Fall 2023

CBDC+: Why CBDC Proposals Need to Become More Comprehensive to Succeed

Muharem Kianieff
University of Windsor, Faculty of Law

CBDC+: WHY CBDC PROPOSALS NEED TO BECOME MORE COMPREHENSIVE TO SUCCEED

By: Muharem Kianieff[*]

I. INTRODUCTION

The rise of modern private money in the form of cryptocurrencies is a development that has always been viewed with some apprehension by Central Banks. Many of these Distributed Ledger ("DLT") and Blockchain based concepts were previously seen as too niche to pose a threat to fiat money which had an established user base, backed by decades of goodwill, and solidified through lock-in. While Central Banks around the world had some curiosity regarding any technological innovations that could be offered by cryptocurrencies, Central Banks and regulators have been careful not to extend regulation to these products in the early 2020s. Instead, they chose to follow a 1990s ethos of that was predominate during the initial emergence of the internet era and the debates surrounding its regulation – namely the familiar refrain that premature regulation would end up "killing innovation."[1] Consequently, this wait and see attitude has meant that Central Banks in the developed world have simply continued supplying money to the public using the same tried and true methods on the established payment rails that they always did.

The emergence of the COVID-19 pandemic, coupled with the then-eminent launch of Facebook's Libra (since renamed as "Diem") had brought a new sense of urgency to Central Bankers that their monopoly on the money supply could

* Full Professor, University of Windsor (Canada), Faculty of Law. B.A. (Hons.) Trent University 1997, LL.B. Osgoode Hall Law School 2000, Ph.D. Osgoode Hall Law School 2008. I would like to thank Benjamin Geva for all of his helpful comments and suggestions on an earlier draft of this paper. Many thanks also to Professor Leonard I. Rotman, Nev Kent, George Xhabija, Besa Xhabija, Sevil Kianieff, Yasmine Kianieff and Bret Kianieff for their thoughts and support. I am also grateful to the KJLPP staff for their excellent editorial assistance. Any errors and omissions are mine alone.

[1] Gregory Barber, *Cryptocurrency Firms Renew Push to Break Free From SEC Rules*, WIRED (May 30, 2019), https://www.wired.com/story/cryptocurrency-firms-renew-push-break-free-sec-rules/ [https://perma.cc/Q2WP-97CZ]; *See* Brian D. Feinstein & Kevin Werbach, *Does Regulation Chill Cryptocurrency Trading?*, THE REGULATORY REVIEW (Aug. 31, 2020), https://www.theregreview.org/2020/08/31/feinstein-werbach-does-regulation-chill-cryptocurrency-trading/ [https://perma.cc/7K45-7QJ2].

face its first credible challenge in years.[2] The development of the former Libra was the first time a cryptocurrency had emerged with the backing, and built in userbase, of a global social media giant. Secondly, the need to provide financial benefits to those who were adversely affected by the COVID-19 pandemic had exposed many of the inefficiencies and lags of the current payment system in getting those benefits into the hands of recipients.[3]

These developments have served as an impetus for Central Banks to consider whether to offer a Central Bank issued digital currency ("CBDC") that is meant to serve as a replacement for paper-based money. The innovation that is associated with developing a digital currency has also provided for a unique opportunity to reconsider how consumers can access payment mechanisms and conduct retail banking following the emergence of new fintech technologies. As such, this is a prescient time for policy makers to reconsider financial reform efforts to leverage new technological developments as a means of making the payments system more efficient.

This paper will consider some of the challenges facing Central Banks as they attempt to navigate these pressing challenges. In particular, the paper will assess the relative prospects for success for some of the more popular CBDC proposals and identify potential avenues for Central Banks to improve the efficiency of their retail payment systems. Part One will examine some of the more prominent proposals that utilize a combination of increasing access to financial services through a digitization of conventional bank notes to be supplied either directly as accounts operated by Central Banks, or through conventional intermediaries that utilize the payment rails to be established by a Central Bank to provide access to their customers to digital banknote equivalents. Part Two will consider how these present efforts can be enhanced by re-examining the roles that Central Banks play in enhancing economic efficiency. Attention will be paid to recent advances pioneered in fintech in order to reimagine the role played by Central Banks in facilitating the circulation of money and credit throughout the economy. Part Three will address some of the criticisms of the existing CBDC proposals and will offer thoughts on how to mitigate some of the risks involved.

---

[2] Anna Baydakova, *Sandboxes Aren't Enough: Blockchain Leaders Seek Regulation Relief*, COINDESK (Sept. 25, 2018), https://www.coindesk.com/sandboxes-arent-enough-blockchain-leaders-seek-regulation-relief/ [https://perma.cc/K83S-D4XA]; *See also,* Mike Orcutt, *Three things central bankers can learn from Bitcoin*, MIT TECH. REV. (March 13, 2020), https://www.technologyreview.com/s/615362/mit-central-bank-digital-currency-bitcoin/. [https://perma.cc/G89E-22JP]; Corrine Zellweger-Gutknecht, Benjamin Geva & Seraina Neva Grunewald, *The ECB and Euro E-Banknotes*, 17 (2020) (Draft), https://digitalcommons.osgoode.yorku.ca/cgi/viewcontent.cgi?article=3805&context=scholarly_works. [https://perma.cc/SY34-9RCN].

[3] J. Christopher Giancarlo, Alex Tapscott & Dan Tapscott, *Going Cashless: The Digital Dollar in the Face of COVID-19*, BLOCKCHAIN RSCH. INST., 22 (2020), https://briwebinars.s3.us-east-2.amazonaws.com/Research/Giancarlo-Tapscott_Going+Cashless_Digital+Dollar_Blockchain+Research+Institute.pdf?utm_campaign=Sales%20Leads&utm_medium=email&_hsmi=89366615&_hsenc=p2ANqtz--l0UrA9ePxVGJKOmRFW7PSUm58ddCAFS9i_Fnj6XsPgOkQn_v9KUIuC8uUmmDEIMffffhKy0wNkjatGOvRY_sb9TYuz7w&utm_content=89366615&utm_source=hs_email. [https://perma.cc/E5AT-748B].

A. Economic Efficiency as a Predictor of Success

Before proceeding, it may be helpful to set out the theoretical framework that will be used to evaluate the efficacy of the various proposals under consideration. In 1997, as stored value cards were being discussed as a possible evolution in consumer retail electronic payments, the American Bar Association created a task force that was charged with evaluating what changes in the existing legal frameworks were necessary to facilitate consumer adoption of the then-new concept of stored value cards.[4] The task force noted that American monetary history suggests a correlation between economic prosperity and payments efficiency.[5] The task force reasoned:

> Commerce and industry thrive when both the maker and the receiver of a payment for a good, a service, or financial transaction have confidence that good value is being delivered. Conversely, when the maker or a receiver of a payment loses confidence that good value is being exchanged, commerce and industry tend to slow down.[6]

One can reasonably conclude that any efforts to increase the efficiency of a means of payment will have a significant impact on the economy as a whole by virtue of the fact that public confidence in payment products will provide greater acceptability of new payment mediums of exchange. Indeed, the lack of public confidence in certain entities has made private cryptocurrencies that compete in this space less desirable than government issued media of exchange that have benefitted from decades of public goodwill towards Central Banks.[7]

The relative efficiency gains that are offered by a CBDC are a useful measure to assess recent proposals against each other in order to predict which model has the greatest possibility of success. Obviously, a major factor that will have to be considered is to what extent transactions costs are lowered both from an infrastructure perspective, and to consumers in the form of lower service fees that may result from the adoption of one of these models. These savings, if any, can generally arrive through increasing returns to scale that result from a Central Bank spreading the costs of a system implementation across the entire monetary base, and through technological and system design advances that lower costs

---

[4] American Bar Association Task Force on Stored Value Cards, *A Commercial Lawyer's Take on the Electronic Purse: An Analysis of Commercial Law Issues Associated with Stored-Value Cards and Electronic Money*, 52 BUS. LAW. (1997).

[5] *Id.*

[6] *Id.*

[7] Muharem Kianieff, *A Question of Trust: Facebook Libra as Money in the Legal and Economic Sense*, 12 CASE W. RESERVE J. L., TECH. & INTERNET 21 (2021).

that can then be used to either finance the system itself, or be passed along to consumers through lower service fees[8].

II. THE EMERGENCE OF CBDC PROPOSALS IN THE POST COVID-19 PANDEMIC ERA

The COVID-19 pandemic has brought further attention to structural inefficiencies that plague consumer retail electronic payments. As Mehrsa Baradaran notes, nearly twenty-five percent of the American population are unbanked or underbanked.[9] This results in low-income families spending about ten percent of their total income in fees to alternative service providers in order to access their money.[10] Being underbanked brings tremendous transactions costs with respect to every financial transaction that an underbanked or unbanked individual must carry out. This includes incurring costs to send and receive money, cash checks, use debit cards and engage in other types of commercial activity that is routine and nearly free for most Americans.[11]

These changes have also been exacerbated by a changing regulatory environment and the aftereffects of the subprime mortgage crisis that have resulted in changes in the banking industry.[12] Communities in lower income zip codes and rural areas have been devastated as banks have closed branches leaving many communities with no access to physical banking facilities.[13] The results of this withdrawal has a cumulative effect on the economy in general in what has been termed "banking deserts" where local economic activity has declined by twenty percent following the withdrawal of physical banking services.[14] These banking deserts have also increased an underaged resident's risks of a poor credit profile with negative effects lasting long into adulthood.[15]

Banking deserts tend to affect individuals who have a low-income and disproportionately affect African American and Latin American communities.[16] These effects can be attributed to payment system frictions that relate to the access and timing frictions inherent in the current payment system that is dependent on financial intermediaries.[17] The privatized nature of the payment system results in access to payments depending in large part on how profitable

---

[8] *See* discussion *infra* Part II.

[9] *Testimony of Mehrsa Baradaran: Hearing on Banking the Unbanked: Exploring Private and Public Efforts to Expand Access to the Financial System Before the H. Subcomm. on Comsumer Protection and Financial Institutions of the H. Comm. on Financial Services*, 116 th Cong. (2020) (statement of Mehrsa Baradaran), https://financialservices.house.gov/uploadedfiles/hhrg-116-ba00-wstate-baradaranm-20200611.pdf. [https://perma.cc/X9WM-BCPT].

[10] *Id.*

[11] *Id.*

[12] *Id.*

[13] *Id.*

[14] *Testimony of Nakita Q. Cuttino Before the S. Comm. on Banking, Housing and Urban Affairs*, 116th Cong. 2 (2020), https://www.banking.senate.gov/imo/media/doc/Cuttino%20Testimony%206-30-20.pdf. [https://perma.cc/U8A2-7YK3].

[15] *Id.*

[16] *Id.*

[17] *Id.*

an individual is to banks.[18] The source of these profits include transactions costs for consumers such as minimum balance requirements, account fees and maintenance fees.[19]

The presence of these various fees and costs inevitably hinders the efficiency of the present consumer payment systems. Notice as well that this does not take into account some of the costs that Morgan Ricks has termed "tolls" to use private payment infrastructure.[20] The most prominent of these are the interchange fees that are currently a feature of modern credit and debit card networks.[21] These costs are ultimately passed on to consumers in the form of higher prices, that ought to be considered, as yet another inefficiency that is associated with the status quo.[22]

Moreover, one needs to consider the *indirect* costs that contribute to payment inefficiencies that are associated with the present consumer payment rubrics. These are the lags that plague the status quo, which ultimately compound many of the fees and charges that are described above. For instance, the fact that the current payment infrastructure results in delays in getting funds into the hands of individuals, in contrast to the real time settlement regimes associated with modern electronic payment processing, can result in numerous late fees and overdraft fees being assessed on consumers. This is particularly the case with individuals that still rely on checks that need time to clear before funds are available.[23] The effects of delays in receiving pay checks for example, is a significant hurdle for low and fixed income households, as waiting times for checks to clear will result in the inability to pay a bill on time, having to rely on overdraft, incurring service and late fees, or having to rely on costly alternative sources of credit.[24] Conversely, the ability to receive consumer payments instantly is beneficial for small businesses as well, as this would be helpful in managing cash flows when capital is tied up in materials or inventory.[25]

The present payment system brings with it several concerns vis-à-vis inefficiencies both in a pecuniary sense and in terms of accessibility. These inefficiencies threaten to weaken the competitive position of paper-based currencies that rely on traditional financial intermediaries, against the new

---

[18] *Id.*
[19] *Id.*; *See also, Testimony of Morgan Ricks before the Task Force on Financial Technology of the H. Comm. on Financial Services*, 116th Cong. 2–3 (2020), https://financialservices.house.gov/uploadedfiles/hhrg-116-ba00-wstate-ricksm-20200611.pdf. [https://perma.cc/K3KP-HMJK].
[20] *Id*. at 6.
[21] *Id.*
[22] *Id.*
[23] Lael Brainard, *The Future of Retail Payments in the United States*, Address at the Board of Governors of the Federal Reserve System at the FedNow Service Webinar, 2 (Aug. 6, 2020).
[24] *Id.*
[25] *Id.*

crypto-currency based upstarts posing the first major challenge to the hegemony of fiat-based currencies in decades.

