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Banking in a Digital Fiat Currency Regime

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I. Introduction

In recent years, policy-makers around the world have begun to experiment with new forms of central bank-issued digital currency technology.[1] At the same time, there has been growing scholarly and political interest in the direct public provisioning of digital payments and basic banking services to both retail and wholesale non-bank customers, either through the expansion of central bank services to non-bank actors,[2] or the creation of new public or postal banking institutions.[3]

Together, these developments point towards a possible future in which both retail and wholesale transactions are settled directly via a universally accessible, public digital payments network, without recourse to the current bank depository system.[4] Such a digital fiat currency ('DFC') regime could significantly increase payment efficiency and access to payments services amongst the unbanked and underbanked,[5] while improving transactional privacy by preserving the possibility of decentralized, anonymous, cash-like digital payments.[6]

Currently, most discussions of DFC proposals have yet to fully grapple with the implications of widespread retail deposit flight upon banking-sector dynamics or macroprudential

[1] See, e.g., Max Seddon and Martin Arnold, 'Putin Considers "Cryptoruble" as Moscow Seeks to Evade Sanctions' (*FinancialTimes.com*, 1 January 2018) https://www.ft.com/content/54d026d8-e4cc-11e7-97e2-916d4fbac0da; Lynsey Chutel, 'West Africa Now Has Its Own Digital Currency' (*Quartz.com*, 27 December 2016) https://qz.com/872876/fintech-senegal-is-launched-the-ecfa-digital-currency/; Riksbank Sveriges, The Riksbank's E-Krona Project (*Sveriges Riksbank*, September 2017) https://www.riksbank.se/globalassets/media/rapporter/e-krona/2017/rapport_ekrona_uppdaterad_170920_eng.pdf; Will Knight, 'China's Central Bank Has Begun Cautiously Testing a Digital Currency' (2017) *MIT Technology Review*, https://www.technologyreview.com/s/608088/chinas-central-bank-has-begun-cautiously-testing-a-digital-currency/; Ben Schiller, 'Ecuador is the World's First Country with a Digital Cash System' (*FastCompany.com*, 10 August 2015) https://www.fastcompany.com/3049536/ecuador-is-the-worlds-first-country-with-a-public-digital-cash-system.

[2] See, e.g., Morgan Ricks, John Crawford, and Lev Menand, 'A Public Option for Bank Accounts (or Central Banking for All)' (2018) Vanderbilt Law Research Paper, 18–33, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3192162; Thurvald Grung Moe, 'Shadow Banking: Policy Challenges for Central Banks' (2014) Levy Economics Institute Working Paper No. 802, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.434.3922&rep=rep1&type=pdf.

[3] A. P. Joyce, 'Progressive Groups are Launching a Movement to Create a Public Bank in New York City' (*Mic.com*, 6 June 2018) https://mic.com/articles/189687/progressive-groups-are-launching-a-movement-to-create-a-public-bank-in-new-york-city#.hqKRq1PIo; Daniel Marans, 'Kristen Gillibrand Unveils a Public Option for Banking' (*HuffPost.com*, 25 April 2018) https://www.huffingtonpost.com/entry/kirsten-gillibrand-postal-banking-bill_us_5ae07f9fe4b07be4d4c6feae; Mehrsa Baradaran, 'It's Time for Postal Banking' (2014) 127 *Harvard Law Review*, 165; Heather Morton, 'Many States See the Potential of Public Banking' (*NYTimes.com*, 1 October 2013) https://www.nytimes.com/roomfordebate/2013/10/01/should-states-operate-public-banks/many-states-see-the-potential-of-public-banking.

[4] See, e.g., Jonathan Dharmapalan and Rohan Grey, 'The Macroeconomic Policy Implications of Digital Fiat Currency' (eCurrency.net, 2017) https://www.ecurrency.net/static/resources/201802/TheMacroeconomicImplicationsOfDigitalFiatCurrencyEVersion.pdf.

[5] See, e.g., Jonathan Dharmapalan and Carolyn Hall McMahon, 'Central Bank Issued Digital Currency and Its Impact on Financial Inclusion' (*eCurrency.net*, 2016) https://www.ecurrency.net/static/resources/201802/TheCaseForDigitalLegalTender-ImpactOnFinancialInclusion.pdf.

