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Introducing Digital Currencies to the Global Interbank Settlement System

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Introducing Digital Currencies to the Global Interbank Settlement System *

By Herbert Poenisch *

2019

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Introduction and Outline

The global financial architecture, including the financial infrastructures was set up after WW2 and is still in place, with marginal improvements.

At the centre of the financial infrastructures are the national central banks and national banking systems. The central banks hold foreign assets, mostly denominated in USD and the commercial banks hold reserves at the central banks. The public hold claims on the central banks in the form of cash and claims on commercial banks in the form of deposits. Transactions within a national system are carried out through the payment and settlement infrastructure (such as CNAPS in China). Payments are made through banks and non-banks (VISA, Mastercard, Union Pay, Alipay, WeChat Pay). This includes an RTGS for large, time critical amounts and netting system for smaller amounts. The costs of settlements have declined drastically and the speed has increased to real time clearance. While digital technology has accelerated the payment process, no digital currencies are used at present1.

The cross-border payments and settlement happens between central banks through their accounts at the Federal Reserve of New York and the Bank for International Settlements where all central banks hold accounts in key currencies. Countries accumulate reserves or lose them through this channel.

The global interbank market is one of the largest financial markets. However, cross-border payments among commercial banks are still carried out through intra bank transfers (within a bank) and the century old "correspondent banking model" for moving funds. China introduced its interbank payments system (CIPS) in 2015. Foreign exchange is obtained up front. In order to reduce the so called "Herstatt Risk"2, commercial banks use the Continuous Linked Settlement System (CLS). Messaging is standardized through the SWIFT format. The present system is not only costly, time consuming, particularly if the commercial banks are not directly linked, but have to go through larger banks, members of RTGS and CLS. Furthermore, payments in USD are routed through the US clearing banks.

According to the BIS foreign exchange survey3, forex transactions in USD account for nearly 90% of all transactions4, for current account purposes as well as financial account transactions, while this USD predominance has been unchanged for decades. This system is imbalanced as the global share of the US economy has declined, countries are excluded from this system due to US political decisions, subject to US surveillance and the whole system is subject to risks incurred by the major US banks as witnessed in the GFC ten years ago.

The new economic power, China has played along with this system so far but bumped into limits as it wants to expand the financial underpinning of its vast trading and investment network, first and foremost within the Belt and Road Initiative. The Chinese commercial banks are the largest commercial banks in the world, but they have to comply by a system designed and run by others.

It is therefore time to use the clout of Chinese banks and the advanced internet technology available to them to design a new cross-border interbank payment and settlement system. It can be based on digital currencies, either official ones, such as a Central Bank Digital Currency (CBDC),

1 The real time settlement systems of Ali Pay and Tencent introduced new technology but has to be prepaid in RMB through banks. The IMF calls this emoney: emoney is a means of payment and a store of value fully backed by fiat money, such as RMB

2 Herstatt Risk arises from different time zones, when a partner bank can default.

3 Latest in April 2019. See BIS (2019): Triennial Central Bank Survey, Global foreign exchange market turnover in 2019, September www.bis.org/statistics It is estimated that this survey captures 95% of market activity as most important centres are reporters.

4 As currency pairs are recorded, this percentage is out of 200%

to be issued in RMB by the Peoples Bank of China (PBoC), or banks create a private digital currency, similar to the Utility Settlement Currency (USC), designed by 15 major western commercial banks5.

This article will first address the limitations of the current global interbank clearing system, mainly through correspondent accounts and outline planned improvements. The only data available on the interbank market are the cross-border locational banking statistics collected by the Bank for International Settlements (BIS). An alternative to the present system will be suggested, which China could initiate and propagate. This would use Distributed Ledger Technology (DLT) and blockchain. Finally, two models will be suggested to digitalise the Chinese proposal, through use of official digital currency or private digital currency. The first would be a wholesale W-CBDC and the second one a private digital currency issued by banks, such as BRICS banks, for wholesale use only. Both can utilize the swap framework provided by the PBoC for 38 countries and regions with a total of over USD 500bn6.

1. Present cross-border settlement for banks

The value of cross-border payments is expected to rise by 5.5% a year from USD 22tr in 2016 to USD 30tr in 2022 across retail and corporate payments7. Is the present cross-border payment and settlement system up to the task, is it suitable for digitalization? There are presently two major channels for cross-border settlement, either through intra bank fund transfers for major banks with affiliates in major financial centres or through correspondent accounts for the other banks, often through a number of banks.

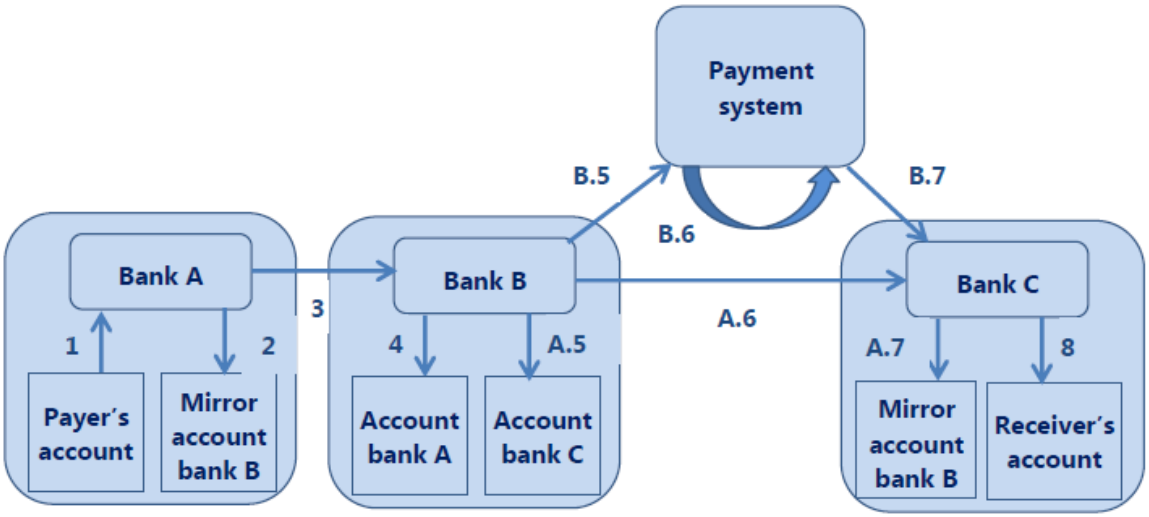
The intra bank fund transfer is possible when major banks are members of various RTGS systems in various currencies. For example, a Bank of China (BOC) affiliate anywhere in the world needs to send funds in USD to a US client. It transfers the funds in-house to the BOC in New York which is member of the US FedWire Clearing system. If the recipient bank is also member of Fedwire, the funds will be credited electronically without delay. In addition to the message confirming the transfer provided by SWIFT, the BOC will monitor the progress of payment at each stage, able to inform the clients.