However, rather than taking a cynical view that Central Bank efforts to modernize their payment infrastructure is a means of maintaining this hegemony, the better view is to see the process as a healthy one that is forcing regulators and innovators alike to redress many of the difficulties that plague the status quo. In other words, the challenge for Central Bankers around the world is to reconsider how best to fulfil their *mandates* to provide a safe and efficient payment system for their respective jurisdictions and reimagine ways that they can do this better by leveraging technology. Sometimes this may take the form of working with the private sector, at other times, it may result in an increasing role for the public sector in increasing the efficiency of payment systems.

A. Recent CBDC Proposals

In a 2020 article, Auer and Bohme neatly summarize various proposals that are designed to implement a CBDC.[26] They draw a distinction between Direct, Indirect and Hybrid models that rely on either a token or account-based concept of a digital currency.[27] The main differences between these various models revolve around their reliance on traditional financial intermediaries to supply and distribute a CBDC to consumers.[28] These differences manifest themselves legally with respect to the nature of the claim against the Central Bank, and with respect to the nature of the records that are kept by the Central Bank.[29]

With respect to the differences between an account-based CBDC and a token-based one, it may be helpful to illustrate some of the distinguishing features of the two before moving on to consider how CBDCs are implemented in these various proposals. Digital tokens are the closest to existing physical forms of money, as they are the electronic equivalent of a direct claim on the Central Bank, and possess the anonymity and peer-to-peer transferability that is most similar to Central Bank notes.[30] By contrast, proposals that utilize account-based CBDCs rely on giving individuals access to accounts held at the Central Bank in much the same way that banks currently enjoy now.[31] The difference between these accounts and conventional deposit accounts held at banks is that these accounts would not offer overdraft facilities.[32] However, these accounts are promoted as offering all of the special features that banks currently enjoy with respect to their Central Bank accounts in addition to some complementary features.[33]

---

[26] Raphael Auer & Rainer Böhme, *The Technology of Retail Central Bank Digital Currency*, BANK FOR INT'L SETTLEMENTS Q. REV., 85 (2020).
[27] *Id.* at 88.
[28] *Id.*
[29] *Id.* at 90.
[30] John Crawford, Lev Menand & Morgan Ricks, *FedAccounts: Digital Dollars*, 89 GEO. WASH. L. REV. 113, 117–88 (2020).
[31] *Id.* at 151.
[32] *Id.* at 116–17.
[33] *Id.*

B. Direct CBDC Models

The account based CBDC is featured prominently in proposals that provide for a Direct CBDC. A Direct CBDC is operated by the Central Bank itself and does not rely on intermediaries by doing away with them.[34] Under this system, the Central Bank would maintain records of all direct claims on the bank, and would update them as transactions would be processed.[35] The fact that the claims are made on the Central Bank also means that these records of "account money" would be placed on par with government-issued physical currency. [36] This would result in a resource that would be transformed into one that anyone could use.[37] The central feature on the direct model is that it would be the Central Bank itself that is charged with the task of processing payments.[38] This point should not be understated. By virtue of the fact that a Central Bank has a public policy, rather than a profit objective, enables it to espouse neutrality as a guiding feature in providing services to users, and provides for the building of a more open and inclusive system.[39]

One of the novel variants of Direct CBDC proposals, is that the provision of banking facilities to all citizens (including individuals in underserviced communities) would occur through a combination of electronic and physical means. These proposals would utilize the post office as a means of providing access to Account Based CBDCs as a means of increasing access to financial services.[40] This is reminiscent of the Post Office Savings Bank that opened in the UK in 1861.[41] In the United States, a similar system existed from 1911 to 1967, accumulating by the end of World War II around 10% of the assets of the commercial banking sector.[42]

It should be noted that, with respect to the onboarding of customers to the Direct model, compliance with Know Your Customer ("KYC") and customer due diligence is a function that is left undetermined.[43] In theory these functions

---

[34] Auer & Böhme, *supra* note 26, at 90.
[35] *Id.* at 88.
[36] Crawford, Menand & Ricks, *supra* note 30, at 117–18.
[37] *Id.* at 117.
[38] Auer & Böhme, *supra* note 26, at 88.
[39] BANK FOR INT'L SETTLEMENTS, *Central Bank Digital Currencies: Foundational Principles and Core Features* 2 (2020), https://www.bis.org/publ/othp33.pdf [https://perma.cc/G5UN-28PM].
[40] *See, e.g.*, Baradaran, *supra* note 9; Cuttino, *supra* note 14; *See also* Nicole Goodkind, *Bloomberg, Sanders, and Warren Want to Use Post Offices as Banks*, FORTUNE (Mar. 4, 2020), https://fortune.com/2020/03/04/post-office-banks-sanders-warren-bloomberg/ [https://perma.cc/F446-53NB]; BANK FOR INT'L SETTLEMENTS, *supra* note 39.
[41] Jesús Fernandez-Villaverde, Daniel Sanches, Linda Schilling & Harald Uhlig, *Central Bank Digital Currency: Central Banking for All?* 5 (Fed. Rsrv. Bank Phila., Working Paper No. 20-19, 2020), https://www.philadelphiafed.org/-/media/frbp/assets/working-papers/2020/wp20-19.pdf?la=en [https://perma.cc/2YDT-ZTYT].
[42] *Id.*
[43] Auer & Böhme, *supra* note 26, at 90.

could be carried out by the Central Bank itself, be contracted out to a private sector actor, or be conducted through the auspices of another public sector institution.[44] Moreover, this is a feature that is also present in Direct models that rely on a provision of currency using digital tokens. Under this variant, the Central Bank would issue a "digital banknote" that would be the feature of the payment service offered by the Central Bank.[45] The private sector would be responsible for fulfilling the KYC and onboarding functions described above.[46]

As for the nature of the legal claim on the Central Bank with respect to its obligations recorded in the account, the Direct model ensures that the claim is one on the Bank itself. It is the Central Bank that must bear the ultimate responsibility for dispute resolution, KYC and related services.[47] This feature of the Direct model has naturally resulted in a feeling of trepidation among Central Bankers who are faced with a considerable broadening of their mandates in order to bring the system to fruition.

The apprehension of Central Bankers can be attributed to two factors. First, the system would have to be developed in order to enable offline capabilities for both the CBDC system and any dependencies.[48] Second, the compromises of eliminating a dependence on intermediaries comes at a cost in terms of the payment system's reliability, speed and efficiency, ultimately affecting the viability of a CBDC to displace a conventional payment mechanism.[49]

On the other hand, one must not underestimate the effect that the legal framework that underpins the CBDC can have on mitigating some of these risks and increasing consumer acceptability. The power to compel public acceptability of the new payment medium through legal tender laws, and various changes that could be made even to the KYC regime will help to mitigate some of the costs associated with reducing a dependence on intermediaries *ceteris paribus*.

C. Indirect CBDC Models

Rather than having the Central Bank assume all of the responsibility for the operation of the payment system as is the case in the Direct model, the Indirect model (also referred to as the "synthetic CBDC" or "two tier" model) utilizes

---

[44] *Id.*
[45] *Id.*
[46] *Id.*
[47] *Id.* at 89–90; *See* Benjamin Geva, Seraina N. Grunewald & Corinne Zellweger-Gutknecht, *The e-Banknote as a "Banknote": A Monetary Law Interpreted*, 41 OXFORD J. LEGAL STUD. 1119, 1135 (2021).
[48] BANK FOR INT'L SETTLEMENTS, *supra* note 3939, at 5; *See also* Auer & Böhme, *supra* note 26, at 90 (as is noted by Auer and Böhme) ("Electronic payments must deal with connectivity outages or offline payments, which involve risk-taking by intermediaries. Importantly, it is the customer relationship – based on KYC – that allows an intermediary to accept such risks. Unless a Central Bank were to take on responsibility for KYC and customer due diligence – which would require a massive expansion of operations, well beyond existing mandates – it would find it difficult to provide this service.").
[49] Auer & Böhme, *supra* note 26, at 90.

private entities to serve as intermediaries.[50] The key differences between the two systems are in the legal claims and records that are kept by the Central Bank.[51] In the Indirect model, the end user has a claim on the intermediary, with the Central Bank keeping track only of wholesale accounts. It is the intermediary rather than the Central Bank that is charged with backing the outstanding CBDC-like claims to the consumer, with actual CBDCs that are deposited with the Central Bank.[52]

Indeed, there is no restriction on the intermediary that prevents them from issuing their own redeemable digital tokens that are backed by the CBDC in much the same way that private banknotes once were.[53] Consequently, the Central Bank has no records of individual claims since these are kept with the intermediary, nor is there a direct proof of the claim vis-à-vis the Central Bank.[54] The reliance on the intermediary that is present in these systems, results in additional features that maintain elements of the existing payments system. For example, the intermediary assumes responsibility for communication with retail clients, nets payments and sends payment messages to other intermediaries and wholesale payment instructions to the Central Bank.[55] What remains unclear in these proposals, is whether the intermediary will provide consumers with an option to reverse payments. This is a point that should be considered further as it will help boost consumer acceptability by offering assurances that transactions can be reversed should something go wrong and has been attributed to increasing the acceptability of credit cards during their initial development.[56]

However, it should be noted that unlike the Direct model, the intermediary also assumes responsibility for dispute resolution and KYC.[57] This poses a significant risk for consumers who must contend with dispute resolution procedures that have resulted in significant consumer frustration with the status quo legacy payment systems.[58] The fact that intermediaries will rely on legacy dispute resolution procedures represents a significant transaction cost for consumers, hindering the long term acceptability of CBDC's unless new procedures can be mandated that will reduce these costs. Conversely, some Central Banks have expressed a preference for having intermediaries play a

---

[50] *Id.* at 88.
[51] *Id.* at 90.
[52] *Id.* at 88–89.
[53] *See generally* Muharem Kianieff, *Private Banknotes in Canada: 1867 (and Before) to 1950*, 30 QUEEN'S L. J. 400 (2004).
[54] Auer & Böhme, *supra* note 26, at 90.
[55] *Id.* at 89.
[56] Jane Kaufman Winn, *Clash of the Titans: Regulating the Competition Between Established and Emerging Electronic Payment Systems*, 14 BERKELEY TECH. L. J. 675, 687 (1999).
[57] Auer & Böhme, *supra* note 26, at 89–90.
[58] *See* MUHAREM KIANIEFF, BLOCKCHAIN TECHNOLOGY AND THE LAW: OPPORTUNITIES AND RISKS 55–66 (2020); *See also* Michael S. Barr, *Manditory Arbitration in Consumer Finance and Investor Contracts*, 11 N.Y.U. J. L. & BUS. 794 (2015).

prominent role in the CBDC system on the "user-facing" side.[59] This gives the private sector the opportunity to build new business models on the core back end functionality of the CBDC.[60] Presumably, this is to allow the Central Bank to concentrate its activities on a set of core processes without having to interact directly with retail users.[61]

D. Hybrid Models

The compromise position of some public and private cooperation comes in the form of hybrid systems. Here, the Central Bank operates payment rails that serve as the underlying infrastructure that support private sector innovations that allow consumers to access their funds. Under this model, there is a direct claim made on the Central Bank that is then combined with a private sector messaging layer.[62] To quote Auer and Bohme:

> One key element of the hybrid CBDC architecture is the legal framework that underpins claims, keeps them segregated from the balance sheets of the payment service providers (PSPs), and allows for portability. If a PSP fails, holdings of the CBDC are not considered part of the PSP's estate available to creditors. The legal framework should also allow for portability in bulk, ie give the Central Bank the power to switch retail customer relationships from a failing PSP to a fully functional one. The second key element is the technical capability to enable the portability of holdings. Since the requirement is to sustain payments when one intermediary is under technical stress, the Central Bank must have the technical capability to restore retail balances. It thus retains a copy of all retail CBDC holdings, allowing it to transfer retail CBDC holdings from one PSP to another in the event of a technical failure.[63]

Hybrid models offer many of the same advantages of the Indirect model, namely that the Central Bank can continue to carry out its core functions while leaving the retail side to be serviced by the private sector.

