



Central Bank Digital Currency Around the Globe

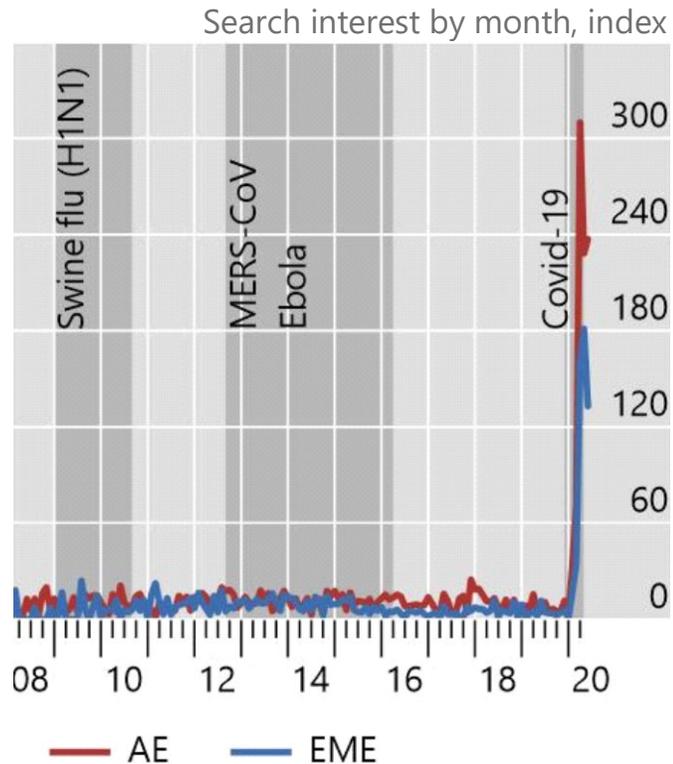
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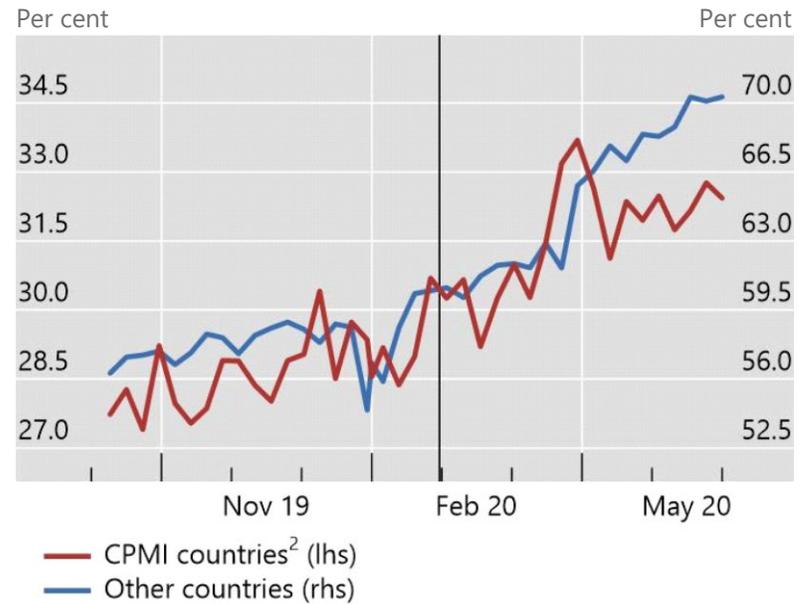
* The views expressed here are those of the presenter and not necessarily of the Bank for International Settlements

