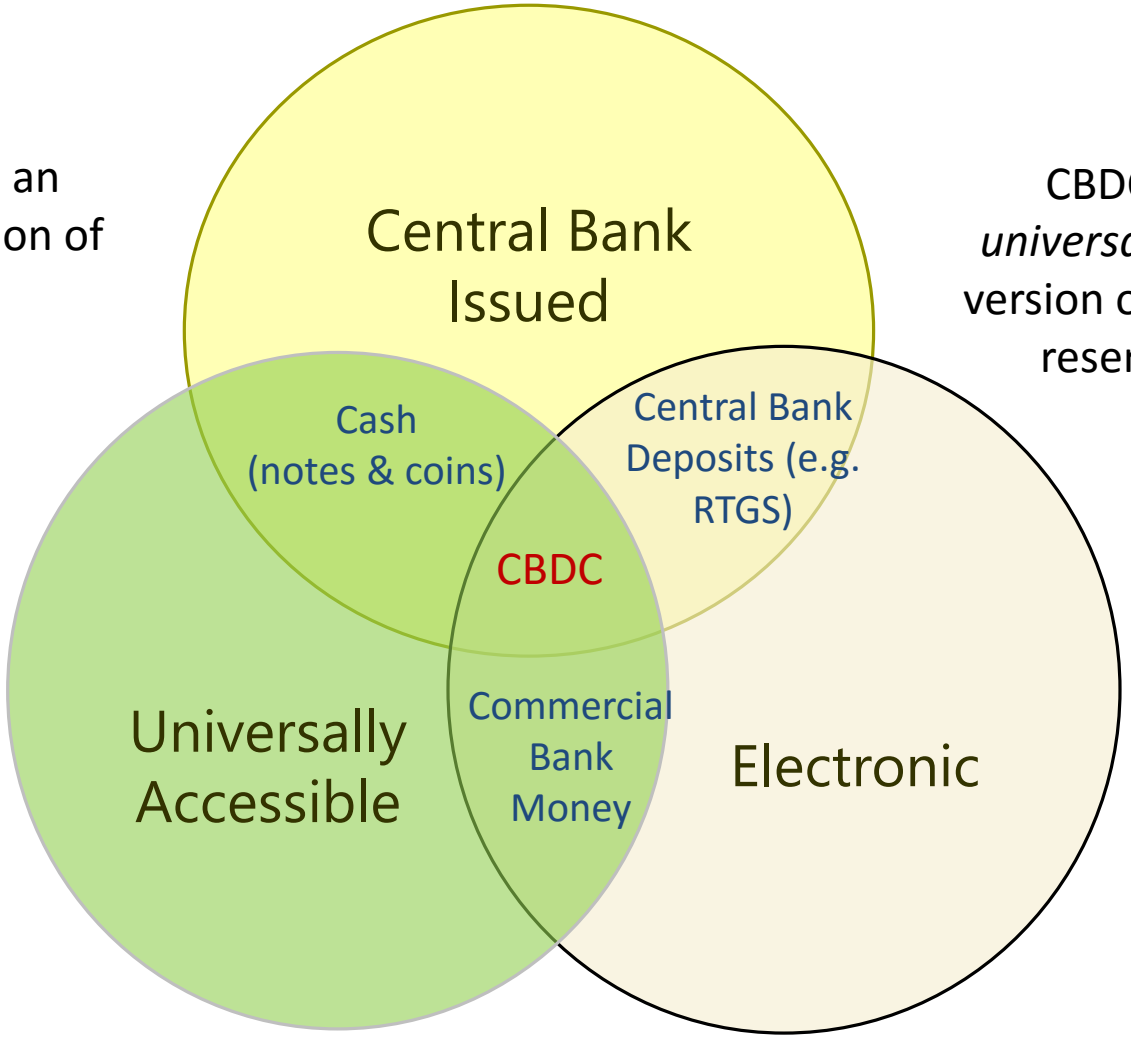
A CBDC is a digital form of central bank money that is different from balances in traditional reserve or settlement accounts

By CBDC, we refer to a central bank granting universal, electronic, 24x7, national-currency-denominated and interest-bearing access to its balance sheet. (Barrdear and Kumhof 2016)