Analogous to the Indirect model, the hybrid model is also a means whereby private sector advancements in the field of technology are not unnecessarily excluded from the payments system. The hybrid system represents a middle ground where the core functions of the payment system remain in the hands of a Central Bank, while the CBDC in this case is designed to serve as a product

---

[59] EUR. CENT. BANK, *Report on a Digital Euro* 4 (2020), https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf [https://perma.cc/PH29-XQH8].
[60] *Id.*
[61] Auer & Böhme, *supra* note 26, at 91.
[62] *Id.* at 90.
[63] *Id.* at 90–91.

that is backing an access product that is made available by a financial institution or technology company.

E. Benefits and Risks Associated with Current CBDC Proposals

As is the case with any new product, there are trade-offs with respect to the benefits and costs to consumers. In evaluating whether or not these developments are a net positive for consumers, it is important to bear in mind that the ultimate success of a particular concept is a function of how well they minimize transactions costs. Again, the greater the efficiency of the payment system, the greater the potential for global economic growth. This is particularly the case where access to the payments system can be broadened to allow a greater cross section of society to participate economically.

By eliminating the need to handle physical cash, the costs associated with accessing the financial system through a digital cash equivalent can be expected to decrease as parties can settle through a new publicly owned payment infrastructure or rail. Moreover, a move to any model of a CBDC, ensures that money stays as a public good while preserving various options that allow private sector participants to build and innovate in various degrees.[64] This in turn, will serve as an influence on the future utility of a CBDC.[65] These new innovations could include a consumer wallet infrastructure that enables custody and recoverability of digital dollars, that is currently not possible with physical cash.[66]

Developing this point further, one could point out that the various CBDC proposals seek to minimize the role played by the present intermediaries, in order to realize savings that manifest themselves in transactions costs (in the form of interchange fees, less delay for clearing and settlement, and lower handling costs) that plague the status quo. These efficiencies can be realized by bypassing traditional payment intermediaries and freeing up trapped liquidity for merchants who depend on them.[67] These savings would be substantial when considering that handling customer payments cost a retailer between five and fifteen percent of their annual revenue.[68] Moreover, by eliminating delayed payment transactions, merchants would also realize capital benefits.[69]

Operationally, there are significant cost savings that can be realized by moving from a system that is still largely based on legacy computer technologies

---

[64] *The Digital Dollar Project: Exploring a US CBDC*, 29 DIGITAL DOLLAR FOUND. (2020), https://static1.squarespace.com/static/5e16627eb901b656f2c174ca/t/5ecfc542da96fb2d2d5b5f15/1590674759958/Digital-Dollar-Project-Whitepaper_vF.pdf [https://perma.cc/8KNC-5UYZ].
[65] *Id.*
[66] *Id.*
[67] *Id.* at 39.
[68] *Id.*
[69] *Id.*

to one that leverages the latest advances in computer processing in order to improve efficiencies.[70]

This is not to say that a move to a CBDC will not be entirely costless for consumers. And indeed, some Central Banks have been trying to consider how best to address the issue of cost recovery in setting up a CBDC. For instance, the Bank of England has considered the possibility of charging a small transaction fee to Payment Interface Providers.[71] Others such as the European Central Bank have proposed financing the development of a CBDC from the proceeds of seigniorage that accrues to the Central Bank.[72] However, end users are likely to expect that a CBDC be issued free of charge, like physical banknotes.[73] Any attempt to impose a charge paid directly by consumers is likely to hamper the acceptability of a CBDC and increase transactions costs as well.

Perhaps one of the largest financial risks to consumers is that like the Indirect system, and indeed the present financial system, there still exists the potential for losses that result from the failure of one of the intermediaries. Should financial intermediaries prove to be central to the operation of the system, and their business models likely to stay the same as they are now, there does exist the very real possibility that deposit insurance will be required to safeguard consumer savings.[74] This is in and of itself a transactions cost of the present system where resources (both public and private) must be devoted to hedging against private risk taking by financial institutions. The same is also true of the costs that accrue on the part of regulators and financial service providers who must engage in prudential supervision to ensure that consumer savings are not endangered by imprudent lending decisions. This risk is amplified even further when non-financial institutions are contemplated as potential participants as intermediaries, when they may lack the regulatory oversight that have helped to mitigate the risks to consumers in the financial sector. The European Central Bank and the Bank of England have emphasized that any intermediaries who seek to participate in a CBDC model should be regulated ones.[75]

In contrast, the public claim on the Central Bank as embodied in the physical banknote is nearly risk free largely as a result of the fact that the Central Bank is effectively unable to fail, and by virtue of the fact that the government can compel their acceptance through legal tender laws.[76] If banknotes were to

---

[70] Michael J. Casey, *Central Banks Will Jump-Start the Decentralization of Money*, COINDESK (June 19, 2018, 3:00 AM), https://www.coindesk.com/markets/2018/06/19/central-banks-will-jump-start-the-decentralization-of-money/ [https://perma.cc/9TDF-SPD6].

[71] BANK FOR INT'L SETTLEMENTS, *supra* note 3940, at 29.

[72] EUR. CENT. BANK, *supra* note 59, at 10.

[73] *Id.* at 11.

[74] BD. GOVERNORS FED. RSRV. SYS., *Money and Payments: The U.S. Dollar in the Age of Digital Transformation* 17 (Jan. 14, 2022), https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf [https://perma.cc/W4QM-N3VY].

[75] *See* EUR. CENT. BANK, *supra* note 59, at 25; *See also* BANK FOR INT'L SETTLEMENTS, *supra* note 3940, at 30.

[76] *See Report 1: The Riksbanks e-krona project*, SVERIGES RIKSBANK 36 (Sept. 2017),

disappear in their entirety and the general public were to only have access to commercial bank money, what would the concept of legal tender entail?[77] Rather than relying on payment rails to construct a CBDC, the Central Bank could avoid these questions entirely by supplying a general CBDC directly that is backed by a legislative framework deeming them to be legal tender.

Given the electronic nature of the online transaction component that is essential for a CBDC to reduce transactions costs, some thought needs to be given with respect to the reversibility of payments.[78] That is to say, consideration needs to be given as to how to address a scenario where a consumer makes a payment by mistake, needs a refund to resolve a dispute, or has their account hacked and needs to recover amounts that have been stolen. Placing the responsibility for dispute resolution in the hands of intermediaries results in significant costs both for intermediaries and consumers. By placing the responsibility for CBDCs in the hands of a Central Bank exclusively, more fair outcomes can be assured for consumers since the Central Bank will not have the same economic incentives to rely on arbitration in the same manner as private sector providers have. The reliance on private arbitration in a comparable industry, such as the credit card industry has shown time and again that these mechanisms have worked almost exclusively against consumer interests.[79]

These developments result in significant transactions costs that must be borne by consumers in two significant ways. First, through the time, money and opportunity costs that are devoted to the existing dispute resolution system. By removing the financial incentive to maximize profits, a Central Bank (or designate) could adjudicate disputes with a view to providing consumers with

---

https://www.riksbank.se/en-gb/payments--cash/e-krona/e-krona-reports/e-krona-project-report-1/ [https://perma.cc/LE9U-W4CW].

[77] *Id.*

[78] Sarah Allen, Srdjan Capkun, Ittay Eyal, Giulia Fanti, Bryan Ford, James Grimmelman, Ari Jules, Kari Kostiainen, Sarah Meiklejohn, Andrew Miller, Eswar Prasad, Karl Wüst & Fan Zhang, *Design Choices for Central Bank Digital Currency: Policy and technical considerations*, BROOKINGS INST., Working Paper No. 140, 74 (July 2020), https://www.brookings.edu/wp-content/uploads/2020/07/Design-Choices-for-CBDC_Final-for-web.pdf [https://perma.cc/5YX2-Y44K].

[79] KIANIEFF, *supra* note 58, at 64. For instance, one study conducted in the State of California found that:

- 94.7 percent of all damage awards ordered by arbitrators were in favour of businesses;
- 99.6 percent of cases are brought by creditors rather than consumers;
- In the State of California, the top five arbitrators issued handled on average 1000 cases each and found in favour of businesses 97% of the time;
- The highest volume arbitrator issued approximately 68 awards in a single day. Out of these 68, the creditor seeking relief from a consumer was awarded 100% of the damages that they sought. During the 6 busiest days for this arbitrator, they issued 332 damage awards in which businesses obtained 100 percent of the damage awards they were seeking;
- Excessive fees were charged for a written decision and other aspects of the arbitration.

Id.

fairer outcomes. Second, in the form of a loss in goodwill towards existing payment systems if the dispute resolution systems that they rely upon are seen to be unfair. A similar development in the CBDC regime will have significant impacts on the acceptability of the product. It could be argued that these transactions costs have not hurt the acceptability of the status quo. However, one should point out that if this were indeed the case, consumers would not be looking to fintech companies to provide them with better alternatives.

III. RECONSIDERING THE ROLE THAT THE CENTRAL BANK SHOULD PLAY IN THE FINANCIAL SYSTEM

The present payment mechanism architecture has emerged over centuries as evolutions have sought to incorporate new product and legal innovations to simplify making payments.[80] As part of this evolution, the concept of a Central Bank emerged in order to mimic the operation of goldsmiths who helped to pioneer the concept of a receipt with respect to moneys that were deposited with them.[81] These were precursors to the modern banknote that were receipts for coins deposited with banks as a promissory note.[82] The banknote that forms the basis of our present monetary base was eventually transferred from private hands into public ones in order to provide the functionality that is required to make money a public good.

This evolution created a new role for government through the Central Bank as the custodian of the financial system. Beginning with the Bank of England in 1844, Central Banks around the world began to assume responsibility for the issuance of national banknotes.[83] These activities would be broadened over the years, in the case of the United States Federal Reserve, to include the responsibility for enhancing economic growth and the promotion of initiatives that maximize employment, maintain price stability and moderate long-term interest rates.[84] Similar mandates exist with respect to the other major Central Banks around the world.

A. Resolving the Conflict Between Existing and Novel Payment Mechanisms

As part of the new accepted mandates of Central Banks, comes a responsibility over the regulation of payment mechanisms in use throughout the economy. When considering these functions, it must be borne in mind the central role that payment mechanisms and systems play with respect to their effects on facilitating economic growth. Returning to the common refrain echoed throughout this essay, achieving greater efficiencies in the payment

---

[80] *See generally* Benjamin Geva, *The Concept of Payment Mechanism*, 24 OSGOODE HALL L. J. 1 (1986); *See also* Benjamin Geva, *From Commodity to Currency in Ancient History: On Commerce, Tyranny, and the Modern Law of Money*, 25 OSGOODE HALL L. J. 1 (1987) [hereinafter Geva, *Commodity to Currency*].

[81] Zellweger-Gutknecht, Geva & Grunewald, *supra* note 2, at 19.

[82] *Id.*

[83] Geva, *Commodity to Currency*, *supra* note 80, at 152.

[84] 12 USCS § 225a.

system is a critical means of achieving more economic growth for all. As such, the issuance of a CBDC, or the development of payment rails and various associated infrastructures should be viewed, not as something that is a controversial change to the traditional mandate of Central Banks, but rather ought to be viewed as part of the natural evolution of these mandates. While Central Banks are, by their very nature, extremely reluctant to depart from their traditional scopes of operations, this level of caution with respect to CBDCs is unwarranted. In fact, the evolution of the payments systems creates a heightened sense of urgency for Central Banks to intercede as a means of reducing transactions for consumers by utilizing the returns to scale offered by a Central Bank, along with the public nature of the institution in order to facilitate the evolution towards tomorrow's payment instruments.