[6] See, e.g., David Clarke, 'The Future of Cash: Protecting Access to Payments in the Digital Age' (*PositiveMoney.org*, 25 March 2018) http://positivemoney.org/wp-content/uploads/2018/03/Positive-Money-Future-of-Cash.pdf.

regulation more broadly.[7] Instead, most policy-makers identify the risk of a run from deposits towards DFC as unequivocally negative outcome.[8] Indeed, some proposals even include limits on DFC functionality intended to reduce the risk of deposit flight occurring.[9]

This chapter takes a different approach. Rather than attempting to minimize the disruptive impact of DFC technology, it embraces the possibility of widespread consumer flight out of bank deposits and into the DFC payments network, on the basis that such a shift would improve the safety and functioning of the financial system.[10] From this view, the critical question is not how to preserve the banking system as it currently exists, but rather how to preserve the socially valuable functions of banking, while jettisoning those aspects that have been rendered obsolete or inferior compared to modern alternatives, such as a dedicated public payments network.

In particular, I argue that the core social responsibility of the banking system is not to maintain a monopoly over payments processing but to conduct credit analysis and collateral evaluation in ways that promote the capital development of the economy.[11] By accepting a borrower's IOU, or a pledge of collateral of a certain quality, in exchange for its own, more liquid and publicly supported deposit liabilities, banks engage in a form of credit laundering.[12] That is to say, they effectively transform illiquid promissory notes or collateral assets into demand deposits with greater 'moneyness'[13] by virtue of their underwriting and validation practices. Bank deposits, in turn, are backstopped by the central bank and the political authority of the backing monetary sovereign through deposit insurance, discount window access, lender of last resort support and a general commitment to maintain at-par convertibility between fiat currency and bank deposits. Thus, as Hockett and Omarova have argued, the act of commercial bank lending resembles a franchised exercise of sovereign monetary power in which a bank generates new purchasing power, backed by the sovereign, and gives it to a borrower, in exchange for a commitment to repay a specified amount in the future.[14]

[7] A notable exception is Ricks et al. (n 2), whose analysis and arguments closely resemble those articulated in this chapter.

[8] See, e.g., Bank of International Settlements ('BIS'), 'Central Bank Digital Currencies' (2018) Bank of International Settlements, Committee on Payments and Market Infrastructures Report No. 174, 16, https://www.bis.org/cpmi/publ/d174.pdf: 'Arguably, the most significant and plausible financial stability risk of a general purpose CBDC is that it can facilitate a flight away from private financial institutions and markets towards the central bank.'

[9] See, e.g., John Barrdear and Michael Kumhof, 'The Macroeconomics of Central Bank Issued Digital Currencies' (2016), Bank of England Staff Working Paper No. 605, 15, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2811208, who propose quantitative restrictions on the supply of central bank digital currency.

[10] As shadow banking scholar Zoltan Poszar has argued, the existence of deposit insurance caps on individual accounts renders the retail banking system unsuitable for the large institutional cash pools held by money managers. This, in turn, has contributed to the structural undersupply of safe assets relative to investor demand prior to 2008, which fuelled the growth of shadow banking. Zoltan Poszar, 'Can Shadow Banking Be Addressed without the Balance Sheet of the Sovereign?' (*Vox.org*, 16 November 2011) https://voxeu.org/article/shadow-banking-what-do.

[11] The term 'capital development' was used by Hyman Minsky to refer to 'a broad measure of investment that goes beyond privately owned capital equipment … to include technology, human capital, and public infrastructure'. Mariana Mazzucato and L. Wray, 'Financing the Capital Development of the Economy: A Keynes-Schumpeter-Minsky Synthesis' (2015) Levy Economics Institute Working Paper No. 837, 2, http://www.levyinstitute.org/pubs/wp_837.pdf.

[12] Hyman Minsky described this as the 'acceptance' function of banking. See, e.g., *Stabilizing an Unstable Economy* (McGraw-Hill 2008 [1986]), 256: 'the fundamental banking activity is accepting, that is, guaranteeing that some party is credit worthy. A bank, by accepting a debt instrument, agrees to make specific payments if the debtor will not or can not. Such an accepted or endorsed note can then be sold in the open market.'

[13] See, e.g., J. P. Koning, 'Why Moneyness?' (*Moneyness*, 4 December 2012) http://jpkoning.blogspot.com/2012/12/why-moneyness.html: 'when it comes to monetary analysis, you can divide the world up two ways. The standard way is to draw a line between all those things in an economy that are "money" and all those things which are not … The second way to classify the world is to … ask the following sorts of questions: in what way are all of these things money-like? How does the element of moneyness inhere in every valuable object? To what degree is some item more liquid than another?'

[14] Robert Hockett and Saule Omarova, 'The Finance Franchise' (2017) 102 *Cornell Law Review*, 1143.