2.3. Taxonomy

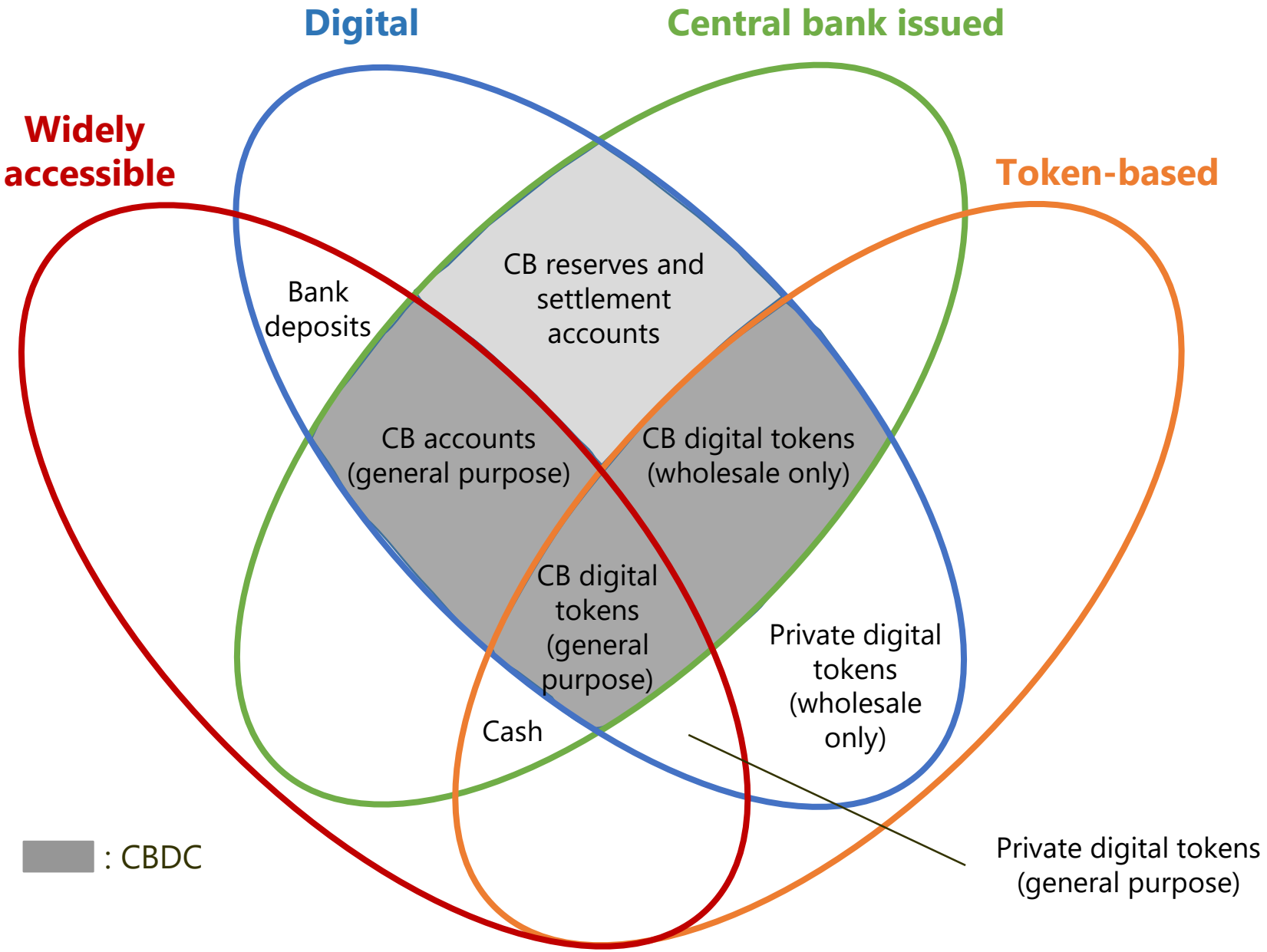
CBDC can be an *electronic* version of cash

CBDC can be a *universally accessible* version of central bank reserve money



CBDC can be a *central bank issued* version of commercial bank account money

Source: Bjerg, 2017


Digital
Central bank issued
Widely accessible
Token-based
Bank deposits
CB reserves and settlement accounts
CB accounts (general purpose)
CB digital tokens (wholesale only)
CB digital tokens (general purpose)
Cash
Private digital tokens (wholesale only)
: CBDC
Private digital tokens (general purpose)

2.4. Key design features of central bank money

	Existing central bank money		Central bank digital currencies		
	Cash	Reserves and settlement balances	General purpose		Wholesale only token
			token	accounts	
24/7 availability	✓	×	✓	(✓)	(✓)
Anonymity vis-à-vis central bank	✓	×	(✓)	×	(✓)
Peer-to-peer transfer	✓	×	(✓)	×	(✓)
Interest-bearing	×	(✓)	(✓)	(✓)	(✓)
Limits or caps	×	×	(✓)	(✓)	(✓)
✓ = existing or likely feature, (✓) = possible feature, × = not typical or possible feature.					

