Technology and Monetary Sovereignty: Understanding Motivations for Central Bank Digital Currencies

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Abstract: Central bank digital currency (CBDC) projects have advanced the furthest in small or developing economies. In contrast, central banks in wealthy countries where technologies that fuelled this trend developed are holding back on such plans. What explains this divergence? I argue that CBDCs are attractive to states which see them as useful to increase and reinforce sovereignty over economic territory. They have thus been adopted in states with high currency substitution, large informal economies, or limited reach of the banking system. For similar reasons, wealthier states see less need for CBDCs. This paper contributes to understanding the impacts of digital money on the spatial dynamics of monetary politics.

Keywords: digital currency, monetary sovereignty, deterritorialization, technology

Why have small or emerging economies been the first to launch central bank digital currency (CBDC) projects rather than developed countries at the technological frontier? All fully launched CBDCs are in low-income or Caribbean island countries, while despite extensive studies and tests, central banks in developed countries remain cautious and some have already ruled out launching CBDCs in the near future. This is puzzling given earlier predictions that digital currencies would take off in countries at the technological frontier, that lower-income states would be helpless as digital currencies eroded their monetary sovereignty, and even developed countries would face challenges. This was also expected to be part of a wider deterritorialization of the global economy through digital commerce. Explaining why these predictions were inaccurate is important for a better understanding of the limits and possibilities of new monetary technologies to impact international monetary politics.

I argue that CBDCs are most attractive to states that see them as important tools to increase sovereignty over their economic territory. Thus, the early adopters tend to be states that have high circulation of foreign currencies, large informal economies, or limited reach of the banking system. In contrast, central banks in wealthy countries generally see less immediate need for CBDCs because they tend to be satisfied with the level of internal monetary sovereignty they already have. However, some states with low concerns about internal sovereignty may still be concerned about the external sovereignty implications of currencies used in international transactions. To systematize these insights, I develop a typology of states that are likely to be proactive, reactive, or reserved towards launching CBDCs, and analyze the factors that make states more likely to fit or move between these categories.

Typically envisioned as a digital form of cash, the Bank for International Settlements (BIS) defines a CBDC as "a digital payment instrument denominated in the national unit of account, which is a direct liability of the central bank" (BIS, 2022). Alternatively, CBDCs can be described as public digital currency, a counterpart to private digital currencies (like Bitcoin). Furthermore, this definition distinguishes CBDCs from accounts held at the central bank by commercial banks, which are digital liabilities of the central bank but not normally used as payment instruments. It also distinguishes CBDC from existing digital payment instruments like credit and debit cards which involve liabilities of commercial banks denominated in the official currency.

Two important features of CBDCs are highlighted by the lines drawn by this definition. Firstly, it shows that while CBDCs have a distinct niche in the monetary system, it is not a radically new one and overlaps with existing forms of money. Secondly, it highlights that everyday use for payments is a crucial factor in competition between different currencies and forms of money. CBDCs primarily address the medium of exchange function of money, with a secondary impact on the unit of account and store of value functions. Thus, driven by the research problem of understanding the political economic dimensions of state-backed digital currencies, I apply a slightly different scope in this study. I exclude "wholesale" CBDCs not intended for use by the general public, which are equivalent to existing systems for interbank settlement and have hence "existed for decades" (Panetta, 2022: 2). At the same time, I include digital payment instruments intended for public use where the central bank created and administers the system but is not directly liability for funds within it. Some analysts call these "quasi-CBDCs" (Dakila,

2022: 154). These projects clearly serve similar purposes and functions and should thus be understood as part of the same phenomenon of CBDC projects.

This article contributes to understanding the impacts of digital money on the spatial dynamics of monetary politics, as well as how states are adapting and defending their monetary sovereignty in the context of the digitalization of money. The impact of digital currencies has been limited and has not led to the decline of state money as earlier literature suggested. However, the impacts vary between states. Some states face the prospect of competition between their official currencies and those of other states, as well as private digital currencies, within their territory. For other states, CBDCs raise concerns and opportunities in regard to competition against the currencies of other states to be used for international transactions outside of their territory. Analyzing different policymakers' perceptions and structural factors behind CBDC stances in different countries helps understand how digital currencies are seen as helping states to reinforce and adapt monetary sovereignty.

The puzzle and argument

Earlier studies of digital currencies suggested they had the potential to deterritorialize and privatize money, thus upending monetary sovereignty. Cohen (2004: 197–198) predicted that digital money would impact the monetary sovereignty of Europe, Japan, and the US first, because of their high penetration of digital technologies and internet use. Electronic money and commerce were expected to be especially difficult to regulate because capital mobility would allow the use of external jurisdictions to circumvent state efforts at regulation. Central banks would face an "oligopolistic struggle" as substitute currencies emerged to challenge the dominance of state-

issued money, and this would profoundly impact countries where "currency substitution is already a familiar and accepted fact of life" (Cohen, 2004: 195–196). Digital currencies would thus exacerbate the deterritorialization and loss of autonomy faced by emerging economies, while bringing this reality to high-income countries. A similar prediction was that digital commerce and the growth of cyberspace would mean the "irrelevance of geographic jurisdiction in a digital world economy" (Kobrin, 1997). This narrative would be echoed by libertarian advocates of Bitcoin a decade later.