In this sense, commercial banking is, at least, in part, a form of delegated public policy-making,[15] whereby financial authorities establish regulatory standards and guidelines for the banking system, which, in turn, determines the kinds of profitable lending activities banks are permitted to engage in as franchisees of the monetary sovereign. Crucially, however, banks do not require a monopoly over the payments system or even any control over consumer payment accounts whatsoever in order to fulfil this social function. With the correct technical, accounting, and legal framework, it is possible to preserve the core underwriting and collateral evaluation functions of contemporary banking, even while allowing—and encouraging—deposit outflow as part of a broader shift towards a DFC-centered universal payments system.[16]

The remainder of this chapter proceeds as follows. Section II explores the legal, economic, and operational dynamics of modern commercial banking. Section III introduces a conceptual framework for evaluating the relevant features of a DFC-centred monetary regime. Section IV outlines one legal and accounting approach to preserving core features of modern banking under a DFC regime, while section V considers potential challenges and objections to such an approach. Section VI concludes by recommending further research into the macroprudential implications of digital fiat currency technology.

II. Modern Commercial Banking

In order to understand the relationship between digital fiat currency technology and the banking system, it is important to first clarify what is meant by modern commercial banking. Contrary to popular understanding, commercial banks do not simply act as intermediaries between borrowers and savers by lending out existing depositor funds, anchored by a 'fractional reserve'.[17] Instead, commercial bank lending involves the creation of new purchasing power, *ex nihilo*, through banks' acceptance of borrowers' loans, or other adequate collateral, in exchange for newly created demand deposits.[18] This process, in which loans make deposits, rather than the other way around, has been described as 'fountain pen' money, as bankers effectively create new monetary instruments with the stroke of a pen by approving new loans.[19]

From a balance sheet perspective, the act of 'acceptance' of a borrower's loan involves four simultaneous entries, consisting of two pairs of identical entries on the two actors' respective balance sheets:

1. The borrower records its new loan as a liability on its balance sheet;
2. the bank records the borrower's new loan as an asset on its balance sheet;
3. the borrower records the bank's new demand deposit balance as an asset on its balance sheet; and
4. the bank records its new demand deposit balance as a liability on its balance sheet.

[15] ibid., 1215.

[16] See, e.g., Dharmapalan and Grey (n 4). Note that this proposal is distinct from the traditional 'Chicago Plan' proposals, in that it proposes the separation of banks and payments institutions, rather than the complete elimination of banking itself. For more on the Chicago Plan and its limits, see Jan Kregel, 'Minsky and the Narrow Banking Proposal' (2012) Levy Economics Institute Public Policy Brief No. 125, http://www.levyinstitute.org/pubs/ppb_125.pdf.

[17] See, e.g., Michael McLeay, Amar Radia, and Thomas Ryland, 'Money Creation in the Modern Economy' (2014) Bank of England Quarterly Bulletin, Q1, https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf; Paul Sheard, 'Repeat After Me: Banks Cannot and Do Not "Lend Out" Reserves' (2013), Standard & Poor's RatingsDirect, https://www.kreditopferhilfe.net/docs/S_and_P__Repeat_After_Me_8_14_13.pdf.

[18] Banks only need to obtain reserves to settle interbank payments and transfers on behalf of customers to another bank or the government, or to satisfy minimum reserve requirements.

[19] McLeay et al. (n 17), 16.

Thus, the end result is that the borrower's balance sheet has both an asset (deposits) and liability (loan), and the bank has both an asset (loan) and liability (deposits).

In addition to accepting actors' unsecured IOUs, banks may also choose to accept certain kinds of real or financial assets as collateral for a secured loan, on the understanding that in the event of borrower default, the bank is granted rights over the pledged collateral. In these situations, banks are responsible for evaluating not only the creditworthiness of the borrower, but also the value of the underlying collateral. Thus, contemporary banking involves making decisions about the creditworthiness of actors and the value of collateral assets, often in combination.[20]

In addition to determining whether a borrower and/or pledged collateral is adequate to warrant extending a loan, banks also have to ensure that the loans they acquire are consistent with their regulatory requirements regarding capital adequacy, leverage, and liquidity coverage ratios.[21] Crucially, however, such requirements do not require the accumulation of passive, liquid settlement balances prior to extending a new loan.[22] Indeed, it is possible for a new loan to satisfy its own capital requirements, i.e. if the lending bank charges an origination fee that it then records as retained earnings.[23] Thus, the overriding limit on bank lending activity is not availability of loanable funds but the perceived profitability of the loan relative to the cost of the liabilities required to fund it.[24]

Funding costs include not only the rate of interest paid on the newly created deposits, but also the cost of securing any additional liquidity necessary to satisfy daily settlement needs and reserve requirements, if they exist. In a floating fiat currency regime, settlement liquidity is not restricted in quantity but is made available upon demand to the market, at a price consistent with the central bank's prevailing overnight rate target.[25] In such contexts, central banks must provide settlement reserves on demand to the banking sector, at whatever quantity they require, or else risk serious disruption to the payments system and loss of control over interest rate policy.[26]

