Position Paper No. 1 Central Bank Digital Currency (CBDC)

Emerging Payments Association Asia (EPAA)

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Why CBDC and why now?

The citizens of a territory have, where available and trustworthy, relied on their central bank or a regulated bank to provide them with access to a means of exchange, colloquially known as cash, allowing these persons to be rewarded in a form that is recognised, accepted and easily used.

The digitisation of economic activity over the last two decades, accelerating during the recent pandemic, has seen physical cash either being unsuitable or in some cases not accepted as a means of exchange.

The emergence of private entities such as Facebook to create a retail 'currency' as a global means of exchange, prompted a recognition that an increasing and fundamental need for a form of digital cash was not being addressed by governments and central banks. Similarly, the development of digital economic activity outside of ordinary regulatory protections, most notably through Bitcoin, also set the context for reflection on weaknesses of the current physical central bank currency system (notes and coins) as a means of exchange.

Over 60 central banks have undertaken CBDC pilots, with many now in production. As of January 2022, a handful of CBDCs are now live. In early 2022, the US Federal Reserve began its own consultation on a CBDC - a significant development given the US dollar's role as the global reserve currency.

Whilst there is strong interest in CBDCs, the need to balance a raft of competing interests and ensuring financial stability (a core function of any central bank) means that central banks are cautious in how they progress and, as evidenced by the BIS updates, undertaking investigations and pilots to ensure that any CBDC meets the needs of consumers and the core features they expect of a payment system such as reliability, accessibility and ubiquity without causing unnecessary disruption and cost to industry and general dissatisfaction. This reasoned approach has, however, left the market open to the the emergence of alternatives, regulated or otherwise, as we have seen with the rise of cryptocurrency.

Rationale

Rationale for a government-backed currency being available to the public

Enable all *bona fide* persons (citizens, visitors, corporate and government entities) to participate and be rewarded for legitimate economic activity within a sovereign territory with following features:

01 without barriers to entry

02 without need (as government backed) of the credit risk of the money system operator to be a cause of concern to the holder, as occurs in 'bank runs'

03 with minimal cost to the participants

04 with minimal operational and fraud risk to the participants

05 with common unit of account as defined by the territory as its currency

06 accepted as legal tender - that is recognised by a court of law and/or government agencies (such as tax authorities) to settle debts

07 with universal or near universal acceptance (this is different from legal tender as recently observed by retailers refusing to accept physical cash during peak periods of the pandemic)

08 with the privilege of 'seigniorage' - the profit from controlling the creation of central bank money supporting the central bank/government - including the privilege to profit from the dilution of purchasing value of issued currency through inflating the base.

Note - this is very close to the definition of the primary function of money as 'generally accepted medium of exchange' as expanded in this paper.

Rationale for currency reserves available to regulated banks that are part of the clearing system

01 Mechanism for real-time high value settlement with finality

02 Mechanism for monitoring and supporting the stability of the regulated banks and the overall banking system

03 Distribution mechanism via the regulated banks, better placed for relationship provision of banking services

04 Mechanism to foster innovation not available to the government/central bank

05 Practical 'scaling' during the physical analogue era of banking - even with digitisation

Weaknesses with current physical cash based government backed currency system

01 The only government-guaranteed money available to public and non-financial businesses is physical cash (banknotes and coins)

02 Individuals (the public) and non-financial businesses wishing to conduct payments digitally have had to rely on private entities (some regulated, some not regulated) to intermediate

- conversions to/from physical cash to private bank 'money' held in accounts (usually in the form of balances in deposit accounts but range of options including extension of credit)
- transmission of payments to/from other private bank money accounts

03 Such private entities (whether regulated or not) present a number of challenges

- **primarily profit motivated** (although some non-for-profit may exist, such as Government-owned banks or credit unions)
- **ability to restrict access** often preferred (profitable customer groups) and at times required to restrict access (e.g. sanctions, AML) although the criminal offense in certainly English law jurisdictions of 'tipping off' creates a major challenge once an account is opened
- **ability to set charges** (unless regulator imposes caps e.g. interchange regulations for payment schemes) which may deter access and economic activity
- **ability to exploit asymmetrical competitive advantage**, especially for those individuals and businesses excluded from traditional financial system, to charge unreasonably high fees (usually fixed) relative to the value of transaction