Cash use is declining; in some jurisdictions, general acceptance is under threat

Concerns about viruses and cash^{1,2}



Contactless cards have seen rapid growth in the pandemic¹

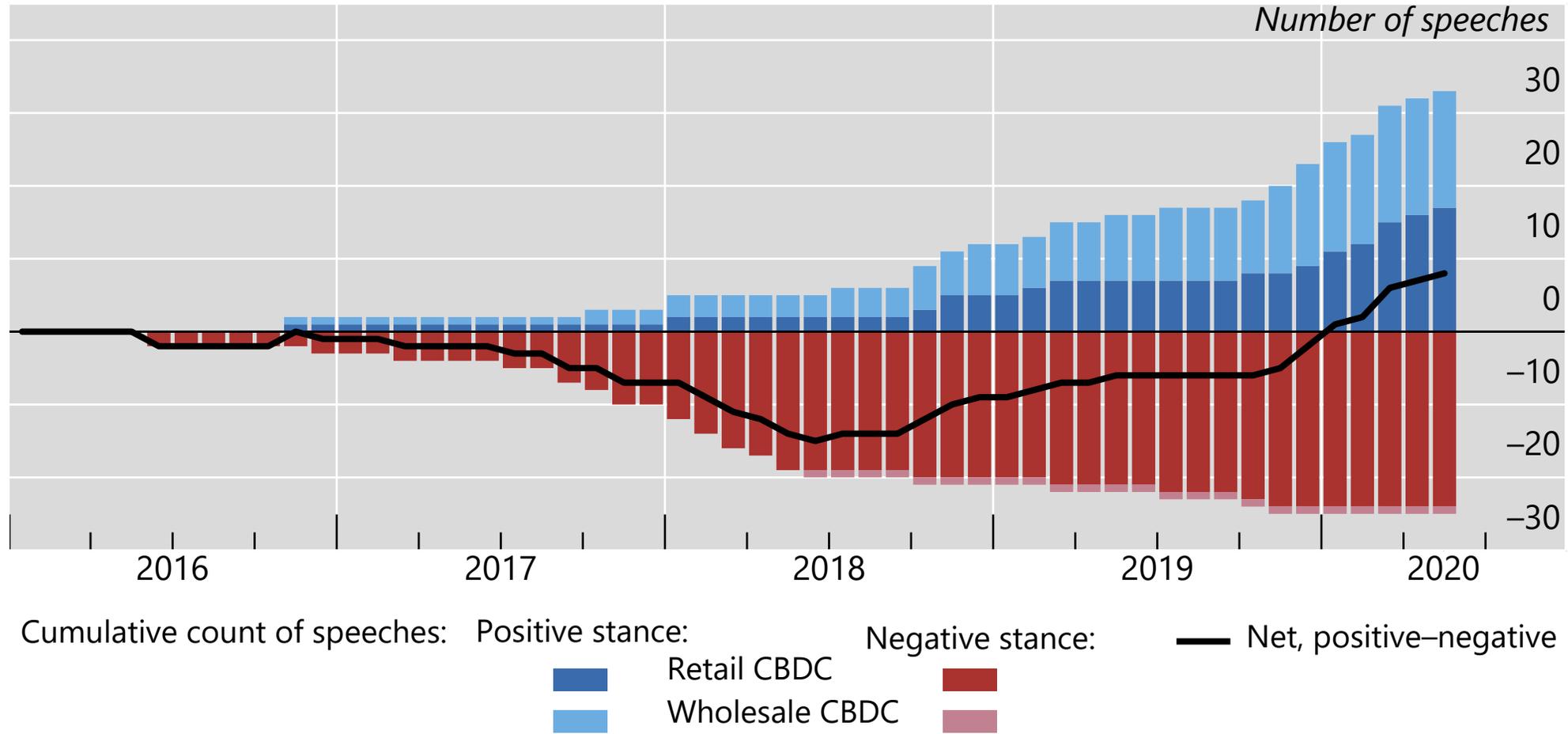


The black vertical lines indicate 30 Jan 2020, when the World Health emergency of international concern".