The most simple and straightforward way for banks to acquire additional funding is to either sell assets or borrow the funds directly from the central bank at the prevailing discount rate, either on an unsecured basis or in exchange for pledging adequate collateral. By contrast, in countries with established interbank markets, and/or deep capital markets, banks have historically sought funding from banks and/or other financial institutions[27] first and only relied on the central bank as a last resort.[28] This is due, in part, to the perceived stigma

[20] Indeed, collateral-driven financial dynamics are a dominant driver of both commercial and shadow banking activity in the modern economy. See Daniela Gabor and Jakob Vestergaard, 'Toward a Theory of Shadow Money' (2016) The Institute for New Economic Thinking, https://www.ineteconomics.org/uploads/papers/Towards_Theory_Shadow_Money_GV_INET.pdf; Annalise Riles, *Collateral Knowledge: Legal Reasoning in the Global Financial Markets* (University of Chicago Press 2011).

[21] In addition, banks have additional non-financial regulatory requirements, such as Know-Your-Customer ('KYC') and Anti-Money Laundering ('AML'), that must be satisfied before extending a loan.

[22] Sheard (n 17).

[23] John Carney, 'Basics of Banking: Loans Create a Lot More than Deposits' (*CNBC.com*, 26 February 2018) https://www.cnbc.com/id/100497710, explains this process.

[24] In this context, 'funding liabilities' refers to the deposits issued to the borrower at the point of extension of the loan, which typically pay interest, and thus represent an interest-earning liability of the issuing bank. For an extended treatment of this issue, see Basil Moore, *Horizontalists and Verticalists: The Macroeconomics of Credit Money* (Cambridge University Press 1988).

[25] Scott Fullwiler, 'Modern Central Bank Operations—the General Principles' in *Advances in Endogenous Money Analysis*, edited by Louis-Philippe Rochon and Sergio Rossi (Edward Elgar 2017), 6.

[26] Scott Fullwiler, 'Setting Interest Rates in the Modern Era' (2006) 28(3) *Journal of Post Keynesian Economics*, 514: 'because the Fed must accommodate overnight and (even larger) intraday demands for reserve balances to achieve its target … the Fed's commitment to its target is always being "tested"'.

[27] In recent decades, the share of overall bank funding sourced directly from capital market lenders, as opposed to depositors, has increased dramatically. See, e.g., Adam Tooze, *Crashed: How a Decade of Financial Crises Changed the World* (Viking 2018), 111–12 (noting that prior to the 2008 crisis, less than 20% of Northern Rock's funding came from deposits).

[28] Since the implementation of quantitative easing following the global financial crisis, many banking systems around the world have been awash in excess settlement balances, causing the interbank lending market

of using the discount window,[29] and, in part, to the discount rate often being intentionally set above the prevailing market rate as part of an interest rate corridor system of monetary policy implementation.[30]

In addition, banks also seek to attract retail and wholesale depositors, who represent a relatively cheap and stable source of funds compared to the central bank or discount window.[31] For example, in an environment where the prevailing cost of overnight reserves is 2% but the average rate paid out to depositors is 1%, it may be cheaper to attract new depositors or poach existing depositors from other banks than to borrow reserves directly from the central bank or overnight money market. Unfortunately, this practice has given the impression that banks need to acquire deposits in order to then 'lend them out', when, in fact, deposits represent a liability of the bank and, thus, can never be 'borrowed' by the bank itself.[32]

Each of these approaches to obtaining additional liquidity (central bank discount window lending, interbank market borrowing, and deposit seeking) have different balance sheet dynamics and exert different effects on the broader financial system. Nevertheless, they represent equally viable sources of additional funding liquidity, even as their relative attractiveness depends on prevailing regulatory, market, and interest rate conditions.

Indeed, it is possible to imagine a context in which a bank continues to lend in the absence of both interbank lending *and* additional depositor funding. In such a system, bank settlement liquidity is obtained exclusively via direct overdrafts from the central bank on either a secured or unsecured basis.[33] As long as other regulatory requirements are satisfied, banks are free to continue making loans they perceive to be profitable relative to the prevailing overdraft interest rate.