Routing payments through RGTS systems (bank B and C in figure 1 are members) has two advantages, first settlement takes place in central bank money, ie at zero risk. Secondly, it is a real-time system, thus excluding the build-up of credit risk during the settlement process. The communication standard is ISO 20022 and SWIFT uses MT messaging format.

5 FT (2019): Top banks push ahead with digital coins for 2020. In FT 2 June www.ft.com
6 PBoC (2019): RMB Internationalisation Report, August www.pbc.gov.cn
7 BOC, BOE, MAS (2018): Cross-border interbank payments and settlements. Emerging opportunities for digital transformation, November, p 6 www.bankofengland.com.uk

Figure 1

Payments settled via correspondent banking



1. Debiting of payer's account with bank A
2. Crediting of bank B's mirror account with bank A, which is kept for accounting purposes
3. Payment message from bank A to bank B via telecommunication network
4. Debiting of bank A's account with bank B (loro account)

A. Use correspondent bank only

5. Crediting of bank C's account with bank B
6. Payment message from bank B to bank C via telecommunication network
7. Debiting of bank's B mirror account with bank C, which is kept for accounting purposes
8. Crediting of receiver's account with bank C

B. Involvement of payment system

5. Payment message from bank B to payment system
6. Settlement via payment system
7. Payment message from payment system to bank C
8. Crediting of receiver's account with bank C

Source: ECB, *Ninth survey on correspondent banking in euro*, 2015, adapted from Danmarks Nationalbank, *Payment systems in Denmark*, 2005.

If the originating bank is a lesser bank (such as bank A) or the receiving bank is not a member of the close to 10,000 member banks of Fedwire, there needs to be a chain of interbank transfers. These transfers are expensive, can take multiple days and lack transparency, regarding both time and costs.

This is primarily due to the complexity of the cross-border payment and settlement process, which includes the involvement of multiple entities in the execution of a cross-border transaction, the degree of regulation-for example anti-money laundering (AML), counter terrorist financing (CTF) and know your customer (KYC) requirements, as well as capital requirements- differences in technical and operational standards across jurisdictions, and the prevalence of legacy systems and infrastructure8.

While operational resilience of an RTGS is assured, strategic resilience to facilitate innovation is not always inherent. For example, the RTGS infrastructure may not be able to incorporate the necessary processes of proofs required to interoperate with systems based on distributed ledger technology (DLT).

Differing technical requirements combined with varying regulatory standards across

8 BOC, BOE, MAS, ibid, p6

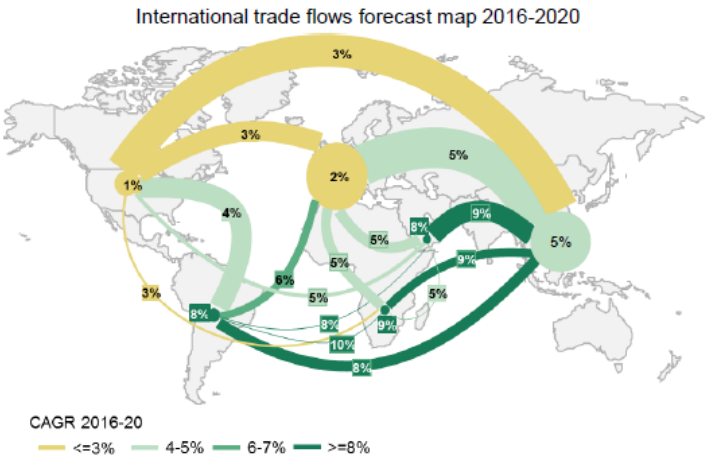
jurisdictions present a barrier to an institution that wants to have access to settlement accounts (RTGS) in different countries simultaneously, it adds cost and complexity to these operations. Consequently, only few banks have the scale required to maintain a global network of settlements in multiple jurisdictions. The recent history has shown a cutback in the number of correspondent relationships9.

Correspondent banking relationships are being reduced especially for respondent banks that (i) do not generate sufficient volumes to recover compliance costs, (ii) are located in jurisdictions perceived to be too risky, (iii) where adequate risk assessment is not possible, (iv) offer products or services that are more difficult to manage10. This puts pressure on the commercial viability of the correspondent banking model.

It has been estimated, that the cost for a US bank to execute a cross-border payment via the correspondent banking network is in the range of USD 25 to USD 35, lately even USD 40, ie more than ten times the cost of an average domestic payment11. The breakdown is as follows: 34% are liquidity costs, treasury operations at 27%, foreign exchange costs at15%, compliance costs at 13%, payment operations at 9% and network management at 2%. The major concern is liquidity, which can be avoided by settlement in digital currencies.

There has been a disconnect between trade, which has increasing moved to south-south (exhibit 1) and payment which still pass through the northern financial centres (exhibit 2) in figure 2 below.

Exhibit 1: Shift of the center of international trade to South-South corridors ...