However, digital currencies have not had the impact of deterritorializing money that these predictions expected, and they have yet to seriously challenge or compete with the official currencies of the most technologically advanced economies. This is striking because the associated predictions of globally connected markets allowing individuals unprecedented access to retailers across the world have indeed come true. UNCTAD (2021: 5) estimates that e-commerce in 2019 had a value of $26.7 trillion, close to the GDP of the United States, so by any measure the world of electronic money and commerce is already here. Moreover, cryptocurrencies represent a serious and deliberate attempt to challenge state monetary sovereignty. Bitcoin is widely available, was designed with the aim of avoiding state authority, and indeed is often used to hide the profits from illicit activities (Campbell-Verduyn, 2018). Hence, while arguments about digitalization and deterritorialization usefully frame the issue, the politics around monetary sovereignty sparked by new digital currencies has turned out differently than they anticipated. The ability of states to adaptively enact sovereignty in the face of changing situations has defied predictions of their disappearing relevance made during the early growth of a global digitized economy.

In this paper, I theorize that internal and external monetary sovereignty concerns are behind decisions to launch CBDCs. Both the extent of these concerns, and the balance between internal and external concerns, influence decisions to take *reserved*, *proactive*, or *reactive* stances. In the following section I examine the concept of monetary sovereignty and how existing literature understands state motivations and actions faced with the latest wave of digital currencies. I then develop a typology categorizing states based on the extent of their concerns about internal and external monetary sovereignty. Sovereignty concerns, in turn, depend on subjective perceptions of policymakers and structural macroeconomic factors shaping the country's global economic position. In the empirical section, I then analyze decisions about CBDC implementation and outcomes to date. This qualitative analysis is based on available data on payments and currency usage patterns, official reports, and public statements by central bank officials. Monetary sovereignty concerns are explicitly mentioned by some officials, but are also evident in what officials identify as problems that CBDCs might help solve. These include currency substitution, improving payments systems, and constraints on foreign policy influence and autonomy.

Sovereignty and digital money

Why are states concerned about digital currencies and why do some seek to launch state-backed versions? I argue that this is because of the implications policymakers perceive digital currencies to have for monetary sovereignty. Monetary sovereignty is "the state's ability to use its tools for monetary governance to achieve its economic objectives" (Murau and van 't Klooster, 2022: 10). This includes but goes beyond the established concept of monetary sovereignty as the ability of states to maintain territorial currencies, that is, to issue their own money and prevent

currency substitution (the widespread use of foreign or private currencies) within their territory (Helleiner, 2003). Focusing on state capacity for monetary governance takes into account how states are situated differently in the global hierarchy of money, which depends on where and for what its currency can be used. Some currencies are used beyond a state's borders for a wide range of purposes, while others struggle to gain acceptance even within their own territory (Cohen, 2004: 14–16). States thus enjoy different levels of monetary sovereignty even if they issue their own money, which may compete with and be substituted by other currencies higher in the hierarchy. Conversely, joining a monetary union and thus ceasing to issue its own sovereign currency may actually increase a state's influence in the global monetary system (Murau and van 't Klooster, 2022: 8–9).

Thus, monetary sovereignty is intimately connected to the practical use of money in the everyday economy. This is linked to sovereignty because it is part of the governmental strategies states adopt towards populations that seek to enhance economic output, public health, security, and other desired goals (Bartelson, 2014: 82). This accords with current concepts of sovereignty as a "particular kind of idealized agency" that states pursue even if it "remains ultimately unrealisable" (Epstein et al., 2018: 788). States are thus highly concerned with using political power to shape patterns of action around money within their territories, and a state's capacity to do this increases its monetary sovereignty in a self-reinforcing way.

Monetary policy autonomy, conventionally understood, hence depends on the dominant usage of the state's currency in its domestic economy and is also compromised by currency substitution. A central bank seeks to dampen or stimulate economic activity within its territory by adjusting the supply of the money it issues. But these policy moves have less effect if people in

that space are not predominantly using that currency, especially in everyday life as a claim on labour (wages) and output (goods and services). The use and acceptance of a currency also affects the issuing state's fiscal capacity, since a government able to borrow in its own currency can sustain greater spending than one that must borrow in foreign currencies. Private actors also play a role: economic output and growth can be fuelled by firms and citizens borrowing in foreign currencies to fund investment and consumption. This also exposes the country to a debt crisis if a sudden stop occurs, which could be due to exogeneous factors like the Federal Reserve raising interest rates in response to inflation in the US.

The monetary practices of people and firms within a state's territory are hence at least as important for a state's monetary sovereignty as the legal power to issue currency. Seen in this way, state efforts to achieve "territorially exclusive and homogeneous currency" (Helleiner, 2003: 1) serve to both exercise monetary governance within that state's territory, and to maintain or increase that capacity. Historically, the one-nation-one-currency norm has been the default since the nineteenth century, a change from the cosmopolitan circulation of money issued by various governments and firms. This outcome was the result of states' efforts to construct national markets and change the territorial configurations of transaction costs, which were reduced for economic activity within a state territory and increased for exchange taking place across a border (Helleiner, 2003: 3). By structuring and influencing economic activity to conform with territorial borders, official currencies help constitute those state boundaries. This is another way that currency substitution can reduce monetary sovereignty even when a state maintains the legal power to issue currency.

Money is also connected to a state's ongoing symbolic performance of sovereignty. Using a currency implies acceptance of its socially constructed value, and therefore of the issuing entity's political legitimacy to establish social facts (Bourdieu, 1991). This is a relationship that policymakers themselves have historically recognized and used as a basis for action. Central bankers refer directly to safeguarding public trust, which they see as intrinsically linked to acceptance of the official currency (Braun, 2016). Newly independent states pursued national currencies in the belief they helped to construct national identity through the circulation of national imagery on notes and coins (Helleiner, 2003). It was a key reason the Baltic States established their own currencies to create distance from Russia after the breakup of the Soviet Union, despite the International Monetary Fund warning it could be economically detrimental (Abdelal, 2001: 5). State-issued, territorially dominant currencies thus contribute to bringing about the political and economic geography which they symbolize (Dodd, 2016: 6).