However, one should not minimize the gravity of the proposed project. Part of the difficulties encountered when one is looking to transition from an established payment system, is lock in, both on the part of consumers, and on the part of regulators who are accustomed to functioning under the status quo. One of the effects of this lock in, is that Central Banks in developing economies are in a better position to implement the types of wholesale changes that a CBDC requires.[85]

Perhaps the best example of such a situation may occur when considering the decision to roll out telecommunications services in an underdeveloped area. In light of the current state of technology, would it make sense to invest in conventional landlines and then invest in mobile service at a later date (as was the case in developed countries where the technology was developed), or skip ahead and provide mobile service directly? Obviously, it makes sense to proceed with the most modern solution available since this is the most cost effective and is likely to encounter less consumer resistance due to lock in.

However, what the example indicates is that when presented with the opportunity to deploy a new system *ab initio*, one of the emancipating features of the exercise is that one is free to reimagine a new means of operationalizing the functions proposed to be assumed by the new system. In other words, one is not constrained by the limitations of previous concepts, traditions, ideas or technologies when developing something new. The same is true of the new CBDC models that are beginning to emerge. The reimagining of money as a medium of exchange, is also an opportunity not only to reconsider the future of

---

[85] To illustrate this point, writing in the late 1990's with respect to the prospects of newer payment products to displace conventional payment mechanisms, Professor Jane Kaufman Winn wrote:

> The greatest successes for such new payment devices may ultimately come in markets in developing countries such as China, where there are virtually no alternative electronic payment technologies. In such markets, there may be no business case for rolling out older models of electronic payment systems where the basic infrastructure is still lacking, and consumers may accept the most up-to-date technology available quite happily.

Winn, *supra* note 56, at 702.

the financial system as a whole, but also to ask the question: What functions are now associated with money as a piece of our economic infrastructure and ought to be incorporated into any model of a potential CBDC? Further, how can these re-conceptions result in increased efficiencies that will help to foster more economic inclusion and growth for all? The next section will consider how some technological advances made in India could prove to be a very helpful in minimizing some of the transactions costs associated with the present monetary regime should they be incorporated into a prospective CBDC proposal.

B. Transactions Costs Associated with AML and KYC

As was noted above, the increasing costs of Anti-Money Laundering ("AML") and KYC compliance have proven to be a significant barrier for low-income households who are seeking to access the financial system. The high costs associated with opening a bank account in the United States work as a disincentive to financial institutions to service clients from all income demographics. It is estimated that the costs for onboarding a customer after complying with KYC requirements is approximately $280 on average.[86] Rather than decreasing over time as technology makes processing data more efficient, the effects of technology investments has been shown to merely slow down the annual increase in AML and KYC compliance costs rather than reversing them.[87]

The data that was reported prior to the COVID-19 pandemic is particularly telling. In 2019, LexisNexis Risk Solutions conducted a survey where financial institutions reported that the KYC onboarding process is becoming increasingly more cumbersome despite very significant investments that are being made in order to reduce processing times.[88] This is a factor that is present regardless of the size of the financial institution.

For those firms who chose to invest in compliance technologies, the survey found significant benefits to be derived from these technological advances. These include a more positive impact on productivity and new customer acquisition from compliance requirements, increased speed in completing due diligence on new accounts, and fewer delays and loss of prospective customers

---

[86] Vincent Bezemer, *Digital Onboarding and Origination: The Cure for Banks' Customer Acquisition Pains*, AM. BANKERS ASS'N BANKING J. 7 (Aug. 11, 2020), https://bankingjournal.aba.com/2020/08/digital-onboarding-and-origination-the-cure-for-financial-institutions-customer-acquisition-pains/ [https://perma.cc/SUE2-W2ME].

[87] LEXISNEXIS RISK SOL., *LexisNexis Risk Solutions 2019 True Cost of AML Compliance Study: Canada and United States Edition*, https://risk.lexisnexis.com/-/media/files/financial%20services/research/lnrs2019%20true%20cost%20of%20aml%20compliance%20studyus%20and%20canada%20editionresearchnxr13946010719enus.pdf [https://perma.cc/5HQ5-8NCG].

[88] Onboarding is a challenge across firm size, nonetheless. A large part of this is due to lack of standardization with required KYC/AML data; different types of data may be required for different accounts, leading to due diligence being a customized effort on a case-by-case basis. Further, financial firms often lack a unified view about an individual or business across various databases. Both of these situations slow the onboarding process and can make it painful for those with larger onboarding volume. *Id.* at 6.

during onboarding.[89] However, despite these increased efficiencies, firms that adopted new technologies still reported an average increase in AML compliance costs year over year of approximately eight percent.[90] Even more interesting is the increases in compliance costs for firms that did not make aggressive technological investments. Here, the increase was in the range of sixteen to eighteen percent, which represents a very significant transactions cost.[91] As was noted above, the high costs of onboarding represent a significant barrier in providing access to financial services to the unbanked. To put this into perspective, the aggregate costs of AML costs for United States financial institutions in 2019 was $26.4 billion.[92] Any advancements that can significantly reduce these costs, while maintaining the same or better levels of vigilance will have positive effects on the economy as a whole.

One of the drivers cited by survey participants as having the most impact on financial institutions are United States regulations. The survey asks the question of participants in both the United States and Canada what regulator they saw as having the greatest impact on regulatory compliance change in their region.[93] One hundred percent of United States based respondents stated that the actions of United States regulators would have the greatest impact.[94] Seventy-eight percent of Canadian financial institutions cited the United States as well. EU regulation (which one would expect to be more onerous) is not ranked among the top influencers for financial institutions in both the United States and Canada.[95]

Following the first wave of the COVID-19 pandemic in 2020, a number of changes have been observed in compliance costs. First, most firms in the United States have reported significant year over year increases in their compliance costs from $26.4 billion to $35.2 billion.[96] These increases have been attributed to an increase in labor intensive activities. This is still the case, even for firms that had made significant technological investments in the past, who reported an increase in labor costs from fifty-four percent to sixty percent since 2019.[97] Participants in the 2020 survey noted that the Financial Crimes Enforcement Network ("FinCEN"), along with federal and state regulators, have prioritized

---

[89] *Id.* at 7.
[90] *Id.*
[91] *Id.*
[92] LEXISNEXIS RISK SOL., 41 [https://perma.cc/5HQ5-8NCG].
[93] *Id.* at 16.
[94] *Id.*
[95] *Id.*
[96] LEXISNEXIS RISK SOL., *True Cost of Financial Crime Compliance Study: United States and Canada*, LEXISNEXIS (Oct. 2020), https://risk.lexisnexis.com/-/media/files/financial%20services/research/lnrs_2020-true%20cost%20of%20financial%20crime%20compliance%20study--us-canada%20edition-nxr14633001020enus.pdf [https://perma.cc/ZPU7-C4AP].
[97] *Id.* at 9.

actions with respect to further combatting AML and terrorist financing.[98] In addition, participants observed an increase in KYC costs from twenty-three percent to thirty percent year over year. Interestingly, participants in the 2020 survey indicated that cryptocurrency and digital assets have risen as the top risks for AML both with respect to the due diligence obligations that are associated with them, as well as the corresponding reporting obligations that pertain to their beneficial ownership.[99]

In the 2021 survey, these trends are continuing for both medium and large sized firms.[100] LexisNexis notes that since 2019 (pre-pandemic), the costs of AML and KYC have nearly doubled for United States based financial institutions, with firms in Canada experiencing a sixty-four percent increase.[101] In the United States, this is attributed to the sheer increase in labor costs that is associated with the due diligence required to comply with AML and KYC regulations that are becoming more complex and comprehensive.[102]

The reason for this is twofold: costs are increasing to conduct KYC due diligence for on-boarding, and risk profiling when new business accounts are opened and financial crimes involving digital payments and cryptocurrencies are on the rise, further driving increases in compliance costs.[103] With respect to KYC for onboarding, survey respondents have noted that the data that they are working with in order to identify relationships and attributes of entities when assessing risk or searching for ultimate beneficial owners, is either lacking, or is not sufficiently comprehensive in order to form an effective risk profile.[104] This also results in lower productivity of staff conducting due diligence and increased costs as a result.[105] As for cryptocurrencies and digital payments, the increased reliance on digital payments and cryptocurrencies during the pandemic has resulted in a corresponding increase in compliance costs.[106]

It is interesting to note that in the 2021 study, LexisNexis found that those financial institutions in the United States that were able to slow down the rate of growth of their increase in compliance costs, were those that increased their reliance on third parties to conduct their due diligence.[107] This was particularly the case with the cost increases and challenges that resulted from evolving financial crime that used digital payments and cryptocurrencies.[108] The use of third parties has allowed these institutions to be more effective at risk profiling,

---

[98] *Id.* at 7.
[99] *Id.*
[100] LEXISNEXIS RISK SOL., *True Cost of Financial Crime Compliance Study: United States and Canada Edition*, LEXISNEXIS (Sept. 2021), https://risk.lexisnexis.com/insights-resources/research/true-cost-of-financial-crime-compliance-study-for-the-united-states-and-canada [https://perma.cc/6EL7-TD5Q].
[101] *Id.* at 9.
[102] *Id.* at 11.
[103] *Id.* at 6.
[104] *Id.* at 25.
[105] *Id.* at 30.
[106] LEXISNEXIS RISK SOL, *supra* note 100, at 28.
[107] *Id*. at 40.
[108] *Id.* at 43.

ultimate beneficial owner identification and maintaining audit trails.[109] Curiously though, those firms that had an increased exposure to crimes involving digital payments were less likely to use third party solutions, preferring instead to rely on manual workloads.[110]

The end result of the prevalence of financial crimes using digital payments and cryptocurrencies is likely to result in increasing regulatory scrutiny.[111] This will put greater pressure on financial institutions that are struggling to keep up with their due diligence requirements. For example, American respondents to the 2021 LexisNexis survey stated that the loss of productivity attributable to the costs of complying with existing regulations has had a negative impact on new customer acquisition, resulting in a greater loss of new customer opportunities due to refused accounts or walkouts.[112] There was a greater propensity for this to occur in the United States than in Canada.[113]

The increasing costs of AML and KYC compliance represents a serious impediment to the goal of increasing access to the financial system for the most vulnerable. Moreover, it represents an increasing inefficiency in the payment system since the costs of complying with progressively more complex regulations and payment products will ultimately have to be recovered either through increased service fees or through lower access to credit products. This is a concerning trend since technological advancements alone cannot account for the fact that the operators of the payment system must ultimately ensure compliance with the regulatory scheme where each firm is expected to bear the costs of compliance. Not all entities can take advantage of increasing returns to scale to amortize their costs over a large userbase.

C. Aadhaar and the India Stack

One jurisdiction that has been able to leverage increasing returns to scale in the KYC context is India. Here, Aadhaar, a government sponsored program, has yielded impressive results under the auspices of a public program that allows individuals to share their digital identities with private financial institutions. The Aadhaar program is one component of the technology stack. A technology stack is a set of interconnected yet independent single-purpose technologies that work together towards general purpose tasks.[114]

Briefly, Aadhaar is a biometric identity tool. It consists of a 12-digit random number that corresponds to various personal details of an individual that

---

[109] *Id.* at 36.
[110] *Id*. at 18.
[111] *Id*. at 43.
[112] LEXISNEXIS RISK SOL, *supra* note 100, at 35.
[113] *Id.*
[114] Derryl D'Silva, Zuzana Filkova, Frank Packer & Siddharth Tiwari, *The Design of Financial Infrastructure: Lessons from India*, BANK FOR INT'L SETTLEMENTS 6 (Dec. 2019), https://www.bis.org/publ/bppdf/bispap106.pdf. [https://perma.cc/UT82-E942].

includes biometric and demographic information.[115] Citizens are required to provide mandatory information to the government in order to receive their Aadhaar number.[116] The user is also photographed, and their fingerprints and iris scans are recorded in order to allow for the authentication of their identity when their Aadhaar number is used.[117] Aadhaar is primarily used to confirm identity in order to obtain services and products, including from financial institutions.[118] It can be used on mobile platforms in order to generate a temporary "virtual ID" that can be used by financial institutions in order to verify an individual's identity, but does not allow any financial institutions or data brokers to create a detailed user profile that would combine transactions across databases.[119] Since its launch in 2010, more than 1.2 billion Indians now have a unique digital identity.[120] Even more remarkable is the cost of administering the program – in 2012 the cost per identification was estimated at approximately $0.79 USD based on 200 million individuals enrolled at that time.[121]

The India Stack consists of three separate rails. These include an Identity rail which consists of the Aadhaar program and e-KYC verification (more on this below), a Payment rail that provides for an interoperable interface to bank accounts (which allows for individuals to engage in financial transactions that are settled in real time using fiat money), and a Data Sharing rail that ensures data privacy and helps to provide access to customer data to financial institutions.[122] The Government of India has built these rails upon four pillars:

- Providing digital financial infrastructure as a public good;
- Encouraging private innovation by providing open access to this infrastructure;
- Creating a level playing field through a robust regulatory framework; and
- Empowering individuals through a data-sharing framework that requires their consent.[123]

The initial experience in India based on the rollout of Aadhaar alone, has been quite favorable as a means of increasing access to the financial system.