Note: Forecasts are at constant FX rates Source: BCG Trade Finance Model 2016

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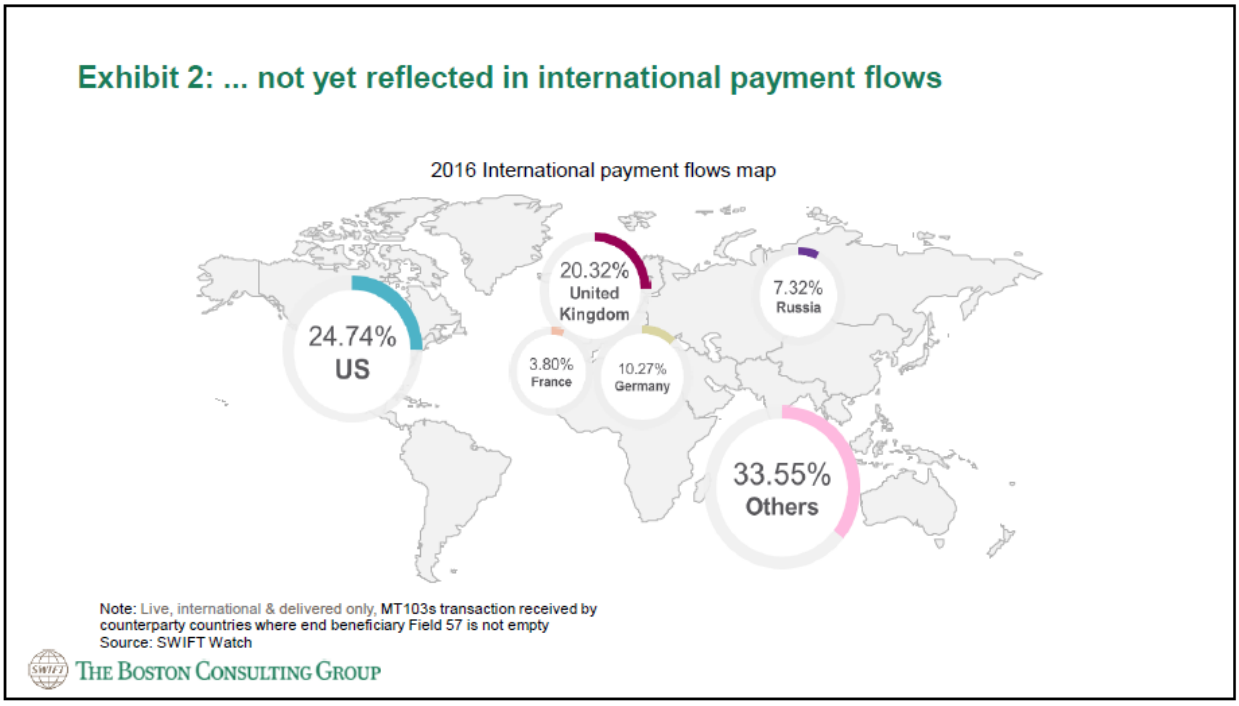
9 Financial Stability Board (2019): FSB Action Plan to Assess and Address the Decline in Correspondent Banking, May p.1 www.fsb.org

10 Committee on Payments and Market Infrastructures (2016): Correspondent banking, July, p11 www.bis.org/cpmi

11 BOC, BOE, MAS, ibid, p 11



The present cross border clearing and settlement system is not only outdated but has major functional problems.

There are major challenges for end users, either individuals or businesses. There is a lack of transparency regarding payment status and costs, which makes it impossible to track cross-border payments and reach finality at a certain date. There are delays in payment processing as each bank across the payment value chain will individually undertake its own processes to meet regulatory requirements12, such as sanctions screening, and assessment of collateral requirements as well as ensuring that the payment message format and content are correct13.

There are time restrictions on cross-border payments to be processed round the clock as operating hours vary across multiple jurisdictions. Cross-border payments are subject to stipulated cut-off times; payment instructions received after the specified times are processed the next working day14.

Several RTGS operators have proposed improvements to modernize and renew their payments infrastructure.

These proposals include interoperability with DLT platforms, broadening access to RTGS to allow non-banks to participate, adopting ISO 20022 messaging standard, extending operating hours, upgrading of CLS to include more currencies, called CLS NOW, greater transparency regarding payment speed and visibility, called SWFT gpi (global payments initiative) and harmonizing and standardizing the quality and types of data a firm can access regarding a client enhances KYC process for banks15. However, these initiatives have so far fallen short of the desired expectations in both intent and implementation, and uptake by the participating banks has been low.

The quoted report by the Bank of Canada (BOC), Bank of England (BOE) and Monetary

12 For details see CPMI (2016), ibid, p11.
13 BOC, BOE, MAS, ibid, p14.
14 BOC, BOE, MAS, ibid, p14.
15 BOC, BOE, MAS, ibid p21.

Authority of Singapore (MAS) then goes on to list the capabilities that must be delivered by any future model for cross-border payments and settlement to solve the root causes.

In addition, there are China specific considerations which will be incorporated in the model proposed here. These are the political organisations, such as BRICS and the Belt and Road Initiative as well as new regional interbank associations such as based on the Shanghai Cooperation Organisation, ASEAN, Central and Eastern Europe, Africa, Arab countries etc. These are set up not only to facilitate interbank payments between China and major regional banks but also to support the internationalization of the RMB. Data on Chinese cross-border payments are not readily available (such as CIPS) and statistics collected by international bodies, such as the BIS16 and SWIFT17 show no increase in use of China's own alternatives (CIPS and RMB) to the present payments infrastructure.

This leads to the conclusion that presently, Chinese international active banks use the international financial infrastructure, such as existing RGTS, as well as the major currencies, such as USD, EUR, GBP, JPY, CAD to conduct their cross-border business.

The only RTGS covering a number of countries and regions are the Euro Target 2 system and the RMB RTGS including Hong Kong and Macao18.

2. Data on cross-border interbank payments

Real time turnover data are collected by major banks but not published. The best source are the messages processed by SWIFT. On an average day, SWIFT dispatches messages covering 15 million transactions and a value of some USD 5tr. This includes major RGTS systems, such as FedWire. In comparison, the China Interbank payment system (CIPS) pales with yearly 3.42 million transactions at a value of some USD 6.5tr19. The difference is explained by technical factors and costs for through processing.

The only consistent data on cross-border intra bank and interbank transactions, outstanding volumes and quarterly changes have been collected by the BIS since the 1970s in the form of locational banking statistics (LBS)20. They are reported quarterly by banks in close to 50 major financial centres of the world, compiled by their central banks, reported to the BIS, where double counting is eliminated and seasonal adjustment is made.

The core are the cross-border claims and liabilities of banks in the reporting area on their clients, both banks and non-banks. The claims amounted to USD 30.5 tr compared with their domestic claims of USD 72tr (memo: USD 90tr Global GDP estimate 2019). The total liabilities amount to USD 27bn, compared with domestic liabilities of USD 72tr.