Thus, it is clear that contemporary banks do not require customer deposits, or other forms of idle funds, in order to extend new loans.[34] Furthermore, the fact that central banks are required to defensively accommodate the banking system's demand for additional reserves in order to maintain control over its target interest rate,[35] as well as the existence of other banking system supports such as deposit insurance, clearly establishes that bank lending is not a purely private endeavour.[36] Rather, it represents a form of indirect government sponsorship of private activity undertaken by a privileged class of chartered, limited liability depository institutions.[37] Thus, as Hockett and Omarova argue, banks are best thought of today as licensed franchisees of the monetary sovereign, responsible for allocating the full faith and credit of the monetary sovereign in accordance with collateral and prudential regulatory standards intended to promote economic development and the capital formation of the economy.[38] Banks may exercise discretion in choosing which loans and forms of collateral

to largely dry up. See, e.g., Stephen Cecchetti and Kermit Schoenholtz, 'Bank Financing: The Disappearance of Interbank Lending' (2018) Money & Banking, https://www.moneyandbanking.com/commentary/2018/3/4/bank-financing-the-disappearance-of-interbank-lending.

[29] See, e.g., Mark Carlson and Jonathan Rose, 'Stigma and the Discount Window' (2017) Federal Reserve System —FEDS Notes, https://www.federalreserve.gov/econres/notes/feds-notes/stigma-and-the-discount-window-20171219.htm.

[30] See, e.g., George Kahn, 'Monetary Policy under a Corridor Operating Framework' (2010) Federal Reserve Bank of Kansas City Economic Review (Q4), https://www.kansascityfed.org/publicat/econrev/pdf/10q4Kahn.pdf.

[31] See, e.g., Ellen Brown, "Why Do Banks Want Our Deposits? Hint: It's Not to Make Loans' (*Web of Debt*, 27 October 2014) https://ellenbrown.com/2014/10/26/why-do-banks-want-our-deposits-hint-its-not-to-make-loans/.

[32] See Sheard (n 17).

[33] Ultimately, all settlement liquidity, including that which banks seek via interbank loans and depositor funding, originates from the central bank. Thus, of the three sources of liquidity identified above, it makes most sense to focus primarily on central bank's balance sheet.

[34] McLeay et al. (n 17). [35] Fullwiler, 'Setting Interest Rates' (n 26).

[36] Hockett and Omarova, 'The Finance Franchise' (n 14).

[37] See, e.g., Robert Hockett and Saule Omarova, 'Special, Vestigial, or Visionary? What Bank Regulation Tells Us About the Corporation—and Vice Versa' (2015) 39 *Seattle Law Review*, 453: '[r]ediscovering and reaffirming [the] painfully derived historical understanding of banks' public–private franchise nature should once again be at the top of our policy agenda'.

[38] Hockett and Omarova, 'The Finance Franchise' (n 14).

to 'accept', but their decisions are bounded and guided by the legal requirements of their banking charters, deposit insurance schemes, and the prevailing macroprudential regulatory framework.[39]

III. Imagining Digital Fiat Currency

There are many varying proposals to extend the range of financial services and products offered directly by the public sector. Many of these proposals share similar policy goals and operational outcomes but differ in the legal or institutional form by which they seek to achieve them. For example, proposals to introduce postal/public bank and central bank retail accounts share many similarities in terms of their impact on consumer behaviour and their ability to provide a public option in contrast to private banks but they have vastly different implications for intra-government legal and accounting practices.

For the purposes of this chapter, a DFC regime is defined as a monetary regime with a universally accessible and interoperable payments network, managed by the government, which settles and stores balances in digital fiat currency units that are legal tender[40] and are readily convertible at par with other forms of government currency. Such a regime could be implemented via universal retail central bank or public/postal bank deposit accounts[41] and/or a decentralized e-wallet network in which wallet-holders exchange DFC balances without intermediaries via an open, secure transaction protocol, similar to certain kinds of mobile money transactions today.[42]

Under such a regime, individuals could manage their own accounts or wallets, or, alternatively, could authorize payments intermediaries to make transactions from their wallet on their behalf.[43] Intermediaries could even host or manage accounts or wallets on their clients' behalf, similar to commercial email hosts or lawyers' escrow accounts. Unlike with commercial banking, however, the individual would retain direct ownership over the DFC balance in question, rather than exchanging it for a generalized deposit liability against the intermediary.[44]

In addition to expanding the availability of basic consumer banking services, a DFC regime could significantly improve the stability of the broader financial system by providing large, institutional investors with access to safe, cash-like accounts not subject to deposit

[39] See, e.g., the guidelines issued by the Federal Reserve regarding what collateral they would accept in discount window lending. Federal Reserve Discount Window, 'Pledging Collateral' (2018) https://www.frbdiscountwindow.org/RightNavPages/Pledging-Collateral.aspx.

[40] The critical aspect of legal tender status that gives an instrument a high degree of moneyness is acceptability in payment of taxes. Acceptability for payment of private debts is an additional benefit to an IOU's 'moneyness', but not a necessary one.

[41] See, e.g., Ricks et al. (n 2); Baradaran (n 3).

[42] See Dharmapalan and Grey (n 4).