Source: Auer R, G Cornelli, J Frost (2020) "Covid-19, cash, and the future of payments" BIS Bulletin 3, picture: E. Eren

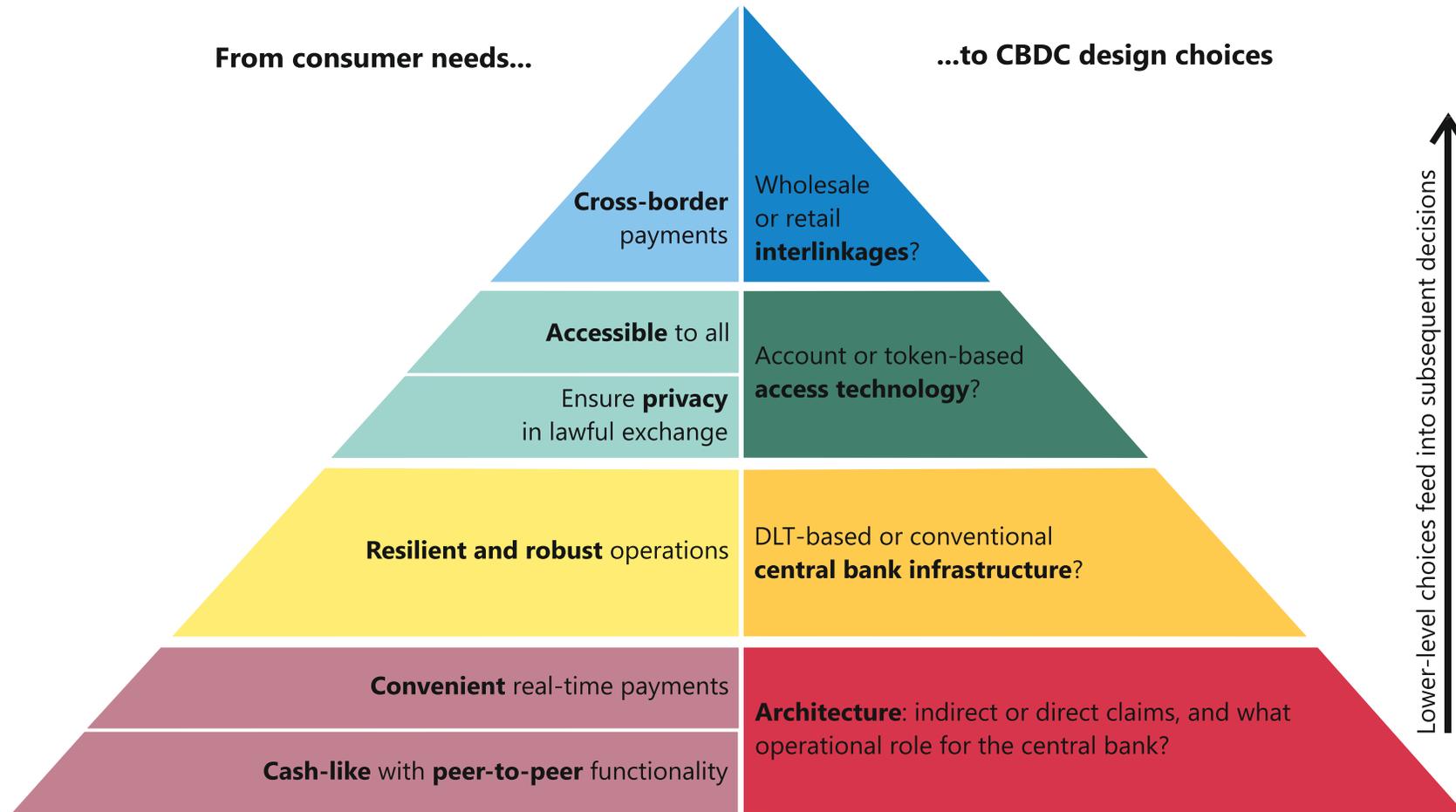
Central Bank's stance on CBDC issuance has become more positive



From motives for issuance for retail CBDC...

