

Technical aspects for use of CBDC for cross border payments

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The cross border payment system is in urgent need of reform. This has featured prominently on the agenda of the G20 and other international organisations. The present system through correspondent banking has been slow, opaque, costly and thus impeded cross border financial relations. This has also been deplored by the guiding BRICS research paper as obstacle to promoting trade.

The main obstacles to quickly resolving this problem by applying new technology are the existence of various currencies which have to be exchanged on foreign exchange markets and the regulatory requirement of KYC which means the originators and recipients of foreign exchange transactions have to be screened and approved during the process. Technical solutions, such as CBDC which might look sound cannot address these problems which are man made and require human vetting.

This article will cover these formidable obstacles to allowing cross border transaction being solved by technology, such as CBDC and machine learning only. The first one is the existence of various currencies which are an expression of national sovereignty, closely tied to a non-scientific concept of nationhood. The second one are the foreign exchange markets where various national currencies are exchanged. The third one is the KYC requirement which screens foreign exchange market participants according to their eligibility to carry out any transaction. Another obstacle are capital controls which limits the eligibility to carry out foreign exchange transactions.

This will be followed by the technical solutions offered by central bank digital currencies (CBDC). There are three feasible technical solutions, compatible CBDC with intermediated transactions, inter linked CBDC with automated transactions and single CBDC systems with harmonisation of technical infrastructure, rule book and participation criteria help to overcome these obstacles.

The final sections will present the G20 roadmap for enhancing cross-border payments. This is the most comprehensive report, published by the Financial Stability Board (FSB) (on how to move forward. Any BRICS plan will have to follow this roadmap as there are no shortcuts.

Concluding comments will address the concerns of this conference, to promote CBDC with an international dimension in BRICS countries and to strengthen interoperability as outlined in phase 2 of this research project.

1. Basic requirements of technical solutions
 - 1.1. Existence of various currencies

The ongoing academic discussion on how many different currencies the world needs addresses the basic concerns. Any nationhood has issuing its own currency and controlling the issue as a main pillar of its existence. In addition to a flag, a national anthem next on the list is its own currency. Countries are unwilling to give up any of these key symbols of sovereignty. The development of the Euro in the European Union is an illustration of the reticence of some EU member countries to give up their national currencies, such as Sweden and Denmark and the United Kingdom before Brexit. Other countries using a common currency, such as the West African CFA and the Central African CFA have their historical gestation but they are in the process of creating their own currencies. The Common Currency Area (CCA) in Southern Africa is another illustration for the limits to one currency being used by a number of countries.

The main concern in the case of CCA is the control over a common currency, such as the ZAR in Southern Africa. The institutions of one country ensure control over the issue of a currency. If other

countries are involved there has to be a common decision making mechanism, such as the European Central Bank. Such an institution is lacking in the CCA and the Reserve Bank of ZA is solely in charge. The Council of the ECB decides over the backing of the Euro, on how many national securities are allowed to form the backing of the common currency. Because of the national determination of currencies, their existence will be assured for the time being. The PBOC has declared the priority of using national CBDCs, such as eCNY in cross border settlement, such as the mBridge project.

1.2. Foreign exchange markets

Countries can agree to use a third currency for payments, but this will have to be obtained in foreign exchange markets. It needs the agreements of the issuer, the FED in case of the USD. The global foreign exchange markets are the biggest financial markets in the world with a daily turnover in April 2019 of USD 6.6 trillion, amounting to more than 20 times the nominal world GDP. The USD is used in 88% on one side of all trades. The market is not centralised but decentralised among the major players which control 95% of the total market. Anybody wanting to pay cross border transactions has to go through one of these brokers. The market is highly automated and high frequency machine initiated trades have caused excess volatility in the forex market.

However, the underlying motivations for forex trades are determined by human activity, either on the demand or supply side. These very complex determinants cannot be automated. The need to interact cross border is a very voluntaristic element. In the ultimate case economic agents can transact domestically, which solves the forex problem. As globalisation has advanced in leaps and bounds, forex markets have multiplied. In case countries do not have adequate foreign exchange, they can resort to exchange rate changes or just borrow in the financial markets. The present system based on convertible currencies, first and foremost the USD has stood up well to these constraints and any further digitalisation will face the same challenges.