[43] Such a set-up would allow for competition and choice in consumer-facing, API-layer applications, whilst preserving the standardization and integrity of the back-end accounting database.

[44] The relevant legal principle is that of 'bailment', which predates the origins of transferable deposit law in the sixteenth century. According to legal-monetary historian Benjamin Geva, there were originally two different kinds of bailment rights relevant to monetary custodianship: the first concerned bailment with respect to a sum of money, which gave rise to a rightwhile; the second concerned bailment over a particular 'bag' or 'box' that contained money. Benjamin Geva, 'Bank Money: The Rise, Fall, and Metamorphosis of the "Transferable Deposit"' in *Money in the Western Legal Tradition*, edited by David Fox and Wolfgang Ernst (Oxford University Press 2015), 361. The former, known as a 'right of debt', ultimately developed into the modern depository obligation, while the latter, also known as a 'right of detinue', remained focused on chattel property. ibid., 362. In the context of government-managed accounts, the right of debt would likely suffice, whereas for individual wallets, a right of detinue would be necessary to prevent mixing between the individual wallet holder's funds and the intermediary's funds. See Richard Werner, 'How Do Banks Create Money, and Why Can Other Firms Not Do the Same? An Explanation for the Co-existence of Lending and Deposit-Taking' (2014) 36 *International Review of Financial Analysis*, 71, arguing that contemporary banks' unique money-creation powers derive in part from the relaxing for banks of standard Client Money Rules, which prevent the mixing of client and personal funds.

insurance caps.[45] This, in turn, would reduce demand for private 'near-monies' and treasury securities to serve as alternative forms of 'wholesale money'.[46]

A DFC regime could also potentially simplify monetary and fiscal policy operations by facilitating direct monetary finance of fiscal spending (while monetary policy is maintained entirely through central bank balance sheet operations).[47] Under such a system, monetary policymakers could pay interest directly on DFC accounts[48] and/or issue central bank securities and other instruments to maintain a government securities market and a maturity yield curve if they so desired.[49] This would also eliminate the need for banks and other financial intermediaries to serve as primary dealers in treasury auctions, thereby further reducing entanglement between public financial operations and the banking system.[50]

IV. Commercial Bank Lending under a DFC Regime

As discussed in section II, commercial bank lending is best understood as the franchised extension of sovereign monetary power to a limited class of licensed financial institutions. These institutions are empowered to extend the full faith and credit of the sovereign to borrowers, in accordance with public lending standards, in pursuit of profit and the capital development of the economy. Furthermore, while commercial bank loan-making occurs primarily via accounting operations conducted on the bank's balance sheet, the socially valuable aspects of credit and collateral analysis take place off the balance sheet. Thus, they can be maintained even under a different monetary regime with different accounting practices.

In the context of a DFC regime, the fundamental design question is how to accommodate large-scale deposit flight away from the banking system and into the DFC system without undermining bank lending activity. Or, to put it another way, the challenge is how to create a banking system that does not include any bank deposits.

From an accounting perspective, the solution to this problem is remarkably simple. Commercial banks could be authorized to extend DFC overdrafts directly to successful loan applicants who are creditworthy and/or whose proffered collateral meets prudential regulatory standards. Such overdrafts could be obtained from the government (or central bank) via a secure loan, collateralized by the newly created loan asset.[51] These DFC overdrafts would,

[45] Currently, in the United States, deposit insurance is capped at $250,000 per account, thereby limiting its functional use for large, institutional cash-pool investors.

[46] According to Poszar (n 10), the undersupply of safe, government-guaranteed instruments, in the form of either insured bank deposits or government-guaranteed cash/securities played a large role in the growth of shadow banking activity prior to the global financial crisis.

[47] For example, the treasury could announce that all future fiscal spending would be implemented through the direct injection of DFC balances, which would be offset by the simultaneous issuance of new central bank securities at auction. From the market's perspective, the end result of this process would be functionally similar to the Treasury conducting a securities auction, and the central bank engaging in open market operations ('OMOs') in order to sterilize any imbalances in reserve levels caused by the auction (or subsequent fiscal spending). See, e.g., Scott Fullwiler, 'Treasury Debt Operations: An Analysis Integrating Social Fabric Matrix and Social Accounting Matrix Methodologies' (2011), Social Science Research Network Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1825303.

[48] It could be possible, for example, to conduct monetary policy via paying interest directly on excess DFC balances, similar to the practice of paying interest on excess reserves. See Scott Fullwiler, 'Paying Interest on Reserve Balances: It's More Significant Than You Think' (2004), Social Science Research Network Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1723589.