The table 1 below also shows that the interbank cross border business makes up 50% of all transactions and the intra bank (within a banking group) makes up 2/3 of interbank transactions (bank sector, of which intra bank)21. The bulk of these transactions are loans, mostly unsecured, they are denominated mostly in USD and EUR. The bulk of the trade is between advanced economies and between them and offshore centres. These data are a documentation of the international interbank market, part of which is used for routing retail payments either intra bank or via correspondent accounts.

16 BIS (2019): Triennial Central Bank Survey. Global foreign exchange market turnover, ibid.
17 SWIFT (2019): RMB Tracker. Monthly reporting and statistics on RMB progress towards becoming an international currency, August 2019 www.swift.com
18 Committee on Payments and Market Infrastructure (CPMI) (2012): Red Book-China www.bis.org/cpmi
19 The Peoples Bank of China (2019): RMB Internationalisation Report www.pbc.gov.cn
20 Bank for International Settlements (2019): Locational Banking Statistics www.bis.org/statistics; China has been a reporter since the end of 2015.
21 The origin of the large share of interbank business is the Basel 1 accord of 1988. BCBS (2019): History of the Basel Accord www.bis.org/bcbs/history

Table 1: Cross-border banking assets and liabilities, outstanding 1Q2019

Summary of locational statistics, by currency, instrument and residence and sector of

Amounts outstanding, in billions of US dollars

Sector of counterparty	All sectors		Bank sector			
			Total		Of which: Intragroup	
	Claims	Liabilities	Claims	Liabilities	Claims	Liabilities
Type of position	Q1 19	Q1 19	Q1 19	Q1 19	Q1 19	Q1 19
Cross-border positions	**30,472.7**	**27,222.1**	**15,388.0**	**14,668.6**	**9,621.1**	**8,530.8**
By residence of counterparty						
Developed countries	21,000.4	17,287.5	11,297.0	10,264.9	6,739.7	6,246.6
Of which: euro area	8,248.4	6,767.4	4,546.5	4,056.5	2,535.7	2,348.8
Offshore centres	4,935.1	4,485.6	1,961.4	2,137.4	1,357.2	1,394.8
Developing Africa and Middle East	808.8	981.8	320.8	561.6	133.2	92.8
Developing Asia and Pacific	2,080.5	1,658.3	1,146.5	1,093.6	494.2	436.6
Developing Europe	545.6	359.5	273.4	247.6	152.5	50.3
Developing Latin America and Caribbean	631.4	409.2	235.1	205.6	107.3	46.4
International organisations	251.0	282.3	39.2	54.0	0.1	0.1
Unallocated	220.0	1,757.9	114.4	103.9	636.9	263.1
By currency						
US dollar	14,665.3	13,428.5	7,235.6	7,527.4	4,818.7	4,497.7
Euro	8,951.8	8,156.4	4,872.4	4,271.6	2,518.6	2,340.7
Yen	1,850.0	891.1	685.4	566.9	421.8	330.3
Pound sterling	1,417.2	1,381.1	606.3	633.4	422.6	412.8
Swiss franc	406.3	343.2	265.6	192.7	148.5	67.5
Other currencies	1,226.7	1,663.6	638.1	899.0	368.4	584.4
Unallocated	1,955.6	1,358.3	1,084.5	577.7	922.5	297.3
By instrument						
Loans	20,678.1	21,258.2	12,121.6	13,180.5	7,891.4	7,259.2
Debt securities	6,636.2	3,665.1	1,694.1	506.5	123.7	31.7
Of which: short-term	.	682.3	.	147.6	.	10.1
Other instruments	2,958.5	2,124.3	1,376.3	968.5	719.7	447.8
Unallocated	199.8	174.5	195.9	13.1	553.8	799.5
Local positions in foreign currencies	**4,175.6**	**5,858.1**	**1,547.3**	**1,585.6**	**360.0**	**358.9**
Local positions in local currencies	**68,079.1**	**63,576.5**	**12,031.5**	**8,092.8**	**2,663.6**	**2,706.5**
Unallocated	**194.8**	**2,706.6**	**28.6**	**227.6**	**1.8**	**1.3**

[1] Data are incomplete. See Table A2 for a list of countries that report non-bank subsectors.

Source: BIS Locational Banking Statistics June 2019

Table 2: Cross border banking assets and liabilities, changes in 1Q2019

Summary of locational statistics, by currency, instrument and residence and sector o

Break- and exchange rate-adjusted changes, in billions of US dollars

Sector of counterparty	All sectors		Bank sector			
			Total		Of which: Intragroup	
	Claims	Liabilities	Claims	Liabilities	Claims	Liabilities
Type of position	Q1 19	Q1 19	Q1 19	Q1 19	Q1 19	Q1 19
Cross-border positions	**1,375.5**	**1,017.7**	**454.3**	**604.9**	**27.7**	**96.1**
By residence of counterparty						
Developed countries	1,031.9	769.4	464.6	541.0	96.4	166.9
Of which: euro area	544.5	492.2	345.6	380.6	75.8	72.4
Offshore centres	242.3	65.2	1.1	–54.9	–32.5	–38.0
Developing Africa and Middle East	33.5	17.5	12.9	11.7	–1.5	–3.9
Developing Asia and Pacific	6.4	79.4	–47.7	68.7	–31.1	–31.1
Developing Europe	–0.7	36.0	–7.4	22.9	–4.5	3.2
Developing Latin America and Caribbean	11.8	6.3	6.4	9.3	4.4	4.8
International organisations	23.1	19.5	1.6	2.6	0.1	0.1
Unallocated	27.0	24.4	22.8	3.6	-3.6	-5.9
By currency						
US dollar	419.6	221.9	16.1	102.4	–20.0	31.7
Euro	637.8	567.5	364.0	425.1	58.4	68.2
Yen	81.4	54.4	23.5	44.4	–0.3	17.6
Pound sterling	49.2	39.5	–17.3	–15.5	–17.0	–25.6
Swiss franc	12.1	7.7	6.8	3.0	–2.2	1.0
Other currencies	26.0	90.7	–23.1	38.6	–22.8	10.3
Unallocated	149.2	36.1	84.2	7.1	31.6	–7.1
By instrument						
Loans	721.2	798.4	324.8	576.9	42.3	65.3
Debt securities	470.7	85.9	87.9	9.8	10.1	2.4
Of which: short-term	.	–3.4	.	–10.3	.	0.7
Other instruments	177.1	125.1	34.0	17.4	20.8	3.2
Unallocated	6.5	8.2	7.6	0.7	–54.2	26.8
Local positions in foreign currencies	**–102.2**	**–102.7**	**–63.2**	**–86.7**	**–72.4**	**–67.7**
Local positions in local currencies	**1,112.2**	**1,083.2**	**251.5**	**64.9**	**101.3**	**104.7**
Unallocated	**8.8**	**46.8**	**–0.6**	**–5.0**	**0.0**	**0.1**

[1] Data are incomplete. See Table A2 for a list of countries that report non-bank subsectors.