Attempts have been made to promote new exchanges, such as the RMB clearing system (CIPS), but this has been slow in taking off, as the RMB is not fully liberalised for financial transactions. As a result China's partner countries prefer to use the existing foreign exchange markets and major traded currencies. This discussion is conducted under the heading 'internationalisation of RMB'. Cross border payments in RMB at 3.3% are still well below the weight of RMB of 11% in the SDR basket. China, similar to Japan in the 1980s is constrained by prudential considerations to becoming a provider of a global means of payment, let alone a global savings vehicle.

1.2. Obstacles to free flows: KYC

One major human intervention in the forex markets is the eligibility of market participants. There is universal agreement that illegal activities should not be allowed to enter the forex market. Brokers are obliged by international agreements to screen the market participants. Determining who is and who is not eligible is not subject to technical decision or machine learning. Equally detecting fraud cannot be done by technology. Thus future use of CBDC will need to be subject to the same vetting process. This will be one major difference compared to cash which does not need any KYC.

There have been efforts to create digital KYC but so far this has not been operational. The main reason is that nobody has the full oversight of the originators of financial transactions. Data privacy and cross border legal differences are the main hurdles to obtaining the full picture. The OECD legal entity initiative is a great step forward but is still struggling to get to terms with legal creativity. Among BRICS countries there are widely different participation criteria, which allow national cronies, or even war criminals in the case of Russia to participate as legitimate participants in the cross border payments system.

1.3. Obstacles to free flows: Foreign exchange controls

Another criteria for screening the eligibility of market participants is according to the type of transactions. Countries determine that current account transactions are good for the country whereas financial transactions can destabilise countries' macro economic policy. The IMF has been successful in spreading current account convertibility, but has run into objections to financial account convertibility. Countries are even allowed to temporarily suspend financial convertibility in times of stress.

Technology can quickly execute transactions once they have been declared as one or the other. However it cannot detect whether the declared information is true or not. This will be a defining feature of the digital RMB, the eCNY as China will continue its financial account controls for the time being. Most illegal capital flows happen because of fraudulent declarations, such as the famous over invoicing of imports for capital outflows. The screening process is a major concern over the introduction of CBDCs. Cash does not make such distinctions.

2. Technical solution through CBDC

The three technical solutions on offer by the BIS envisage the integration of different, but compatible systems based on degree of integration of technical infrastructure, rule book and participation criteria. None of them includes the foreign exchange market, such as obtaining quotes.

The first system needs a multitude of private intermediaries in order to process payments through two separate CBDCs. Their role is the same as correspondent banking, performing the forex conversion as well as the KYC verification. However the process will be much faster and transparent. Common technical standards, such as message formats, cryptographic techniques, data requirements and user interfaces can reduce the operational burden of participating in multiple systems. Aligned legal, regulatory and supervisory standards can simplify KYC and transaction monitoring processes.

The second system either has a technical interface with automated intermediation or a common clearing mechanism, which could be either centralised or decentralised clearing. Arrangements could incorporate foreign exchange, offered by central banks or private institutions. Central banks involved will end up owning each others CBDC. A more centralised approach could use a trusted intermediary to act as clearing mechanism for central banks. The BOE-BOC-MAS clearing design provides for such a 'super correspondent'. However, just interlinking systems, without investment in broader coordination to achieve compatibility, has been insufficient in the past to achieve efficient cross-border systems.

The third system will require the harmonisation of technical infrastructure, rule book and participation criteria of the two systems. This needs sticking to a common roadmap to enhancing cross-border payments. The major elements of such a roadmap are a common vision and targets, adherence to international guidelines and principles, common features of service levels, align regulatory, supervisory and oversight frameworks, apply common AML/CTF, interaction between data frameworks, safe payment corridors, foster identity sharing such as KYC, adopt PvP, reciprocal liquidity arrangements, align operating hours, harmonised ISO 20022 for messages and API protocols for data exchange, and adding an international dimension into CBDC design.

Deeper integration allows for potentially more operational functionality and efficiency but increases the governance and control hurdles. New technologies could be used, such as CBDC could be issued onto a common distributed ledger. In the Inthanon-LionRock project participants from two systems

directly engage in a shared “corridor” network with a jointly controlled operator, allowing participants to make cross-border payments through depository receipts tied to CBDC held in domestic systems.

Yet the single mCBDC raises a series of policy issues for central banks. The shared management of the rulebook and governance arrangements for a shared system will be one concern. The wider implications of issuing a CBDC for monetary policy, financial stability and payment policy will need to be worked through for each central bank, potentially requiring trade-offs in the final design. Central banks might need to evaluate whether they are willing to relinquish some system control and monitoring functions to an operator, for which governance arrangements would need to be agreed. Negotiating these trade-offs across multiple central banks will be a challenge.