What makes Aadhaar so effective is that it provides a structure for maximum participation since multiple authentication points have access to a

---

[115] *Id.* at 10.
[116] *Id.* (This includes their name, date of birth, gender and residential address).
[117] *Id.*
[118] *Id*. at 11.
[119] *Id.*
[120] D'Silva, Filkova, Packer & Tiwari, *supra* note 114, at 8.
[121] *Id.* at 10 (citing Frances Zelazny, *The Evolution of India's UID Program: Lessons Learned and Implications for Other Developing Countries*, Center for Global Development, Policy Paper 008, (Aug. 2012), https://www.cgdev.org/sites/default/files/1426371_file_Zelazny_India_Case_Study_FINAL.pdf.)
[122] D'Silva. Filkova, Packer & Tiwari, *supra* note 114, at 9.
[123] *Id*. at 2.

central ID repository.[124] It is this ID repository that makes it possible for government agencies and private sector entities to provide services to people since the Universal ID ("UID") will link to an individual's passport, driver's license, tax ID card, bank accounts, voter ID, etc.[125] This fact not only helps to decrease transactions costs and enhances efforts to promote inclusion and participation, but also serves as a deterrent to individuals that seek to operate with different names and addresses.[126] While the UID makes it possible to deliver health care, mobile banking, online food ration accounts, conditional transfers and more, it also makes it possible to understand who may not be getting access to the services that they are entitled to.[127]

The emergence of Aadhaar demonstrates that by rethinking how services are delivered, and how technology can be leveraged in situations where there is no status quo, substantial efficiencies can be realized by using the opportunity to re-evaluate how policies are operationalized. As D'Silva et al. note, it is becoming increasingly recognized that identification is one of the key elements in promoting financial inclusion.[128] As people obtain easily verifiable identities, they have an easier time opening bank accounts, obtaining credit and enrolling in social welfare programs.[129] Moreover, transactions become more efficient, with less leakage of value along the path to the payee.[130]

The efficiencies to be found in the banking and payments system not only depend on innovations that can be leveraged within those fields but can also benefit from exogenous technological developments as well. In evaluating which model of a CBDC to adopt, policy makers should not confine themselves to financial or technological innovations alone, but rather should take a holistic approach to evaluating innovations that touch on the regulatory components of the financial system, since these can also bring significant efficiencies and advance public policy goals.

The results over the last few years illustrate how substantial some of these efficiencies can be. For example, with respect to financial inclusion, a study by the World Bank found that between 2011 and 2017, approximately 470 million Indian adults opened a bank account in a financial institution.[131] This resulted

---

[124] Frances Zelazny, *The Evolution of India's UID Program: Lessons Learned and Implications for Other Developing Countries*, CTR. FOR GLOB. DEV. 27 (Aug. 2012), https://www.cgdev.org/sites/default/files/1426371_file_Zelazny_India_Case_Study_FINAL.pdf. [https://perma.cc/Z2BW-MZZG]

[125] *Id*.

[126] *Id*.

[127] *Id*. at 28.

[128] D'Silva. Filkova, Packer & Tiwari, *supra* note 114, at 4.

[129] *Id*.

[130] *Id*.

[131] *Id*. at 12 (citing Asli Demirgüç-Kunt, et al., *The Global Findex Database: Measuring Financial Inclusion and the Fintech Revolution*, WORLD BANK GRP. (2018), https://openknowledge.worldbank.org/bitstream/handle/10986/29510/9781464812590.pdf.).

in the share of the population of India with a bank account to increase from forty-five percent to approximately eighty percent of the adult population.[132] As rates of financial inclusion were found to increase, these were accompanied with a sharp reduction in the exclusion of marginalized groups.[133] In particular, the gender gap reduced from seventeen percent in 2011 to six percent in 2017.[134] The gap between those with a college education and those without fell from twenty-nine percent in 2011 to ten percent in 2017.[135] The gap between the rich and the poor also fell from fourteen percent in 2011 to five percent in 2017.[136]

With respect to social welfare programs, D'Silva et al. have found that there were significant savings to be realized by using the India Stack. In the past seven years, the government of India has transferred more than $100 billion in benefits to its citizens.[137] This is the equivalent of five percent of the GDP average over that same period.[138] This has not only allowed the government to transfer these benefits outside of the conventional payment mechanisms, but it has also allowed it to realize substantial savings through reductions in fraud and leakage.[139]

Even more promising is the potential savings to be realized through the Aadhaar based e-KYC regime. The system helps to replace conventional paper-based identity verification through biometrics that grants a service provider access to a user's Aadhaar profile.[140] The e-KYC regime can allow for an instant verification of an individual's identity and also reduces the possibility of document forgeries since the system is paperless.[141] Since 2012, the system has processed a total of 8 billion e-KYC inquiries.[142] In the last twelve months alone, it has processed an average of three million requests per day.[143] The resulting reduction in compliance costs has been quite impressive with the average costs of mandatory KYC processes that relate to customer onboarding falling from $15 to around $0.07 USD.[144]

The reduction in transactions costs associated with modernizing some of the regulatory mechanisms that pertain to the financial system can result in efficiency gains in the entire system. It is submitted that these gains can be maximized when a CBDC is combined with additional reforms that can help to advance the policy goal of achieving full employment. The experience of the India stack demonstrates that a holistic approach to facilitating payments can result in significant savings that can be passed along to consumers. Reductions

---

[132] D'Silva, Filkova, Packer & Tiwari, *supra* note 114, at 12–13.
[133] *Id.* at 13.
[134] *Id.*
[135] *Id.*
[136] *Id.*
[137] D'Silva. Filkova, Packer & Tiwari, *supra* note 114, at 8.
[138] *Id.*
[139] *Id.* at 14.
[140] *Id.*
[141] *Id.*
[142] *Id*.
[143] D'Silva, Filkova, Packer & Tiwari, *supra* note 114, at 14.
[144] *Id.*

in AML compliance expenditures for the financial sector as a whole can be found by moving KYC and AML activities onto a single entity for oversight. This will result in savings not only from economies of scale, but also from reductions in duplicative AML reviews.[145]

The integration of a CBDC with a national digital identity scheme is a subject that is garnering increasing attention from Central Banks that are studying a move towards a CBDC. In a recent report, the Central Banks of Canada, England, the EU, Japan, Sweden, Switzerland, along with the Federal Reserve and Bank for International Settlements, stated:

> A CBDC system with identified users (e.g., a system linked to a national identify scheme) could be used for these payments.
>
> Although a CBDC could play a role in making fiscal transfers more efficiently (especially in jurisdictions with greater unbanked populations), on its own, it would not be necessary or sufficient. A linked digital identity system would be a necessity to realise real improvement. If such a system were in place, the incremental benefit of CBDC over transfers to (e.g.) commercial accounts, etc could be small, depending on designs. Additionally, if fiscal transfers were made with CBDC there is a risk of blurring the division between monetary and fiscal policy and a potential reduction in monetary policy independence.[146]

Curiously, this report makes no mention of the Indian experience either with the India Stack or with the Aadhaar program, which had been in operation for quite some time before the report was released. Nevertheless, the statements above are reassuring insofar that they constitute a recognition of the fact that all modern 21st century Central Banks need to find ways of improving their operations in the fulfilment of their mandates.

Indeed, Central Banks, in considering whether to launch a CBDC need to consider very carefully how the scope of their operations may need to be broadened in order to reach the full potential offered not only by CBDCs, but by the new generations of technological developments that can bring newfound efficiencies to existing payment mechanisms. An unnecessary reliance on old paradigms and concepts based on a fear of creating too much disruption, runs the risk of only offering piecemeal approaches that will ultimately result in a failure of these technologies to reach their full potential. As was mentioned above, part of the trepidation may arise from officials in Central Banks who see

---

[145] Crawford, Menand & Ricks, *supra* note 30, at 162–63.
[146] BANK FOR INT'L SETTLEMENTS, *supra* note 39, at 6–7.

themselves as providing wholesale banking to financial institutions rather than retail level services to the public. In this sense, a move to a front facing or public serving position may make them uncomfortable with such a drastic alteration of their traditional functions. Indeed, one will recall that this was one of the arguments that was raised against the Direct CBDC model described above, and indeed can also be made against proposals that advocate a postal banking model of providing individuals with access to basic retail banking services.

The expansion of a Central Bank's functions to encompass the establishment of a CBDC, along with a national digital identity repository ought to be viewed as the next phase in the evolution of a Central Bank. Its use as a provider of the payment infrastructure is essential to attaining the economic growth that the full employment mandate that is common to all Central Banks requires. This is especially true in a rapidly changing economy that leverages the full potential offered by technology. This technology cannot be successfully leveraged in a private context, but rather needs to reach an economy of scale that only a Central Bank and the legal monopoly conferred upon it to provide the economy with a universal payment medium can achieve. While there may be some apprehension to having government develop technologies that would be front facing, recent events would suggest that government has been having some success in this area.[147]

The trepidation that Central Bank officials have expressed must be overcome if we can move to a wholesale reconsideration of how best to realize a Central Bank's mandate in an increasingly digital era.

Indeed, the move to a National Digital ID register that constitutes part of a stack of suites that are designed to support a CBDC can benefit from additional enhancements. For example, providing individuals with access to a bank account is part of the equation to achieving more access to financial institutions for the unbanked. However, this does not account for granting access to credit for those who are unable to establish a credit history. Part of the reason why this is the case is that financial institutions have difficulty in making risk assessments for individuals that do not have an established credit history.[148] Indeed, this is a characteristic that is present in many low-income developing countries where

---

[147] Crawford, Menand & Ricks, *supra* note 30, at 161 ("Building this retail infrastructure would be challenging, but thousands of banks have done it successfully. And all sorts of governmental entities already interface directly with the public. Notably, the U.S. Treasury Department processes over one billion payments per year and disburses benefits to millions of Social Security and Pension recipients each month. Treasury also settles claims resulting from forged, lost, and stolen benefit checks and collects monies from parties liable for fraud. Following the botched roll-out of healthcare.gov, the Executive Office of the President set up the U.S. Digital Service ("USDS"), which recruits top technologists for term-limited tours of duty in the federal government. USDS has dramatically improved direct services in areas ranging from the Education Department's $1 trillion student loan program to the Department of Homeland Security's immigration program." [footnotes omitted]).

[148] WORLD BANK GRP., *Disruptive Technology in the Credit Information Sharing Industry: Developments and Implications*, 11 (2019), https://openknowledge.worldbank.org/bitstream/handle/10986/31714/Disruptive-Technologies-in-the-Credit-Information-Sharing-Industry-Developments-and-Implications.pdf?sequence=1&isAllowed=y. [https://perma.cc/2JJE-5NHY].

individuals do not have as ready access to credit as in developed countries. As a World Bank study notes, the most common source of credit in high- income economies are through formal borrowing from financial institutions or through credit cards.[149] In contrast, in developing countries the most common source is borrowing from family and friends.[150]

As is the case with the India stack described above, an integration of a CBDC with a digital identity verification scheme that is linked to a governmental ID, would prove to be a significant means by which transactions costs could be drastically reduced. As one of the major expenses that currently hinders the scalability of cryptocurrencies, the savings in KYC and AML alone to be found in economies of scale if these functions were to be assumed by the government makes the project a worthwhile endeavor. Moreover, this is without even considering the efficiencies to be realized by moving to a more efficient and inclusive payment system that can more effectively leverage all of the economic resources in a particular jurisdiction. Either of these two goals would prove to be a considerable improvement over the status quo, and both would bring a much needed social and economic improvement to society as a whole.