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3. CBDC: Payment Aspects

3.1. General purpose CBDC

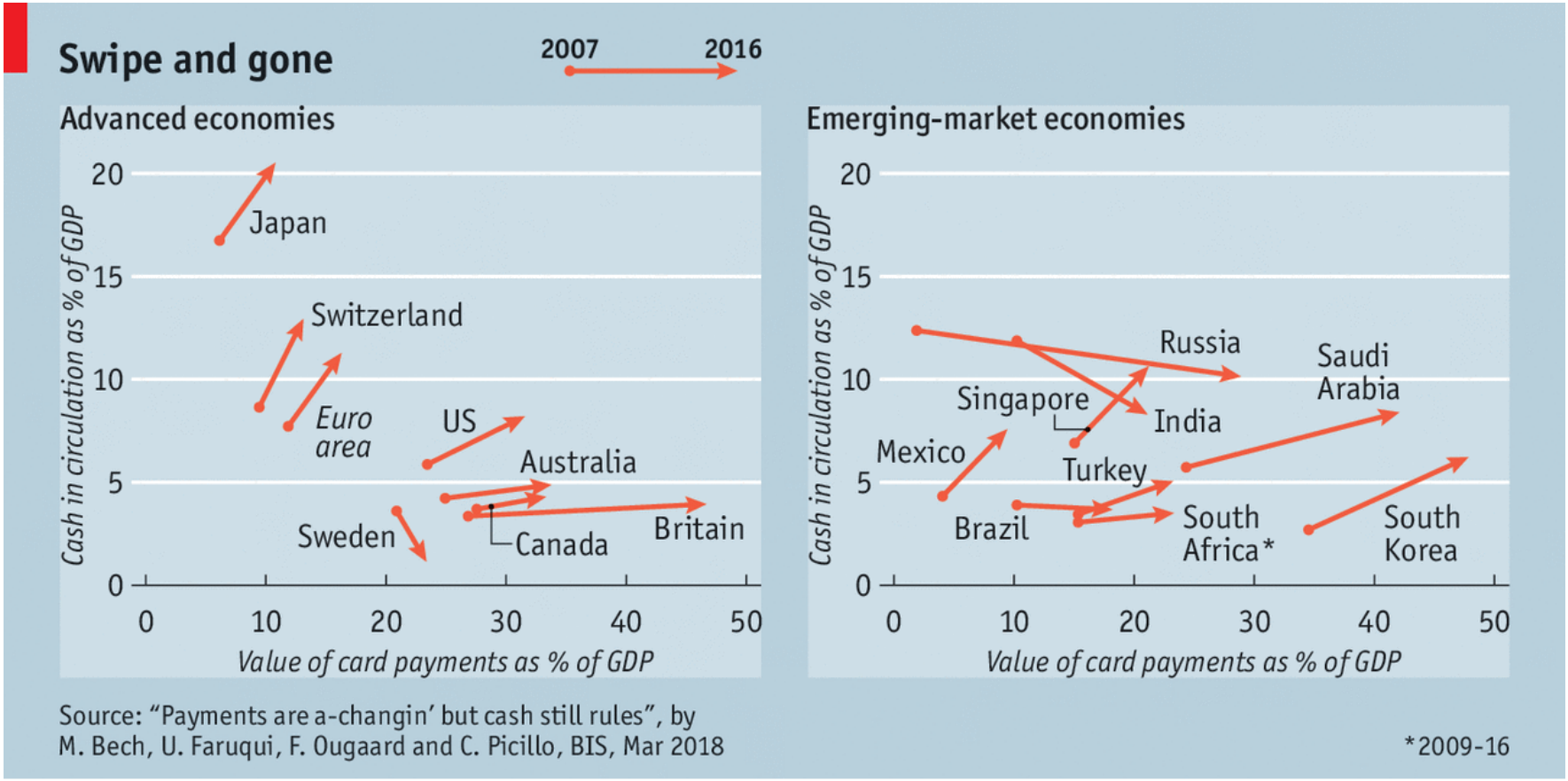
3.2. Wholesale-only CBDC

3.3. Other considerations

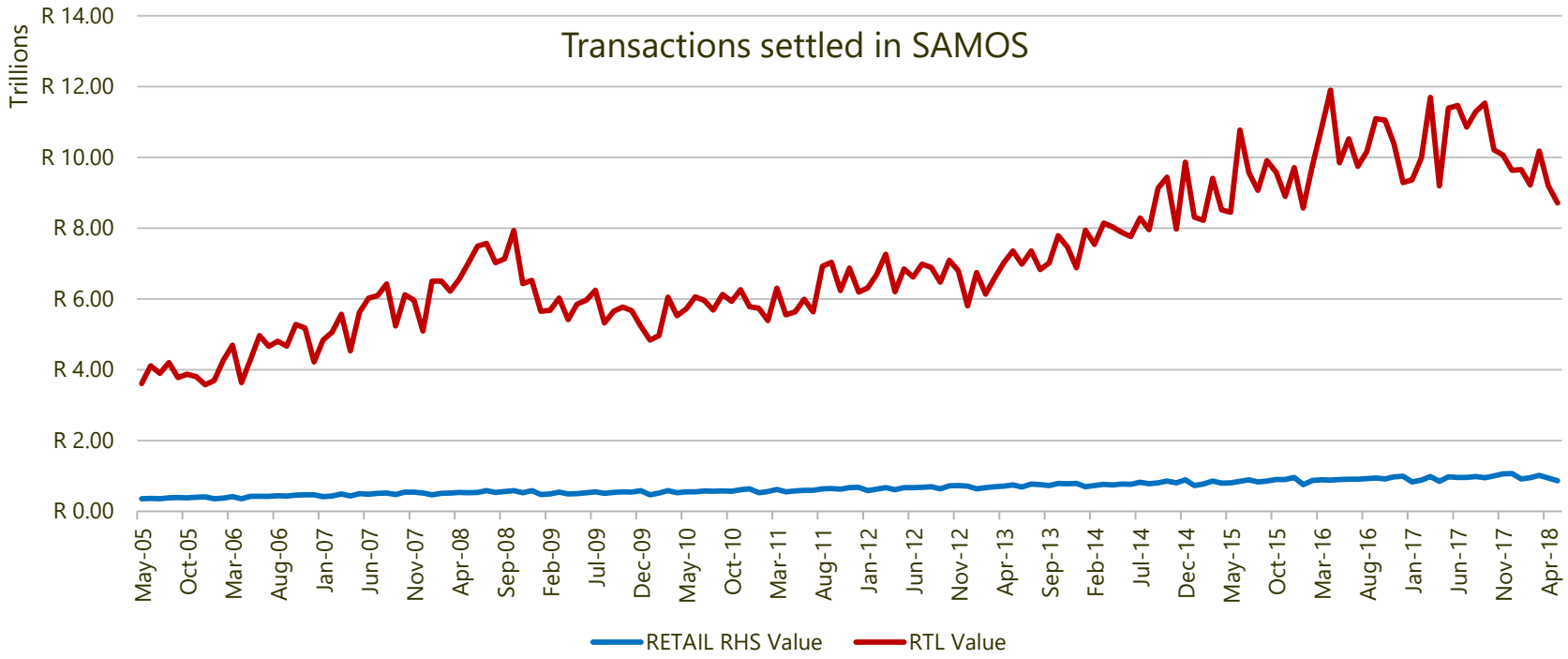
3.1. General Purpose CBDC

Benefits of a GP-CBDC	Risks & Challenges of a GP-CBDC
Provide a safe, central bank instrument, especially should the use of cash decline significantly	Growing use of electronic means of payment generally not yet resulted in a substantial reduction in the demand for cash (see next slide). Current retail payment solutions are convenient, efficient and reliable. Have earned public trust and confidence over time. Faster and more convenient approaches to payments compatible with new digital and mobile technologies. Some already providing real-time or near real-time settlement and close to 24/7 availability.
CBDC could also reinforce the resilience of a country's retail payment systems (disruption of private sector infrastructures, banks under stress etc.)	Operational resilience achieved through the diversity afforded by multiple payment systems. Overseers continue to emphasise the need for improving the efficiency and speed of private systems. Cash more immune to disruptions.
CBDC could reduce the concentration of liquidity and credit risk in payment systems	Retail transactions generally have significantly lower aggregated values than wholesale payments (see following slide)
Counter potential for private digital tokens to more widely displace central bank money in transactions. Retail customers face more credit & liquidity risks, exposure to either private issuers of digital tokens or from a lack of issuer	Volatile valuations and inadequate investor & consumer protection make private digital tokens unsafe to rely on as a common means of payment and a stable store of value or unit of account.

3.1a. Card payments and cash demand



3.1b. Retail vs wholesale payments (SA example)