[49] For more on the central bank securities and their capacity to serve as a substitute for treasury securities in money market operations, see Simon Gray and Runchana Pongsaparn, 'Issuance of Central Bank Securities: International Experiences and Guidelines' (2015), International Monetary Fund Working Paper No. 15-106, https://www.imf.org/external/pubs/ft/wp/2015/wp15106.pdf.

[50] Of course, this disentanglement process would likely require structural changes to existing public budgeting and accounting practices.

[51] It would also be possible to achieve a similar result via extending unsecured loans; however, for reasons discussed below, such an approach would be less desirable from a macroprudential regulatory perspective, as it would limit the ability of regulators to inspect bank assets and would permit banks to continue to sell, lend, and pledge their assets in the secondary lending markets, rather than holding them to maturity.

in turn, be recorded as a liability of the lending bank, and an asset of the government (or central bank).[52]

Hence, the four-entry accounting record of a bank loan described in section II would be replaced with a six-entry process, reflecting the government's new role as explicit central counterparty to the transaction:

1. The borrower records its new loan as a liability on its balance sheet;
2. the bank records the borrower's new loan as an asset on its balance sheet;
3. the borrower records its new DFC balance as an asset on its balance sheet;
4. the government (central bank) records the new DFC balance as a liability on its balance sheet;
5. the bank records its DFC overdraft as a liability on its balance sheet; and
6. the government (central bank) records the bank's DFC overdraft as an asset on its balance sheet.

For the borrower, the end result is functionally identical to under the current process of obtaining a loan, except that they end up holding DFC balances as an asset, rather than demand deposits.[53] Given that DFC balances would not have deposit insurance caps and would be more interoperable across payments media than deposits, this represents an improvement in security and flexibility for the borrower.

For the lending bank, however, the accounting treatment is somewhat similar but the legal and financial dynamics are very different. In particular, the bank's balance sheet features a new loan asset, and a new DFC overdraft liability (instead of a deposit liability) and its profits are still determined by the spread between the risk-adjusted return on the loan, and the prevailing interest rate paid on the DFC overdraft. However, because the bank pledges the new loan asset as collateral to secure the DFC overdraft, it retains the right to any income earned on the asset but is unable to securitize, sell, or repledge the loan in the secondary market. Furthermore, the bank must maintain a DFC overdraft equivalent to the full value of the loan, in contrast to the current system, whereby it must only seek reserve balances to satisfy settlement and minimum reserve requirements. Thus, a DFC system restricts secondary market trading, forcing banks to effectively hold loans to maturity, while simultaneously replacing depositor funding risk with central bank-determined interest rate risk.[54]

For the government, the regulatory and accounting treatment of bank lending is also vastly different under a DFC regime, along with most other aspects of macroeconomic policy. First, providing automatic DFC overdrafts for the full value of loans at the point they are made effectively transforms the discount window from a liquidity provider of last resort into a lender of first resort for the banking system.[55] This, in turn, eliminates the need for interbank lending markets and significantly reduces the risk of liquidity crises and contagion

[52] In many respects, this set-up resembles the US financial system in the postbellum era. At that time, national banks pledged government securities to the treasury in exchange for national bank notes, which circulated as legal tender currency. However, because government securities were in limited supply, demand for bank notes outstripped capacity, encouraging the rise of new forms of shadow 'near monies'. By contrast, under the approach proposed here, intermediaries would be permitted to submit a wider range of collateral in exchange for DFC balances, thereby reducing the pressure to provide alternative monies. See Nathan Tankus, 'Receivability for Public Dues: The Unrecognized Glue of the Antebellum Monetary System' (2019), Institute for Sustainable Prosperity Working Paper (unpublished); Howard Bodenhorn, *A History of Banking in Antebellum America: Financial Markets and Economic Development in an Era of Nation-Building* (Cambridge University Press 2000).

[53] Another way of viewing this transaction is as a quasi-fiscal operation, in which the lender, acting as a public spending franchisee, makes a payment of new DFC dollars to the borrower, and later 'taxes' back an amount equivalent to the total repayment amount of the loan.

[54] As discussed in section II, this would not be an issue in terms of bank lending rates, provided the policy rate was kept sufficiently low.

[55] See Ricks et al. (n 2).

in the event of bank failure. Second, providing safe, liquid DFC funds directly to borrowers, and insulating them from direct exposure to their lending bank, effectively eliminates the need for deposit insurance, while significantly reducing the likelihood of commercial banks becoming 'too big to fail'. Third, requiring banks to pledge their entire loan book as collateral in exchange for DFC overdrafts increases financial market transparency and makes it easier for regulators and auditors to inspect the quality of loans and experiment with different risk models used for evaluating loans and collateral.[56] Fourth, making explicit the fiscal/monetary aspect of bank lending allows policy-makers and the public to directly compare the social value of additional lending compared to additional public spending and to compare the broader effects of banking activity on the macroeconomy.