However, what is needed is not simply a revision of existing systems and business models in order to leverage these new technologies. Rather, a wholesale reimagining of the payment system and the proper role that the public and the private sectors ought to play within it is necessary for these efficiencies to become a reality. This will undoubtedly involve a drastic overhaul of the status quo from an operational perspective. Yet, in order to maximize the efficiency gains to be realized from a CBDC, this will also involve a paradigmatical re-evaluation as well.

Admittedly, this an easier exercise to perform on paper than it is in reality. This reality will require regulatory and legislative changes that will be implemented across numerous governmental agencies whose members may be entrenched in existing practices, and who may resent any encroachments on their jurisdiction. A central question for policy makers is not whether this change will result in disruptions that are best left undisturbed, but whether society can bear the costs of failing to act where private alternatives and foreign CBDCs lie in wait to capture market share from conventional fiat currencies.[151] Indeed the failure to adapt could have more significant consequences than choosing to act

---

[149] Asli Demirgüç-Kunt, Leora Klapper, Dorthe Singer, Saniya Ansar & Jake Hess, *The Global Findex Database: Measuring Financial Inclusion and the Fintech Revolution*, WORLD BANK GRP., 76 (2018), https://openknowledge.worldbank.org/bitstream/handle/10986/29510/9781464812590.pdf. [https://perma.cc/APG2-XKKT].

[150] *Id.*

[151] Dion Rabouin, *The US Is Losing the Global Race to Decide the Future of Money - and It Could Doom the Almighty Dollar*, TIME (Sept. 21, 2021, 7:00 AM), https://time.com/6099105/us-china-digital-currency-central-bank/?utm_source=Sailthru&utm_medium=email&utm_campaign=NODE%20SEPT%2022%202021&utm_term=The%20Node. [https://perma.cc/59XF-ZVGX].

and having to deal with the costs related to transitioning from one system to another.

These paradigmatical changes will help to advance projects that seek to modernize payments infrastructure. At other times, this will require a wholesale re-evaluation on the types of activities that can be said to form the backbone of modern payment rails that will help to power the new financial infrastructure that will fully leverage advances in digital technology. Here again, the answer will not depend on whether one particular facet of the proposed CBDC models will be the correct "answer" to the problem of how to best implement a CBDC, but rather what elements of these specific proposals can be incorporated into other developments in order to find the operational efficiencies that will help to lower transactions costs and increase financial inclusion. Adding an additional level of complexity is the fact that one must ensure that any solution that is developed will be accepted by consumers within a particular jurisdiction. Simply because a product or approach has found success in one jurisdiction does not necessarily mean that it will find success in another. For example, while the M-Pesa concept has been successful in Kenya, Tanzania, Egypt and Ghana, it has been withdrawn from India, Afghanistan, Romania, Albania and South Africa due to a lack of success.[152]

There are some lessons to be learned from some of the previous examples that have been discussed above. First, a completely digital solution will not alleviate the problem of banking deserts or the corresponding decrease in access to the financial system that results therefrom. Any solution must continue to maintain a physical presence, and indeed, the postal banking proposal that forms a part of the Direct CBDC proposal helps to reverse the trends of previous years. Second, government can use the rule of law, the public treasury and sheer scale to provide a safe, cost effective, and reliable payment medium that serves as the foundation of a robust payment system that consumers and commercial banks can rely upon to do business. It can serve as a vital public infrastructure that operates payment rails that can then be leveraged to offer innovative new products. Third, this payment system foundation does not need to be relegated solely to providing for a network that moves a medium of exchange around the economy virtually, but rather forms a part of a suite of services that can properly be considered to be a part of a 21st century payment system.

This then brings us to the question of what might some of these ancillary services be? The example of Aadhaar that was discussed above gives us some indication of what is required both to reduce transactions costs associated with AML and KYC and also demonstrates how these technologies can be leveraged to reduce the costs associated with loan risk assessments. The use of official government issued identification is now viewed as essential in a modern economy, and if this is the case, then government must ensure that all residents

---

[152] Nic Fildes & Tom Wilson, *Vodafone Targets Africa's Unbanked with Ambitious Plans for M-Pesa*, FIN. TIMES (Dec. 17, 2019), https://www.ft.com/content/c2bd2a8e-e07d-11e9-9743-db5a370481bc. [https://perma.cc/V3CV-KRMR].

have access to a costless and easy to verify identification method that can serve as a gateway to a multitude of services.

D. Credit Histories as Part of a CBDC Technology Stack

One could certainly imagine a situation that would extend the Aadhaar concept even further. For instance, the Aadhaar concept could be used to provide a financial institution not only with a verification of an individual's identity but could also supplement this with a credit history. This would mark a considerable change in how financial institutions could assess creditworthiness since the costs of assembling this information would be reduced, and with a distributed ledger supporting the system that could track one's payment history through a CBDC, one could form a more complete and accurate profile of an applicant to use in assessing credit risk.[153]

The notion of having the existing private credit bureaus replaced with a publicly administered registry is not new – in fact President Biden proposed such an initiative during the 2020 Presidential Election.[154] One of the rationales for this proposal is the fact that existing practices in the credit reporting industry have resulted in numerous distortions in the information that is provided. As noted in a FTC study, over one in five consumers have an error on their credit report, and one in twenty have a serious error on their credit report that would result in either credit denial, or force a consumer into paying a higher price for credit.[155] Moreover, credit bureaus have been criticized for not taking consumer complaints seriously since it is easier to farm out accuracy reinvestigations to foreign affiliates rather than conducting these investigations in house.[156] One set of commentators have even gone so far as to allege that this is done deliberately in order to add another layer of corporate separation to make it harder to be sued.[157]

Moving to a public credit registry would result in the development of algorithms that would diminish the legacy of built in discrimination present in the status quo and would help to make credit registries more secure and offer a

---

[153] *See* DON TAPSCOTT & ALEX TAPSCOTT, BLOCKCHAIN REVOLUTION: HOW THE TECHNOLOGY BEHIND BITCOIN IS CHANGING MONEY, BUSINESS AND THE WORLD (Portfolio Penguin. 2016).
[154] Ed Mierzwinsky, *Should We Fire the Big 3 Credit Bureaus?*, U.S. PUB. INT. RSCH. GRP. (Dec. 11, 2020), https://uspirg.org/blogs/eds-blog/usp/should-we-fire-big-3-credit-bureaus. [https://perma.cc/BA9S-J3RJ].
[155] FED. TRADE COMM'N, *In FTC Study, Five Percent of Consumers Had Errors on Their Credit Reports That Could Result in Less Favorable Terms for Loans* (Feb. 11, 2013), https://www.ftc.gov/news-events/news/press-releases/2013/02/ftc-study-five-percent-consumers-had-errors-their-credit-reports-could-result-less-favorable-terms [https://perma.cc/B96W-BGW7].
[156] Mierzwinsky, *supra* note 154, at 3.
[157] *Id.*

publicly accountable way to resolve disputes.[158] They could also restrict the use of personal credit information for non credit purposes such as employment credit checks.[159] Moreover, a public registry on its own can bring about significant efficiency gains. This takes the form of more accurate information that can be corrected much faster than the present system allows, and which therefore results in more efficient allocations of credit free from inaccuracies and built-in biases, that unjustly exclude individuals who may not pose a significant credit risk, from accessing credit.

The fact that this information can be accessed publicly also results in greater opportunities for monitoring by individuals to ensure that information is corrected quickly. If linked to a distributed ledger, this system could also assist in mitigating security risks such as identity theft for instance, by automatically updating all governmental and credit reporting databases instantly to alleviate the effects of fraud on an individual's creditworthiness. Second, a public registry could be run on a cost recovery basis that would help lower the costs associated with the existing system that charges economic rents for those seeking to utilize this information. This itself would help to significantly reduce transaction costs associated with granting credit.

However, as has been emphasized above, public policy makers would be remiss if they were to view these proposals as being restricted solely to improving access to credit. When viewed as part of the payments infrastructure, one can begin to understand how a credit registry can find even greater utility. For instance, as the Aadhaar example demonstrates, the payment history that can be tied to an individual can be even more comprehensive than the status quo which relies on creditor reporting in order to compile credit information.[160] Even more importantly, the interoperability that is made possible by tying credit histories to the payment system results in higher levels of utility to be reached.[161] Again, the more comprehensive the information that is contained in the registry becomes, the more efficiently the credit market can operate.

The integration of this information in a publicly administered CBDC that maintains a similar "information rail" as that found in the Aadhaar example, will help to support lending activities and provide individuals with greater access to cheaper credit that results from the efficiency gains and more accurate information afforded by such a system.[162] Moreover, the AML and KYC functions in existing systems could also experience significant cost reductions if

---

[158] Amy Traub, ESTABLISH A PUBLIC CREDIT REGISTRY, DEMOS 3 (Apr. 3, 2019), https://www.demos.org/sites/default/files/2019-03/Credit%20Report_Full.pdf [https://perma.cc/ZC8L-4DMJ].

[159] *Id.*

[160] *See* Jonathan Weinberg, *"Know Everything That Can Be Known About Everybody": The Birth Of The Modern Credit Report*, 63 VILL. L. REV.431 (2019). (Outlining the historical development of credit reporting).

[161] Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trillema*, 107 GEO. L. J. 235, 278 (2019).

[162] *See* Giullio Prisco, *Polish Credit Office to Deploy Blockchain Solution for Credit Histories*, BITCOIN MAG. (May 15, 2018), https://bitcoinmagazine.com/articles/polish-credit-office-deploy-blockchain-solution-credit-histories/ [https://perma.cc/B63G-AFN5].

the information that is tied to the provision of a CBDC contains a more accurate and complete payment profile of an individual or entity than is presently possible. However, in order to maximize the potential efficiency gains from a CBDC, policy makers will be wise to avail themselves of the opportunity to reassess and modernize the functions played by institutions and regulatory agencies in order to reimagine the payment system to encompass activities that nowadays can be considered indispensable to a modern economy.

IV. ADDRESSING SHORTCOMINGS IN CBDC MODELS

For a Central Bank to assume this role, there will undoubtedly be a number of hurdles and challenges that must be overcome. After all, if there already is considerable resistance among Central Bankers about assuming a front facing role in the provision of direct retail banking services to consumers, how will this trepidation be overcome with respect to running a credit bureau facility that is arguably much more remotely detached from a Central Bank's functions than retail banking is? Making the transition to provide a public equivalent to simplify one of these functions could take years and will undoubtedly have a number of unforeseen issues arise (without even considering some of the technical ones that arise to a DLT-based CBDC for instance), let alone contemplating two concurrently. Moreover, will a move into these aforementioned areas detract from the core mission of a Central Bank to pursue monetary policies that promote full employment while keeping inflation at manageable levels?

There are no easy answers to these questions. However, one should recall that the status quo at this point is not sustainable. The fact remains that as retail banking becomes more sophisticated, and has an increasing reliance on fintech products, many of which are creating new media of exchange that threaten to undermine the hegemony of fiat currencies, it will force Central Banks to find ways to reassert this hegemony or risk ceding control over domestic monetary policy to third parties.[163] These third parties will be free to operate without the constraints of remaining accountable to a domestic electorate and may be located in jurisdictions where regulation may be difficult to enforce.[164] Moreover, the costs of additional AML and KYC compliance can be expected to increase well into the future. These costs will place additional pressure on private financial institutions who may be forced to respond by either increasing service fees for existing customers, or by severing ties with less profitable ones.

Here, we find ourselves full circle once again, as these measures will place additional pressure on governments to increase financial inclusion and find a way of reducing transactions costs for those bank customers who are still able

---

[163] Kianieff, *supra* note 7, at 26, 32, and 35.

[164] Muharem Kianieff, *Show Me The Money! A Critical Evaluation of Laissez-Faire Internet Currencies*, 17 BANKING AND FIN. L. R. 216, 227 (2001).

to access their bank's payment facilities. Consider the fact as well that as other countries embrace a direct CBDC model, the status quo will begin to look more and more inefficient by comparison, particularly in those countries that will be able to provide their citizens with lower cost access to basic financial services, and cheaper alternatives in making cross border payments.