Source: BIS Locational Banking Statistics June 2019

The figures show that interbank business as well as intra bank business continued to growth healthily, despite of slowing global economic growth and the stagnation of international trade due to rising trade tensions.

3. Proposed new Chinese interbank payments infrastructure

While Chinese banks and non-bank financial institutions are increasing their international operations, they basically use the existing infrastructure. While Non-banks like Alipay have offered retail payments solutions in various countries, the wholesale payment and settlement systems needs to be addressed, by not only using digital technology but also digital currencies.

While a Chinese-led overhaul of the global financial infrastructure is not realistic at present, a

limited controlled experiment, such as within the BRICS, is feasible. China has gained experience in the past by limited controlled reforms, such as special economic zones (SEZ).

It is suggested that the BRICS Interbank Association, with major banks as members should be in charge of the reform of the interbank payments system among member countries[22]. An alternative would be the Belt and Road countries, but the scope is too large for an experiment and the diversity among countries and banking systems could be an impediment.

The four major banks in each of the BRICS countries should be assigned a role in the new wholesale payments system. For Brasil, these would be Bank Itau, Banco do Brasil, Bradesco and Caixa Economica Federal. For Russia these would be Sberbank, VTB, Gazprombank and Rosselkhozbank. For India the participating banks should be the State Bank of India, Baroda Bank, Punjab National Bank and Bank of India. Chinese banks, ICBC, BOC, CCB and ABC could play a leading role in this process. South African Bank which also offer ample cross-border experience are Standard, ABSA, First Rand and Nedbank. They would form a closed set of 20 participants with restricted access, a major requirement for DLT. The national development banks and export-import banks could be added.

Technological innovation would be the utilization of Distributed Ledger Technology (DLT) together with blockchain for the wholesale payment, clearing and settlement system. While banks have used correspondent accounts in the past, this technology would be similar by allowing banks access to each others' accounts, without recourse to banks' reserves at the central banks' domestic accounts. The introduction of DLT could reduce the traditional reliance on a central ledger managed by a trusted entity, such as the central bank for holding and transferring funds and other financial assets[23].

Proponents of introducing DLT argue that it (i) reduces complexity, (ii) Improves end-to-end processing speed and thus availability of assets and funds; (iii) decreases the need for reconciliation across multiple record-keeping infrastructures; (iv) increases transparency and immutability in transaction record keeping; (v) improves network resilience through distributed data management; and (vi) reduces operational and financial risks[24].

However, DLT may pose new or different risks, including (i) potential uncertainty about operational and security issues arising from the technology; (ii) lack of interoperability with existing processes and infrastructures; (iii) ambiguity relating to settlement finality; (iv) questions regarding the soundness of legal underpinnings for DLT implementations; (v) absence of an effective and robust governance framework; and (vi) issues related to data integrity, immutability and privacy. DLT is an evolving technology that has not yet been proven sufficiently robust for wide scale implementation[25].

22 The Communique of the BRICS Interbank Cooperation Mechanism states "creating basic mechanisms for settling payments and financing projects in local currencies". Dimitry Kozevnikov (2015): The BRICS Interbank Cooperation Mechanism. In: Defence Technologies Review1/2015

23 Committee on Payments and Market Infrastructures (CPMI) (2017): Distributed ledger technology in payment, clearing and settlement. An analytical framework, February, p1 www.bis.org/cpmi

24D Mills, K.Wang, B Malone et al (2016): Distributed ledger technology in payments, clearing and settlement. Quoted in CPMI, ibid, p1.