These insights, which emphasize how patterns of currency use reify and reinforce territorial boundaries, parallel theories in international relations and critical geopolitics about how sovereignty is produced through practices like diplomacy or border control (Adler-Nissen, 2012). In this context, the border-producing practices of states, in the context of governing and filtering flows of trade, migration, and illicit activities, have been a key focus (Chalfin, 2010; Dijstelbloem, 2021). Structuring economic activity with and according to state borders is one part of the ongoing work that states perform to constitute economic territories as practical facts of life. CBDCs can thus also be seen as a sociotechnical means of territorialization: they help reify, communicate, and facilitate state governance power over space in the context of a highly

digitized and global economy (Lambach, 2020: 493). This paper extends these insights and illustrates their relevance in the area of monetary politics.

How could CBDCs boost monetary sovereignty?

Central banks have considered various models for implementing CBDCs. The prevailing model seeks to emulate physical cash by providing instant transfers with zero transaction fees, and no interest earned on balances. Beyond this there is already some variation, with CBDCs in the Caribbean and Nigeria usable without bank accounts, while a bank account is necessary in Cambodia. The Bahamas allows anonymous wallets to hold up to $500 and transact $1500 per month, but identification is required to open a wallet elsewhere. Most commonly, CBDCs are accessed through a mobile phone application through which users set up virtual wallets. Users can then move funds in or out of the virtual wallet through online banking or at authorized retailers. Users also have the choice, at least in The Bahamas and the e-CNY pilot project in China, to use cards with embedded chips or machine-readable codes instead of a smartphone. CBDCs may thus function like debit cards, prepaid phone credit, or the stored-value cards used by public transit systems. The earliest example of a CBDC is perhaps the Avant card system introduced in 1993 by the Bank of Finland. It was used by one-fifth of the country's population before it was discontinued in 2003 when use declined sharply in favour of debit and credit cards (Grym, 2020).

Why do central banks think CBDCs will help increase or maintain monetary sovereignty, independent of macroeconomic and structural factors? One key aim is to prevent or decrease currency substitution, the use of money other than the official currency within the state's territory.

Advocates believe a CBDC could help the official currency compete against alternatives. The challenge is not seen as coming from Bitcoin or other cryptocurrencies, since their design creates long time lags and transaction fees which make them impractical for everyday transactions. They are hence limited to serving as a store of value. Instead, what prompted central banks to more seriously examine CBDCs was Facebook's Libra, announced in June 2019. This proposed private digital currency could be used to make payments through Facebook's online services. Unlike cryptocurrencies, Libra had the potential to be used for routine transactions at a global scale of two billion Facebook users, and thus to compete with official currencies as a medium of exchange. In December 2019, a joint statement by the European Commission and Council listed "risks to monetary sovereignty, monetary policy, the safety and efficiency of payment systems, financial stability, and fair competition" as concerns to be addressed before they would allow private digital currencies like Libra to launch in Europe (European Council, 2019). This brought attention to CBDCs as a policy response that could ensure public and universal alternatives in case private digital currencies started to gain widespread use.

Particularly for emerging economies, policymakers may believe a CBDC will help maintain or increase the use of the official currency. The expectation is that the currency will become more attractive with a CBDC that offers convenient payments and a modernized user experience. Although this may increase a currency's use by improving its function as a medium of exchange and unit of account, it does not fundamentally address a lack of trust in the currency as a store of value. If this is the main reason the underlying currency is not more widely used, its digital form will also suffer the same problem, constraining the extent to which it will serve monetary sovereignty objectives.

Policymakers also link monetary sovereignty to "financial inclusion", which has been touted as a major benefit of digital currencies (Auer et al., 2022). "Financial inclusion" aims to increase the share of the population using the formal banking system. By capturing more of the informal economy, this helps states increase domestic monetary sovereignty by making economic activity within their territories more legible to the state (Mader, 2018: 465).[1] From the state's perspective, increasing the scope of the banking system can also increase state capacity for surveillance and governance, and thus more effectively enact its sovereignty as social reality (Salter, 2019). For instance, China's party-state is exploring how a CBDC could be the basis for a massive extent of data-gathering and market-shaping that would support governance towards its "authoritarian capitalist vision" (Gruin, 2021: 599).

This raises important questions about how CBDCs would interact with existing banking systems. There is speculation about technical possibilities for CBDCs to be interest-bearing, allowing immediate transmission of monetary policy, or to facilitate targeted fiscal policy by issuing "helicopter money" that could be restricted to only be spent on specific goods. But since reducing currency substitution is a necessary condition to enable such features to increase sovereign capacity, possibilities like CBDC balances being made to expire or restricted to being spent on certain goods could undermine that very acceptance and prove counterproductive. Furthermore, these features could introduce new risks to banking and monetary stability (Bindseil, 2020). These risks and ambiguities are some of the reasons that policymakers are relatively cautious about rushing into CBDC adoption. Discussions about banking

[1] On the concept of "legibility" see Scott, 1998.