A. CBDC Management in a Separate Branch of the Central Bank to Protect Privacy

In making the choice to embrace a CBDC, a Central Bank need not view the decision as one that will necessitate the Central Bank's open market operations being expanded to cover a CBDC service. For instance, one possible avenue for consideration is whether a CBDC could be managed by a separate governmental agency that is at arm's length from the Central Bank. This would have the added benefit of allowing the Central Bank to appear more apolitical in advancing its mandates. In Canada for example, there is a public purpose, non-profit organization, *Payments Canada*, that is empowered by federal legislation to oversee the payment rail infrastructure, operate a high value payments system that settles in real time and develop the rules and frameworks that underpin these.[165]

Alternatively, having the management of a retail payment system delegated to a new branch of the Central Bank whose primary function would be to manage a CBDC completely separate from the monetary policy side would accomplish a similar result. Indeed, an Ethical Wall or Cone of Silence approach where the CBDC operations would be isolated from the conventional operations of the Central Bank would serve to help reinforce the notion in the eyes of the public that appropriate precautions can be taken to safeguard user privacy. This is crucial to supporting user confidence that participating in a Direct CBDC will not subject the user to unnecessary scrutiny that they would not normally face in the present monetary system.[166]

Unfortunately, some of the comments from regulators are not particularly encouraging in this regard. For example, recent reports in the Canadian media have provided some insights into the Bank of Canada's views on the opportunities that are presented by CBDCs. One such report was based upon a *Freedom of Information Act* request to access the materials that were used in a private presentation of CBDC models to Bank of Canada officials.[167] The presentation notes that one of the attractive features of a CBDC is that more information can be collected about individuals than is possible with cash and that "personal details [would] not [be] shared with payees, but could be shared

---

[165] PAYMENTS CANADA, *Who We Are* (2017) (last visited Oct. 7, 2023), https://www.payments.ca/about-us/who-we-are [https://perma.cc/V8Z8-APZE].

[166] Corrine Zellweger-Gutknecht, et al., *Digital Euro, Monetary Objects and Price Stability: A Legal Analysis*, 7 J. FIN. REGUL. 285 (2021).

[167] Zane Schwartz, *Bank of Canada exploring digital currency that would replace cash, track how people spend money*, FIN. POST (Oct. 15 2019), https://business.financialpost.com/technology/blockchain/bank-of-canada-exploring-digital-currency-that-would-replace-cash-track-how-people-spend-money. [https://perma.cc/JGM4-8MCE].

with police or tax authorities."[168] Certainly, this is a feature that is bound to appeal to regulators, particularly those who are interested in frustrating efforts aimed at facilitating money laundering, terrorist financing and tax evasion. Moreover, to be fair, while these sentiments may be expressed at a preliminary stage, they could be viewed as simple musings rather than explicit policy aspirations.

However, the fact that these considerations are being contemplated is evidence that shows that appropriate safeguards need to be taken in order to get the balance right between thwarting crime and preserving individual privacy.[169] A necessary element of preserving this balance lies in appropriate checks and balances that serve to reassure citizens that a CBDC is committed to preserving individual privacy. Indeed, the Ethical Wall approach described above could be an ideal setting for achieving this goal by ensuring that information that is entrusted to a CBDC administrator is to be kept confidential and not shared with other elements of the government without a judicial warrant. Here again, the Indian experience with Aadhaar is instructive, as one of the major features of the information rail is a robust legal regime that serves to protect consumer privacy and boost confidence in the system.[170] Moreover, this issue is likely to become more urgent if the existing credit registry system is left in private hands where new advances in Artificial Intelligence threaten to encroach on individual privacy rights.[171]

Furthermore, if an indirect model were to be deployed with a reliance on private credit reporting, there may remain an issue with respect to the robustness of existing credit reporting systems to withstand repeated hacking attempts. This is particularly the case since all of the databases where this information is kept is typically in a central location where it is prized by hackers.[172] As such, from a security perspective, additional precautions must be taken regardless of whether one employs an Indirect, Hybrid or Direct CBDC model. One of the

---

[168] *Id.*

[169] Allen, Capkun, Eyal, Fanti, Ford, Grimmelman, Jules, Kostiainen, Meiklejohn, Miller, Prasad, Wüst & Zhang, *supra* note 78, at 71; *See also* Andrew Bailey, *Reinventing the Wheel (with more automation)*, BROOKINGS INST. (Sept. 3 2020), https://www.bankofengland.co.uk/-/media/boe/files/speech/2020/reinventing-the-wheel-with-more-automation-speech-by-andrew-bailey.pdf?la=en&hash=6B5DE50DC09345C4D88FA9BF6CC1F660CA742FD4. [https://perma.cc/LY7Q-FFDL].

[170] D'Silva, Filkova, Packer & Tiwari, *supra* note 114, at 23; *See also* Leena Datwani & Anand Raman, *India's New Approach to Personal Data Sharing*, CGAP (July 2020), https://www.cgap.org/sites/default/files/publications/2020_07_Working_Paper_India_New_Approach_Personal_Data_Sharing.pdf. [https://perma.cc/4VPY-J8AB].

[171] David Lazarus, *Equifax and FICO are getting in bed with each other. 'This should keep everyone up a night.'*, L.A. TIMES (Apr. 9, 2019), https://www.latimes.com/business/lazarus/la-la-fi-lazarus-equifax-fico-big-data-gets-bigger-20190409-story.html [https://perma.cc/4L8H-QHFC]

[172] Allen, Capkun, Eyal, Fanti, Ford, Grimmelman, Jules, Kostiainen, Meiklejohn, Miller, Prasad, Wüst & Zhang, *supra* note 78, at 45.

benefits of having a credit reporting facility as part of a Direct CBDC is that attempts to encroach consumer privacy rights that result from a desire to monetize big data, is significantly reduced. Further, if it were to employ a permissioned DLT infrastructure to support the system, a Central Bank could mitigate against the potential that sensitive customer information could be hacked or tampered with on a similar scale to that which recently transpired with Equifax.[173]

Once again, the question of expertise remains in doubt. Would a Central Bank be expected to be well-versed in data hygiene best practices to ensure that it does not retain more information than necessary? Second, how would data collection assist with a direct model where AML functions are carried out directly by the Central Bank? Would a Central Bank be able to offer advantages that could not be offered by the private sector? These questions will be examined briefly below.

With respect to data privacy practices, the fact that the system will be deployed ab initio presents a unique opportunity. Rather than having to adapt the system to existing practices, the system can move directly to espousing the most recent best practices. These will be backed by some of the strongest regulations and will help to manage consumer expectations. One could even look to rigorous data privacy regulations and regimes, such as the General Directive on Privacy Rights in the European Union, as a starting point for developing a robust legal regime that can underpin the development of a Direct CBDC model. As the Aadhaar example demonstrates, the legal regime plays a crucial function in enhancing public acceptability which will allow a CBDC to reach a critical mass.

With respect to the AML aspect described above, moving to a Direct CBDC model would offer a few advantages vis-à-vis the status quo. For one, the status quo at the present does not show any signs of mitigating the costs associated with AML and KYC. The fact that data has to be gathered from many diverse sources in order to provide government officials with a complete transaction history with which to combat money laundering is a daunting task. This is made even more difficult considering that the rise of cryptocurrencies that could be located offshore and who may refuse to comply with domestic regulations. A Direct CBDC would have access to complete payment profiles that in theory, would make an analysis of data more comprehensive as a result since much of this information would be easier to access than the present. While cryptocurrencies may prove to be a challenge, offering a similar level of functionality with the added protection of legal regimes and mechanisms for insuring accountability will significantly undermine the business case for relying on cryptocurrencies for most individuals.[174] Moreover, the on and off ramps to cryptocurrency exchanges could be more closely monitored to detect the

---

[173] *See* Charlie Warzel, *Chinese Hacking is Alarming. So Are Data Brokers*, N.Y. TIMES (Feb 10, 2020), https://www.nytimes.com/2020/02/10/opinion/equifax-breach-china-hacking.html [https://perma.cc/KUR6-ZVMR] (explaining the Equifax data breach).

[174] Crawford, Menand & Ricks, *supra* note 30, at 152.

movement of illicit funds into and out of cryptocurrencies to further hinder the ability to utilize cryptocurrencies as conduits for fraud or crime.[175]

Another means by which costs could be reduced, not only with respect to AML compliance, but also with respect to overall transactions cost reductions comes in the form of increasing returns to scale that would be offered by a Direct CBDC. The costs of administering the system would be spread out over a larger base than the status quo and could even be provided free to end users by relying on seigniorage income.[176] The increasing returns to scale could also see increasing efficiencies owing to a reduction in duplicative AML reviews that presently take place over the fragmented institutional base of the status quo.[177] Indeed, the Central Banks themselves have recognized that any efficiency gains offered by a CBDC model simply as a payment system, would be negligible on its own. Rather in order to realize the full range of efficiency advantages that would be realized from a CBDC, this regime would have to be linked to a digital identity system.[178] Given the fact that Central Banks have acknowledged this, one can expect that this feature will become more prominent as the CBDC proof of concept is further developed and refined. This identity system could be leveraged to encompass credit histories that would generate further increasing returns to scale.

To be sure, deciding who we will trust to manage our identity varies with the country under consideration.[179] This could include government, regulated financial institutions, or tech companies for instance, to manage the data component of a CBDC as is proposed in the Indirect and Hybrid CBDC models.[180] Here again though, a legal regime that respects individual privacy rights while frustrating crime, is crucial in bolstering public acceptability. The inherent danger in delegating credit reporting functions to a private entity is ensuring that parties are held accountable for breaches. The issue becomes compounded when attempting to regulate entities incorporated abroad, or that become "too big to fail." Indeed, these entities could force the public to accept compromises in privacy regulation (by either allowing them to escape enforcement actions or by allowing certain offending practices to continue)

---

[175] Chris Brummer, *99 Problems*, Written Testimony of Chris Brummer before the United States House of Representatives, Committee on Financial Services, (July 18 2018), https://financialservices.house.gov/uploadedfiles/hhrg-116-ba00-wstate-brummerc-20190717.pdf. GEORGETOWN LAW *At* 10. [https://perma.cc/64K9-6EUY].

[176] EUR. CENT. BANK, *supra* note 59, at 19. (each individual financial institution provides services to a subset of the general population).

[177] Crawford, Menand & Ricks, *supra* note 30, at 163.

[178] BANK FOR INT'L SETTLEMENTS, *supra* note 39, at 12-13; *See* Izabella Kaminska, *Why CBDCs will likely be ID-based*, FIN. TIMES (4 May 2021), https://www.ft.com/content/88f47c48-97fe-4df3-854e-0d404a3a5f9a. [https://perma.cc/WJ5T-B97W].

[179] Kaminska, *supra* note 178.

[180] *Id.*

when faced with a crisis in confidence.[181] For example, could a government move to enforce a high level of privacy regulations on entities the size of Facebook or X (formerly Twitter) where identification services could be presented to a Central Bank that is dependent on these services on a take it or leave it basis?

In contrast, keeping the data regime under public control would ensure that authorities would not be trying to regulate an enormous entity that is located in a foreign jurisdiction once it has reached the "point of no return" as it were. Moreover, there is also a question of scale when it comes to making the necessary investments to ensure that the technological infrastructure can keep up with new technological advancements that could result in data breaches or that compromise data. With a central authority managing these systems, these costs, in theory, could be amortized over the entire monetary base on a cost recovery basis. It is unclear whether the private sector could achieve similar returns to scale given its difficulty in controlling costs under the status quo, and one has to wonder whether or not the necessary investments that must be made will not be marked up with additional fees that contribute to the financial tolls that Professor Ricks and his co-authors describe. Again, time will tell whether this will be the case, however policy makers are urged to consider these issues at the outset before a system is deployed so as to minimize the potential turbulence that could result by having these issues remain unresolved.