- **Payments safety** tops the list of motivations Boar et al (2020)
- Jurisdictions are heterogeneous – **financial inclusion dominates in EME**
- Issuance has not been decided – process will take years and the principle is to “**Do no Harm**” (Group of Central Banks (2020))
- **What design makes for a cash-like and useful addition to existing electronic payment options without distorting the financial system?**

...to a design framework: the CBDC pyramid

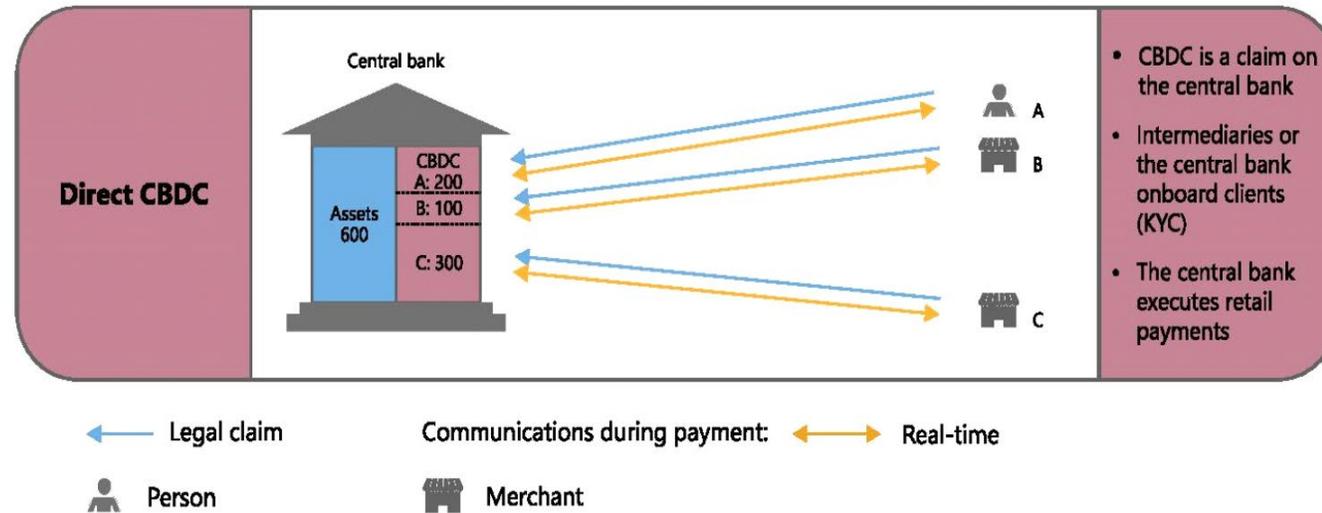


Source: Auer and Böhme (2020)

CBDC architectures and private-public sector cooperation

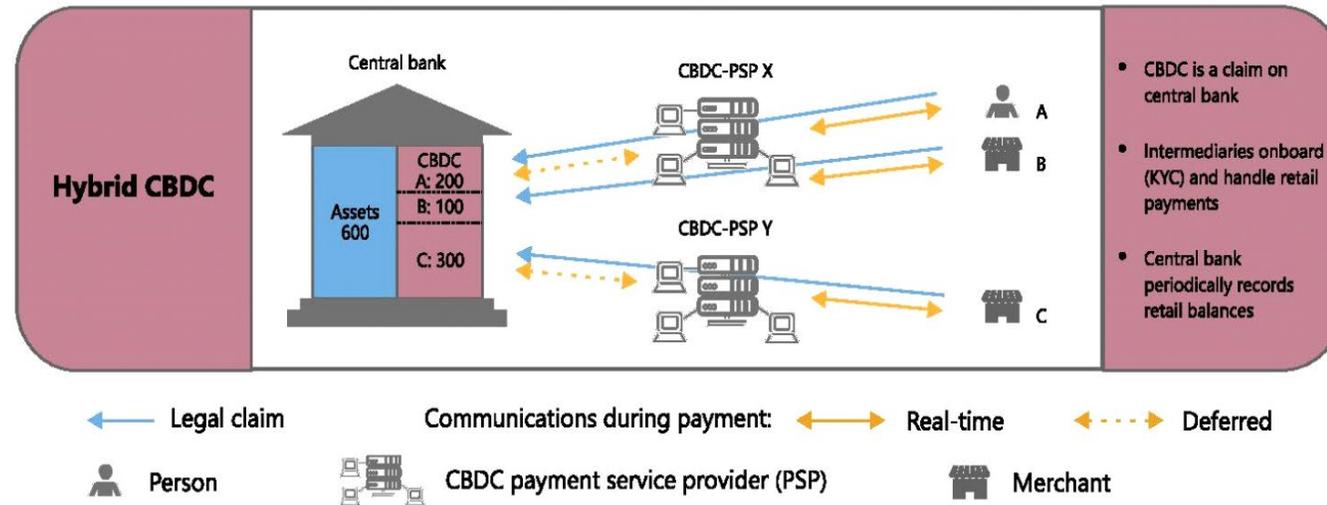
- Retail **CBDC is a cash-like direct claim on the central bank** available to the economy at large
- But how do the private and the public sector work together in the payment system?
 - I. **Direct CBDC** – payments operated by the central bank
 - II. **Hybrid CBDC** - payments operated by private sector
 - Either the central bank operates a **backup infrastructure**
 - Or Fully **intermediated CBDC**