25 CPMI(2017), ibid p1.

Figure 3

Stylised process flow of a DLT-based payment system

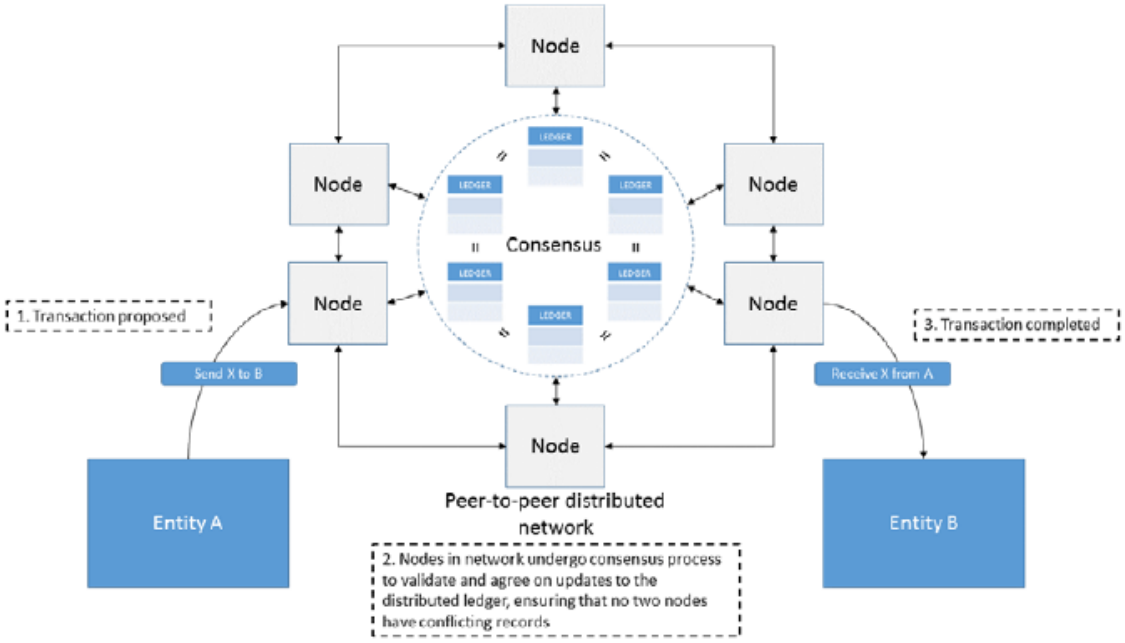
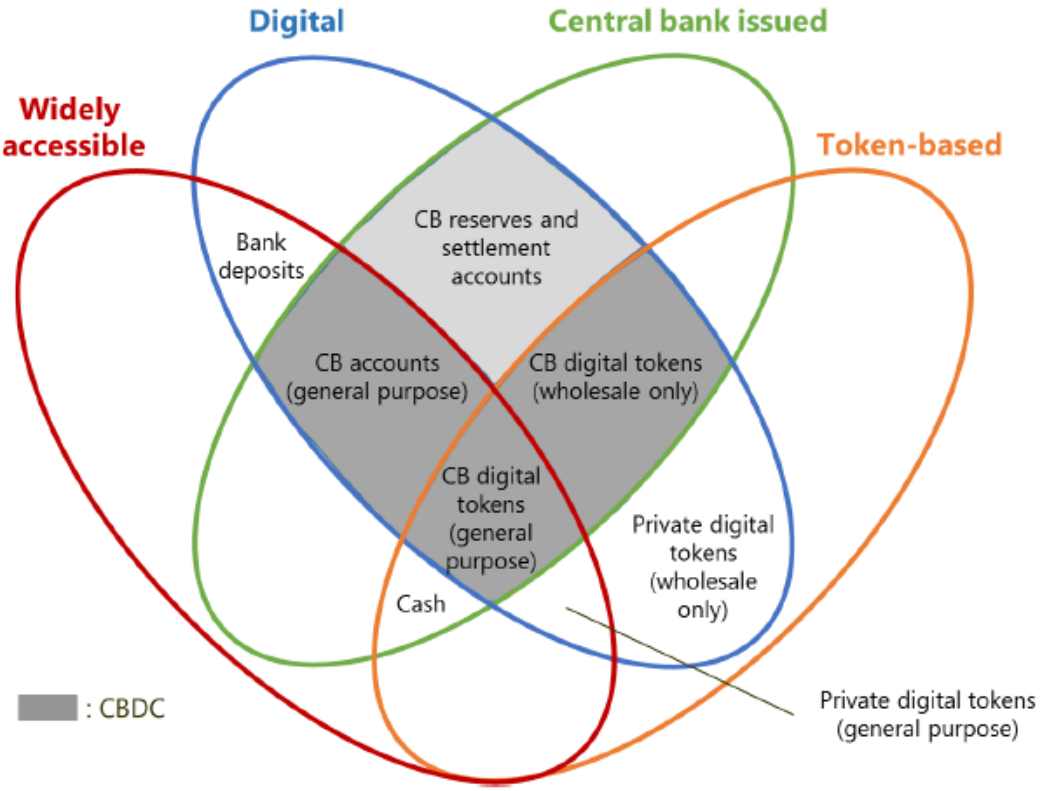


Figure 3 shows how payments will be processed in a DLT system. For example China imports oil from Russia, SINOPEC would make entry A to BOC (member of the peer-to-peer distributed network); on the Russian side VTB (also member of the DLT network) would receive this payment and credit it to Rosneft (entry B). The following two models show which digital currencies can be used.

4. Model 1: Central Bank Digital Currency (CBDC)

While at present all payments systems are anchored in central bank money, which was created at some point of time by a central bank. Commercial bank money is linked rigidly to central bank money as any commercial bank is licensed in a country with a central bank. Commercial banks have to deposit reserves with the central bank and can extend the money supply by a multiple, the so called money multiplier. Non-bank payment providers have to collect central bank money and deposit the float with the central bank. The following Graph 1, the 'money flower' illustrates the anchor function of central banks. The shaded areas are CBDC.

The money flower: a taxonomy of money Graph 1



Notes: The Venn-diagram illustrates the four key properties of money: *issuer* (central bank or not); *form* (digital or physical); *accessibility* (widely or restricted) and *technology* (account-based or token-based). *CB* = central bank, *CBDC* = central bank digital currency (excluding digital central bank money already available to monetary counterparties and some non-monetary counterparties). *Private digital tokens (general purpose)* include crypto-assets and currencies, such as bitcoin and ethereum. *Bank deposits* are not widely accessible in all jurisdictions. For examples of how other forms of money may fit in the diagram, please refer to the source.

Source: Based on Bech and Garratt (2017).

