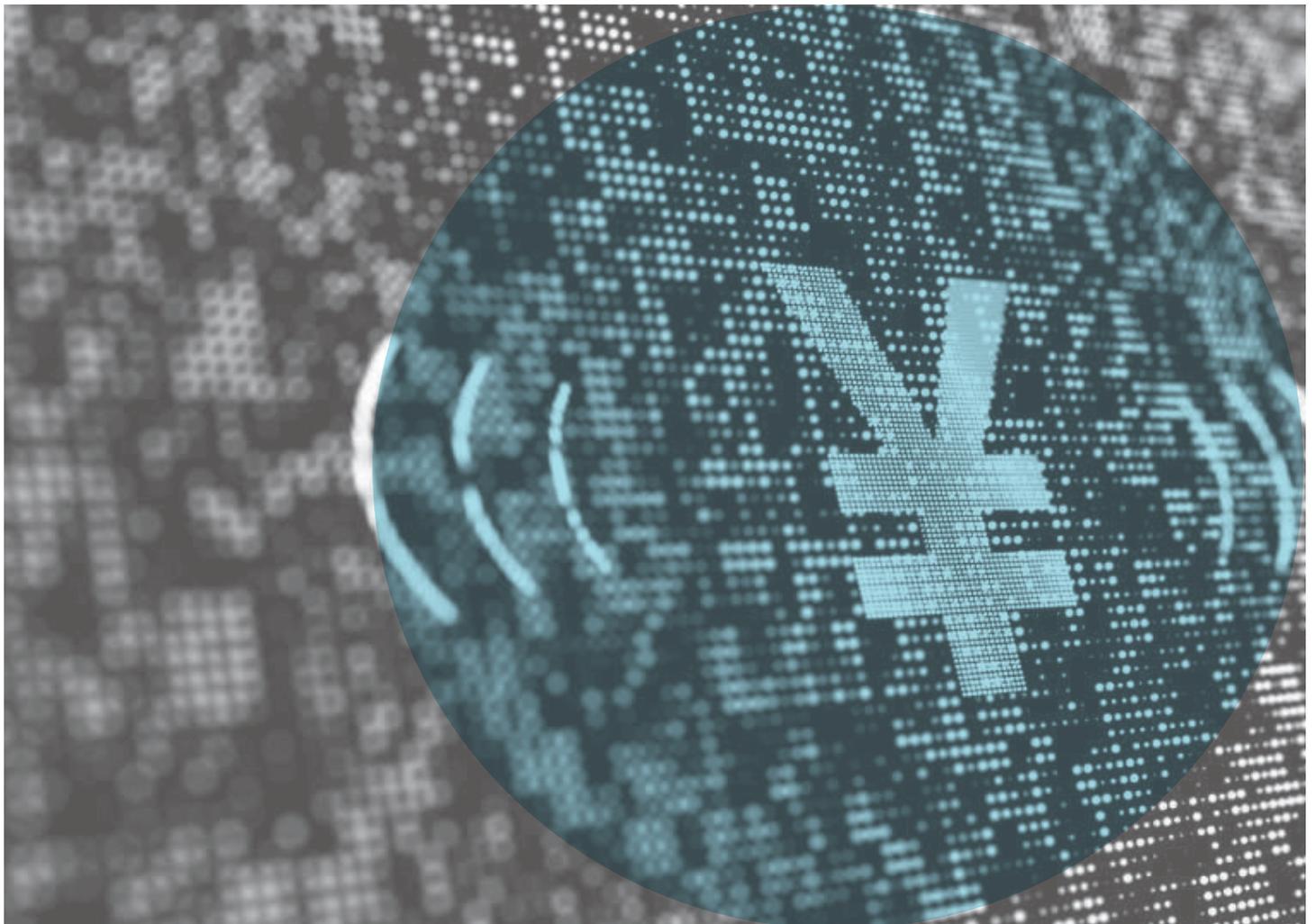


The digital Yuan and China's potential financial revolution:

A primer on Central Bank Digital Currencies (CBDCs)

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Foreword

China is leading the way among major economies in trialing a Central Bank Digital Currency (CBDC). Given China's technological ability and the speed of adoption of new payment methods by Chinese consumers, we should not be surprised if the CBDC takes off in a major way, displacing physical cash in the economy over the next few years. The power that this gives to the state is enormous, both in terms of law enforcement, and potentially, in improving economic management through avenues such as surveillance of the shadow banking system, fiscal tax raising power, and more efficient pass through of monetary policy. A CBDC has the potential to transform the efficacy of state involvement in economic management and widens the scope of potential state economic action.

This paper explains how a CBDC could operate domestically; specifically, the impact it could have on the Chinese economy and society. It also looks at the possible international implications for trade and geopolitics.

Introduction

The People's Bank of China (PBOC) has begun trials of its Central Bank Digital Currency (CBDC). The official name is the Digital Currency Electronic Payment system (DCEP). Unlike say, Bitcoin, which does not have legal standing as a currency, the digital Yuan is simply an electronic version of physical Yuan¹ cash. The introduction and development of a CBDC in China and elsewhere has the potential to transform or at least meaningfully change, the payment system, the financial system, the operation of monetary and fiscal policy, and alter dramatically the balance between the state and private sector economic agents. This paper aims to introduce the concept and some of the possible ramifications for the Chinese economy and society as well as the ramifications for trade and the international economy. It is worth pointing out that China is very much "feeling for pebbles while crossing the river" with its trial of CBDC, and its initial form and characteristics may well change before it is fully implemented and evolve thereafter. We should therefore consider not just the ramification of its present form but how it could be used with other design characteristics.

What is it and what could it become?

The digital Yuan is legal tender (unlike other cryptocurrencies) issued by the PBOC, who will have full transparency on every transaction in which it is used.

The digital Yuan will be legal tender in the same way as physical cash and holders will be able to meet, for example, tax liabilities using digital Yuan. It is therefore quite different from say, Bitcoin. Initially, the currency will operate on a “two-tier system”, with the PBOC distributing the currency to domestic commercial banks who will then pass it on to customers. Users of the currency will hold a digital wallet on their phones or electronic devices and be able to transact for goods and services by passing the electronic currency to one another. The records of each transaction will most likely be kept centrally by the PBOC.

Eventually CBDC could replace cash. This has enormous ramifications for policy and society.

There are a number of key features that need to be decided upon that will shape the nature of a CBDC in any jurisdiction: to whom is it available; the degree of anonymity; whether there will be peer-to-peer transferability or whether all transactions will go through the central bank; the degree to which CBDC replaces physical cash; and the limits placed on its issuance. These features in turn will determine its efficacy as a store of value and as a payment system, the shape and the stability of the financial system and the impact the CBDC has on meeting state objectives for monetary and fiscal policy.

It is also important to note that in China digital money already exists in the form of bank reserves at the PBOC and household and corporate deposits at banks which are far larger than cash in circulation. The characteristics built into the design of the CBDC will determine how different, or not, it will be from existing forms of money or near money.

Longer term, the CBDC has the potential to replace cash entirely. It should be stated upfront that, for now digital Yuan will circulate alongside physical Yuan, but longer term the abolition of physical cash would widen the scope of benefits (and potential costs) from digitalization. Given how fast Chinese consumers have adopted mobile payments systems, we should not be surprised if CBDC has replaced a large portion of the physical cash economy within a few years. Digital wallets, in time, could also obviate some of the need for electronic payment systems such as Alipay. In fact, the adoption of CBDC, assuming cash is still an alternative, will depend to a large extent on CBDC providing cash-like security characteristics, but with enhanced convenience and/or lower costs to the user, over and above existing payment systems. The official name for the digital currency is in fact “Digital Currency Electronic Payment”.

CBDC has ramifications for monetary policy, the fiscal system, the banking system and state power. It has the potential to be transformative.