B. The Impact of CBDCs on the Business of Banking

The development of a CBDC and the new paradigms that it will entail, brings us to another point of no return of sorts. This time, the question pertains to how private banks will fit into the overall scheme of a CBDC proposal. In particular, if a Direct CBDC model were adopted that would essentially replace the use of banks as savings depositories and payment providers for large segments of the population, will this not negatively affect a bank's ability to lend and result in restrictions in the supply with a potential for negative impacts on economic growth?[182] Moreover, will a Direct CBDC leave a large part of the economy in public rather than private hands? These questions will be examined in turn.

Without question, a move to a Direct CBDC will result in a substantial decline in a bank's supply of consumer deposits. One of the criticisms and fears of a move to a pure Direct CBDC model is that this will result in a reduction in credit intermediation as a result of the loss of these funds.[183] The fear is that if

---

[181] Kianieff, *supra* note 7, *at* 29–47.

[182] BANK FOR INT'L SETTLEMENTS, *supra* note 39, at 8; *See* BANK FOR INT'L SETTLEMENTS, *Central Bank Digital Currencies: Financial Stability Implications* 17 (Sept 30, 2021), https://www.bis.org/publ/othp42_fin_stab.pdf. [https://perma.cc/4MTP-5LUX].

[183] Bejoy Das Gupta, Burkhard Drees & Carol Marina Tojeiro, *We Are Not in Kansas Anymore: Key Drivers, Policy Questions and Design Considerations for Retail Central Bank Digital Currencies*, WHITEPAPER (Aug. 31, 2020), https://financelawpolicy.umich.edu/sites/cflp/files/2021-10/das-gupta-drees-marina-tojeiro-we-are-not-in-kansas-anymore-key-drivers-policy-

a bank were to compete with an interest bearing CBDC, a bank's funding costs will rise, thereby pushing up their lending rates and making the availability of credit scarcer for consumers.[184] Moreover, it is argued that moving funds away from private institutions towards Central Banks will force Central Banks to assume the role of an investor in the private economy, a role that it is not set up for.[185]

These fears ignore the facts that even if a CBDC was not introduced, existing trends in the status quo demonstrate that banks are moving away from consumer deposits as a source of capital funding. In 2019 demand deposits in the United States amounted to approximately two percent of the total credit volume.[186] Moreover, they have also noted that there has been a secular trend towards enhanced lending by non-bank financial institutions and a correspondingly diminished role for banks.[187] This is a similar argument made by CBDC sceptics, and one would expect that these trends would result in a diminished availability of credit in the economy, which thus far has not been the case.[188]

However, in the interim, a Central Bank can still mitigate the shift away from bank deposits to CBDCs without having to become an outright investor in the economy. A Central Bank could extend discount window loans in order to offset the shortfall in lost deposit balances.[189] Here it is argued that bank balance sheets would stop shrinking. The only difference that banks would experience to their position would be a change in the composition of their asset base from bank deposits to a greater proportion of discount window borrowings rather than a change in aggregate amounts.[190] It has been argued that this development would not result in any restrictions in loaning by banks. Nor should it raise the costs of borrowing for consumers since it is argued that bank lending decisions are influenced by the marginal cost of funds or the Central Bank discount rate rather than the average cost of funds.[191]

---

concerns-design-considerations-retail-CBDCs%20%282020%29.pdf [https://perma.cc/R7XE-4X89]; *See* Raphael Auer & Rainer Böhme, *Central Bank Digital Currency: The Quest for Minimally Invasive Technology*, Bank for International Settlements (8 June 2021), https://www.bis.org/publ/work948.pdf [https://perma.cc/48W2-Q8DB].

[184] Gupta, Drees & Tojeiro, *supra* note 183, at 3.

[185] Auer & Böhme, *supra* note 183, at 7.

[186] Gupta, Drees & Tojeiro, *supra* note 183, at 3.

[187] *Id.*

[188] *Id.* at 5.

[189] Crawford, Menand & Ricks, *supra* note 30, at 143.

[190] *Id.*

[191] *Id*. at 148; *See* David Andolfatto, *Assessing the Impact of Central Bank Digital Currencies on Private Banks*, FED. RSRV. BANK ST. LOUIS 16 (Apr. 22, 2020), https://s3.amazonaws.com/real.stlouisfed.org/wp/2018/2018-026.pdf [https://perma.cc/LJ6W-PTSN].

As Patrick Honohan, the former Governor of the Central Bank of Ireland, notes, commercial banks may have additional options at their disposal.[192] For instance, they could issue bonds to make up for the decline in retail deposits.[193] A Central Bank could also assist them by loaning their holdings of CBDC deposits back to commercial banks.[194] This would have the added benefit of shifting the risks of a bank failure from depositors to the Central Bank.[195] Governor Honohan argues that this may be a preferable outcome since Central Banks are in a better position to mitigate these risks since they have access to more information than ordinary depositors.[196]

Many of these details will undoubtedly have to be considered at the design stage and observed in the implementation phase to consider the effect of moving towards a retail CBDC concept. It is worth remembering that the evolution of Central Banking is also accompanied with evolutions in the banking industry. We cannot assume that simply because the banking industry has been dependent on consumer deposits over the last few decades, that this will remain the case in the future. As was noted above, the movement away from retail deposits is already taking place.

However, it is worth bearing in mind that not so long ago in North America, the discounting of bills and notes performed a function similar to that performed by retail deposits today. This was coupled with the issuance of private banknotes in the well-known historical phenomena known as Wildcat Banking in the United States.[197] As the case was made for the assumption of the note issuing power by the United States federal government at that time, a similar evolution may be making the same case today. While Wildcat Banking did provide people with a paper currency, they had serious drawbacks such as the fact that they did not circulate at par which made their use very inefficient.[198]

Moreover, it is worth considering that as Central Banking evolves, similar evolutions have and will continue to occur on the private sector side. As was noted above by the Digital Dollar foundation, banks have a multifaceted

---

[192] HOUSE OF LORDS ECON. AFFS. COMM., *Central Bank Digital Currencies: A Solution in Search of a Problem* 28 (2022), https://publications.parliament.uk/pa/ld5802/ldselect/ldeconaf/131/131.pdf [https://perma.cc/NK2E-YAKU].

[193] *Id.*; *See* Sergey Sarkisyan, *Central Bank Digital Currency: Will Banks Survive?*, SSRN (4 August 2022), https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID4202690_code4411399.pdf?abstractid=4176990&type=2. [https://perma.cc/2LT6-5RWX].

[194] HOUSE OF LORDS, *supra* note 192, at 28.

[195] *Id.*

[196] *Id.*

[197] *See* ALONZO BARTON HEPBURN, A HISTORY OF CURRENCY IN THE UNITED STATES: WITH A BRIEF DESCRIPTION OF THE CURRENCY SYSTEMS OF ALL COMMERCIAL NATIONS (McMillan. 1915); WILLIAM J. SHULTZ & M.R. CAINE, FINANCIAL DEVELOPMENT OF THE UNITED STATES (Prentice-Hall, Incorporated. 1937); ARTHUR NUSSBAUM, A HISTORY OF THE DOLLAR (Columbia University Press. 1957); JAMES WILLARD HURST, A LEGAL HISTORY OF MONEY IN THE UNITED STATES, 1774-1970 (University of NEBRASKA PRESS. 1973); THOMAS F. WILSON, THE POWER "TO COIN" MONEY: THE EXERCISE OF MONETARY POWERS BY THE CONGRESS (M.E. Sharp. 1992).

[198] Ali Khan, *The Evolution of Money: A Story of Constitutional Nullification*, UNIV. CIN. L. REV. 393 (1999).

relationship with their customers beyond merely providing payment mechanisms–for instance offering loans to their customers or wealth management services. Some institutions may find it desirable to retain custody of their customers deposit balances and could offer value added services and inducements to retain them. Indeed, although it may seem like a distant memory for some, not so long ago, banks paid their customers interest on their deposit holdings and did not charge them fees to access their money! Sarcasm aside, it would be a mistake to assume that while changes are taking place on the Central Bank side of the equation, that the retail banking side will remain static. New evolutions will take place in bank business models as well as banks find ways to offer their customers value for money for a suite of services that will constitute the next phase in the banker customer relationship.[199]

C. Geopolitical Considerations

The fact remains that not taking action for fear of disrupting the financial system or overburdening our Central Bank infrastructure is not sustainable in the long run unless steps are taken that would curtail KYC and AML regulations and this option is politically unrealistic, particularly in light of recent geopolitical events. Indeed, one would note some recent comments from the UK House of Lords that emphasize additional geopolitical considerations.[200]

Their Lordships noted that one of the primary motivations in developing a CBDC in many countries is a desire to avoid United States sanctions or reduce their reliance on the US Dollar.[201] This is particularly the case with Russia who was responding to sanctions levied at the time of the Invasion of Crimea in 2014.[202] These geopolitical considerations are adding a further impetus to the creation of a CBDC in developed economies. A failure to act will result in the undermining of the international financial order as we know it and have wide ranging repercussions beyond the economy and financial system. Simply put, doing nothing is no longer a viable long-term option.

Even without the challenges posed by recent geopolitical events, the present state of the status quo may end up forcing the hands of policymakers.

---

[199] Andolfatto, *supra* note 191, at 16–17.

[200] HOUSE OF LORDS, *supra* note 192, at 34. In a recent report that addressed the issue of whether the UK ought to adopt a CBDC, their Lordships had this to say: In the long term, the Atlantic Council has said that the lack of American-led innovation with interoperable CBDC mechanisms for cross-border trade could "begin to erode the dollar's hegemony and replace the use of SWIFT, thereby reducing US sanctions leverage." It said, "similar effects could occur for currencies such as the pound or euro if relevant authorities fail to innovate." Tom Keatinge warned of a world where states might have to choose between payment systems dominated by either the US or China – "whether you want to be part of the Chinese walled garden or part of the United States walled garden." [footnotes omitted]

[201] *Id.* at 33.

[202] *Id.*

After all, should present trends continue, we may witness a change from the traditional developers of new financial products, the financial institutions, to tech companies and subsidiaries of payment service providers.[203] This change itself could also force Central Banks to issue a CBDC since the effects on monetary policy may end up too large to ignore.[204] Perhaps more importantly, we have yet to see any advancement either on the regulatory side or on the technological side that will significantly halt the rapid increases in AML and KYC costs that financial institutions have experienced over the past few years. In other words, even the private sector itself has found considerable difficulty in addressing the challenges of rising AML and KYC costs, and as fintech products become more widespread, and more sophisticated, we can expect that these increases will persist in the short and medium terms.

V. CONCLUSION

Policy makers would be well advised to use this opportunity to reconsider how to increase both efficiency in the payment system and to make our financial system more accessible for all (which will also increase efficiency). Rather than simply creating a digital equivalent of banknotes that is designed to replicate the existing financial order, policy makers need to re-evaluate the role that banknotes play as a payment mechanism and as the underpinning of deposit accounts, checks, debit cards and various other payment devices in our economy. As was the case with private banknotes, checks, wholesale payments, wire payment etc., increasing economies of scale may necessitate that the Central Bank assume or coordinates some of these activities, as it has done so in the past. While success is not assured by any means, the same was also true in the past when government assumed these functions.

It bears repeating that a holistic approach as described above, will allow Central Banks to leverage all of the efficiencies that can be brought to the payment system by updating the technology used and the legal framework that serves as its foundation. This requires policy makers to incorporate a stack of interoperable suites that provide identity verification, credit histories and a secure payment mechanism that first and foremost, protects consumers, offers them privacy and strikes an appropriate balance in providing law enforcement with the tools that they need to combat crime. These innovations cannot exist only virtually, but as recent research has shown, may require a physical presence as well in order to fully reduce transactions costs for consumers. On the private sector side, financial institutions will have to ensure that they offer consumers a solid value proposition, however one cannot assume that the technological and regulatory changes described above will not be reflected in innovations in the financial and tech sectors. These evolutions will undoubtedly bring us some uncertain times that will require a great deal of courage to upend existing

---

[203] Markus K. Brunnermeier & Harold James., *The Digitization of Money*, PRINCETON UNIV. SCHOLAR'S PORTAL 15 (Aug 2019), https://scholar.princeton.edu/sites/default/files/markus/files/02c_digitalmoney.pdf [https://perma.cc/BFP8-C22U].

[204] *Id.* at 7.

practices. However, the opportunities that may present themselves if this is properly executed, make this a risk that is well worth taking in the long term.