The Direct CBDC: **central bank-operated payments**



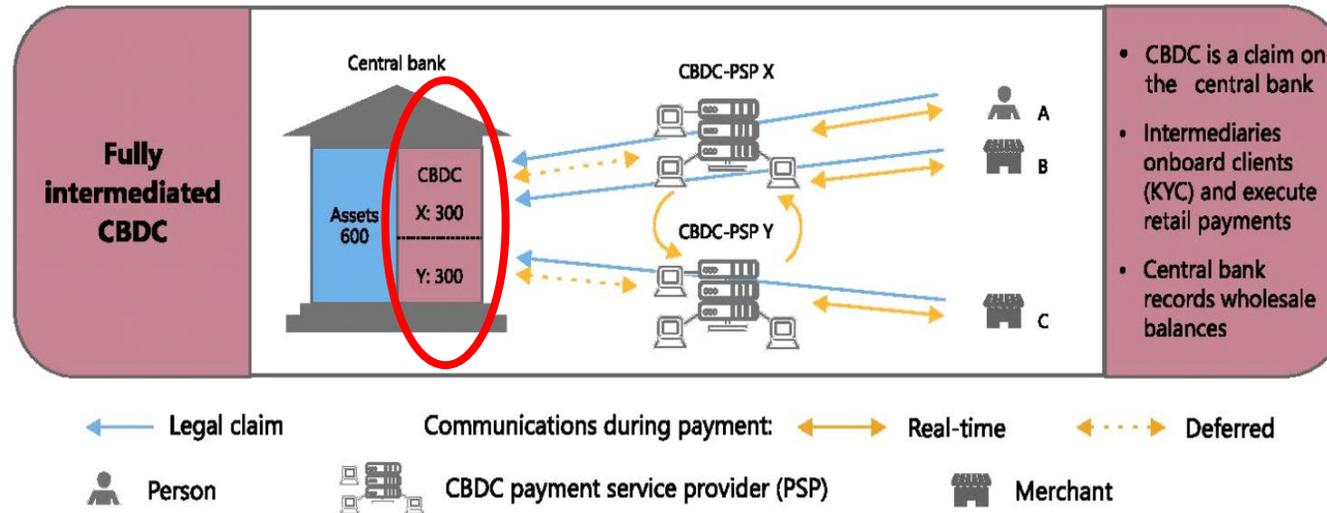
- Direct claims on the central bank
 - Private sector payment at most provides KYC
- Central bank operates payments:
 - How well-suited is the central bank for this activity?
 - Absence of risk-taking may impair real time payments