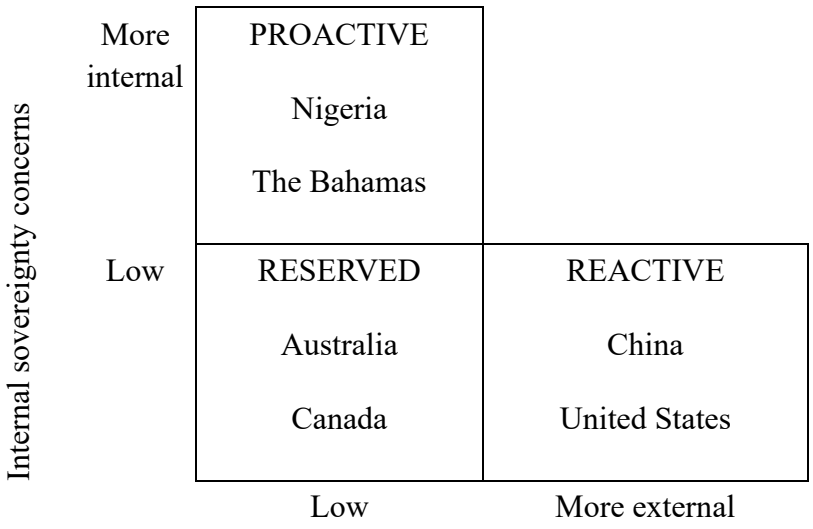
disintermediation highlight problems that might arise if citizens preferred keeping their savings in CBDC rather than commercial bank deposits. This could hamper credit creation and potentially weaken banking systems. The collapses of Silicon Valley Bank and Credit Suisse in early 2023 highlighted how digitization already accelerates bank runs even without the ability to quickly convert deposits into a risk-free CBDC.

Sovereignty concerns and CBDC stances: a typology

I theorize that the extent of policymakers' monetary sovereignty concerns, and the relative importance of internal and external monetary sovereignty, helps account for the variation in stances towards CBDCs. The benefit of this concept is to distill the wide range of monetary policy goals that might be affected in different ways by digital currencies into a simplified model. Figure 1 illustrates how different clusters of state CBDC policies can be categorized based on their extent of internal and external sovereignty concerns.

I define monetary sovereignty concerns as the extent to which policymakers perceive their state to have the capacity to use monetary governance tools to attain political objectives, as well as the imminent prospects of a negative change in that capacity. Sovereignty concerns are a *subjective* perception of policymakers and distinct from the structural conditions which might contribute to them. Thus, a state that already has high levels of capacity or autonomy may still have high sovereignty concerns, due to fears of an imminent downturn in sovereignty or the ambition to improve an already dominant position. Conversely, low sovereignty concerns mean that policymakers do not perceive an imminent problem that requires a response. This might exist even in countries whose monetary sovereignty is marginal, such as Ecuador which officially uses

Figure 1. Typology of CBDC stances.



a foreign currency (in this case the US dollar). Domestic political factors may thus affect desired levels of monetary sovereignty; interest groups may politically oppose a national currency or it may be considered economically impractical.

Sovereignty concerns may result from desires to strengthen monetary sovereignty or defend against its loss. Countries might also move within this space due to changes in the level of sovereignty concerns, or the balance between internal and external sovereignty concerns. Structural factors are important and the very different monetary challenges facing wealthy and emerging economies goes a long way in explaining their different approaches to CBDCs. But they do not fully determine outcomes because policymakers have goals that include trying to change those structural factors over time. For instance, technological optimism may have

encouraged policymakers to overestimate both the challenge posed by private digital currencies and the effectiveness of CBDCs as a means to their objectives.

The likelihood of launching a CBDC increases with sovereignty concerns (distance from the bottom left of the diagram). However, whether policymakers are more concerned with internal or external monetary sovereignty influences how proactive they will be in launching CBDCs. When internal sovereignty is the main concern, states tend to be proactive in launching CBDCs. This is because policymakers hope to reap key benefits from increased governance capacity over the domestic economy, and these do not depend on what other state or private actors do. Conversely, when external sovereignty is the greater concern, states will tend to be more reactive with their CBDC projects. External sovereignty concerns are about constraints on a state's foreign policy, or capacity to act internationally, which emerge from the use of currencies for international transactions. This is more complex and uncertain because of interaction with other states, potential trade-offs between domestic and external autonomy, and global economic factors outside any one state's direct control. In the following section I examine shared characteristics of countries in each category to analyze the factors that influence the monetary sovereignty concerns of policymakers and their likely stance towards CBDCs.

States in the bottom left quadrant have the least concerns about either their internal or external monetary sovereignty. They find that status quo gives them acceptable levels of both, and hence tend to see CBDCs as offering few benefits. This quadrant will tend to share the following characteristics: the state's official currency dominates the domestic economy, coupled with a banking and payments system that is well-established and widely used by residents. My argument predicts these states will be the most reserved and cautious towards launching CBDCs.

Countries in the upper-left of the diagram are dissatisfied with their internal monetary sovereignty, and likely to proactively launch CBDCs as part of state-building and development policies. These countries tend to be low on the currency hierarchy, and may also have a high penetration of foreign currency in their territories. They may fear an imminent increase in currency substitution, or view CBDCs as an opportunity to reduce it. These states place more emphasis on increasing or maintaining state capacity. However, these countries have few concerns about external monetary sovereignty. States in this cluster usually have little of it, as implied by their official currency being low on the hierarchy and facing high currency substitution. However, the situation is perceived as a byproduct of economic realities these states have little hope of influencing or controlling (such as globalization or US dollar hegemony). Their focus is thus more on increasing internal rather than external monetary sovereignty and, all else being equal, they are indifferent to what currency is used for transactions that cross their borders or take place outside them.

States in the bottom-right quadrant have relatively high internal capacity or are not driven by a pressing need to increase it. However, these states also perceive the currency used for international transactions to have political importance, as they have policy goals affected by the currencies used internationally. They are thus more concerned with external sovereignty, which includes foreign policy autonomy and ability to exert power over others (Paris, 2020). Their global monetary positions may be affected by digital currencies launched by other actors, whether private or by other states. My theory expects these states to react to developments they perceive to weaken their external monetary sovereignty, although they would have no pressing incentive to act unless others go first.