- **operational risk**, even with deposit insurance, to individuals and business (both non-financial and financial) with loss of savings or money in transit from failure of such private entities even if regulated (as demonstrated during the global financial crisis)
- **indirectly exposed to costs and moral hazard through bailouts of 'too big to fail' private entities**
- **exposed to anti-competitive practices,** given strong self-interests of the private entities and strengths of network effects once established

04 Physical cash is increasingly presenting a number of challenges

- **excluding individuals with only access to physical cash from digital economic activity** (whether reward for services or access to services) or exposing them to intermediaries able to charge excessive 'access' fees
- **exposing individuals** to the risks of theft, loss, destruction of holding physical cash
- **depriving individuals** with only access to physical cash of opportunities to save and earn a return from loaning to reputable institutions e.g. depositing in retail banks
- no mechanism to detect and deter **illegal economic activity** except the physical bulk from limiting the highest denomination notes

Desirable Attributes of Electronic Cash/Central Bank Digital Currency for Payments

01 Enabling economic activity (digital, remote or in person) to occur and be rewarded

02 Accessible to all

03 Bona fide persons acting in good faith

04 Extend concept of person to legal entity, machine (industrial use of electronic cash is an interesting area)

05 Decisions to exclude participation should be last resort - legal and human based (e.g. sanctions) and not algorithmic

06 Akin to a utility service

07 Unit cost of transaction that trends to zero

08 Speed of payments trends to immediate

09 Transparency trends to fully reduce the uncertainty / lack of visibility associated with making the payment

10 Finality of settlement trends to absolute

Managing Counterfeit Risk

01 Consequence of government-backed is that the Central Bank has to manage the risk of counterfeiting, which similar to bank notes is the Issuer's risk if undetectable (note opportunity in digital to have perfect copy as a feature of digital system if not constrained). In case of Central Bank Digital Currency therefore the Central Bank underwrites this risk.

02 Bearer risk if detectable by the receiver in a transaction

03 Major investments to prevent counterfeiting

04 Physical cash is incorporation of anti-counterfeiting measures and control of means of production

05 Digital cash is incorporation of tamper resistant hardware (smartcards/trusted execution environments) with cryptography to constrain the ability to copy/create unsupported value

06 Central ledger based balance - restriction of access to trusted parties for unauthorised updating of the ledger

07 Decentralized ledger based unspent tokens - cryptographically protected history with either trusted (private) or untrusted (public) mechanisms to constrain ability to control the means of updating (50%+ CPU problem in proof of work or 50%+ holdings in proof of stake).

08 Fit-for-purpose risk management problem that needs to be constrained within acceptable economic (cost of counterfeit) and reputational risk (confidence in the system) parameters - there is no 'perfect' security only series of prevent, detect, contain and recovery mechanisms that make the costs of compromising unattractive.

Transfer of counterfeit risk

01 Central banks may transfer the counterfeit risk to private entities through, for instance, currency board arrangements where the private entity creates a centrally backed currency (in the extreme 1:1 backed) and the private entity carries the risks of counterfeit but may place constraints on the users of the currency issued to mitigate this risk

Considerations as a Central Bank Assesses its Approach to CBDC

EPA Asia believes careful consideration and wide consultation is warranted, given the magnitude of any such change, and that central banks should consider the following before the introduction of a CBDC. It should be noted, however, that EPA Asia's take on CBDCs is from a payments perspective and that other considerations, particularly around the conduct of monetary policy and financial stability, are outside of our expertise and not covered in this position paper.

Clear benefits of introducing a CBDC

As detailed above, there are a number of key rationales for a central bank providing government backed currency to be available to the public.

A Central Bank assessment of whether to introduce a CBDC should be premised on the interest of the community and benefits to the economy, particularly the inclusion in a digital economy as discussed above. A like-for-like replacement would fail to justify change, and a negative change could create a loss of confidence in the wider payment system.

Impact on the existing payment systems?