Therefore, it is clearly possible to preserve, and even strengthen, basic commercial banking services under a DFC regime, albeit in ways that potentially alter and transform the existing financial system and underlying power dynamics between customers, banks, and public authorities.[57]

V. Criticisms and Concerns

One potential objection to this approach is that it would drastically expand the government's presence in lending markets and expose it to potential financial losses in the event of bank failure. While this is accurate, there is nothing intrinsically harmful or undesirable about a large government balance sheet expansion accompanied by a parallel contraction in the combined balance sheet of the banking system. Indeed, such a shift would significantly reduce the implicit public subsidies granted to the banking system as well as the economic and regulatory costs of maintaining deposit insurance and other forms of banking support. Furthermore, eliminating interbank lending and keeping customers' funds ringfenced away from banks' balance sheets will reduce the fragility and interconnectedness of the banking system, thereby minimizing the systemic costs of individual bank failure.

Another objection is that requiring banks to borrow DFC balances equivalent to the full value of their loan books is significantly more costly than requiring them to borrow reserves for interbank settlement and other liquidity-related needs. However, this concern is easily addressed. Simply by reducing the interest rate charged on DFC overdrafts until the effective cost of funds is similar or equivalent to what it would be under a traditional banking system. Alternatively, it would be entirely feasible to establish a permanent zero interest rate on DFC overdrafts to lending institutions and instead regulate overall bank lending rates through qualitative credit controls and adjustments to bank lending fees and tax rates.

A third concern is that such a system would place an excessive administrative burden on the government, both in terms of liquidity provisioning and loan/collateral review and inspection. While it is undoubtedly true that transitioning to a DFC regime would require a large-scale restructuring of existing public financial regulatory practices as well as a carefully managed transitional period, the end result would be a much more coherent financial architecture and macroprudential framework, which, in turn, would simplify regulatory enforcement and reduce administrative overhead. Thus, any additional administrative costs of DFC system regulation would likely be offset by the reduced costs of banking system regulation as well as the improved efficiency of the underlying payments and banking system.

A fourth concern is that a DFC-based system would peel back the 'monetary veil' of how public finance and banking actually work, thereby causing a general market panic

[56] In this sense, a DFC-based banking system has the potential to improve capital risk weighting practices and refigure the debate over future modifications to the Basel Accords.

[57] The implications of a DFC system for shadow banking and the financial system more general are equally important questions; however, it is beyond the scope of this chapter to attempt to address them here.

and collapse in the value of currency and the financial system more broadly.[58] While this is possible, it is far more likely that a DFC regime would do exactly the opposite. It would serve as a teaching moment to educate the populace about how money and banking actually work and, in doing, so open up new spaces for debate and political action in ways that improve the financial system.

VI. Conclusion

DFC technologies today are still in their infancy, with a wide range of models and permutations vying for viability and dominance. As central bankers and the broader public begin to consider more seriously proposals for new, large-scale public payments and banking infrastructure reform, the second- and third-order economic and regulatory implications of DFC technologies are likely to receive increasing attention and scrutiny.

For advocates of expanded public payments and banking services, it is critical to develop a clear and comprehensive vision of the interaction between DFC technologies and the broader financial system, including banking activities, in order to address theoretical and practical concerns and objections in the planning stage. This chapter offers only a brief glimpse of such a vision. Further research is necessary to address more granular questions relating to: (i) loan approval and discount window operations; (ii) collateral adequacy and loan evaluation standards; (iii) bank balance sheet reporting requirements; and (iv) the implications of DFC technology for shadow banking and collateral-based capital market activity.

Overall, DFC technology, if properly designed and implemented, could revolutionize the payments system, and with it the financial system and economy more broadly. Just as importantly, it has the potential to spark a new public discussion around money, banking, and the future of the financial system.

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[58] See, e.g., Neil Buchanan, 'If You're Explaining, Everyone's Losing (Platinum Coin Edition)' (*Dorf on Law*, 11 January 2013) http://www.dorfonlaw.org/2013/01/if-youre-explaining-everyones-losing.html: 'If the [trillion-dollar platinum coin is] merely an accounting fiction … then why should anyone care? We should care, because looking "undignified" is not merely a matter of rustling the hoop skirts of nervous Nellies. Even business columnists at top newspapers like *The New York Times* make a big deal of the Fed "creating money out of thin air," … We are … talking about pulling back the curtain on the entirely ephemeral nature of money and finance itself. That will affect not just Wall Street traders, but everyone in the world. A monetary system simply cannot work if people do not collectively take a leap of faith.… If the delusion starts to fall apart, then there are very real, very negative effects.'

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