This category fits the stances of the US and China, who are acutely concerned with how the international use of each others' currency impacts their power and influence in global politics. In recent years China has shown increasing concern with how the internationally pervasive use of the US dollar constrains its foreign policy action. Many policymakers in the US also hold an exaggerated threat perception wherein Beijing's policies to increase its internal capacity are interpreted as strengthening to attack US interests.

The case studies seek to identify common features that account for cases falling into each of the typology's clusters. The argument is developed from the *reserved* and *proactive* clusters because these are where definite outcomes already exist. The *reserved* cluster includes states where central banks have explicitly stated they will not launch a CBDC in the near future, while in the *proactive* cluster CBDCs are already launched, and available for public use. In each cluster, I discuss cases selected to be broadly representative of the group, including of differences within them. In the *proactive* cluster, I detail three of the five active CBDCs, with high confidence that I address factors relevant to all five. The *reserved* cluster covers a potentially much wider range of countries. However, one reason to think the relatively small number of examples is broadly representative is the close epistemic community between central banks (Johnson, 2016), which is reflected in their cooperative efforts to study and test CBDCs (e.g. Group of Central Banks, 2020). This makes it likely that the policy approaches and thinking I describe are part of an ideational consensus among relevant experts.

I then extend the insights to infer the potential responses of a *reactive* cluster, consisting of states more concerned with external monetary sovereignty. My theory suggests they have less incentive to move first, but will react to moves by states with internationalized currencies or to

shifts in currencies used for international transactions. An important limitation is that I do not address change in policymakers' subjective perceptions, or how this might occur, which I treat as exogenous. Secondly, only time will tell if we are at the beginning of a CBDC wave or it has already crested. Indeed, the prevailing *reserved* response reflects central banks preparing CBDCs "just in case", perceiving a lack of present net benefits but also uncertainty about future developments.

Sovereignty concerns and CBDCs: case studies

Reserved: Australia and Canada

A number of developed economy central banks have developed CBDCs but decided not to launch them for now. These include Australia and Canada, who have the technological capability and state capacity to launch CBDCs independently. Similar situations can be observed in other countries with similar characteristics like Sweden and the United Kingdom, whose central banks have also worked and collaborated on CBDC development and are similarly reserved about launching them. These countries generally have currencies that are domestically dominant and are relatively indifferent to patterns of international currency use.

The Bank of Canada has concluded that a CBDC is unnecessary barring unforeseen changes in the practical use of money in Canada. Its stated position is that "[w]e don't see a need to issue a CBDC right now. And we don't know if we will need to in the future." The relevant policy document's title sums up that for the Bank of Canada, a CBDC is something that needs "contingency planning" rather than immediate action (Bank of Canada, 2020).

One reason a Canadian CBDC might have been judged unnecessary is that it would give little added utility for everyday users, and consequently no increase of domestic monetary sovereignty. A Bank of Canada survey found that 99 per cent of residents had a bank account and debit card allowing them to make digital payments, and two-thirds of transactions in Canada, representing 84 per cent of total value, were already conducted using these digital systems (Henry et al., 2018). Canada also has an established electronic transfer system, Interac, which has allowed people to email money to each other since 1996. As in most high-income countries, user preference, not a lack of options, generally determines the choice of payment method. Consequently, a CBDC seems to offer no improvement for practical use of the official currency, and thus for monetary governance capacity.

In Australia, policymakers have reached similar conclusions. The Reserve Bank of Australia (RBA) continues to run open-ended CBDC experiments which have attracted much participation from the financial industry. However, its position remains that "we have not seen a strong public policy case to move in this direction, especially given Australia's efficient, fast and convenient electronic payments system" (Lowe, 2021). According to one RBA research bulletin assessing the need for an Australian CBDC, "it may be that the concerns about loss of monetary sovereignty are overstated" because Australia is a country with "well-functioning financial and payment systems and a history of low inflation," and currency substitution is thus unlikely (Richards et al., 2020: 40). The RBA frames CBDC as a payments system issue, emphasizing the everyday use of money in Australia's territory as the main factor for any decision.

The factors which have led Australia and Canada to decide not to launch CBDCs are generalizable to other developed economies. Japan and the UK have recently announced the same

cautious approach of readying a CBDC without any definite plans to launch it. This reflects that expectations that new digital currencies would eclipse official currencies have not been borne out. Such predictions overlooked that many purported benefits already exist or can be offered through official currencies. Indeed, the digitalization of state-backed currencies by private banks and payments firms has had a far greater impact than the new digital currencies, having driven a decline of cash as a payment method since the 1990s. In the United States, 93 per cent of retail purchases by value use digital payments and there are 4.45 credit or debit cards per capita (J.P. Morgan, 2019). In Sweden, digital payments are so dominant that its central bank is concerned about ensuring the continued acceptance and usability of cash (Sveriges Riksbank, 2022: 44–45). In this sense, digital dollars, kronor, and euros already dominate domestically. Hence, these states also have little to gain from CBDCs in terms of governance capacity.

For similar reasons, countries which are lower-income but have well-developed payments systems are also reserved towards launching CBDCs. In Kenya, the M-Pesa system founded in 2007 means that "electronic money has already taken root" and thus "the proposed value solution offered by CBDC seems to be already met" (Central Bank of Kenya, 2022: 21). Indeed, as a mark of Kenya's technological modernity, M-Pesa has been a point of national pride (Tuwei and Tully, 2017). Strong payments systems and low currency substitution can thus be mutually reinforcing and imply low internal sovereignty concerns. States facing such conditions are thus unlikely to launch CBDCs under current circumstances. But states might move out of this cluster and proactively introduce CBDCs if these conditions change in ways that increase internal sovereignty concerns. Possibilities include the emergence of new payments systems outside the

national currency which gain widespread use, or a currency crisis that changes usage patterns such that currency substitution becomes a major issue.