A CBDC will likely operate alongside other payment rails in the initial stages, and careful consideration is required around how a CBDC would impact on the wider payments ecosystem and existing payment systems. Particularly, is it the intent of the Central Bank that a CBDC transfer creates a new payment system, and how will it affect the streamlining of payment systems that existing participants may be undertaking?. Failure to design simple integrations of existing payment systems with a new CBDC is one of the key risk factors likely to impact the rate of adoption.

Technologic neutrality

Retaining the fairness and equality afforded by central bank money in respect to both end-users and providers remains critical. This includes “technology neutrality” to avoid lock-in, so that payment service providers, businesses and consumers all have choice about the technology they use to access the system.Should a Central Bank insist on the Intellectual Property underlining the CBDC be placed in the collaborative domain so as not to restrict future development of or access to the system?

Approach to competition and innovation - within the CBDC design or utilising the CBDC

Should the Central Bank design a CBDC to drive competition and innovation in the payments and money ecosystem? Allowing flexibility in the core CBDC adds technical complexity and risk, however should be balanced with some of the innovation areas that have been proposed e.g. the ability for multiple currencies to exist in a jurisdiction. Attaching expiry dates to some digital currencies (e.g. stamp paper/vouchers). Attaching purposes to certain digital currencies (e.g. “health dollars” or “education dollars” or “carbon coins”).

Reflection of a territory/country’s policy on privacy - which may change over time

The Central Bank will need to reflect the territory/country’s current balance of privacy with safety in the design of its CBDC. Regulators should consider the role of cash and/or a digital cash substitute. In one model the central bank and government sees-all, and true anonymity is not possible. In another more decentralized model, CBDCs are able to emulate cash-like characteristics: anonymity in holding and/or transferring money. In the decentralized model, where the CBDC provides a high degree of anonymity, security and privacy, regulators should consider controls on money laundering, terrorism financing and tax evasion.

Bearer options, offline operation and risk of loss

The Central Bank will need to reflect how to enable offline operation, which would involve the utilisation of tamper resistance smartcards/trusted execution environments. The extent to which bearer options, offline operations impact the risks of losing money and lack of recourse that should also be considered. Physical cash has an accepted risk of loss as a consequence of being a bearer instrument.

Mitigating the impact of declining cash acceptance and usage

The Central Bank should consider if its design of a CBDC can assist in mitigating the negative impact of declining cash usage, although this is likely to only be limited in the short-term impact unless factors such as inertia, a lack of access to and/or lack of comfort with technology.

Role within wider initiatives to address financial inclusion

The Central Bank should consider the role the CBDC may play to assist in addressing financial inclusion, however each territory/country will need to carefully examine their situation as financial exclusion is a complex issue. The design of a CBDC will need to be accompanied by other elements such as digital education, access dependability, foundational digital ID and simplified KYC.

Market by market assessment of priorities

The introduction by the Central Bank of CBDCs may be at a wholesale level or a retail level. Whilst each territory/county will be different and have its own assessment, generally it would appear that retail may provide more benefits than wholesale, depending on the current features of the existing systems.

If retail CDBC is considered the priority, a general-purpose version may be the most appropriate place to start, so as to address the challenges of changing behaviour and ensuring it is widely used and accepted in the community.

Clear boundary between Central Bank guaranteed currency and Private backed money/stored value

The Central Bank will need to carefully consider the boundary between Central Bank guaranteed currency as a means of exchange and other Private-backed currencies whether Private Bank issued money (the digital form of money most common) or Private Stored Value operators (who may be either regulated if general purpose or unregulated if single purpose).

The public's understanding of the difference between Central Bank guaranteed currency being credit risk free as opposed to the inherent credit risk of regulated private bank issued money - broad money will be an important consideration. Further distinguishing the increased risk of non-regulated issuers of stored value within a broader digital currency framework such as shop stored value, or a credit facility with a merchant with buy-now-pay-later or other innovations that may arise.

Technology options should be assessed against the design requirements the Central Bank requires

Technology should be selected based on the core design requirements rather than adapting requirements to suit a particular technical solution.