The Hybrid CBDC with a central bank backup



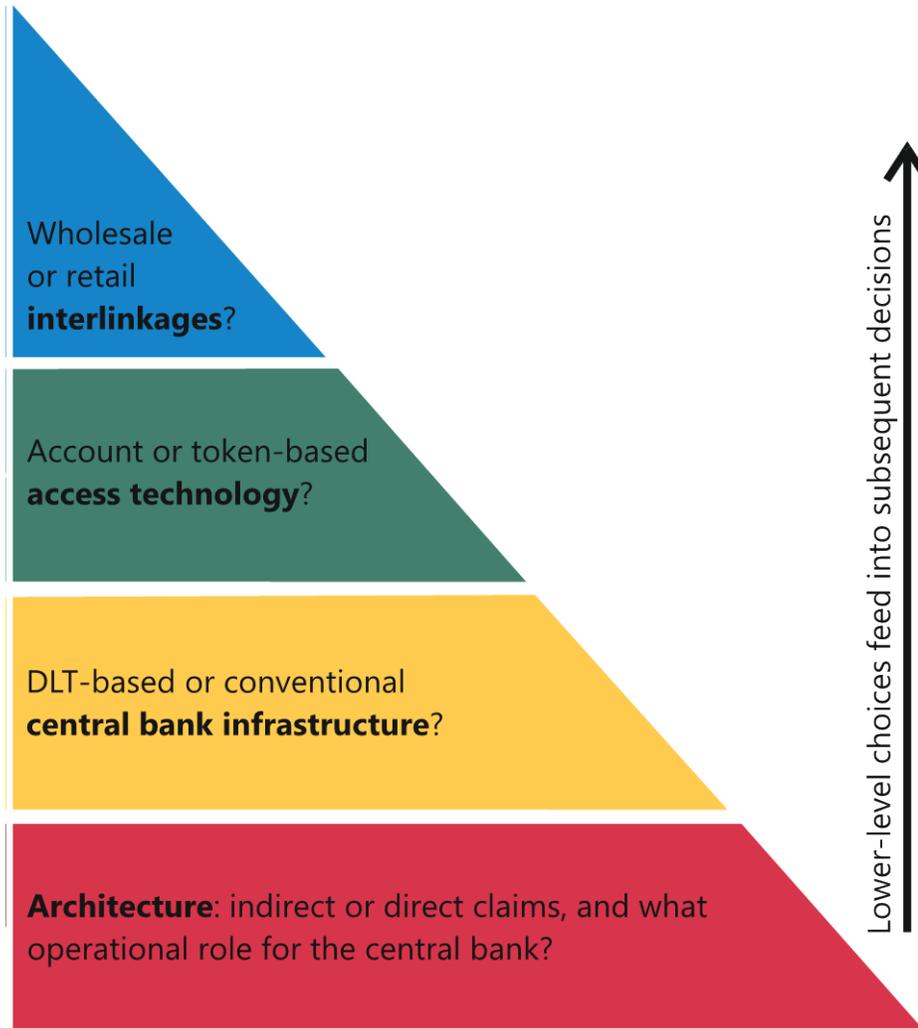
- Auer and Böhme (2020) propose hybrid approach:
 - Private sector payment providers perform onboarding, due diligence, and payments
 - The central bank has the technical means and legal power to switch retail client relations from a failing PSP to a working one.

Hybrid CBDC without a backup: fully **Intermediated CBDC**



- Direct claims on the central bank
- But central bank only operates a wholesale ledger
 - Associated need for financial supervision