Proactive: Island states and emerging economies

In contrast to the cautious *reserved* approach, some states have been proactive towards CBDCs. They have high levels of concern about internal monetary sovereignty, and generally face currency substitution or aim to increase the scope of the formal economy. Within this cluster are two further groups: Caribbean island states, where CBDCs are seen as useful to overcome problems of physical geography, and emerging economies where CBDCs aim to help the official currency compete with other forms of money within the state's territory as well as to capture the informal economy. Sovereignty concern manifests here more as ambitions for gain rather than preventing loss.

Caribbean states have been early adopters with three active CBDCs, based on the Bahamian dollar (Sand Dollar), Jamaican dollar (Jam-Dex), and Eastern Caribbean dollar (DCash) used in six independent states and two British overseas territories. These countries share some key characteristics: they have small and vulnerable economies, their currencies are pegged to the US dollar, and a large proportion of their economic activity is made up of tourism, a shock-prone globalized service industry.

The Bahamas was the first country to fully launch a CBDC in October 2020. As a high-income country with a strong banking system, the key reason given by policymakers was the need to increase and maintain access to money through that system. Although access to bank accounts is high at 94 per cent, a key problem is the physical geography of the archipelagic

nation. This makes access to banking services difficult for a significant number of residents, while vulnerability to natural disasters is also a major problem. Difficulties delivering financial assistance after a hurricane in 2019 destroyed the banking and electronic payments infrastructure on some islands were cited as a key rationale to move ahead with a CBDC (Patrick and Lyle, 2022: 346). Offline functionality is planned, but still yet to be implemented as of August 2023.

In larger emerging economies, concerns about internal monetary sovereignty are more acute and manifest differently. These states tend to face competition within their territory between the official currency and other forms of money. Existing currency substitution by foreign official currencies, especially the US dollar, is potentially increased by the new private digital currencies. One analysis of global cryptocurrency adoption finds the highest rates are in emerging markets because of the greater desire to evade capital controls and the official currency's poor utility as a store of value (Chainalysis, 2022: 9).

Nigeria is the largest country to have launched a CBDC, and is differentiated from the Caribbean states by its larger and more complex economy. The Central Bank of Nigeria (CBN) is particularly concerned about currency substitution, and views the eNaira CBDC as a means to increase monetary sovereignty in the form of governance capacity. However, the naira experiences an unstable foreign exchange value and high inflation, and is subject to strict capital controls. Nigerians thus have a widespread preference for foreign currencies like the US dollar or CFA franc (which is pegged to the euro). A 2014 estimate suggested between 49 to 62 per cent of Nigerian bank deposits were in foreign currencies (Doguwa, 2014). Nigeria also has the world's highest rate of private digital currency adoption, with 32 per cent of the population reporting that they use or own cryptocurrency (see Chainalysis, 2022: 75–80). This is despite the CBN's 2021

effort to ban cryptocurrencies, consistent with monetary sovereignty objectives. The eNaira also aims at expansion to facilitate the sending of remittances from abroad, which in 2021 made up 4.4 per cent of Nigeria's GDP. However, the naira's unstable value means that its digital form is no more preferable or likely to outcompete other forms of money within Nigeria (Obianwu and Okwor, 2022: 13–14).

One aspect of this emphasis on internal monetary sovereignty concerns is the CBN's explicit objective of reducing the use of physical cash in the Nigerian economy. Nigeria's informal economy is estimated to make up half its GDP and 80 per cent of employment, while 36 per cent of residents do not have a bank account (Ree, 2023: 4). Given this context, Nigerian policymakers saw reducing cash use as a means to draw more economic activity into the formal sector, thus making it more legible and taxable by the state. The CBN initiated a policy of reducing the use of cash in 2012, and the eNaira is presented as contributing to this goal and its expected macroeconomic benefits (Central Bank of Nigeria, 2022: 3, 17, 22). In December 2022, the CBN controversially took further steps to discourage the use of cash by limiting cash withdrawals from banks to 500,000 naira per week (US$44) and demonetizing old banknotes. A shortage of new banknotes led to a crisis in early 2023 with long lines at banks, protests, and court challenges against the policy (Jolaoso, 2023). This extent of state imposition and intervention illustrates the intensity of policymakers' ambitions to increase internal monetary sovereignty. It contrasts strongly with developed-country central banks which are generally indifferent to the use of cash, and see CBDCs as possibly needed to respond to declining cash usage rather than a means to force it on the public (Boar and Wehrli, 2021).

This shows an interesting contrast with Cambodia's experience. Cambodia's Bakong system, launched in October 2020, is a digital payment instrument initiated and administered by the National Bank of Cambodia (NBC), its central bank. The Bakong system is seen by the NBC as augmenting and supporting the riel, but it allows transactions to be made both in the Cambodian riel and US dollar. Cambodia remains highly dollarized, with 83 per cent of domestic bank deposits in US dollars (IMF, 2022a: 61). Displacing the US dollar's use in Cambodia is not a goal of Bakong at present, and indeed would be unlikely to happen in the near future. However, the NBC has stated a desire to "wean off that dependence" on the US dollar and eventually reach sole domestic use of the riel (quoted in Nagumo, 2021).

The bigger objective of Bakong is to draw into the formal economy and the banking system people and transactions that would otherwise not have engaged with either. It hence relies on mobile phones but does not require a bank account, as Cambodia has 1.2 mobile subscriptions per person but only 61 per cent hold bank accounts. The system has also expanded to include remittances, which are a key part of Cambodia's economy. In August 2021, Bakong introduced the ability to send instant one-way money transfers from Malaysia, processing the equivalent of US$2.8 billion that year. Bakong thus augments Cambodia's internal monetary sovereignty by bringing a greater share of economic activity into the formal economy. Furthermore, Bakong accommodated popular preferences to use the US dollar while bringing it into the central bank's system. This illustrates how CBDC projects and the practical increase of governance capacity complicates classic understandings of monetary sovereignty. Even if Bakong does not ultimately reduce dollarization in Cambodia it still increases the state's governance capacity over the alternative.