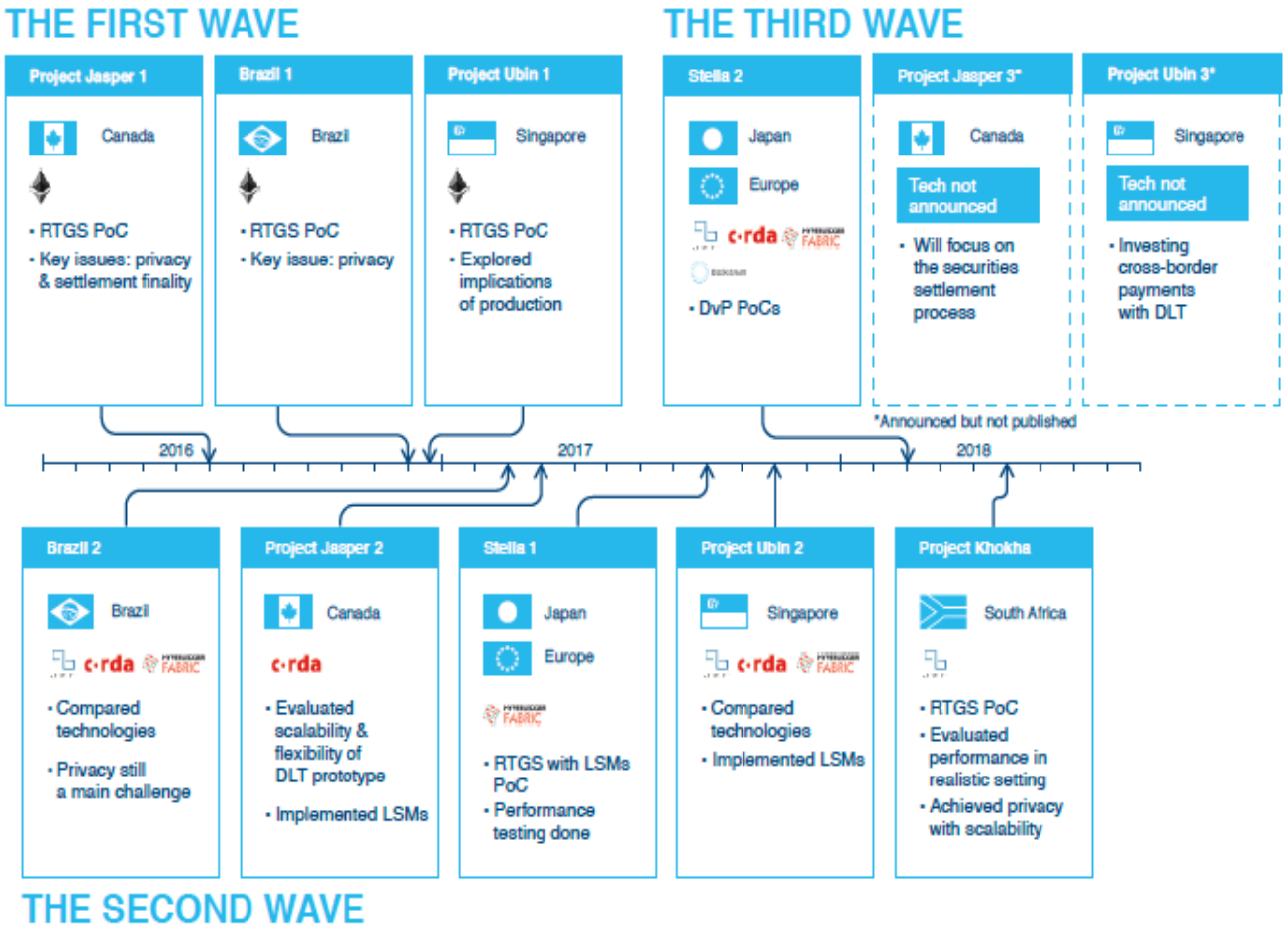


3.2. Wholesale-only CBDC

Main argument

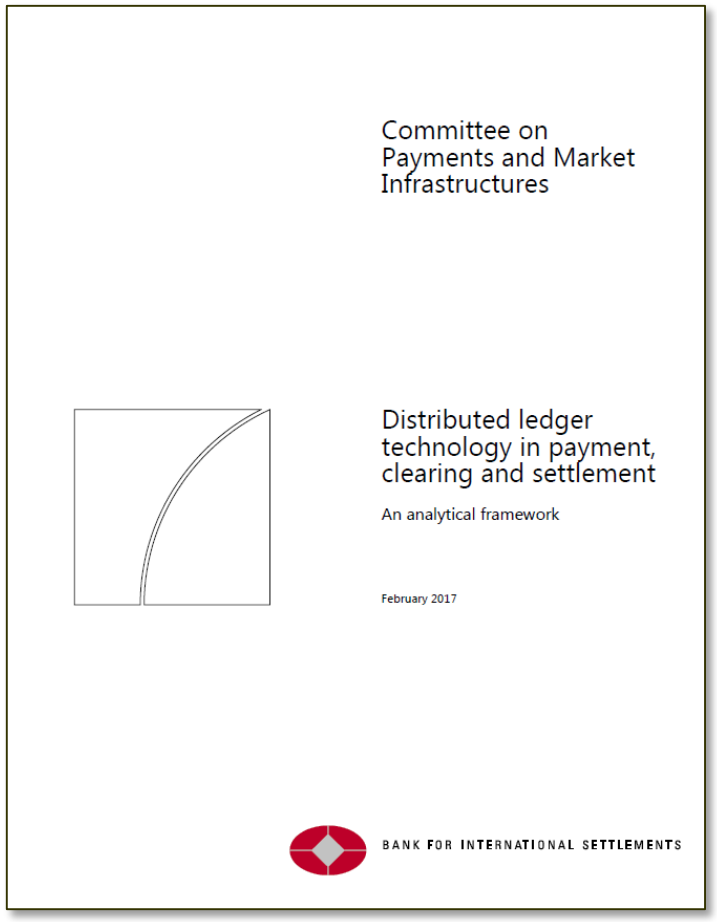
Settlement systems for financial transactions could be made more efficient – in terms of operational costs and use of collateral and liquidity – and more secure by using wholesale CBDC