Current technical solutions to be assessed include

- Role of bearer tokens that allow offline transfers - enables level of flexibility, anonymity and privacy will also present risks that will need to be mitigated around bearer instruments, including risk of loss, use in illegal activity, tax avoidance etc.
- Distributed ledger technology - with or without specific use of private blockchain (reflecting the Central Bank is a trusted entity and tends to operate through trusted entities).

Distributed ledger technology may be useful if wallets are non-custodial, decentralized, and if the CBDC is designed to operate cross-border or via multiple parties. A purely domestic digital currency that is held on central ledgers may be able to utilise conventional non-blockchain technology. Successful use of private blockchain implementations have supported interbank banking reconciliations.

It is worth noting the blockchain UTXO model - unspent transaction output - is a particular feature of blockchain-based currencies as an alternative to a balance or an account. Each UTXO represents a chain of ownership implemented as a chain of digital signatures where the owner signs a message (transaction) transferring ownership of their UTXO to the receiver. This provides (despite popular misperception) full traceability of all transactions.

Digital identity technology is likely to play a crucial role in central bank custodial designs (see below) as there will be individual association of a digital identity with the store of value. Authentication and authorisation of transactions needs to become consistent to facilitate adoption.

Options for custodial, non-custodial or hybrid

Providing an option for an individual or entity to control its own ability to access CBDC is generally referred to as the need for an intermediary or custodian.

In custodial models, central and/or private banks have control over balances, there is legal and consumer recourse, and greater visibility of holdings and transactions. In non-custodial (or self-custody) models there is more independence, balanced with a level of risks, in terms of, theft, loss, and use for illegal activities, money laundering etc.

As noted above, in a custodial, retail model of CBDCs, digital identity is a key consideration to interact with CBDC solutions. Authorisation of transactions should be considered, via a federated model where private institutions control access, centralised models such as India's AePS or decentralized models such as W3C's DID.

The decision on custodial options impacts whether offline capabilities can be supported, which may be a key requirement depending on the Central Bank's market. Offline capabilities offered by self-custody (non-custodial) models would allow a CBDC (most likely within fit for purpose limits/parameters) to operate in environments where connectivity is unavailable or limited. Such considerations would be critical to support the making of Disaster Payments for Emergency Recovery. The greater the reliance on online models throughout the economy creates increased systemic risks such a natural disaster or other incidents.

Cross-border/boundary interoperability

Depending on the Central Bank's interrelationship with cross-border/boundary territories/countries, selected interoperability with other CBDCs (particularly within a region) may be desirable. To the extent that appropriate features that may facilitate interoperability with other virtual currencies, for instance stablecoins, may be worth considering in support of possible future needs of a decentralised economy. If appropriate, consideration may be given to emerging global CBDC standards.

Autonominity

One historic advantage of the current system is the autonomous nature of money and payments. Cash requires no central authority to intercede on person-to-person payments. The move to electronic money has technically eroded this independence, but not in practice. Increased central control could result in greater curtailment of individual transactions, that may be justified or not: especially if implemented under a corrupt regime. This can dampen the free-flow of commerce, and/or lead to a lack of confidence in the system, eroding central monetary control.

Regional and local independence and control may be warranted where policy differs. Some states at a point of time wish to curtail spending, others wish to encourage it. Similarly, balance of payments, may wish to be encouraged within a region or more broadly.

Consultation with the private sector

Whilst the final decision on the design of a CBDC will rest with the Central Bank, private sector participation in the design and delivery of the CBDC is likely to be highly beneficial given to ensure market needs are appropriately met.

Potential for change

As the Central Bank considers its approach to CBDC, opportunities to improve people's access to digital payments could lead to enhanced opportunities for inclusion in private bank deposits and the availability of credit.

Other aspects of the financial system are expected to change and provide further opportunities, including open banking, existing payment system modernisation, expanded access to existing payment systems, regulatory reform, digital identity framework etc.