The transparency produced to the PBOC, and therefore one assumes the Party-State generally, by the use of CBDC could produce some key advantages to the state: improved efficacy and scope of stabilization policy; greater tax raising powers to close the “tax-gap”; greater control of the financial system to obviate systemic risk and greater seigniorage from currency issuance. Furthermore, if the efficiency enhancements of CBDC are as substantial as it seems they might turn out to be, China’s first mover advantage among the major economies of the world could further enhance the use of RMB in international transactions which could in

turn accelerate the Yuan's use as a reserve currency. This could have far reaching geopolitical consequences as it would enable, among other things, countries and companies to bypass the SWIFT system rendering economic sanctions harder to implement. If this is the trajectory, then it would be no exaggeration to say that the transition to CBDC has the potential to be an epoch defining event.

The efficacy and scope of stabilization policy

In recent years, particularly since the Global Financial Crisis (GFC), monetary policy has appeared to have had a more limited impact on economic growth than expected. High levels of national indebtedness have limited governments' willingness to run large fiscal deficits and central banks have had to resort to unconventional tools to try to engender money supply growth and to stave off deflation. The rise of digital currency, and eventually the replacement of physical cash, has the potential to improve the efficiency and widen the scope of stabilization policy.

CBDC potentially removes the lower bound from interest rates and could improve the transmission mechanism by which policy rates impact market rates.

On the monetary side, a key constraint on monetary policy has been the inability to apply negative interest rates. While physical cash exists, it is a potential substitute for bank deposits. If a commercial bank were to charge negative rates of interest on its deposit, depositors could flee to physical cash. Hence, even where central banks have charged negative rates of interest on commercial bank reserves at the central bank (an already existent form of central bank digital money but one only available to commercial banks), the negative rates have seldom been passed onto depositors at commercial banks. If CBDC and digital wallets were to replace physical cash entirely, then negative interest rates become a very real policy instrument to stimulate spending and discourage saving through "currency hoarding".

The ability to charge a negative rate of interest on cash holdings changes the very nature of money. Digital cash will no longer necessarily provide a risk-free means of transitioning nominal purchasing power from one time period to another and hence currency digitalization could have a profound impact on savings and spending behavior. Conversely, if CBDC were positively remunerated, it could act as a substitute asset for other low risk short-term investments such as government debt and bank deposits particularly at times of stress. This in turn, could prove very disruptive to the banking and financial system. However, it could also improve the pass-through mechanism for interest rates between policy rates and market interest rates, if the CBDC were to earn a return equivalent to or in proportion to the policy rates.

The provision of real-time economic data could significantly help with stabilization policy and economic management.

The second impact on stabilization policy comes through the greater transparency that CBDC gives and information that this provides. For example, the velocity of circulation of money could be accurately measured in real time, regional variations and demographic variations will become transparent and therefore stimulus could be targeted more effectively to generate desired outcomes. Combined with progress in artificial intelligence and big data, CBDC could facilitate accurate predictive modeling of economic behavior to a degree that simply does not exist presently because of a lack of information.

Transparency could also help policy makers target fiscal policy more effectively to meet policy goals.

On the fiscal expenditure side, CBDC could allow governments to target spending and put purchasing power into selected wallets with greater efficiency. Since digital wallets will be linked through a digital identification to a legal person or

entity, if say the government policy was to provide a fiscal transfer to people in a certain income bracket, the identification of those entitled to the benefit could be automatically obtained through the spending and income records pertaining to the CBDC. Expenditure could be targeted with great efficiency to meet whatever social or economic goal the policy was aimed at achieving.

China's fiscal system and taxation

China's decentralized fiscal expenditure coupled with centralized tax raising has been a source of inefficiency and political tension between Beijing and the provinces. CBDC could help change this.