While policymakers thus perceive CBDCs as increasing domestic monetary sovereignty, whether CBDCs will be effective in achieving these goals remains to be seen. The structural conditions of low internal monetary sovereignty, which lead to attempts at innovative solutions like CBDCs, are also obstacles to their success. While Bakong has been relatively successful, other CBDCs have not gained significant usage. In 2022, US$5 billion in transactions were processed by Bakong, more than double the previous year and making up 16.6 per cent of GDP, far higher than other CBDC projects (National Bank of Cambodia, 2022: 41). The Bahamas Sand Dollar makes up less than 0.1 per cent of currency in circulation there (IMF, 2022c). In the Eastern Caribbean countries, the issuance of DCash is capped at 1 per cent of cash in circulation and the IMF describes its uptake as "slow, largely due to the lack of marketing and public awareness" (IMF, 2022b: 10). Nigeria's central bank announced in 2022 that eNaira transactions totalled less than 0.001 per cent of GDP in its first year. This suggests that the structural conditions of low internal monetary sovereignty, which lead to attempts at innovative solutions like CBDCs, also make them less likely to succeed. Further research could examine what helped Cambodia overcome these odds.

Reactive: Internationally competing currencies

States where concerns about the currency's international position are greater than concerns about internal monetary sovereignty likely to take a *reactive* approach to CBDCs. States in this cluster have relatively greater external sovereignty concerns because of how the cross-border use of various currencies affects their foreign policy and international political influence, even if they do not aim to internationalize their own currency. They thus have interests in the patterns of

currency usage for international transactions, either to maintain their own position or to diminish the role of others. Decisions to launch CBDCs of their own are thus likely to be shaped by the CBDC projects of states with internationalized currencies, as well as private currencies with potential for global scope. This contrasts with both the reserved and proactive clusters where external monetary sovereignty is not the primary issue. Most states see little difference in foreign policy constraints stemming from what currencies are used for international transactions, and thus domestic sovereignty concerns take priority.

External monetary sovereignty concerns reflect constraints stemming from the currencies used outside a state's borders, or aversion to losing existing international governance capacity. The widespread use of the US dollar as a vehicle currency for international transactions gives the US an asymmetric ability to exert economic coercion and enforce sanctions through its centrality in the global monetary system (Emmenegger, 2015; McDowell, 2023). Erosion of the US dollar's dominant international position could thus reduce effectiveness of a key foreign policy instrument for Washington.

Both China and Europe are increasingly conscious of foreign policy constraints they face because of the US dollar's globally dominant position. Chinese and European firms were forced to comply with US sanctions on Iran which they disagreed with because of the threat of prosecution by US authorities and being cut off from US-based financial networks. While currently *reserved,* the euro's status as the world's second-most important currency allows a move towards *reactive* if external sovereignty concerns increase. The ECB has historically been reluctant to promote euro internationalization, but recently suggested a euro CBDC would "address risks stemming from geopolitical tensions" (ECB, 2023: 4). Since 2018, the European

Commission has shown interest in how a digital euro and alternative payments system could bolster Europe's strategic autonomy (Boonstra, 2022; McDowell, 2023: 133–134).

China's CBDC project has moved closer to launch and was driven by a perceived challenge to sovereignty posed by private digital currencies. The People's Bank of China (PBOC) official heading the e-CNY project, Mu Changchun, directly drew this link when he said in October 2020 that it was designed "to fight against cryptocurrencies and global stablecoins and prevent their erosion of currency-issuance rights" (Tang, 2020). In 2021, China banned the use and exchange of cryptocurrency within its borders. Furthermore, China viewed Libra as something that would reinforce the US dollar's global dominance. Indeed, Facebook's Mark Zuckerberg tried to use exactly this claim to mollify the US Congress's skepticism of Libra in 2019. He argued that Libra would "extend America's financial leadership around the world," trying to appeal to US external monetary sovereignty motives (US Congress, 2019: 5).

China has longstanding external monetary sovereignty concerns about how patterns of currency use across and outside its borders constrain its foreign policy. Some of these are outgrowths of domestic concerns, such as preventing capital flight. In the international context, political tensions with the US, coupled with demonstrations of Washington's ability to exert power and enforce sanctions through the existing global payments infrastructure, have raised the need to find alternatives to it. Key Chinese firms or the state itself being sanctioned and cut off from US dollar networks would severely disrupt China's trade even with countries that oppose such measures, and is a vulnerability Beijing hopes to address.

More broadly, China may hope to gain some of the advantages that the US enjoys from the dollar's internationalization and centrality for itself. China has joined other central banks in

experimenting with using CBDCs in cross-border transactions, participating for instance in a BIS trial along with Hong Kong, Thailand, and the United Arab Emirates. International payments is one area where CBDCs could offer real improvements on transaction costs, and an internationalized CBDC might provide an alternative source of liquidity to the US dollar (Fantacci and Gobbi, 2021). If successful, this could also increase China's ability to influence international monetary and financial governance. But it should be noted that the e-CNY, which officially remains in the pilot stage, has struggled to gain even domestic use. Data suggests its usage is low and accounts are "highly inactive" (Reuters, 2022), with the CNY 100 billion total value of transactions in its two years of use being roughly equivalent to two days of retailer Alibaba's sales during China's largest shopping event in 2021.