Conclusion

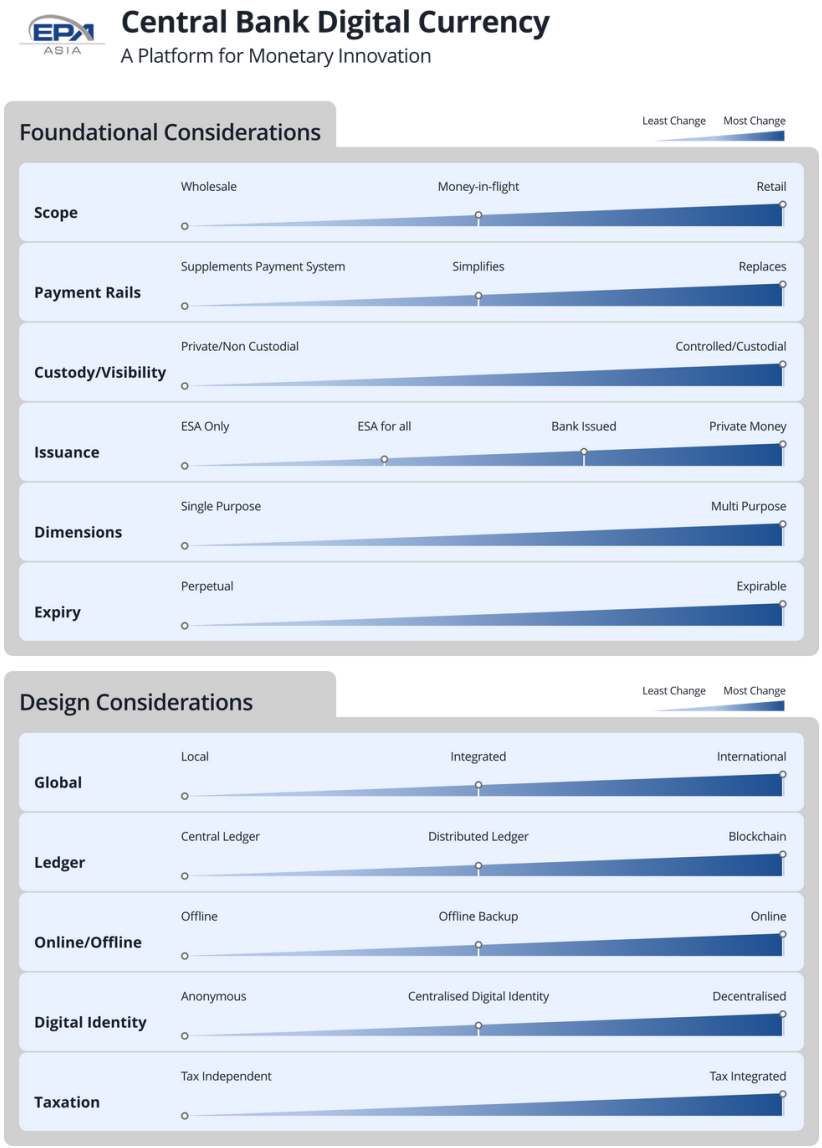
While central banks consider their position with regard to sovereign digital currencies, there are many aspects that should be considered.

Too little change could be meaningless, and result in a generational lost opportunity. Too much change is risky and could impact segments of the economy significantly - it could also destabilise confidence in the local currency.

We urge countries to consider at some level globally integrated approaches, not for the want of a global CBDC (though this should not be ruled out), but for greater technical and monetary interoperability if the need did arise to integrate with neighbours in the future, and to leverage solutions to problems across borders. At the same time, it is fair to expect diverse approaches in this emerging area of money, so balancing diversity and interoperability is another critical trade-off.

Appendix A - Illustration of the multiple facets of CBDCs for consideration by Central Banks