Commentators on China often describe the system as “centralized”. In the case of fiscal expenditure, this is incorrect: China is among the most decentralized countries in the world. According to the Asian Development Bank (ADB), about 85% of state expenditure takes place at the subnational government level². Taxes on the other hand are largely raised by the central government. Although the tax take has risen as a percentage of GDP over time, in 2016 it was estimated at only 21% of GDP. Centrally raised revenue is then distributed to local governments for expenditure. This system of intergovernmental transfer between the center and the regions inevitably leads to tension. The power to raise revenue is centralized; the responsibility for spending it and fulfilling the state's obligations to the people is decentralized. Recent and proposed tax reforms have had the aim of decentralizing limited tax raising powers to give local government more control and responsibility for tax raising. The low tax take relative to GDP, together with the centralized nature of tax raising powers mean that local governments have become very dependent on selling land to raise revenue to finance expenditure, making local government funding subject to the vagaries of the property market. Furthermore, local governments have resorted to large off-balance sheet borrowings to finance investment in local infrastructure, which have proven hard to monitor and have been a source of corruption in the past.

The greater efficiency and ease with which taxes could be raised in an environment where every transaction is automatically known to the authorities suggests that it would be easier to decentralize tax raising powers to the regions. The location and identity of digital wallets would be known, potentially, to the fiscal authorities and the appropriate tax liability stemming from any transaction could be levied in real time.

China's tax system is heavily reliant on indirect taxes that are hard to collect, resulting in a “tax-gap”.

A further trait of the Chinese fiscal system is that it is consumption tax heavy with Goods and Services taxes (GST) accounting for about 55% of total taxation. GST include consumption tax and VAT. In a cash economy, the scope for tax avoidance is obvious. The rapid growth of the digital economy has also posed collection problems. Estimates of compliance with Chinese VAT laws for example, put the tax gap – the difference between collections and legal liabilities – at a huge 40% in 2000, which had fallen to 25% by 2010. The rise in online shopping though might have reversed this progress with the OECD estimating that perhaps 55% of VAT in China is not accounted for properly.

This not just a Chinese problem.

This is not just a problem for the Chinese tax authorities. The American Internal Revenue Service (IRS) estimate that voluntary compliance with federal tax laws ran at about 84% in 2011-2013, with enforcement adding another 2% or so to collections. This means US entities and citizens are under-paying tax by about USD440 billion. In the UK the “tax-gap” has been estimated at about 5% of liabilities (i.e. 95% compliance). Furthermore, the growth in the online economy has posed significant tax issues with accusations leveled against online retailers such as Amazon that they are not paying “their fair share” of taxes due.

CBDC has the potential to close the tax gap, allowing significantly higher rates of tax collection and thus enhance the power of the state.

The introduction of a CBDC in China has the potential to close the tax gap very meaningfully. The reduction in use of physical cash will help bring part of the “black economy” into the measured (and taxable) economy. More importantly however, the traceability of transactions through digital transfers of money from one electronic wallet to another will provide an indisputable record of how money has circulated in the economy. With time, tax raising can take place in real-time with the proportion of revenue, profit or income that is due in tax, being deducted directly from the relevant digital wallet following a transaction. The efficiency gains of such a system of taxation would clearly be enormous. If one of the key limitations on the state's ability to tax in the past has been a reliance on voluntary compliance, then such a limitation would not necessarily exist in the world of a digital central bank currency.

China and credit and the banking system

CBDC could have far reaching consequences for the banking system.

If CBDC is distributed through banks as is currently planned, the removal of the zero bound could restore profitability in a low interest rate environment.

Depending on whether banks have access to transaction history, credit related information could either be enhanced or diminished very substantially.

If the PBOC eventually allows individuals and companies to obtain CBDC directly from it, the banking system could be bypassed and banks will converge with non-bank institutions in their business model.

The introduction of CBDC could have far reaching consequences for the banking system and credit allocation. The nature of these consequences will depend on how digitalization progresses, but it is worth considering some scenarios. As things currently stand, the PBOC will use commercial banks to distribute CBDC, thus having them compete to issue digital wallets and the banks will therefore stay in the information loop vis-à-vis their customers transactions.