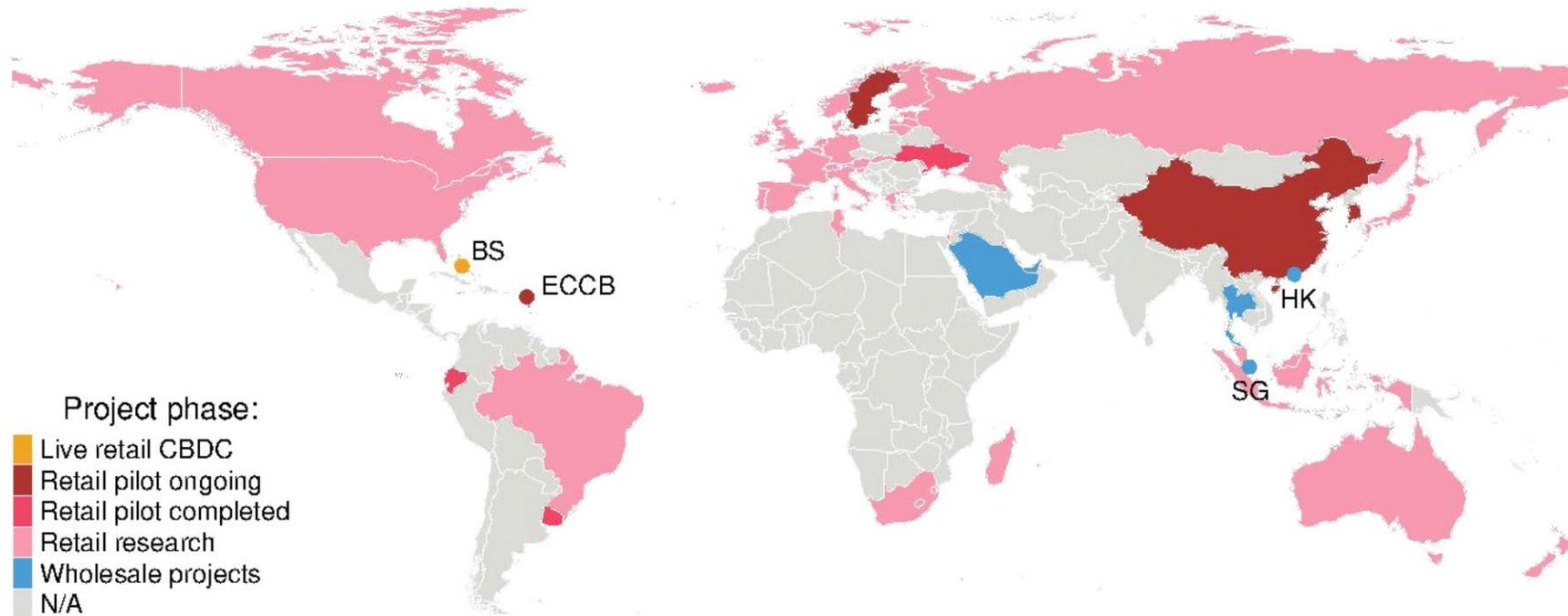
Moving up the CBDC pyramid: taking stock



- Is CBDC designed for **use across borders?**
- **How much privacy** would a CBDC offer?
- Which **infrastructure** should a CBDC be run on?
- Direct, Hybrid, or Intermediated **operational architecture?**

CBDCs research and pilots around the globe: a stock take

- Next, draw on R Auer, G Cornelli and J Frost (2020): "Rise of the central bank digital currencies: drivers, approaches and technologies" BIS Working Papers, No 880, August



BS = The Bahamas; ECCB = Eastern Caribbean central bank; HK = Hong Kong SAR; SG = Singapore.