In this context, maintaining the US dollar's international position has been one of the primary rationales in arguments for a "digital dollar" backed by the Federal Reserve. As the flip side of China's external sovereignty concerns, the US concern is about the possible erosion of its ability to exert political power through the international monetary system. External sovereignty concerns for the US focus on the potential blunting of an instrument of Washington's power to exert governance within the global economy (see Greene, 2021). These focus on the possibility that the e-CNY would foster new international payments networks and create technical standards for other CBDCs which would work against the US. Along with an "anxiety of falling behind China" these have created alarm about the need for a CBDC to stave off the US dollar's international demise (Huang and Mayer, 2022: 334).

Washington's foreign policy community has thus argued for a CBDC by linking it to external monetary sovereignty. One result was when US president Joseph Biden issued an

executive order in September 2022 instructing the US Treasury to support the Federal Reserve's development of a US dollar CBDC. The Federal Reserve itself is more cautious, with chair Jay Powell saying that "it's more important to do this right than to do it fast" (Cox, 2021). A similar stance that there was no urgent need for a US dollar CBDC was reiterated in December 2022 (Condon and Torres, 2022). If so, the Federal Reserve seems to have reached similar conclusions as its counterparts in Australia and Canada, although an important difference for the US is its relatively greater weight of external monetary sovereignty concerns.

However, it is unclear that a US dollar CBDC would be necessary or sufficient to defend the incumbent's advantages. The existence of a digital US dollar would do nothing to prevent people from transacting through other currencies or networks to evade US sanctions. China, the EU, and Russia have all set up alternatives to the SWIFT international payments network seeking to reduce the constraints that US financial power places on their foreign policy actions. The willingness of the US to exploit the dollar's centrality for political goals is itself a key reason behind the search for alternatives (McDowell, 2023). Despite portrayals of a technological race with first-mover advantages, there is little reason to believe that a CBDC meaningfully improves its underlying currency's international desirability (Chorzempa, 2021).

Hence, even if China wanted to increase global use of the renminbi at expense of the US dollar, a CBDC is not a necessary or even an effective means of pursuing this goal. The extent the e-CNY would increase China's external monetary sovereignty is ultimately limited to international acceptance of the renminbi itself. Some of the touted technological features of CBDCs like programmability could also work against their use or acceptance. The prospect of some e-CNY being programmed to expire or to be spent only on specific things, which has been

tested in the e-CNY pilot, adds a new dimension of currency risk that would reduce its desirability. The PBOC (2021) has also signalled it will prioritize enforcement of capital controls if it does go ahead with a full launch of its CBDC. The e-CNY thus faces the same obstacles to internationalization as its underlying currency, which derives from the Chinese government's political priorities on economic stability and domestic control.

In the international context, CBDCs could thus facilitate shifts away from a dominant currency motivated by concerns about foreign policy autonomy and international influence. However, simply introducing CBDC does not suffice to dethrone a dominant currency. Competition between currencies is not based primarily on convenient payments, but also their relative ability to claim output from a large, productive economy with deep and liquid financial markets. At the same time, a digital dollar would not dissuade greater use of rival currencies driven by fear of surveillance and sanctions by Washington. Claims that CBDCs will help their base currency out-compete others thus need to be carefully examined, as they only address the means of payment aspect of money.

One area that CBDCs may have a significant impact is to reduce transaction costs for cross-border payments and remittances, where there is more room for improvement than with domestic payments (World Bank, 2021). Facilitating and channelling remittances could prove particularly important for emerging economies. In the context of international transactions, CBDCs may offer improvements such as faster settlement and greater efficiency. Developed-country central banks have indeed explored how the underlying technology could improve cross-border payments and settlement (sometimes referred to as "wholesale CBDC"). However, all else equal, convenient payments alone are unlikely to decide rivalries between major currencies.

Conclusion

States thus take different stances towards CBDCs based on their level of monetary sovereignty concerns, as well as the relative importance of external or internal monetary sovereignty for them. Some emerging economies and small states have been *proactive*, hoping to increase state capacity and reduce currency substitution. Conversely, countries higher in the currency hierarchy have already obtained key benefits of CBDCs through existing payments technology, and thus see little benefit to them. Current trends thus suggest CBDCs will be limited to small or emerging economies with poor existing payments systems. Such projects are unlikely to trigger *reactive* responses from the cluster of states with concerns about their capacity for external monetary governance. These tend to be major economies who are likely to monitor each others' CBDC projects closely and introduce their own only if they perceive threats to external monetary sovereignty.

One area for further research is variations in actual use of CBDCs. Fitting the project to citizens' preferences rather than pushing governance objectives might be an important factor in Cambodia's relative success. Another issue for further research is the interaction between monetary sovereignty and financial stability. CBDCs would likely crowd out "stablecoins", private digital currencies pegged to official currencies, and the collapse of these pegs was a key part of the 2022 "crypto crash". This is relevant to ongoing debates as to whether governments should regulate such assets, thus implicitly legitimizing them, or discourage their growth – and if so, how.

The rationales behind both proactive and reserved clusters also help to understand the external sovereignty motives and competitive dynamics for the reactive cluster. Competition between major currencies hinges on wider political issues like sanctions vulnerability and foreign policy autonomy. This does not rule out, however, states launching CBDCs for symbolic and sociological reasons, such as to signal themselves as being technologically advanced or quell fears about "falling behind". However, no CBDC can ultimately be more attractive than the currency it is a digital version of. Particularly for states aiming to reduce currency substitution through CBDCs, technology alone will not achieve monetary sovereignty goals unless it is coupled with meeting public needs and gaining political trust. Policymakers are thus attentive to the practical use of money and its implications for sovereignty and governance capacity. CBDCs may help further these objectives, but at present they seem at most a potentially useful tool rather than a game-changer.

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