The banking system has come under increasing pressure in China, and indeed elsewhere, as low nominal lending rates have compressed margins. Deposit rates have been negative in real terms and in many places have been stuck at zero in nominal terms with no space to fall without causing customers to switch from deposits to cash. The elimination of the zero bound on deposit rates, assuming physical cash were removed as an option, could restore bank profitability. Such a move could alleviate another problem which has been the unwillingness of market driven banking systems to lend in an uncertain and unprofitable environment. This in turn has caused very lackluster growth in money supply which has further increased downward pressure on inflation and interest rates. Money supply growth has come largely from the expansion of narrow money by central banks in the post-GFC period rather than from broad money as a result of commercial bank lending activity.

A second possible ramification comes from the ready availability of credit related information that a digital ledger of transactions will provide to the financial system. The transparency of digital transactions, should commercial banks have complete access to the records, mean that credit assessment by machines based off big data could dramatically improve credit quality. Alternatively, if the transaction records were to remain at the central bank, and lenders did not have access to them, the use of CBDC at the expense of bank deposit-based debit and credit cards, would deny lenders access to the information they need for rational credit assessment.

A third possible implication of CBDC, however, would be the disintermediation of the commercial banking system with a convergence between banks and non-deposit taking financial institutions as the concept of bank deposits becomes obsolete. The rationale here is that if a digital wallet is as safe as a bank deposit and the technicalities of making a payment are easier from a digital wallet than say a debit card, which is the closest thing to CBDC at present, then why bother with a bank account? The removal of a large part of bank funding which is essentially free (or low cost) to the banks could severely damage profitability and at least in the short term increase systemic financial risk. The Chinese CBDC as of now will operate through the banks but in the future CBDC could operate directly through companies and individuals if these economic agents are allowed to hold accounts directly with the central bank. Hence the payments system would largely bypass commercial banks.

Seigniorage

CBDC has the potential to enhance seigniorage for the central bank and to capture seigniorage from the commercial banking system.

Seigniorage is usually thought of as the difference between the face value of currency and the cost of producing it. In the case of paper or coin currency, the seigniorage is high, but with digital currency it will be higher still as the costs are negligible. In a fractional banking system, where commercial banks create deposits through lending, and deposits are as good as cash and therefore constitute near-money, considerable seigniorage accrues not to the state that issues coins and notes but to commercial banks. The bank deposits are largely interest-free and the banks can create them, while the loans attract interest payments.

While China's banking system is largely state-owned, and therefore seigniorage accruing to banks also accrues to the state, this is obviously not necessarily true elsewhere. A consequence for China of allowing individuals and companies to bank directly with the PBOC would be the greater control over money creation and with it, the enhanced ease with which fiscal deficits could be funded through money issuance, subject of course to the constraints of inflation and user confidence in the currency. Combined with real-time information on the consequences of monetary expansion, CBDC may enable China to maximize the domestic seigniorage from the monopoly of currency issuance.

International and trade ramifications

National power springs from many sources: population size, technological advancement, economic and industrial prowess and military strength are among the most obvious factors that have at different times contributed to the rise of a power to regional or global hegemony. Soft power too has, and is, playing a major role while dominance of the cyber sphere has added a new dimension to national rivalry. Financial sophistication is often over-looked, but has more often than not been a crucial factor; in particular, the ability to raise taxes, borrow money and extract seigniorage.

Monetary systems, financial innovation and global power have often gone hand in hand.

Consider for example, the discovery of silver at the Potosi mines in Bolivia in 1545. The huge quantities of silver discovered in the New World combined with technological advances in the process of extracting the metal played a crucial role in the struggle of Hapsburg Spain for European dominance. The purchasing power that silver imports provided to Spain helped finance its wars in continental Europe, but the ubiquity of silver coinage was also the birthing partner of global trade in the modern age. The financial revolution of late seventeenth and early eighteenth-century England helped facilitate its rise to European great power status and ultimately to global hegemony. More recently, the prevalence of the US Dollar in international trade and investment transactions has bestowed upon the United States, at least in some people's eyes an "exorbitant privilege" in the management of its economy and the Dollar standard as come to be perceived as both a consequence and reinforcement of American suzerainty.