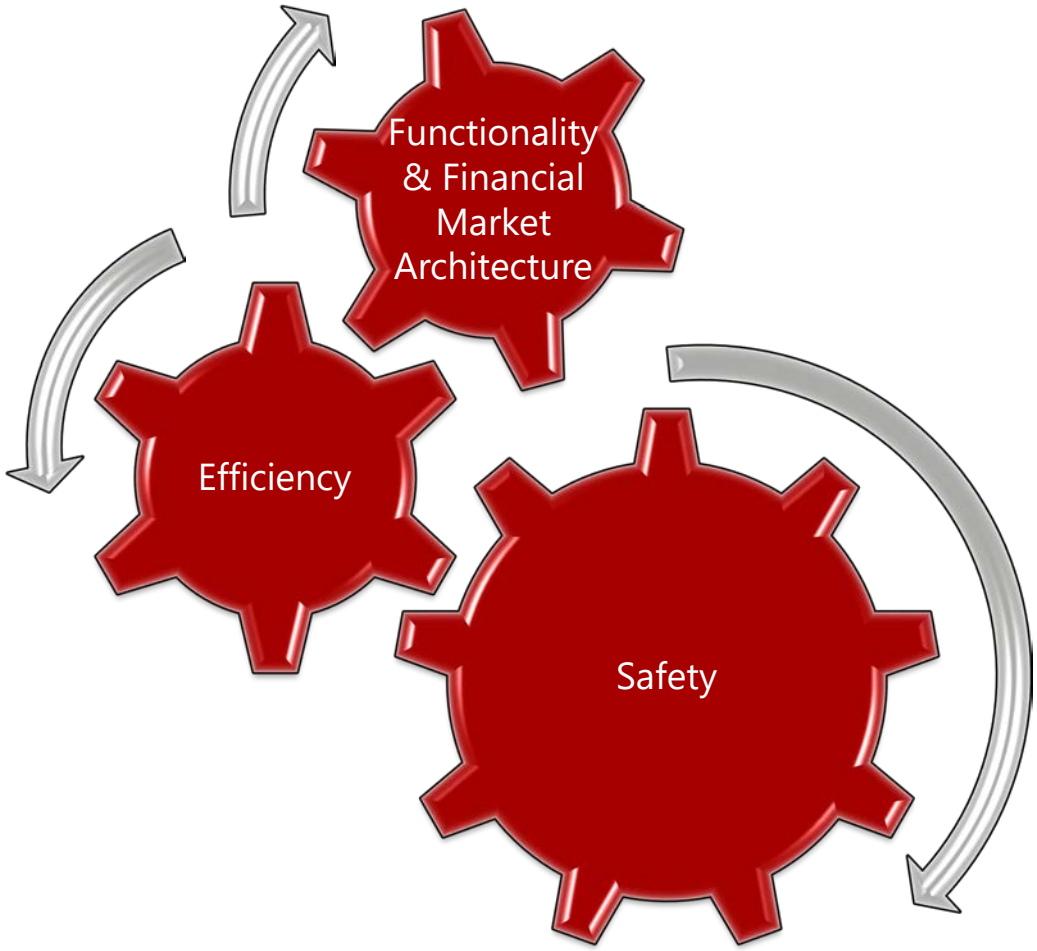
3.2a. Wholesale CBDC Experimentation: Three Waves



Source: South African Reserve Bank

3.2b. DLT Suitability





Doubts remain regarding the maturity of the technology and the size of efficiency gains associated with the use of DLT

3.3. Other considerations

- **Legal Considerations**
  - Mandate to issue CBDC
  - CBs could be called upon to provide information to tax & other authorities (e.g. for judicial matters)

- **AML/CFT concerns & considerations**
  - CBDC can allow for digital records and traces. Could improve the application of rules aimed at AML/CFT
  - "Know-your-customer" function could fall to the central bank: commercial banks could lose valuable interface with their consumers
  - Appropriate degree of privacy

3.3. Other considerations

- **Operational considerations**
  - Central banks take on a much larger role in this field, with associated costs.
  - Robustness of new technologies
  - Better real-time data on economic activity

- **Financial inclusion**
  - Possibly help reduce informal economic activities.