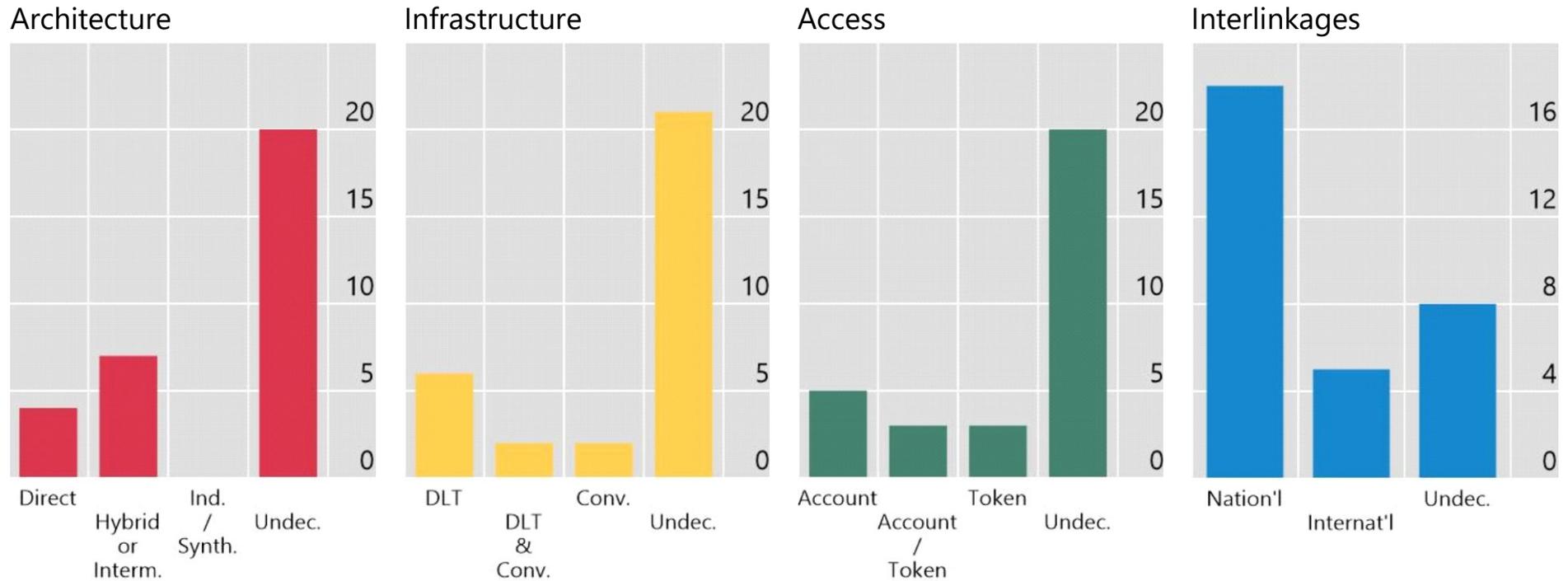
Design characteristics of the PBC's e-CNY project (pilot)

Design aspect	PBC e-CNY design choices	Details
Inter-linkages	Retail & wholesale linkages	Tourists and business travellers may be able to use CBDC domestically in China with a foreign cell phone number.
Account or token-based access?	Mostly account-based , allowing for smart money interfaces	Different levels of user identification. Balances and transaction limits increase with the strength of the KYC requirements.
DLT-based or conventional CB infrastructure ?	PBC runs conventional infrastructure and DLT	PBC runs conventional infrastructure and DLT, private sector free to choose.
Architecture: indirect or direct claims, and what operational role for the central bank?	Hybrid CBDC	CBDC is a direct claim on the central bank, private sector intermediaries ("Authorised operators") execute payments, central bank periodically receives a backup copy of holdings and transactions.

Source: R Auer, G Cornelli and J Frost (2020): "Rise of the central bank digital currencies: drivers, approaches and technologies", *BIS Working Papers*, No 880, August.

Histograms on design choices of retail CBDCs

Number of retail CBDC projects investigating each design option



Intern. = Intermediated; Ind. = Indirect; Synth. = Synthetic; Undec. = undecided/unspecified or multiple options under consideration; DLT = distributed ledger technology; Conv. = Conventional; Nation'l = national use; Internat'l = international use.

Sources: Central bank websites; authors' calculations.

Conclusion

- Around the world, CBDC design efforts are intensifying
 - Except in the Bahamas, issuance has not been decided upon
- A wide range of options are being considered, but tendency is:
 - To complement cash rather than replace it
 - Offer a solution with cash-like claims on central bank and an important role for the private sector (“Hybrid” design)
- International cooperation is key to foster exchange of knowledge and experiences
 - See ie CPMI/G20 task-force on cross-border payments

Appendix

References

- Auer R, G Cornelli , and J Frost (2020): "Cash, Covid, and the future of payments" BIS Bulletin 3, April.
- Auer R, G Cornelli , and J Frost (2020): "Rise of the central bank digital currencies: drivers, approaches and technologies", BIS WP 880, August.
- Auer R and R Böhme (2020): "The technology of retail central bank digital currency", BIS Quarterly Review, March.
- Bank for International Settlements (2020): "Central banks and payments in the digital era", Chapter III, Annual Economic Report.
- Boar, C, H Holden and A Wadsworth (2020): "Impending arrival: a sequel to the survey on central bank digital currency", BIS Papers, no 107, January.
- Carstens, A (2019): "The future of money and the payment system: what role for central banks?" Lecture at Princeton University, 5 December.