China's economic success gives it considerable global clout and its urban population have proved rapid adopters of new technology.

Viewed from this perspective the current trials of the digital Yuan take on a potentially greater degree of importance than has perhaps been widely discussed. Few would argue that the rapid growth in China's economy since economic reforms began in 1978 and especially since WTO accession in 2001, has resulted in it acquiring significant global clout. As the second largest economy, the largest trading nation, and the manufacturing powerhouse of the world, China is the most important economic partner in terms of trade to over 120 nations. Furthermore, in terms of financial technology, China is arguably the global leader. The Chinese people have been very rapid adopters of electronic payments, apparently untroubled by the uncertainties of "the new". In 2019, about 580 million people in China used mobile payment methods in about 530 billion transactions with a total value of about USD60 trillion. These are staggering numbers, with transactions ranging from the mundane purchases of everyday life to merchant-to-merchant trade.

Additionally, China's economy has been heavily financialized during the course of its economic rise. Chinese money stock measured by M2 is the largest in the world at current exchange rates.

In addition, China's financial system – both formal and shadow – have grown spectacularly; far faster than the real economy. Chinese money stock is now larger than that of the United States when measured in terms of M2. As at the end of 2019, China's M2 stood at the equivalent of USD28 trillion versus USD16 trillion in the United States. Yet despite all of the above, China remains very much entangled in the Dollar Standard. Foreign exchange reserves remain the

overwhelming asset on the PBOC's balance sheet and these continue to be dominated by Dollars despite some diversification.

With this in mind, what is the potential for the digital Yuan to supplant or at least challenge the US Dollar as the global reserve currency? What are the possible implications of such a challenge for the geopolitics of the Asia region and beyond? And what might it mean for the global trading system, prosperity and security?

The RMB faces several obstacles to gaining widespread acceptance as a reserve currency.

The first and perhaps obvious point to make is that for a currency to gain reserve currency status, in a de facto sense rather than by acclamation by the International Monetary Fund (IMF) through inclusion in the Special Drawing Right (SDR), it must be available. Deep and liquid capital markets in America, an absence of capital controls and America's past willingness to run current account deficits have allowed Dollars to spread across the world in the same way that Latin American silver found its way across the Pacific to China and across the Atlantic to Europe and through the Eurasian land mass to India and beyond. China's capital controls, a mercantilist approach to foreign reserves or other foreign asset accumulation (such as SOE overseas investment) and the relatively closed and retarded nature of its capital markets present perhaps insurmountable barriers to displacing the US Dollar as things currently stand. However, if the prize is deemed big enough, China could try to dismantle these obstacles. The challenge for China's leaders is the question of whether the free flow of accurate information and rational self-interested behavior by market participants is compatible with the broader nature of a CPC-led China and its political-economic structure.

If digitalization improves transactional efficiency, that could be a driver of RMB internationalization.

Perhaps, though, it is not a case of "all or nothing". The RMB could after all be further internationalized without displacing the Dollar entirely or even substantially. While trust in the issuer of currency is fundamental to its success and use, particularly as a store of value, it is less true as a means of payment where the parties (or one of the parties) do not intend to hold the currency for any length of time. When it comes to transactional demand for currency, efficiency is a key variable, but when it comes to savings demand for currency trust in its future value is the crucial factor variable.

Circumventing SWIFT will provide appeal to some counterparties.

In addition, different parties have very different levels of trust if it comes to choosing between transacting in RMB or USD. Russia, Iran and other countries subject to US sanctions have been keen to obviate the SWIFT network for many years and there could well be ramifications for things such as nuclear proliferation as a result of a transfer system being developed that is beyond international scrutiny. Nor need the digital Yuan's appeal be limited to pariah states. If the digital Yuan and its payments system were to provide increased efficiency, faster settlement and lower transaction costs with clearing through a central bank potentially with payment guarantees, it could be the case that it outcompetes the incumbent system of international payments and its associated instruction network.