- **Direct link between CBs & citizens** (especially where cash use is diminishing)
  - Foster public's understanding of CBs roles & need for independence

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4. Monetary policy aspects

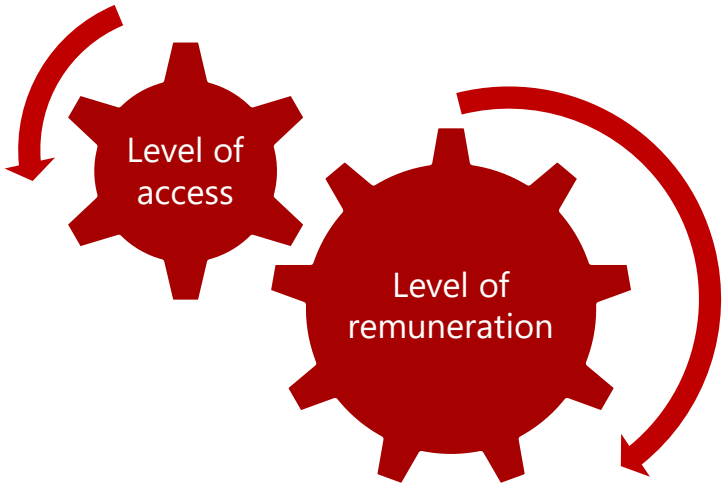
4.1. Design aspects that impact monetary policy

4.2. Desirability for monetary policy

4.3. Caveats & counterarguments

4.4. Implications for monetary policy & interest rates

4.1. Design aspects that impact monetary policy



Monetary policy aspects for issuing CBDC

- Potential strengthening of the pass-through of the policy rate to money markets and deposit rates and,
- Helping to alleviate the zero (or effective) lower bound constraint

4.2. Desirability for monetary policy

DESIGN ASPECTS

1. **INTEREST BEARING**
2. **AVAILABILITY BEYOND INTRADAY USE**
2. **ACCESS BY DIFFERENT AGENTS**
4. **RATE OF INTEREST**

SUBSTITUTION EFFECTS	ATTRACTIVE TO
 Cash & Commercial bank deposits	Individuals
 Money market instruments (government bills, reverse repos, FX swaps)	FM participants (cash pools & asset managers, institutional investors)
 Internationally used banknotes, bank deposits, & international reserve assets	Non-residents
 Cash & Commercial bank deposits (other countries)	Residents in high inflation countries

4.3a. Caveats & counterarguments

- **Do central banks need a new instrument to effect monetary policy?**

- **Does the pass through of the policy rate need strengthening? Is pass through impeded? (Not clear)**
  - *Other conventional tools exist*

- **Is it expected bank deposit rates respond immediately to policy rate changes?**
  - *Spreads between policy & retail rates represent compensations for risks & transaction costs, including for services implicitly cross-subsidised*
  - *Stickiness of retail deposits allows commercial banks perform more easily maturity, credit risk and liquidity transformation roles in the economy*
  - *Lack of a one-to-one response to policy rate hikes and cuts does not represent a challenge as long as central banks have appropriate control over financial conditions*

4.4a. Implications for monetary policy and interest rates

- **Limited impact on monetary policy implementation**
  - How central banks use balance sheets to control short-term interest rates
  - Accommodate demand same as bank notes

- **CBDC does not alter the basic "mechanics" of monetary policy** implementation (see following slide)

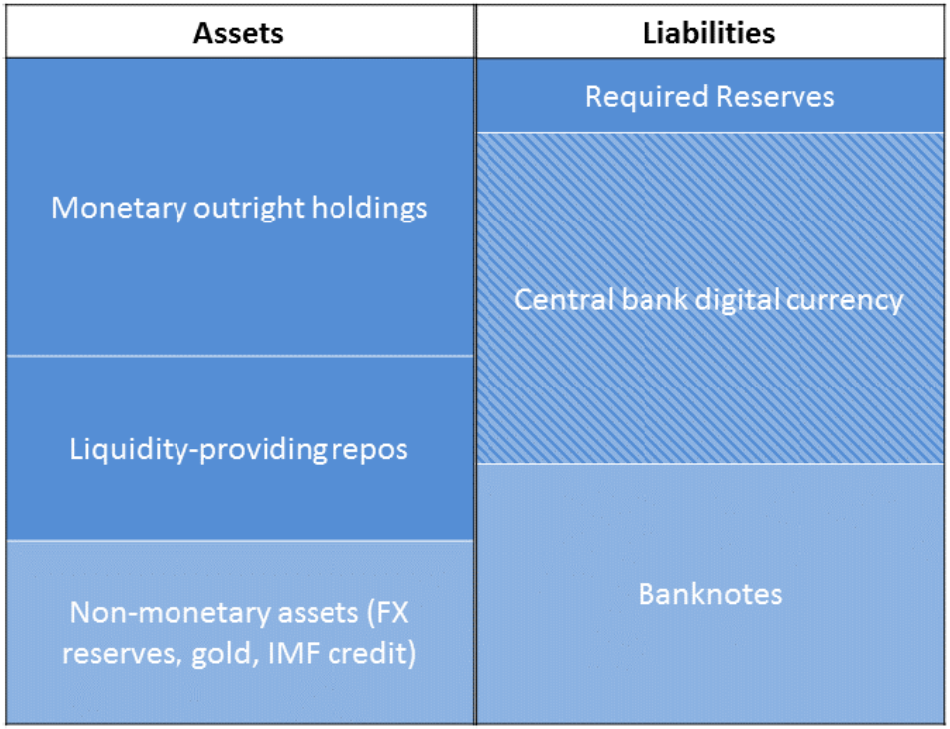
- **May not address effectively the zero lower bound**
  - If higher denomination banknotes were not simultaneously abolished
  - Political economy consequences - uncertain how deeply negative rates may work in practice