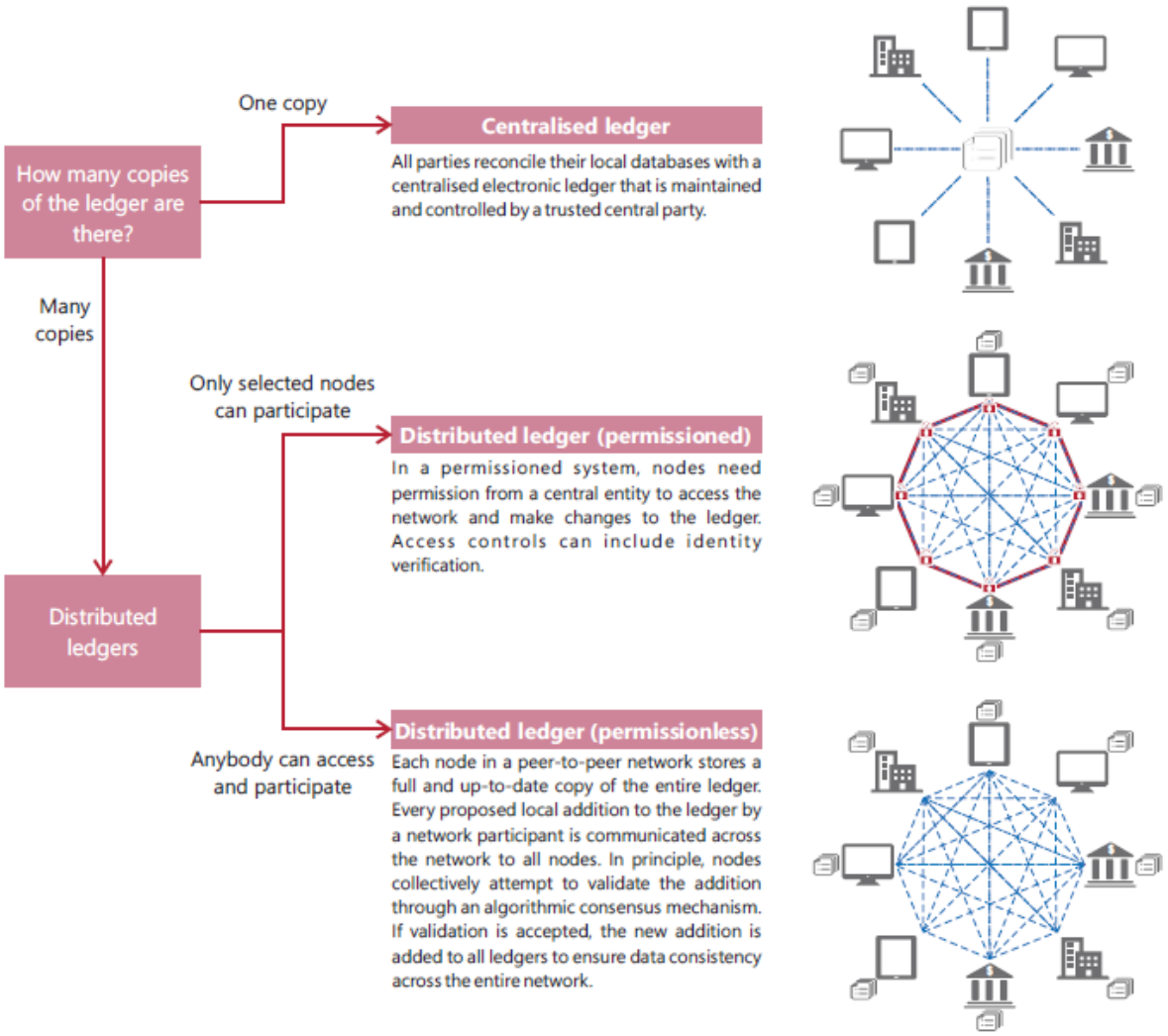
Digital currencies replacing cash do not exist presently. Those which call themselves peer-to-peer crypto currencies, such as Bitcoin and Ethereum are assets but not currencies as they do not fulfill the basic functions of money.

For the project suggested here, a national central bank has to provide the digital currency for wholesale and/or retail purposes. This could be any one of the BRICS countries but in view of the importance of China among these countries this would be the Peoples Bank of China (PBOC).

At the first stage there would be a centralized ledger for all 20 members at the PBOC, perhaps later a permissioned account if the DLT technology was adopted26.

26 BIS (2018): Annual Report 2018, Chapter V: Crypto currencies: looking beyond the hype, p 109. www.bis.org/publications

Centralised ledger and permissioned/permissionless decentralised ledgers Graph V.2



The PBOC would create the CBDC, similar to cash and distribute it to the participating 20 BRICS banks. Chinese banks would transfer RMB assets to the PBOC, not much different from the present mechanism. Foreign BRICS banks which do not have such RMB assets could transfer their national currencies to the PBOC swap account, receive RMB which will be deposited at the PBOC for Chinese W-CBDC. The swap account would receive BRICS currencies, BRL, RUB, INR, ZAR and provide RMB. The PBOC would take on the exchange rate risk, which would be the case in any swap agreement.

The key challenge is how to transfer CBDC to a distributed ledger. The currently most advanced projects, Jasper in Canada and Ubin in Singapore use a digital depository receipt (DRR) approach. A DDR is a claim on central bank reserves held in a segregated account against which the central bank issues digital tokens on the distributed ledger. In Jasper, the digital tokens – initially known as CADcoins20 – are created at the beginning of the day and redeemed at the end. In Ubin, banks acquire or redeem digital tokens at any point during the day and can keep them on the distributed ledger overnight. Hence, transfers on the DLT platform of the Singaporean proof of concept are

not restricted to the opening hours of MAS27.

The main issues which need to be addressed before the introduction of CBDC are the following: (i) anonymity; (ii) transfer mechanism; (iii) interest bearing or not; and (iv) limits or caps28. The later has bearings on the substitution between reserves and CBDC. These issues and the fallout for monetary and financial stability are intensively researched by central banks worldwide. A survey by the BIS finds that a wide variety of motivations is driving an increasing number of central banks to conduct conceptual research on CBDCs. However, only a few central banks have firm intentions to issue a CBDC within the next decade29.

In China, the PBOC are actively exploring the use of CBDC30. A law on cryptography has been passed recently. However, Governor Yi Gang poured cold water on prospects of an imminent launch of CBDC, saying the PBOC "did not have a timetable". The development of CBDC needs further "research, testing, trials, assessment and risk prevention". In particular, if the CBDC involves cross-border use, it will involve a series of regulatory issues, regarding AML, CFT, tax evasion as well as KYC31. In addition they have doubts about the robustness of blockchain for CBDC purposes.

As the issue of a Chinese W-CBDC is further down the road, a second possibility will be explored. In this case a number of commercial banks would issue their own digital currency for wholesale purposes only.

5. Model 2: A wholesale digital currency issued by commercial banks

While acknowledging the inadequacies of the present cross-border interbank clearing and settlement system, in 2015 a small consortium of commercial banks explored the need and potential for a tokenized settlement asset to complement the DLT and blockchain developments under way32.

They came up with a project called USC, or Utility Settlement Coin, to create a peer-to-peer digital cash asset to settle tokenized value transactions with finality. It must be available in multiple currencies and work across multiple business platforms. USC will be a digital representation, recorded on a private distributed ledger (DLT), of a claim…in or to central bank money held in a central bank account33. It thus deserves the title Stable Coin, as it is firmly anchored in central bank money and offers finality.