The CLS provides a useful example for designing a new system for the settlement of foreign exchange transactions, bearing in mind systemic risks, liquidity risk, monetary policy, international interdependencies, access for participants and currencies, and balancing the role of private and public sector. For example, CLS settles foreign transactions on its own books, but the final (netted) payments are made through the accounts it holds at each central bank.

To use the potential of mCBDC, greater international coordination among central banks is required. Exchange rate conversion will be a necessary friction for any mCBDC arrangement. Forex markets are vast but also highly complex, fragmented and concentrated among a few large dealers. The three mCBDC models above do not prescribe foreign exchange mechanism. Improvements could be made by adopting a PvP system by default, rather than requiring routing or specific settlement instructions through an interface.

Compatible CBDC systems could foster open, competitive and innovative markets services offering convenience and choice to end users. At the same time CBDCs could allow for enhanced monitoring and control by central banks. Experience has shown that setting up cross-border governance, addressing conflict of laws issues and making changes to multiple compliance and regulatory regimes take many years. Experts cite at least five years.

Cooperation on exploring how new technologies can enable novel designs for potential multi-currency systems may also play an important part in CBDC development. Time will be required to properly understand the possibilities that new technologies could bring. Yet CBDCs that form well-functioning mCBDC arrangements can then allow cheap and fast conversion to discourage holding of foreign currency, or currency substitution, a main concern for countries. Among BRICS countries practically all of them face this possibility.

3. G20 Roadmap for Enhancing Cross-Border Payments

This roadmap was published in October 2021 and maps out the milestones to be achieved in 2022 and beyond. It consists of various focus areas which contain building blocks.

The focus areas A is Committing to a joint public and private sector vision to enhance cross-border payments. Within the area, building block 1 addresses the development of a common cross-border payments vision and targets. Building block 2 covers the implementation of international guidance and principles. Building block 3 defines common features of cross-border payment levels.

The focus area B requires coordination on regulatory, supervisory and oversight frameworks. Building block 4 envisages the alignment of regulatory, supervisory and oversight frameworks for cross-border payments. Building block 5 stipulates application of AML/CTF rules consistently and comprehensively. Building block 6 postulates reviewing the interaction between data frameworks

and cross-border payments. Building block 7 promotes safe payment corridors, such as remittance corridors. Building block 8 addresses fostering KYC and identity sharing.

Focus area C covers improving existing payment infrastructure and arrangements to support the requirements of the cross-border payments market. Within the area building block 9 features facilitating increased adoption of PvP, notably the settlement of two or more currencies. Building block 10 postulates improvement of direct access to payment systems by banks, non banks and payment infrastructures. Building block 11 postulates exploring liquidity arrangements across central banks, so called liquidity bridges, typically in a reciprocal fashion. Building block 12 requires the extension and alignment of operating hours of key payments systems to avoid overlapping. Building block 13 requires interlinking of payment systems for cross-border payments.

Focus area D stipulates increasing data quality and straight through processing by enhancing data and market practices. Within this area building block 14 requires adopting a harmonised message format, such as ISO 20022, including rules for conversion and mapping. Building block 15 requires harmonisation of application programming interface (API) protocols for data exchanges. Building block 16 recommends establishing unique identifiers with proxy registries.

Focus area E expands into exploring the potential role of new payment infrastructures and arrangements. Within this area building block 17 suggests considering the feasibility of new multilateral platforms and arrangements for cross-border payments. One such platform, global stablecoins would be covered by building block 18. Building block 19 addresses CBDC design by factoring in an international dimension. In the three versions of CBDC in section 2 above, the models will have to include international aspects, in technical design, rule book as well as participation criteria. Needless to say that this area will pose many new challenges.

4. Conclusion

Bearing in mind that the G20 efforts in creating a new robust cross-border payments system, the current BRICS initiative will be subordinate to this, as all BRICS member countries are also in the G20. The BRICS might accelerate the consultation, coordination and cooperation between the members to form a core group which harmonises major issues such as interoperability as envisaged in the current project. This commendable initiative by the BRICS think tank will have to be followed up by joint actions which will be difficult in the absence of a permanent BRICS secretariat. Linking with the BIS innovation hub will expose BRICS to cutting edge technology as well as ongoing pilot projects. As a final reminder, the diversity of BRICS countries is a far cry from the pilot project JURA between the BIS, the Banque de France and the Swiss National Bank listed below.

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