China's BRI projects and Chinese tourist spending could provide the perfect platform for the introduction of digital Yuan to Eurasian economies.

China's Belt and Road Initiative (BRI) projects may provide the perfect testing ground for the internationalization of the digital Yuan. With so many state companies involved in supplying materials, undertaking construction and financing the development of infrastructure, not to mention Chinese workers living and spending money along the new silk road, the potential to create a

digital Yuan economic system associated with BRI is clear. The result, especially in countries whose domestic currencies have limited credibility, could be the beginnings of Yuan-bloc. Furthermore, the cost-benefits of Chinese tourists using digital Yuan when overseas on holiday, may well encourage vendors in other countries to accept the digital Yuan as a means of payment.

Efficiency could enhance trade;
bifurcation could impede it.

The impact on global trade in totality is perhaps ambiguous. Competition in the international payment infrastructure could well lead to rapid innovation and efficiency improvement. This in turn could reduce the impact of national borders in limiting the trade in goods and services, eliminating uncertainty in payments and facilitating greater exchange. Equally, bifurcation of standards, particularly if parallel systems develop which are not cross-compatible, could lead to inefficiency. The impact could be to divide the world into spheres of influence demarcated by currency usage, limiting the welfare gains from trade.

Conclusions

China is leading the way among major economies in trialing a CBDC. Given China's technological ability and the proven speed of adoption of new payment methods by Chinese consumers, we should not be surprised if the CBDC takes off in a major way, displacing physical cash in the economy over the next few years. The power that this potentially gives to the state is enormous, both in terms of law enforcement and in improving economic management through avenues such as surveillance of the shadow banking system, fiscal tax raising power, and more efficient pass through of monetary policy including removing the lower bound constraint from interest rate policy. CBDC has the potential to transform the efficacy of state involvement in economic management and widens the scope of potential state economic action. Private sector economic agents could stand to benefit from real time information provision.

There are of course risks, not least is the potential vulnerability of the technology. Assuming the platform is robust however, the key risk is the unintended consequences of disturbing the financial system. China's decision to operate through commercial banks and the fact that the formal financial system is dominated by state-owned institutions anyway, significantly reduce these risks for China. The efficiency gains from a cheap and quick settlements system have the potential to provide an economic uplift at a time when the economy faces secular forces causing stagnation, but the "cost" is the loss of individual anonymity and greater control being passed to the state. These costs of course are in the eye of the beholder.

At the international level, the digitalization of the Yuan has the potential to accelerate the use of the Chinese currency in international transactions, if the payment system out-competes the existing infrastructure. The BRI and Chinese tourists traveling around the region provides the perfect opportunity for China to push the digital Yuan into neighboring countries. The circumvention of SWIFT will appeal to those seeking to avoid scrutiny by the OECD and could limit the efficacy of economic sanctions against security threats. In many ways, a competing international currency will serve to highlight the arrival of a bipolar world and could accelerate the decoupling that is already underway.

Researcher bio: Stewart Paterson

Stewart Paterson is a Research Fellow at the Hinrich Foundation and the author of “China, Trade and Power: Why the West’s Economic Engagement Has Failed”. Paterson has been following the Chinese economy since 1991. After a stint in London and Mumbai, he lived in Hong Kong from 1998 to 2007 working firstly for CLSA as Head of Global Emerging Market Strategy and then for Credit Suisse, as Managing Director and Head of Asia-Pacific Strategy. He then moved to Singapore in 2007 to co-found the eponymous Riley Paterson investment Management. He now lives and works in the UK. He holds a Master’s degree in Economics from the University of Aberdeen.



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Endnotes

1. In this paper, the term Yuan, Renminbi and RMB will be used interchangeably to mean the legal tender of the People's Republic of China.
2. ADB: The Governance Brief issue 34 2019

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