- **Practical implications:** larger balance sheet; volatility of autonomous factors impacted

4.4b. Implications for monetary policy and interest

Central bank balance sheet with CBDC

Graph A3



4.4c. Implications for monetary policy and interest rates

CBDC does not alter the basic "mechanics" of monetary policy implementation

CBDC and the structure of the financial system: a flow-of-funds analysis[1] Table B1

Households (retail)			
Real assets	RA1	Equity	E
Retail deposits	DEP **– CBDCb**	Retail mortgage loans	RML
CBDC	**CBDCa + CBDCb**		
Banknotes	BAN **– CBDCa**		
Bonds (for investment)	B1 + BB1		
(Money market) fund shares	FS		
Corporations/government			
Real assets	RA2	Loans	L
Cash pool participation	CPP	Corporate/government bonds	B1 + B2 + B3
		MM instruments	MM1
Banks (monetary counterparties)			
Corporate/government bonds	B2	Retail deposits	DEP **– CBDCb**
Loans	L	MM instruments	MM2
Retail mortgage loans	RML	Bank bonds	BB1 + BB2
Reserves	RES	CB credit facilities	RES + BAN – B3 – BB2 **+ CBDCb**
Central bank			
CB credit facilities	RES + BAN – B3 – BB2 **+ CBDCb**	Reserves	RES
		Banknotes	BAN **– CBDCa**
Corporate/government/bank bonds	B3 + BB2	CBDC	**CBDCa + CBDCb**

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5. Financial intermediation, financial stability & cross-border aspects

5.1. Role of central bank

5.2. Banks business models, financial intermediation & markets

5.3. Financial stability

5.4. Cross border & global dimensions

5.1. Role of the central bank

- **Market structure**: Larger role for central banks in financial intermediation (design dependent)
  - Could challenge the two-tier banking system (narrow vs fractional reserve)

- **Large operational demands**: infrastructure, governance, technology etc.

- **Impact on markets & risk:** As demand CBDC & becomes very large, may need to hold less liquid & riskier assets
  - May influence prices of such securities & potentially affect market functioning
  - CBs may need to provide substantial maturity, liquidity and credit risk transformation at times to both banks and markets
  - Volatile demand for government debt. May impact sovereign debt

5.2. Banks business models

- **Structural implications for payment markets**
  - Payment-related income streams eroded
  - Private sector FMIs (e.g. CCPs/SSSs) may be affected by the issuance of wholesale CBDC

- **GP-CBDC: large impact on financial intermediation**
  - Loss of low-cost & stable funding
  - Raise interest rates or seek funding to replace such outflows, eg through wholesale funds and term deposits, (more costly).
  - Raise spreads & increase transaction fees
  - May shrink balance sheets with adverse consequences (see next slide)

5.3. Financial stability

- **Increased or decreased stability risk?**
  - More rather less financial stability risk: possibility banks engage in riskier forms of lending to restore profitability
  - CBDC allow for "digital runs" towards the central bank with unprecedented speed and scale: even stronger banks could face withdrawals in the presence of CBDC
  - Provision of a safe and ultra-liquid asset may help reduce rollover risks and excessive maturity transformation (in wholesale markets). Benefits relative to other tools largely uncertain.

5.4. Cross border & global dimensions

Numerous reflections & concerns

- **Non residents:** Complications as non-residents hold CBDC. Cross-border & global dimensions pronounced during times of generalised flight to safety

- **Anonymity & reputational risks**: More difficult apply AML/CFT requirements because of a lack of formal powers over intermediaries involved in token-based CBDC distribution. Anonymity of instrument – reputational risks for CB

- **Price effects:** Potential large capital movement & related exchange rate and other asset price effects (if sudden introduction)