In May 2019, the consortium of members took the next step, investing in Fnality International34, whose aim is to deliver the USC promise. ..Fnality has 15 major global banks as shareholders, Banco Santander, BNY Mello, CIBC, Commerzbank, Credit Suisse, ING, KBG Group, Lloyds Banking Group, Mizuho, MUFG, Nasdaq, Sumitomo Mitsui Banking Corporation, and UBS35. The following transactions will be possible:

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27 Bech, Morten and Garrat, Rodney (2017): Central Bank Crypto currencies. In: BIS Review, September www.bis.org/publications

28 Committee of Payments and Markets Infrastructure (CPMI) and Markets Committee (MC) (2018): Central bank digital currencies, March www.bis.org/committees

29 Barontini, Christian and Holden Henry (2019): Proceeding with caution-a survey on central bank digital currencies. IN: BIS papers No 101, January www.bis.org/publications

30 Tommaso Mancini-Griffoli, Maria Soledad Martinez Peria, Itai Agur, Anil Ari, John Kiff, Adina Popescu (2018): Casting Light on Digital Currency. IMF SDN/18/08 www.imf.org

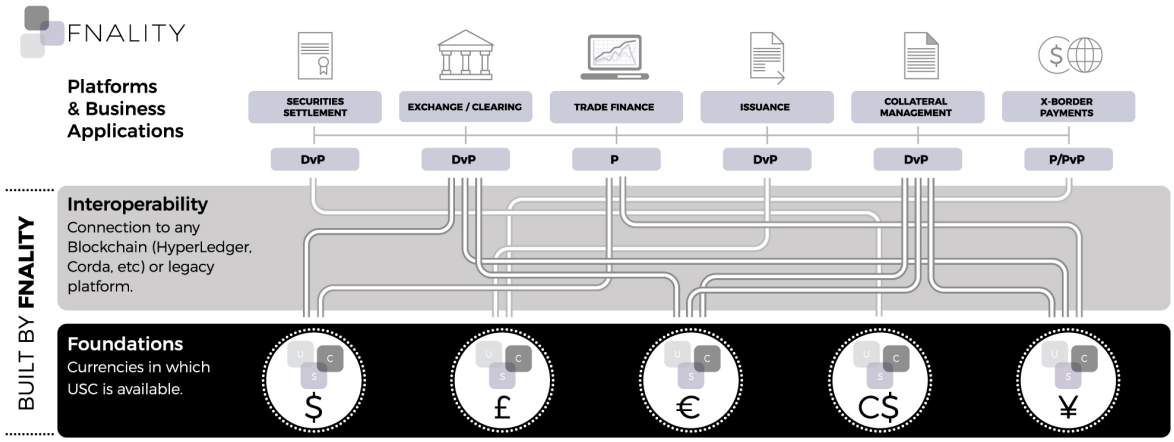
31 Governor Yi Gang quoted in South China Morning Post, 24 September 2019 www.scmp.com

32 Fnality (2019): The catalyst for true peer-to-peer financial markets, September www.fnality.com

33 Fnality (2019): ibid, p6.

34 Fnality was invited by the BIS to the summit of prospective private Digital Currency Providers, together with Libra/Calibra and JPM on 16 September 2019.

35 Fnality (2019): ibid, p6.



Source: Fnality 2019

The following are the underlying considerations: (i) the CPMI paper on W-CBDC for wholesale market (quoted here); (ii) the project by the BOE, BOC and MAS on "Cross-border Interbank Payments and Settlements" (quoted here); (iii) the Swiss Federal Government paper on things DLT; and (iv) IMF paper on digital money in July 2019 (quoted here) which introduces the concept of a synthetic central bank digital currency (sCBDC)36, where private institutions with access to central bank money create Stable Coins37.

To enable peer-to-peer markets to function effectively, central banks need to be comfortable to allow banks from outside their jurisdiction (such as BRICS banks for China) to hold the USC units overnight, ie as a store of value. This is not an end in itself, rather as an enable of settlement38. The goal is for USC to be used by all wholesale market participants as a medium of exchange. There will be some restrictions on which institutions can hold USC overnight and in what quantities; USC is intended to be a store of value only to support settlement.

Applying the same logic to the BRICS banks selected in section 3, each country's commercial banks would deposit a certain amount of local currency of BRICS countries with the relevant central banks. These would deposit this with a central bank, such as the PBOC or any other institution to be designated. The BRICS Interbank Association should decide over this institution, which could be called the BRICS Fund. This Fund would issue the equivalent amount of digital currency, called 'bricks'. There would be an agreement as to which value the 'bricks' would have in terms of a basket of currencies, similar to the SDR. Alternatively, countries can deposit the main currencies of the SDR basket and the Fund would issue 'bricks' backed by SDR39.

If China still wanted to respect the present financial infrastructure, a SDR based 'bricks' would be preferable. The share would be 41.73% for the USD, 30.93% for the EUR, 10.92% for the RMB, 8.33% for the JPY and 8.09% for the GBP. The total amount would be issued by the Fund against such deposits and allocated to countries according to their shares.

If China wanted to distance itself from present dominant currencies, ie get away from the USD, the other alternative could be adopted. Similarly to the SDR basket, countries would contribute according to their GDP weight, this would be the lion share of 67.6% for RMB, 14.0% for INR,

36 First mentioned in: IMF (2019): Stablecoins, CBDC and cross-border payments: a new look at the International Monetary System. Speech by Tobias Adrian at the IMF-Swiss National Bank Conference, May www.imf.org/speeches

37 Fnality (2019); ibid, p6/7.

38 Fnality (2019; ibid, p10.

39 Governor Zhou Xiaochuan suggested a greater international use of SDR in 2009.

8.8% for BRL, 7.9% for RUB and 1.7% for ZAR. Daily exchange rates of 'bricks' would be calculated. Commercial banks from these countries would be allocated the corresponding shares of 'bricks' issued, in proportion of their GDP sizes.

The amount of 'bricks' to be issued should be related to the volume of payments made among these countries, and could be modest at an initial experimental phase. This limit needs to be in place to stop 'bricks' becoming a store of value. The settlement between each other would take place on distributed ledgers with blockchain technology40. All transactions could be permission less, as there is no central authority. Any excess bricks could be deposited with participating central banks.

6. Conclusion

The proposed two models would be modest contributions to introducing digital currencies for the sole use of cross-border interbank clearing and settlement. The concerns about verification of AML, CFT, KYC and tax evasion would be addressed as participating banks are properly supervised by their respective supervisory authorities. Transactions in 'bricks' would be authorized and executed by them. This would be a China designed and operated cross-border payments infrastructure, first for BRICS countries41 and later for partner countries of the Belt and Road Initiative. Like this, China and its partner countries could wean themselves off an outdated USD based system, which needs to face the digital age in a reform of its own before long.

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40 President Xi Jinping recent propagated the use of blockchain technology.

41 The forthcoming BRICS summit in Basil could propose such an alternative clearing system.

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