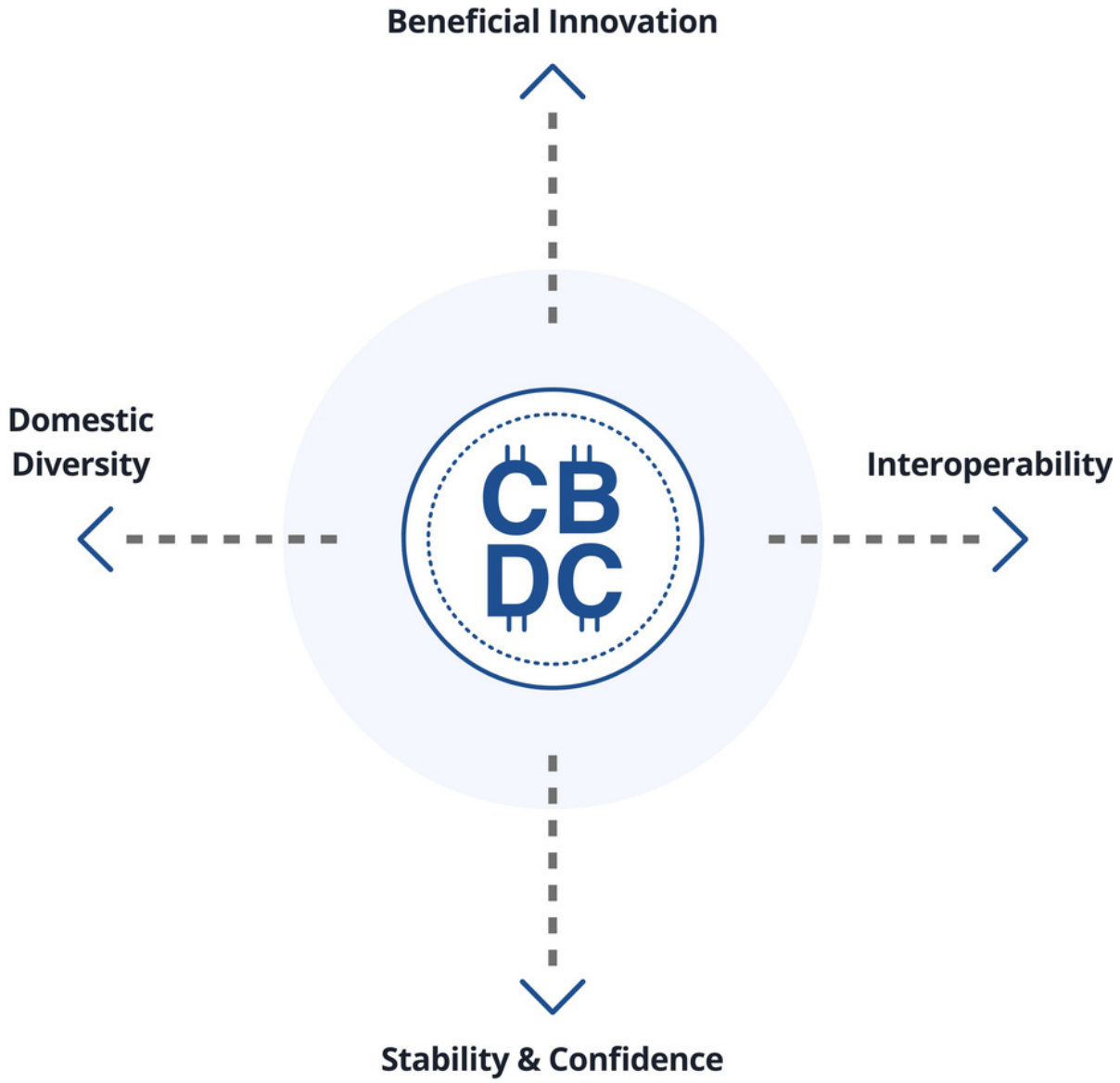
Some of the multiple facets of a potential CBDC are described as illustrated on the diagram below:



EPAA recommends central banks consider CBDCs as a platform for cautious innovation, and while they should be guarded with experimentation, their platform and policy should support multiple facets of change, and avoid ruling aspects out, aspects that may prove beneficial and more acceptable in the future.

Appendix B - The critical CBDC trade offs each country will need to make

Some of the multiple facets of a potential CBDC are described as illustrated on the diagram below:



About EPA Asia

The Emerging Payments Association Asia's (EPA Asia) goal is to unify the payments agenda in the region, drive business development and improve the regulatory landscape for all organisations within the payments value chain. We are a community of payments professionals whose goals are to strengthen and expand the payments industry to benefit all stakeholders. EPA Asia runs an inclusive programme of activities for members, which addresses key areas impacting the industry.